

**TRUST AND TECHNOLOGY ADOPTION IN AUSTRALIAN
AGRIBUSINESS SUPPLY CHAINS: A GAP ANALYSIS APPROACH.**

A dissertation submitted by

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In partial fulfilment of the award of

Doctor of Business Administration

Faculty of Business, University of Southern Queensland

2006

ABSTRACT

Australian agribusiness supply chains make an important contribution to the Australian economy. Highly cohesive supply chain partnerships between the sectors from the farm gate to the retailers and restaurants of Australian agribusiness are essential for continued sustainable growth in Australian agribusiness. Trust and technology adoption have been identified as critical success factors in supply chain management. This research has investigated the *level* and *importance* of the factors of trust and technology adoption focusing on the Australian meat and horticulture industry supply chains. The term *level* relates to the perceived performance level and the term *importance* relates to the expected performance level for the factors of trust and technology adoption used in this research. The study has set about to identify the *critical gaps* between the *level* and *importance* for the factors of trust and technology adoption in the Australian meat and horticulture industry supply chains. The research also investigated other important success factors relating to partnership, technology, government, outsourcing and traceability in the Australian agribusiness supply chains. In this research 36 cases studies were undertaken through face-to-face interviews with senior managers from the respective case study organisations. The research has shown the meat and horticulture industry supply chain rated the factors of trust and technology adoption of high *importance*. However research revealed that the *level* of trust and technology adoption was lower than the *importance*, presenting *gaps* in most of the factors of trust and technology adoption. Across both these industries there were eight *critical gaps* for the factors of trust which were ‘Information sharing’, ‘Reliability’, ‘Timeliness’, ‘Customisation’, ‘Work standards’, ‘Shared values’, ‘POS information’ and ‘Honesty and Integrity’. There were three *critical gaps* identified in technology adoption, which were ‘Relative advantage’, ‘Traceability’ and ‘Trialability’. The conclusions from this research for the managers of the sectors in the Australian agribusiness supply chain are (a) there is a need to assess the differences between the *level* and *importance* of trust and technology adoption to identify the *critical gaps* in the supply chain and (b) *critical gaps* in trust and technology adoption need to be eliminated or diminished to improve Australian agribusiness supply chains. From a theoretical perspective this research provides managers in the Australian agribusiness supply chain with a framework for creating strategies to eliminate or diminish the *critical gaps* for the factors of trust and technology and improve the cohesion between supply chain partners.

CERTIFICATE OF DISSERTATION

I certify that the ideas, case study work, results, analyses, software, and conclusions reported in this dissertation are entirely my own efforts, except where otherwise acknowledged. I also certify that the work is original and has not been previously submitted for another award, except where otherwise acknowledged.

Signature of Candidate

Date

ENDORSEMENT

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ACKNOWLEDGMENTS

This dissertation would not have been possible without the considerable support from academic supervisors, business colleagues, contributing participants, my family and friends.

I would like to sincerely thank my supervisors, Dr. Latif Al Hakim and Dr. Heather Maguire for their academic knowledge, judicial recommendations, and invaluable insights. I would also like to thank them for their patience, guidance and encouragement. Furthermore, I would like to acknowledge Professor Ronel Erwee for her guidance and involvement throughout.

The case study research undertaken in this dissertation would not have been possible without the generous time provided to me by the senior executive management of the organisations that agreed to take part in this research. I would like to express my deepest appreciation and gratitude to these organisations for their willingness to share their views on the factors of trust and technology adoption, pertaining to Australian agribusiness supply chains.

I would like to thank the readers and my editor Caitlin Gahan for proof reading various drafts of this dissertation for improving its quality.

On a more personal note, I would like to thank my late father-in-law Peter for his camaraderie and mentoring. To Christina and Rita thank you for your dedication and support of us all. A heart-felt expression of gratitude goes to Vivien for her enduring benevolence. To the two Rosemarys a special thank you for their belief and encouragement.

Furthermore I would like to thank my sons for their patience and forbearance over the time of this study. I would also like to say to my sons and my daughter, “dare to dream because dreams can become reality if you work at them”. In memory of my late mother and father, Beatrice and Frederick Paterson.

Finally, neither the commencement, nor the completion, of my university studies and this dissertation would have been possible without the selflessness, generosity, consideration and sacrifices made by my wife, Sonja. For the duration, she supported, encouraged and emotionally empowered me when all else was failing.

I dedicate this to her.

For Sonja.

LIST OF ABBREVIATIONS

ABARE	Australian Bureau of Agriculture and Resource
ABC	Australian Broad Casting Commission
ABS	Australian Bureau of Statistics
ALFA	Australian Lot Feeders Association
AMIC	Australian Meat Industry Council
AUF	Australian United Fruit and Vegetable Association Ltd
AWBC	Australian Wine and Brandy Corporation
CCA	Cattle Council of Australia
DAFF	Department of Agriculture, Forestry and Fisheries
DFAT	Department of Foreign Affairs and Trade
DPIE	Australian Department of Primary Industry and Energy
EAN-UCC	European Archival Network - Uniform Code Council inc
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organisation of United Nations
HAL	Horticulture Australia Limited
MLA	Meat and Livestock Australia
MSA	Meat Standards Australia
NLIS	National Livestock Identification System
QDPIE	Queensland Department of Primary Industry and Energy
RFID	Radio Frequency Identification
SPSS	Statistical Packages for Social Science
USDA	United States Department of Agriculture

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CHAPTER ONE - INTRODUCTION

1.0 INTRODUCTION

Australian agribusiness supply chain partnerships have been recognised as the vibrant economic lifeblood of regional and urban Australia. These supply chains have been part of the legend of the Australian Heritage known as the 'Great Australian Outback'. For many decades the supply chain partners in the Australian agribusiness supply chain have made a significant contribution to the economic wealth of Australia. A number of the brands and products, which are part of today's agribusiness supply chain partnerships, have become internationally recognised as Australian icons. In the 1950s it was said, 'Australia rode on the sheep's back' when that industry alone contributed 56 percent of the total value of production of all Australian agricultural industries (ABS 2000, p. 447).

Direct agriculture in this country manages and uses approximately 70 percent of Australia's stored water and almost 60 percent of Australia's suitable agricultural land (ABS 2006, p. 405). Establishments with agricultural activity in Australia in 2004 represented land holdings of 440.1 million hectares, 57 percent of Australia's total land area (ABS 2006, p. 406). The direct contribution from agriculture in 2003-4 was three percent of Australia's GDP (ABS 2006, p. 405) considerably less than in the 1950s when agriculture contributed 15 to 20 percent of Australia's GDP (ABS 2000, p. 447). The Australian economy has diversified over this time, with mining, manufacture and the services industries reducing the relative share of GDP contributed to the Australian economy by agriculture. However, Australian agribusiness supply chains remain extremely important to the Australian economy. The combined sectors in the Australian agribusiness supply chain, from the farm gate to the retailers and restaurateurs, contributed an average over six years of 12.1 percent 2003-04 of the national GDP (Econtech 2005, p. 21). This national GDP figure of 12.1 percent demonstrates the critical part Australian agribusiness supply chain partnerships play in the economic, social and environmental fabric of Australian society.

To maintain and build strong supply chain partnerships, two critical success factors must exist between supply chain partners; These are trust and technology adoption

(McGregor 2002; Petersen, Cornwell & Pearson 2000). In order to compete against other supply chain networks in the international market, it is vital in today's ever-changing business environment that Australian agribusiness supply chains hone their skills to the highest level for the factors of trust and technology adoption.

For Australian agribusiness supply chain partnerships to achieve the highest levels of trust and technology adoption necessary they must first evaluate the *level* and *importance* of trust and technology adoption factors within their supply chain. From the farm gate to the retailers and restaurants, supply chain partners in these sectors need to assess the difference between the perceived *level* and *importance* of trust and technology adoption in the supply chain. The outcome of this assessment will identify the existence of any *critical gaps*. By reducing the dimensions of the *critical gaps* in the supply chain for the factors of trust and technology adoption Australian agribusiness supply chain, partnerships can be improved.

This research undertakes 36 case studies in the Australian meat and horticulture industry supply chain. The data collected in the 36 face-to-face case study interviews investigates the differences between the perceived *level* and *importance* of a number of factors relating to trust and technology adoption. In a comparison of the meat and horticulture industry supply chains the difference between the *level* and *importance* for the factors of trust and technology adoption is used to identify the *critical gaps* that exist in relation to these factors. This study identified eight factors of trust and three factors of technology adoption displaying *critical gaps*. The eight *critical gaps* relating to trust are illustrated in Table 1.1 (See page 3) which shows the abbreviation of the trust factor and the detailed questions on the factors of trust used in this research.

Table 1.1: Critical gaps in trust across the meat and horticulture industry supply chain

Abbreviations of the questions on the factors of trust	Full details of the questions on the factors of trust
Information sharing	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning
Reliability	Our partners are reliable and can be depended upon to deliver on their promises
Timeliness	Our partners attend promptly to our needs and requests handling these in a timely manner
Customisation	Our partners provide suitable customised business solutions to meet the unique requirements of our company
Work standard	Our partners demonstrate a high standard of work in their business
Shared values	Our partners have shared values and goals similar to our company
POS information	Our partners regularly share real time POS information with our company
Honesty and integrity	Our partners always show a high level of honesty and integrity in our business dealings

(Source: Developed for this research)

The three factors of technology adoption displaying *critical gaps* across the meat and horticulture supply chain are shown in Table 1.2 with the abbreviations of the factors of technology adoption and the detailed questions on the factors of technology adoption used in this research.

Table 1.2: Critical gaps in technology adoption across the meat and horticulture industry supply chain

Abbreviations of the questions on the factors of technology adoption	Full details of the questions on the factors of technology adoption
Relative advantage	Our company will adopt new technology when there is a need to improve the current technology
Trialability	Our company will normally only adopt new technology if we can trial the new technology in a section of our business
Traceability	Our company is using technology to ensure our products have full traceability in the supply chain

(Source: Developed for this research)

Improvements in the factors of trust and technology adoption identified as displaying *critical gaps* should contribute towards ensuring that Australian agribusiness supply chains continue to make a significant contribution to sustainable economic development in Australian. The *critical gaps* identified by this research provide the leaders of the Australian agriculture supply chain with a direction to reduce the gaps

within these factors of trust and technology adoption in order to improve the cohesion and efficiency of their supply chain partnerships

Having introduced the important role Australian agribusiness supply chains play in the Australian economy, and the part the critical success factors of trust and technology adoption perform in the supply chain, the next section discusses the background to this research.

1.1 BACKGROUND TO THE RESEARCH

Australian agribusiness supply chains have played an important part in Australia's business history, culture, economy, and employment. Many regional towns and cities were founded and still exist today because of these industries. Agribusiness production in Australia is determined by the natural, economic and human conditions that exist at any given time in Australia (Malcolm, Egan & Sale 1996). Research undertaken for the Australian Farm Institute estimated that the Australian agribusiness supply chain in 1998/99 had contributed over a six-year average 12.1 percent of the national GDP (Econtech 2005, p. 21). This equated to approximately \$72 billion (Econtech 2005, p. 19) providing some 17 percent of all employment positions in the Australian economy (Econtech 2005, p. 21). Australian agribusiness industries were significant world exporters of beef, wheat, wool, wine and sugar. Total Australian agribusiness exports from agriculture and manufactured agricultural goods in 2005 were valued over \$27 billion (ABS 2006, p. 719).

Australian agribusiness has expanded significantly over recent decades to meet consumer demand in Australia and overseas (Keogh 2004). This expansion of production has been due to larger farm enterprises consolidating smaller, unviable farms to establish agribusiness entities that were large enough to be economically and competitively viable (Keogh 2004; Mitchell 2006).

Australia government policy has removed and deregulated many of the statutory bodies which had marketed farm produce, leaving the private agribusiness sector, in most cases, to market Australia's agricultural products. The notable trend flowing from this deregulation and industry restructuring has been the growth in farmers operating as contracted parts of an integrated supply chain (Keogh 2004). Traditional relationships between retailer, manufacturer, distributor and farmer have begun to

change, with moves toward partnerships and alliances that have a greater emphasis on supply chain management (Thompson 2001). This has seen the move by Australian supermarkets to purchase fresh produce and process their own meat products through direct supply chain contracts with farmers (Keogh 2004). This paradigm shift in Australian agribusiness reflects the definition of Lummus and Alber (1997), who described supply chain management as: “the network of entities through which material flows” which may include, “suppliers, carriers, manufacturing sites, distribution centres, retailers, and customers” (Lummus & Vokurka 1999, p. 11).

In order to build supply chain partnerships and alliances, trust has been recognised as an important factor (Batt 2003; Coulter & Coulter 2002; Heffernan 2004; Kwon & Suh 2005; Sahay 2003; Selnes 1998; Wilson 1995; Wu et al. 2004; Zineldin & Jonsson 2000). Trust can be difficult to create between, and be embraced by, supply chain members (Batt 2003). This applies to many sectors in the agribusiness supply chain. An example of this is that Australian farmers are recognised as being independent and extremely reluctant to relinquish their independence, particularly to a traditionally adversarial party in the supply chain (Nitschke & O’Keefe 1997).

Another important factor in the agribusiness supply chain has been the continued use of technology adoption to improve the efficiency of the supply chain. Technology adoption and development has been underpinned by research and development. Research has been funded by private investment, peak industry bodies funded from industry levies, and government grants (HAL 2006c; MLA 2006c). Increased productivity in Australian agribusiness has been attributed to professional management and new technologies (Mitchell 2006). It was noted by Mitchell (2006) that the adoption of new expensive technology was best suited to larger scaled agribusiness enterprises that can afford to adopt the technology on a positive cost benefit basis (Mitchell 2006).

This research has investigated the role that the critical success factors of trust and technology adoption play in Australian agribusiness supply chains. These factors are investigated in order to assess the current perceived *level* and *importance* of trust and technology adoption in the Australian agribusiness supply chain and to identify any critical gaps in relation to these factors. The term *level* relates to the perceived

performance level and the term *importance* relates to the expected performance level for the factors of trust and technology adoption used in this research. The aims of this research are explained in the following section, 'The Research Problem'.

1.2 RESEARCH PROBLEM

The underlying research question for this study is:

What are the critical gaps in trust and technology adoption factors affecting the Australian meat and horticulture supply chains?

This question was underpinned by a number of research objectives to determine: -

- (A) Current perceptions of the level and importance of trust and technology adoption in the meat and horticulture supply chain
- (B) Critical gaps between perceptions of the level and importance of trust and technology adoption in the meat and horticulture supply chain
- (C) Related issues seen as important to the success of the meat and horticulture supply chain

The information gathered from these research objectives will provide the necessary data to analyse and identify the critical gaps for the factors of trust and technology adoption in the Australian meat and horticulture supply chains, together with the possible implications of these gaps in trust and technology adoption on Australian agribusiness supply chains.

Having outlined the research problem and the aims of this research, the next section explains the justification for selecting this research problem.

1.3 JUSTIFICATION FOR THE RESEARCH

There are a number of reasons that justify undertaking research into trust and technology adoption in Australian agribusiness supply chains.

Research on trust, as a critical success factor in Australian agribusiness supply chains, is firstly justifiable because of its importance. The importance of trust was raised by Petersen, Cornwell and & Pearson (2000) who stated that trust was a major factor in the advancement of supply chain alliances, and that the lack of trust in an agribusiness

supply chain was an immediate impediment to a successful and efficient supply chain. Batt (2003) mentioned how important trust was in maintaining partner alliances. O’Keefe (1998) reinforced this comment by confirming that the factor of trust in building alliances and partnerships was not easy to achieve in supply chain management. The chairman of the Australian Meat Industry Council (AMIC), Alan Teys, has spoken strongly in support of the importance of trust in the Australian meat industry supply chain (Farmonline 2006). Teys stated: “AMIC’s position (on trust) has been endorsed by comments made by speakers at the World Meat Congress held in Brisbane in April” (AMIC 2006b; Farmonline 2006c). Teys referred to the comments of Gary Johnson, director of McDonalds worldwide supply chain management system who informed the conference that “the critical factor that is determining the future of the meat industry is trust; trust in product integrity, trust in food safety and trust in each of the companies along every step of the supply chain” (AMIC 2006b; Farmonline 2006c). Despite the importance being placed on trust, limited research has been undertaken to assess the perceived *level* and *importance* of trust that exists in Australian agribusiness supply chains (Al-Hakim & Chua 2005).

A second justification for this study relates to the limited research undertaken in relation to the gaps that may exist between the *level* and *importance* of trust that may adversely affect the success and efficiency of the supply chain. Evidence of the breakdown in trust and its implications for relationships between the partners in the Australian agribusiness supply chains has been provided in the following examples.

In August 2006 the misrepresentation of mutton sheep meat being processed and marketed as lamb created controversy in the meat industry. This misrepresentation could have substantially affected the difference between the *level* and *importance* of trust in the supply chain with consumers and producers, who put significant trust in the organisations which process meat products. The processors concerned in this misrepresentation have degraded the *level* of trust in relation to honesty and work standards. In view of this situation, the executive director of the Australian Sheepmeat Council, Bernie O’Sullivan entered into the controversy stating: “Producers have invested a lot of money in the lamb brand, it has to be protected in the interests of the public and growers” (Farmonline 2006b). This action by the Australian Sheepmeat

Council highlights their concerns this event may have created a significant gap in trust for the Australian lamb industry.

Another example of the a breakdown in trust in the Australian meat industry supply chains has occurred with the detection of MLA staff rorting an Internet survey in August 2006 relating to the performance of the National Livestock Identification System (NLIS). The public image of MLA and the Australian meat industry may have been damaged by this survey rorting creating *gaps* between the *level* and *importance* of trust in the Australian meat industry supply chains. In a move to restore trust in the business ethics of the MLA in the meat supply chain, Palmer (2006) publicly apologised for this rorting stating: “MLA holds a position of trust and because of this it takes seriously any action by staff that undermines this trust” (Palmer 2006).

In the Australian horticulture industry the issue of trust has decayed to the extent that the Australian federal government has intervened to implement a mandatory code of conduct governing the trading arrangements between growers and wholesalers (Farmonline 2006e).

Having justified undertaking research relating to trust factors, justification for undertaking research into the factors of technology adoption in the Australian meat and horticulture industry are discussed next.

Petersen, Cornwell and Pearson (2000) in their study on agribusiness supply chains commented that the Australian horticulture industry needed to more readily adopt new improved technology as it became available. The Australian horticulture industry also needed to undertake greater research and development initiatives to advance supply chain efficiency (Petersen, Cornwell & Pearson 2000). The Horticulture Australia Limited (HAL) supply chain solutions conference illustrated the importance being placed on technology adoption with a study on the ‘Calypso mango project’. The project identified the importance of technology adoption with the need to undertake a whole-of-supply-chain focus. The project identified the importance of integrating technology adoption across the whole-of-supply-chain and considered the variety of the plant, capping of tree numbers, appointing a sole marketer, and data scanning for tracking sales to assist in the marketing strategy (Haig 2006).

The importance of technology adoption has also been topical in the meat industry supply chain with the introduction of the national livestock identification scheme (NLIS). Teys (2006) stated that, “Australia has emerged as a world leader in product traceability and this will pay dividends for processors and producers alike” (AMIC 2006). Teys (2006) went on to say, “NLIS is an important tool for giving Australia a significant competitive advantage in world markets” (Farmonline 2006c). The correlation between trust and technology adoption was made by Teys (2006) when he stated: “Community trust in our products is paramount and Australia's competitive advantage rests with its ability to provide these assurances and NLIS is the tool to achieve that” (Farmonline 2006c).

This work will contribute to assessing *gaps* in trust and technology adoption between supply chain partners. The study provides a theoretical framework for managers in the various sectors of Australian agribusiness supply chains to institute in their own supply chain networks. By using this framework, the leaders of Australian agribusiness supply chains can develop a strategy to eliminate or diminish the *critical gaps* in factors of trust and technology in order to improve the supply chain.

The qualitative research examining other related issues in the meat and horticulture supply chain is justifiable, as it seeks to build and expand knowledge of the other important success factors in agribusiness such as partnerships, technology, outsourcing, government and traceability. This knowledge can be applied across all Australian agribusiness supply chains.

This research is justified because limited research has been undertaken to assess the perceived *level* and *importance* of technology adoption and the *critical gaps* that may exist between these factors in Australian meat and horticulture industry supply chains.

Having justified this research, the next section explains the research methodology utilised in this study.

1.4 RESEARCH METHODOLOGY

The research methodology for this study was managed in three stages.

The first stage involved an in-depth literature review on the theories of trust and technology adoption within the context of the Australian meat and horticultural agribusiness supply chains. This was followed by two pilot case studies that were conducted using the theories of trust and technology adoption. The overriding scientific paradigm used in the research methodology was critical realism, which is the preferred paradigm for case study research (Hunt 1991).

The second stage involved case study research, which used a case study protocol that included a structured quantitative and qualitative interview questionnaire. The interview questionnaire was used in all of the 36 case study interviews, which were conducted by personal face-to-face interviews with senior management from the case study organisations. The structured quantitative interview questionnaire used in the face-to-face interviews focused on the theories of trust and technology adoption in the meat and horticulture agribusiness supply chain. The qualitative section involved open-ended questions for the interviewer to investigate the relativity of the other important success factors in agribusiness concerning partnerships, technology, outsourcing, government and traceability.

The third stage of the research methodology relates to the analysis of the data collected from the 36 case studies. The data from the qualitative open unstructured questions was coded and entered into SPSS (Statistical Packages for Social Science) for Windows version 13 to enable the data to be manipulated to produce frequency distribution analysis. The data from the quantitative closed structured questions was also entered into the SPSS for Windows version 13. The data entered into SPSS was manipulated to perform statistical testing for significant difference using t-tests, paired t-tests and One-way Anova tests to assess the *level* and *importance* of trust and technology adoption in the meat and horticulture industry supply chain and to test for significant differences between *level* and *importance* of trust and technology factors.

The differences between the mean *level* and *importance* for the 12 factors of trust and eight factors of technology adoption were calculated. This provided the mean gaps for

the gap analysis undertaken for the factors of trust and technology adoption in the meat and horticulture industry supply chain.

This research used three methods of analysis to identify the *critical gaps* for the factors of trust and technology adoption. These three methods were: the statistical testing for significant difference, the mean weighted gap analysis and the mean unweighted importance performance analysis (IPA) matrix analysis.

The results from these three methods of analysis were used to formulate a selection criterion to subjectively identify the *critical gaps* in the factors of trust and technology adoption.

Having discussed the research methodology used in this study the next section explains the chapter outline for this dissertation.

1.5 OUTLINE OF THE CHAPTERS

This dissertation contains five chapters, which are illustrated in the chapter outline in Figure 1.1.

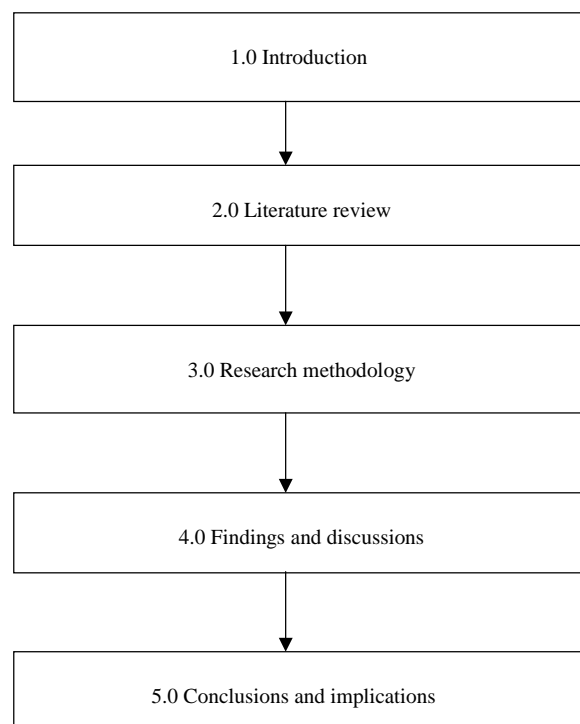


Figure 1.1: Chapter Outline
(Source: Developed for this research)

Chapter one includes the background to this research, and the research question and objectives. This chapter provides the justification for this research and an overview of the research methodology together with the delimitation of scope for the research.

Chapter two provides an in depth literature review on Australian agribusiness and discusses supply chain management in general and for agribusiness. The chapter explains the importance of agribusiness to Australia. The scope of the research is then determined in relation to selecting the meat and horticulture industry for this study due to the importance of these two industries to Australian agribusiness. These two supply chains were also selected to manage the time and funding constraints of this dissertation. Chapter two then discusses the theories of trust and technology adoption together with the gap analysis theory of SERVQUAL and Importance performance analysis that were adapted for this research on the Australian meat and horticultural agribusiness supply chains.

Chapter three explains the research methodology used in managing the 36 face-to-face interviews with senior managers from the case study organisations. This chapter provides the justification for using case study methodology and the process used to select the case study organisations. The research methodology chapter also includes sections on the interview protocol, the data collection process and data analysis methods used in this research.

Chapter four contains the findings and the discussions for this research. The proposition testing revealed that significant differences exist in relation to *level* and *importance* of trust for three of the six propositions tested. Calculation and analysis of weighted and unweighted gaps led to objective identification of eight trust factors and three technology adoption factors displaying critical gaps in relation to *level* and *importance* of trust and technology adoption factors.

Chapter five summarises and discusses the findings relating to the *level* and *importance* of trust and technology adoption and the critical gaps identified in this research for the factors of trust and technology adoption. This chapter also considers the implications of the findings relating to the *level* and *importance* of trust and technology adoption and critical gaps within those factors for the meat and

horticulture industry supply chain. The findings from the qualitative section of this research relating to other important issues in agribusiness are discussed in respect to how improvements in these factors could contribute to the success of Australian agribusiness supply chains. The chapter then sets out the contributions made by this research to the theory of trust and technology as well as gap analysis theory. This is followed by a discussion on the limitations that were managed in this research and future research opportunities.

Having discussed the outline of the five chapters in this research the next section explains the delimitations that were decided upon to manage this research.

1.6 DELIMITATION OF SCOPE FOR THE RESEARCH

A number of delimitations have been set in place in order to manage this research within the constraints set out for this dissertation.

The first delimitation of this research was to focus on just two Australian agribusiness supply chains which were significant in Australian agribusiness, and which would allow the interviewer the opportunity to undertake face-to-face interviews with senior management. The two Australian agribusiness supply chains chosen were the meat and horticulture industry.

The second delimitation was the selection of the geographic area of Queensland and northern New South Wales. This region was regarded as both important to Australian agribusiness in the meat and horticulture industry supply chain and close enough to Brisbane to allow the interviewer access to the case study organisations to manage the time and funding constraints of this dissertation.

The third delimitation related to the number of case studies and sectors that could be managed within the constraints of this dissertation. A total of 36 case studies were completed overall, with 18 cases studies undertaken in both the meat and horticulture industry supply chains. The 18 case studies in each supply chain were selected from six sectors each containing three case studies. The 36 case study organisations selected for this research were based on their importance to the industry and their ability to provide suitable rigor in the case study methodology. The sectors selected

in each supply chain were chosen based on their importance in the supply chain and on the ability to compare to a similar sector in either the meat or horticulture supply chain.

The fourth delimitation related to general case study limitations encountered in any research. The general case study limitations that were managed in this research were: the constraints of time and finance available, the total number of case studies that could be suitably managed, transport arrangements, unexpected interruptions and reduced time during face-to-face interviews, cancelled and rescheduled appointment times, restricted disclosure of information and data due to company policy, absence of respondents due to summer holidays and international business trips, and the reliance on senior managers to allow time to undertake personal interviews involving both structured quantitative and unstructured qualitative interviewing methods.

Having explained the delimitations that were decided upon to manage this research the next section presents the conclusion to chapter one.

1.7 CONCLUSION

This chapter has highlighted the significant contribution Australian agribusiness supply makes to the economy of rural and urban Australia. This contribution makes it imperative for these Australian agribusiness supply chains to remain competitive and efficient.

The chapter has outlined the scope of the research to focus on the meat and horticulture supply chain due to their importance to Australian agribusiness and managing the time and funding constraints of this dissertation.

This chapter has explained the correlation between the *level* and *importance* for the factors of trust and technology adoption in building strong supply chain partnerships within the sectors of the Australian agribusiness supply chain. Eliminating or reducing the *critical gaps* in the factors of trust and technology adoption is vital to improving the Australian agribusiness supply chain.

This research has completed 36 case studies through face-to-face interviews comparing sectors of the meat and horticulture industry supply chain, which provided the richness of data necessary to investigate the factors of trust and technology adoption. The collective use of the results from three analysis methods, coupled with the development of a subjective selection criteria to identify the factors with the *critical gaps* in trust and technology adoption has represented a contribution of this research to gap analysis theory.

This research has addressed the fundamental question of: “What are the critical gaps in trust and technology adoption factors affecting the Australian meat and horticulture supply chains?” Eight factors of trust and three factors of technology adoption were identified as recording *critical gaps*.

Australian agribusiness supply chain partners must harness and embrace the power of the factors of trust and technology adoption in their supply chain to remain a strong contributor to the Australian economy. Trust was best summarised by Johnson (2006) when he stated, “Trust is a gradual commodity and it can take years to earn it, but one mistake to burn it” (Cattle Council of Australia 2006). Testimony to the importance of technology adoption in the Australian meat industry supply chain was spoken about by Teys (2006) when he described how community trust in our products was paramount and Australia's competitive advantage rested on its ability to provide assurances to its customers, and that the NLIS technology was the tool to achieve this (Farmonline 2006c).

This chapter has provided a number of examples of issues surrounding trust and technology adoption in the Australian meat and horticulture supply chain that justify undertaking the current research. This research uses 36 case studies to investigate the perceived *level* and *importance* of trust and technology adoption factors in order to identify the critical gaps that may be affecting the Australian meat and horticulture supply chain. The elimination or reduction of these critical gaps provides the leaders of Australian agribusiness with an opportunity to improve Australian agribusiness supply chains, which have immense importance to the Australian economy. The critical role the factors of trust and technology adoption play in advancing Australian

agribusiness supply chains have been highlighted in this introduction, and are expanded upon in the literature review that follows.

CHAPTER TWO – LITERATURE REVIEW

2.1 INTRODUCTION

Chapter one provided an overview of the current study of Australian agribusiness relating to trust and technology adoption in the meat and horticulture industry supply chains.

Chapter two provides a literature review relating to Australian agribusiness supply chains together with related theory and concepts. The related theory used in this research refers to the factors of trust and technology adoption, which are measured by the use of gap theory including statistical analysis, SERVQUAL and Importance performance analysis. Figure 2.1 (See page 18) provides a diagrammatic overview of Chapter 2, which is divided into eight sections. Section 2.2 explains supply chain management from both a general business and agribusiness perspective. Section 2.3 discusses Australian agribusiness supply chains and describes the developments in the Australian agribusiness supply chain over many years. Section 2.4 illustrates the importance of agribusiness in Australia and compares world production and trade of agribusiness products with Australia. Section 2.5 discusses the scope of the research and reasons this research will focus on the Australian meat and horticulture industry supply chain. Section 2.6 provides a deeper insight into the Australian meat and horticulture industry supply chain. Section 2.7 focuses on the theories of trust and diffusion of innovation technology (technology adoption) in relation to supply chains. This section also explains critical success factors and the parts trust and technology adoption play in Australian agribusiness, along with other related issues such as partnerships, traceability, government and outsourcing in the supply chain. This is followed by an explanation of gap analysis theory, which is used to measure the gaps between the perceived performance level (*level*) and expected level of performance (*importance*) of the factors of trust and technology adoption in this research. This section highlights the lack of literature and analysis concerning trust and technology adoption in agribusiness supply chains.

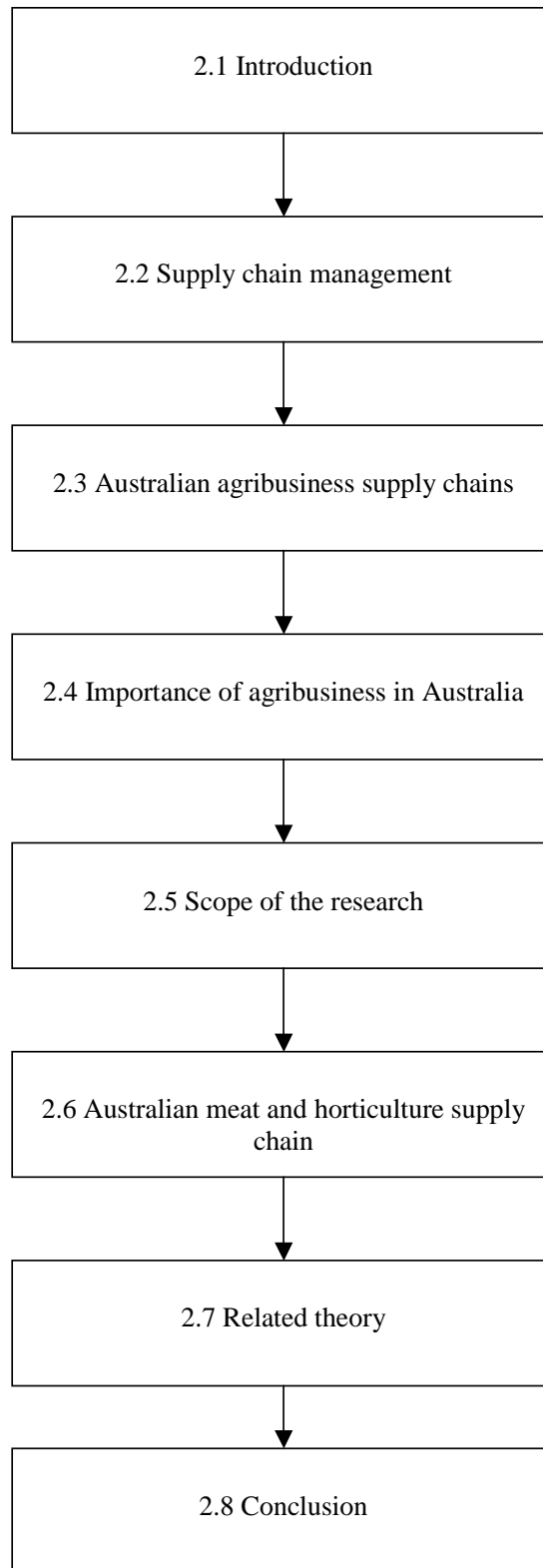


Figure 2.1: Chapter Outline
(Source: Developed for this research)

2.2 SUPPLY CHAIN MANAGEMENT

The term supply chain management has been used to describe the business process that takes place from the source supply of raw materials or services to the eventual delivery of products or services to the end consumer. Supply chain management has been described using a number of clichés such as conception to consumption, farm to fork, and paddock to plate. Lee and Billington (1992) has described supply chain management as a “strategic weapon to develop an sustainable competitive advantage by reducing investment without sacrificing customer satisfaction costs”(Sahay, Cavale & Mohan 2003). For businesses to remain successful in this century “a supply chain has to appeal to the end customer and give him what he wants – the right product at the right price and at the right time”(Mason-Jones & Towill 1998, p. 102)

The supply chain can be divided into a number of sectors or groups that deliver goods and services to consumers. A simple four level supply chain was identified by the Forrester model in 1961 which described how orders flow upstream from the market- place via a retailer, distributor, and a warehouse to the factory (Towill 1996, p. 15). In response to this order flow “material flows in the form of products downstream” to the warehouse, distributor and the retailer (Towill 1996, p. 15). The supply chain was described by A.T. Kearney Consulting Services (1994) as comprising “five linkage groups which included the suppliers, manufacturers, distributors, retail outlets and consumers” (Poirier & Reiter 1996, pp. 3-6). Lummus and Alber (1997) stated that these entities may include, “suppliers, carriers, manufacturing sites, distribution centres, retailers, and customers” (Lummus & Vokurka 1999, p. 11). The Supply Chain Council (SCC) (1997) described the supply chain as a term used by logistics professionals – encompassing every effort involved in producing and delivering a final product, from the supplier’s supplier to the customer’s customer (Lummus & Vokurka 1999; Quinn 1997).

Supply chain management uses a number of processes and systems to deliver good and services to consumers. The supply chain is “a system through which organisations deliver their products of services” (Poirier & Reiter 1996, p. 3). Cox, Blackstone and Spencer (1995) has defined the supply chain and quoted from the APICS dictionary describing the supply chain as: “the process from the initial raw materials to the ultimate consumption of the finished product linking across supplier - user companies

and the functions within and outside a company that enable the value chain to make products and provide services to the customer” (Lummus & Vokurka 1999, p. 11). Steven described the supply chain as, “a system whose constituent parts include material suppliers, production facilities, distribution services and customers linked together via the free forward flow of material and the feedback flow of information” (Towill 1996, p. 15). Quinn (1997) has described the supply chain as “all the activities associated with moving goods from the raw material stage through to the end user” (Lummus & Vokurka 1999, p. 11). Handfield and Nichols (1999) stated that the supply chain “encompassed all activities associated with the flow and transformation of goods from raw material stage (extraction), through to the end user as well as all information flows” (Sahay, Cavale & Mohan 2003). Quinn (1997) also described how the supply chain included business activities such as “sourcing and procurement, production scheduling, order processing, inventory management, transportation, warehousing and customer service” (Lummus & Vokurka 1999, p. 11). The Supply Chain Council used four basic processes to describe how the supply chain functions which included planning, sourcing, making and delivering a product or service to a consumer (Supply Chain Council 2006).

Supply chain management involves sectors or groups of companies in the supply chain working together in a network to deliver goods and services to consumers. The term supply chain management has been defined by, Lummus and Alber (1997), as, “the network of entities through which material flows” (Lummus & Vokurka 1999, p. 11). Supply chain management alters the strategy of companies and how they interact with each other. “The supply chain concept fundamentally changes the nature of organisations; control is no longer based on ownership and control, but rather on integration across the interfaces between function and companies” (van Hoek 1998, p. 187). Towell (1997) described how the supply chain needed to be integrated and operate in a seamless manner (Childerhouse & Towill 2004; Towill 1997). The supply chain is a complex process and a standardisation of business process is necessary to allow the supply chain to function effectively by using communication and integration between business partners in the supply chain network (Al-Hakim 2005a; Gunasekaran, Patel & Tirtiroglu 2001). Ellram and Cooper (1993) have described supply chain management as an “integrated philosophy to manage the flow of a distribution channel from the supplier to the ultimate customer”(Lummus & Vokurka

1999, p. 11). “In today’s business, organisations have formed networks for sourcing raw materials, manufacture products or create services, storing and distribution of goods, and ultimately delivering the products and services to customers and consumers” (Poirier 1999, p. 2). In an overall summary for the future of supply chain management Monczka and Morgan (1997) (Lummus & Vokurka 1999, p. 11) believe that:

Supply chains, not firms, compete and that those who will be the strongest competitors are those that can provide management and leadership to the fully integrated supply chain, including external customers as well as prime suppliers, their suppliers, and their suppliers’ suppliers.

The literature has suggested that a supply chain network can have a number sectors ranging upward from four sectors and this research has used six sectors as suggested by Cox, Zhou and Choi (2003) and Petersen, Cornwell & Pearson (2000) who described the six sectors in the Australian meat and horticulture industry.

Having discussed the general philosophy concerning the term supply chain management the next section relates specifically to describing how supply chain management is embodied into the concept of agribusiness supply chains.

2.2.1 Supply Chain Management – Agribusiness

The concept of ‘agribusiness’ was founded in the USA by Davis and Goldberg in 1957 (Binotto et al. 2004, p. 54). Davis and Goldberg took the important initial step in describing the agribusiness supply chain as, “the sum total of operations, stock, process and distribution of agricultural products and items produced by them” (Binotto et al. 2004, p. 54). Davis and Goldberg focused on the notion of a systematic vision “from the agricultural producer to arrive at the distribution of final products” (Binotto et al. 2004, p. 54). The agribusiness supply chain in Australia has been described as, “a sphere of activity in which non-farm and farm businesses interact in many directions and ways with the aim of making a profit by successfully meeting the requirements of their buyers” (Malcolm, Egan & Sale 1996, p. 211). Another definition of agribusiness supply chains in Australia has been provided by Petersen, Cornwell and Pearson (2000, p. 5) who suggest that these supply chains, “include all

the production, storage, packaging, marketing, sales, transport and quality management throughout the various stages”.

This section has defined supply chain management both in general and within the agribusiness industry. The next section provides a detailed background of Australian agribusiness supply chains.

2.3 AUSTRALIAN AGRIBUSINESS SUPPLY CHAINS

This section discusses developments in the Australian agribusiness supply chain. Australian agribusiness production in Australia is determined by the natural, economic and human conditions that exist at any given time. In agriculture the resources deemed necessary for efficient production can broadly be categorised into air, light, heat, land, water, capital, labour, knowledge, technology and management skills (Malcolm, Egan & Sale 1996). Australia is a huge landmass of 7.6 million square kilometres (760 million hectares) with some 440.1 million hectares of land in Australia used for agribusiness (ABS 2006; Australian Government Geoscience Australia 2001).

Australian agribusiness has expanded significantly over recent decades to meet consumer demand in Australia and overseas. Government policy has removed and deregulated many of the statutory bodies which marketed farm produce during this time, leaving the private agribusiness sector in most cases to market Australia’s agricultural products (Keogh 2004).

Australian agricultural farming methods have intensified to expand production and improve efficiency. This has meant the agribusiness sectors have increased the inputs of chemicals and fertiliser in their business to lift productivity and yields. The lifts in productivity and yields however, are subject to the impact of climatic change and drought, which adversely affect the output of farm products into the agribusiness food chain.

In recent years the various Australian agribusiness sectors in the grain, meat, seafood, horticulture, wine, wool, sugar and cotton industries have consolidated to become larger enterprises and landholders. This consolidation of family, private and public companies in the various supply chain sectors of agribusiness has been significant. The consolidation has been driven by the need for agribusiness entities to be large enough to be economically and competitively viable as a supply chain partner. Consolidation driven by economical and

competitive variables has also occurred in other parts of the world. This rationalisation of the farm size is a direct reflection of the “retailers seeking to deal with fewer, larger, technically efficient and innovative suppliers” (Fearne & Hughes 2000, p. 122). It has become very important that the size of the farming operation is “big enough to forge a sturdy alliance” with supply chain partners (Drabenstott 2000, p. 67). In the UK the same situation exists with the scale of farming operations mentioned by Grimsdell (1996, p. 12) who states, “a large crop is essential, as it increases our customers’ confidence in our ability to produce sufficient volume throughout the season”. If these businesses are not economically and competitively viable as a supply chain partner they will be forced to withdraw from the business through economic rationalism (Keogh 2004). The notable trend flowing from this deregulation and industry restructuring has been the growth in farmers operating as contracted parts of an integrated supply chain. This is in contrast to traditionally supplying produce to an open market or auction system (Keogh 2004). Keogh claims that some Australian supermarkets source more than 50 percent of their fresh produce through direct supply chain contracts with farmers (Keogh 2004). This closer integration of production and markets has meant less waste and reduced supply chain costs. The produce grown and processed by the agribusiness supply chain partners now more closely meets expectations of customers’ and partners’ in the supply chain (Keogh 2004). The creation of supply chain partnerships provides the opportunity for farmers to move past the ‘Farm gate’ and belong to a supply chain, understand what people want, and share information (Wheatley 1996). This trend was also evident in the United Kingdom with J. Sainsbury initiating a formal partnership program titled ‘Partners in produce’ linking the supermarket with meat and horticulture supply chain partners to deliver (Hughes & Merton 1996).

With Australia’s relatively small population of 23 million people, agribusiness has a heavy dependence on export markets for the large quantity of primary produce grown in this country. The export of Australian products has benefited by technology advancement and expertise. The diverse climatic regions in Australia provide different growing season for similar products across Australia. Being in the southern hemisphere provides opportunities to supply counter-seasonal produce to markets in the northern hemisphere. Australian produce is internationally recognised from a food safety perspective as being free of insect and agricultural diseases found in many other countries (Agri Chain Solutions 2001). While slow to emerge, the supply chain evolution in Australian agribusiness is gradually moving farmed and wild caught produce away from being a commodity, to include more value adding in the

supply chain. This is particularly so in the meat, horticulture, wine and seafood industry and to a lesser degree in the grain industry (Keogh 2004).

The major agribusiness industries in Australia and particularly Queensland and New South Wales measured by volume and value have been the meat, horticulture, seafood, sugar and the grain industries. Australia is the second largest red meat exporter in the world and has a high reputation for food safety that is managed by a sophisticated supply chain (MLA 2006e). The gross value of the meat industry in 2003/04 was over \$10.8 billion (ABS 2006, p. 428) employing some 48,000 people (AMIC 2006a). The meat industry has been a free market with limited government ownership or regulation in the marketing supply chain (Malcolm, Egan & Sale 1996).

The horticulture industry in Australia is a significant growth industry, which is worth 6.5 billion dollars to the Australian economy at the farm gate contributing up to 13 billion across the processing, wholesale, distribution and retail sectors (HAL 2006d). This industry had export earnings of \$827 million in 2005/06 (HAL 2006d). Within this industry there are 25,000 enterprises employing 108,000 people nationally in 2005 (HAL 2006d). The majority of horticulture produce is consumed on the domestic market. In years past the state governments had owned a number of the central state produce markets in the capital cities in Australia. However the marketing supply chain in the horticulture industry has been a free market with limited government regulation (Malcolm, Egan & Sale 1996).

The seafood industry in Australia is a significant coastal regional employer with an annual gross value of production in 2003/04 over \$ 2.1 billion (ABS 2006, p. 447). Similar to the meat and horticulture supply chain, the seafood industry has been a free market. Government involvement in the seafood supply chain includes managing the volume of the catch through fishing quotas and seasons, the acceptable size of fish and crustaceans allowed to be caught, and protecting Australian waters from illegal fishing by overseas fishermen (Malcolm, Egan & Sale 1996).

The grain industry has had significant government involvement in marketing the two major crops in Australia, which are wheat and barley (Malcolm, Egan & Sale 1996). The supply chain is gradually being deregulated with the Australian Wheat Board being the sole exporter of Australian wheat and Graincorp handling the marketing of some course grains from New

South Wales. The combined value of barley, oats, wheat and other crops in the grain industry had an annual gross value of production in 2003/04 over \$8.4 billion (ABS 2006, p. 410).

Having discussed the Australian agribusiness supply chains the next section explains the importance of agribusiness in Australia to world agribusiness production and trade.

2.4 IMPORTANCE OF AGRIBUSINESS IN AUSTRALIA

Australian agribusiness supply chains are an important contributor to the Australian economy. The supply chain spans across many different sectors from the ‘Farm gate’ to retailers and restaurants to reach the end consumer. The report of Australia’s Farm-dependent Economy (FDE) undertaken by Econtech (2005) illustrates the significant importance of Australian agribusiness supply chains to urban and regional Australia. Table 2.1 illustrates Australia’s Farm-dependent Economy during 1998/99 showing the share of employment and Gross Domestic Product (GDP) attributed to agribusiness supply chains from the farm gate to the retail and restaurant sector.

Table 2.1: Australia’s Farm Dependent Economy (FDE) 1998/99

Details	Share of GDP (percentage)	Share of GDP (millions dollars)	Share of employment (percentage)	Share of employment (number of people)
Agriculture (Farming)	3.1	18.1	4.4	407,000
Farm input sectors (Total inputs)	0.8	4.5	0.5	65,000
Farm output sectors (Manufacture to retail)	8.4	49.7	12.1	1,100,000
Total	12.2	72.3	17.2	1,600,000

(Adapted from: Econtech 2005) Some figures may not add due to rounding

Table 2.1 shows the combined share of GDP from agriculture, farm inputs and farm outputs in 1998/99 amounted to 12.2 percent contributing \$72.3 billion to the Australian economy. The share of Australian employment placements provided by the Australian agribusiness supply chain was 17.2 percent, which equates to 1.6 million jobs. The Australian agribusiness supply chains share of GDP 1998/99 was spread nearly equally between the six capital cities (50.7 percent; \$36.7 billion) and regional Australia (49.3 percent; 35.6 billion) (Econtech 2005, p. 19). Australia’s total exports in 2004/2005 were \$126 billion and exports related to the Australian agribusiness supply chains were valued in excess of \$27 billion (ABS 2006, p. 719). When the Australian FDE share of GDP is compared with the USA, UK and Canada the Australian economy has a greater dependency on the FDE than any of these countries (Econtech 2005).

The major agribusiness food supply chains in Australia are the meat, horticulture, grain, sugar, seafood, dairy and wine industries (ABS 2006; Keogh 2004). The same agribusiness food products are recognised internationally as some of the major agribusiness supply chain products in the world. The information compiled in this section illustrates the importance of the Australian agribusiness sector in the world supply chain.

2.5 SCOPE OF THE RESEARCH

The two Australian agribusiness supply chains selected for this research study are the meat, and horticulture industry. The meat industry has been selected due to its prominence in the world and Australian export market with a gross value of production over \$10 billion in 2004/05 (MLA 2006f, 2006e, 2006h). In particular the dominance of the Australian meat industry on the world stage is significant being the second largest red meat exporter in the world. The beef industry represented 53 percent (2,033,00 tonnes) of Australia's total meat production and 78 percent (1,263,517 tonnes) of total meat exports (MLA 2006e). Over 71 percent of the beef production and processing in Australia is undertaken in Queensland and New South Wales (MLA 2006e). The beef industry is the largest primary industry in Queensland (QDPI 2002f).

The horticulture industry has been selected due to its importance in the Australian agribusiness supply chain. The gross value of farm production in the Australian horticulture industry was \$6.5 billion and \$13 billion multiplied across the entire supply chain in 2005/06 (HAL 2006d). Horticulture is the third largest agricultural industry in Australia employing approximately 108,000 people (HAL 2006d). Queensland is a significant producer of fruit and vegetables with a gross value at the farm gate of nearly \$1.5 billion employing over \$25,000 people (GROWCOM 2006). The horticulture industry is a significant regional employer and is the fastest growing agribusiness sector being the second largest primary industry after beef in Queensland (GROWCOM 2006; QDPI 2002e, 2002d).

Agricultural activity in Australia is undertaken on approximately 440.1 million hectares of land with Queensland having a significant share of Australia's total agricultural activity of 144.3 million hectares. New South Wales, with 63.6 million hectares of agribusiness activity is also an extremely important region for Australia agribusiness (ABS 2006, p. 407). These two regions were selected, as agribusiness

was the single biggest contributor to employment placements in the northern and central regions of New South Wales and the state of Queensland (Econtech 2005, p. 19).

An additional reason for selecting these two industries for the current research is that they provide the opportunity to study a number of organisations situated close to Brisbane as case studies which could be managed within the time and funding constraints of this research.

The data collected on the other major Australian agribusiness supply chains mentioned in section 2.4 ie grain, sugar, seafood, dairy and wine industry are shown in Appendix 1.

Having defined the scope of this research, the next section provides an overview of the world and the Australian meat and horticulture industry.

2.5.1 Meat Industry

The major types of meat produced and exported in the world and Australia are compared in Table 2.2.

Table 2.2: World and Australian meat production and exports 2004

World and Australian meat production and exports 2004				
Meat products	Production (metric tonnes)		Export (metric tonnes)	
	World	Australian	World	Australian
Poultry	68,421,265	694,000	9,700,246	21,449
Pork	100,483,985	406,000	7,047,687	46,140
Beef and Buffalo	62,850,252	2,033,000	8,110,583	1,263,517
Sheep	8,210,255	561,000	904,382	275,082
Goat	4,259,200	16,500	33,087	16,431
Total	244,224,957	3,710,500	25,795,985	1,622,619

(Adapted from: FAOSTAT 2006)

As set out in Table 2.2, the major meat product in Australia is beef. Table 2.2 illustrates the significance of the Australian beef industry representing 55 percent of Australia's total meat production and 78 percent of Australia's total meat exports. In 2004, over 2 million tonnes of beef was produced in Australia with exports of 1.2 million tonnes representing approximately 15 percent of world beef exports. Table 2.2 also illustrates that Australia's

exports of sheep meat (275,082 tonnes) represented approximately 30 percent of world trade in sheep meat. The volume of Australian goat meat export in Table 2.2 (16,431 tonnes) represents nearly 50 percent of world trade in goat meat. Australia is second largest beef exporter in the world, but only represents approximately 2.6 percent of the world beef cattle inventory and 3.6 percent of the world's beef supply (MLA 2006e). The Australian cattle herd comprised some 27.7 million cattle in 2005 (MLA 2006e). Queensland has approximately 11.6 million beef cattle and New South Wales has almost 5.7 million beef cattle (MLA 2006e). Most of these cattle in Australia are range fed with up to 940,000 cattle held in feedlots nationally in 2006 (ALFA 2006). Over 71 percent of the beef production and processing in Australia is undertaken in Queensland and New South Wales (MLA 2006e).

Collectively the beef, sheep and pork industry contributed 48 percent of the gross value of production (GVP) to the agricultural sector in Queensland in 2001. The beef industry represented 41 percent of this GVP and was ranked the leading agricultural sector in Queensland (QDPI 2002f).

2.5.2 Horticulture Industry

Australian production of fruit and vegetables in 2003 (shown in Table 2.3) was 5,254,000 tonnes, which represented less than one percent share of world horticulture production and trade.

Table 2.3: World and Australian horticulture production and exports 2003

World and Australian horticulture production and exports 2003				
Fruit and vegetables	Production (metric tonnes)		Export (metric tonnes)	
	World	Australian	World	Australian
Total	135,336,119	5,254,000	1,332,454	497,704

(Adapted from: FAOSTAT 2006; HAL 2004)

Table 2.3 also shows the major share of Australia's horticultural production is consumed in Australia with less than (497,704 tonnes) 10 percent of produce exported in 2003.

Horticulture is ranked the second leading agricultural industry in Queensland after the beef industry with a combined GVP of 16 percent (QDPI 2002e, 2002d). Queensland produces over one third of the national production in fruit and vegetables (AUF 2003, p. 82). In 2002 it was estimated that there were almost 3,700 farms in Queensland that grow approximately 120 different types of fruit and vegetables (AUF 2003, p. 82). In 1997 it was estimated that

85 percent of these growers were family partnerships or sole proprietors (QDPI 2002e, 2002d). Horticulture production in Queensland is estimated to be valued at \$1.2 billion and the industry employs some 25,000 people (AUF 2003, p. 82). Horticulture product exports from Queensland are mostly shipped to Asia and provided \$72 million in export revenue in 2003 (AUF 2003, p. 82). Queensland fruit exports account for 13 percent of Australia's total fruit export and 17 percent of this country's total vegetable exports (AUF 2003, p. 83).

Having provided an overview of the world and Australian meat and horticulture industry the next section explains the Australian meat and horticulture industry supply chains in more depth.

2.6 AUSTRALIAN MEAT AND HORTICULTURE SUPPLY CHAIN

This section includes discussion of the major organisations in the Australian meat and horticulture agribusiness supply chains together with discussion of various initiatives undertaken to improve the supply chain in both these industries. For the purposes of this research it is assumed that the meat and horticulture industry supply chain each has six main sectors.

2.6.1 Australian Meat Industry Supply Chain

The six meat industry sectors selected for this research are the meat producers, meat feedlots, meat abattoirs, meat wholesalers, meat retailers and meat restaurants. Cox, Zhou and Choi (2003) and Petersen, Cornwell & Pearson (2000) described a similar supply chain including these sectors relating to the Australian meat industry.

The Australian beef producer sector is the major meat sector when measured by tonnage and value in Australia (Cox, Zhou & Choi 2003; Petersen, Cornwell & Pearson 2000; Rixon 2002). In the Australian meat industry supply chain individual and corporate meat producers that breed and grow livestock can market them to the next link in the chain by various methods. These organisations can sell livestock through sale yard auctions, direct sale, Auction plus (E-commerce), on property and feature sales, forward contracts, and over the hooks (Cox, Zhou & Choi 2003; Petersen, Cornwell & Pearson 2000; Rixon 2002).

In Table 2.4 (See page 30) the top beef cattle producer organisations in Australia are identified from the MLA Feedback top 25 listing which shows the number of properties and

cattle on these land holdings. The organisations in Table 2.4 illustrate the dominance of private ownership in Australian cattle production with over 120,000 head from the top 25 cattle producers in Australia. An increasing percentage of cattle produced are entering the beef feedlot sector of the supply chain due to the demand for grainfed beef and drought conditions in Australia.

Table 2.4: Top 25 beef cattle producers in Australia in 2003

Company	Owner	Properties	Hectares (Millions)	Cattle
Stanbroke Pastoral	Private company	27	11.3	462,000
AA Co.	Publicly listed Co.	18	6.5	460,000
Consolidated Pastoral Co.	Private company	16	4.9	242,000
Heytsbury Beef	Private company	11	3.34	200,000
North Aust Pastoral Co.	Private company	14	5.7	188,000
Kidman Holdings	Private company	12	10.5	188,000
Colonial Agricultural Co.	Colonial Mutual	9	2	122,432
MDH Pastoral Co.	Private company	11	3.4	148,000
Acton Land and Cattle Co.	Private company	7	2.2	120,000
Total		125	49.84	2,130,432

(Adapted from: MLA Feedback 2004a)

In Table 2.5 the major beef feedlot organisations in Australia are identified from the MLA Feedback top 25 beef feedlot companies and lists the number of feedlots managed, capacity, turnoff and weight of cattle sold by these organisations.

Table 2.5: Top 25 beef feed lot companies in Australia in 2003

Company	Feedlots	Capacity (number of head)	Cattle (turn off per year)	Turn-off (weight in tonnes)
AMH	4	99,000	174,471	63,234
Oakey Holdings	1	75,000	93,150	33,344
Rockdale Beef	1	50,000	91,284	33,325
AA Co.	2	32,500	112,526	32,433
Elders Ltd	2	40,000	100,898	26,721
Total	10	296,500	572,329	189,057

(Adapted from: MLA Feedback 2004b)

Three of the top feedlots organisations shown in Table 2.5 (AMH, Oakey Holdings and Rockdale) also operate abattoirs. Cattle from these feedlots are used to supply their processing facilities. Cattle grown in the meat producer sector on natural pasture or from the beef feedlot sector enter the next link in the supply chain which the abattoir sector.

The major beef abattoirs in Australia, together with the quantity of beef they process, number of employees, percentage share of the market and turnover are shown in Table 2.6.

Table 2.6: Top 25 red meat processors in Australia in 2002 to 2004

Company	Weight (tonnes)			% Share of Australian beef slaughter			Turnover \$ millions			Employees		
	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
Calendar year	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
AMH	392,191	399,788	435,000	14.4	15.7	16.2	\$2,200	\$ 2,500	\$ 3,100	2,600	4,800	4,900
Teys Bros	198,900	166,500	205,000	7.3	6.5	7.6	\$ 580	\$ 737	\$ 929	1,550	1,550	2,500
Nippon Meat Packers	180,000	170,000	166,500	6.6	6.7	6.2	\$ 810	\$ 700	\$ 750	1,700	1,700	2,200
Bindaree Beef	126,000	96,600	106,000	4.6	3.8	3.9	NA	NA	NA	1,200	1,000	850
Cargill Beef	120,000	120,000	130,000	4.4	4.7	4.8	\$ 350	\$ 375	\$ 400	750	800	1,000
Total	1,017,091	952,888	1,042,500	37.3	37.4	38.7	\$3,940	\$ 4,312	\$ 5,179	7,800	9,850	11,450

(Adapted from: MLA Feedback 2003a; 2004a; 2005b)

The top five red meat processors shown in Table 2.6 are selected from the top 25 red meat producers report from the MLA. These organisations are the dominant red meat abattoir operators in Australia. These five organisations from 2002 to 2004 have slaughtered between 37.3 to 38.7 percent of Australia’s beef with AMH holding the dominant market share in this sector. The Australian meat industry supply chain “employs 48,000 contributing an estimated seven billion dollars per annum to Australia’s export earnings with turnover in excess of \$11 billion per annum”(AMIC 2006a; Jahan, Smith & Rodriguez 2003). In 2004 the top five abattoir operators were significant employers in the meat industry supply chain employing 11,450 people from the 20,604 people employed in total from the top 25 red meat processors in Australia (MLA 2005a). The abattoirs slaughter, process, debone and pack the meat as chilled or frozen meat ready for distribution for the domestic or export market. The meat industry has pursued value adding to all types of meat in manufactured products and meals.

The companies listed in the Table 2.7 (See page 32) are the major red meat value adding companies in Australia. Companies such as AMH and Australian Country Choice listed in Table 2.7 have a vertically integrated supply chain with feedlots, cattle processing and value adding to produce hamburgers, pizza topping and case-ready beefsteaks for the supermarkets. The other organisations mentioned buy in meat products from abattoirs to manufacture hamburgers, small goods, canned foods and ready to eat meals.

Table 2.7: Top 25 red meat value-adding companies in Australia in 2002

Company	Volume of red meat material (tonnes)		Employees	
	2002	2003	2002	2003
Calendar year	2002	2003	2002	2003
AMH Trading as, F.J. Walker Foodpartners	19,500	20,300	500	503
Primo Smallgoods	19,500	19,890	450	470
Heinz Wattie	18,000	16,200	200	200
Top Cut Group	16,000	18,340	800	800
Comgroup	15,500	16,300	186	174
OSI International Foods	15,000	15,800	800	NA
Australian Country Choice	11,550	10,700	530	525
Beak and Johnson	10,000	11,500	200	230

(Adapted from: MLA 2003b; MLA 2004d)

The meat products derived from the abattoir and the processing sector supply the next links in the supply chain, which are wholesalers, brokers, butcher shops and supermarkets (Cox, Zhou & Choi 2003; Petersen, Cornwell & Pearson 2000).

Some of the large corporate and individual producers breed and grow cattle, process the cattle and market their beef to retailers, supermarkets and through their own butcher shops, over the internet and to overseas importers (Australian Agricultural Company 2006; Gardiner 2003a; Petersen, Cornwell & Pearson 2000).

The domestic retail market is, “the largest and most stable market for Australia’s red meat, taking approximately 34 percent of beef production, 62 percent of lamb production and 27 percent of mutton production”(MLA 2006i). The retail meat sector is split between the supermarkets and butchers, foodservice and processing. The retail supermarket market share represents between 60 to 70 percent of the retail trade with the retail butcher section of the market handling the remaining 30 to 40 percent (MLA 2006a). The leading Australian supermarkets are Woolworth’s and Coles. Both of these companies have a strategic supply chain alliance with two large beef processing companies in Australia to supply beef cuts to their distribution centre and direct to their supermarkets in some cases. Woolworth’s has a supply chain alliance with Cargill Foods who have processing facilities in Wagga Wagga and Tamworth in New South Wales (Cargill Australia 2003). Coles has a supply chain alliance with Australian Country Choice in Brisbane and supplies beef to the supermarkets in primals or case-ready packs (Gardiner 2003a; MLA 2003b, 2004a).

The Australian cafe and restaurant industry generated a total income of \$10.1 billion as of June 30 2004. Some 51 percent or \$5.5 billion of this income was attributed to the sales of meals consumed on the premises or taken away (ABS 2006, pp. 523-24). The largest expense item was purchases (\$3.8 billion), which represented 39 percent of costs (ABS 2006, p. 523). The industry employed 188,103 people as of June 30 2004 (ABS 2006, p. 524). These purchases include meat and horticulture products derived from the Australian agribusiness supply chain. The meat restaurant is the final link in the meat supply chain for the serving of specialised meat meals to the consumers either from a fast food chain or in various dining styles. The MLA produced the, “Chef Special”, that aims to provide culinary professionals with fresh ideas for Australian beef, veal, lamb, mutton and goat (MLA 2006d). A number of these restaurants have specific partnership relationships with various links in the supply chain to provide them with meat and horticulture products ('Fast-food chain faces new challenges: Jack still has plenty to smile about,' 2004; Mawson & Fearn 1996; Riley 2005; Vignali 2001).

The Australia meat industry has undertaken a number of initiatives to improve the meat supply chain. Meat and Livestock Australia (MLA) managed the BeefNet (Beef Marketing Support Network) from 1998 to 2002. Through the assistance of the BeefNet program beef producers such as Bluegum Beef, Brigalow Beef, Banksia Beef, and Organic Beef Exporters have formed their own supply chain network to supply beef to wholesalers and importers overseas managing the product from the farm gate to the wholesaler or retailer (Blue Gum Beef 2006; Brigalow Beef 2006; MLA 2002; Organic Beef Exporters 2006; Rixon 2002). The BeefNet program was successful in amalgamating two thousand cattle producers into 73 local and regional marketing groups. It was estimated that the 73 groups from all over Australia marketed some 265,000 cattle for slaughter during the financial year of 2002 (MLA 2002). Following the BeefNet initiative in July 2002 MLA initiated the Supply Chain Management Research and Development program with the aim to achieve three major outcomes: to increase efficiency and lower the cost of production, enhance food safety systems and improve product quality and response to consumers.

The Cattlecare and Flockcare program was initiated by the Cattle Council of Australia (CCA) and supported by the MLA. This initiative provided a program that created a quality assurance standard for cattle and sheep farms in Australia, a training program and an auditing

procedure to ensure livestock producers could demonstrate the cattle they provide to the consumer was free of contamination and safe to their health. These two programs have now been incorporated under the Livestock Production Assurance Quality Assurance Program (LPA QU) which is managed by MLA (MLA 2006b).

The Meat Standards Australia (MSA) grading program was introduced in 1996 to improve meat quality and involved all sectors from the producer to the retailer (MLA 2003a).

The National Livestock Identification System (NLIS) was an initiative of SAFEMEAT, which has been designed with the aim to trace cattle individually through the total supply chain from birth to final consumption. NLIS provides the technology through the use of ear tags that include radio frequency identification devices (RFID) with a unique code to trace each animal through the system (MLA 2006j; SAFEMEAT 2006). To have access to the European market the Australian producers must provide full traceability, which NLIS provides.

The MLA has undertaken another initiative in the use of the EAN-UCC in partnership with NLIS to improve traceability of meat products from the time the cattle are processed at the abattoirs until the final point of sale and consumption (Bowler 2001). Apart from providing the important aspect of product traceability the EAN-UCC delivers commercial efficiency and cost reductions in the supply chain as it is a valuable information source, paperless and improves logistics through scanning technology at dispatch and receipt of beef products at the supermarkets or cold stores. The system provides instant stock control from the time the product is processed and packed through the entire supply chain until the product is sold to the end customer (EAN International 2000).

Having discussed the Australian meat industry in more depth the other main agribusiness industry to be discussed is the horticulture supply chain.

2.6.2 Australian Horticulture Industry Supply Chain

The Australian horticulture supply chain is similar to the Australian meat industry supply chain comprising a number of sectors, which link the supply chain from the horticultural seed nursery producer to the end consumers (Petersen, Cornwell & Pearson 2000; Spencer 2004). The six main sectors selected in the Australian

horticulture industry were the horticultural seed nursery producer, horticultural growers, fruit and vegetable processor, wholesalers, fruiterers and supermarkets and restaurants.

The Australian and overseas horticultural supply chain involves independent and corporate producers of various varieties of seed and plants that links to the next sector of the fruit and vegetables supply chain who are the growers. These growers can be independent and corporate growers of various varieties of fruit and vegetables producing crops as the source of raw material to the fruit and vegetable supply chain. These growers can supply the next link in the supply chain, which is the wholesale market. The horticultural supply chain comprises growers who consign their produce to agents or fruit wholesalers that are located in a central produce market (Petersen, Cornwell & Pearson 2000). These markets are in the major capital cities where their wholesaler markets the produce to other wholesalers, merchants, supermarkets, food service companies, exporters, fruit shops, restaurants and the general public (Petersen, Cornwell & Pearson 2000). The state governments and produce authorities established these central fruit and vegetable markets to assist growers with a market outlet for their produce. The markets provided a supply chain to consumers in the cities (Petersen, Cornwell & Pearson 2000). These markets have since returned to the control and management of private enterprise companies as private and publicly unlisted companies (AUF 2003).

Growers in Australia can also be part of cooperatives or shareholder members in grower corporations that forward contract fruit and vegetables for the season ahead. The growers supply at harvest, specific quantities and qualities of products. Examples of such organisations are Golden Circle, Buderim Ginger, the Peanut Company of Australia, Australian Tropical Marketing and the Macadamia Processing Company ('Growers control supply chain' 2003; Buderim Ginger 2006; Golden Circle 2006; Macadamia Processing Company 2006; Peanut Company of Australia 2006). These companies further process and manufacture the products into consumer packs to supply the next sector in the supply chain being the retail traders and supermarkets in Australia and overseas. The product can also be processed as a manufacture pack for further processing in Australia or overseas (Buderim Ginger 2006). Some growers concentrate specifically on the export market having a supply chain alliance direct to importers and wholesalers overseas such as Miandetta Farms who

exported asparagus to Japan (DPIE 1998) and Havenglaze who export ginger for further processing to the USA (('Short and sweet' 2002; Gingerpeople 2006).

In Queensland a number of statutory marketing boards were formed to support industries such as the pineapple, ginger and peanut industries. Like the central markets these boards have been privatised over the last two decades. The growers in these industries as in the past still use these organisations in the supply chain as the next link to the market their fresh produce.

The pineapple, ginger and peanut industries over the last fifty years have pursued value adding to their product to market their products through the food supply chain.

These products are marketed both in Australia and overseas where their production exceeds the Australian market demand and or they can achieve a higher price on the export market (Buderim Ginger 2006; Golden Circle 2006; Peanut Company of Australia 2006).

Alternatively the growers can supply under contract to a supermarket through a category wholesale manager (Petersen, Cornwell & Pearson 2000). Some growers have a very close supply chain linkage with the supermarkets and supply direct to the supermarket distribution centre such as Mulgowie Farming Company in Queensland ('Qld company lifts profile of industry' 2003; Gardiner 2003b; Mulgowie Farming Company 2006).

The horticulture industry in Queensland has been a leader in supply chain alliances with the supermarkets in Australia. These supply chains deliver fresh produce direct from the packinghouses in their region, by refrigerated and general road transport to the supermarkets distribution centres. These individual companies and grower organisations such as Mulgowie Farms, Golden Circle, The Peanut Company of Australia, Buderim Ginger, and the Atherton Tableland Potato Growers Co-operative have become part of the integrated supply chain of preferred suppliers to the supermarket chains based on agreed specification and quality assurance standards ('Qld company lifts profile of industry' 2003; ABC 2004; Buderim Ginger 2006; Dunne & O'Keefe 2003; Gardiner 2003b; Golden Circle 2006; Peanut Company of Australia 2006). Some organisations have changed their business strategy away from the vegetable wholesale sector of the market to value add produce and deliver directly to the supermarket such as the Harvest Group in Queensland. This company has grower

alliances that supply various types of fruit and vegetables, which are then packed case ready for the supermarket shelves (Heathcote 2004; Molina 2003).

Almost every restaurant including the various specific and vegetarian restaurants that concentrate on using high quality fresh fruit and vegetables have horticultural produce in their menus. A number of these have strong links to the various sectors that supply horticultural produce in the supply chain (Mawson & Fearn 1996; Riley 2005; Vignali 2001).

The Australian fruit and vegetable industry through Horticulture Australia Limited has invested approximately 80 million in research and market activity projects in 2006 in partnership with the horticulture sector (HAL 2006c). In 2006 HAL had 900 projects which cover every aspect of the horticulture business including supply chain management, market research, export marketing, market access, quality assurance, food safety, industry communication, agriculture, irrigation and sustainable practices (HAL 2006c).

Having discussed the Australian meat and horticulture agribusiness supply chains in more detail the next section concerns the related to theory used in this research.

2.7 RELATED THEORY AND CONCEPTS

This section explains critical success factors and their importance in business and supply chain management. The next part of this section discusses the theories related to trust and the diffusion of innovation technology (technology adoption) as critical success factors in relationship to supply chain partnerships. This chapter also discusses a number of other important related issues in agribusiness such as partnerships, government, outsourcing and traceability. The final part of this section explains the SERVQUAL and Importance Performance Analysis (IPA) gap theory used in this research, relating to the factors of trust and technology adoption.

2.7.1 Critical Success Factors

The concept of critical success factors has been used by management for many years. Daniels (1961) was considered one of the earliest supporters of this method of management (Brotherton 2004). This work was advanced by Rockart (1979) who popularised this concept in the field by helping executives identify critical information

needs (Brotherton 2004). Rockart (1979) defines critical success factors as, “a limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organisation” and refers to the concept of the need for a few key areas where, “things must go right” for the business to flourish (Soliman, Clegg & Tantoush 2001, p. 613). In a similar definition Digman (1990), Butler and Fitzgerald (1999) Guynes and Vanecek (1996) defined critical success factors as, “the areas or functions where things must go right to ensure successful competitive performance for an organisation” (Eid, Trueman & Ahmed 2002, p. 110). Ingram et al. (2000, p. 107) stated Freund (1998) defined critical success factors as, “those things that must be done if a company is to be successful”. The literature suggests that both trust and technology adoption are critical success factors that must be working efficiently and being done for “things to be right” in the supply chain.

Critical success factors have contributed to the strengths in many areas of business including information systems, building core competency, value chain partnerships, business processes and knowledge management (Brotherton 2004). The literature supports the fact that trust and technology adoption are critical to building relationships and information systems. Brotherton and Shaw (1996) described critical success factors as a “focused specialisation where the company concentrates resources and efforts on these factors that are capable of providing the greatest competitive leverage for the organisation or supply chain network” (Brotherton 2004, p. 945). Organisations need to allocate resources and efforts to build trust and improve technology adoption as well as focusing on the other important related issues of partnerships, traceability, government and outsourcing within the agribusiness supply chain to remain competitive.

A further extension to this definition of critical success factors includes factors that are, “essential to the success of any program or technique, in the sense that, if objectives associated with the factor are not achieved, the application of the technique will fail catastrophically” (Rungasamy, Antony & Ghosh 2002, p. 218). Critical success factors are “the factors that must be achieved if the company is to attain its overall goals” (Brotherton 2004, p. 945). Literature has shown that if trust and technology adoption are not managed correctly in the supply chain business relationships and efficiency will not be as efficient as they could be.

Pinto and Selvin (1989) note that in any project the relative importance of these factors may differ with the stages of the project cycle (Ingram et al. 2000, p. 107). Sparkes and Thomas (2001, p. 333) and Guimaraes et al. (1999, p. 1257) have expanded the idea of critical success factors stating that, “management must constantly monitor critical success factors to ensure successful performance by the organisation”. Another point that has been made is that “critical success factors must also be few in number, and measurable” (Ingram et al. 2000, p. 107). The factors of trust and technology adoption need to be monitored and measured as undertaken in this research to ensure that the supply chain is operating to optimum efficiency.

However, the concept of critical success factors has been criticised by Davis (1979, 1980) on the basis that the factors being proposed by management can have a bias (Soliman, Clegg & Tantoush 2001, p. 614). This criticism has been acknowledged and managed through later work by Munro (1983) who clarified the work by Rockart (1982) demonstrated that “the use of critical success factors was a reasonable and reliable technique but the process needs to be free from the bias of managers and interviewers”(Soliman, Clegg & Tantoush 2001, p. 614). This bias can be removed through the use of experienced interviewers (Yin 2003). It has been noted that “the perceived importance of critical success factors can vary among industries and nations” (Lau 2002, p. 127) and this can show different variations in factors rather than the effect of bias by the interviewers or the managers.

Having discussed critical success factors, the next section concerns the theory of trust and technology adoption together with a number of other related issues impacting upon the Australian agribusiness supply such as partnerships, traceability, political factors and outsourcing. These critical success factors of trust and technology adoption are the few things that must go right for the business to flourish and have been identified as extremely important to enable the agribusiness supply chain networks to work cohesively so they may be competitive, efficient, and deliver consistent quality products in the right quantities, time, price and place from the farm gate to the end consumer.

2.7.1.1 Trust Theory

Trust is a “fundamental relationship model building block” which can be applied to the supply chain partnerships (Wilson 1995, p. 8). The lack of trust in a supply chain is “the single biggest obstacle to advancing supply chain improvement”(Poirier 1999, p. 46). The commitment to building trust by supply chain partners is a significant determinant in achieving successful supply chain partnerships (Heffernan 2004; Kwon & Suh 2005; Poirier 1999; Sahay 2003; Selnes 1998; Wilson 1995; Zineldin & Jonsson 2000). “A degree of trust is essential” in the continuity of a long-term partnership between supply chain partners (Dapiran & Hogarth-Scott 2003, p. 260).

Trust relates to the willingness of two or more partners to take the risk of relying on the exchange of another partner with whom they have confidence (Batt 2003; Kwon & Suh 2005; Mayer, Davis & Schoorman 1995; Moorman, Deshpande & Zaltman 1993; Sahay 2003; Selnes 1998; Wilson 1995; Wu et al. 2004; Zineldin & Jonsson 2000).

This exchange between the partners relies on the continual flow of communication or information sharing that binds the partnership or relationship together to grow the trust, between the partners (Batt 2001a, 2001b, 2003; Coulter & Coulter 2002; Dapiran & Hogarth-Scott 2003; Kwon & Suh 2005; Myhr & Spekman 2005; Ruppel 2004; Sahay 2003; Selnes 1998; Wu et al. 2004; Yee & Yeung 2002; Zineldin & Jonsson 2000). The commitment to communication, sharing information and planning between partners in the supply chain will continue to build and maintained trust in supply chain partnerships (Wu et al. 2004; Yee & Yeung 2002; Zineldin & Jonsson 2000).

Confidentiality has been mentioned as an important factor between supply chain partners and the sharing of secrets in building supply chain partnerships (Batt 2001b; Coulter & Coulter 2002; Moorman, Deshpande & Zaltman 1993; Sahay 2003; Wong & Sohal 2002).

Honesty and integrity has been identified as one of the main factors in building and maintaining supply chain partnerships (Batt 2001b, 2003; Coulter & Coulter 2002;

Heffernan 2004; Kwon & Suh 2005; O'Malley & Tynan 1997; Ruppel 2004; Sahay 2003; Selnes 1998; Wu et al. 2004; Yee & Yeung 2002; Zineldin & Jonsson 2000).

Trust between partners can be created by the supply chain partners adapting and customising business operations and providing alternatives to meet the specific needs of the other supply chain partner (Batt 2001a; Coulter & Coulter 2002; Heide 1994; Zineldin & Jonsson 2000). Collaboration between partners can enable the supply chain members to adapt and customise their supply chain practices, goods and services to fit their partner's business to provide improved performance for the supply chain (Coulter & Coulter 2002; Zineldin & Jonsson 2000). Trust in the supply chain can build relationship satisfaction which can encourage partners to collaborate and adapt business processes, designs and planning of the goods and services, which are used in their supply chain (Zineldin & Jonsson 2000).

The promptness of a partner in reacting to another partner's request in a timely manner builds trust between the partners in the supply chain (Batt 2001b; Coulter & Coulter 2002; Selnes 1998; Yee & Yeung 2002).

Supply chain partnerships are built on the trust that their partners pursue shared values or compatible goals that are common to both partners (Batt 2003; Coulter & Coulter 2002; Dapiran & Hogarth-Scott 2003; Sahay 2003; Wilson 1995; Wong & Sohal 2002; Zineldin & Jonsson 2000). Similarity between the partners relating to the products or services they offer to the supply chain can more easily build trust with shared values and goals. Trust can also be created through similarity that goes beyond the business and can be related to, "Lifestyle, social class, and education" between the parties concerned (Coulter & Coulter 2002, p. 38).

Trust in a supply chain can be related to the competence or work standard, skill, knowledge and the ability to fulfil, a promise, agreement or obligation (Coulter & Coulter 2002; Kwon & Suh 2005; Mayer, Davis & Schoorman 1995; Selnes 1998; Wu et al. 2004; Yee & Yeung 2002). The belief held by partners in each other is built on the trust and acknowledgement of the competence of the other partner to provide goods or services customised to their requirements in the supply chain (Batt 2003; Coulter & Coulter 2002; Heffernan 2004; Kwon & Suh 2005; Zineldin & Jonsson

2000). Trust can also be established between partners based on the experience, professional qualifications or expertise their profession represents in the supply chain to manufacture goods or provide a service (Coulter & Coulter 2002).

Trust in partnerships can be related to contractual trust where the partner's trust in each other is increased by continually delivering on promises of the contract. "Trust is developed by the partners doing what they said they would do" (Heffernan 2004, p. 121). Trust between partners is based on the knowledge the partners are reliable and will keep their promises to each other (Batt 2001a, 2001b, 2003; Heffernan 2004; Kwon & Suh 2005; Morgan & Hunt 1994; Myhr & Spekman 2005; Sahay 2003; Schurr & Ozanne 1985; Wong & Sohal 2002; Wu et al. 2004; Yee & Yeung 2002; Zineldin & Jonsson 2000).

Goodwill is a major contributor to building trust (Batt 2001b; Dapiran & Hogarth-Scott 2003; Heffernan 2004; Kwon & Suh 2005; Sahay 2003; Wu et al. 2004; Yee & Yeung 2002; Zineldin & Jonsson 2000). Goodwill is created by partners when: "They put the other partners interests in front of their own, or are willing to do more than is formally requested of them or are responsive to certain requests outside of the normal" (Heffernan 2004, pp. 115-116; Sako 1992; Sirdeshmukh, Singh & Sabol 2002).

Trust in supply chain partnerships requires each partner to have a belief in the other partner not to take advantage of them (Batt 2001a, 2001b; Heffernan 2004; Kwon & Suh 2005; Lane & Bachmann 2000; Zineldin & Jonsson 2000). In addition to goodwill the trust factors of faith, empathy, politeness together with being warm and friendly can maintain and build trust when dealing with each other on a regular basis (Coulter & Coulter 2002).

Sometimes in a supply chain one partner will be the dominant member. This situation can lead to a power dependence on a partnership which can favour the most powerful partner in the supply chain (Dapiran & Hogarth-Scott 2003). Opportunistic behaviour relates to one of the supply chain members taking advantage of the other supply chain partner (Batt 2003; Kwon & Suh 2005; Wong & Sohal 2002; Yee & Yeung 2002; Zineldin & Jonsson 2000). Power dependence can lead to opportunistic behaviour by

the dominant member in the supply chain taking advantage of the other supply chain partner, which may have a negative impact on trust (Batt 2001a; Kwon & Suh 2005).

To reduce the risk of a breakdown in trust and conflict in the supply chain partnership, the act of benevolence by all partners in the supply chain builds confidence amongst the partners, which creates greater trust. Ganesan (1994) explained trust between partners relies on the benevolence of one party to the other in being “accommodating and acting with equity when issues arise”(Ganesan 1994; Heffernan 2004, p. 115).

The long-term relational enhancement and satisfaction between the partners built on trust can be gained from competence, communication, commitment and conflict handling between the partners (Selnes 1998). “Conflict resolution may be crucial in maintaining trust for the life of a relationship” in the supply chain (Selnes 1998, p. 310). Selnes (1998, p. 319) suggested “proactive conflict handling” could lead to improved trust between the supply chain partners. When conflict arises it is important to have the best people manage and resolve the conflict within the supply chain partnerships (Sahay 2003).

Another issue concerning trust relates to the commitment of a partnership when switching or termination costs are considered. This issue requires an assessment of the risk of terminating the current partnership compared to the potential unknown risk of choosing a new partner. The longer a partnership exists, the perception of switch costs increases (Coulter & Coulter 2002; Porter 1985). The higher the relational investment in capital, training, people, equipment and time the greater the commitment and level of trust will be for the partnership to continue due to the high exit costs associated with breaking up the partnership (Coulter & Coulter 2002; Dwyer, Schurr & Oh 1987; Morgan & Hunt 1994; Porter 1985; Zineldin & Jonsson 2000).

There have been a number of studies on agribusiness supply chains in Australia and overseas that make reference to trust being a major factor in the advancement of supply chain alliances. Petersen, Cornwell and Pearson (2000) clearly state the importance of trust and the attributes that are part of trust such as information flow, openness and reliability, communication and competence between supply chain partners. They consider that the lack of trust in agribusiness supply chains is an

immediate impediment to a successful and efficient supply chain. Lack of trust coupled with this poor information flow and poor coordinated planning or collaboration will result in poor supply chain performance. Batt (2003) surveyed the fruit and vegetable supply chain relating to trust and its importance in maintaining partner alliances. Batt (2003) confirms that market agents that demonstrate a willingness to work with growers and share information can enter into supplier relationships as well as provide profitable returns to the growers, which is a high focus for growers.

The “Asian Food Buyers Survey” undertaken by Agri Chain Solutions (2001) claims that Australian agribusiness needs to improve information flow with its supply chain partners to compete more strongly against the competition from other countries in the Asian market. This survey also claims that Australian agribusiness partners in Asia seek improved joint planning or collaboration to improve the supply chain alliance. The case studies conducted by the Australian Department of Primary Industries and Energy (DPIE 1998) found that information flow was a critical issue to the citrus industry in Australia when dealing with various links in the supply chain and that non disclosure of information was probably caused by distrust and a desire to maximise profits at the expense of other partners in the supply chain.

Trust was identified as an important factor in agribusiness supply chain partnerships globally at the “World Meat Conference” in Brisbane in 2006 (AMIC 2006b; Brown 2006; Cattle Council of Australia 2006).

Trust has been selected as an important factor in this study because the theory indicates that trust helps build and maintain successful agribusiness supply chain partnerships. A lack of trust may result in sectors in the supply chain partnerships deliberately competing in an adversarial, uncooperative manner to achieve a suitable business process and model.

This study will contribute to the literature relating to trust in the various six sectors of the meat and horticulture agribusiness supply chain in northern New South Wales and Queensland. Table 2.8 (see page 46 & 47) provides a summary of the main authors

used for the literature relating to trust factors in the supply chain, which formed the basis for selection of trust factors for the current study.

Having explained the theory of trust, the next section discusses the diffusion of innovation technology theory or technology adoption.

Table 2.8: Literature relating to trust in the supply chain

Trust	Zineldin & Jonsson 2000	Wilson 1995	Batt 2003 2001	Coulter & Coulter 2002	Heffernan 2004	Wong & Sohal 2002	Dapiran & Hogarth-Scott 2003	Kwon & Suh 2005	Ruppel 2004	Poirier 1999	Myhr & Spekman 2005	Sahay 2003	Yee & Yeung 2002	Selnes 1998	Wu, et al 2004
Willingness	X	X	X					X				X		X	X
Confidentiality			X	X								X			
Honesty and integrity	X		X	X				X	X			X	X	X	X
Collaboration	X							X	X	X	X	X			
Information sharing, POS Communication	X		X	X			X	X	X		X	X	X	X	X
Adaptation customisation	X	X		X											
Shared value, Compatible goals	X	X	X	X		X	X	X			X	X			
Expertise and qualification			X	X	X								X		
Reliance / keep promises/ reliability	X		X	X				X			X	X	X		X
Competence Work standards				X				X					X	X	X
Promptness, Timeliness			X	X									X	X	
Politeness				X											
Empathy, Warm, Friendliness, Caring,				X									X		X

(Source: Developed for this research by the author from literature)

Table 2.8: (continued) Literature relating to trust in the supply chain

Trust	Zineldin & Jonsson 2000	Wilson 1995	Batt 2003 2001	Coulter & Coulter 2002	Heffernan 2004	Wong & Sohal 2002	Dapiran & Hogarth-Scott	Kwon & Suh 2005	Ruppel 2004	Poirier 1999	Myhr & Spekman 2005	Sahay 2003	Yee & Yeung 2002	Selnes 1998	Wu, et al 2004
Confidence		X	X		X			X	X				X	X	X
Belief	X	X	X	X			X	X				X			X
Goodwill	X		X		X		X	X				X	X		X
Faith				X								X			
Commitment	X	X			X			X		X		X		X	
Benevolent	X		X		X			X			X	X	X		X
Conflict handling												X		X	
Contractual			X		X							X		X	
Similarity with partners				X											
Power / dependence		X	X				X								X
Opportunistic behaviour	X		X			X		X					X		
Switch costs, Relationship termination costs, Relational investment	X		X	X				X							X
Continuity, Duration of partnership	X		X	X											
Relational satisfaction, Satisfaction	X		X											X	

(Source: Developed for this research by the author from literature)

2.7.1.2 Diffusion of Innovation Technology Theory

Innovation in the supply chain is essential to remain competitive. Innovation can take place at the design or process level and the use of technology can offer opportunities for either or both design or process innovation. Partners in a supply chain need to use innovation to provide a continual flow of a variety of quality products and services to remain competitive in the marketplace. (Poirier 1999, p. 137) discussed the need for innovative products and service:

The supply chain needs to make a transition from merely supplying quality products that work with marketing support to providing products and supply chain solutions that are, “innovative, unique, have special sizes and assortments, financial options in the buying process, special services not offered by competing networks, and substantial attention to after sales service.

There is also a “consistent emphasis on the need for logistics to be innovative” in methods of handling material, supplies, products and goods to market (Poirier & Reiter 1996, p. 215) .

Rogers’ diffusion of innovation theory has been well accepted since being first published (Tran 2005). Diffusion is defined as, “the process by which an innovation is communicated through certain channels over time among members of a social system” (Rogers 1983, p. 5). The idea of this social system can be extended to encompass a supply chain where partners adopt innovation to improve the supply chain network. Many other research studies have followed Roger’s theory, which covers five sets of factors that affect the rate of adoption (Au & Enderwick 2000; Gregor & Jones 1999; Parthasarathy, Rittenburg & Ball 1995; Polatoglu & Ekin 2001; Power & Simon 2004; Prater, Frazier & Reyes 2005; Reid & Buisson 2001; Rogers 1983; Tran 2005; Warren 2004). The rate of adoption of an innovation is an important factor. Rogers (2003) commented that the initial adoption begins with a relatively slow demand and then after a period of time the demand for the innovation may suddenly “take off” for a period (Tran 2005). As the innovation reaches its mature life cycle, the demand for the innovation eventually levels off (Tran 2005).

The five factors considered by adopters in diffusion of innovation process identified by Rogers (1983) are explained in Table 2.9.

Table 2.9: Rogers' diffusion of innovation theory

Heading	Explanation
Relative advantage	Relative advantage is the degree to which an innovation is perceived to be better than the idea it supersedes. Relative advantage is commonly expressed as an economic profit, social prestige or other benefits.
Compatibility	The compatibility factor is the degree to which an innovation is perceived as consistent with the existing values, past experience and the needs of the potential adopter. The more compatible an innovation is to a potential supply chain partner and the closer it fits to the supply chain partners life experiences and situation the more familiar they will be with the innovation and the less uncertain they will be about adopting the innovation.
Complexity	The complexity factor is the degree to which an innovation is perceived to be difficult to understand and use. The greater the complexity of the innovation the more negatively the supply chain partner may view this innovation.
Trialability	The trialability factor relates to opportunity adopters have to try out an innovation. The more opportunity early adopters have to trial an innovation the more positive are the chances of adopting the innovation.
Observability	The observability factor is the degree to which the results of an innovation can be visible to others. The more observable an innovation becomes, and is perceived as suitable by supply chain partners, the more positively related to the rate of adoption it will become.

(Adapted from: Rogers 1983)

An innovation can be adopted or rejected once an organisation has studied the new technology. However, there are cases where new technology has been adopted and used but later rejected because it was not successful (Parthasarathy, Rittenburg & Ball 1995).

In Australian agribusiness diffusion of innovation has been identified in the beef industry in relation to electronic commerce. Over a nine-month period a project was run involving a horizontal beef supply chain alliance with 22 partners. When the

project commenced there were two partners that used the technology, but by the end of the nine months 21 of the 22 partners had adopted the innovation (Gregor & Jones 1999).

The improvement in real productivity growth in Australian agribusiness between 1953 to 2000 can be attributed to 70 percent of the value of output coming from improved infrastructure, high quality inputs and technology adoption (Mullen 2002). McGregor (2002) discussed the need for Australian agribusiness to be aware of and adopt various types of technology if suitable such as information technology, and biotechnology, with the need to increase innovation in products, processes, logistics, environment, and supply chain relationships. Salin (1998) stated that “Good information technology systems in agri-food can generate information that will bring competitive advantage to the entire supply chain”. This trend must be continued in Australian agribusiness to remain competitive, as other supply chains in overseas countries are undertaking innovation and technology adoption to compete on the global market. These improved supply chain networks overseas are creating “new varieties of products, with extended shelf life, and production efficiencies” to maintain their position in the competitive retail food industry (Fearne & Hughes 1999, p. 122). Salin (1998) commented that “the major information technology systems in food chain today are implemented at retail, giving the retailers the opportunity of chain leadership”. Consumers in Australia and overseas are looking for new, improved products and continued research and development initiatives will provide the technology for the members of the supply chain to satisfy consumer demand in the future (HAL 2006c; Hughes 1996; MLA 2006c).

Miandetta Farms in Queensland, who were asparagus growers and exporters to Japan claim that the innovations in packaging of their asparagus products had improved the quality of the asparagus on arrival in Japan (DPIE 1998). Woods Fisheries also in Queensland consider the investment in technology helped provide the products that met customer requirements (DPIE 1998). The “Asian Food Buyers Survey” undertaken by Agri Chain Solutions (2001) mentions innovation in their survey relating to the diffusion of new varieties, packaging and business practices. In relation to issues considered in this dissertation these survey results show that in the majority of cases, Australian agribusiness falls behind the customer’s expectations and needs

relating to innovation. In a number of cases it has also been identified that Australian agribusiness is behind other competitor nations in innovation.

Innovation in Australian agribusiness has been mentioned by Petersen, Cornwell and & Pearson (2000) in their study on agribusiness supply chains. They commented that the Australian horticulture industry needed to more readily adopt new improved technology as it became available. The Australian horticulture industry also needed to undertake greater research and development initiatives to advance supply chain efficiency.

Table 2.10 (see page 52) provides a summary of the literature relating to technology adoption factors in the supply chain, which formed the basis for selection of technology adoption factors for the current study.

Having discussed the theory of technology adoption, the next section concerns the other critical success factors in this research concerning partnerships, traceability, political factors and outsourcing.

Table 2.10: Literature relating to technology adoption

Technology adoption	Rogers 1983	Reid & Buisson 2001	Gregor & Jones 1999	Power & Simon 2004	Parthasarathy, Rittenburg & Ball 1995	Prater, Fraser, & Reyes 2005	Warren 2004	Au & Enderwick 2000	Tran 2005	Polatoglu & Ekin 2001
Relative advantage	X	X	X	X	X	X	X	X	X	X
Compatibility	X		X	X	X		X	X	X	X
Complexity	X		X	X	X		X	X	X	X
Trialability	X	X	X	X	X				X	X
Observability	X		X	X	X	X		X	X	
Rejection					X					

(Source: Developed for this research by the author from literature)

2.7.1.3 Other Related Issues

Section 2.7.1.1 and 2.7.1.2 outlined the critical success factors of trust and technology adoption, which are the focus of this research. This next section examines a number of other related issues including partnerships, traceability, political factors and outsourcing, which have been suggested by the literature as being important to the success of agribusiness supply chains.

2.7.1.3.1 Partnerships

Partnerships are an important factor in agribusiness supply chain management. Greater cooperation between supply chain partnerships will become extremely important to compete effectively in the market. The organisations in the agribusiness supply chains concerned need to be better at cooperating with each member in the supply chain (O’Keeffe 1998). Spekman, Kamauff, and Myhr (1998) set out the main criteria for selecting supply chain partners. These criteria were: that the supply chain partners needed to be trustworthy, have a high degree of integrity, and know about each other’s business. For supply chain partnerships to be successful they must be based on the premise of partners having a commitment to a long-term relationship between the partners in the supply chain. The factor of trust in building alliances and partnerships has been considered one of the hardest factors to achieve in supply chain management (O’Keeffe 1998). In the long term it is considered that individual companies in the agribusiness and food industries cannot achieve their desired market position solely through their own efforts (Thompson 2001). Woods (1998, p. 1) stated that: “The traditional approach of focusing on producing undifferentiated bulk products which the supply chain lose track of as soon as they go out the farm gate is becoming outdated”. Traditional relationships between retailer, manufacturer, distributor and farmer are undergoing fundamental changes, with greater moves towards partnerships and alliances, which will require greater emphasis on supply chain management in the future (Thompson 2001). More and more retailers globally are looking to have direct links with preferred suppliers in their supply chain network (Fearne 1998; Fearne & Hughes 1999; Grimsdell 1996; Hingley 2005; Hughes 1996; Hughes & Merton 1996; Lindgreen 2003; O’Keeffe 1998; O’Keeffe & Fearne 2002; Parker, Bridson & Evans 2006; Starkey & Carberry-Long 1995; White 2000; Wilson 1996). For those suppliers that are not big enough to forge sturdy supply chain alliances with the large retailers Drabenstott (2000) suggests these suppliers may be

best served as part of a new generation cooperative that becomes part of a supply chain linked with the end retailer. There is a willingness by producers to consider the new generation cooperatives and there are examples of these supply chains in Australia and overseas such as Blue Gum Beef, Brigalow Beef, Organic beef exporters, Australian Tropical Marketing and US Premium Beef ('Growers control supply chain ' 2003; Blue Gum Beef 2006; Brigalow Beef 2006; Katz & Boland 2000; Kularatna, Spriggs & Storey 2001; Organic Beef Exporters 2006). Revenue sharing in supply chain partnerships is concerned with partners in the supply chain improving their profit margins to make the strategy worthwhile. Improved revenue for each member of the supply chain is a major strategy to make supply chain management worthwhile and maintain the partnership to achieve relationship satisfaction Poirier. However, this is not always the case as some of the partners in the agribusiness supply chain at times have suffered from poor financial rewards (Petersen, Cornwell & Pearson 2000; Spencer 2004).

2.7.1.3.2 Traceability

Traceability in the agribusiness supply chain for many products has become an important factor and is linked to trust as a given expectation today by consumers (Brown 2006; Hughes 2006). Traceability in the agribusiness supply chain has been a key initiative by members of the food supply chain to build trust and assure consumers of the measures taken to provide food safety in the supply chain. Traceability provides a system that consumers can trust as they have increasing concerns and demands to know where the food they are consuming came from and consequently whether it is safe to eat (AMIC 2006b; Calder & Marr 1998; Cattle Council of Australia 2005b, 2006; Lea & Worsley 2006; Leat, Marr & Ritchie 1998; Schröder & McEachern 2002; Simpson, Muggoch & Leat 1998; van Dorp 2002; Wilson & Clarke 1998). Recent disease outbreaks overseas relating to animal diseases such as Foot and Mouth Disease (FMD) and Mad Cow Disease (BSE) have caused extreme financial hardships to agribusiness supply chain members and caused a breakdown in trust with consumers (Baines & Harris 2000; Dawson & Lyons 2003; Lindgreen & Hingley 2003; Loader & Hobbs 1996; Viaene & Verbeke 1998). These disease outbreaks, together with chemical residues, hormone and antibiotic practices as well as pathogenic organisms in the supply chain, have raised consumers' concerns world wide about the source of their food products and what is in their food products (Fearne & Hughes 1999; Grimsdell 1996; Hobbs 1996; Hughes & Merton 1996; Lindgreen & Hingley 2003; Palmer 1996). The Australian

meat industry has implemented the National Livestock Identification Scheme (NLIS) for beef and sheep providing a whole of life identification. This technology adoption uses RFID which enables swift trace back to the property of origin in order to manage the risk of identifying animal cases of disease or chemical residue detection during processing (Cattle Council of Australia 2005b, 2006; Gregor, Jones & Menzies 1999; MLA 2006j). The NLIS technology adoption strategy is linked in building trust with members of the supply chain from the producer to the consumer. Despite the NLIS initiatives instituted by the Australian government and managed by the MLA, there is still concerns by some sectors of the industry on the operation of the system, the financial costs and benefits to be achieved as well as NLIS not being a mandatory importing requirement by international customers and government authorities (Thomson 2006).

The requirement for traceability of horticultural produce has been driven by consumers who want information on the producer's country of origin and the growing methods used on the farms. Supermarkets are assisting these customers by requesting the supply chain to inform them "how, where and from whom food items are produced" (Hughes & Merton 1996, p. 5). Traceability of fruit and vegetables using RFID is being considered by some of the large stores and warehouses in UK and the USA. By using this technology the supply chain will be able to more easily link farmers with consumers (Folinas, Manikas & Manos 2006; Jones et al. 2005; Kärkkäinen 2003). HAL has funded research on the use of RFID to commercialise a monitoring and tracking system for fruit and vegetable products which records the temperature and the location of these products in the supply chain (HAL 2006b). The Australian Lychee industry has emphasised improving transparency and traceability in their supply chain to improve their knowledge from the farm to the consumer in their 2003 to 2008 strategic plan (HAL 2006a).

2.7.1.3.3 Government

Agribusiness supply chains, organisations and industry groups endeavour to build partnerships with local, state and federal governments to maintain and advance trade. Due to Australia's small population and large production of agribusiness products, factors that politically affect free trade internationally are a critical factor in the Australian agribusiness supply chain. Market access is a critical factor for Australian agribusiness and restrictive import laws, trade policy together with import regulations

by overseas countries can have an adverse effect on Australian what agribusiness and effect free trade globally (Crombie 2006a; DAFF 2006; HAL 2006f; Malcolm, Egan & Sale 1996; MLA 2005b; Ueberbang 2006).

Environmental management in agribusiness is closely monitored by external stakeholders and controlled by laws that stipulate environmental standards on water, air, soil and noise pollution. Management and control of the environment in a sustainable manner by agribusiness supply chain partners will underpin the long-term future and profit in the supply chain. (Australian Pork Limited 2003; Cattle Council of Australia 2005a; DAFF 2006; Gamini 1998; Gunningham & Sinclair 2002; HAL 2006e; Malcolm, Egan & Sale 1996; MLA 2003c, 2006g; Toyne, Mech & Cowell 2004).

Availability of suitable land is a critical factor in any agribusiness supply chain that produces crops or livestock (Malcolm, Egan & Sale 1996; MLA 2003c). Agribusiness partners have to communicate, collaborate and share information with external stakeholders and government to ensure suitable land can be used for agribusiness purposes and not locked out of use by what Agforce (2006) describe as, “overly rigorous, rigid legislation such as the Vegetation Management Act”.

Partners in land-based agribusiness supply chains have to build relationships with government and other external stakeholders to secure their access to suitable water volumes at economic rates to ensure the long-term future to irrigate horticultural crops and normal water usage for livestock production (DAFF 2006; HAL 2006d; MLA 2003c).

Agribusiness partners and industry bodies have strong relationships, goodwill, and shared values with government concerning the control of animal and plant disease risk relating to domestic disease outbreaks and potential import disease risks. Industry maintains a high level of trust in government to manage quarantine risk based on scientific risk assessment to ensure Australian agribusiness is not crippled by the import of exotic diseases from overseas. Crombie (2006) commented that the revised Australia’s quarantine Import Risk Analysis (IRA) process, “will substantially boost Australian farmers confidence in the Australian quarantine system” (Crombie 2006b; Farmonline 2006a).

2.7.1.3.4 Outsourcing

Outsourcing is an important factor in agribusiness where a number of important goods and services are provided by outside organisations. The majority of goods or services that are outsourced are not part of a partner's core business. The decision to strategically outsource these goods or services is made under a "make or buy" principal for a business partner to decide if the good or service constitutes a core part of the business or not (Al-Hakim & Mahaorand 2005; Linder, Cole & Jacobson 2002; Zineldin & Bredenl w 2003).

Logistics is an important sector of the agribusiness supply chain where significant outsourcing is carried out. Poirier and Reiter (1996, p. 199) describe the logistics function as:

Being the operation of packaging, unitising, loading, unloading, transporting, moving, storing, sorting, and reloading products. Its keeps track of these actions providing valuable data on location and storage and finding ways to constantly improve handling, inventory, warehousing, and transit costs.

The major reason to outsource has now moved from offloading non-core activities and reducing costs to collaboration between the partners. This collaboration between outsourcing partners requires a high level of trust between the partners to gain access to competitive skills, improve service levels and increase their ability to respond to changing business needs (Linder, Cole & Jacobson 2002).

Having discussed the other critical success factors in Australian agribusiness, the next section explains the methodology and use of gap analysis theory in this research.

2.7.2 Methodology

The critical success factors concerning the theory of trust and technology adoption described in section 2.7.1.1 and 2.7.1.2 will be investigated using the gap theory methodology. This methodology will use gap theory to measure the gap between the perceived performance level (*level*) and the expected performance level (*importance*) of the factors of trust and technology adoption in the agribusiness supply chain.

2.7.2.1 Gap Analysis Theory

An understanding of gap analysis is of interest in theory and in management practices. Understanding of gaps in the relationship between buyers and sellers is important as these gaps affect the development of buyer/seller relationships (Leminen 2001). Gap

theory is useful in identifying the gap or distance between the customer's perception and expectation of service satisfaction in case studies. The buyers and sellers referred to in this theory are the various supply chain partners that represent any given supply chain and hence can be applied to the agribusiness supply chain. Increased numbers of gaps or a high number of gaps can illustrate that there are differences and possible problems between companies in terms of their service (Leminen 2001).

This research will use an adaptation of two dual rating gap analysis methods known as SERVQUAL and Importance Performance Analysis (IPA). These two methods measure the gaps between the perceived performance level (*level*) and the expected performance level (*importance*) which can identify the critical gaps in trust and technology adoption in the agribusiness supply chain.

The SERVQUAL model has become widely recognised, being used by both business and researchers (Silvestro 2005; Zeithaml, Parasuraman & Berry 1990). The SERVQUAL method concentrates on five areas relating to customer service, which are: reliability, responsiveness, assurance, empathy and tangibles (Zeithaml, Bittner & Gremler 2006; Zeithaml, Parasuraman & Berry 1990). SERVQUAL is used to analyse and research gaps between the perception and expectation of service quality to customers (Chow & Luk 2005; Hwang, Eves & Desombre 2003; LaBay & Comm 2003; Leminen 2001; Narasimhan 1997; Samson & Parker 1994; Silvestro 2005; Zeithaml & Bitner 1996; Zeithaml, Parasuraman & Berry 1990). The SERVQUAL model is designed to seek information from customers or partners concerning their perception of what they believe is the actual situation of service quality at the moment (Chow & Luk 2005; Hwang, Eves & Desombre 2003; Kreppa et al. 2003; LaBay & Comm 2003; Leminen 2001; Narasimhan 1997; Samson & Parker 1994; Silvestro 2005; Zeithaml & Bitner 1996; Zeithaml, Parasuraman & Berry 1990). The SERVQUAL model then seeks information from customers or partners concerning their expectation or how they believe or desire the service quality should be (Chow & Luk 2005; Hwang, Eves & Desombre 2003; Kreppa et al. 2003; LaBay & Comm 2003; Leminen 2001; Narasimhan 1997; Samson & Parker 1994; Silvestro 2005; Zeithaml & Bitner 1996; Zeithaml, Parasuraman & Berry 1990). The difference or gap between the perception and expectation concerning service or product quality has a direct relation to the customer's satisfaction (Chow & Luk 2005; Samson & Parker

1994; Silvestro 2005; Zeithaml & Bitner 1996). The greater the divergence between the customer's perception and the customer's expectation, the lower the level of customer service satisfaction (Chow & Luk 2005; Hwang, Eves & Desombre 2003; Krepapa et al. 2003; LaBay & Comm 2003; Leminen 2001; Narasimhan 1997; Samson & Parker 1994; Silvestro 2005; Zeithaml & Bitner 1996). Table 2.11 (See page 64) provides a summary of the literature relating to gap analysis theory, which formed the basis for selecting this theory in the current study.

The Importance Performance Analysis (IPA) theory has been widely used and recognised as a simple but effective theory to illustrate customer satisfaction (Duke & Mount 1996; Johns 2001; O'Neill & Palmer 2004; Slack 1994). Lovelock, Patterson and Walker (2001) stated the IPA theory provides information that is invaluable in terms of the development of marketing strategies for management to improve customer satisfaction (O'Neill & Palmer 2004). The use of IPA theory can illustrate to managers areas to direct scarce resources to where performance improvement will have the most effect on improving customer satisfaction (Lovelock, Patterson & Walker 2001; O'Neill & Palmer 2004).

Martilla and James (1977) first introduced IPA theory to measure customer satisfaction relating to an attribute of a good or service (Duke & Mount 1996; Huang, Hsu & Wu 2006; Hudson, Hudson & Miller 2004; Matzler, Sauerwein & Heischmidt 2003; Slack 1994; Yavas & J. Shemwell 2001). The IPA theory can be used to measure the perceived performance level and the expected performance level of a number of attributes (Duke & Mount 1996; Huang, Hsu & Wu 2006; Hudson, Hudson & Miller 2004; Johns 2001; Keyt, Yavas & Riecken 1994; Matzler, Sauerwein & Heischmidt 2003; O'Neill & Palmer 2004; Slack 1994; Yavas & J. Shemwell 2001). The perceived performance level is concerned with how a customer currently rates the performance of an attribute. In contrast the expected performance level relates to how a customer rates the importance of the same attribute (Duke & Mount 1996; Huang, Hsu & Wu 2006; Hudson, Hudson & Miller 2004; Johns 2001; Keyt, Yavas & Riecken 1994; Matzler, Sauerwein & Heischmidt 2003; O'Neill & Palmer 2004; Slack 1994; Yavas & J. Shemwell 2001). IPA theory can be used to obtain market research information through customer satisfaction ratings on a number of attributes by the use of survey questionnaires, focus groups or personal interviews (Huang, Hsu & Wu

2006; Hudson, Hudson & Miller 2004; Johns 2001; Keyt, Yavas & Riecken 1994; Matzler, Sauerwein & Heischmidt 2003; O'Neill & Palmer 2004; Yavas & J. Shemwell 2001).

The perceived performance level and expected performance level ratings gathered from the market research for the attributes of a product or services provides a paired rating for that attribute which clearly illustrates if a gap exists in the customer satisfaction rating. The data gathered from these market research methods is used to produce a two-dimensional matrix, where the perceived performance level is depicted along the x-axis and expected performance level is plotted along the y-axis (Duke & Mount 1996; Huang, Hsu & Wu 2006; Hudson, Hudson & Miller 2004; Matzler, Sauerwein & Heischmidt 2003; Yavas & J. Shemwell 2001). This method produces a clear picture to compare the perceived performance level and expected performance level rating for each attribute. The matrix is divided into four quadrants using the scales of the axes and the location of the attributes in the four quadrants is critical as this determines the interpretation of the results (Matzler, Sauerwein & Heischmidt 2003). Sampson and Showeralter (1999) say the placement of the four quadrants on the grid is “somewhat arbitrary” (Matzler, Sauerwein & Heischmidt 2003). However, Martilla and James (1977) suggest that the means for perceived performance level and expected performance level should be used to divide the matrix into quadrants as the focus is on the relative positioning of the various points (Matzler, Sauerwein & Heischmidt 2003; Yavas & J. Shemwell 2001). This comment was reinforced by Keyt, Yavas and Riecken (1994) who suggested the quadrant can be divided by the use of a central tendency such as the mean or the median or a ranked order measure.

Quadrant one is labelled ‘Keep up the good work’ and represents ratings, which have a high perceived performance level and a high expected performance level. ‘Keeping up the good work’ quadrant requires the supply chain to maintain this customer satisfaction rating to provide opportunities to gain and maintain market share for supply chain members. Quadrant two is labelled ‘Concentrate here’ and involves customer ratings with a low perceived performance level and high expected performance level. The ‘Concentrate here’ quadrant represents an area where customer satisfaction needs to be improved to provide overall customer satisfaction in the supply chain. Quadrant three is labelled ‘Low priority’ and concerns attributes that

have a low perceived performance level and low importance rating. The 'Low priority' quadrant requires no additional effort by supply chain members. Quadrant four is labelled 'Possible overkill' and relates to attributes that have a high perceived performance level rating but a low expected performance level. The attributes that have a 'Possible overkill' rating imply that the resources committed in this area would be better used in other areas of the supply chain (Duke & Mount 1996; Huang, Hsu & Wu 2006; Hudson, Hudson & Miller 2004; Johns 2001; Keyt, Yavas & Riecken 1994; Matzler, Sauerwein & Heischmidt 2003; O'Neill & Palmer 2004; Slack 1994; Yavas & J. Shemwell 2001).

IPA theory provides a strategy to focus on the attributes with the largest gaps between the perceived performance level and the expected performance level of the attributes or factors which have been researched to improve the efficiency of the supply chain (Duke & Mount 1996; Keyt, Yavas & Riecken 1994; Myers 1999; O'Neill & Palmer 2004; Slack 1994; Vavra 1997; Yavas & J. Shemwell 2001). Table 2.12 (See page 65) provides a summary of the literature relating to importance performance theory, which formed the basis for selecting this theory in the current study.

Both of these methods follow a similar measurement process and can use the Likert Scale for the dual measurement scales. These measurement scales allow the researchers or management to identify the gap in the factor by deducting the interviewee's perceived level of performance rating from the interviewee's expected level of performance to provide a numeric quantifiable gap (Chow & Luk 2005; Hwang, Eves & Desombre 2003; Krepapa et al. 2003; Samson & Parker 1994; Silvestro 2005; Zeithaml & Bitner 1996). The level of trust in supply chain partnerships has been referred to as a measurement base between supply chain partners (Poirier 1999; Sahay 2003; Wong & Sohal 2002).

SERVQUAL and IPA have been used and adapted for this research concerning the interchangeable use of the term expectation and importance. The use of the term importance rating can be used as an, "alternative to expectation" (Myers 1999, p. 20) however, "there is a question as to the semantic equivalence of the words 'importance' and 'expectation'" (Myers 1999, p. 21). The expectation rating has been interchanged with importance by Huang, Hsu and Wu (2006). The factors that fall

into the category of having a high gap and a high importance or high expectation are critical and are in need of improvement to ensure high customer satisfaction and optimal performance in the supply chain. This is similar to the zoning method used by Slack (1994) and Hudson, Hudson and Miller (2004) where four zones were designed drawn on a matrix. Slack (1994) designates the quadrants on the matrix as excess, appropriate, improve and critical. Hudson, Hudson and Miller (2004) use the terms: 'Concentrate here', 'Keep up the good work', 'Low priority and 'Possible overkill'. The zoning of performance gaps relate to placing factors in zones dependant upon the numeric gap. Factors with positive and low gaps were placed in the excess and appropriate zones. The factors placed in the improve zone had a gap with poor performance but not a high importance and were not treated as a first priority to remedy. The factors with gaps in the urgent zone were critical to be competitive in their business, which were below the acceptable performance rating with a high importance rating. The factors which had gaps that were critical with a high mean gap and a high mean expected performance level (importance) provided management and supply chain partners with the opportunity to reduce these critical gaps to improve their supply chain network and relationships.

Both SERVQUAL and IPA have been critiqued for their limitations. Vavra (1997) commented that the use of importance in formal satisfaction models has no theoretical foundation on satisfaction results but is useful for acting on satisfaction results. The Likert scale has been criticised for 'the ability to distinguish between subtle differences in the level of importance and performance' (Hudson, Hudson & Miller 2004). SERVQUAL has been criticised for not gathering information about performance and integrating it into the calculations of the rating. These three criticisms were managed by using a dual seven point Likert scale rather than a five-point scale to add extra preferences in the interviews. The expectation and importance rating have been used interchangeably to provide the SERVQUAL method with an importance rating. The expectation importance rating has been used to identify critical gaps that were evident in the urgent zone to improve. The perception performance rating has been further adapted and simplified in this research, referred to as the perceived level of a factor rather than perception or performance.

Having discussed gap theory, the next section concerns the lack of literature on trust and technology adoption in agribusiness supply chains in the meat and horticulture industry in northern New South Wales and Queensland.

Table 2.11: Literature relating to SERVQUAL gap analysis in the supply chain

Gap Analysis	LaBay Comm 2003	Narasimhan 1997	Silvestro 2005	Hwang, Eves, Desombre 2003	Chow, Luk 2005	Samson, Parker 1994	Leminen 2001	Krepapa, Berthon, Webb, Pitt 2003	Zeithaml Bitner 1996	Hudson, Hudson, Miller 2004	Zeithaml Parasuraman Berry 1990
Servqual	X	X	X	X	X	X			X	X	X
Perception	X	X	X	X	X	X	X	X	X		X
Expectation	X	X		X	X	X	X	X	X	X	X
Satisfaction	X			X	X	X		X	X		X
Service Quality			X		X	X			X	X	X
Quality Factors			X		X				X		
Gap Analysis	X	X	X	X	X	X	X	X	X	X	X
Likert Scale	X		X	X	X	X			X	X	X
Continuous Improvement		X					X				
Gap Closing						X	X	X	X	X	X
Structured Questionnaire	X		X	X	X	X		X	X	X	X
Measurement Scale			X	X	X	X		X	X		X
Ranking Factors		X	X	X	X	X			X		
Interview			X		X				X		X
Case Study Suitability	X		X		X	X			X		
Gap Model						X			X		X

(Source: Developed for this research by the author from literature)

Table 2.12: Literature relating to importance-performance analysis in the supply chain

IPA	Huang, Wu, Hsu 2006	Hudson, Hudson & Miller 2004	Matzler, Sauerwein, & Heischmidt 2003	O'Neill, Palmer 2004	Johns 2001	Yavas, Shemwell 2001	Myers 1999	Vavra 1997	Duke, Mount 1996	Keyt, Yavas, Riecken 1994	Slack 1994
Importance	X	X	X	X	X	X	X	X	X	X	X
Performance	X	X	X	X	X	X	X	X	X	X	X
Satisfaction	X		X	X			X	X	X		
Questionnaire Survey	X	X	X	X	X	X	X	X		X	
Interview		X		X			X	X			
Ranking		X	X	X	X		X	X	X	X	
Measurement	X	X		X	X		X	X	X	X	
Analysis	X	X	X	X	X	X	X	X	X	X	
Expectation	X	X			X		X	X	X	X	
Perception, Perceived performance level	X	X		X	X		X	X	X		
Improvement	X	X		X		X		X			
Factors	X	X	X				X	X			
Gap	X	X			X		X	X			

(Source: Developed for this research by the author from literature)

2.8 GAPS IN LITERATURE

A number of papers have been written about trust and the technology adoption in business and supply chain management. However, a limited amount of literature on trust and technology adoption has been written related to partners in the Australian agribusiness supply chain. A specific gap has been identified in the literature concerning trust, and technology adoption relating to the meat and horticulture industry agribusiness supply chain in Queensland and northern New South Wales.

2.9 CONCLUSION

This chapter has introduced the subject of supply chain management and the importance of agribusiness in Australia and internationally. While a number of agribusiness industries in Australia are significant by world standards, the scope of this research focuses on the meat and horticulture industry due to their importance in the Queensland and Northern New South Wales region.

The agribusiness sectors in Australia can continue to operate as individual entities. However this literature highlights the trend and advantages to be gained of being a member of a supply chain partnership.

The theories of trust and technology adoption in building and maintaining relationship in supply chains are important. These theories are critical factors to the success of supply chain management, as are other factors such as partnerships, traceability, political factors and outsourcing in Australian agribusiness.

The measurement of the performance of these factors in the supply chain is important. By using the gap analysis and IPA theories, the critical gaps in trust and technology adoption in the Australian meat and horticulture supply chain can be identified. The next chapter explains the research methodology used in this study including the research questions and propositions.

CHAPTER THREE – RESEARCH METHODOLOGY

3.1 INTRODUCTION

In Chapter 2, the literature relating to Australian agribusiness supply chains and the theories of trust and diffusion of innovation (technology adoption) laid the foundation for the research questions and the research propositions. This chapter presents the design, data collection procedures and data analysis methods used to study these research questions.

The research questions focus on the Australian meat and horticulture agribusiness supply chain. Each supply chain is divided into six specific sectors. In each of these sectors three case studies were undertaken. This methodology provided a total of 36 case studies relative to these research questions.

Figure 3.1 (See page 68) provides a diagrammatic overview of Chapter 3, which is divided into eight sections. The chapter first discusses the research questions and the propositions, which is followed by an overview of the application of theory to this research. The next section discusses the selection of a suitable scientific research paradigm. The case study methodology that is used in this research is then provided, followed by a description of the data analysis. The next section discusses the case study limitations. The final section of this chapter discusses ethical considerations in case studies and how these were handled in this research.

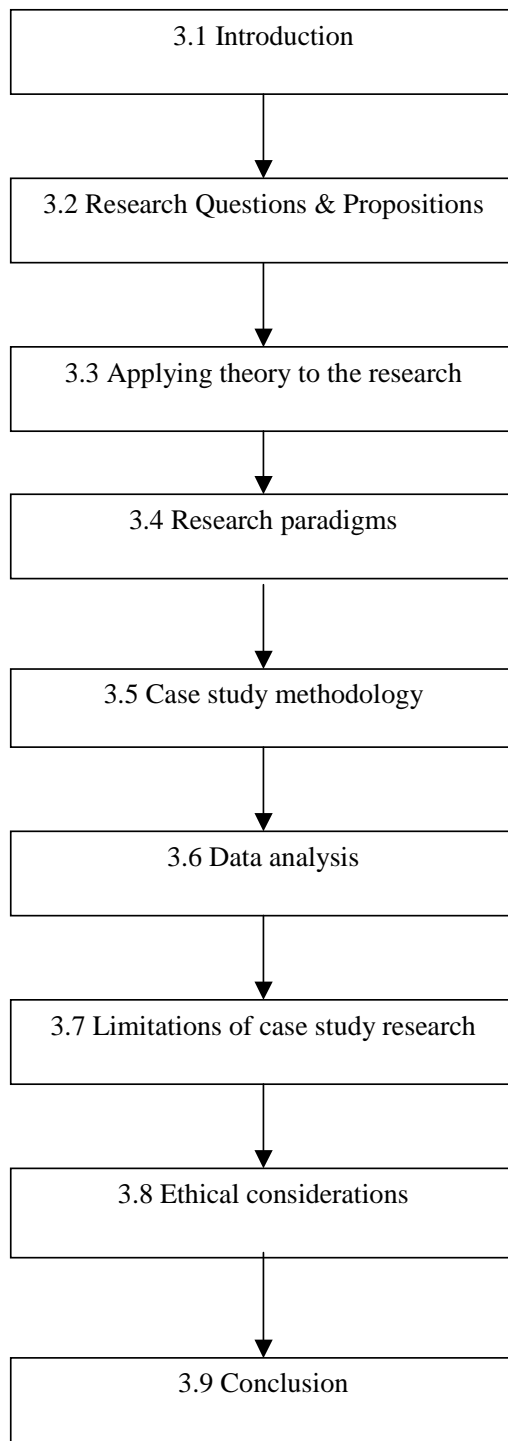


Figure 3.1: Chapter Outline
(Source: Developed for this research)

3.2 RESEARCH QUESTIONS AND PROPOSITIONS

This section contains a list of the research questions and propositions to be tested in this study. The research questions focus on establishing the *level* and *importance* of trust and technology adoption in the Australian meat and horticulture supply chain. The questions are designed to identify the critical gaps between the *level* and *importance* of trust and technology adoption in the Australian meat and horticulture supply chain. The final research question concerns the related issues of partnerships, technology, government, outsourcing and traceability in the Australian meat and horticulture industry.

The propositions that follow the research questions are tested against the data collected to establish the differences in the *level* and *importance* of trust and technology adoption in the Australian meat and horticulture supply chain.

3.2.1 Research Questions

The underlying research question is as follows:

What are the critical gaps in trust and technology adoption factors affecting the Australian meat and horticulture supply chains?

To answer the underlying research question, a number of supplementary questions need to be addressed. These questions include -

Level and Importance

1. What is the current perception of the perceived performance level (*level*) of trust in the Australian meat and horticulture industry supply chains?
2. What is the expected performance level (*importance*) of trust in the Australian meat and horticulture industry supply chain?
3. What is the current perception of the perceived performance level (*level*) of technology adoption in the Australian meat and horticulture industry supply chains?
4. What is the expected performance level (*importance*) of technology adoption in the Australian meat and horticulture industry supply chain?

Gap between Level and Importance

5. What is the gap between the perceived overall *level* and *importance* of trust in the Australian meat and horticulture industry supply chains?
6. What is the gap between the perceived overall *level* and *importance* of technology adoption in the Australian meat and horticulture industry supply chains?
7. What is the gap between the perceived *level* and *importance* of each factor of trust in the Australian meat and horticulture industry supply chains?
8. What is the gap between the perceived *level* and *importance* of each factor of technology adoption in the Australian meat and horticulture industry supply chains?

Critical Gaps

9. Which trust factors demonstrate critical gaps between *level* and *importance* of trust in the Australian meat and horticulture industry supply chains?
10. Which technology factors demonstrate critical gaps between the *level* and *importance* of technology adoption in the Australian meat and horticulture industry supply chains?

Other Related Issues

11. Which factors relating to partnership, technology, government, outsourcing and traceability were rated as important by the interviewees to the success of their supply chain in the meat and horticulture industries?

¹ Level is the perceived performance level – Importance is the expected performance level

3.2.2 Proposition testing

The following proposition will be tested to answer the research questions defined for this study.

P1: That there are significant differences between the perceived performance level (*level*) of trust in (a) the meat and horticulture supply chains and (b) within the sectors comprising those supply chains.

P2: That there are significant differences between the expected performance level (*importance*) of trust between (a) the meat and horticulture supply chains and (b) within the sectors comprising those supply chains.

P3: That significant differences exist between the perceived performance level (*level*) and expected performance level (*importance*) of trust within (a) the meat and horticulture supply chains and (b) the sectors making up those supply chains.

P4: That there are significant differences between the perceived performance level (*level*) of technology adoption between (a) the meat and horticulture supply chains and (b) within the sectors comprising those supply chains.

P5: That there are significant differences between the expected performance level (*importance*) of technology adoption between (a) the meat and horticulture supply chains and (b) within the sectors comprising those supply chains.

P6: That significant differences exist between the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption exist within (a) the meat and horticulture supply chains and (b) the sectors making up those supply chains.

Having defined and explained the research questions and propositions for this study, the next section discusses the application of the theories of trust and technology adoption to this research.

3.3 APPLYING THEORY TO THE RESEARCH

The application and incorporation of theory in this research is important in ensuring there is a tight focus for the research design for the case studies, data collection and data analysis. The theory in this research has been obtained from extant literature relating to trust, diffusion of innovation (technology adoption) and gap theory.

3.3.1 Stages in theory development

Figure 3.2 (See page 73) illustrates the three stages of theory development in this research. Stage one relates to the exploratory and inductive reasoning stage of this research to build theory for the case studies. The first stage involves building theory through an in depth literature review on the theories of trust and technology adoption within the context of meat and horticultural agribusiness supply chains. This is followed by two pilot case studies that were conducted using the theories of trust and technology adoption to help refine the data collection and refine questions in order to improve the quality of the theory building process.

Stage two is concerned with the confirmatory or disconfirmatory stages of collecting data through a structured interview questionnaire using 36 case studies. These case studies are focused on the theories of trust and technology adoption in the meat and horticulture agribusiness supply chain. The types of questions posed in this research use inductive reasoning to logically build the theory of the general proposition of trust and technology adoption through the use of observation, which is suited to case study methodology (Zikmund 1997).

Stage three is the final theory testing stage which uses deductive reasoning to cross analyse the data collected to assess generalisation across the two supply chains, and the six sectors in each supply chain. The structured interview questionnaire collected empirical data to test the proposition of this research. The next section discusses the research paradigms that were considered and selected for this research.

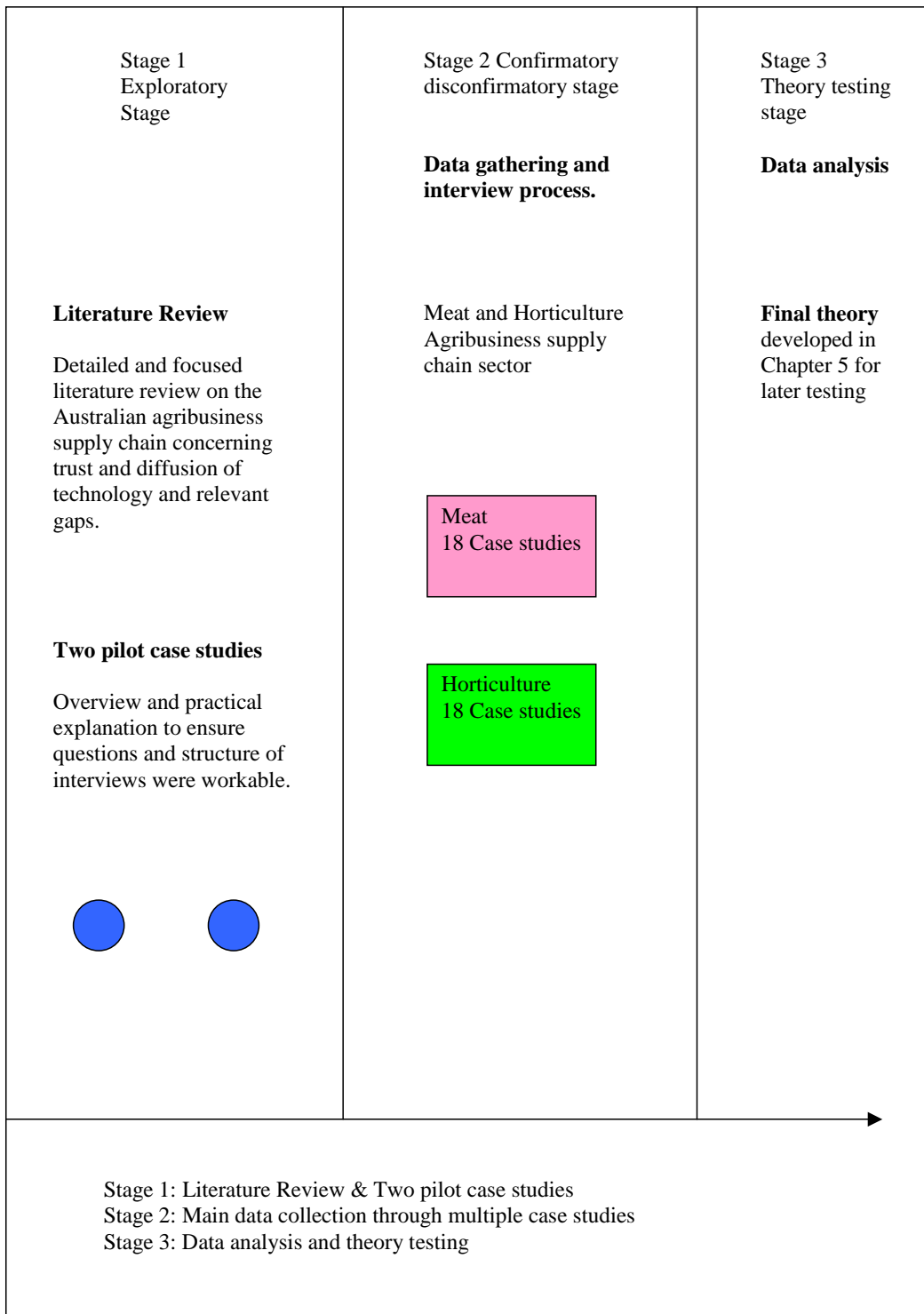


Figure 3.2: Stages of applying theory to this research
(Adapted from: Perry 1998)

Having explained how theory was applied to this study in order to focus the research, the next section discusses how the most suitable research paradigm was selected for this study.

3.4 RESEARCH PARADIGMS

A research paradigm has been defined as a framework of beliefs, values, orientations and techniques shared by a specific professional community (Kuhn 1962, p. 11). This section explains four scientific paradigms (See Table 3.1), which can be considered in research methodology and then provides the reasons why critical realism is the most suitable methodology for this research. The four scientific paradigms shown in Table 3.1 are: positivism, critical realism, critical theory, and constructivism as described by Guba and Lincoln (1994). Table 3.1 also includes three philosophical assumptions, which are ontology, epistemology, and methodology that support these four social scientific paradigms described by Guba and Lincoln (1994).

Table 3.1: Scientific research paradigms and assumptions

	Dominant paradigm	Alternative paradigms		
Assumptions	Positivism	Critical realism	Critical theory	Constructivism
Ontology	An apprehensible reality exists driven by immutable natural mechanism and the investigator and reality are independent	Reality is imperfectly apprehensible because of human mental limitations and the complexity of the world	Reality is shaped by social and other forces, and research should emancipate the perceptions of co-researchers and participants	Reality is constructed by people (and a researcher), and so there is no "truth".
Epistemology	"Disinterested scientific" or "one way mirror" Observer	Observer with some level of participation as dualism is not possible to maintain but some objectivity is sought	Transformative intellectual	Passionate participant
Methodology	Surveys and experiments	Case studies, interviews, convergent interviewing	Action research	In-depth interviews, participants observation

(Adapted from: Chew D 2001; Guba & Lincoln 1994; Lake 2004; Perry & McPhail 2001)

The scientific paradigm of positivism views the world through a "one way mirror" that does not change and has a deductive line of view or reasoning (Guba & Lincoln 1994). Positivism ignores social science involving humans and real life experiences and treats the respondents as independent, non reflective objects "ignoring their ability to reflect on problem situations, and act on these" in a independent way and is considered inappropriate for social science (Robson 1993, p.60; 2002, p. 21).

The critical theory paradigm relates to research, which seeks to critique and transform social, political, economic, ethnic and gender values over a long period of time (Perry,

Riege & Brown 1999). These studies aim to transform the situation by changing the system or the current strategy formulation.

The scientific paradigm of constructivism focuses on social science research related to religion, beauty, ideology or prejudice and is rarely used for business research. The constructivism approach excludes concerns about economic and technological dimensions of a business (Hunt 1991; Perry, Riege & Brown 1999). In constructivism the reality that occurs is between the researcher and the interviewee with the researcher being the passionate participant (Guba & Lincoln 1994).

The final scientific paradigm is critical realism, which is based on the belief there is a real world to discover if it is only imperfectly and probabilistically apprehensible (Godfrey & Hill 1995; Guba & Lincoln 1994; Merriam 1988; Tsoukas 1989). Critical realists believe there is one reality, although several perceptions of this reality must be triangulated to obtain a better picture of reality (Perry, Riege & Brown 1999).

These four scientific paradigms use all three philosophical assumptions: ontology, epistemology and methodology.

Ontology relates to ‘what is the real world’ or ‘what is reality. Only matters which can be viewed as real fall into this legitimate scientific assumption and are so simple and straightforward that they can be measured (Guba & Lincoln 1994). The second of these assumption questions is epistemology, which concerns the relationship between reality and the researcher, who is an objective observer (Guba & Lincoln 1994). The third of these assumption questions is methodology, which deals with the appropriate research tools and techniques being used when conducting research (Guba & Lincoln 1994).

Whilst all of these *assumptions* are suitable for this research, only one scientific *paradigm* is suitable. Critical realism is the most suitable and justifiable scientific paradigm for this research. This paradigm has been recommended by Hunt (1991) as the preferred paradigm for case study research, which is used to collect perceptions that are unobservable in the external world. The critical realism paradigm supports a study where there is one reality, although several perceptions of this reality must be

triangulated to obtain a better picture of reality (Perry, Riege & Brown 1999). The critical realism paradigm can be used in this study to triangulate the data collected to provide generalisation of results. Critical realism is the preferred paradigmatic basis for the qualitative theory building stage of research (Bhaskar 1978).

Having explained the scientific research paradigms and selected critical realism as the preferred paradigm for this research, the next section discusses the justification for and the use of case study methodology for this research.

3.5 CASE STUDY METHODOLOGY

This section explains the justification for using case study methodology, managing limitations in case study research, ensuring the quality of the case study methodology, and how the case studies were selected and managed.

3.5.1 Justification for selecting case study methodology

Case study methodology has been defined as “a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence” (Robson 2002, p. 178).

When considering a research methodology Yin (2003) suggests that there are five options that can be considered: experiments, surveys, archival analysis, history and case studies. These five options are illustrated in Table 3.2. These five research strategies will be discussed to establish why case study methodology is the most suitable research methodology for this research.

Table 3.2: Research strategies

Strategy	Form of Research Question	Requires control of Behavioural Events?	Focuses on Contemporary Events
Experiment	how, why	Yes	Yes
Survey	who, what, where, how many, how much	No	Yes
Archival analysis	who, what, where, how many, how much	No	Yes/No
History	how, why	No	No
Case Study	how, why	No	Yes

(Source: Yin 2003, p. 5)

The experiment strategy was not appropriate, as this study undertook no experiments in the field or a laboratory.

A survey was not considered suitable, as the study used some open qualitative questions relating to partnerships, technology, government, outsourcing and traceability.

Archival analysis was not suitable, as public records, files and reports do not provide suitable data on the theories of trust and technology adoption relating to this research. The use of history as a research strategy was not suitable, as this strategy relates to quoting research and facts already established and does not have the option to undertake research on contemporary events.

The use of the case study strategy is most suited to this research as it is regarded as a suitable strategy when research subjects or areas are in their exploratory stage (Eisenhardt 1989). The literature review has discussed the theories of trust and diffusion of innovation technology noting the lack of knowledge in this area in Australian agribusiness. The case study strategy focuses on contemporary events, which is important to this research. Case study research methodology focuses on a particular part of an organisation or industry in order to rigorously explore and analyse contemporary real life experiences in depth using a variety of evidence (Riege & Nair 1996). The case study researcher is not attempting to change behavioural events, which further supports the use of the case study strategy for the current research.

Having established the justification for using the case study research methodology there is a need to ensure the quality of the case study methodology, which is discussed next.

3.5.2 Ensuring quality in case study methodology

The creation of a robust research design has ensured the quality of the case study methodology in this research. The use of multiple case studies ensures quality in case design and addresses concerns in relation to the limitations of case study methodology. The four design tests provided by (Yin 2003) (See Table 3.3 page 78)

help establish the quality of an empirical research design. These four tests ie, construct validity, internal validity, external validity and reliability are discussed below.

Table 3.3: Research design tests and tactics

Tests	Case study tactics	Action tactics
Construct validity	<ul style="list-style-type: none"> • Use multiple sources of evidence • Establish chains of evidence 	Data collection Data collection
Internal validity	<ul style="list-style-type: none"> • Do pattern matching 	Data analysis
External validity	<ul style="list-style-type: none"> • Use replication logic in multiple case studies 	Research design
Reliability	<ul style="list-style-type: none"> • Use case study protocol • Develop case study database 	Data collection Data collection

(Adapted from: Yin 2003, p. 34)

3.5.2.1 Construct validity

Construct validity is concerned with “establishing correct operational measures from the concepts being studied” (Yin 2003, p. 34). No single approach is sufficient for sound theory as it is unlikely that a single research approach will achieve the criteria for a quality research design (Parkhe 1993). Table 3.3 shows that construct validity can be achieved through the use of multiple sources of evidence. The first step in ensuring that the current case study research had construct validity was the use of an in depth literature review, multiple case studies and multiple sources of evidence in the data collection process. This was achieved by conducting in depth interviews with senior managers from the selected case study organisations, together with additional evidence from their Internet sites, industry journals, and field observations.

Table 3.3 also shows that construct validity can be achieved by establishing chains of evidence. The case study protocol design included a structured interview questionnaire (See Appendix 5) with closed structured questions on trust and technology adoption and five open unstructured questions relating specifically to partnerships, technology, government, outsourcing and traceability in the Australian agribusiness supply chains.

By using the same interview questionnaire for the 36 case studies a chain of evidence for this research was established. The data from these interviews was collected and systematically recorded during the interview using the specifically designed interview

questionnaire. The data was then carefully referenced to ensure the data analysis would be of a high quality as recommended by Yin (2003). The 36 case study reports used a standard format to maintain the chain of evidence.

Case studies can be difficult to conduct due to operational and logistical reasons (Parkhe 1993; Yin 2003). However the use of the field procedure (Appendix 4) in the case study protocol helped manage this issue. The field procedure ensured that organisations selected for the research were located close to Brisbane.

The issue of research bias (Eisenhardt 1989) was addressed by having numerous meetings with the supervisor on the case study protocol design, which includes the interview questionnaire and data collection methods. Validity checks were used to ensure the results were reliable. The researcher checked answers to the interview questions to ensure consistency of interpretation. When necessary the researcher checked comments and ratings to questions with the respondents to ensure the data was reliable.

3.5.2.2 Internal validity

Internal validity is concerned with the correctness and reliability of results in the case study (Yin 2003). Table 3.3 (See page 78) shows that pattern matching is a case study tactic used to help ensure internal validity in the research design. This research has used the pattern-matching tactic by producing matrices in data analysis and explanation building. These matrices allow the research to illustrate the various case analyses and cross case analysis, which has also been recommended by Yin (2003). The structured interview questions relating to the *level* and *importance* of the factors of trust and technology adoption enable the research to provide a mean rating for the *level* and *importance* of trust by sector in the meat and horticulture industry. Pattern matching has been used to compare the mean *level*, *importance* and gap in trust and technology adoption between each of the six sectors in both industries. The mean *level*, *importance* and gap in trust and technology adoption can be compared to the equivalent sector in either the meat and horticulture industry. Pattern matching can be used to illustrate and compare the factors with the largest gaps in trust and technology adoption across the sectors and the industries in this study.

3.5.2.3 External validity

External validity is concerned with case study research that can demonstrate findings that are generalisable. Generalisation in case studies concentrates on testing a theory through the findings of the case study. Case study theory testing uses analytical generalisation, which can be applied to both single and multiple case studies (Yin 2003). This means that the findings on the theory tested in one case study on a particular subject can be compared to another case study, which is testing the same theory to establish the replication of the theory (Yin 2003). Figure 3.3 illustrates the case study replication model used in this research. The use of this model provides a replication process that is used across the 36 case studies. When two or three case studies can demonstrate a similar finding on a theory, then replication on a theory can be supported. This research uses multiple case studies to develop findings and test theories using analytical generalisation to seek results that are generalisable.

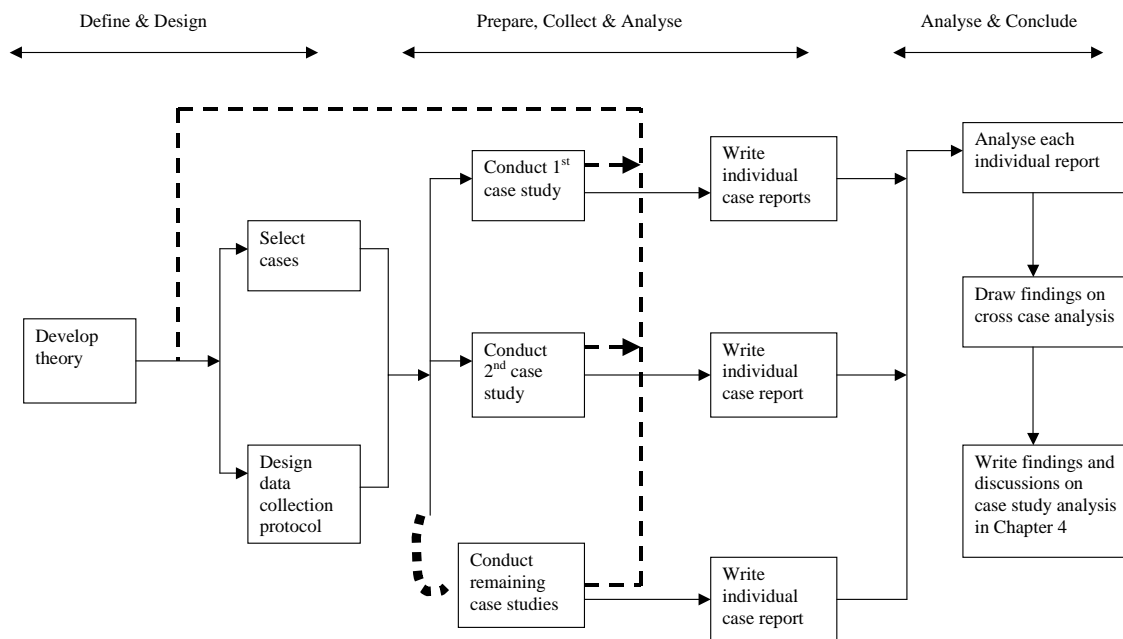


Figure 3.3: Case study replication model
(Adapted from: Yin 2003, p. 50)

3.5.2.4 Reliability

Reliability in case study research is concerned with minimising the errors and biases in a study (Yin 2003). Table 3.3 (See page 78) shows reliability can be achieved by the tactic of using a case study protocol and developing a case study database. Reliability in case studies relates to arriving at the same findings and conclusions if the same case study was performed all over again by another researcher (Yin 2003).

In order to achieve reliability in this research, a case study protocol was designed prior to the interview process. The case study protocol contained, 'The overview of the case study' (See Appendix 2), 'Email introduction of case study' (See Appendix 3), 'Field procedures' (See Appendix 4), 'Interview questionnaire' (See Appendix 5), 'Information and consent form for interview participants' (See Appendix 6) and 'Pilot case studies' (See Appendix 7). The interview questionnaire was tested in two pilot case studies to ensure the design provided a data collection process that was reliable. The research methodology provides that the 36 interviews in each case study are reported in a standard format (See Appendix 8). Each of the 36 interviews is documented on an interview questionnaire, which is retained at the University of Southern Queensland for further reference if required. A recommendation by Yin (2003) to develop and maintain a case study database for researchers to access the case study data and written reports if required was adopted.

3.5.3 Selecting case studies

This section discusses the process of selecting and coding the 36 case study organisations and deciding upon the most suitable number of case studies for this research.

3.5.3.1 Case selection

The case study organisations that have been selected are from the Australian meat and horticulture industry agribusiness supply chains. The first reason these two supply chains were selected is that they have a significant position in Australia agribusiness, as illustrated in the literature review. The 36 case study organisations that were selected from these two supply chains have been chosen due to their prominence and recognised achievements within the agribusiness sector in which they operate.

The second reason these cases have been selected is that they provide both literal and theoretical replication logic. By selecting two industries which have similar supply chain partnerships in agribusiness, these cases provide an opportunity to provide overall literal replication.

The third reason these multiple case studies were selected was to demonstrate and include organisations involved in the various activities carried out within each of the

six sectors of the supply chain. The sectors commence with the organisations that produce the raw material and progressively work downstream to the organisations that supply the end consumer. This case study selection process methodology was used to add rigor and richness to the research. The selection of two different supply chains divided into six sectors, with each sector including three case study organisations, provides the opportunity to use theoretical replication (Yin 2003).

Table 3.4 shows the two supply chains and each of the six sectors selected together with the codes designated to the individual sectors and case study organisations in that sector.

Table 3.4: Research design for selecting case studies

Meat industry sectors	Meat industry case organisations codes	Horticulture industry sectors	Horticulture industry organisations codes
Producer	MP1, MP2, MP3	Nursery, Seeds	HNS1, HNS2, HNS3
Feedlotter	MF1, MF2, MF3	Grower	HG1, HG2, HG3
Abattoir	MA1, MA2, MA3	Processor	HP1, HP2, HP3
Wholesaler	MW1, MW2, MW3	Wholesaler	HW1, HW2, HW3
Butcher	MB1, MB2, MB3	Fruiterer	HF1, HF2, HF3
Restaurant	MR1, MR2, MR3	Restaurant	HR1, HR2, HR3

(Source: Developed for this research)

The respective supply chains were designated a common alphabetic prefix code ie the meat industry was coded as “M” and the horticulture industry as “H”. Both supply chains are separated into six sectors of major importance and coded alphabetically. Within each of the six sectors three case study organisations are selected and each is distinguished by a numeric code from one to three. The code works in the following manner: MP1 represents meat producer one, HNS1 represents organisation one in the horticulture nursery seeds section etc.

The next area to be considered is the number of case studies considered suitable for this research.

3.5.3.2 Number of case studies

There are different views on how many case studies should be undertaken in a research study and no unanimity has been reached on this subject. One group of

researchers believe the number of cases undertaken in a research study is the choice of the researcher conducting the study and that there are no rules to sampling size in qualitative research (Patton 1990; Romano 1989). Eisenhardt (1989) has encouraged researchers to add as many case studies as required to achieve theoretical saturation while Lincoln and Guba (1985) speak of selecting cases to the point of redundancy.

Others' views mention that case study research is costly and if high volumes of quantitative data are obtained whether the data can be effectively assimilated (Hedges 1985). Another concern with having a high number of case studies is that the research could become unwieldy and difficult to manage (Miles & Huberman 1994). There has been a range mentioned for case studies of between 12 to 15 uniform case studies (Eisenhardt 1989; Hedges 1985; Perry 1998).

This research undertakes a total of 36 case studies. However, when the study is divided into the two industries with a total of 18 in each industry, this number is close to the range of 12 to 15 suggested as being manageable. The use of replication logic (Yin 2003) makes the research of a large number of cases feasible (See Figure 3.3 page 80). The research has undertaken three case studies in each of the six sectors for both the meat and horticulture industry. The choice of using three case studies in each sector was made in view of the time and funding constraints of this dissertation. This point has been made by Perry and McPhail (2001) who state that postgraduate research has "real constraints of time and funding" which need to be managed. The use of three case studies at six hierarchical levels involving 18 case studies from each industry is similar to the suggestion of Perry and McPhail (2001) who claim that a PhD thesis could relate to approximately three interviews within 15 case study organisations at a range of hierarchical levels.

Having justified selecting case study methodology, and having explained how steps were taken to ensure quality in the case study design, the selection of case study organisations and the suitable number of case studies, the next section discusses the data collection procedure, which has been employed.

3.5.4 Data collection procedures

Data collection is the commencement of Stage Two in applying theory to this research (See Figure 3.2 page 73). This section discusses the sources and processes that were used to collect data for this research. The case study protocol design and methodology are explained together with how the case study interviews were conducted. The final section illustrates the process used in the fieldwork from the initial selection and interview appointments through to writing the final case report for each case study.

3.5.4.1 Sources of data

Multiple case studies provide multiple sources of evidence which allow the investigator to address a broader range of historical, attitudinal and behavioural data. While a single case study can provide a satisfactory result this approach can be subject to adverse comment as to their empirical work (Yin 2003). However, the use of two case studies on a subject can provide direct replication and immeasurable generalisation (Yin 2003). This research has undertaken 36 case studies and hence this research provides an extremely high direct replication and generalisation. Multiple sources of data collection are likely to be much more convincing and accurate based on several sources of data (Yin 2003).

3.5.4.2 Case study protocol

This research has developed a case study protocol as a means of increasing the reliability of the study by providing guidelines for data collection to guide the researcher through each single case study (Yin 2003). The use of a case study protocol assists in providing a data collection methodology that improves the efficiency of collecting data and maintains the focus of the study (Perry 1998). The case study protocol designed for this research is set out in Table 3.5 (See page 85). The first section in Table 3.5 relates to the overview of the case study project. The overview (See Appendix 2) contains the research topic, purpose and context of the study. The overview of the case study was provided to interviewees prior to the interview or verbally explained to the interviewee during the interview. A standard text email (See Appendix 3) was used as a brief introduction to interviewees prior to the interview.

Table 3.5: Case study protocol sections

Case study protocol sections	Essential components
Overview	<ul style="list-style-type: none">• Project objectives and auspices• Case study issues• Relevant readings/literature• Statement about the project• Introduction emails
Field procedures	<ul style="list-style-type: none">• Selection of specific replicatable case study organisations• Access to organisation and respondent• General sources of information
Interview questionnaire	<ul style="list-style-type: none">• Specific structured questions on trust and technology adoption to guide and remind interviewer during the interview to obtain this data• Open-ended questions specifically related to partnerships, technology, government, outsourcing and traceability to guide and remind interviewer during the interview to obtain this data.• Information and consent form for interviewee participants
Guidelines for case report	<ul style="list-style-type: none">• Outline• Format• Annotated case study bibliography

(Source: Developed from Chew D 2001; Yin 2003)

The field procedures (See Appendix 4) were used to systematically identify the multiple case study organisations. The field procedure involved arranging interviews to access three suitable case study organisations in view of the time and funding constraints of this dissertation in each of the six sectors for both the meat and horticulture sectors. The organisations selected were close to Brisbane for easy access. Research of general sources of information included the collection of relevant documents and archival evidence from reports, brochures, Internet, newspapers and trade journals.

The interview questionnaire (See Appendix 5) contains a number of closed structured and open unstructured questions with blank shells to remind the interviewer to collect this data during the interview, which has been recommended by (Yin 2003). This questionnaire was adapted from another questionnaire on trust in the meat industry titled, “Designing a Future for the Australian meat industry” (Al-Hakim 2005b).

The closed structured questions used the Likert scale with a rating system of one as the lowest rating and seven as the highest rating to record the level and importance of trust and technology adoption. The case study interview method of collecting data is a more fluid way of obtaining information on a subject. The face-to-face interview is more suited to obtaining data on the more humanistic social soft subjects such as the perceived *level* and expected *importance* of trust and technology adoption. The face-to-face interview allowed the

interviewer to pick up social cues and contextual information related to the *level* and *importance* of trust and technology adoption. The interview questionnaire was accompanied by the information and consent form (See Appendix 6) that was provided to each respondent to peruse and sign before taking part in the interview.

The guidelines for the case study report involved the outline and format of a template for the two pilot case studies shown in Appendix seven. The annotated bibliography in Appendix eight contains the 36 case study reports, which follow the template designed for the pilot case studies.

3.5.5 Pilot case studies

Two pilot interviews were conducted to develop and test the interview questionnaire design, which was part of the case study protocol. The organisations selected for the pilot case studies were from different sectors of the meat industry supply chain. The pilot case studies were expansive and included many elements of agribusiness supply chain partnerships relating to trust and technology adoption. The pilot studies included nearly all the relevant data collection issues that potentially would be encountered in the total 36 case studies. Both the pilot study organisations were located near Brisbane for ready access for the interview and subsequent questions and/or refining of the interview questionnaire (Yin 2003). The pilot case studies enabled the researcher and the supervisor to review and assess the response to the closed structured questions to ensure the researcher could convey the context of the question suitably to the respondent to ensure reliability of the data collected. The pilot case studies were also used to design a standard case study template for the 36 case studies. No changes were required to be made to alter the pilot case study interview questionnaire design as part of the case study protocol. The case study interview questionnaire used in the pilot studies was used in all the 36 case studies. The pilot case studies are also contained in the 36 case studies in Appendix eight.

Having discussed the sources of data, the case study protocol and the pilot studies used in the research the next section discusses the data analysis procedures.

3.6 DATA ANALYSIS

This section is concerned with the data analysis procedures undertaken to display the data, focus on specific data, cross-analyse data and draw conclusions from the data.

Figure 3.4 provides an overview of the components of data analysis that have been adopted in this research.

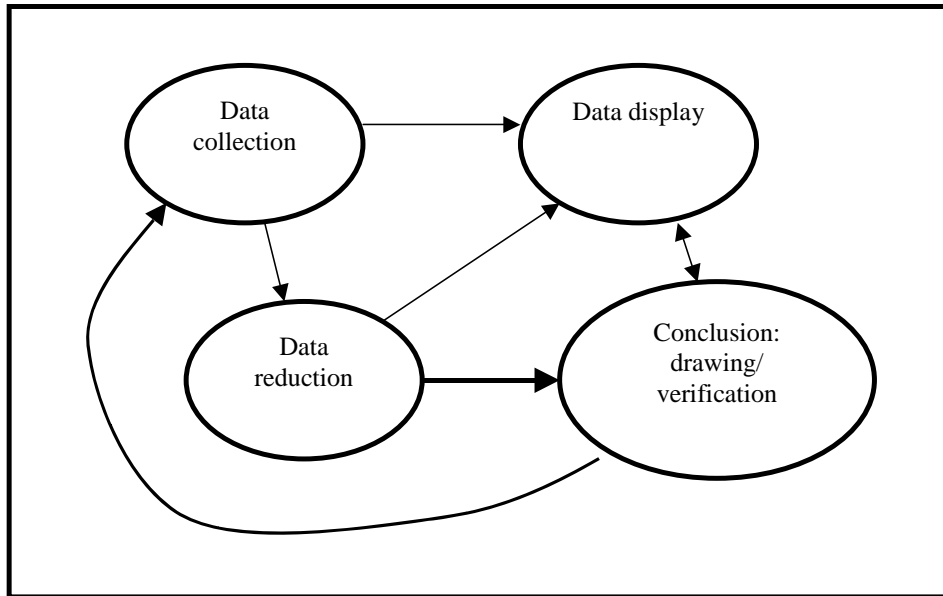


Figure 3.4: Components of data analysis: an interactive model

(Source: Lake 2004; Perry & McPhail 2001)

Figure 3.4 illustrates that data needs to be examined in a display format for easy analyse. Miles and Huberman (1994) suggest that the data collected can be presented and managed in different arrays, matrix forms, data displays and tables of tabulated frequencies of events. Specific data needs to be focused upon that is important to pursuing the research questions and other data that is not specific to the theory or the research questions should be reduced. The data that was collected through the case study interview process was analysed to examine the quantitative and qualitative evidence to address the initial propositions in the case study (Yin 2003). The 36 multiple case studies created a large volume of data that was compiled and tabulated using the theoretical proposition strategy (Yin 2003). This strategy was used as it focuses the data analysis on the original objective and design of the case study (Yin 2003).

The structured closed interview questions used the Likert scale to record the interviewee's perceived performance level (*level*) and the expected performance level (*importance*) rating for the factors of trust and technology adoption to provide a

numeric quantifiable database (Chow & Luk 2005; Hwang, Eves & Desombre 2003; Krepapa et al. 2003; Samson & Parker 1994; Silvestro 2005; Zeithaml & Bitner 1996). The Likert scale provides a measurement scale that allows the researchers or management to identify the gap in the factor by deducting the interviewee's perceived performance level and expected performance level (importance) rating to provide a numeric quantifiable gap (Chow & Luk 2005; Hwang, Eves & Desombre 2003; Krepapa et al. 2003; Samson & Parker 1994; Silvestro 2005; Zeithaml & Bitner 1996).

The first step in the data analysis process involved coding and entering all the data collected from the quantitative closed structured and qualitative open unstructured questions into SPSS software (Statistical Packages for Social Science) for Windows version 13. The data from the closed questions entered into SPSS was used to calculate the means scores for the perceived performance level (*level*) and the expected performance level (*importance*) for the factors of trust and technology adoption factors in the meat and horticulture industry. SPSS was also used to code the qualitative data collected as it was not voluminous enough to use the software package Nvivo, which is used to code and analyse quotations from large amounts of qualitative data.

There were three methods of analysis undertaken in this research to identify the critical gaps for the factors of trust in the Australian meat and horticulture industry supply chain. These three analysis methods were: statistical testing for significant difference, the mean weighted gap analysis and the mean unweighted importance performance analysis (IPA) matrix.

The first analysis undertaken involved the structured closed questions, which used SPSS to conduct statistical significant difference testing overall for both industries, by each industry and by sectors (Kerr, Howard & Kozub 2002). The statistical significant difference testing was used to test the six propositions. These tests measured the statistical significant difference between the means scores for the perceived performance level (*level*) and the expected performance level (*importance*) of trust and technology adoption factors in the meat and horticulture industry using t-tests, paired t-tests and One-way Anova tests. The statistical significance difference

confidence level chosen for this research was 95 percent because this level has been used in agribusiness research and is the standard confidence level used by SPSS (Creative Research Systems 2007; Fearne, Duffy & Hornibrook 2005; Kularatna, Spriggs & Storey 2001; Statistical Solutions 2007).

The data from the open unstructured qualitative interview questions concerning the other important success factors relating to partnerships, technology, government, outsourcing and traceability that had been entered into SPSS was manipulated to establish whether the responses were positive, neutral or negative. Further analysis was undertaken to identify the frequency of various different success factors that impacted upon the respondents supply chain concerning partnerships, technology, government, outsourcing and traceability.

The two other methods of analysis that were adapted for this research were the SERVQUAL model and the importance performance analysis (IPA) model.

This research uses the SERVQUAL model to test the differences between the mean scores for the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption factors in the meat and horticulture industry to calculate the gap. The five dimensions of SERVQUAL relating to customer service are reliability, responsiveness, assurance, empathy, and tangibles (Zeithaml, Bittner & Gremler 2006). These five dimensions of SERVQUAL can be related to the 12 factors of trust in the closed interview questions. The eight factors in technology adoption in the closed interview questions can be related to one dimension in SERVQUAL, i.e. tangibles. The SERVQUAL gap measurement can be a simplistic unweighted calculation by deducting the mean rating of the expected performance level (*importance*) from the perceived performance level (*level*) to provide a negative, neutral or positive gap rating (Zeithaml, Parasuraman & Berry 1990). The gap can also be weighted by multiplying the mean gap scores for each factor by the mean expected performance level (*importance*) rating for the same factor which was the method used in this research to identify the critical gap for the factors of trust and technology adoption. The gap is weighted to take into account the relative importance that is related to that gap (Zeithaml, Parasuraman & Berry 1990). This is an

adaptation of SERVQUAL which multiplies the average of the five dimensions against the scores for the customer (Zeithaml, Parasuraman & Berry 1990).

The third method of analysis used in this research was adapted from the gap theory of importance performance analysis (IPA). IPA uses the mean rating score of the performance of a factor compared against the importance mean rating scores for the factor. The IPA method was adapted with the performance rating being interchanged with the perception *level* from SERVQUAL. IPA was further adapted with the expectation rating from SERVQUAL being interchangeable with the *importance* rating of a factor. The IPA method calculates the gap for the factors by deducting the mean importance rating score from the mean performance with the gap being negative, neutral or positive. IPA uses a matrix to plot the factors on a graph with the determinants being the unweighted performance and the importance rating. The matrix is divided into four quadrants to identify where the factor is located. These four quadrants can be labelled: 'Concentrate here', 'Keep up the good work', 'Low priority' and 'Possible overkill'. The 'Concentrate here' quadrant has a low performance and high importance, which needs improvement. The "Keep up the good work" quadrant has a high performance and a high importance that needs to be maintained. The 'Low priority' has low performance and low importance and requires limited attention. The 'Possible overkill' has a high performance and low importance and this area may be over serviced (Hudson, Hudson & Miller 2004). For this research the 'Concentrate here' quadrant has again been divided into four quadrants to assist in identifying the critical gaps for the factors of trust and technology adoption in the meat and horticulture industry supply chain. These four quadrants have been labelled in order of the *improvement* required. The four improvement quadrants were labelled in order of priority commencing with 'Critical', then 'Significant', followed by 'Important' with the least required improvement area labelled as 'Necessary'.

A critical gap can be defined as a factor that has a high mean gap score rating and a high mean expected performance level (*importance*) score rating. The factors with critical gaps can be ranked as either unweighted or weighted gaps. By ranking the factors with gaps this provides a list of potential critical gaps. From this list of gaps a subjective selection method has been used in the past based on choosing the top three to five highest ranked unweighted or weighted gaps to be considered as critical gaps.

This research has developed a selection criterion using the results from the three analysis methods to collectively identify the critical gaps for the factors of trust and technology adoption. This selection criterion provides a more objective selection method than the traditional subjective method. The selection criteria chosen to determine the factors with the critical gap in trust and technology adoption was based firstly on the factors that had the highest statistical significant differences Sig. (2-tailed) in the study. The second criterion concerned the factors that were ranked within the six highest weighted gaps adapted from the SERVQUAL model. The third criterion was based on the factors that fell within either the 'Critical' or 'Significant' improvement area adapted from the IPA model. This selection criteria identified the critical gaps that can be selected to diminish or eliminate the critical gap to improve the supply chain.

Having explained the data analysis procedures used in this research the next section discusses the limitations that can be encountered with case study research.

3.7 LIMITATIONS OF CASE STUDY RESEARCH

Case study research has been subject to criticism for a number of reasons. Yin (2003) has made a number of comments concerning the criticisms raised about the use of case study research. The first criticism has been that case study research lacks rigor and can be subject to bias. The second issue has been the confusion between case study teaching and case study research. In classroom teaching, case study material may be 'deliberately altered to demonstrate a particular point, which is strictly forbidden in case study research' (Yin 2003, p. 10). Thirdly, single case studies have often caused concerns, as a single case study cannot provide scientific generalisation. The fourth criticism has been that case studies have often taken too long, provide masses of information, and have been presented in an unreadable format. Due to these comments, some researchers have avoided the use of the case study strategy (Yin 2003). In this section the strategies that have been used in this research to manage these limitations are explained to overcome these criticisms.

Table 3.6 (See page 92) has been developed to address the areas of criticism relating to case study research and to provide strategies to overcome these issues.

Table 3.6: Limitations of case study research and related strategic responses

Criticism of case study research	Strategic responses to overcome shortcomings	Sections where limitation is addressed
Results in overly complex theories	Develop prior theories and specific research questions	Chapter 2
External validity	<ul style="list-style-type: none"> Use theoretical replication logic compare evidence with extant literature 	Section 3.5.2.3
Difficult to conduct	<ul style="list-style-type: none"> Use case study protocol and a systematic fieldwork process 	Section 3.5.4.2
No single approach is sufficient for sound theory development	<ul style="list-style-type: none"> Use multiple research methodology 	Section 3.5.2.3
Researcher bias	<ul style="list-style-type: none"> The interview questionnaire and protocol provides a structure to avoid researcher bias Use of validity checks with case study respondents on answers to questions 	Section 3.5.4.2 Appendix 5 File notes on case study questionnaires
Lack of rigour	<ul style="list-style-type: none"> Construct validity Multiple case studies Create a database for interview questionnaires Produce a report for each case study 	3.5.2.3 3.5.2.1 Case study reports Appendix 8

(Source: Developed from Chew 2001; Eisenhardt 1989; Parkhe 1993; Yin 2003)

The criticism of overly complex theory has been managed by focusing on the theory of trust and diffusion of innovation in the literature review to provide a tight focus on these core theories in the case study research.

External validity has been managed by choosing multiple case studies that provided theoretical replication logic. The 36 case studies chosen used an interview protocol that ensures the theory being tested was replicated in each study.

The issue of case studies being difficult to conduct due to operational and logistical reasons (Parkhe 1993; Yin 2003) was an important factor in this study. The operational issue was managed through a systematic data collection process. The design and use of the case study protocol ensured that the research was focused and the data collected was recorded systematically (Yin 2003). Logistically while some of the organisations selected for the research have parts of their business geographically thousands of kilometres from Brisbane, many of these have head offices in Brisbane or are located in regional areas within one hundred and fifty kilometres of Brisbane. The knowledge and past involvement of the interviewer in Australian agribusiness over many decades was an important factor in gaining access to the most senior executives in the case study organisations. This strategy also ensured the information

obtained during the face-to-face interviews was reputable and reflective of the case study organisations' views on the *level* and *importance* of trust and technology adoption. The interviewer was also seen as an independent researcher not aligned to any sector or organisation in the supply chain and without self-interest in the results.

The criticism that no single approach is sufficient for sound theory as it is unlikely that a single research approach will achieve the criteria for a quality research design (Parkhe 1993) has been addressed. In Stage One of this research a focused literature review was undertaken on the theory of trust and technology adoption. Then two pilot case studies were undertaken to test the suitability of the case study interview questionnaire used in this study. In stage two the researcher conducted 36 multiple case studies using a structured and unstructured interview questionnaire in the face-to-face interviews. Stage Two used the grounded theory during the data analysis process of the confirmatory/disconfirmatory stage to access the research data to provide sound theory development.

The issue of research bias (Eisenhardt 1989) was addressed by having numerous meetings with the supervisor on the research design of the interview protocol, data collection and data analysis of the findings to ensure the research was unbiased. Validity checks were used to ensure the results were reliable. The researcher checked answers to questions to ensure consistency of interpretation. When necessary the researcher checked comments and ratings to questions with the respondents to ensure the data was reliable and noted these on the interview questionnaire. The criticism concerning the lack of rigor in case studies was managed through the case study protocol and by filing all of the 36 interview questionnaires and typed reports in the database held at the university for this research.

A number of general case study limitations were encountered in this research in a real-life context as mentioned by Yin (2003). The face-to-face interviews took place with respondents at their offices in "every day situations and not within the confines of a laboratory" (Yin 2003, p. 72). The general case study limitations that were managed in this research were the constraints of time and finance available, the total number of case studies that could be suitably managed, and arranging suitable transport. During the interviews some unexpected interruptions did occur which

reduced time for the face-to-face interviews. On some occasions appointments had to be cancelled and rescheduled. Sometimes the respondent restricted disclosure of information and data due to company policy. The time taken to conduct all the 36 face-to-face interviews was delayed due to the absence of respondents for summer holidays and international business trips. The research was also very reliant on senior managers to allow the time to undertake a personal interview involving both structured quantitative and unstructured qualitative interviewing methods.

Having presented the strategies for managing the limitations and criticisms of case studies, the next section discusses the ethical considerations that have been taken into account when conducting the case studies.

3.8 ETHICAL CONSIDERATIONS

Protecting the rights of interviewees in the case studies was of critical importance. Researchers need to be concerned with ethical issues, confidentiality of proprietary data and anonymity of a client (Davis 2000; Davis & Cosenza 1996). The researcher must maintain a high standard of work to ensure the data collected is accurate, and that participating organisations and individuals are protected from any possible disadvantages or adverse consequences that may result from the research (Emory & Cooper 1991). The confidentiality of the case study organisations was managed by replacing the name of each case study organisation with a code. The case study data collected from the face-to-face interviews was filed in the case study database stored in a steel locked cabinet at the University of Southern Queensland. When this research study was designed, ethical clearance was obtained before the case studies interviews commenced. All interviewees were asked to read and sign an “Information and consent form for interviewee participants”, set out in Appendix six prior to the interview taking place.

3.9 CONCLUSIONS

A focus on the theory relating to trust and technology adoption has been of the highest importance in this research to concentrate on collecting data relative to these theories. The examination and analysis of various scientific paradigms has resulted in selecting critical realism as the most suitable scientific paradigm for this research. Critical

realism has supported the use of case study methodology, which provides a strong foundation for this research. The case study design and tests used in this research provided validity and reliability checks to ensure the quality of the case studies. To improve the rigor of the research the use of 36 multiple cases studies has provided multiple sources of evidence to give high direct replication and generalisation producing a much more convincing case study analysis. The case study protocol, which included the case study interview protocol, provided a research methodology that collecting replicable data that concentrated on the theory of trust and technology adoption.

The use of two initial pilot studies assisted in making any improvements required in the case study interview protocol and designing the case study reporting template.

The data analysis data stage was specifically designed to concentrate on analysing data that directly related to the structured questions on the theory of trust and technology adoption. The data analysis stage also included the analysis of the unstructured questions on partnerships, technology, government, outsourcing and traceability in Australian meat and horticulture agribusiness supply chains. SPSS software was used for analysis of both the closed structured and open unstructured questions. The data from the closed questions was analysed using the three analysis methods of statistical testing for significant difference, the mean weighted gap analysis and the mean unweighted importance performance analysis (IPA) matrix analysis. The results from these methods were used in the selection criteria formulated to subjectively identify the factors with critical gaps in trust and technology adoption.

While various general and specific limitations relating to the use of case study methodology were faced in this research, and strategies were put in place to manage these.

Finally the importance of ethical considerations and handling the confidentiality of the respondents was managed through the creation of a coding system for each case study organisation and sensitivity toward maintaining the anonymity of each respondent. These logically planned steps in developing the research methodology has provided the foundation for the 36 rigorous quality case studies in this research.

CHAPTER FOUR – FINDINGS AND DISCUSSIONS

4.1 INTRODUCTION

Chapter 3 described the research methodology used to collect the data for this research.

This chapter provides an analysis of data relating to 12 research questions which has been obtained from the 36 case study interviews conducted in the meat and horticulture supply chain. The chapter is divided into five sections as illustrated in Figure 4.1. Following the introduction, the case study background provides an overview of the organisations in this study. Section 4.3 provides the data analysis relating to the research questions and the propositions. The next section discusses the research concerning the other important factors in agribusiness supply chains, which is followed by the conclusions in relation to the study.

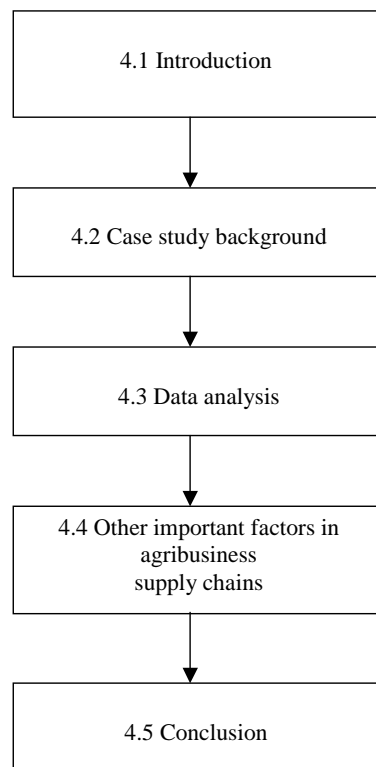


Figure 4.1: Chapter Outline
(Source: Developed for this work)

4.2 CASE STUDY BACKGROUND

This section provides background data for the case study organisations relating to annual turnover, company assets, years of establishment, number of employees, company structure and partnerships. A more detailed summary of the background of each case study organisation in this study is provided in Appendix 9.

4.2.1 Annual turnover

Table 4.1 shows that considerable variation existed in the annual turnover of the case study organisations. In the horticulture industry 61.1 percent of case study organisations reported an annual turnover in excess of \$21 million compared to just 38.9 percent of case study organisations in the meat industry.

Table 4.1: Annual turnover for the meat and horticulture industry

Meat industry		Annual turnover	Horticulture industry	
Frequency	Percent		Frequency	Percent
2	11.1	<\$1million	2	11.1
7	38.9	\$1million - \$20 million	3	16.7
3	16.7	\$21 million - \$50 million	8	44.4
4	22.2	>\$51million	3	16.7
2	11.1	Not provided	2	11.1
18	100.0	Total	18	100.0

(Source: Analysis of field data)

4.2.2 Company assets

Table 4.2 (See page 98) illustrates that the percentage of horticulture case study organisations reporting company assets in excess of \$21million exceeded the number of cases from the meat industry in this range (44.4 percent compared to 33.4 percent). Whilst no case study organisations in the horticulture industry reported company assets valued at less than \$1million, 22.2 percent of meat industry case study organisations reported company assets in this range.

Table 4.2: Company assets for the meat and horticulture industry

Meat industry		Company assets	Horticulture industry	
Frequency	Percent		Frequency	Percent
4	22.2	<\$1million	0	00.0
4	22.2	\$1million - \$20 million	5	27.8
1	5.6	\$21 million - \$50 million	4	22.2
5	27.8	>\$51million	4	22.2
4	22.2	Not provided	5	27.8
18	100.0	Total	18	100.0

(Source: Analysis of field data)

4.2.3 Number of years established

Table 4.3 shows that only four case organisations across both industries in this research had been established for less than five years. Case study organisations from the horticulture industry were reported as being established for longer than those in the meat industry. This was evidenced by the fact that 94.5 percent of case study organisations from the horticulture industry had been established for over ten years compared to just 55.5 percent of the case study organisations from the meat industry. Of particular interest was the fact that two thirds of the horticulture case study organisations had been established for over 20 years compared to just one third of those from the meat industry.

Table 4.3: Number of years established for the meat and horticulture industry

Meat industry		Year established	Horticulture industry	
Frequency	Percent		Frequency	Percent
3	16.7	<5	1	5.6
5	27.8	5-10	0	0.0
4	22.2	11-20	5	27.8
6	33.3	>20	12	66.7
18	100.0	Total	18	100.0

(Source: Analysis of field data)

4.2.4 Number of employees

Reflecting the fact that the percentage of meat industry case study organisations reported both annual turnover and company assets of less than \$20 million exceeded the figures reported from the horticulture industry, 66.7 percent of meat industry case study organisations reported employing less than 100 people (See Table 4.4 page 99) compared to 44.5 percent of horticulture case study organisations.

Table 4.4: Number of employees for the meat and horticulture industry

Meat industry		Number of employees	Horticulture industry	
Frequency	Percent		Frequency	Percent
10	55.6	<50	7	38.9
2	11.1	50-100	1	5.6
4	22.2	101-500	7	38.9
2	11.1	>500	3	16.7
18	100.0	Total	18	100.0

(Source: Analysis of field data)

4.2.5 Company structure

Over 90 percent of the organisations in this study reported their structure as ‘unlisted private company’ (see Table 4.5) with only one organisation reporting its structure as ‘listed private company’ and a further two organisations reporting their structure as ‘listed public company’.

Table 4.5: Company structure for the meat and horticulture industry

Meat industry		Company Structure	Horticulture industry	
Frequency	Percent		Frequency	Percent
1	5.6	Listed public	1	5.6
1	5.6	Listed Private	0	0.0
16	88.9	Unlisted private	17	94.4
18	100.0	Total	18	100.0

(Source: Analysis of field data)

4.2.6 Supply chain partnerships

Table 4.6 (See page 100) shows that over half of the organisations (20 cases) in this study were involved in both vertical and horizontal partnerships. The meat industry case study organisations reported being involved equally in ‘vertical and horizontal’ and ‘vertical’ partnerships while 61.1 percent of horticulture case organisations reported being involved in both ‘vertical and horizontal’ partnerships compared to just 38.9 percent reporting involvement in ‘vertical’ partnerships only.

Table 4.6: Vertical and horizontal supply chain partnerships for the meat and horticulture industry

Meat industry		Partnerships	Horticulture industry	
Frequency	Percent		Frequency	Percent
9	50.0	Vertical partnerships	7	38.9
9	50.0	Vertical and horizontal partnerships	11	61.1
18	100.0	Total	18	100.0

(Source: Analysis of field data)

Informal partnerships with suppliers were reported by 72.2 percent of case study organisations from the horticulture industry compared to 55.5 percent from the meat industry (Table 4.7). Very few organisations reported being involved in formal supplier partnerships i.e. meat industry 16.7 percent; horticulture industry 5.6 percent. A similar percentage of case study organisations from both industries reported being involved in both informal and formal supplier partnerships (27.8 percent meat industry, 22.2 percent horticulture industry).

Table 4.7: Formal and informal supplier partnerships for the meat and horticulture industry

Meat industry		Supplier Partnerships	Horticulture industry	
Frequency	Percent		Frequency	Percent
10	55.6	Supplier informal partnerships	13	72.2
3	16.7	Supplier formal partnerships	1	5.6
5	27.8	Supplier informal and formal partnerships	4	22.2
18	100.0	Total	18	100.0

(Source: Analysis of field data)

Table 4.8 (See page 101) shows that a similar pattern to that described above in relation to supplier partnerships was found in both industries in relation to customer partnerships. Informal customer partnerships were reported by 72.2 percent of case study organisations from both the meat and the horticulture industries. Whilst only one case study organisation (from the meat industry) reported being involved in formal customer partnerships, 22.2 percent (meat industry) and 27.8 percent (horticulture industry) of case study organisations reported being involved in both informal and formal customer partnerships.

Table 4.8: Formal and informal customer partnerships for the meat and horticulture industry

Meat industry		Customer Partnerships	Horticulture industry	
Frequency	Percent		Frequency	Percent
13	72.2	Customer informal partnerships	13	72.2
1	5.6	Customer formal partnerships	0	0.0
4	22.2	Customer informal and formal partnerships	5	27.8
18	100.0	Total	18	100.0

(Source: Analysis of field data)

Having determined that the majority of case study organisations were long established unlisted private companies with annual turnover and assets valued in excess of \$20 million and a relatively small number of employees who undertook mainly informal partnerships within their relative supply chains, the next section will describe the analysis of data collected for the current study.

4.3 DATA ANALYSIS RELATING TO LEVEL AND IMPORTANCE OF TRUST

The fundamental research question addressed in this study is: ‘What are the critical gaps in trust and technology factors affecting the Australian meat and horticulture supply chains?’ This question was underpinned by a number of research objectives to determine:-

- (A) Current perceptions of the *level* and *importance* of trust and technology adoption in the meat and horticulture supply chain.
- (B) Critical gaps between perceptions of the *level* and *importance* of trust and technology adoption in the meat and horticulture supply chain.
- (C) Other factors rated as important to the success of the meat and horticulture supply chain.

4.3.1 Perceived levels and importance of trust in the meat and horticulture supply chains.

The means for perceived performance level (*level*) and expected performance level (*importance*) for trust in the meat and horticulture supply chain are illustrated in Table 4.9 (See page 102).

Table 4.9: Means for the perceived performance level (*level*) and expected performance level (*importance*) of trust in the meat and horticulture industry supply chains (a)

Means for the <i>level</i> and <i>importance</i> of trust in the meat and horticulture industry supply chains						
Factors	<i>Level</i>			<i>Importance</i>		
	Meat	Horticulture	Overall	Meat	Horticulture	Overall
Confidentiality	5.06	5.44	5.25	5.78	6.22	6.00
Honesty and integrity	5.67	5.50	5.58	6.61	6.44	6.53
Work standard	5.72	5.00	5.36	6.72	6.17	6.00
Friendliness	5.06	5.06	5.06	6.00	5.67	5.83
Shared values	5.56	5.06	5.31	6.44	6.00	6.22
Politeness	5.67	5.61	5.64	6.28	6.11	6.19
Experience and qualification	6.00	5.61	5.81	6.61	6.22	6.42
Reliability	5.33	5.22	5.28	6.61	6.33	6.47
Timeliness	5.33	5.72	5.53	6.44	6.28	6.36
Customisation	5.17	5.39	5.28	6.33	5.94	6.14
Information sharing	4.83	4.78	4.81	6.22	6.33	6.28
POS information	4.06	4.50	4.28	5.06	5.78	5.42
Overall mean of the factors	5.29	5.24	5.26	6.26	6.12	6.19

(Source: Analysis of field data)

(Refer to end note (a) see page 156)

Table 4.9 shows that the meat industry demonstrated slightly higher means for both perceived performance level (*level*) (5.29) and expected performance level (*importance*) (6.26) of trust, compared to the horticulture industry, which showed a mean for perceived performance level (*level*) of trust of 5.24 and for expected performance level (*importance*) of trust of 6.12. The factor with the highest mean perceived performance level (*level*) of trust both within the meat industry (6.00) and the overall mean (5.81) related ‘Experience and qualification’. In contrast, the highest mean perceived performance level (*level*) of trust (5.72) for the horticulture industry concerned ‘Timeliness’. The factor with the highest mean expected performance level (*importance*) of trust (6.72) in the meat industry was ‘Work standard’. This factor differed from the highest mean expected performance level (*importance*) of trust overall (6.53) and the horticulture industry (6.44) which was ‘Honesty and integrity’.

The sectoral means for the perceived performance level (*level*) and the expected performance level (*importance*) for trust in the meat and horticulture supply chain are shown in Table 4.10. (See page 103).

Table 4.10: Sectoral means for the perceived performance level (*level*) and expected performance level (*importance*) for trust in the meat and horticulture supply chains

Mean <i>level</i> and <i>importance</i> of trust by sector in the meat and horticulture supply chains					
Meat Industry sectors			Horticulture Industry sectors		
Sectors	<i>Level</i>	<i>Importance</i>	Sectors	<i>Level</i>	<i>Importance</i>
MP [Beef producer]	5.14	6.14	HNS [Horticulture nursery & seeds]	5.08	6.11
MF [Meat feedlotter]	5.61	6.11	HG [Horticulture grower]	5.11	5.97
MA [Meat abattoir]	4.56	5.97	HP [Horticulture processor]	4.58	6.31
MW [Meat wholesaler]	4.72	6.28	HW [Horticulture Fruit market agent]	5.08	5.86
MB [Meat butcher]	5.83	6.44	HF [Horticulture fruit retailer]	5.17	6.17
MR [Meat restaurant]	5.86	6.61	HR [Horticulture restaurant]	5.78	6.33
Overall mean of the factors	5.29	6.26	Overall mean of the factors	5.24	6.13

(Source: Analysis of field data)

The lowest mean perceived performance level (*level*) and the expected performance level (*importance*) of trust (4.56 and 5.97) in the meat industry sectors was evident in the meat abattoir (MA) sector. Interestingly the horticultural processing sector had the lowest mean perceived performance level (*level*) of trust (4.58) and one of the highest expected performance level (*importance*) ratings of trust (6.31) across both industries. The meat wholesaler (MW) sector follows a similar pattern with a low mean perceived performance level (*level*) of trust (4.72) and a high mean expected performance level (*importance*) of trust (6.28). In contrast the horticulture fruit market agent (HW) sector had a mean perceived performance level (*level*) of trust of 5.08 but the lowest mean expected performance level (*importance*) of trust ie (5.86) across both industries. The restaurant sector had the highest mean perceived performance level (*level*) and the expected performance level (*importance*) of trust in the meat industry (5.86 and 6.6) and in the horticulture industry (5.78 and 6.63).

Having discussed the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust overall, by industry and sector for the meat and horticulture industry, the next section examines the significant difference between

perceived performance level (*level*) of trust between the meat and horticulture supply chains and within the sectors comprising those supply chains.

4.3.1.1 Proposition 1 – Level of trust

P1: That there are significant differences between the perceived performance level (*level*) of trust in (a) the meat and horticulture supply chains and (b) within the sectors comprising those supply chains.

A Levene’s t-test (Table 4.11) was undertaken to test whether the difference in mean *level* of trust between the two supply chains ie 5.28 (meat industry) and 5.24 (horticulture industry) was significant. The Levene’s test for equality shows a result of .528, which is well above the .05 significance rating required indicating that there is no significant difference between the overall perceived performance level (*level*) of trust in the meat and horticulture industry. Proposition P1 (a) is therefore rejected.

Table 4.11: Perceived performance level (*level*) of trust t-test in the meat and horticulture industry supply chains

Levene's Test for Equality of Variances		t-test for Equality of Means						
F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
.407	.528	.214	34	.832	.55556	2.59727	-4.72274	5.83385
		.214	33.943	.832	.55556	2.59727	-4.72306	5.83418

(Source: Analysis of field data)

A One-way anova test (Table 4.12 See page 105) was undertaken to test whether a significant difference in the mean perceived performance level (*level*) of trust existed amongst the six sectors in the meat industry. The One-way Anova test resulted in a significance level of .017, well below the .05 significance rating required to support Proposition P1 (b). This test indicates there is a significant difference between the mean perceived performance level (*level*) of trust amongst the sectors in the meat industry sectors. Proposition P1 (b) is therefore supported for the meat sectors. In view of this finding, a Tukey HSD test was undertaken to investigate between which sectors the significant differences could be found. The Tukey test showed that significant differences in the mean perceived performance level (*level*) of trust existed between the meat abattoir (MA) and meat butcher (MB) - .052 and between the meat abattoir (MA) and the meat restaurant (MR) - .046.

Table 4.12: One-way anova test – Perceived performance level (*level*) of trust in the meat industry supply chain sectors

Level trust in the meat industry sectors	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	695.111	5	139.022	4.398	.017
Within Groups	379.333	12	31.611		
Total	1074.444	17			

(Source: Analysis of field data)

By contrast, the One-way anova test (Table 4.13) undertaken to test whether a significant difference in the mean perceived performance level (*level*) of trust existed amongst the six sectors in the horticulture industry resulted in a significance level of .176, well above the .05 significance rating required. This test indicates there is no significant difference between the mean perceived performance level (*level*) of trust amongst the sectors in the horticulture industry sectors. Proposition P1 (b) is therefore rejected in the horticulture sectors.

Table 4.13: One-way anova test – Perceived performance level (*level*) of trust in the horticulture industry supply chain sectors

Level trust in the horticulture industry sectors	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.998	5	.600	1.857	.176
Within Groups	3.875	12	.323		
Total	6.873	17			

(Source: Analysis of field data)

Having discussed the significant differences for the mean perceived performance level (*level*) of trust in the meat and horticulture supply chain by industry and sector, the next section examines the significant difference for the expected performance level (*importance*) of trust in the meat and horticulture industry supply chain.

4.3.1.2 Proposition 2 – Importance of trust

P2: That there are significant differences between the expected performance level (*importance*) of trust between (a) the meat and horticulture supply chains and (b) within the sectors comprising those supply chains.

A Levene's t-test (Table 4.14 See page 106) was undertaken to test whether the differences in the means for the expected performance level (*importance*) of trust between the two supply chains ie 6.26 (meat industry) and 6.13 (horticulture industry) was significant. The Levene's test for equality shows a result of .502, which is well

above the .05 significance rating required. Hence there is no significant difference between the overall expected performance level (*importance*) of trust in the meat and horticulture industry. Proposition P2 (a) is therefore rejected.

Table 4.14: Expected performance level (*importance*) of trust t-test in the meat and horticulture industry supply chains

Levene's Test for Equality of Variances		t-test for Equality of Means						
F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
.460	.502	.994	34	.327	1.61111	1.62122	-1.68361	4.90583
		.994	33.639	.327	1.61111	1.62122	-1.68491	4.90713

(Source: Analysis of field data)

A One-way anova test (Table 4.15) was undertaken to test whether a significant difference in the mean expected performance level (*importance*) of trust existed amongst the six sectors in the meat industry. The One-way anova test resulted in a significance level of .519, well above the .05 significance rating required to support Proposition P2 (b). This test shows there is no significant difference between the expected performance level (*importance*) of trust amongst the sectors in the meat industry sectors. Proposition P2 (b) is therefore rejected.

Table 4.15: One-way anova test – Expected performance level (*importance*) of trust in the meat industry supply chain sectors

Importance of trust in the meat industry sectors	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	119.778	5	23.956	.887	.519
Within Groups	324.000	12	27.000		
Total	443.778	17			

(Source: Analysis of field data)

A One-way anova test (Table 4.16 See page 107) was undertaken to test whether a significant difference in the mean expected performance level (*importance*) of trust existed amongst the six sectors in the horticulture industry. This test resulted in a significance level of .689, well above the .05 significance rating required to support Proposition P2 (b). This test shows there is no significant difference between the expected performance level (*importance*) of trust amongst the sectors in the horticulture industry sectors. Proposition P2 (b) is therefore rejected.

Table 4.16: One-way anova test – Expected performance level (*importance*) of trust in the horticulture industry supply chain sectors

Importance of trust in the horticulture industry sectors	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.513	5	.103	.618	.689
Within Groups	1.991	12	.166		
Total	2.503	17			

(Source: Analysis of field data)

Having analysed the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust, no significant differences either across the combined supply chains or within either the meat or horticulture industry were found. However, significant differences in the mean perceived performance level (*level*) of trust were found within the sectors of the meat industry. The next section analyses the gaps between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust in the meat and horticulture industry supply chain.

4.3.1.3 Proposition 3 – Significant differences between the level and importance of trust.

P3: That significant differences exist between the perceived performance level (*level*) and the expected performance level (*importance*) of trust within (a) the meat and horticulture supply chains and (b) the sectors making up those supply chains.

The gaps between the mean perceived performance level (*level*) and the expected performance level (*importance*) of each of the trust factors in the meat and horticulture supply chains are shown in Table 4.17 (See page 108).

The factor with the highest mean expected performance level (*importance*) of trust (6.72) in the meat industry was ‘Work standard’. This factor differed from the highest mean expected performance level (*importance*) of trust overall (6.53) and the horticulture industry as well (6.44) which concerned ‘Honesty and integrity’. The second highest mean gap in trust overall (1.19) and in the meat industry (1.28) was in relation to the ‘Reliability’ of supply chain partners. This was in contrast to the second highest gap (1.28) in the horticulture industry concerning partners sharing ‘POS information’.

Table 4.17: Gaps between the mean perceived performance level (*level*) and mean expected performance level (*importance*) of trust in the meat and horticulture supply chains.

Gap between the mean perceived <i>level</i> and <i>importance</i> of trust in the meat and horticulture supply chains									
Trust factors	Meat industry			Horticulture industry			Overall		
	<i>Level</i>	<i>Importance</i>	Gap	<i>Level</i>	<i>Importance</i>	Gap	<i>Level</i>	<i>Importance</i>	Gap
Confidentiality	5.06	5.78	0.72	5.44	6.22	0.78	5.25	6.00	0.75
Honesty and integrity	5.67	6.61	0.94	5.50	6.44	0.94	5.58	6.53	0.94
Work standard	5.72	6.72	1.00	5.00	6.17	1.17	5.36	6.00	1.08
Friendliness	5.06	6.00	0.94	5.06	5.67	0.61	5.06	5.83	0.78
Shared values	5.56	6.44	0.89	5.06	6.00	0.94	5.31	6.22	0.75
Politeness	5.67	6.28	0.61	5.61	6.11	0.50	5.64	6.19	0.56
Experience and qualification	6.00	6.61	0.61	5.61	6.22	0.61	5.81	6.42	0.61
Reliability	5.33	6.61	1.28	5.22	6.33	1.11	5.28	6.47	1.19
Timeliness	5.33	6.44	1.11	5.72	6.28	0.56	5.53	6.36	0.83
Customisation	5.17	6.33	1.17	5.39	5.94	0.56	5.28	6.14	0.86
Information sharing	4.83	6.22	1.39	4.78	6.33	1.56	4.81	6.28	1.47
POS information	4.06	5.06	1.00	4.50	5.78	1.28	4.28	5.42	1.14
Overall mean of the factors	5.29	6.26	0.97	5.24	6.12	0.88	5.26	6.19	0.93

(Source: Analysis of field data)

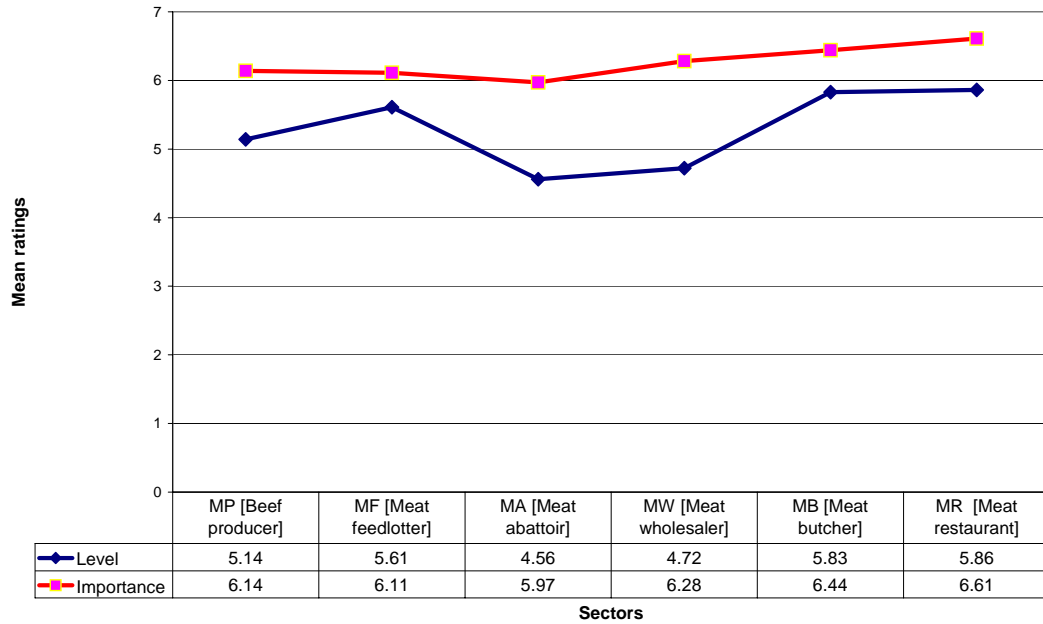
The sectoral mean gaps between the mean perceived performance level (*level*) and the expected performance level (*importance*) perceived *level* and *importance* of trust in the meat and horticulture industry are set out in Table 4.18 (See page 109). The highest mean gap (1.56) in trust for the meat industry was in the meat wholesale sector while the highest mean gap (1.72) in trust for the horticulture industry was in the horticulture processor sector. The horticulture processor had the highest mean gap (1.72) in trust across both industries. It is probable that the high mean gaps identified in these two sectors indicate the meat wholesale and horticulture processor may have critical gaps in their supply chain.

Table 4.18: Sectoral mean gaps between the perceived performance level (*level*) and expected performance level (*importance*) of trust in the meat and horticulture industry.

Gap between the mean <i>level</i> and <i>importance</i> of trust in the meat and horticulture sectors							
Meat industry				Horticulture industry			
Sectors	<i>Level</i>	<i>Importance</i>	Gap	Sectors	<i>Level</i>	<i>Importance</i>	Gap
MP [Beef producer]	5.14	6.14	1.00	HNS [Horticulture nursery & seeds]	5.08	6.11	1.03
MF [Meat feedlot]	5.61	6.11	0.50	HG [Horticulture grower]	5.11	5.97	0.86
MA [Meat abattoir]	4.56	5.97	1.42	HP [Horticulture processor]	4.58	6.31	1.72
MW [Meat wholesaler]	4.72	6.28	1.56	HW [Horticulture Fruit market agent]	5.72	5.86	0.14
MB [Meat butcher]	5.83	6.44	0.61	HF [Horticulture fruit retailer]	5.17	6.17	1.00
MR [Meat restaurant]	5.86	6.61	0.75	HR [Horticulture restaurant]	5.78	6.33	0.56
Overall mean of the factors	5.29	6.26	0.97	Overall mean of the factors	5.24	6.13	0.88

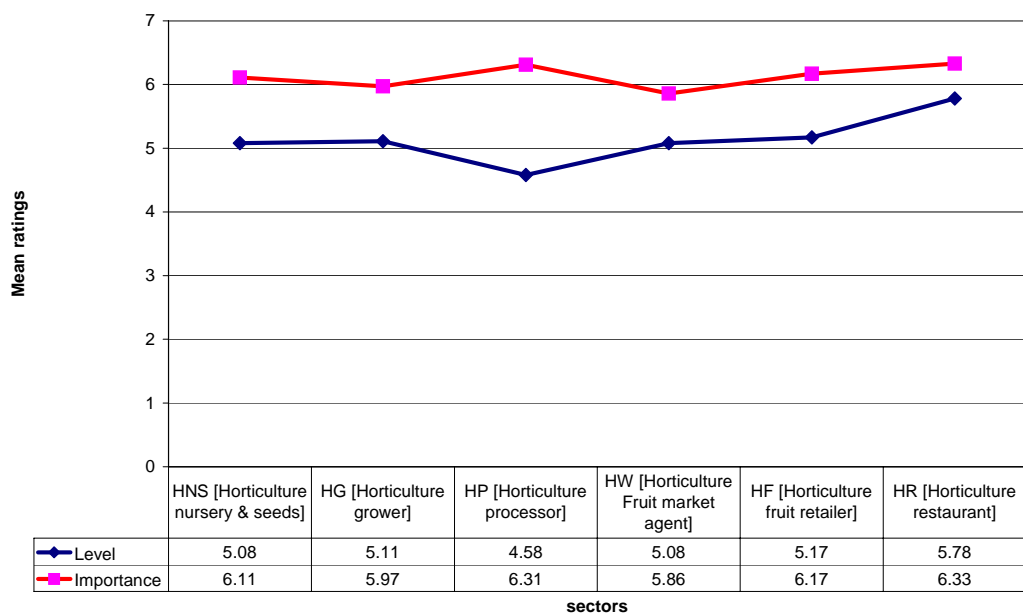
(Source: Analysis of field data)

The difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust within the sectors of the meat industry is illustrated in Graph 4.1 (See page 110). This graph shows that there were differences between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust in the meat industry sectors with the greatest difference in trust appearing in the meat producer (MP), the meat abattoir (MA) and the meat wholesaler (MW) sectors.



Graph 4.1: Perceived performance level (*level*) and expected performance level (*importance*) of trust by sector in the meat industry supply chain
 (Source: Analysis of field data)

The difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust within the sectors of the horticulture industry is illustrated in Graph 4.2.



Graph 4.2: Perceived performance level (*level*) and expected performance level (*importance*) of trust by sector in the horticulture industry supply chain
 (Source: Analysis of field data)

The graph illustrates that there were differences between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust in the horticulture industry, with the greatest difference in trust appearing in the horticulture nursery and seed producer (HNS), the horticulture processor (HP) and the horticulture fruit retailer (HF) sectors.

A paired t-test for significance (Table 4.19) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust existed overall. The paired t-test for significance resulted in a significance level of .000, well below the .05 significance rating, which confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust overall. Proposition P3 (a) is therefore supported for trust overall.

Table 4.19: Paired t-test for significant difference in perceived performance level (*level*) and expected performance level (*importance*) for trust – Overall

Paired factors for the overall mean level and importance of trust								
Paired Sample Statistics						Paired Sample Test		
Mean	N	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
-.92824	36	.57637	.09606	-1.12326	-.73322	-9.663	35	.000

(Source: Analysis of field data)

While Table 4.19 shows that there is a significant difference in trust overall a paired t-tests were undertaken to identify any significant differences between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust in the meat and horticulture industry. The paired t-test for significance (Table 4.20 See page 112) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust existed in the meat industry. The paired t-test for significance resulted in a significance level of .000, well below the .05 significance rating, which confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust in the meat industry. Proposition P3 (a) is therefore supported for trust in the meat industry.

Table 4.20: Paired t-test for significant difference in perceived performance level (*level*) and expected performance level (*importance*) for trust – Meat industry

Paired factors for the mean <i>level</i> and <i>importance</i> of trust in the meat industry								
Paired Sample Statistics						Paired Sample Test		
Mean	N	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
-.97222	18	.55719	.13133	-1.24930	-.69514	-7.403	17	.000

(Source: Analysis of field data)

A paired t-test for significance (Table 4.21) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust existed in the horticulture industry. The paired t-test for significance resulted in a significance level of .000, well below the .05 significance rating, which confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust in the horticulture industry. Proposition P3 (a) is therefore supported for trust in the horticulture industry.

Table 4.21: Paired t-test for significant difference in perceived performance level (*level*) and expected performance level (*importance*) for trust – Horticulture industry

Paired factors for the mean <i>level</i> and <i>importance</i> of trust in the horticulture industry								
Paired Sample Statistics						Paired Sample Test		
Mean	N	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
-.88426	18	.60778	.14325	-1.18650	-.58202	-6.173	17	.000

(Source: Analysis of field data)

Having discussed the significant gaps between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust overall and in the meat and horticulture industry supply chains paired t-tests were undertaken to examine significant gaps in the factors between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust in the meat and horticulture industry supply chains.

A paired t-test for significance (Table 4.22 See page 113) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust by factor existed overall in

the meat and horticulture industry supply chain. The paired t-test for significance resulted in a significance level of .000, well below the .05 significance rating, which confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust by factors in the meat and horticulture industry supply chain. This test confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust of trust by factors overall in the meat and horticulture industry supply chain and Proposition P3 (a) is therefore proven. The paired t-test for significance also shows there were two high standard deviations for the factors in trust overall which were ‘POS information’ (1.515) and ‘Information sharing’ (1.383) and these results could indicate that these two factors may have critical gaps.

Table 4.22: Paired t-test for significant difference between mean perceived performance level (*level*) and mean expected performance level (*importance*) of trust by factor overall

Paired Samples	Paired Sample Statistics					Paired Sample Test		
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Overall								
Confidentiality	-.750	.996	.166	-1.087	-.413	-4.516	35	.000
Honesty and integrity	-.944	1.120	.187	-1.323	-.566	-5.060	35	.000
Work standard	-1.083	.967	.161	-1.411	-.756	-6.720	35	.000
Friendliness	-.778	.929	.155	-1.092	-.463	-5.022	35	.000
Shared values	-.917	1.025	.171	-1.263	-.570	-5.367	35	.000
Politeness	-.556	.843	.141	-.841	-.270	-3.953	35	.000
Experience and qualification	-.611	.871	.145	-.906	-.316	-4.209	35	.000
Reliability	-1.194	1.117	.186	-1.572	-.817	-6.418	35	.000
Timeliness	-.833	.941	.157	-1.152	-.515	-5.313	35	.000
Customisation	-.861	1.018	.170	-1.206	-.517	-5.073	35	.000
Information sharing	-1.472	1.383	.231	-1.940	-1.004	-6.386	35	.000
POS information	-1.139	1.515	.252	-1.651	-.626	-4.511	35	.000

(Source: Analysis of field data)

A paired t-test for significance (Table 4.23 see page 114) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust by factor existed in the meat industry supply chain. The paired t-test for significance resulted in a significance level ranging from .000 to .011, well below the .05 significance rating, which confirms

there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust by factors in the meat industry. This test confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust by factors in the meat industry. Proposition P3 (a) is therefore proven for the meat industry. The paired t-test for significance also shows there were two high standard deviations for the factors of trust in the meat industry, which were ‘POS information’ (1.335) and ‘Information sharing’ (1.495) and this could indicate that these two factors may have critical gaps.

Table 4.23: Paired t-test for significance difference in mean perceived performance level (*level*) and mean expected performance level (*importance*) of trust by factor in the meat industry

Paired Samples	Paired Sample Statistics					Paired Sample Test		
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Meat Industry								
Confidentiality	-.722	1.018	.240	-1.228	-.216	-3.010	17	.008
Honesty and integrity	-.944	1.056	.249	-1.469	-.419	-3.796	17	.001
Work standard	-1.000	.686	.162	-1.341	-.659	-6.185	17	.000
Friendliness	-.944	.938	.221	-1.411	-.478	-4.274	17	.001
Shared values	-.889	.963	.227	-1.368	-.410	-3.915	17	.001
Politeness	-.611	.850	.200	-1.034	-.188	-3.051	17	.007
Experience and qualification	-.611	.850	.200	-1.034	-.188	-3.051	17	.007
Reliability	-1.278	1.179	.278	-1.864	-.692	-4.600	17	.000
Timeliness	-1.111	1.079	.254	-1.647	-.575	-4.370	17	.000
Customisation	-1.167	.985	.232	-1.657	-.677	-5.024	17	.000
Information sharing	-1.389	1.335	.315	-2.053	-.725	-4.415	17	.000
POS information	-1.000	1.495	.352	-1.743	-.257	-2.838	17	.011

(Source: Analysis of field data)

A paired t-test for significance (Table 4.24 See page 115) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust by factor existed in the horticulture industry supply chain. The paired t-test for significance resulted in a significance level ranging from .000 to .028, well below the .05 significance rating, which confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust by factors in the horticulture industry. This test confirms there is a significant difference

or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust by factors in the meat industry. Proposition P3 (a) is therefore proven for the horticulture industry. The paired t-test for significance also shows that two high standard deviations were evident for the factors of trust in the horticulture industry ‘POS information’ (1.565) and ‘Information sharing’ (1.464) and this could suggest these two factors may have critical gaps.

Table 4.24: Paired t-test for significance difference between the mean perceived performance level (*level*) and mean expected performance level (*importance*) of trust by factor in the horticulture industry

Paired Samples	Paired Sample Statistics					Paired Sample Test		
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Horticulture industry								
Confidentiality	-.778	1.003	.236	-1.277	-.279	-3.289	17	.004
Honesty and integrity	-.944	1.211	.286	-1.547	-.342	-3.308	17	.004
Work standard	-1.167	1.200	.283	-1.764	-.570	-4.123	17	.001
Friendliness	-.611	.916	.216	-1.067	-.155	-2.829	17	.012
Shared values	-.944	1.110	.262	-1.496	-.392	-3.610	17	.002
Politeness	-.500	.857	.202	-.926	-.074	-2.474	17	.024
Experience and qualification	-.611	.916	.216	-1.067	-.155	-2.829	17	.012
Reliability	-1.111	1.079	.254	-1.647	-.575	-4.370	17	.000
Timeliness	-.556	.705	.166	-.906	-.205	-3.344	17	.004
Customisation	-.556	.984	.232	-1.045	-.066	-2.397	17	.028
Information sharing	-1.556	1.464	.345	-2.284	-.827	-4.507	17	.000
POS information	-1.278	1.565	.369	-2.056	-.500	-3.465	17	.003

(Source: Analysis of field data)

Having discussed the significant differences between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust for the factors overall as well as the meat and horticulture industry, paired t-tests were undertaken to examine significant differences or gaps in the factors between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust in the meat and horticulture sectors.

The results for the paired t-test for significance (Table 4.25 See page 116) undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust existed for the trust

factors in the meat industry sectors. The paired t-test for significance resulted in a significance level of .038, in the meat abattoir (MA) sector for the trust factors concerning ‘Honest and integrity’, ‘Work standard’, ‘Experience and qualification’, ‘Information sharing’ and ‘POS information’. The paired t-test for the factors of trust also showed a significant difference for ‘Timeless’, rated at .038 in the meat producer (MP) sector and .020 in the meat wholesale (MW) sector. This test confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust by factors in three of the meat industry sectors. Proposition P3 (b) is therefore proven for these meat industry sectors.

Table 4.25: Paired t-test for significance difference between the mean perceived performance level (*level*) and mean expected performance level (*importance*) of trust by factor in the meat industry – by sector

Sig. (2-tailed) Meat industry sectors						
Factors	MP	MF	MA	MW	MB	MR
Confidentiality	.270	.423	.423	.074	.423	.184
Honesty and integrity	.270	.057	.038	.270	.184	.225
Work standard	.184	.423	.038	.184	.423	.225
Friendliness	.423	.423	.184	.270	.423	.184
Shared values	.184	.423	.225	.199	.225	.423
Politeness	.184	.184	.057	.423	.225	.074
Experience and qualification	.423	.184	.038	.094	.225	.423
Reliability	.225	.423	.188	.118	.184	.423
Timeliness	.038	.423	.423	.020	.423	.423
Customisation	.057	.423	.423	.423	.423	.074
Information sharing	.270	.423	.038	.057	.423	.184
POS information	.184	.057	.038	.074	.184	.225

(Source: Analysis of field data)

A paired t-test for significance (Table 4.26 See page 117) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust existed for the trust factors in the horticulture industry sectors. Some of the factors in the horticultural wholesaler (HW) and the horticultural fruiterer (HF) had mean scores of zero gaps and therefore do not show a score. The paired t-test for significance resulted in a significance level of .038 for the trust factors of ‘Honesty and integrity’ and ‘Experience and qualification’ in the horticulture processing (HP) sector and .038 for ‘Customisation’

in the horticulture fruiter (HF) sector, well below the .05 significance rating. This test confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust by factors in two of the horticulture industry sectors. Proposition P3 (b) is therefore proven for these horticulture industry sectors.

Table 4.26: Paired t-test for significance difference between the mean perceived performance level (*level*) and mean expected performance level (*importance*) of trust by factor in the horticulture industry - by sector

Sig. (2-tailed) Horticulture industry sectors						
Factors	HNS	HG	HP	HW	HF	HR
Confidentiality	.423	.423	.225	.000	.270	.184
Honesty and integrity	.270	.423	.038	.000	.300	.423
Work standard	.184	.184	.057	.000	.074	.423
Friendliness	.118	.057	.225	.000	.423	.000
Shared values	.423	.423	.130	.000	.423	.000
Politeness	.423	.423	.057	.000	.184	.000
Experience and qualification	.184	.130	.038	.000	.270	.000
Reliability	.225	.184	.057	.000	.423	.423
Timeliness	.423	.184	.074	.000	.225	.000
Customisation	.192	.423	.095	.000	.038	.000
Information sharing	.423	.057	.208	.000	.184	.000
POS information	.423	.423	.074	.000	.423	.300

(Source: Analysis of field data)

This section has provided the results of the statistical significance difference for trust overall, by industry and sector in the meat and horticulture supply chains. Statistical significance difference was the first of three analysis methods used in this research to identify factors of trust which may have critical gaps in the Australia meat and horticulture industry supply chain. The next section explains the use of gap analysis to investigate the critical gaps for the factors of trust in the meat and horticulture industry supply chain.

4.3.2 Gap analysis for trust

This section uses two gap analysis theories to investigate the mean gaps for the factors of trust in the meat and horticulture industry supply chain. These two gap analysis theories will be used to identify possible critical gaps in the factors of trust. The first gap analysis method used was the mean weighted gap theory. The other gap analysis

method used was the mean unweighted IPA theory matrix, which graphically plots the gaps for the factors of trust.

4.3.2.1 Weighted gap for trust in the meat supply chain

Commencing with the mean weighted gap analysis theory, the gaps for the factors of trust for the meat and horticulture industry have been ranked in descending order of magnitude according to the weighted gap. The mean weighted gaps for the factors of trust have been calculated by multiplying the mean importance and the mean gap together to provide the mean weighted gaps for the factors of trust in the meat industry supply chain. The mean weighted gaps for the factors of trust in the meat industry supply chain are illustrated in Table 4.27.

Table 4.27: Mean weighted gaps between perceived performance level (*level*) and expected performance level (*importance*) for trust factors within the meat industry supply chain

Weighted mean gaps for the factors of trust in the meat industry			
Factors of trust in the meat industry	Importance	Mean gap	Weighted gap
Information sharing	6.22	1.39	8.65
Reliability	6.61	1.28	8.46
Customisation	6.33	1.17	7.41
Timeliness	6.44	1.11	7.15
Work standard	6.72	1.00	6.72
Honesty and integrity	6.61	0.94	6.21
Shared values	6.44	0.89	5.73
Friendliness	6.00	0.94	5.64
POS information	5.06	1.00	5.06
Confidentiality	5.78	0.72	4.16
Experience and qualified	6.61	0.61	4.03
Politeness	6.28	0.61	3.83

(Source: Analysis of field data)

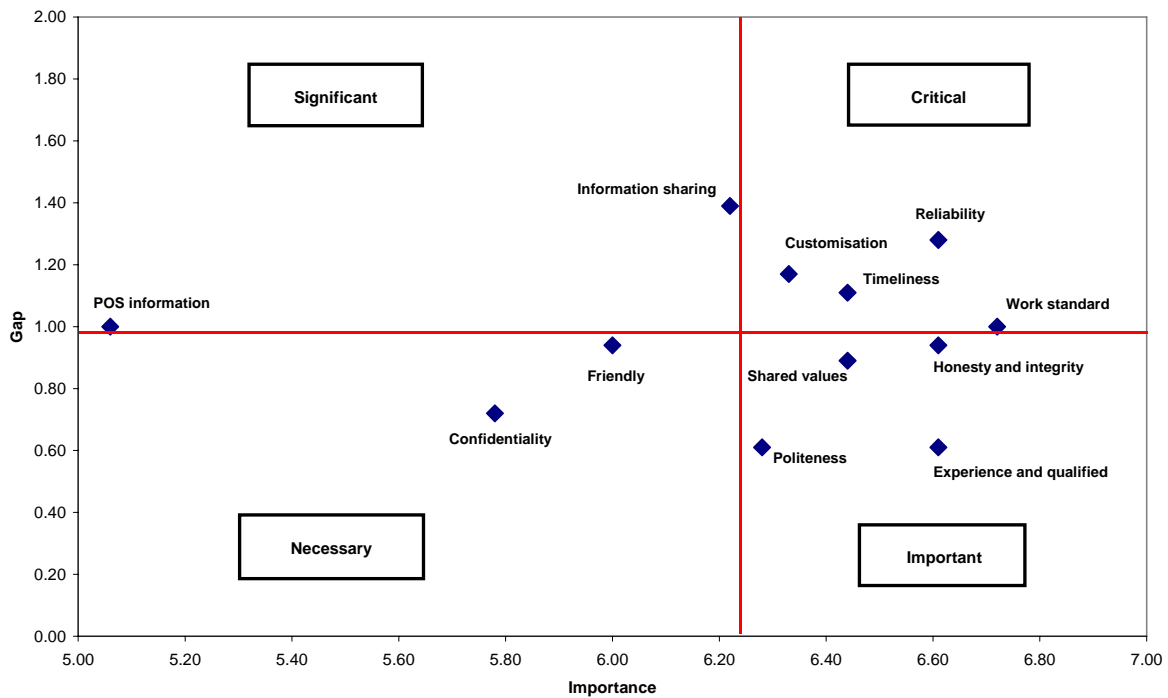
The highest ranked mean weighted gap for the factors of trust in the meat industry was ‘Information sharing’ (8.65). The second highest ranked mean weighted gap factor of trust related to ‘Reliability’ (8.46). The third highest ranked mean weighted gap factor of trust concerned ‘Customisation’ (7.41). The fourth highest ranked mean weighted gap factor of trust was ‘Timeliness’ (7.15). The fifth highest ranked mean weighted gap factor of trust was the ‘Work standard’ (6.72).

Having discussed the ranked mean weighted gaps for the factors of trust in the meat industry supply chain, the next subsection discusses the mean unweighted gaps in trust by using a matrix to graphically plot the gaps in trust using the IPA theory.

4.3.2.2 Unweighted gap for trust in the meat supply chain

This section uses the mean unweighted IPA theory to compare the unweighed *importance* and the unweighted performance or *gap* of a factor to analyse the performance gap. A matrix is used to graphically plot the two determinants of the factors using the unweighed *importance* and the unweighted performance or *gap*. The graph is then divided into four quadrants to identify where the factor is located. These four quadrants can be labelled 'Concentrate here', 'Keep up the good work', 'Low priority' and 'Possible overkill'. None of the factors of trust in the meat industry supply chain in this research fell into the 'Keep up the good work', 'Low priority' and 'Possible overkill'. However, all the factors of trust in the meat industry supply chain had gaps and therefore all fell into the 'Concentrate here' quadrant of this matrix.

The 'Concentrate here' quadrant is concerned with factors that have a low performance or high gap, which need to be improved. The 'Concentrate here' quadrant contains the factors that need to be improved to provide customer/supplier satisfaction in the meat and horticulture industry supply chain. For this research, the 'Concentrate here' quadrant has again been divided into four quadrants to assist in identifying the critical gaps for the factors of trust in the meat and horticulture industry supply chain. These four quadrants have been labelled in order of the *improvement* required. The four improvement quadrants were labelled in order of priority, commencing with 'Critical', and then 'Significant', followed by 'Important', with the least required improvement area labelled as 'Necessary'. The quadrant cross hairs (Hudson, Hudson, & Miller 2004) on the graph have been determined by using the mean overall *gap* and overall mean *importance* for the meat and horticulture industry. Graph 4.3 (Seepage 120) shows the improvement area for the unweighted factors of trust in the meat industry supply chain. The 'Concentrate here' quadrant has been divided into the four quadrants for this research and labelled 'Critical', 'Significant', 'Important' and 'Necessary'. The 12 factors of trust in the meat industry all have gaps that require improvement and have been plotted on the matrix according to their mean unweighted *gap* and *importance*.



Graph 4.3: Improvement area for the unweighted factors of trust in the meat industry supply chain

(Source: Analysis of field data)

The improvement area labelled ‘Critical’ shows four factors of trust that fell into this quadrant in the meat industry supply chain. These factors were: ‘Reliability, Customisation, Timeliness, and Work standard’. There were two factors that fell into the ‘Significant’ improvement quadrant which were: ‘Information sharing’ and ‘Point of sale information’. The ‘Important’ improvement quadrant contains four factors of trust which were: ‘Shared values, ‘Honesty and integrity’, ‘Politeness’ and ‘Experience and qualification. There were two factors of trust in the ‘Necessary’ improvement quadrant, which were: ‘Friendliness’ and ‘Confidentiality’.

Having discussed the mean unweighted gaps for trust using the IPA matrix for the meat industry, the next subsection investigates the mean weighted gaps for the factors of trust in the horticulture industry.

4.3.2.3 Weighted gap for trust in the horticulture supply chain

This section analyses the mean weighted gaps for the factors of trust in the horticulture industry supply chain to assist in identifying critical gaps in trust.

The mean weighted gaps for the factors of trust have been calculated by multiplying the mean *importance* and the mean *gap* together to provide the mean weighted gaps for the factors of technology adoption in the horticulture industry supply chain. The mean weighted gaps for the factors of trust for the horticulture industry have been ranked in descending order of magnitude and are displayed in Table 4.28.

Table 4.28: Mean weighted gaps between perceived performance level (*level*) and expected performance level (*importance*) for trust factors within the horticulture industry supply chain

Weighted mean gaps in trust for the horticulture industry			
Factors of trust for the horticulture industry	Importance	Mean gap	Weighted gap
Information sharing	6.33	1.56	9.87
POS information	5.78	1.28	7.40
Work standard	6.17	1.17	7.22
Reliability	6.33	1.11	7.03
Honesty and integrity	6.44	0.94	6.05
Shared values	6.00	0.94	5.64
Confidentiality	6.22	0.78	4.85
Experience and qualified	6.22	0.61	3.79
Timeliness	6.28	0.56	3.52
Friendliness	5.67	0.61	3.46
Customisation	5.94	0.56	3.33
Politeness	6.11	0.50	3.06

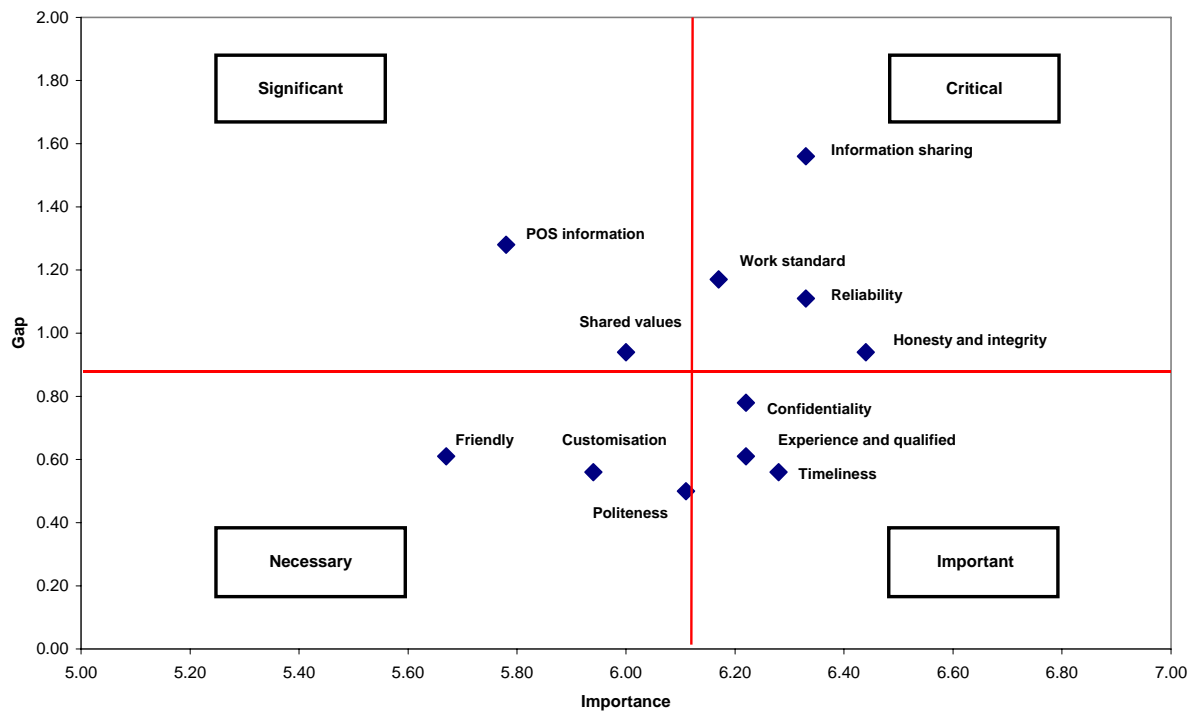
(Source: Analysis of field data)

The highest ranked mean weighted gap for the factors of trust in the horticulture industry was ‘Information sharing’ (9.87). The second highest ranked mean weighted gap related to ‘POS information’ (7.40). The third highest ranked mean weighted gap concerned ‘Work standard’ (7.22). The fourth highest ranked mean weighted gap result was ‘Reliability’ (7.03) and the fifth highest ranked mean weighted gap was ‘Honesty and integrity’ (6.05).

Having discussed the ranked mean weighted gaps in trust for the horticulture industry supply chain, the next subsection analyses the unweighted gaps for the factors of trust for the horticulture industry using the IPA matrix theory.

4.3.2.4 Unweighted gap for trust the horticulture supply chain

The same IPA matrix theory method that was performed for the meat supply chain was used to assist in identifying the critical gaps for the factors of trust in the horticulture industry. All of the factors of trust in the horticulture industry had gaps and fell into the ‘Concentrate here’ quadrant, showing the need for improvement. Graph 4.4 shows the improvement area for the unweighted factors of trust in the horticulture industry supply chain. The ‘Concentrate here’ quadrant has been divided into the four quadrants for this research and labelled: ‘Critical’, ‘Significant’, ‘Important’ and ‘Necessary’. The 12 factors of trust in the horticulture industry all have gaps that require improvement and have been plotted on the matrix according to their mean unweighted gap and importance.



Graph 4.4: Improvement area for the unweighted factors of trust in the horticulture industry supply chain

(Source: Analysis of field data)

The improvement quadrant area labelled ‘Critical’ shows four factors of trust that fell into this quadrant in the horticulture industry supply chain. These factors were: ‘Information sharing’, ‘Work standard’, ‘Reliability’, and ‘Honesty and integrity’. There were two factors that fell in the ‘Significant’ improvement quadrant which were: ‘Point of sale information’ and ‘Shared values’. The ‘Important’ improvement

quadrant contained three factors of trust, which were: 'Confidentiality', 'Experience and qualification' and 'Timeliness'. There were three factors of trust in the 'Necessary' improvement quadrant, which were: 'Friendliness', 'Customisation' and 'Politeness'.

Having discussed the two gap analysis theories for the factors of trust in the meat and horticulture supply chain, the next subsection identifies the factors of trust with critical gaps in the meat and horticulture industry supply chain.

4.3.3 Critical gaps in trust

This section determines which factors of trust have critical gaps in the meat and horticulture industry supply chain. There have been no exact recognised methods to select factors that have critical gaps other than the subjective selection method of selecting three to five of the factors with the highest weighted or unweighted gap or the most statistical significant difference in a research study.

This section has assessed the factors of trust in the meat and horticulture supply chain by collectively using the results from the three analysis methods used in this research. The three analysis methods used were statistical significant difference test, the mean weighted gap analysis and the mean unweighted IPA matrix analysis. By using the results of these three analysis methods collectively to determine the critical gaps for the factors of trust in the meat and horticulture industry supply chain, the selection of the critical gap will be more objective and less subjective.

The statistical significant difference tests were used in this research together with the two gap analysis methods provides confirmatory analysis to assess the critical gaps in trust to provide results which will be less subjective.

The selection criteria to determine the factors with the critical gap in trust were based firstly on the factors that had the highest statistical significant differences Sig. (2-tailed) in the study. The second criterion concerned the factors that were ranked within the six highest weighted gaps. The third criterion was based on the factors that fell within either the 'Critical' or 'Significant' improvement areas.

Table 4.29 provides a summary of the results from the three analysis methods labelled under test one, two and three. Test one is the Sig. (2-tailed) statistical significant difference test. Test two is the ranked mean weighted gap and test three is the unweighted mean improvement area for the factors of trust. These results have been used as the basis to determine the critical gaps in trust for the meat industry supply chain.

Table 4.29: Critical gaps between perceived performance level (*level*) and expected performance level (*importance*) for trust factors within the meat industry supply chain

Critical gaps for the factors of trust in the meat industry			
Factors of trust in the meat industry	Test one	Test two	Test three
	Sig. (2-tailed)	Ranked weighted gap factors	Improvement area
Information sharing	.000	1	Significant
Reliability	.000	2	Critical
Timeliness	.000	3	Critical
Customisation	.000	4	Critical
Work standard	.000	5	Critical
Honesty and integrity	.001	6	Important
Shared values	.001	7	Important
Friendliness	.001	8	Important
POS information	.011	9	Significant
Experience and qualification	.007	11	Important
Confidentiality	.008	10	Necessary
Politeness	.007	12	Necessary

(Source: Analysis of field data)

By using this selection criteria, there were four clear critical gaps for the factors of trust identified in the meat industry supply chain which were: ‘Reliability’, ‘Timeliness’, ‘Customisation’ and ‘Work standard’.

The fifth factor of trust selected with a critical gap in the meat industry was ‘Information sharing’. This factor was chosen based on having the highest mean weighted gap ranking with a statistical significant difference of .000. In addition to this, ‘Information sharing’ lies just outside the ‘Critical’ improvement quadrant by a mean value of 0.04. ‘Information sharing’ had a mean importance value of 6.22, plotted against the mean importance cross hairline for the meat industry of 6.26 shown in Table 4.17 (See page 108).

In contrast, the 'POS information' factor of trust was not selected as a critical gap in trust. This factor was not selected as it was ranked ninth in the mean weighted gap rankings for trust and had a statistical significant difference of .011. The 'POS information' factor also lay nearly in the necessary improvement quadrant by a mean value of 0.03. 'POS information' had a mean gap of 1.00, plotted against the mean gap cross hair line for the meat industry of 0.97 as shown in Table 4.17 (See page 108).

Having identified the critical gaps in trust in the meat supply chain, the next subsection discusses the critical gaps in trust in the horticulture industry.

The selection process for the factors of trust that have critical gaps in the horticulture industry supply chain was carried out using the same three analysis methods as undertaken in the meat industry. The results from the statistical significant difference, the ranked mean weighted gap and the unweighted mean improvement area for the factors of trust from the horticulture industry were used in combination to subjectively determine the critical gaps.

The selection criteria to determine the factors of trust with critical gaps in the horticulture industry were assessed in the same manner as for the meat industry. The first criterion concerned the factors of trust with the highest statistical significant differences. The second selection criterion concerned the factors that were ranked within the six highest weighted gaps. The third criterion was based on the factors that fell within either the 'Critical' or 'Significant' improvement area.

Table 4.30 (See page 126) provides a summary of the results from the three analysis methods labelled under test one, two and three. Test one is the Sig. (2-tailed) statistical significant difference test, test two is the ranked mean weighted gap and test three is the unweighted mean improvement area for the factors of trust. As with the meat industry, these results have been used as the basis to determine the critical gaps in trust in the horticulture industry supply chains.

Table 4.30: Critical gaps between perceived performance level (*level*) and expected performance level (*importance*) for trust factors within the horticulture industry supply chain

Critical gaps for the factors of trust in the horticulture industry			
Factors of trust in the horticulture industry	Test one	Test two	Test three
	Sig. (2-tailed)	Ranked weighted gap factors	Improvement area
Information sharing	.000	1	Critical
Reliability	.000	4	Critical
Work standard	.001	3	Critical
Shared values	.002	6	Significant
POS information	.003	2	Significant
Honesty and integrity	.004	5	Critical
Confidentiality	.004	7	Important
Experience and qualified	.012	8	Important
Timeliness	.004	9	Important
Friendliness	.012	10	Necessary
Customisation	.028	11	Necessary
Politeness	.024	12	Necessary

(Source: Analysis of field data)

By using these selection criteria, there were three clear factors of trust chosen as having critical gaps in the horticulture industry supply chain, which were: ‘Information sharing’, ‘Reliability’, and ‘Work standard’.

Three other factors of trust have been chosen as having critical gaps in the horticulture industry supply chain. The ‘POS information’ trust factor was selected as it had a statistical significant difference of .003 with a mean weighted ranking of two and fell in the ‘Significant’ improvement area. The next factor of trust selected was ‘Shared values’ which had a statistical significant difference of .002 with a mean weighted ranking of six and fell in the ‘Significant’ improvement area. The last factor of trust selected was ‘Honesty and integrity’ which had a statistical significant difference of .004 with a mean weighted ranking of five and fell in the ‘Critical’ improvement area.

Having selected the critical gaps in trust for the factors of trust in the meat and the horticulture industry supply chain, the next section discusses the perceived performance level (*level*) and the expected performance level (*importance*) of the factors in technology adoption in the meat and horticulture industry supply chain.

4.3.4 Perceived levels and importance of technology adoption in the meat and horticulture supply chains

The means for perceived performance level (*level*) and expected performance level (*importance*) for technology adoption in the meat and horticulture supply chain are illustrated in Table 4.31.

Table 4.31: Means for the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption in the meat and horticulture industry supply chains (b)

Mean <i>level</i> and <i>importance</i> of technology adoption in the meat and horticulture supply chains						
Technology adoption factors	<i>Level</i>			<i>Importance</i>		
	Meat	Horticulture	Overall	Meat	Horticulture	Overall
Compliance / mandate	4.67	4.78	4.72	5.00	4.78	4.89
Relative advantage	6.00	6.06	6.03	6.67	6.50	6.58
Ease of use	5.78	5.56	5.67	6.06	5.61	5.83
Compatibility	6.06	6.06	6.06	6.22	6.17	6.19
Trialability	5.17	6.00	5.58	5.56	6.17	5.86
Observability	5.83	5.11	5.47	6.00	5.28	5.64
Complexity	6.06	5.94	6.00	6.28	5.94	6.11
Traceability	6.00	5.06	5.53	6.61	5.89	6.25
Overall mean of the factors	5.69	5.57	5.63	6.05	5.79	5.92

(Source: Analysis of field data)

(Refer to end note (b) see page 157)

The meat industry has a slightly higher mean perceived performance level (*level*) (5.69) and mean expected performance level (*importance*) (6.05) rating of technology adoption compared to the horticulture industry, which has a mean perceived performance level (*level*) of technology adoption of 5.57 and a mean expected performance level (*importance*) of technology adoption of 5.79. The factor with the highest mean perceived performance level (*level*) (6.06) of technology adoption in the meat industry was ‘Compatibility’. The horticulture industry rated two factors with the highest mean perceived performance level (*level*) (6.06) in technology adoption, being ‘Relative advantage’ and ‘Compatibility’. The factor with the highest mean expected performance level (*importance*) within both meat and horticulture industries and across both industries in technology adoption was the ‘Relative advantage’. The mean ratings of the expected performance level (*importance*) of this factor were: meat industry (6.67), horticulture industry (6.50) and overall (6.58).

The sectoral means for the perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption in the meat and horticulture supply chain are illustrated in Table 4.32.

Table 4.32: Sectoral means for the perceived performance level (*level*) and expected performance level (*importance*) for technology adoption in the meat and horticulture supply chains

Mean <i>level</i> and <i>importance</i> of technology adoption by sector in the meat and horticulture supply chains					
Meat Industry sectors			Horticulture Industry sectors		
Sectors	<i>Level</i>	<i>Importance</i>	Sectors	<i>Level</i>	<i>Importance</i>
MP [Beef producer]	5.88	6.00	HNS [Horticulture nursery & seeds]	5.46	5.79
MF [Meat feedlot]	5.42	5.88	HG [Horticulture grower]	5.42	5.50
MA [Meat abattoir]	5.83	6.04	HP [Horticulture processor]	5.63	5.79
MW [Meat wholesaler]	5.63	5.83	HW [Horticulture Fruit market agent]	5.88	6.04
MB [Meat butcher]	6.00	6.50	HF [Horticulture fruit retailer]	5.58	5.71
MR [Meat restaurant]	5.42	6.04	HR [Horticulture restaurant]	5.46	5.75
Overall mean of the factors	5.69	6.05	Overall mean of the factors	5.57	5.79

(Source: Analysis of field data)

The lowest mean perceived performance level (*level*) (5.42) of technology adoption in the meat industry sectors was evident in the meat feedlot and meat restaurant sector. The lowest mean perceived performance level (*level*) (5.42) of technology adoption in the horticulture industry was found in the horticultural grower (HG) sector. The highest mean perceived performance level (*level*) (6.00) of technology adoption in the meat industry was in the meat butcher (MB) sector. The highest mean perceived performance level (*level*) (5.88) in the horticulture industry was in the horticulture fruit market agent (HW) sector. The lowest mean expected performance level (*importance*) (5.83) of technology adoption in the meat industry was in the meat wholesaler (MW) sector and in the horticulture industry the lowest mean expected performance level (*importance*) (5.50) was found in the horticulture grower (HG) sector. The highest mean expected performance level (*importance*) (6.50) of technology adoption in the meat was found in the meat butcher (MB) sector while in the horticulture industry the highest mean expected performance level (*importance*)

(6.04) was in the horticultural fruit market agent (HW) sector. Interestingly, the meat butcher (MB) had the highest mean perceived performance level (*level*) (6.00) and highest mean expected performance level (*importance*) (6.50) for technology adoption in the meat industry. The meat wholesaler (MW) showed a relatively low rating in the mean perceived performance level (*level*) (5.63) of technology adoption and the lowest mean expected performance level (*importance*) rating (5.83) for technology adoption in the meat industry. This was in contrast to the horticulture fruit market agent (HW), which had rated the mean perceived performance level (*level*) (5.88) and the mean expected performance level (*importance*) (6.04) of technology adoption the highest in the horticultural supply chain. The horticultural grower (HG) rated both the mean perceived performance level (*level*) (5.42) and mean expected performance level (*importance*) (5.50) of technology adoption the lowest in the horticultural industry.

Having discussed the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption overall, by industry and sector for the meat and horticulture industry, the next section examines the significant difference between the perceived performance level (*level*) of technology adoption between the meat and horticulture supply chains and within the sectors comprising those supply chains.

4.3.4.1 Proposition 4 – Level of technology adoption

P4: That there are significant differences between the perceived performance level (*level*) of technology adoption (a) the meat and horticulture supply chains and (b) within the sectors comprising those supply chains.

The statistical testing for significant difference results in this research for the technology adoption factors were treated in the same manner as the trust factors.

A Levene's t-test (Table 4.33 See page 130) was undertaken to test whether the difference in the mean perceived performance level (*level*) of technology adoption between the two supply chains ie 5.69 (meat industry) and 5.57 (horticulture industry) was significant. The Levene's test for equality shows a result of .120, which is well above the .05 significance rating required indicating that there is no significant

difference between the overall perceived performance level (*level*) of technology adoption in the meat and horticulture industry. Proposition P4 (a) is therefore rejected.

Table 4.33: Perceived performance level (*level*) of technology adoption t-test in the meat and horticulture industry supply chains

Levene's Test for Equality of Variances		t-test for Equality of Means						
F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
2.546	.120	.766	34	.449	1.00000	1.30470	-1.65148	3.65148
		.766	30.081	.449	1.00000	1.30470	-1.66426	3.66426

(Source: Analysis of field data)

A One-way anova test (Table 4.34) was undertaken to test whether a significant difference existed between the six sectors in the meat industry relating to the mean perceived performance level (*level*) of technology adoption in the supply chain. The One-way Anova test resulted in a significance level of .789, well above the .05 significance rating required to support Proposition P4 (b). This test shows there is not a significant difference between the mean perceived performance level (*level*) of technology adoption amongst the sectors in the meat industry and Proposition P4 (b) is therefore rejected.

Table 4.34: One-way anova test – Perceived performance level (*level*) of technology adoption in the meat industry supply chains sectors

Level of technology adoption in the meat industry	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	58.444	5	11.689	.474	.789
Within Groups	296.000	12	24.667		
Total	354.444	17			

(Source: Analysis of field data)

A One-way anova test (Table 4.35 See page 131) was undertaken to test whether a significant difference existed between the six sectors in the horticulture industry relating the mean perceived performance level (*level*) of technology adoption in the supply chain. The One-way Anova test resulted in a significance level of .784, well above the .05 significance rating required to support Proposition P4 (b). This test shows there is not a significant difference between the mean perceived performance level (*level*) of technology adoption amongst the sectors in the horticulture industry and Proposition P4 (b) is therefore rejected.

Table 4.35: One-way anova test – Perceived performance level (*level*) of technology adoption in the horticulture industry supply chains sectors

Level of technology adoption in the horticulture industry	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.434	5	.087	.481	.784
Within Groups	2.167	12	.181		
Total	2.601	17			

(Source: Analysis of field data)

Having discussed the significant differences for the mean perceived performance level (*level*) of technology adoption in the meat and horticulture supply chain by industry and sector the next section examines the significant difference for the expected performance level (*importance*) of technology adoption in the meat and horticulture industry supply chain.

4.3.4.2 Proposition 5 – Importance of technology adoption

P5: That there are significant differences between the expected performance level (*importance*) of technology adoption between (a) the meat and horticulture supply chains and (b) within the sectors comprising those supply chains.

A Levene's t-test (Table 4.36) was undertaken to test whether the differences in the mean expected performance level (*importance*) of technology adoption between the two supply chains ie 6.05 (meat industry) and 5.79 (horticulture industry) was significant. The Levene's test for equality shows a result of .522, which is well above the .05 significance rating required. Hence there is no significant difference between the overall mean expected performance level (*importance*) of technology adoption in the meat and horticulture industry and Proposition P5 (a) is therefore rejected.

Table 4.36: Expected performance level (*Importance*) of technology adoption t-test in the meat and horticulture industry supply chains

Levene's Test for Equality of Variances		t-test for Equality of Means						
F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
.418	.522	1.680	34	.102	2.05556	1.22378	-.43147	4.54258
		1.680	32.836	.103	2.05556	1.22378	-.43472	4.54583

(Source: Analysis of field data)

A One-way anova test (Table 4.37 See page 132) was undertaken to test whether a significant difference existed between the six sectors in the meat industry relating to

the mean expected performance level (*importance*) of technology adoption in the supply chain. The One-way Anova test resulted in a significance level of .703, well above the .05 significance rating required to support Proposition P5 (b). This test shows there is not a significant difference between the mean expected performance level (*importance*) of technology adoption amongst the sectors in the meat industry and Proposition P5 (b) is therefore rejected.

Table 4.37: One-way anova test – Expected performance level (*Importance*) of technology adoption in the meat industry sectors

Importance of technology adoption between the sectors in the meat industry	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	54.278	5	10.856	.598	.703
Within Groups	218.000	12	18.167		
Total	272.278	17			

(Source: Analysis of field data)

A One-way anova test (Table 4.38) was undertaken to test whether a significant difference existed between the six sectors in the horticulture industry relating to the mean expected performance level (*importance*) of technology adoption in the supply chain. The One-way Anova test resulted in a significance level of .727, well above the .05 significance rating required to support Proposition P5 (b). This test shows there is not a significant difference between the mean expected performance level (*importance*) of technology adoption amongst the sectors in the horticulture industry and Proposition P5 (b) is therefore rejected.

Table 4.38: One-way anova test – Expected performance level (*Importance*) of technology adoption in the horticulture industry sectors

Importance of technology adoption between the sectors in the horticulture industry	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.552	5	.110	.563	.727
Within Groups	2.354	12	.196		
Total	2.906	17			

(Source: Analysis of field data)

Having analysed the expected performance level (*importance*) of technology adoption, no significant differences exist either across the combined supply chains or within either the meat or horticulture industry. The next section analyses the significant differences between the perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption.

4.3.4.3 Proposition 6 - Significant differences between the level and importance of technology adoption.

P6: That significant differences exist between the perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption within (a) the meat and horticulture supply chains and (b) the sectors making up those supply chains.

The gaps between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption in the meat and horticulture supply chains are shown in Table 4.39. The mean gap (0.35) in technology adoption for the meat industry is slightly higher than the mean gap (0.22) in technology adoption for the horticulture industry. The two factors with the highest mean gap (0.67) and (0.61) in technology adoption for the meat industry were ‘Relative advantage’ and ‘Traceability’. The same two factors in reverse order had the highest mean gap (0.83) and (0.44) in technology adoption in the horticulture industry.

Table 4.39: Gaps between the mean perceived performance level (*level*) and mean expected performance level (*importance*) of technology adoption in the meat and horticulture supply chains.

Gap between the mean <i>level</i> and <i>importance</i> of technology adoption in the meat and horticulture supply chains									
Technology adoption factors	Meat industry			Horticulture industry			Overall		
	<i>Level</i>	<i>Importance</i>	Gap	<i>Level</i>	<i>Importance</i>	Gap	<i>Level</i>	<i>Importance</i>	Gap
Compliance / mandate	4.67	5.00	0.33	4.78	4.78	0.00	4.72	4.89	0.17
Relative advantage	6.00	6.67	0.67	6.06	6.50	0.44	6.03	6.58	0.56
Ease of use	5.78	6.06	0.28	5.56	5.61	0.06	5.67	5.83	0.17
Compatibility	6.06	6.22	0.17	6.06	6.17	0.11	6.06	6.19	0.14
Trialability	5.17	5.56	0.39	6.00	6.17	0.17	5.58	5.86	0.28
Observability	5.83	6.00	0.17	5.11	5.28	0.17	5.47	5.64	0.17
Complexity	6.06	6.28	0.22	5.94	5.94	0.00	6.00	6.11	0.11
Traceability	6.00	6.61	0.61	5.06	5.89	0.83	5.53	6.25	0.72
Overall mean	5.69	6.05	0.35	5.57	5.79	0.22	5.63	5.92	0.29

(Source: Analysis of field data)

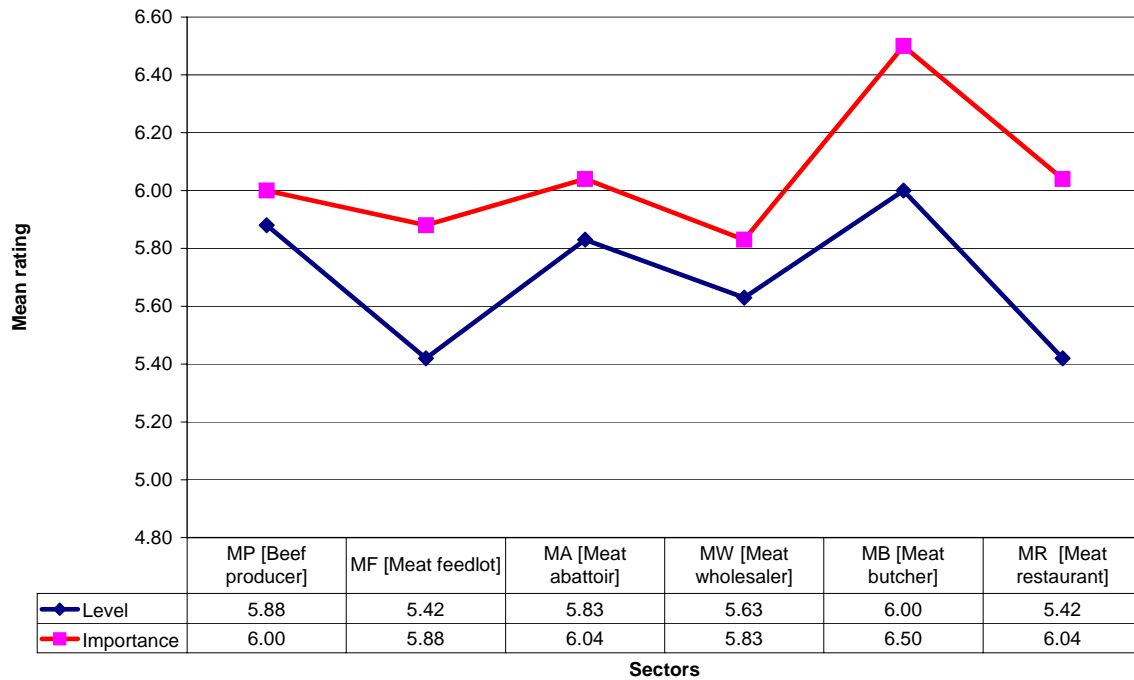
The sectoral mean gaps between the perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption in the meat and horticulture supply chain are illustrated in Table 4.40. The highest mean gap (0.50) in technology adoption for the meat industry was in the meat butcher (MB) sector and in the horticulture industry the highest mean gap (0.33) was in both the horticulture nursery and seed producer (HNS) and the horticulture processor (HP) sector.

Table 4.40: Sectoral mean gaps between the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption in the meat and horticulture industry.

Gap between the mean level and importance of technology adoption in the meat and horticulture supply chain sectors							
Meat industry				Horticulture industry			
Sectors	<i>Level</i>	<i>Importance</i>	Gap	Sectors	<i>Level</i>	<i>Importance</i>	Gap
MP [Beef producer]	5.88	6.00	0.13	HNS [Horticulture nursery & seeds]	5.46	5.79	0.33
MF [Meat feedlot]	5.42	5.88	0.46	HG [Horticulture grower]	5.42	5.50	0.08
MA [Meat abattoir]	5.83	6.04	0.21	HP [Horticulture processor]	5.63	5.79	0.33
MW [Meat wholesaler]	5.63	5.83	0.21	HW [Horticulture Fruit market agent]	5.88	6.04	0.17
MB [Meat butcher]	6.00	6.50	0.50	HF [Horticulture fruit retailer]	5.58	5.71	0.13
MR [Meat restaurant]	5.42	6.04	0.63	HR [Horticulture restaurant]	5.46	5.75	0.29
Overall mean of the factors	5.69	6.05	0.35	Overall mean of the factors	5.57	5.79	0.22

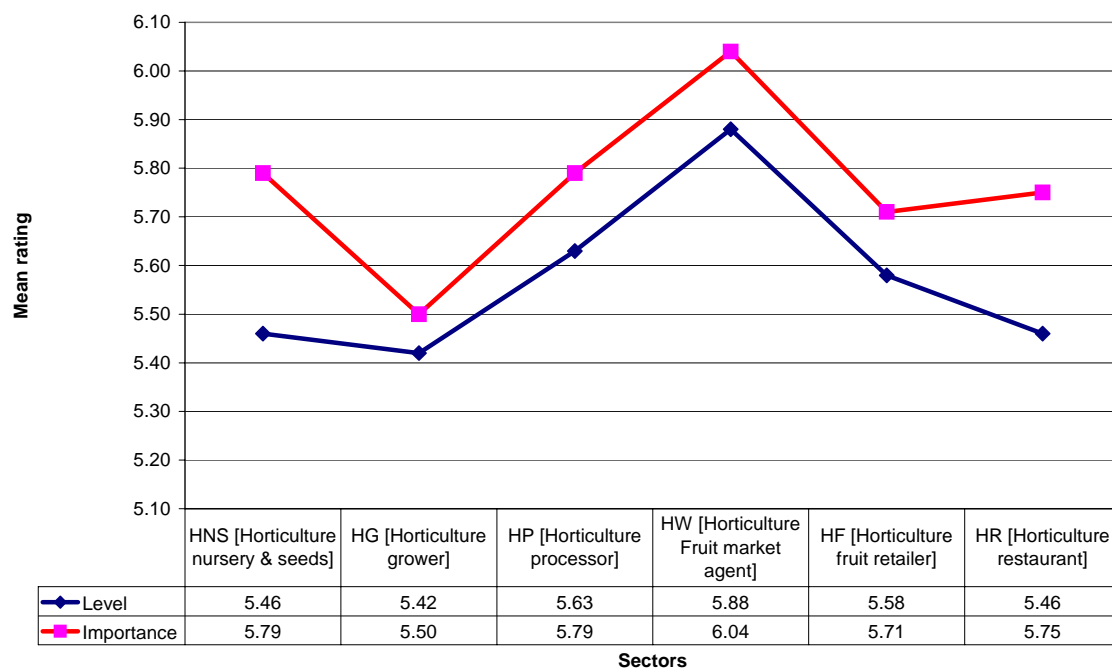
(Source: Analysis of field data)

The perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption within the sectors of the meat industry supply chain sectors has been illustrated in Graph 4.5 (See page 135). The Graph shows the largest differences between the perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption in the meat industry was evident in the meat feedlot (MF), and the meat butcher (MB) and meat restaurant (MR) sectors.



Graph 4.5: Perceived performance level (*level*) and expected performance level (*importance*) of technology by sector in the meat industry supply chain
 (Source: Analysis of field data)

The perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption within the sectors of the horticulture industry supply chain sectors are illustrated in Graph 4.6.



Graph 4.6: Perceived performance level (*level*) and expected performance level (*importance*) of trust by sector in the horticulture industry supply chain
 (Source: Analysis of field data)

Graph 4.6 illustrates the largest differences between the perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption appeared in the horticulture nursery and seed producer (HNS) and the horticulture restaurant (HR) sectors.

A paired t-test for significance (Table 4.41) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption existed overall. The paired t-test for significance resulted in a significance level of .000, well below the .05 significance rating, which confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption overall and Proposition P6 (a) is therefore supported for technology adoption overall.

Table 4.41: Paired t-test for significant difference in perceived performance level (*level*) and expected performance level (*importance*) for technology adoption Overall

Paired factors for the overall mean <i>level</i> and <i>importance</i> of technology adoption								
Paired Differences					Paired Sample Test			
Mean	N	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
.28819	36	.27681	.04614	.19453	.38185	6.247	35	.000

(Source: Analysis of field data)

While Table 4.41 shows that there is a significant difference in technology adoption overall, a paired t-test was undertaken to identify any significant differences between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption in the meat and horticulture industry.

A paired t-test for significance (Table 4.42 See page 137) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption existed in the meat industry. The paired t-test for significance resulted in a significance level of .000, well below the .05 significance rating, which confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption in the meat industry

and Proposition H6 (a) is therefore supported for technology adoption in the meat industry.

Table 4.42: Paired t-test for significant difference in perceived performance level (*level*) and expected performance level (*importance*) for technology adoption – Meat industry

Paired factors for the mean <i>level</i> and <i>importance</i> of technology adoption in the meat industry								
Paired Differences						Paired Sample Test		
Mean	N	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
.35417	36	.33555	.07909	.18730	.52103	4.478	17	.000

(Source: Analysis of field data)

A paired t-test for significance (Table 4.43) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption existed in the horticulture industry. The paired t-test for significance resulted in a significance level of .000, well below the .05 significance rating, which confirms there is a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption in the horticulture industry. Proposition P6 (a) is therefore supported for technology adoption in the horticulture industry.

Table 4.43: Paired t-test for significant difference in perceived performance level (*level*) and expected performance level (*importance*) for technology adoption – horticulture industry

Paired factors for the mean <i>level</i> and <i>importance</i> of technology adoption in the horticulture industry								
Paired Differences						Paired Sample Test		
Mean	N	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	Df	Sig. (2-tailed)
				Lower	Upper			
.22222	36	.18960	.04469	.12794	.31651	4.973	17	.000

(Source: Analysis of field data)

A paired t-test for significance (Table 4.44 See page 138) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption by factor existed overall in the meat and horticulture industry supply chain.

Table 4.44: Paired t-test for significant difference between mean perceived performance level (*level*) and mean expected performance level (*importance*) of technology adoption by factor overall

Paired Samples	Paired Sample Statistics					Paired Sample Test		
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Technology adoption factors overall								
Compliance / mandate	-.167	.507	.085	-.338	.005	-1.972	35	.057
Relative advantage	-.556	.773	.129	-.817	-.294	-4.315	35	.000
Ease of use	-.167	.447	.075	-.318	-.015	-2.236	35	.032
Compatibility	-.139	.424	.071	-.283	.005	-1.963	35	.058
Trialability	-.278	.615	.102	-.486	-.070	-2.712	35	.010
Observability	-.167	.378	.063	-.295	-.039	-2.646	35	.012
Complexity	-.111	.398	.066	-.246	.024	-1.673	35	.103
Traceability	-.722	.944	.157	-1.042	-.403	-4.588	35	.000

(Source: Analysis of field data)

The paired t-test for significance resulted in a significance level of .000 to .103. Five technology adoption factors ranged from .000 to .032 which are below the .05 significance rating. This confirms that the technology adoption factors of the ‘Relative advantage’, ‘Ease of use’, ‘Trialability’, ‘Observability’ and ‘Traceability,’ have a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) and Proposition P6 (a) is therefore supported for technology adoption overall for these five factors. Table 4.44 also shows that two high standard deviations were identified for the factors in technology adoption overall, which were ‘Relative advantage’ (.773) and ‘Traceability’ (.944) and this may indicate these factors have critical gaps.

While Table 4.44 shows that there is a significant difference in technology adoption for these five factors, a paired t-test was undertaken to identify any significant differences between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption in the meat and horticulture industries.

A paired t-test for significance (Table 4.45 See page 139) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption existed in

the meat industry. The paired t-test for significance resulted in a significance level of .006 to .187. Four technology adoption factors ranged from .006 to .030, which were below the .05 significance rating. These ratings indicate that the technology adoption factors of the ‘Relative advantage’, ‘Compliance / mandate’, ‘Trialability’, and ‘Traceability,’ have a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) and Proposition P6 (a) is therefore supported for technology adoption in the meat industry for these four factors.

Table 4.45: Paired t-test for significance difference in mean perceived performance level (*level*) and mean expected performance level (*importance*) of technology adoption by factor in the meat industry

Paired Samples	Paired Sample Statistics					Paired Sample Test		
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Technology adoption factors in the meat industry								
Compliance / mandate	-.333	.594	.140	-.629	-.038	-2.380	17	.029
Relative advantage	-.667	.907	.214	-1.118	-.215	-3.117	17	.006
Ease of use	-.278	.575	.135	-.563	.008	-2.051	17	.056
Compatibility	-.167	.514	.121	-.423	.089	-1.374	17	.187
Trialability	-.389	.698	.164	-.736	-.042	-2.364	17	.030
Observability	-.167	.383	.090	-.357	.024	-1.844	17	.083
Complexity	-.222	.548	.129	-.495	.050	-1.719	17	.104
Traceability	-.611	1.037	.244	-1.127	-.095	-2.500	17	.023

(Source: Analysis of field data)

Table 4.45 shows that two high standard deviations were identified for the factors in technology adoption in the meat industry being ‘Relative advantage’ (.907) and ‘Traceability’ (1.037) which indicates these factors may have critical gaps.

A paired t-test for significance (Table 4.46 see page 140) was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption existed in the horticulture industry. The paired t-test for significance resulted in a significance level from .001 to 1.000. Two technology adoption factors ranged from .001 to .007, which are below the .05 significance rating. These ratings indicate that the technology adoption factors of the ‘Relative advantage’, and ‘Traceability,’ have a significant

difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*). Proposition P6 (a) is therefore supported for technology adoption in the horticulture industry for these two factors. One factor in Table 4.50 (See Page 145), which was ‘Complexity’, did not have a result as the difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption was zero in the horticulture industry.

Table 4.46: Paired t-test for significance difference in mean perceived performance level (*level*) and mean expected performance level (*importance*) of technology adoption by factor in the horticulture industry

Paired Samples	Paired Sample Statistics					Paired Sample Test		
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Technology adoption factors in the horticulture industry								
Compliance / mandate	.000	.343	.081	-.171	.171	.000	17	1.000
Relative advantage	-.444	.616	.145	-.751	-.138	-3.063	17	.007
Ease of use	-.056	.236	.056	-.173	.062	-1.000	17	.331
Compatibility	-.111	.323	.076	-.272	.050	-1.458	17	.163
Trialability	-.167	.514	.121	-.423	.089	-1.374	17	.187
Observability	-.167	.383	.090	-.357	.024	-1.844	17	.083
Complexity								
Traceability	-.833	.857	.202	-1.260	-.407	-4.123	17	.001

(Source: Analysis of field data)

Table 4.46 shows that two high standard deviations were identified for the factors in technology adoption in the meat industry: ‘Relative advantage’ (.616) and ‘Traceability’ (.857) that could indicate these factors may have critical gaps.

Having discussed the significant differences or gaps for the factors of technology adoption in the meat and horticulture industry supply chain overall and by industry, the next subsection investigates significant difference in the factors of technology adoption for the sectors in the meat and horticulture industry supply chain.

A paired t-test for significance was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption existed for the sectors in the meat and horticulture industries. The paired t-test for significance (Table 4.47 See page 141) for

the meat industry resulted in a significance level for all technology adoption factors between .184 and .423 all being well above the .05 significance rating, which confirms there is not a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption factors in the meat industry sectors and Proposition P6 (b) is therefore rejected in the meat industry sector.

Table 4.47: Paired t-test for significance difference between the mean perceived performance level (*level*) and mean expected performance level (*importance*) of technology adoption by factor in the meat industry – by sector

Technology adoption factors in the meat industry sector	MP	MF	MA	MW	MB	MR
Compliance / mandate	.000	.225	.000	.184	.423	.000
Relative advantage	.000	.225	.423	.184	.270	.423
Ease of use	.000	.423	.000	.000	.423	.225
Compatibility	.423	.000	.000	.000	.000	.423
Trialability	.423	.423	.423	.000	.423	.423
Observability	.000	.423	.000	.000	.423	.423
Complexity	.000	.423	.000	.423	.000	.423
Traceability	.000	.000	.423	.000	.270	.057

(Source: Analysis of field data)

A paired t-test for significance was undertaken to test whether a significant difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption existed for the factors in the horticulture industries.

The paired t-test for significance (Table 4.48 See page 142) for the horticulture industry resulted in a significance level for all technology adoption factors between .057 and .423 all being above the .05 significance rating, which confirms there is not a significant difference or gap between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption factors in the horticulture industry and Proposition P6 (b) is therefore rejected in the horticulture industry sector.

Table 4.48: Paired t-test for significance difference between the mean perceived performance level (*level*) and mean expected performance level (*importance*) of technology adoption by factor in the horticulture industry – by sector

Technology adoption factors in the horticulture industry sector	HNS	HG	HP	HW	HF	HR
Compliance / mandate	.423	.000	.423	.000	.000	.000
Relative advantage	.423	.000	.184	.423	.423	.184
Ease of use	.423	.000	.000	.000	.000	.000
Compatibility	.423	.000	.423	.000	.000	.000
Trialability	.000	.423	.423	.000	.000	.000
Observability	.000	.000	.423	.423	.000	.423
Complexity	.000	.000	.000	.000	.000	.000
Traceability	.225	.000	.057	.423	.423	.057

(Source: Analysis of field data)

This section has provided the results of the statistical significance difference testing for technology adoption overall, and by industry, factor and sector in the meat and horticulture supply chains. The results of the statistical significance difference testing for technology adoption from this section were the first of three analysis methods used to identify factors of technology adoption with critical gaps. The next section introduces the two other gap analysis methods used to identify the critical gaps for the factors of technology adoption in the meat and horticulture industry supply chain.

4.3.5. Gap analysis for technology adoption

This section uses two gap analysis theories to investigate the gaps for the factors of technology adoption in the meat and horticulture industry supply chain. The same method was undertaken for calculating the weighted and unweighted gaps for the factors of technology adoption as for the trust factors in section 4.3.2.

The first gap analysis method used was the mean weighted gap theory and the other gap analysis method used was the mean unweighted IPA theory matrix to graphically plot the factors of technology adoption with possible critical gaps.

4.3.5.1 Weighted gap for technology adoption in the meat supply chain

This section analyses the weighted gaps for the factors of technology adoption in the meat industry supply chain using the same method as used for trust in section 4.3.2.1. The mean weighted gaps for the factors of technology adoption have been calculated by multiplying the mean importance and the mean gap together to provide the mean

weighted gaps for the factors of technology adoption in the meat industry supply chain. The mean weighted gaps for the factors of technology adoption for the meat and horticulture industry have been ranked in descending order of magnitude using the weighted gap analysis theory to assist in identifying the critical gaps in technology adoption. The mean weighted gaps for the factors of technology adoption in meat industry supply chain are ranked in Table 4.49.

Table 4.49: Mean weighted gaps between perceived performance level (*level*) and expected performance level (*importance*) for technology adoption factors within the meat industry supply chain

Weighted mean gaps in technology adoption in the meat industry			
Factors of technology adoption in the meat industry	Importance	Mean gap	Weighted gap
Relative advantage	6.67	0.67	4.47
Traceability	6.61	0.61	4.03
Trialability	5.56	0.39	2.17
Ease of use	6.06	0.28	1.70
Compliance / mandate	5.00	0.33	1.65
Complexity	6.28	0.22	1.38
Compatibility	6.22	0.17	1.06
Observability	6.00	0.17	1.02

(Source: Analysis of field data)

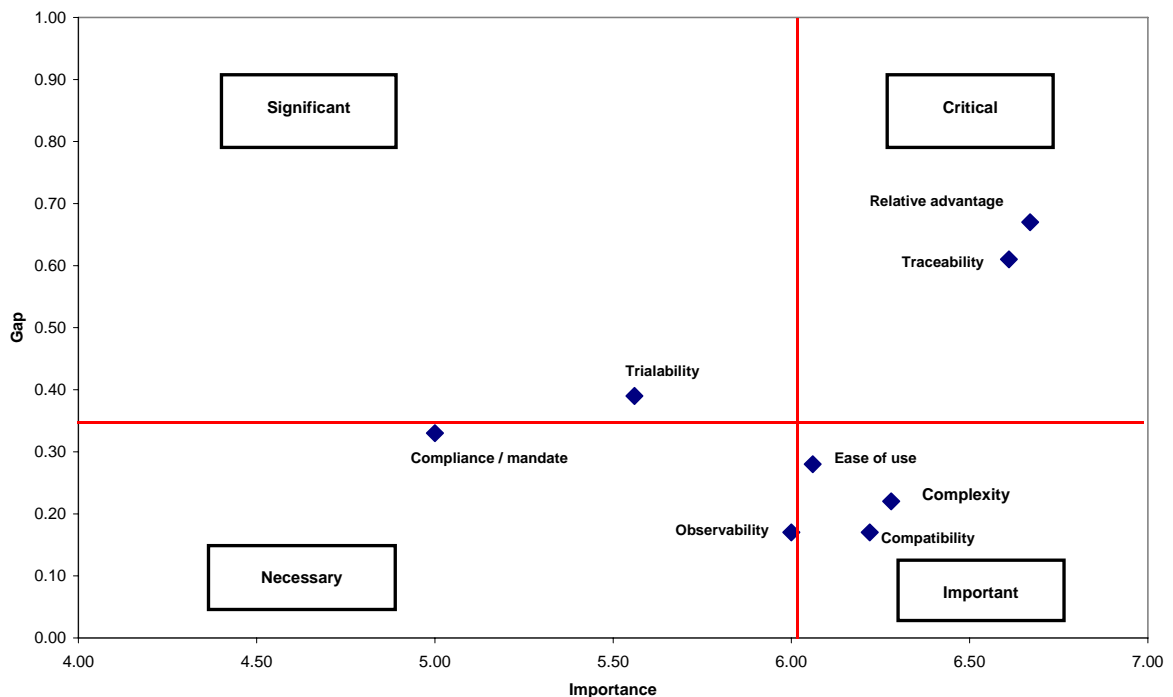
The highest ranked mean weighted gap in technology adoption for the meat industry was the factor of ‘Relative advantage’ (4.47). The second highest ranked mean weighted gap (4.03) in technology adoption for the meat industry was ‘Traceability’. The third highest ranked mean weighted gap (2.17) for technology adoption referred to ‘Trialability’. The fourth highest ranked mean weighted gap (1.70) for technology adoption was ‘Ease of use’. The fifth highest ranked mean weighted gap (1.65) for technology adoption related the factor of ‘Compliance/mandate’.

Having discussed the ranked mean weighted gaps in technology adoption in the meat industry supply chain, the next subsection analyses the unweighted gaps for the factors of trust for the horticulture industry using the IPA matrix theory.

4.3.5.2 Unweighted gap for technology adoption in the meat supply chain

This subsection analyses the mean unweighted gaps in technology adoption for the meat industry using the IPA method, the same method as used for trust in the meat

industry section 4.3.2.2. The IPA method is used to graphically plot two determinants, which are the unweighted mean performance or gap against the mean importance for the technology adoption factors. The plotting of these determinants produces a graph divided into four quadrants. These four quadrants can be labelled ‘Concentrate here’, ‘Keep up the good work’, ‘Low priority’ and ‘Possible overkill’. None of the factors of technology adoption in the meat industry in this research fell into the ‘Keep up the good work’, ‘Low priority’ and ‘Possible overkill’. All of the factors for technology adoption show the need to improve customer/supplier satisfaction and fell into the ‘Concentrate here’ quadrant in the meat industry. The ‘Concentrate here’ quadrant for technology adoption was divided into four improvement quadrants. These four quadrants have been labelled in order of the priority for improvement commencing with ‘Critical’, and then ‘Significant’, followed by ‘Important’ with the least improvement required labelled as ‘Necessary’. The quadrant cross hairs on the graph were also determined in the same manner as for trust by using the mean overall gap and overall mean importance figures for the meat and horticulture industry. Graph 4.7 illustrates the improvement area for the factors of technology adoption in the meat industry.



Graph 4.7: supply chain Improvement area for the unweighted factors of technology adoption in the meat industry supply chain
 (Source: Analysis of field data)

The improvement area labelled ‘Critical’ showed there were two factors for technology adoption that fell into this quadrant in the meat industry supply chain, which were ‘Relative advantage’ and ‘Traceability’. The next factor that required improvement and fell into the ‘Significant’ quadrant was ‘Trialability’. There were three factors of technology adoption in the ‘Important’ quadrant: ‘Ease of use’, ‘Complexity’ and ‘Compatibility’. There were two factors for technology adoption in the ‘Necessary’ quadrant, which were ‘Compliance/mandate’ and ‘Observability’.

Having discussed the mean unweighted gaps for technology adoption in the meat industry using the IPA matrix, the next subsection investigates the mean weighted gaps for the factors of technology adoption in the horticulture industry.

4.3.5.3 Weighted gap for technology adoption in the horticulture supply chain

This section analyses the weighted gaps for the factors of technology adoption in the horticulture industry supply chain to assist in identifying critical gaps in technology adoption. The mean weighted gaps for the factors of technology adoption have been calculated by multiplying the mean importance and the mean gap together to provide the mean weighted gaps for the factors of technology adoption in the meat industry supply chain. The mean weighted gaps for the factors of technology adoption for the horticulture industry have been ranked in descending order of magnitude using the weighted gap analysis theory to assist in identifying the critical gaps in technology adoption. The ranking of the mean weighted gaps for the technology adoption factors in the horticulture industry supply chain are identified in Table 4.50.

Table 4.50: Mean weighted gaps between perceived performance level (*level*) and expected performance level (*importance*) for technology adoption factors within the horticulture industry supply chain

Weighted mean gap in technology adoption in the horticulture industry			
Factors of technology adoption in the horticulture industry	Importance	Mean gap	Weighted gap
Traceability	5.89	0.83	4.89
Relative advantage	6.50	0.44	2.86
Trialability	6.17	0.17	1.05
Observability	5.28	0.17	0.90
Compatibility	6.17	0.11	0.68
Ease of use	5.61	0.06	0.34
Complexity	5.94	0.00	0.00
Compliance / mandate	4.78	0.00	0.00

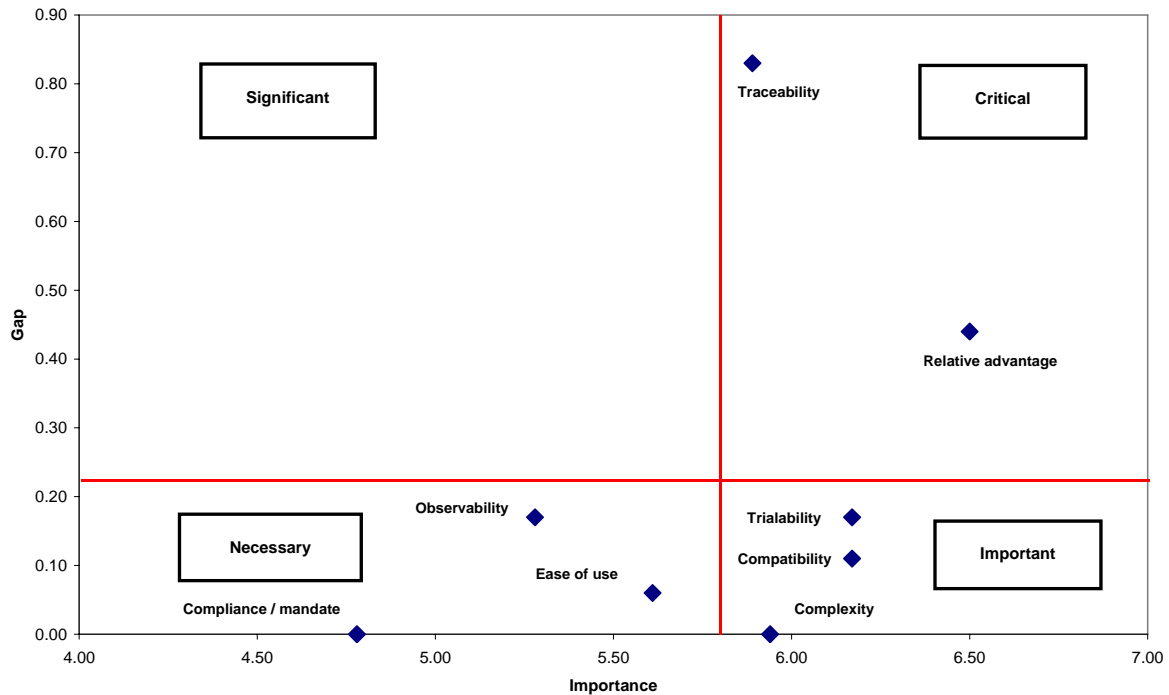
(Source: Analysis of field data)

The technology adoption factor with the highest ranked mean weighted gap in the horticulture industry was 'Traceability' (4.89). The second highest ranked weighted gap (2.86) was 'Relative advantage'. The third highest ranked mean weighted gap (1.05) in technology adoption was 'Trialability'. The next highest ranked mean weighted gap was 'Observability' with the fifth highest ranked mean weighted gap being 'Compatibility'.

Having discussed the ranked mean weighted gaps for the factors of technology adoption in the horticulture industry supply chain, the next subsection analyses the mean unweighted gaps in technology adoption in the horticulture industry supply chain.

4.3.5.4 Unweighted gap for technology adoption in the horticulture supply chain

This subsection repeats the use of the IPA matrix analyse method to identify the factors of technology adoption in the horticulture industry that may have critical gaps. The IPA matrix graphically plots the unweighted mean performance or gap against the mean importance, which produces a graph divided into four quadrants as was used for technology adoption in the meat industry in section 4.3.5.2. From the eight factors of technology adoption in the horticulture industry, six factors showed the need to improve customer/supplier satisfaction and fell into the 'Concentrate here' quadrant. The two remaining factors of technology adoption factors were situated on the borderline of 'Keep up the good work' and 'Concentrate here' quadrant. The 'Concentrate here' quadrant for the technology adoption factors was labelled in order of priority for improvement. These were the same as for the meat industry being: 'Critical', 'Significant', 'Important' and 'Necessary'. The quadrant cross hairs on the graph were determined by using the mean overall gap and overall mean expectation or importance figures for the horticulture industry. Graph 4.8 (See page 147) illustrates the improvement area for the factors of technology adoption in the horticulture industry.



Graph 4.8: Improvement area for the unweighted factors of technology adoption in the horticulture industry supply chain
 (Source: Analysis of field data)

The improvement area labelled ‘Critical’ shows that there were two factors for technology adoption that fell into this quadrant in the horticulture industry supply chain, which were ‘Traceability’ and ‘Relative advantage’. Three other factors of technology adoption fell in the ‘Important’ quadrant being ‘Trialability’, ‘Compatibility’ and ‘Complexity’. There were two factors for technology adoption in the necessary quadrant, which were ‘Observability’ and ‘Ease of use’. The two remaining factors of technology adoption ‘Compliance/mandate’ and ‘Observability’ are the only factors in this research that are on the borderline between ‘Concentrate here’ and ‘Keep up the good work’ quadrants.

Having discussed the factors of technology adoption in the meat and horticulture supply chain using the weighted gap theory and unweighted IPA theory, the next section determines the critical gaps in the meat and horticulture industry supply chain.

4.3.6 Critical gaps in technology adoption

This section determines the factors with critical gaps in technology adoption for the meat and horticulture industry supply chain. The critical gaps in technology adoption are determined using the same method as previously conducted for trust in 4.3.3. This

method is being repeated to ensure the selection of the critical gaps in technology adoption in the meat and horticulture industry will be more objective and less subjective. This section has assessed the factors of technology adoption in the meat and horticulture supply chain using the three analysis methods of statistical significant difference tests, weighted gap analysis and the unweighted IPA matrix analysis theory. The use of the two gap analysis methods to provide confirmatory analysis to the statistical significant difference tests ensures the critical gaps selected will be less subjective and more objective.

Table 4.51 provides a summary of the results from the three analysis methods labelled under test one, two and three. Test one is the Sig. (2-tailed) statistical significant difference test. Test two is the ranked mean weighted gap and test three is the unweighted mean improvement area for the factors of technology adoption. These results have been used as the basis to determine the critical gaps in technology adoption for the meat industry supply chain.

Table 4.51: Critical gaps between perceived performance level (*level*) and expected performance level (*importance*) for technology adoption within the meat industry supply chain

Critical gaps for the factors of technology adoption in the meat industry			
Technology adoption factors	Test one	Test two	Test three
	Sig. (2-tailed)	Ranked weighted gap factors	Improvement area
Relative advantage	.006	1	Critical
Traceability	.023	2	Critical
Trialability	.030	3	Significant
Ease of use	.056	4	Important
Compliance / mandate	.029	5	Necessary
Complexity	.104	6	Important
Observability	.083	8	Necessary
Compatibility	.187	7	Important

(Source: Analysis of field data)

The same selection criteria to determine the factors with the critical gap in technology adoption were used as previously undertaken for the factors of trust in section 4.3.3. The first selection criterion was based on the factors that had the highest statistical significant differences Sig. (2-tailed) in the study. The second criterion concerned the factors that were ranked within the six highest weighted gaps. The third criterion was based on the factors that fell within either the ‘Critical’ or ‘Significant’

quadrant for improvement. By using this selection criteria there were two clear technology adoption factors that showed critical gaps in the meat industry supply chain, which were ‘Relative advantage’ and ‘Traceability’. The other factor for technology adoption in the meat industry that was judged to have a critical gap was ‘Triability’.

Having determined the critical gaps in technology adoption in the meat industry supply chain, the next subsection uses the same process to determine the factors of technology adoption with critical gaps in the horticulture industry supply chain.

Table 4.52 provides a summary of the results from the three analysis methods labelled under test one, two and three. These results have been used as the basis to determine the critical gaps in technology adoption for the horticulture industry supply chain.

Table 4.52: Critical gaps between perceived performance level (*level*) and expected performance level (*importance*) for technology adoption factors within the horticulture industry supply chain

Critical gaps for the factors of technology adoption in the horticulture industry			
Technology adoption factors	Test one	Test two	Test three
	Sig. (2-tailed)	Ranked weighted gap factors	Improvement area
Traceability	.001	1	Critical
Relative advantage	.007	2	Critical
Triability	.187	3	Important
Compatibility	.163	5	Important
Observability	.083	4	Necessary
Ease of use	.331	6	Necessary
Complexity	No result	7	Satisfactory
Compliance / mandate	1.000	8	Satisfactory

(Source: Analysis of field data)

The three selection criterion used commenced with the highest statistical significant differences Sig. (2-tailed) in the study. The second selection criterion identified factors that were ranked within the six highest weighted gaps. The third criterion considered the factors that fell within either the ‘Critical’ or ‘Significant’ quadrant for improvement. By using this selection criteria there were two clear technology adoption factors that showed critical gaps in the horticulture industry supply chain, which were ‘Traceability’ and ‘Relative advantage’.

Having selected the critical gaps in technology adoption in the meat and the horticulture industry supply chain, the next section discusses the other important factors in agribusiness supply chains.

4.4 OTHER RELATED ISSUES IN AGRIBUSINESS SUPPLY CHAINS

This section discusses the qualitative data gathered from the open-ended questions concerning the other related issues indicated in the literature as important to the meat and horticulture supply chain. These issues included partnerships, technology, government, outsourcing and traceability in the meat and horticulture agribusiness supply chains. The data gathered from both industries was coded into SPSS and the results were analysed by frequency distribution due to the small number of case studies in the research.

4.4.1 Partnership

All of the case study interviewees considered that the concept of partnerships was important in their business and was a positive in the success of their supply chain in the industry.

Table 4.53 (See below) provides a summary of the comments made concerning partnership success factor in the meat and horticulture supply chain.

Table 4.53: Partnership issues relating to success in the meat and horticulture supply chain

Partnership	Frequency	Percent
Open communication, collaboration and information sharing	12	33.3
Consistency, predictability	8	22.2
Partner selection	6	16.7
Revenue sharing, payments and pricing	5	13.9
Trained and knowledgeable staff	3	8.3
Conflict handling	1	2.8
Cost efficient	1	2.8
Total	36	100.0

(Source: Analysis of field data)

The major issues relating to partnerships was reported by 33.3 percent of respondents concerning open communication, collaboration and information sharing between supply chain partners. The next most important issue relating to partnerships was reported by 22.2 percent of respondents concerned supply chain partners being

consistent and predictable in terms of product and service quality, delivery, information sharing and payments. Another highly ranked issue reported by 16.7 percent of respondents concerned partner selection while the issue of revenue sharing, payments and pricing between partners (13.9 percent) was also considered important. The other issues reported as being important to successful partnerships included the need for trained and knowledgeable staff (8.3 percent), conflict handling (2.8 percent) and being cost efficient (2.8 percent).

4.4.2 Technology

Just over 97 percent of the case study interviewees considered that technology adoption in their business was a positive issue in the success of their supply chain.

Table 4.54 provides a summary of the comments made concerning technology usage in the meat and horticulture supply chain.

Table 4.54: Technology issues relating to success in the meat and horticulture supply chain

Technology	Frequency	Percent
Mobile phone, email, internet, fax, and digital camera	11	30.6
Packaging, processing, logistics	7	19.4
Computer software and barcoding	7	19.4
Cool chain management	5	13.9
Nutrition, animal and seed genetics	4	11.1
Not Applicable	2	5.6
Total	36	100.0

(Source: Analysis of field data)

Communication technology such as mobile phones, facsimile, Internet and digital photography were reported by over 30.6 percent of respondents as important to their supply chain. The next two highest ranked related issues in technology adoption each reported (19.4 percent) with packaging, processing and logistics and being equally as important was computer software and barcoding in the meat and horticulture supply chain. Another important related issue in the success of the supply chain was cool chain management reported at 13.9 percent. Another important related issue reported (11.1 percent) concerning scientific technology in animal and seed technology involving nutrition and genetics in the supply chain.

4.5.3 Outsourcing

Over 86 percent of the case study interviewees had a positive attitude towards outsourcing as an important related issue the success of their supply chain.

As shown in Table 4.55 over 70 percent of case study organisations considered road transport and computer software outsourcing service providers were important.

Table 4.55: Outsourcing issues relating to success in the meat and horticulture supply chain

Outsourcing	Frequency	Percent
Road transport services	16	44.4
Computer software services	7	19.4
Both road and computer software services	3	8.3
Other issues	10	27.8
Total	36	100.0

(Source: Analysis of field data)

4.4.4 Government

Almost 53 percent of case study interviewees had a negative attitude to the contribution of government to the success of their supply chain. In contrast, less than 28 percent of interviewees considered that government had played a positive part in the success of their supply chain.

Table 4.56 provides a summary of the comments made concerning the influence of government on the meat and horticulture supply chain.

Table 4.56: Government issues relating to success in the meat and horticulture supply chain

Government	Frequency	Percent
Low support in the supply chain sectors	16	44.4
Good initiatives for grants and research	8	22.2
Improved food safety	5	13.9
Low commitment to advance rural Australia	5	13.9
Maintain partnership with Government	2	5.6
Total	36	100.0

(Source: Analysis of field data)

Over 55 percent of case study organisations considered that government provided low support to their sector of the industry or had a low commitment to advancing rural Australia. In contrast, 22 percent of case study organisations felt that government had undertaken good initiatives for grants and research that had assisted their supply

chain. Just under 14 percent of case study organisations also considered that the government had assisted in improving food safety in the supply chain.

4.4.5 Traceability

Approximately 70 percent of case study interviewees considered traceability was a positive factor in their supply chain.

Table 4.57 provides a summary of the comments made concerning traceability as a factor in the meat and horticulture supply chain.

Table 4.57: Traceability issues relating to success in the meat and horticulture supply chain

Traceability	Frequency	Percent
Manages risk for food safety and legal liability	10	27.8
Expensive, added costs, unknown benefits and slows process	10	27.8
Significant issue to customers	8	22.2
Not required for imports	3	8.3
Future applications	3	8.3
Forced on industry by government with limited financial support	2	5.6
Total	36	100.0

(Source: Analysis of field data)

The comments relating to traceability were mixed with 27.8 percent of case study organisations seeing traceability as a risk management and legal liability instrument in their supply chain. In contrast a similar percentage of case study organisations saw traceability as being expensive, adding costs to the supply chain that cannot be recovered, providing unknown benefits and slowing the process in the supply chain. In addition to this just over five percent of case study organisations believed the government forced traceability on the meat sector. These respondents consider government provided limited financial assistance and no option but to comply with the compulsory legislation. Over 22 percent of the organisations felt that traceability was a significant issue to their customers. Some respondents were concerned that imported agribusiness products were not subject to the same traceability requirements and standards as Australian products.

Having discussed a number of related issues important to the Australian agribusiness supply chains apart from trust and technology adoption the next section provides the conclusion to this chapter.

4.5 CONCLUSION

The analysis of data in this chapter has produced a number of findings. Firstly this research has identified that there is a statistically significant difference in the perceived performance level (*level*) of trust within the sectors of the meat industry supply chain. Secondly, a statistical significant difference has been found between the perceived performance level (*level*) and the expected performance level (*importance*) of factors of trust overall and by industry and sector in the meat and horticulture industry supply chain. Another statistically significant difference was identified between the perceived performance level (*level*) and the expected performance level (*importance*) of the factors of technology adoption overall and by industry in the meat and horticulture industry supply chain.

The use of the results from the three analysis methods of statistical significant difference, the mean weighted gap analysis and the mean unweighted IPA matrix analysis provided a more objective and less subjective approach to critical gap analysis. These analysis methods were collectively used incorporating a selection criterion that selected the critical gaps in trust and technology adoption based on three premises. These premises were based, firstly on the factors that had the highest statistical significant differences in the study, secondly on the factors that were ranked within the six highest weighted gaps and thirdly on the factors that fell within either the ‘Critical’ or ‘Significant’ improvement area.

This chapter has identified that all the factors of trust and technology adoption in this study concerning the meat industry supply chain had gaps that were unsatisfactory and needed to be improved. This situation was exactly the same for the horticulture industry supply chain with the exception of two factors: ‘Complexity’ and ‘Compliance/mandate’ in technology adoption, which were on the borderline of being satisfactory. By contrast, the weighted gaps for the factors of trust were higher and more frequent than those identified in technology adoption both in the meat and horticulture supply chains. There were eight factors of trust identified as having critical gaps across both the meat and horticulture supply chain. These eight critical gaps in trust were: ‘Information sharing’, ‘Reliability’, ‘Timeliness’, ‘Customisation’, ‘Work standards’ ‘Shared values’, ‘POS information’ and ‘Honesty and integrity’. In comparison, there were only two factors of technology adoption that had critical gaps

in both the meat and horticulture supply chains. These factors were the same in both the meat and horticulture supply chains being 'Relative advantage and 'Traceability'.

The findings in the qualitative research concerning other important factors in Australian agribusiness highlighted the importance of partnerships in the supply chain including the significant role played by outsourcing partnerships. Communication was a highly recognised factor in successful supply chains with a correlation being made to the importance of technology adoption that supports communication. Respondents in this research raised a number of other important success factors. These factors were: consistency, predictability, partner selection, revenue sharing, pricing, conflict management and cost efficiency. The research also indicated that government partnerships were strained in some sectors of the meat and horticulture supply chains. The importance and positive attitude towards traceability was very topical and highly rated. However some sectors have expressed concerns on the full cost of implementing the system and how well the system performs. There were concerns on the actual benefits that will flow from this technology adoption and how imported products will be expected to comply with Australian traceability standards and technology.

Having explained the data analysis for the factors of trust and technology adoption in the meat and horticulture industry supply chain, Chapter five provides the conclusion and implications for this research.

For reader convenience the research questions in tables for trust have been abbreviated with the full questions shown in Table 4.58

Table 4.58: Abbreviations of the question for the factors of trust in the meat and horticulture industry supply chain (a).

Abbreviations of the questions on the factors of trust	Full details of the questions on the factors of trust
Confidentiality	Our partners maintain a high degree of confidentiality in our business dealings
Honesty and integrity	Our partners always show a high level of honesty and integrity in our business dealings
Work standard	Our partners demonstrate a high standard of work in their business
Friendliness	Our partners have a high concern for being Friendliness, warm, and caring when dealing with our company
Shared values	Our partners have shared values and goals similar to our company
Politeness	Our partners are polite and respectful when dealing with our company
Experience and qualification	Our partners are highly Experience and qualification in their fields and business
Reliability	Our partners are reliable and can be depended upon to deliver on their promises
Timeliness	Our partners attend promptly to our needs and requests handling these in a timely manner
Customisation	Our partners provide suitable customised business solutions to meet the unique requirements of our company
Information sharing	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning
POS information	Our partners regularly share real time POS information with our company

(Source: Developed for this research)

For reader convenience the research questions in tables for trust have been abbreviated with the full questions shown in Table 4.59

Table 4.59: Abbreviations of the question for the factors of technology adoption in the meat and horticulture industry supply chain (b).

Abbreviations of the questions on the factors of technology adoption	Full details of the questions on the factors of technology adoption
Compliance / mandate	Our company will adopt new technology when it is forced upon us by other supply chain members or the government
Relative advantage	Our company will adopt new technology when there is a need to improve the current technology
Ease of use	Our company will adopt new technology provided it is not extremely complex and difficult to understand
Compatibility	Our company will adopt new technology if it is compatible with our type of business
Trialability	Our company will normally only adopt new technology if we can trial the new technology in a section of our business
Observability	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere
Complexity	Our company will reject new technology if it is too expensive or complex to understand
Traceability	Our company is using technology to ensure our products have full traceability in the supply chain

(Source: Developed for this research)

CHAPTER FIVE - CONCLUSION

5.1 INTRODUCTION

Chapter four provided a detailed data analysis concerning the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption and identified the critical gaps in trust and technology adoption in the meat and horticulture industry supply chain.

Chapter five is set out in ten sections as illustrated in the chapter outline in Figure 5.1 (See page 159). The chapter summarises and discusses the findings concerning the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption in the meat and horticulture industry supply (Sections 5.2 to 5.4). Differences between the perceived performance level (*level*) and the expected performance level (*importance*) of trust and technology adoption within and between the two supply chains are discussed along with the critical gaps in trust and technology adoption factors.

Section 5.5 considers the implications of the findings, firstly in relation to the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption in the meat and horticulture industry supply chain, then in relation to the differences between *level* and *importance* of trust and technology adoption in the meat and horticulture supply chain. Finally, this section cogitates on the impacts of any critical gaps in trust and technology adoption factors.

Findings and implications from the qualitative research relating to other important success factors in agribusiness supply chain are discussed in Section 5.6.

The findings and implications are followed by an explanation of the contribution to theory this research has made. A discussion of the limitations encountered during this research is also provided. A number of suggestions for future research relating to trust and technology adoption are made. The conclusion sums up the research findings and implications relating to the importance of trust and technology adoption in the Australian meat and horticulture industry supply chains.

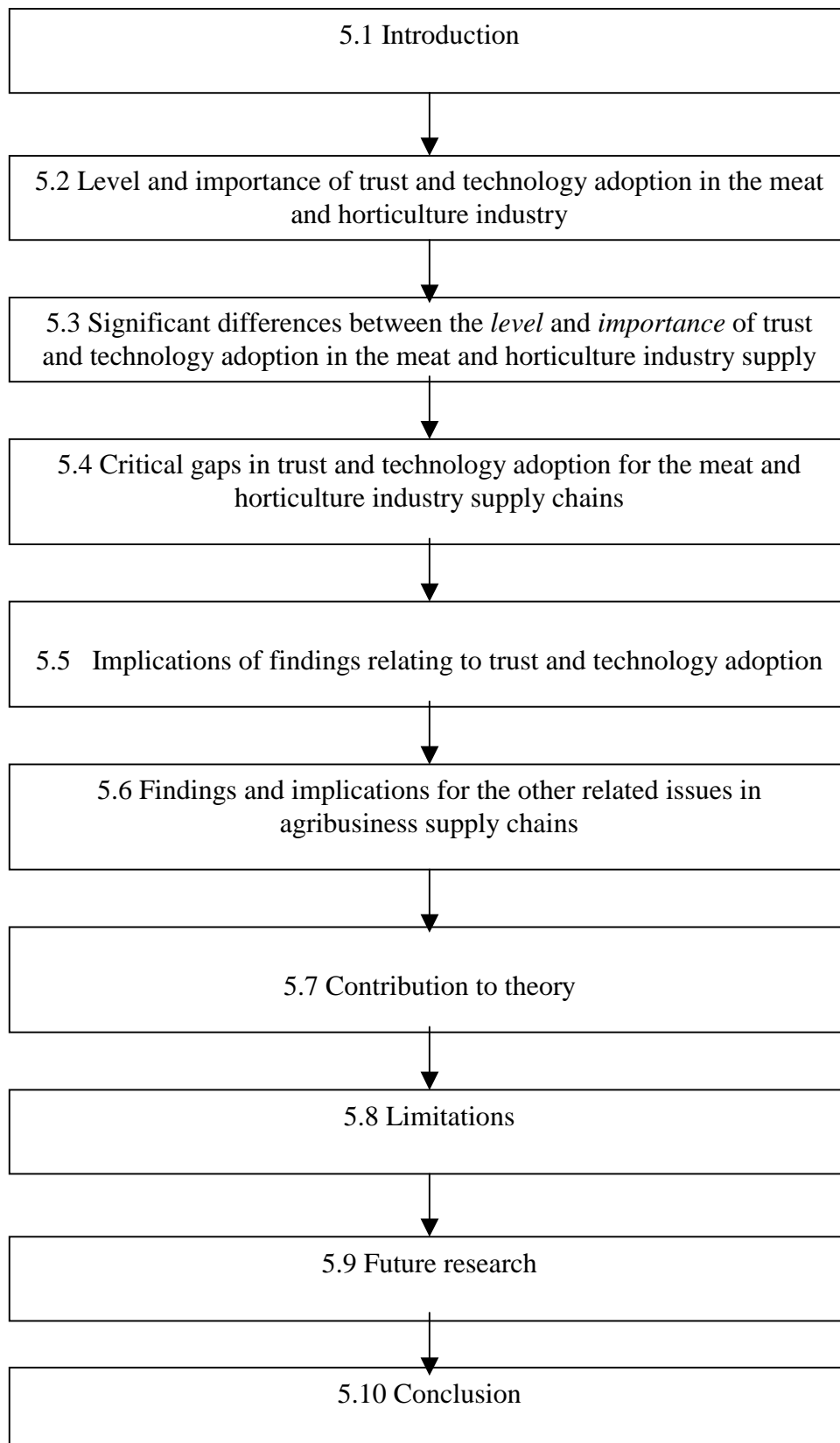


Figure 5.1: Chapter Outline
(Source: Developed for this work)

5.2 LEVEL AND IMPORTANCE OF TRUST AND TECHNOLOGY ADOPTION IN THE MEAT AND HORTICULTURE INDUSTRY

This section discusses the findings concerning the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption for the meat and horticulture industry.

5.2.1 Level and importance of trust in the meat and horticulture industry

No significant differences were found between the perceived performance level (*level*) and expected performance level (*importance*) of trust between the two supply chains, but there was a significant difference in the perceived performance level of trust within the sectors of the meat industry.

5.2.2 Level and importance of technology adoption in the meat and horticulture industry

No significant differences were found between the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption between the two supply chains.

Having summarised the findings of the significant differences for the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption in the meat and horticulture industry supply chain, the next section discusses the significant differences between the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption in the meat and horticulture industry supply chain.

5.3 SIGNIFICANT DIFFERENCES BETWEEN THE LEVEL AND IMPORTANCE OF TRUST AND TECHNOLOGY ADOPTION IN THE MEAT AND HORTICULTURE INDUSTRY SUPPLY CHAIN

This section discusses the findings concerning the significant differences between the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption for the meat and horticulture industry. The significant difference results for trust and technology adoption within each sector should be regarded as indicative only due to the small number of respondents in each sector. These results were combined with other data to assist in identifying factors with

critical gaps between the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology factors.

5.3.1 Significant differences between the level and importance of trust in the meat and horticulture industry supply chain

Significant differences were found between the perceived performance level (*level*) and expected performance level (*importance*) of trust overall in the meat and horticulture supply chains and within each supply chain. Significant differences were also found between the perceived performance level (*level*) and expected performance level (*importance*) of trust in three sectors of the meat industry. These sectors were the meat producer (MP), meat abattoir (MA), and the meat wholesaler (MW). Significant differences between the perceived performance level (*level*) and expected performance level (*importance*) of trust were found in two sectors of the horticulture supply chain. These two sectors were the horticultural processor (HP) and horticultural fruiterer (HF).

5.3.2 Significant differences between the level and importance of technology adoption in the meat and horticulture industry supply chain

Significant differences were found between the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption overall and by industry in the meat and horticulture industry supply chains.

Having summarised the findings of the significant differences between the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption in the meat and horticulture industry supply chain, the next section discusses the critical gaps in trust and technology adoption in the meat and horticulture industry supply chain.

5.4 CRITICAL GAPS IN TRUST AND TECHNOLOGY ADOPTION FOR THE MEAT AND HORTICULTURE INDUSTRY SUPPLY CHAIN

This section provides a summary of the critical gaps identified in this research within the factors of trust and technology adoption that may be affecting the meat and horticulture industry supply chains. Critical gaps in trust and technology adoption

factors were identified by the formulation of a selection criterion that assessed the results from the three analysis methods undertaken in this research. This selection criterion used the results from the weighted gap analysis and the unweighted gap analysis IPA matrix to confirm the statistically significant differences for the trust and technology adoption factors. This selection criterion was formulated to provide a subjectively method to select the factors of trust and technology with critical gaps. The selection criteria formula used to assess a factor with a critical gap was based on three premises, which were; (a) statistically significant difference, (b) ranked within the six largest weighted gaps, and (c) fell within the ‘Critical’ or ‘Significant’ quadrant of the unweighted IPA gap analysis matrix.

The critical gaps in trust identified by this research as potentially adversely affecting the meat industry supply chain have been illustrated in Figure 5.2.

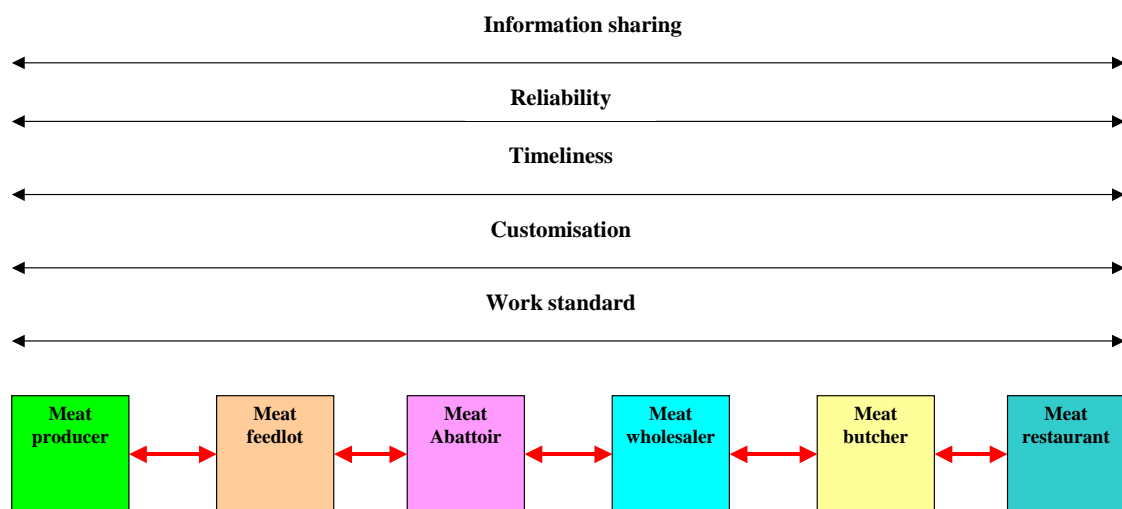


Figure 5.2: Trust factors with critical gaps affecting the meat industry supply chain
(Source: Analysis of field data)

There were five factors of trust that showed critical gaps in the meat industry supply chain, which were: ‘Information sharing’, ‘Reliability’, ‘Timeliness’, ‘Customisation’ and ‘Work standards’.

There were six factors with critical gaps in trust identified as potentially having a negative affect on the horticulture industry supply chain that have been illustrated in Figure 5.3 (See page 163). The six factors with critical gaps in the horticulture

industry supply chain were: ‘Information sharing’, ‘Reliability’, ‘Work standards’, ‘Shared values’, ‘POS information’ and ‘Honesty and integrity’.

There were three factors of trust with critical gaps common to both the meat and the horticulture industry which were ‘Information sharing’, ‘Reliability’, and ‘Work standards’.

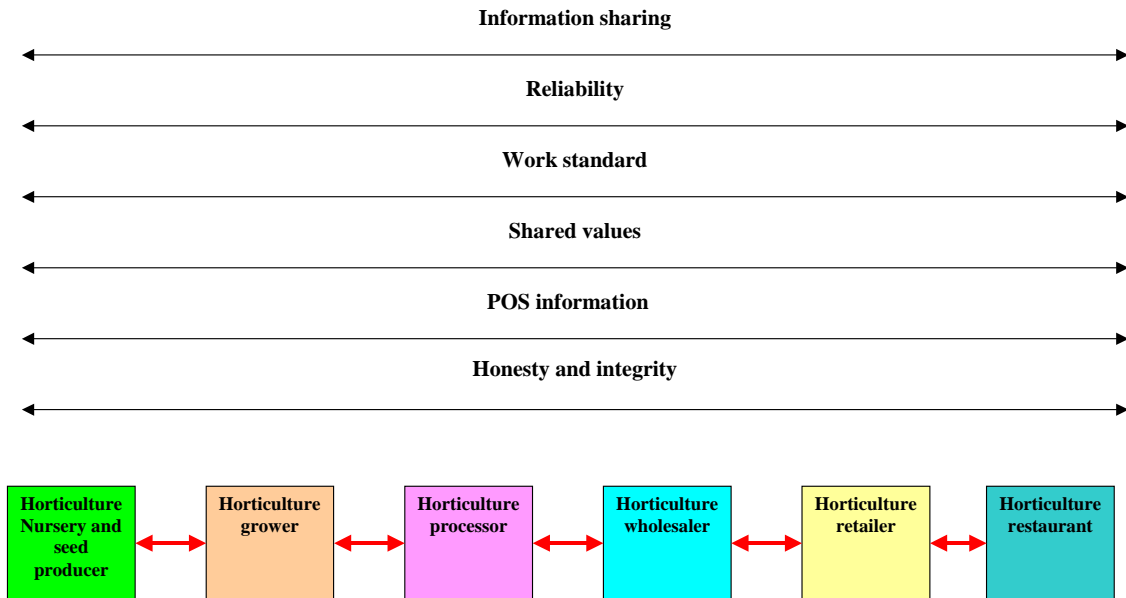


Figure 5.3: Trust factors with critical gaps affecting the horticulture industry supply chain
 (Source: Analysis of field data)

The critical gaps in technology adoption affecting the meat industry supply chain are illustrated in Figure 5.4.

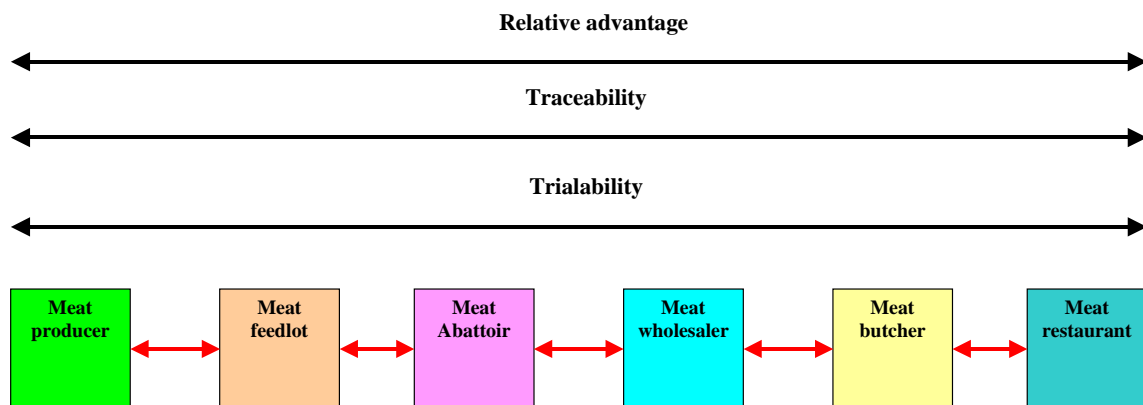


Figure 5.4: Technology adoption factors with critical gaps affecting the meat industry supply chain
 (Source: Analysis of field data)

Three factors with critical gaps in technology adoption were identified as potentially adversely affecting this meat industry supply chain. These three technology adoption factors were ‘Relative advantage’, ‘Traceability’ and ‘Triability’.

There were two factors with critical gaps in technology adoption that may have a negative impact on the horticulture industry supply chain that are illustrated in Figure 5.5. These two technology adoption factors that showed critical gaps within the horticulture industry were ‘Traceability’ and ‘Relative advantage’.

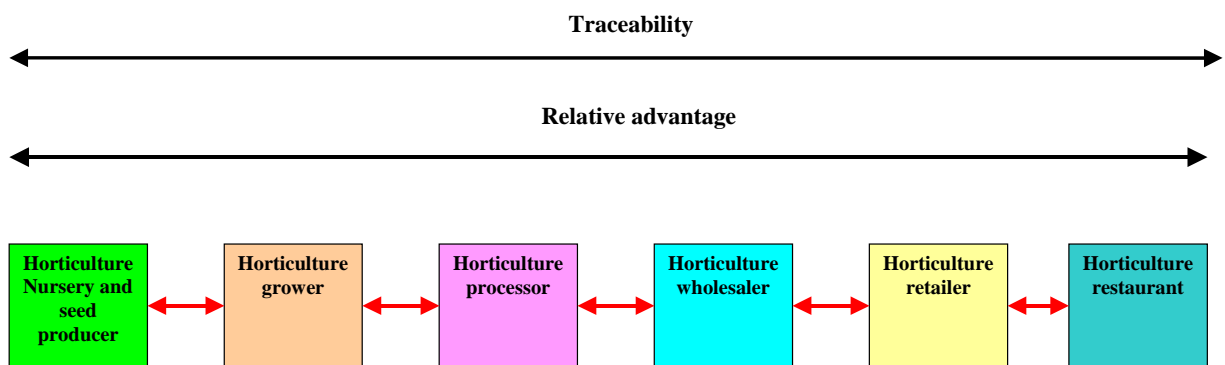


Figure 5.5: Technology adoption factors with critical gaps affecting the horticulture industry supply chain
(Source: Analysis of field data)

Two factors of technology adoption with critical gaps were evident in both the meat and horticulture industry supply chains, which were ‘Relative advantage’ and ‘Traceability’.

This section has discussed the factors with critical gaps in trust and technology adoption in the meat and horticulture industry supply chains. The next section considers the implications of the finding of this research.

5.5 IMPLICATIONS OF THE FINDING OF TRUST AND TECHNOLOGY ADOPTION

The first part of this section looks at the implications of the findings concerning the perceived performance level (*level*) and expected performance level (*importance*) for trust and technology adoption factors in the meat and horticulture industry supply chains. The next part of this section discusses the significant differences between

those perceptions and the critical gaps identified within the factors across the two supply chains.

5.5.1 Implications of the level and importance of trust in the meat and horticulture industry supply chain

This research has identified that both the meat and horticulture industry supply chains recognise that the overall mean perceived performance level (*level*) of trust is lower than the expected performance level (*importance*) (see Table 4.9, page 102)

In both the meat and horticulture industry and overall, 'POS information' and 'Information sharing' were the two trust factors with the lowest mean perceived performance levels (*level*) of trust. These comparatively low levels of trust indicate a weakness in the flow of information from the retail sectors and in general in the supply chain. The low level in trust relating to information flow can impact adversely on supply chain efficiency.

In both industries the lowest mean perceived performance level (*level*) of trust was present in the processing sector i.e. meat abattoir (MA) and horticulture processing (HP) sectors. It can be assumed these two sectors have many suppliers and customers that are both informal and formal partners who have varying approaches to trust in their supply chain partnerships. Low levels of trust in the processing sector impact negatively on the supply chain, reflecting past adversarial breakdowns in trust with suppliers and customers in the supply chain.

The restaurant sectors in both industries recorded the highest perceived performance level (*level*) and mean expected performance level (*importance*) of trust. It could be assumed the higher *level* and *importance* of trust in this sector was associated with the frequent flow of business interactions with their formal and informal supplier partners and the close personal contact this sector has with their informal supply chain partners i.e. the restaurant diners.

The factor with the highest mean expected performance level (*importance*) of trust in the meat industry was 'Work standards'. High 'Work standards' were expected in the meat industry to maintain the workmanship of products and services for each link in

the supply chain. The meat industry is well aware of the negative implications poor 'Work standards' can have on consumer confidence and trust i.e. animal diseases – BSE and FMD disease, food contamination – E. coli 157 and animal welfare.

The factor with the highest mean expected performance level (*importance*) of trust in the horticulture industry was 'Honesty and integrity'. This factor is vital in any supply chain and particularly so in the horticulture industry that handles a vast array of high quality, climatically-sensitive, perishable fruit and vegetables, which are sold to markets sometimes thousands of kilometres away from where they are grown and harvested. The implication of growers being a long way from the market requires a high degree of faith in the honesty and integrity of the horticulture supply chain partners. Unfortunately, the breakdown in trust in the Australian horticulture supply chain relating to honesty and integrity has been responsible for the Australian government legislating a mandatory code of conduct between the horticultural growers and the wholesalers.

Having considered the implications that the perceived performance level (*level*) and expected performance level (*importance*) of trust have for the meat and horticulture industry supply chains, the next subsection considers the implications of the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption.

5.5.2 Implications of the level and importance of technology adoption in the meat and horticulture industry supply chain

This research has identified that both the meat and horticulture industry supply chains recognise the overall mean perceived performance level (*level*) of technology adoption is less than the overall mean expected performance level (*importance*) of technology adoption (see Table 4.31, page 127) and confirms that improvement in technology adoption would create a better supply chain.

The lowest mean overall perceived performance level (*level*) and expected performance level (*importance*) of technology adoption in both industries concerned 'Compliance/mandate'. Both industries considered they were reluctant to adopt technology when supply chain partners or the government forced them to upgrade

technology. The respondents in the research considered that they would adopt technology at their own pace and if it was necessary rather than by the pressure of outside supply chain partners. In a number of cases the respondents believed the current technology in their business was in advance of a number of their supply chain partners and they were not being pressured to adopt technology. However, the meat and horticulture industry need to be aware of the possible negative implication of not having integrated matching technology in each link in the supply chain by not adopting technology in compliance with their supply chain partner's requests. This was the reason the NLIS technology was made compulsory in the meat industry by the Australian government to ensure NLIS was an integrated technology in each link of the supply chain.

The technology adoption factor of 'Trialability' in the meat industry recorded a mean perceived performance level (*level*) less than the overall mean perceived performance level (*level*) of technology for the meat industry. This result implies that the meat industry may be encountering problems with being able to trial various technologies in their business, which may be affecting the uptake of new technology in this supply chain.

The technology adoption factor of observability in the horticulture industry recorded a mean perceived performance level (*level*) less than the overall mean perceived performance level (*level*) of technology for the horticulture industry. This result correlated with comments from the horticulture industry that they needed to have wider exposure to new technology and look outside Australia to improve technology in their supply chain.

'Relative advantage' recorded the highest mean expected performance level (*importance*) in both the meat and horticulture industry. This result illustrates that both these industries recognise the importance of the adoption of new technology and how improving the current technology in the supply chain provides an opportunity to have a more efficient and competitive supply chain network.

The horticulture grower (HG) sector showed a mean perceived performance level (*level*) and expected performance level (*importance*) in technology adoption, below

the overall mean perceived performance level (*level*) and the expected performance level (*importance*). The horticulture grower (HG) also had the closest difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of technology adoption in this research. In view of these results the horticulture industry supply chain needs to be mindful of this disparity in the commitment to technology adoption in the horticulture grower (HG) sector which may have an adverse impact on the competitiveness of the entire horticulture supply chain over time. However this situation may reflect the horticulture growers' (HG) financial ability to fund new technology, referring to a comment by the Australian Government Minister for Agriculture, Peter McGauran on 'ABC Landline' that the horticulture industry was one of the 'Have nots' of Australian agriculture (Harte 2006).

Having considered the implications that the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption have on the meat and horticulture industry supply chains the next section considers the implications of significant differences between the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption have on the meat and horticulture industry supply chains.

5.5.3 Implications of the significant difference between the level and importance of trust in the meat and horticulture industry supply chain

This section explains the implications of significant differences between the perceived performance level (*level*) and expected performance level (*importance*) of trust in the meat and horticulture industry supply chain.

This research has identified that there is a significant difference in both the meat and horticulture industry supply chains between the overall mean perceived performance level (*level*) of trust and the overall mean expected performance level (*importance*) of trust (see Table 4.9, page 102).

There is a significant difference between the mean perceived performance level (*level*) and mean expected performance level (*importance*) for the trust factor of 'information

sharing'. This significant difference provides recognition that there is a gap in these supply chains related to the sharing of information between the supply chain partners. This potentially could have an adverse affect on the efficiency of both the meat and horticulture industry.

A significant difference exists between the mean perceived performance level (*level*) and the mean expected performance level (*importance*) of trust in the meat wholesale (MW) sector. It could be assumed that this situation is a reflection of the price-competitive nature of partnerships in the meat industry. The switching of partners in the wholesale sector between informal supplier partnerships and informal customer partnerships appears common and contributes to the relatively low level of trust in this sector between the meat abattoir (MA), the meat butcher (MB) and the meat restaurant (MR).

A significant difference in trust existed between the mean perceived performance level (*level*) and mean expected performance level (*importance*) of trust in the meat abattoir (MA) sector. This result can be compared to the horticulture processor (HP) sector that showed significant difference in trust between the mean perceived performance level (*level*) and mean expected performance level (*importance*). This breakdown in trust with the other links in the supply chain with the meat abattoir (MA) and horticulture processor (HP) may be reducing the optimum efficiency of the supply chain.

The smallest difference between the mean perceived performance level (*level*) and the expected performance level (*importance*) of trust in the meat industry was evident in the meat feedlot (MF) sector. This result reflected a supply chain with a number of formal contractual partnership agreements with suppliers and customers. It can be assumed the predictable partnerships formulated through a number of regular transactions with standard determined terms and conditions over a given time with both the meat producer (MP) and the meat abattoir (MA) have built trust in this sector of the meat industry supply chain.

The horticulture wholesaler (HW) has the smallest difference between the mean perceived performance level (*level*) and the expected performance level (*importance*)

of trust. However, the horticulture wholesaler sector also showed the lowest mean perceived performance level (*level*) and expected performance (*importance*) of trust in the horticulture industry. This result correlates with the issues of trust in the horticulture industry leading to the mandatory code of conduct. However, a point needs to be made in relation to the small gap in trust in this research on the horticulture wholesaler sector. The results in this research show the lowest mean gap in trust in the horticulture industry was in the horticulture wholesaler sector. This research studied three long established prominent horticulture wholesalers with associations with selected growers for a number of many years that demonstrated the lowest mean gap in trust in any sector of the meat and horticulture supply chain. This result implies some horticulture wholesalers have the willingness to manage trust and do not require the red tape of a mandatory code of conduct.

Having explained the implications of significant differences between the perceived performance level (*level*) and expected performance level (*importance*) of trust in the meat and horticulture industry supply chain, the next section discusses the implications of significant differences between the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption in the meat and horticulture industry supply chain.

5.5.4 Implications of the significant difference between the level and importance of technology adoption in the meat and horticulture industry supply chain

This research has verified that there is a relatively small difference between the overall perceived performance level (*level*) and the overall mean expected performance level (*importance*) of technology adoption in both the meat and horticulture industry supply chains (see Table 4.31, page 127). This mean perceived difference for technology adoption is considerably less than the mean perceived difference in trust. This result for trust may reflect the difficulty of building trust in partnerships as mentioned by O'Keefe (1998) and suggest that managing the hard science decisions on technology adoption in the supply chain presented fewer human dynamics than trust.

There are two factors of technology adoption with clear differences between the mean perceived performance level (*level*) and expected performance level (*importance*) in both the meat and horticulture industries. These factors were 'Relative advantage' and 'Traceability'. These differences provide recognition that these factors could be having an adverse affect on the efficiency of both the meat and horticulture industry.

The horticulture grower (HG) had the lowest mean difference in technology adoption but also the lowest mean rating for perceived performance level (*level*) and expected performance level (*importance*) of technology adoption in the horticulture industry. When the horticulture grower (HG) was compared to the horticulture wholesaler (HW) which has the highest perceived performance level (*level*) and expected performance level (*importance*) of technology adoption, a potential gap in technology interchange existed. Due to the close link these sectors have in the supply chain this difference in technology adoption may cause reduced efficiency in the supply chain.

Having considered the implications of the significant differences between the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption in the meat and horticulture industry supply chain the next subsection discusses the implication of the critical gaps for the factors of trust and technology adoption in the Australian meat and horticulture industry supply chains.

5.5.5 Implications of the factors with critical gaps for trust in the meat and horticulture industry supply chain.

Eight factors of trust have been identified in this research as having critical gaps across the meat and horticulture industry supply chain.

The critical gaps concerning 'Information sharing' in the meat and horticulture industry supply chain related to 'Our partners regularly exchange information with our company in relation to: sales, demand forecasting and production planning'. The implication of the unsatisfactory exchange of information, sales and demand forecasting, and production planning in the supply chain could lead to inventory management issues and a general breakdown in effective operations in the supply chain.

The next critical gap in trust within the meat and horticulture industry supply chain was 'Reliability' i.e: 'Our partners are reliable and can be depended upon to deliver on their promises'. Unreliability in the supply chain can lead to inconsistent products and service to all the partners along the supply chain. Supply chain partners that cannot be relied upon to deliver on their promises can contribute to supply chain inefficiencies and poor partnership relationships.

The critical gap in 'Work standards' in the meat and horticulture industry supply chain concerned: 'Our partners demonstrate a high standard of work in their business'. Unsatisfactory 'Work standards' can lead to products and services which are not of a suitable standard of workmanship and quality that is acceptable to the next links in the supply chain. The meat and horticulture industry supply chain has many customers and suppliers linked in the supply chain and poor work standards can impact from the producers through to the end consumer. An example of this was evident in mutton sheep meat being substituted for lamb in domestic licensed abattoirs in New South Wales and Victoria.

'Timeliness' was a critical gap in trust for the meat industry i.e. 'Our partners attend promptly to our needs and requests handling these in a timely manner'. The impact of unsatisfactory 'Timeliness' can lead to disruptions and delays in services or supply of products or parts to the partners in the supply chain. This critical gap can impact on the supply chain through lost business and market opportunities, slow product development to market and a reduction in market share allowing competing food supply chains to take advantage of this weakness.

The last factor with a critical gap in the meat industry was 'Customisation' and related to 'Our partners provide suitable customised business solutions to meet the unique requirements of our company'. The consequence of unsatisfactory customisation in the supply chain can lead to products that are not exactly suitable or correct for the partners in the supply chain concerning features such as taste, size, age, colour, tenderness, variety, texture, shelf life, freshness and branding.

The horticulture industry has three other factors with critical gaps in trust. The first was 'Shared values' i.e. 'Our partners have shared values and goals similar to our

company'. The consequence of supply chain partners in the horticulture industry not having shared values and goal could contribute to issues with product and service quality, production capacity, profit expectations and business culture overall.

The next critical gap in trust for the horticulture industry was 'POS information' relating to 'Our partners regularly share real time POS information with our company'. The impact of a gap in regularly sharing real time 'POS information' in the horticulture industry could lead to inventory shortages and delays in delivering inventory to the retail customers.

The final critical gap of trust for the horticulture industry was 'Honesty and integrity' i.e. 'Our partners always show a high level of honesty and integrity in our business dealings'. The consequence of unsatisfactory honesty and integrity between supply chain partners may lead to a significant breakdown in relationships and daily negotiations.

These critical gaps in trust for the meat and horticulture industry supply chain could point to both these industries not being as efficient and competitive in Australia and internationally as they could be against other supply chains and food products.

Having considered the implications of the critical gaps for the factors of trust in the meat and horticulture industry supply chains, the next section discusses the implication of the critical gaps for the factors of technology adoption in the meat and horticulture industry supply chains.

5.5.6 Implications of the factors with critical gaps for technology adoption in the meat and horticulture industry supply chain.

There were two clear critical gaps in technology adoption in both the meat and horticulture industry supply chain. These were 'Relative advantage' and 'Traceability'.

'Relative advantage' in the meat and horticulture industry supply chain was based on the following statement - 'Our company will adopt new technology when there is a need to improve the current technology'. A supply chain that has technology

deficiencies between and with in the supply chain partnerships leads to technology processes, products and services that are not compatible with other supply chain partners' technologies. An assumed impact of a technology adoption deficit in "Relative advantage" may be that the meat and horticulture industry supply chain becomes less competitive in Australia and internationally against other supply chains and food products.

The other critical gap in technology adoption factors common to both meat and a horticulture industry supply chain was 'Traceability' i.e: 'Our company is using technology to ensure our products have full traceability in the supply chain'. A supply chain that has partners with products that do not have full traceability by compatible technology can increase risk exposure and product recall time in tracing products if and when required. An assumed impact of this technology deficit is that consumer confidence in the supply chain products may fall unless full traceability, using appropriate technology, can be supported.

The meat industry had one other critical gap in technology adoption which was 'Trialability' based on the following statement - 'Our company will normally only adopt new technology if we can trial the new technology in a section of our business'. An assumed impact of a critical gap in 'Trialability' could mean the meat industry is failing to take up new technology. An assumed impact of technology adoption without trialability is the possible increased risk of the failure of the technology when installed. The consequence of this could include increased cost to modify and adapt the technology, down time in production or services, potential total failure and redundancy of the technology to carry out the purpose it was employed to do, or the possible disruption of supply of products or services to the other supply chain partners.

The managers of organisations in the meat and horticulture industry sectors need to eliminate or reduce the critical gaps in the factors of trust and technology adoption in their supply chain. This action is vital to improving the Australian agribusiness supply chain. Where a number of factors with critical gaps in either trust or technology adoption exist, managers may choose to select one or two of these factors that are considered to be the most critical to improvement in their supply chain. Elimination or

reduction of the selected critical gaps is usually managed over a specific timeframe due to the limitation of both resources and time which management have available to dedicate to this improvement in their supply chain.

Having discussed the implications for the factors of trust and technology adoption in the meat and horticulture industry supply chains, the next section provides a discussion of the implications of the findings for the other important success factors in the agribusiness supply chain.

5.6 FINDINGS AND IMPLICATIONS OF THE OTHER RELATED ISSUES IN AGRIBUSINESS SUPPLY CHAINS

Partnerships were considered extremely important in the meat and horticulture supply chain but the importance of outsourcing partners must be highlighted. The most commonly outsourced partnerships were transport and computer programs and technology play. These particular outsourcing partnerships were of significant importance to the meat and horticulture supply chain and the assumption from these finding is a need to maintain and concentrate on outsourcing partnerships with transport and computer service companies.

One third of respondents considered open communication, collaboration and information sharing important to creating successful partnerships. This finding is highly correlated with the fact that 30.6 percent of respondents considered the most successful technology used in their supply chain related to communication technology including mobile phones, facsimile, email, Internet and digital photography. An implication of this correlation is the meat and horticulture supply chains need to maintain and concentrate on linking daily communication processes with supply chain partners by continuing to match improved communication technology adoption to build successful partnerships.

Respondents in this research referred to a number of other important related issues in successful partnerships. These related issues included consistency, predictability, partner selection, revenue sharing, pricing, conflict management and cost efficiency. While these factors were not part of the focus on the factors of trust in this research, they are discussed in the literature review in Chapter two. The implication of this

finding is that these factors may demand further research in the meat and horticulture supply chain in the future.

The role of government as a successful agribusiness supply chain partner with the meat and horticulture supply chain sectors has raised negative concerns with over 55 percent of case study organisations. It could be assumed that agribusiness supply chain partners together with the government may benefit from a closer partnership to improve the supply chain on issues such as international market access, city/country divide, environmental management issues, biosecurity, and rural assistance.

Traceability in the meat and horticulture industry was considered a positive and important factor in the supply chain. However the mandate of the NLIS technology on the Australian meat industry has resulted in high implementation costs and the objective quantifiable benefits of its implementation remain an uncertain and a contentious issue with some respondents. The recent NLIS Internet survey conducted by Rural Press in Sydney supports this. The results of that survey showed that 63 percent of respondents rated the performance of the National Livestock Identification System (NLIS) as being terrible or poor (Farmonline 2006d) and more work needs to be done to harmonise NLIS with all members of the meat industry supply chain.

The horticulture industry also has concerns with traceability requirements and standards on imported produce. The Australian horticulture industry supply chain has issues about locally grown produce having to compete with imported products that are not required to face the same standards of traceability expected of the Australian horticulture industry supply chain.

Having considered the implications of the other related issues in Australian agribusiness supply chains, the next section discusses the contribution to theory this research has made.

5.7 CONTRIBUTION TO THEORY

This research has made a contribution to gap analysis theory by initiating the strategy of using three methods of analysis to identify the factors with critical gaps in the meat and horticulture supply chain. The selection criterion for identifying the factors with critical gaps used the results from statistical testing for significant differences, mean weighted gap analysis, and mean unweighted matrix IPA theory.

The next contribution to theory relates to the formulation of the selection criteria developed in this research to identify the factors with critical gaps. The selection criteria used three selection criterias. The first selection criterion was based on a factor having a statistical significant difference in the statistical testing. The second criterion was that a factor was ranked within the six highest weighted gaps from the mean weighted gap analysis. The third criterion was that the factors fell within either the 'Critical' or 'Significant' improvement area from the mean unweighted matrix IPA theory. This selection criterion provides an analysis method that is more objective and less subjective. Traditionally, critical gaps were subjectively selected from three to five factors that demonstrated the largest unweighted or weighted mean gap or statistical significant difference.

This is also the first research undertaken to examine the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption in the meat and horticulture industry supply chain in Queensland and northern New South Wales. This work will assist in contributing to the advancement of the meat and horticulture industry supply chain in this region.

This research is the first study undertaken using gap analysis theory to compare the critical gaps of two agribusiness supply chains (meat and horticulture) relating to trust and technology adoption in similar geographic areas. This research will contribute to understanding of gap analysis in the Australian agribusiness industry supply chain.

The approach of this research in simultaneously studying six sectors in two parallel supply chains is an advancement in research methodology. Past supply chain studies have only researched how one or two sectors interact with each other relating to a

specific supply chain. This research is unique as it has investigated factors relating to trust and technology adoption within six different sectors of the meat and horticulture industry supply chains ranging from the producer to the restaurant. This case study approach enabled the researcher to study and compare the corresponding sector in each supply chain with an example being the meat abattoir and horticulture processor sectors. The development of this research approach has contributed to case study research methodology in the Australian agribusiness industry supply chains.

Having explained the contribution to the theory this research has provided, the next section discusses the limitations that were encountered within this research and how they were managed.

5.8 LIMITATIONS

The limited number of case studies that could be undertaken within each sector due to the financial and time constraints of this dissertation was a limitation to this research. A total of 36 cases studies were completed. However, only three case studies from each of the six sectors could be chosen to ensure the study was manageable given the time and funding constraints of this research.

The research was also limited to the geographic region of Queensland and Northern New South Wales to provide access to a suitable number of organisations close to Brisbane to conduct the interviews. Hence this research can only provide an example of the critical gaps in trust and technology adoption specific to this region for the meat and horticulture industry supply chain.

Another limitation of this research was the absence of the large supermarkets in the study. The financial constraints of travel and accommodation costs in this dissertation prevented their inclusion as the head offices were located interstate.

A further limitation concerned the absence of overseas suppliers of products and overseas customers who purchase Australian meat and horticultural products from the case study organisations due to accessibility in relation to financial and time constraints.

Having discussed the limitations of this research, the next section provides some areas of interest for future study that could be considered relating to the factors trust and technology adoption in agribusiness supply chains.

5.9 FUTURE RESEARCH

There are a number of future research studies that could be undertaken to advance research on trust and technology adoption in the Australian and world agribusiness supply chains.

Following the work undertaken in this area, a further study could be undertaken to produce a longitudinal study of changes in the critical gaps in the factors measuring perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption in the meat and horticulture industry supply chains in Queensland and northern New South Wales. This further study would enable the meat and horticulture industry supply chains in Queensland and northern New South Wales to measure and compare the reduction or increase in the size of the critical gaps. This study could be undertaken every three years.

To further advance the knowledge of Australian agribusiness supply chains, this research could be extended to compare the Australian meat and horticulture industry supply chain relating to trust and technology adoption in other states and regions of Australia.

In addition, potential exists to extend this work to include international suppliers of agribusiness products and international customers in the meat and horticulture industry supply chain in Queensland and northern New South Wales. This study would contribute to understanding critical gaps that may exist between Australia and its international customers in relation to the factors of trust and technology adoption setting a platform for improvement strategies.

This research could be extended to focus on critical gaps for the factor of trust and technology adoption with outsourcing service industries to the Australian agribusiness supply chain. These industries could include livestock agents, feed merchants, government, industry bodies, domestic and international transport companies, ports,

and scientific research organisations. The potential competitive advantages derived from this work in relation to trust and technology adoption in agribusiness supply chains can result in an improved Australian agribusiness supply chain.

The foundations of this research could be used to assess and compare other Australian agribusiness supply chains such as the grain, seafood, sugar, wine and dairy industries concerning trust and technology adoption in this region, other regions of Australia and in other countries. This is regarded as an important contribution of this research.

Further research should be undertaken in the Australian meat and horticulture industry supply chain to investigate some of the other important factors in successful agribusiness partnerships that were mentioned by respondents in this study. These important factors were consistency, predictability, partner selection, revenue sharing, pricing, conflict management and cost efficiency. The research into these other important factors in the supply chain could identify areas of improvements in the Australian agribusiness supply chain.

Having discussed the possible future research areas that could be considered to advance the body of knowledge on trust and technology adoption in agribusiness supply chains, the next section provides the conclusion to this chapter.

5.10 CONCLUSION

This chapter has provided a discussion of the findings and implications to draw a conclusion on the fundamental research question of: ‘What are the critical gaps for the trust and technology adoption factors affecting the Australian meat and horticulture supply chains’?

The research has identified eight trust factors that have critical gaps affecting the Australian meat and horticulture industry the supply chains. These have been listed as ‘Information sharing’, ‘Reliability’, ‘Work standards’, ‘Customisation’, ‘Timeliness’, ‘Shared values’, ‘POS information’ and ‘Honesty and integrity’. The critical gaps in technology adoption identified across the Australian meat and horticulture industry supply chain were ‘Relative advantage’, ‘Traceability’ and ‘Triability’.

The perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption in the meat and horticulture industry supply chain have been investigated through proposition testing employing t-tests and One-way Anova tests for the significant differences between the perceived performance level (*level*) and expected performance level (*importance*) of trust and technology adoption overall, by industry and sectors.

The propositions tested resulted in three positive propositions for statistically significant difference. There was a statistically significant difference between the perceived performance level (*level*) of trust in the meat industry supply chain and within the sectors. The next statistically significant differences existed between the perceived performance level (*level*) and expected performance level (*importance*) of trust overall. A statistical significant difference also existed between the perceived performance level (*level*) and expected performance level (*importance*) of trust, by industry and in some sectors within the meat and horticulture supply chains. The third statistical significant difference between the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption existed within the meat and horticulture supply chains overall. Fourthly a statistically significant difference existed between the perceived performance level (*level*) and expected performance level (*importance*) of technology adoption by industry but not by sector.

The discussions of the findings and implications concerning the other related issues in the agribusiness supply chain have confirmed the positive attitude held by respondents in relation to supply chain partnerships. As well as concentrating on the main partnerships linking the supply chain there is also a need to concentrate on outsourcing partnerships. The role of government across all sectors of the agribusiness supply chain may benefit from a closer collaborative partnership to improve the supply chain efficiency and output. The daily link of communication processes with supply chain partners is important together with continuing to match improved communication technology adoption to assist in building successful partnerships. Further research concerning the trust factors of consistency, predictability, partner selection, revenue sharing, pricing, conflict management and cost efficiency may be beneficial to improving the meat and horticulture supply chain. While traceability in the meat and horticulture industry was considered a positive attribute, managing the

negative issues that have arisen is important for the harmony and improvement for all members in the meat industry supply.

In conclusion, the future of Australian agribusiness supply chains hinges on the ability of the supply chain partners in each sector to improve the level of trust and technology in their supply chain network. Such improvement provides the potential to compete against other supply chain networks more efficiently and produce continued growth. The Australian agribusiness supply chain is as strong as its weakest link (AMIC 2006b) and the link between trust and technology adoption in building customer relationships is paramount (AMIC 2006b; Brown 2006). As stated by Johnson at the World Meat Conference, “Any company that cannot build and maintain public trust will simply not be in business anymore” (AMIC 2006b).

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Appendix 1.0: Other significant Australian agribusiness supply chains

Appendix 1.1: Grain Industry

The production and export of cereal grain in the world and Australia during 2004 was significant, as illustrated in Table 1.1.

Table 1.1: World and Australian coarse grain and wheat production and exports 2004

World and Australian coarse grain and wheat production and exports in 2004				
Grain	Production (000's tonnes)		Exports (000's tonnes)	
	World	Australia	World	Australia
Coarse Grains	1,033,558	12,109	116,987	7,020
Wheat	632,594	22,605	118,830	18,450
Total	1,666,152	34,714	235,817	25,470

(Adapted from: FAOSTAT 2006)

Wheat is the main grain product grown in the Australian. As shown in Table 1.1 Australia produced 22.605 million tonnes and exported 18.45 million tonnes in 2004. As shown in Table 2.3 Australian wheat exports are significant, being over 15 percent of total world exports.

In 2003/04, the states of Western Australia (11 million tonnes) and New South Wales (7.3 million tonnes) ranked as the largest producers of wheat in Australia (ABS 2006, p. 415). However, Queensland ranks behind most states in the quantity of wheat that it produces. In 2003/04 Queensland produced only 1.1 million tonnes of wheat compared to the national harvest of 26 million tonnes (ABS 2006, p. 415). The Queensland grain industry contributed nine percent of the GVP in the state's agricultural sector in 2001 (QDPI 2002c).

Appendix 1.2: Sugar Industry

As illustrated in Table 1.2 Australian production of sugar cane (36,993,000 tonnes) represents 2.7 percent of world production with exports of raw sugar (4,157,000 tonnes) representing nearly nine percent of world trade in raw sugar.

Table 1.2: World and Australian sugar cane and raw sugar production and exports 2004

World and Australian sugar cane and raw sugar production and exports 2004				
Sugar Products	Production (metric tonnes)		Export (metric tonnes)	
	World	Australian	World	Australian
Sugar cane	1,328,216,730	36,993,000		
Raw sugar	107,869,000	5,178,000	46,928,000	4,157,000

(Adapted from: FAOSTAT 2006; USDA 2006)

More than 100 countries produce sugar, approximately 76 percent of which is produced from sugar cane grown primarily in the tropical and sub-tropical zones of the southern hemisphere. In 2005 the Australian bulk sugar industry was ranked among the five largest sugar exporters in the world (Illovo 2006). Northern Queensland and Northern New South Wales are the major sugar cane growing regions in Australia with most of the cane growing taking place in North Queensland. Queensland is the largest producer of sugar with 95 percent of Australia's production with five percent produced in Northern New South Wales (QDPI 2002b). Approximately 85 percent of the sugar produced in Queensland is exported as a bulk commodity for further distribution and manufacture overseas (QDPI 2002b). The sugar industry is ranked the equal fourth largest primary industry in Queensland behind the beef and the combined fruit and vegetable industry with a nine percent contribution to the Queensland GVP (QDPI 2002b).

Appendix 1.3: Seafood Industry

As shown in Table 1.3 Australian seafood production and exports play a relatively minor role in the world seafood industry. Australian production of 218,339 tonnes and exports of 23,538 tonnes are less than one percent of world production and exports.

Table 1.3: World and Australian seafood production and exports 2001

World and Australian seafood production and exports 2001				
Seafood types	Production		Export	
	World	Australia	World	Australia
Demersal marine fish fresh	20,781,615	61,829	872,740	56
Pelagic marine fish fresh	38,866,870	34,670	1,169,262	9,716
Crustaceans, molluscs	8,451,073	101,916	822,641	10,429
Fresh water diadrom fresh	31,890,787	19,924	935,925	3,382
Total	99,990,345	218,339	3,800,568	23,583

(Adapted from: FAOSTAT 2006)

Despite these low volumes of seafood production and export;

Australia has the world's third largest fishing zone covering 11 million square kilometres but only ranks fifty second in the world in terms of tonnes of fish landed due to the low nutrient levels in Australia's waters (DFAT 2006).

The major growth in world seafood production is through aquaculture, which has grown from 30.6 million tonnes in 1998 to 41.9 million tonnes in 2003 (FAO Fisheries Department 2004). The aquaculture industry in Australia is one of the fastest growing rural industries in Australia (Love 2003). From 1992 to 2002 the aquaculture

production tonnage in Australia, “nearly trebled rising from 16,150 tonnes to 44,300 tonnes” (Love 2003, p. 9). The seafood industry is ranked the sixth largest primary industry in Queensland (QDPI 2002a) .

Appendix 1.4: Dairy Industry

In 2004 Australian dairy industry production of 911,300 tonnes represented approximately two percent of world production and exports of 647,00 tonnes represented nearly a 13 percent share of world exports as illustrated in Table 1.4.

Table 1.4: World and Australian dairy production and exports in 2004

World and Australian dairy production and exports in 2004				
Dairy Products	Production (000's tonnes)		Exports (000's tonnes)	
	World	Australia	World	Australian
Dairy, Butter	6,627	132	904	75
Dairy, Cheese	13,539	389	1,241	212
Dairy, Dry Whole Milk Powder	3,533	187	1,663	173
Dairy, Milk, Nonfat Dry	3,318	203	1,165	187
Total	27,017	911	4,973	647

(Adapted from: USDA 2006)

As illustrated in Table 2.7 in 2004 approximately (647,000 tonnes) 70 percent of Australia’s dairy production was exported. The state of Victoria is the major state in Australia for dairy production with a dairy herd of almost 1.3 million dairy cattle compared to Queensland’s 195,000 head of dairy cattle that is part of a national dairy herd of over two million cattle in 2004 (Dairy Australia 2005, pp. 7-10). The Queensland dairy industry accounted for eight percent of the national whole milk production and contributed three percent of Queensland’s gross value of agricultural production in 2001(QDPI 2002g). The dairy industry in 2001 was rated the eight largest primary industry in Queensland (QDPI 2002g).

Appendix 1.5: Wine Industry

World and Australian wine production and exports in 2003 are illustrated in Table 1.5, which shows the significant part Australian wine plays in the world export market.

Table 1.5: World and Australian wine production and exports in 2003

World and Australian wine production and exports in 2003				
Wine production	Production (litres)		Export (litres)	
	World	Australian	World	Australian
Wine	26,258,000	1,086,000	7,400,000	507,960

(Adapted from: AWBC 2004, 2006b; 2006a)

In 2003 Australia was the fourth largest wine exporter by volume in the world (AWBC 2005a). However, Queensland is only a small boutique part of the Australian and international wine industry supply chain. For example in 2005 the total Australian wine industry grape production was 1.854 million tonnes compared to Queensland's production of 5,148 tonnes (AWBC 2005b).

Appendix 2.0: Overview of case study

Overview of case study

Statement about the project

Title: Australian agribusiness supply chain; A Gap Analysis Approach.

This research is being undertaken with the purpose of studying the critical success factors in the Australian agribusiness supply chain. The research has a focus on trust and diffusion of innovation in technology and their relationship with the Australian agribusiness supply chain. The level and importance of trust and technology adoption in Australian agribusiness supply chains will be researched. The research also explores partnerships, technology, government, outsourcing and traceability in the supply chain.

The research highlights the importance of agribusiness in Australia and internationally. The agribusiness supply chains of beef and horticulture are the industry sectors, which are researched in the greatest depth. The literature review research has studied government and industry initiatives that have taken place in Australia to assist agribusiness supply chains.

The region, which the study focuses on, is situated in Queensland and Northern New South Wales to assist in the interview process practicality and logistics.

The case study interview should run for about one hour. The interview comprises a number of structured questions to commence with and a general unstructured section of questions relating to several topics in agribusiness supply chains in the second section.

2

² This document was altered slightly during the data collection process

Appendix 3.0: Email introduction of case study

Email introduction of case study

Thank you for your time on the phone today and agreeing to help if possible.

As I explained I am completing my doctorate at USQ in Toowoomba relating to agribusiness supply chains and this involves case study interviews with various sectors of agribusiness.

The case study research concerns the factors of trust and technology adoption in agribusiness supply chains in Queensland and Northern NSW with the focus on the meat and horticulture industries. The industries are divided into 6 sectors from the source to the end retailers

The research interview takes about one hour and is a combination of structured and unstructured questions. The interview questions are not invasive to your business but any questions that you are not comfortable with you are not obliged to answer.

If you would be agreeable to participate in this study in the horticulture supply chain I would be very thankful for your assistance.

My home phone number is 07 32795944 and my mobile is 0421 960 530 or you can drop me an email to arrange a suitable time for me to call at your office.

Can you please send me a return email to confirm you received this message clearly.

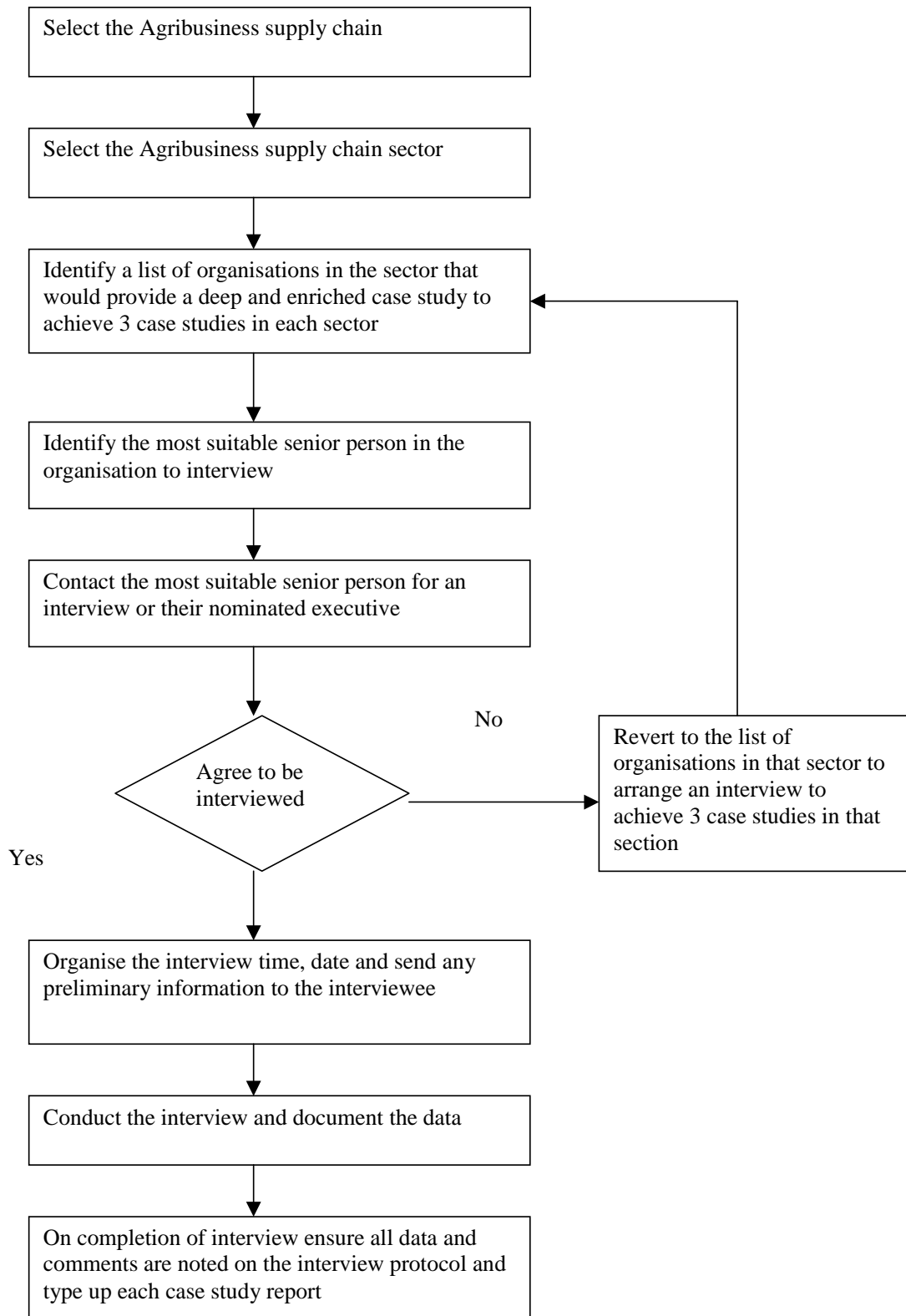
Thank you for your support.

Regards,
Ian Paterson.

³ This document was altered slightly during the data collection process

Appendix 4.0: Field procedures

Field procedures



(Adapted from: Xu 2003)

Appendix 5.0: Interview questionnaire

Interview questionnaire

General Questions

Date:

Company Name:

Address:

Phone Number:

Interviewee's Name:

Title:

1. How many years has your company been established

2. Where is your business located

Urban	Rural	Qld	NSW	NT	WA	SA	Vic	TAS
-------	-------	-----	-----	----	----	----	-----	-----

3. Do you have partnership agreements (Vertical or horizontal)

4. If you have a partnership agreements what type of business are they with

5. What is the core business of your organisation

Meat Producers	<input type="checkbox"/>	Horticulture Seedling or Nursery	<input type="checkbox"/>
Meat Feedlotter	<input type="checkbox"/>	Horticulture Grower	<input type="checkbox"/>
Meat Processor	<input type="checkbox"/>	Horticulture Processor	<input type="checkbox"/>
Meat Wholesaler	<input type="checkbox"/>	Horticulture Wholesaler	<input type="checkbox"/>
Meat Butcher	<input type="checkbox"/>	Horticulture Fruiterer	<input type="checkbox"/>
Meat Restaurant	<input type="checkbox"/>	Horticulture Restaurant	<input type="checkbox"/>

6. Formal company structure eg private, public, listed

Listed Public	Private listed	Private	Other
---------------	----------------	---------	-------

7. What is the value of the assets of the group

8. What was the annual turnover last financial year

9. What was the reported profit last financial year

10. What is the annual sales measured in volume or tonnage

11. How many people do you employ

Up to 50 people	
50 to 100 people	
100 to 500 people	
Over 500 people	

12. The information technology we use reduces the flow of communication type with customers, supplies and government

- Letters
- Faxes
- Face to face contact
- Telephone contact

13. What types of technology does your organisation use

Computer	
Do you have a web site	
Internet	
Email	
RFID	
Barcoding	
EAN	
Mobile phone	
Video conferencing	
Fax	

Trust

Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	What is your perception of the current rating in your business	What is your expectation rating that should be in your business
Our partners maintain a high degree of confidentiality in our business dealings	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our partners always show a high level of honesty and integrity in our business dealings	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our partners demonstrate a high standard of work in their business	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our partners have a high concern for being friendly, warm, and caring when dealing with our company	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our partners have shared values and goals similar to our company	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our partners are polite and respectful when dealing with our company	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our partners are highly experienced and qualified in their fields and business	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our Partners are reliable and can be depended upon to deliver on their promises	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our partners attend promptly to our needs and requests handling these in a timely manner	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our partners provide suitable customised business solutions to meet the unique requirements of our company	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our partners regularly share real time POS information with our company	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7

Technology

Questions - Technology Rating system: - 1 = Lowest rating, 7 = Highest rating	What is your perception of the current rating in your business	What is your expectation rating that should be in your business
Our company will adopt new technology when it is forced upon us by other supply chain members or the government	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our company will adopt new technology when there is a need to improve the current technology	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our company will adopt new technology provided it is not extremely complex and difficult to understand	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our company will adopt new technology if it is compatible with our type of business	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our company will normally only adopt new technology if we can trial the new technology in a section of our business	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our company will reject new technology if it is too expensive or complex to understand	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7
Our company is using technology to ensure our products have full traceability in the supply chain	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> NA	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7

General Comments:

Partnerships

Technology

Government

Outsourcing

Traceability

Appendix 6.0: Information and consent form for interview participants

INFORMATION AND CONSENT FORM FOR INTERVIEW PARTICIPANTS
“Establishing Critical Success Factors in the Australian Agribusiness Supply Chain”

The project is being conducted by the University of Southern Queensland to analyse the current initiatives in fostering a supply chain culture across the Australian agribusiness and investigates the limitations and factors affecting the Australian agribusiness supply chain. Data will be collected through interviews.

The interviews are designed to obtain opinions and gather data to assist in gaining a better understanding of the dynamic nature of the agribusiness supply chain. Information gathered in the meeting will be used to: (a) identify the factors affecting agribusiness (b) establish the critical success factors and (c) identify the performance gaps in the success factors.

Confidentiality of all business information is assured. No identifying information on any staff member from your business will be made at any stage in this research. No questions of a personal nature will be asked, and no inconvenience or discomfort is expected. You are free to withdraw consent and to discontinue participation in the interview at any time.

In the short term (up to one year), the information collected from this meeting will be stored in a locked filing cabinet in the researcher’s office, and then stored at the University of Southern Queensland, Toowoomba, Queensland. After three years the information collected will be destroyed.

This research is funded by the University of Southern Queensland, Toowoomba, Queensland 4350. Any question related to this study can be directed to either Dr Latif Al-Hakim on (07) 46311254; email: hakim@usq.edu.au or to Professor Ronel Erwee on (07) 4631 1173; email: erwee@usq.edu.au.

If you have a concern regarding the implementation of the project, you should contact the Secretary, Human Research Ethics Committee USQ or telephone (07) 4631 2956.

Your cooperation and generosity in participating in this study is highly valued and appreciated.

Consent

I, the participant, have read the information contained in this form, and any questions I have asked have been answered to my satisfaction. I agree to participate in this meeting, realising that I may withdraw at any time. I agree that information and research data gathered for this study will be used in the development of my thesis. No personal identifying data will be used.

Participant: _____ **Date:** _____

Participant: _____ **Date:** _____

Appendix 7.0: Pilot case studies

Appendix 7.1: Pilot case study one

PILOT CASE STUDY (MA1)

OVERVIEW

The data relating to Meat Abattoir One (MA1) was collected in an interview with the Chief Executive Officer of the organisation.

COMPANY BACKGROUND

MA1 is a beef abattoir group with premises located in urban and rural Queensland. MA1's core business involves beef processing, beef feedlotting, domestic wholesaling and international meat exporting.

Table 7.1.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs over 500 people. During the financial year 2004 MA1 had group assets over \$51 million and an annual turnover over \$51 million.

Table 7.1.1: Company details MA1

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
MA [Meat abattoir]	1	>20	Unlisted private	>\$51million	>\$51million	>500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 7.1.2 shows the various formal and informal supply chain partnerships that MA1 has created in their supply chain.

Table 7.1.2: Partnerships MA1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MA [Meat abattoir]	1	Both	Supplier both	Customer both

(Source: Developed for this research from field data by the author)

MA1 has long term informal vertical upstream partnerships with cattle producers and livestock agents who provide various types of cattle for beef processing. MA1 has formal vertical upstream partnerships with several companies that supply food-

packaging material, which is a substantial input cost of production. The company has informal vertical downstream partnership agreements with importers and wholesalers in overseas countries. The MA1 meat wholesale business has informal horizontal supply chain partnerships with other meat wholesalers and traders in Australia.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology are presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 7.1.3 (See 226) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating depicts how the interviewee considers the related trust factors should rate now or in the future. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the current perception *level* rating and the expectation *importance* rating. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 7.1.3: Ratings of trust MA1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	3	4	-1
2	Our partners always show a high level of honesty and integrity in our business dealings	6	7	-1
3	Our partners demonstrate a high standard of work in their business	5	6	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	5	5	0
5	Our partners have shared values and goals similar to our company	6	7	-1
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	6	7	-1
8	Our partners are reliable and can be depended upon to deliver on their promises	6	7	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	3	5	-2
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	2	6	-4
12	Our partners regularly share real time POS information with our company	1	1	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 7.1.4) is designed in exactly the same way as the trust analysis.

Table 7.1.4: Ratings of technology adoption MA1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	7	7	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	7	7	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	7	7	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	4	7	-3

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

MA1 believe the most important factors in the group's supply chain partnership relate to the '*people factor*'. The people in the business communicate the situation and deliver on their promises. This creates confidence and the business partnership repeats itself. Supply chain partnerships have improved with the awareness of the needs of other members in the supply chain. However, the business is still very much production driven and is dependant on farmers breeding and selling cattle for slaughter to the processors. Weather is an important factor. If it rains tomorrow and cattle producers have grass to build their herds this will reduce the number of cattle for MA1 to purchase for processing. The cattle producers are not going to worry about the supply chain in the first instance. It will not be their priority if the supermarkets or MA1 have cattle for meat processing next week. The cattle business has many producers who are spread over a wide geographic area in Australia and travel long distances to the processing works. The cattle produced on these properties are being funnelled into a highly technological but shrinking processing sector. From these processors the beef is being distributed to a domestic and international market of specialised buyers spread over an even larger geographic area.

Technology

MA1 is always looking at the adoption of new technology both from the meat industry and outside the meat industry. MA1 are early adopters of technology and conduct technology advancement and testing in house with robotics and other processing procedures.

Government

MA1 believe the government has created a number of initiatives to support the beef supply chain in Queensland such as funding various events that have provided a forum or platform to improve partnerships in this industry. MA1 has a number of

partnership relations with government, which they view as very important to their progress as an organisation. The company has established a full time role for an employee who collaborates with government to create strong relationships with various government departments.

Outsourcing

Many of the business functions at MA1 are carried out in-house. However certain outsourcing partnerships in the supply of utilities such as water, energy, and chemicals are long- term relationships. The outsourcing of livestock transport is based on long-term informal partnerships with regional carriers. However, they have a formal partnership agreement covering refrigerated road transport, which is outsourced. Likewise they have outsourcing partnership agreements with cold storage companies in many different states of Australia.

Traceability

MA1 consider traceability has competitive advantages apart from food safety assurance to customers. They believe that in the long-term traceability will improve inventory control from the retailer to the meat producer and will be important to the company. The company plans to use this technology to advance the feedback of cattle yields and carcass performances to single cattle rather than a group of cattle which will assist in providing a tool to improve herd genetic analysis in the future.

SUMMARY

Most of the vertical and horizontal partnerships are informal. There are some formal vertical partnership agreements on major packaging inputs, outsourcing agreements for refrigerated road transport and cold storage. The wholesale and international trading business has some informal horizontal partnerships, which are used to purchase and trade meat products.

The largest gap rating in the data collected on trust refers to the regularly exchange of information in relation to sales, demand forecasting and production planning. The highest gap rating in their supply chain concerning technology adoption related to the need to achieve full traceability of their products in the supply chain.

Appendix 7.2: Pilot case study two

PILOT CASE (MF1)

OVERVIEW

The data relating to Meat Feedlot One (MF1) was collected in an interview with the commercial manager for the organisation.

COMPANY BACKGROUND

MF1 is a beef feedlot contractor and livestock agent with its head office in rural Queensland. MF1's core business involves feedlot and cattle management. MF1 purchase cattle which are held on feedlots and then sold to beef processors who market the beef on the domestic and international market.

Table 7.2.1 illustrates that the business has been established for between five to ten years and is a listed private company, which employs less than 50 people. During the financial year 2004 MF1 had group assets between \$21 million and \$50 million and an annual turnover over \$51 million.

Table 7.2.1: Company details

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
MF [Meat feedlotter]	1	5-10	Listed Private	\$21 million - \$50 million	>\$51million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 7.2.2 shows the various formal and informal supply chain partnerships that MF1 has created in their supply chain.

Table 7.2.2: Partnerships MF1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MF [Meat feedlotter]	1	Vertical	Supplier both	Customer informal

(Source: Developed for this research from field data by the author)

MF1 has vertical informal partnership arrangements with suppliers that are graziers, livestock transport companies and beef feedlot operators. MF1 also has formal

vertical contracts with suppliers of cattle. MF1 has vertical informal outsourcing partnership with over ten other feedlots in rural Queensland, New South Wales and Victoria. MF1 has vertical informal customer partnerships with beef processors.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 7.2.3 (See page 231) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 7.2.3: Ratings of trust MF1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	7	-1
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	6	7	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	3	5	-2
5	Our partners have shared values and goals similar to our company	5	6	-1
6	Our partners are polite and respectful when dealing with our company	5	6	-1
7	Our partners are highly experienced and qualified in their fields and business	7	7	0
8	Our partners are reliable and can be depended upon to deliver on their promises	7	7	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	7	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	6	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	6	-2
12	Our partners regularly share real time POS information with our company	1	1	0

(Source: Analysis of field data)

Technology

The data collected on the technology adoption factors (Table 7.2.4) is designed in exactly the same way as the trust analysis.

Table 7.2.4: Ratings of technology adoption MF1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	7	-2
14	Our company will adopt new technology when there is a need to improve the current technology	5	7	-2
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	6	-1
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	4	6	-2
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	6	-1
19	Our company will reject new technology if it is too expensive or complex to understand	4	5	-1
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	6	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for MF1 was building good associations with suppliers and customers in their supply chain.

Technology

MF1 believed that they needed to improve their technology capabilities but were not leaders in new technology adoption.

Government

MF1 consider the government did nothing for feedlot partnerships in Australia and had not funded the NLIS scheme to the satisfaction of industry. The government had not given much support to supply chain management. The funding to MLA by producer levies and the measurable benefit MLA provided was open to conjecture. The MLA needed to provide hard facts to prove its performance for the industry. After the BeefNet program finished the supply chain alliances stayed the same and some may have dropped back. Only a few of the beef alliances have continued strongly. The alliances need strong leaders to ensure the alliance partners will supply cattle at the contracted price regularly and not only when prices are high. The MLA has more of a processor focus on supply chain management these days.

Outsourcing

MF1 did not have any significant outsourcing partnerships. The main outsourcing partnerships related to long-term livestock transport services.

Traceability

MF1 consider government forced traceability upon MF1 through the NLIS and they had no say or alternative but to adopt the system. This technology is not a subject MF1 were putting a major focus on in their business. Traceability was not part of MF1's mission statement.

SUMMARY

The MF1 case study shows that for this case study organisation the vertical upstream partnerships were both formal and informal and the down stream partnerships were informal but there were no horizontal partnerships. MF1 also had formal outsourcing partnerships with feedlot contactors.

The MF1 case study illustrates the largest gap in trust in their supply chain relates to the regular exchange of information on sales and demand forecasting. MF1 felt supply chain partners needed to consider being more friendly, warm and caring when dealing with each other in business. The regular sharing of real time point of sale information with MF1 was rated lowly as they consider their business is too far removed from the retail sector.

MF1 has a number of issues concerning technology adoption. The largest gaps related to adopting new technology more often when asked to do so by other supply chain partners. MF1 advised they should could improve and upgrade their technology more for frequently. MF1 would also like to trial more technology in their business before.

Appendix 8.0: Case Studies

Appendix 8.1: Case Study - Meat Producer One

OVERVIEW

The data related to Meat Producer One (MP1) was collected in an interview with the general manager of livestock and marketing of the organisation.

COMPANY BACKGROUND

MP1 is a beef producer situated in rural Queensland, New South Wales and the Northern Territory. MP1's core business involves the breeding, fattening and growing of cattle for the domestic and specific overseas markets. Approximately 60 percent of the cattle are sold as grassfed while the other 40 percent are sold into the lot feeding industry.

Table 8.1.1 illustrates that the business has been established for between 11 to 20 years and is a private unlisted company, which employs between 50 and 100 people. During the financial year 2004 MP1 had group assets over \$51 million and an annual turnover between \$21 to \$50 million.

Table 8.1.1: Company details MP1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MP [Beef producer]	1	Vertical	Supplier both	Customer both

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.1.2 shows the various formal and informal supply chain partnerships that MP1 has created in their supply chain.

Table 8.1.2: Partnerships MP1

Case study and number	Year established	Company structure	Company assets	Annual turnover	Number of employees	
MP [Beef producer]	1	11-20	Unlisted private	>\$51million	\$21 million - \$50 million	50-100

(Source: Developed for this research from field data by the author)

MP1 has long term informal vertical partnerships with seed stock suppliers of bulls for mating and herd improvement. They have a formal annual tendering partnership with approved rural merchandise suppliers to supply rural merchandise for the MP1

cattle properties. MP1 has informal vertical supply chain partnerships with the abattoirs in Queensland who are the customers for their grassfed cattle. The beef feedlot sector represents the other informal vertical supply chain partnerships. MP1 have contract feedlot partnerships to supply a certain number of cattle each year against a formal contract for an abattoir in Queensland. MP1 did not have any horizontal supply chain partnerships with any other producers.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology are presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.1.3 (See page 237) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.1.3: Ratings of trust MP1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	7	-1
2	Our partners always show a high level of honesty and integrity in our business dealings	5	7	-2
3	Our partners demonstrate a high standard of work in their business	6	7	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	5	6	-1
5	Our partners have shared values and goals similar to our company	4	5	-1
6	Our partners are polite and respectful when dealing with our company	5	6	-1
7	Our partners are highly experienced and qualified in their fields and business	5	6	-1
8	Our partners are reliable and can be depended upon to deliver on their promises	6	6	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	6	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	6	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	5	6	-1
12	Our partners regularly share real time POS information with our company	1	1	0

(Source: Analysis of field data)

Technology

The data collected on the technology adoption factors (Table 8.1.4) is designed in exactly the same way as the trust analysis.

Table 8.1.4: Ratings of technology adoption MP1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	6	6	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	7	7	0
16	Our company will adopt new technology if it is compatible with our type of business	5	5	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	5	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	7	7	0

(Source: Analysis of field data)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors for partnerships in MP1 was the collaboration with their supply chain partners to segment beef products and differentiated their beef products to move away from the bulk commodity market. Matching the type of cattle to the specification required by other supply chain partners that suited the market and resulted in customer satisfaction was an important factor in building partnerships.

Technology

The most successful technology adoption in the supply chain for MP1 was weather-monitoring technology and the Internet, satellite phone, solar power, improved animal genetics and improved nutrition sources

Government

MP1 consider the government partnerships were not conducive to the advancement of agribusiness in relation to water, vegetation, tenure and the overall attitude to the farmers of Australia. MP1 consider the government has low commitment to agribusiness.

Outsourcing

MP1 have few outsourcing partnerships. The main outsourcing partnerships relate to long term livestock transport providers and agronomy service providers.

Traceability

MP1 consider traceability was important to the meat industry but the government had not done enough to fund and assist industry to implement and maintain the system.

SUMMARY

The MP1 case study shows that for this case study organisation the vertical down stream and upstream partnerships are both formal and informal but there were no horizontal partnerships.

The MP1 case study illustrates the level of trust in their supply chain could be improved in a number of areas with the largest gap in trust being in relation to honesty and integrity between supply chain partners.

There were no major gaps in technology adoption but their philosophy of being early adopters of technology. MP1 rated the adoption of technology factors of compatible and observable lower than the other technology adoption factors. MP1 is often willing to try new technology that are not compatible with their current technology and modify the technology to suit their purpose. MP1 will also adopt new technology without observing it working on another property somewhere else.

Appendix 8.2: Case study - Meat Producer Two

OVERVIEW

The data relating to Meat Producer Two (MP2) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

MP2 is a beef producer, which has a number of cattle properties located in rural Queensland. MP2's core business is the breeding and fattening of cattle destined for the domestic and international market. The company breeds most of the cattle they sell but can at times purchase various types of breeding cattle and pedigree bulls.

Table 8.2.1 (See page 240) illustrates that the business has been established for between five to ten years and is a private unlisted company, which employs between 50 and 100 people. During the financial year 2004 MP2 had group assets over \$51 million and an annual turnover between \$21 to \$50 million.

Table 8.2.1: Company details MP2

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
MP [Beef producer]	2	5-10	Unlisted private	>\$51million	\$21 million - \$50 million	50-100

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.2.2 shows the various formal and informal supply chain partnerships that MP2 has created in their supply chain.

Table 8.2.2: Company details MP2

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MP [Beef producer]	2	Vertical	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

MP2 has long term informal vertical supplier partnerships with cattle producers and livestock agents who at times provide various types of breeding cattle and pedigree bulls for breeding on the properties. MP2 has informal vertical customer partnerships with various abattoirs companies in Queensland who purchase the cattle. They do not have any horizontal supply chain partners at this time.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology are presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.2.3 (See page 241) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.2.3: Ratings of trust MP2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	4	7	-3
2	Our partners always show a high level of honesty and integrity in our business dealings	4	7	-3
3	Our partners demonstrate a high standard of work in their business	6	7	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	7	-1
5	Our partners have shared values and goals similar to our company	6	6	0
6	Our partners are polite and respectful when dealing with our company	6	7	-1
7	Our partners are highly experienced and qualified in their fields and business	7	7	0
8	Our partners are reliable and can be depended upon to deliver on their promises	6	7	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	7	-2
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	7	-2
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	6	7	-1
12	Our partners regularly share real time POS information with our company	6	7	-1

(Source: Analysis of field data)

Technology

The data collected on the technology adoption factors (Table 8.2.4) is designed in exactly the same way as the trust analysis.

Table 8.2.4: Ratings of technology adoption MP2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	2	2	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	4	6	-2
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	7	7	0
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	7	7	0

(Source: Analysis of field data)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for MP2 were integrity, revenue sharing, caring and respect.

Technology

The most successful technology adoption in the supply chain for MP2 was improved air travel options, improved roads, and communication options such as email, computers and mobile phones. The invention and adoption of bulldozers for land clearing and poly pipe for moving water were also important.

Government

MP2 considered government partnerships with rural Australia were poor and had a low level of trust. The Queensland Government has ostracised rural industries. MP2 considers the Australian Federal Government had better partnership relationships with rural Australia than the Queensland State Government.

Outsourcing

MP2 have few outsourcing partnerships. The main outsourcing partnerships related to long-term livestock transport, livestock agents and stockfeed suppliers.

Traceability

MP2 consider traceability was important but NLIS was too expensive and a promotional gimmick to the meat industry. NLIS did nothing to solve a problem it merely provided an expensive tracking system by the use of RFID.

SUMMARY

The MP2 case study shows that for this case study organisation the vertical down stream and upstream partnerships are both informal but there were no horizontal partnerships.

The MP2 case study illustrates the largest gap in trust in their supply chain relates to confidentiality, honesty and integrity between supply chain partners. MP2 also has a concern with partners not attending promptly to their needs and requests in a timely manner. MP2 found partners were less willing today to customise business solutions to meet the specific needs of their business.

MP2 has rated the issue of supply chain partners pushing technology on them very low in relation to supply chain partners. Very few supply chain partners pushed technology onto them, except the government with NLIS. The most significant gap in technology adoption was the desire MP 2 had to trial more technology with the suppliers of technology in their business in the future.

Appendix 8.3: Case study - Meat Producer Three

OVERVIEW

The data relating to Meat Producer Three (MP3) was collected in an interview with the Chief Executive Officer of the organisation.

COMPANY BACKGROUND

MP3 is a beef producer with properties located in rural New South Wales, Northern Territory and Queensland. MP3's core business is the breeding and fattening of cattle destined for the domestic and international market.

Table 8.3.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs between 101 to 500 people. During the financial year 2004 MP3 had group assets over \$51 million and an annual turnover in excess of \$51 million.

Table 8.3.1: Company details

Case study and number	Year established	Company structure	Company assets	Annual turnover	Number of employees	
MP [Beef producer]	3	>20	Unlisted private	>\$51million	>\$51million	101-500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.3.2 shows the various formal and informal supply chain partnerships that MP3 has created in their supply chain.

Table 8.3.2: Partnerships MP3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MP [Beef producer]	3	Vertical	Supplier both	Customer informal

(Source: Developed for this research from field data by the author)

MP3 has long-term informal vertical supplier partnerships with providers of veterinary chemicals, animal feed supplements and grain used in cattle production. MP3 has short-term formal contracts for the purchase of grain for livestock feed. MP3 have long-term informal vertical customers partnerships with abattoirs that purchase their cattle. They also have a long-term informal vertical customer partnership with a supermarket chain customer who buys cattle from them every week.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.3.3 (See page 245) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust rating depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.3.3: Ratings of trust MP3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	5	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	5	0
16	Our company will adopt new technology if it is compatible with our type of business	5	6	-1
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	5	0
19	Our company will reject new technology if it is too expensive or complex to understand	5	5	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	6	0

(Source: Analysis of field data)

Technology

The data collected on the technology adoption factors (Table 8.3.4) is designed in exactly the same way as the trust analysis.

Table 8.3.4: Ratings of technology adoption MP3

No	Questions - Trust Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	5	5	0
2	Our partners always show a high level of honesty and integrity in our business dealings	5	6	-1
3	Our partners demonstrate a high standard of work in their business	6	6	0
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	6	0
5	Our partners have shared values and goals similar to our company	6	6	0
6	Our partners are polite and respectful when dealing with our company	5	5	0
7	Our partners are highly experienced and qualified in their fields and business	5	6	-1
8	Our partners are reliable and can be depended upon to deliver on their promises	6	6	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	4	6	-2
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	6	-2
12	Our partners regularly share real time POS information with our company	2	5	-3

(Source: Analysis of field data)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for MP3 was the customer's confidence in MP3 supplying them with the number and quality of cattle that the customer requires.

Technology

The most successful technology adoption in the supply chain for MP3 was improved cattle breeding genetics, computer software to monitor feedlot statistics, and digital camera technology to show people in their operation what climate and pasture conditions are like in remote rural areas.

Government

MP3 consider the government partnerships were a struggle to manage. The structure of the Queensland government departments could mean MP3 had an excellent relationship receiving an award from one department of the Queensland State Government but be in conflict with other departments. Queensland Rail on livestock transport cost, Queensland Transport on road infrastructure and Queensland Health on rural health services are all placing burdens on their partnerships with government.

Outsourcing

MP3 have few outsourcing partnerships. The main outsourcing partnerships relate to long-term livestock transport services, cattle genetics services and aircraft charter services.

Traceability

MP3 consider traceability was important and provides comfort to the company as a risk management tool to prove trace back on their cattle if a food safety problem arose.

SUMMARY

The MP3 case study shows that for this case study organisation the vertical upstream partnerships were both formal and informal and the down stream partnerships were informal but there were no horizontal partnerships.

The MP3 case study illustrates the largest gap in trust in their supply chain relates to the sharing of information from the point of sale and to the regular exchange of information on sales and demand forecasting. MP3 are finding partners less willing today to customise business solutions to meet the specific needs of their business.

MP2 consider they are early adopters of technology. They are prepared to consider extremely complex technology and adopt technology without observing it working successfully elsewhere. In addition to this they will consider buying expensive technology. However MP3 is looking to technology adoption in the future that will be slightly more compatible with their business.

Appendix 8.4: Case study - Meat Feedlot One

OVERVIEW

The data relating to Meat Feedlot One (MF1) was collected in an interview with the commercial manager of the organisation.

COMPANY BACKGROUND

MF1 is a beef feedlot contractor and livestock agent with its head office in rural Queensland. MF1's core business involves feedlot and cattle management. MF1 purchase cattle which are held on feedlots and then sold to beef processors who market the beef on the domestic and international market.

Table 8.4.1 (See page 248) illustrates that the business has been established for between five to ten years and is a listed private company, which employs less than 50 people. During the financial year 2004 MF1 had group assets between \$21 million and \$50 million and an annual turnover over \$51 million.

Table 8.4.1: Company details

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
MF [Meat feedlotter]	1	5-10	Listed Private	\$21 million - \$50 million	>\$51million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.4.2 shows the various formal and informal supply chain partnerships that MF1 has created in their supply chain.

Table 8.4.2: Partnerships MF1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MF [Meat feedlotter]	1	Vertical	Supplier both	Customer informal

(Source: Developed for this research from field data by the author)

MF1 has vertical informal partnership arrangements with suppliers that are graziers, livestock transport companies and beef feedlot operators. MF1 also has formal vertical contracts with suppliers of cattle. MF1 has vertical informal outsourcing partnership with over ten other feedlots in rural Queensland, New South Wales and Victoria. MF1 has vertical informal customer partnerships with beef processors.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.4.3 (See page 249) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.4.3: Ratings of trust MF1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	7	-1
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	6	7	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	3	5	-2
5	Our partners have shared values and goals similar to our company	5	6	-1
6	Our partners are polite and respectful when dealing with our company	5	6	-1
7	Our partners are highly experienced and qualified in their fields and business	7	7	0
8	Our partners are reliable and can be depended upon to deliver on their promises	7	7	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	7	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	6	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	6	-2
12	Our partners regularly share real time POS information with our company	1	1	0

(Source: Analysis of field data)

Technology

The data collected on the technology adoption factors (Table 8.4.4) is designed in exactly the same way as the trust analysis.

Table 8.4.4: Ratings of technology adoption MF1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	7	-2
14	Our company will adopt new technology when there is a need to improve the current technology	5	7	-2
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	6	-1
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	4	6	-2
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	6	-1
19	Our company will reject new technology if it is too expensive or complex to understand	4	5	-1
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	6	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for MF1 was building good associations with suppliers and customers in their supply chain.

Technology

MF1 believed that they needed to improve their technology capabilities but were not leaders in new technology adoption.

Government

MF1 consider the government did nothing for feedlot partnerships in Australia and had not funded the NLIS scheme to the satisfaction of industry. The government had not given much support to supply chain management. The funding to MLA by producer levies and the measurable benefit MLA provided was open to conjecture. The MLA needed to provide hard facts to prove its performance for the industry. After the BeefNet program finished the supply chain alliances stayed the same and some may have dropped back. Only a few of the beef alliances have continued strongly. The alliances need strong leaders to ensure the alliance partners will supply cattle at the contracted price regularly and not only when prices are high. The MLA has more of a processor focus on supply chain management these days.

Outsourcing

MF1 did not have any significant outsourcing partnerships. The main outsourcing partnerships related to long-term livestock transport services.

Traceability

MF1 consider government forced traceability upon MF1 through the through NLIS and they had no say or alternative but to adopt the system. This technology is not a subject we are putting as a major focus in our business. Traceability is not part of our mission statement.

SUMMARY

The MF1 case study shows that for this case study organisation the vertical upstream partnerships were both formal and informal and the down stream partnerships were informal but there were no horizontal partnerships. MF1 also had formal outsourcing partnerships with feedlot contactors.

The MF1 case study illustrates the largest gap in trust in their supply chain relates to the regular exchange of information on sales and demand forecasting. MF1 felt supply chain partners needed to consider being more friendly, warm and caring when dealing with each other in business. The regular sharing of real time point of sale information with MF1 was rated lowly as they consider their business is too far removed from the retail sector.

MF1 has a number of issues concerning technology adoption. The largest gaps related to adopting new technology more often when asked to do so by other supply chain partners. MF1 advised they should could improve and upgrade their technology more for frequently. MF1 would also like to trial more technology in their business before they purchased the technology.

Appendix 8.5: Case study - Meat Feedlot Two

OVERVIEW

The data relating to Meat Feedlot Two (MF2) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

MF2 is a beef feedlot business with its operation located in rural Queensland. MF2's core business involves the feedlotting of cattle destined for the export and domestic market, which is divided into two business structures. One part of the business, which represents approximately thirty percent of the business, is the purchasing and feeding of cattle as a principal. The other seventy percent of their business is the custom service feed lotting of cattle as required for an abattoir.

Table 8.5.1 illustrates that the business has been established for between 11 to 20 years and is an unlisted private company, which employs less than 50 people. During the financial year 2004 MF2 had group assets between \$1 million and \$20 million and an annual turnover between \$1 million and \$20 million.

Table 8.5.1: Company details MF2

Case study and number	Year established	Company structure	Company assets	Annual turnover	Number of employees
MF [Meat feedlotter] 2	11-20	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.5.2 shows the various formal and informal supply chain partnerships that MF2 has created in their supply chain.

Table 8.5.2: Partnerships MF2

Case Sector and Number	Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MF [Meat feedlotter] 2	Vertical	Supplier informal	Customer both

(Source: Developed for this research from field data by the author)

MF2 had informal vertical purchase agreements with cattle producers who supply cattle, which are bred some 1,000 kilometres north of their feedlot. Cattle were supplied to the feedlot by various vendors for custom feeding in the feedlot. These cattle were managed in relation to a formal contract between the supplier and MF2. MF2 had long-term informal supplier partnerships with companies that supplied the feedlot with grain. A number of cattle that were sold to an abattoir near Brisbane during the year were part of a long-term informal vertical partnership agreement.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.5.3 (See page 253) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating

level of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.5.3: Ratings of trust MF2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	6	0
2	Our partners always show a high level of honesty and integrity in our business dealings	7	7	0
3	Our partners demonstrate a high standard of work in their business	5	7	-2
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	6	0
5	Our partners have shared values and goals similar to our company	6	6	0
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	7	7	0
8	Our partners are reliable and can be depended upon to deliver on their promises	6	6	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	6	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	6	6	0
12	Our partners regularly share real time POS information with our company	1	1	0

(Source: Analysis of field data)

Technology

The data collected on the technology adoption factors (Table 8.5.4) is designed in exactly the same way as the trust analysis.

Table 8.5.4: Ratings of technology adoption MF2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	1	1	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	5	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	4	4	0
19	Our company will reject new technology if it is too expensive or complex to understand	5	5	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	7	7	0

(Source: Analysis of field data)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for MF2 had been the focus by the supermarkets to satisfy consumer requirements being market driven rather than production driven. The ability of MF2 to manage and improve their partnerships through conflict-handling skills had been a factor in building long-term relationships.

Technology

The most successful technology adoption in the supply chain for MF2 had been mobile phone technology and computer software systems for feedlot statistical monitoring and reporting.

Government

MF2 consider the government partnerships were poor and had a low level of trust. The government was only interested in votes and keeping food prices as cheap as they could for families. They had no care for rural Australia and their actions were contrary to their talk. This situation had caused a breakdown in trust to occur.

Outsourcing

MF2 had few outsourcing partnerships. The main outsourcing partnership related to a long-term livestock transport service, which had been in existence for 22 years.

Traceability

MF2 considered traceability was important and they had been an early adopter of the NLIS technology at their own expense. The system provided a technology for good communication of cattle yields and automated cattle drafting in the feedlot.

SUMMARY

The MF2 case study shows that for this case study organisation the vertical upstream partnerships were informal and the down stream partnerships were both formal and informal but there were no horizontal partnerships.

The MF2 case study illustrated they have one significant gap in trust in their supply chain, which relates to some partners not having a high standard of work in their business. The regular sharing of real time point of sale information with MF2 was rated lowly as they consider their business was too far removed from the retail sector.

MF2 did not have any gaps in technology adoption with their supply chain partners.

Appendix 8.6: Case study - Meat Feedlot Three

OVERVIEW

The data relating to Meat Feedlot Three (MF3) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

MF3 is a beef feedlot that is located in rural Queensland. MF3's core business involves contract feeding a specific breed of cattle destined for both the domestic and the international market.

Table 8.6.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs less than 50 people. During the financial year 2004 MF 3 had group assets between \$1 million and \$20 million and an annual turnover between \$1 million and \$20 million.

Table 8.6.1: Company details MF3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
MF [Meat feedlotter]	3	>20	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.6.3 shows the various formal and informal supply chain partnerships that MF3 has created in their supply chain.

Table 8.6.2: Partnerships MF3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MF [Meat feedlotter]	3	Vertical	Supplier formal	Customer formal

(Source: Developed for this research from field data by the author)

MF3 had a unique vertical supply chain partnership where the supplier and customer of the specialised breed of cattle that are used in the feedlot are owned by the same partner. The partnership was based on a formal one-year contract. The supply partnership for the grain was a formal one-year contract.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.6.3 illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.6.3: Ratings of trust MF3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	5	5	0
2	Our partners always show a high level of honesty and integrity in our business dealings	7	7	0
3	Our partners demonstrate a high standard of work in their business	5	6	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	7	7	0
5	Our partners have shared values and goals similar to our company	7	7	0
6	Our partners are polite and respectful when dealing with our company	7	7	0
7	Our partners are highly experienced and qualified in their fields and business	7	7	0
8	Our partners are reliable and can be depended upon to deliver on their promises	5	7	-2
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	6	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	6	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	7	7	0
12	Our partners regularly share real time POS information with our company	6	7	-1

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.6.4) is designed in exactly the same way as the trust analysis.

Table 8.6.4: Ratings of technology adoption MF3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	6	-1
14	Our company will adopt new technology when there is a need to improve the current technology	5	6	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	6	6	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	7	7	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for MF3 has been the collaborative partnership with suppliers of livestock feed nutrition in the feedlot. The other important factor in their partnership with their supplier and customer was the feedlot's low cost of operation, low maintenance requirements, and production of a specialised beef type and product.

Technology

The most successful technology adoption in the supply chain for MF3 has been computer software systems for feedlot statistical monitoring and reporting. Another improvement has been the nutrition science for the livestock feed.

Government

MF3 consider the government partnerships have been positive from the viewpoint of the NLIS system. The Queensland Environmental Protection Agency (EPA) has recognised the value of the feedlot industry to Australia. The local government has been supportive of business in rural community.

Outsourcing

MF3 have successfully outsourced software to improve their computer feedlot software. They have also outsourced feedlot nutrition services for livestock feed rations and specific maintenance firms for repairs and service of plant and equipment.

Traceability

MF3 consider traceability was important and has provided assurances to buyers of cattle and grain in the meat supply chain. The NLIS technology is a risk management tool to track residue in cattle. MF3 consider whilst traceability was important and had provided assurances to buyers of cattle and grain in the meat supply chain the future cost benefit to the industry was unknown.

SUMMARY

The MF3 case study shows that for this case study organisation the vertical upstream partnerships were informal and the down stream partnerships were both formal and informal but there were no horizontal partnerships.

The MF3 case study illustrates that there were only a few slight gaps in trust in their supply chain. The largest gap in trust related to their supply chain was partners being reliable and could be depended upon to deliver on their promises.

MF3 had only two slight gaps concerning technology adoption. MF3 consider they could adopt new technology more often when asked to do so by other supply chain partners and could upgrade their technology more frequently.

Appendix 8.7: Case study - Meat Abattoir One

OVERVIEW

The data relating to Meat Abattoir One (MA1) was collected in an interview with the Chief Executive Officer of the organisation.

COMPANY BACKGROUND

MA1 is a beef abattoir group with premises located in urban and rural Queensland.

MA1's core business involves beef processing, beef feed lotting, domestic wholesaling and international meat exporting.

Table 8.7.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs over 500 people. During the financial year 2004 MA1 had group assets over \$51 million and an annual turnover over \$51 million.

Table 8.7.1: Company details MA1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MA [Meat abattoir]	1	Both	Supplier both	Customer both

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.7.2 shows the various formal and informal supply chain partnerships that MA1 has created in their supply chain.

Table 8.7.2: Partnerships MA1

Case study and number	Year established	Company structure	Company assets	Annual turnover	Number of employees	
MA [Meat abattoir]	1	>20	Unlisted private	>\$51million	>\$51million	>500

(Source: Developed for this research from field data by the author)

MA1 has long term informal vertical upstream partnerships with cattle producers and livestock agents who provide various types of cattle for beef processing. It has formal vertical upstream partnerships with several companies that supply food-packaging material, which is a substantial input cost of production. The company has informal

vertical downstream partnership agreements with importers and wholesalers in overseas countries. The MA1 meat wholesale business has informal horizontal supply chain partnerships with other meat wholesalers and traders in Australia.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology are presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.7.3 (See page 262) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating depicts how the interviewee considers the related trust factors should rate now or in the future. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the current perception *level* rating and the expectation *importance* rating. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.7.3: Ratings of trust MA1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	3	4	-1
2	Our partners always show a high level of honesty and integrity in our business dealings	6	7	-1
3	Our partners demonstrate a high standard of work in their business	5	6	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	5	5	0
5	Our partners have shared values and goals similar to our company	6	7	-1
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	6	7	-1
8	Our partners are reliable and can be depended upon to deliver on their promises	6	7	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	3	5	-2
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	2	6	-4
12	Our partners regularly share real time POS information with our company	1	1	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.7.4) is designed in exactly the same way as the trust analysis.

Table 8.7.4: Ratings of technology adoption MA1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	7	7	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	7	7	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	7	7	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	4	7	-3

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

MA1 believe the most important factors in the group's supply chain partnership relate to the '*people factor*'. The people in the business communicate the situation and deliver on their promises. This creates confidence and the business partnership repeats itself. Supply chain partnerships have improved with the awareness of the needs of other members in the supply chain. However, the business is still very much production driven and is dependant on farmers breeding and selling cattle for slaughter to the processors. Weather is an important factor. If it rains tomorrow and cattle producers have grass to build their herds this will reduce the number of cattle for MA1 to purchase for processing. The cattle producers are not going to worry about the supply chain in the first instance. It will not be their priority if the supermarkets or MA1 have cattle for meat processing next week. The cattle business has many producers who are spread over a wide geographic area in Australia and travel long distances to the processing works. The cattle produced on these properties are being funnelled into a highly technological but shrinking processing sector. From these processors the beef is being distributed to a domestic and international market of specialised buyers spread over an even larger geographic area.

Technology

MA1 is always looking at the adoption of new technology both from the meat industry and outside the meat industry. MA1 are early adopters of technology and conduct technology advancement and testing in house with robotics and other processing procedures.

Government

MA1 believe the government has created a number of initiatives to support the beef supply chain in Queensland such as funding various events that have provided a forum or platform to improve partnerships in this industry. MA1 has a number of

partnership relations with government, which they view as very important to their progress as an organisation. The company has established a full time role for an employee who collaborates with government to create strong relationships with various government departments.

Outsourcing

Many of the business functions at MA1 are carried out in-house. However certain outsourcing partnerships in the supply of utilities such as water, energy, and chemicals are long- term relationships. The outsourcing of livestock transport is based on long-term informal partnerships with regional carriers. However, they have a formal partnership agreement covering refrigerated road transport, which is outsourced. Likewise they have outsourcing partnership agreements with cold storage companies in many different states of Australia.

Traceability

MA1 consider traceability has competitive advantages apart from food safety assurance to customers. They believe that in the long-term traceability will improve inventory control from the retailer to the meat producer and will be important to the company. The company plans to use this technology to advance the feedback of cattle yields and carcass performances to single cattle rather than a group of cattle which will assist in providing a tool to improve herd genetic analysis in the future.

SUMMARY

Most of the vertical and horizontal partnerships are informal. There are some formal vertical partnership agreements on major packaging inputs, outsourcing agreements for refrigerated road transport and cold storage. The wholesale and international trading business has some informal horizontal partnerships, which are used to purchase and trade meat products.

The largest gap rating in the data collected on trust refers to the regularly exchange of information in relation to sales, demand forecasting and production planning. The highest gap rating in their supply chain concerning technology adoption related to the need to achieve full traceability of their products in the supply chain.

Appendix 8.8: Case study - Meat Abattoir Two

OVERVIEW

The data relating to Meat Abattoir Two (MA2) was collected in an interview with the Chief Executive Officer of the organisation.

COMPANY BACKGROUND

MA2 is a private unlisted company, which is located in rural Queensland. MA2's core business is beef producing, beef feed lotting, meat wholesaling and distributing.

Table 8.8.1 illustrates that the business has been established over 20 years and is a private unlisted company, which employs between 101 to 500 people. The financial year 2004 figures for the company assets and annual turnover were not provided.

Table 8.8.1: Company details MA2

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MA [Meat abattoir]	2	Both	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.8.2 shows the various formal and informal supply chain partnerships that MA2 has created in their supply chain.

Table 8.8.2: Partnerships MA2

Case study and number	Year established	Company structure	Company assets	Annual turnover	Number of employees	
MA [Meat abattoir]	2	>20	Unlisted private	NA	NA	101-500

(Source: Developed for this research from field data by the author)

MA2 has long term vertical informal partnerships up stream with cattle producers and livestock agents through the livestock auction system. The cattle that are purchased through the livestock auction system are young store cattle suitable for the beef feedlot. They also procure prime beef cattle through the auction system for beef processing. MA2 have vertical informal partnerships down stream with the retail trade. The retail partnerships represent approximately 50 percent of their business and some of these informal partnerships have been in existence for over 20 years. This

sector includes butchers and supermarkets. The other major vertical informal supply chain partnerships are with meat wholesalers in Brisbane and interstate, which represents approximately 40 percent of their business. The remaining partnerships are with export brokers that purchase various meat products for export. MA2 have a formal horizontal partnership agreement with another abattoir to contract process livestock for them on a weekly basis. They have an informal horizontal partnership with a lamb-processing abattoir, which supplies MA2's wholesale business with lamb carcass on a weekly basis. MA2 wholesale business also has informal horizontal partnerships with other meat wholesalers in Brisbane from time to time.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology are presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.8.3 (See page 267) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.8.3: Ratings of trust MA2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	6	0
2	Our partners always show a high level of honesty and integrity in our business dealings	4	6	-2
3	Our partners demonstrate a high standard of work in their business	6	7	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	3	5	-2
5	Our partners have shared values and goals similar to our company	4	6	-2
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	5	6	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	6	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	4	6	-2
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	2	6	-4
12	Our partners regularly share real time POS information with our company	2	6	-4

(Source: Analysis of field data)

Technology

The data collected on the technology adoption factors (Table 8.8.4) is designed in exactly the same way as the trust analysis.

Table 8.8.4: Ratings of technology adoption MA2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	1	1	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	6	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	4	4	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	3	3	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	7	7	0

(Source: Analysis of field data)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for MA2 were honesty, trust, integrity, innovation, competitive prices, information sharing and enjoyable business partnerships.

Technology

The most successful technology adoption in their supply chain has been computer technology and software to coordinate the business from the source to the consumer linked throughout their business units.

Government

MA2 has strong partnerships with various state and federal government departments. They have a proactive collaborative approach with government on relative industry requirements.

Outsourcing

MA2 have few outsourcing partnerships. The main outsourcing partnerships relate to refrigerated road transport and leased cold storage facilities in Brisbane.

Traceability

MA2 consider traceability has internal advantages to their business and is a risk management tool for insurance purposes. Traceability has added to the food safety standards on meat.

SUMMARY

The MA2 case study shows most of the vertical and horizontal partnerships are informal. There was one formal horizontal partnership with an abattoir.

The MA2 case study illustrates there is significant gaps in trust relating to information sharing on sales, demand forecasting and production planning concerning and as well as poor information flow on POS information. There were other large gaps in trust relating to honesty and integrity, shared values and goals, customisation partners being warm, caring and friendly.

There were no major gaps in technology adoption but some low scores were noticeable relating to adopting technology when it was forced upon them. Being early adopters of technology MA2 stated they rarely had supply chain partners forcing technology adoption on them. Another low score related to adopting technology that is observable. Both these scores reflected the comment that MA2 considered they were early adopters of technology in this industry, designing and modifying other technologies to be used in their business.

Appendix 8.9: Case study - Meat Abattoir Three

OVERVIEW

The data relating to Meat Abattoir Three (MA3) was collected in an interview with the Chief Executive Officer of the organisation.

COMPANY BACKGROUND

MA3 is a beef abattoir group located in urban and rural Queensland. MA3's core business is the processing of beef for the international and domestic market. MA3 also owns and manages a feedlot operation.

Table 8.9.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs over 500 people. During the financial year 2004 MA3 had group assets over \$51 million and an annual turnover over \$51 million.

Table 8.9.1: Company details MA3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
MA [Meat abattoir	3	>20	Unlisted private	>\$51million	>\$51million	>500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.9.2 shows the various formal and informal supply chain partnerships that MA3 has created in their supply chain.

Table 8.9.2: Partnerships MA3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MA [Meat abattoir]	3	Vertical	Supplier both	Customer both

(Source: Developed for this research from field data by the author)

MA3 has long term informal vertical upstream partnerships with cattle producers and livestock agents who provide various types of cattle for beef processing. MA3 has formal vertical upstream partnerships with several companies that supply food-packaging material, which is a substantial input cost of production. The company has long-term informal and short-term formal vertical downstream customer partnerships with major importers and wholesalers in Japan who purchase beef products from MA3. They have similar informal vertical downstream customer partnerships with hamburger grinders and further processing manufacturers in the USA who purchase beef products from MA3. MA3 has informal vertical downstream customer partnerships with wholesalers, retailers, supermarket and food service companies who purchase meat products from them.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.9.3 (See page 271) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical

gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.9.3: Ratings of trust MA3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	5	5	0
2	Our partners always show a high level of honesty and integrity in our business dealings	5	7	-2
3	Our partners demonstrate a high standard of work in their business	6	7	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	3	3	0
5	Our partners have shared values and goals similar to our company	5	7	-2
6	Our partners are polite and respectful when dealing with our company	5	5	0
7	Our partners are highly experienced and qualified in their fields and business	6	7	-1
8	Our partners are reliable and can be depended upon to deliver on their promises	6	7	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	7	-2
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	3	7	-4
11	Our partners regularly exchange information with our company in relation to: sales, demand forecasting and production planning	5	7	-2
12	Our partners regularly share real time POS information with our company	2	7	-5

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.9.4) is designed in exactly the same way as the trust analysis.

Table 8.9.4: Ratings of technology adoption MA3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	6	6	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	7	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	7	-1
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	4	4	0
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	5	5	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for MA3 were the selection of partners that provided the best fit to the business and the future strategy of their business. The creation of a strong relationship with supply chain partners built over time brings a confidence in each partner in every transaction.

Technology

The most successful technology adoption in the supply chain for MA3 has been chemical lean measuring technology. The use of 40 foot refrigerated shipping containers has reduced the unit cost of sea transport. The introduction of B-Double road freighters to move greater quantities of products at one time by road has reduced the unit costs of road transport. The improved freezing technology to freeze beef in 24 hours and bulk bins to move large quantities of beef from location to location without having to carton meat between production and processing areas were significant improvements in technology.

Government

MA3 consider the government partnerships did not play a major role in improving the beef supply chain. The government was endeavouring to improve infrastructure and assisted industrial relations reforms.

Outsourcing

MA3 have outsourcing partnerships with a cleaning company to clean the abattoir, a travel agent and road transport operators for livestock and refrigerated transport.

Traceability

MA3 believes traceability does not add value to the product and is a quality assurance tracking technology. MA3 believes traceability does not add value to the product and is a quality assurance tracking technology. However, NLIS provides a positive perception to consumers of meat products.

SUMMARY

The MA3 case study shows that for this case study organisation the vertical downstream and upstream partnerships are both formal and informal but there were no horizontal partnerships.

The MA3 case study illustrates two major gaps in trust that relating to sharing of information and providing customised business solutions. There were also significant gaps relating to honesty and integrity, shared values and goals and partners attending promptly to requests in a timely manner.

There are no major gaps in technology adoption but they consider they could slightly improve their current technology and trial more technology in certain circumstances.

Appendix 8.10: Case study - Meat Wholesaler One

OVERVIEW

The data relating to Meat Wholesaler One (MW1) was collected in an interview with the Queensland Sales Manager of the organisation.

COMPANY BACKGROUND

MW1 commenced business in Sydney and some years later established another office in urban Brisbane. MW1's core business is the wholesaling of various types of meat products with beef being the major product line to butchers, supermarkets and restaurants.

Table 8.10.1 illustrates that the business has been established for between 11 to 20 years and is a private unlisted company, which employs less than 50 people. MW1's financial year 2004 data for the value of the group assets, was not available but the company had an annual turnover between \$21 to \$50 million.

Table 8.10.1: Company details MW1

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
MW [Meat wholesaler]	1	11-20	Unlisted private	NA	\$21 million - \$50 million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.10.2 shows the various formal and informal supply chain partnerships that MW1 has created in their supply chain.

Table 8.10.2: Partnerships MW1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MW [Meat wholesaler]	1	Both	Supplier both	Customer informal

(Source: Developed for this research from field data by the author)

MW1 has vertical informal supplier partnerships with the various meat companies that supply different meat products. They have two formal vertical supplier partnerships with two beef abattoirs. MW 1 has vertical informal customer partnerships with butchers, supermarkets and restaurants. They have informal horizontal supply chain agreements with other meat wholesalers who supply each other from time to time as the situation arises.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.10.3 (See page 275) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors.

The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.10.3: Ratings of trust MW1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	7	-1
2	Our partners always show a high level of honesty and integrity in our business dealings	6	7	-1
3	Our partners demonstrate a high standard of work in their business	5	7	-2
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	7	-1
5	Our partners have shared values and goals similar to our company	6	7	-1
6	Our partners are polite and respectful when dealing with our company	5	7	-2
7	Our partners are highly experienced and qualified in their fields and business	4	7	-3
8	Our partners are reliable and can be depended upon to deliver on their promises	4	7	-3
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	7	-2
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	7	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	7	-3
12	Our partners regularly share real time POS information with our company	1	1	0

(Source: Analysis of field data)

Technology

The data collected on the technology adoption factors (Table 8.10.4) is designed in exactly the same way as the trust analysis.

Table 8.10.4: Ratings of technology adoption MW1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	6	7	-1
14	Our company will adopt new technology when there is a need to improve the current technology	6	6	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	7	7	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	1	1	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	7	7	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	7	7	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for MW1 was the trust built up through their supply chain partners being dependable and sharing information.

Technology

The most successful technology adoption in the supply chain for MW1 has been the Meat Standards Australia meat quality grading system to improve the description of the meat that is being produced for sale. The use of barcoding technology on cartons has been an improvement in efficiency reducing weight discrepancy errors and the use of manual hand tally by cold store personnel.

Government

MW1 consider the government partnerships did not play a major part in improving the beef supply chain in the wholesale beef sector. The government was more interested in helping other members of the supply chain.

Outsourcing

MW1 have outsourcing partnerships with a refrigerated road transport service.

Traceability

MW1 use barcoding technology to trace cartons in their business. Having to maintain a tracing system slows the process.

SUMMARY

The MW1 case study shows that for this case study organisation the vertical upstream and down stream partnerships were informal as was the horizontal partnerships in their supply chain.

The MW1 case study illustrates there were a number of gaps in trust in their supply chain. The major gap related to their supply chain partners not being reliable and depended upon to deliver on their promises. Another major gap involved some of their partners not being highly experienced and qualified in their fields and business. MW1 has major gaps concerning the regular exchange of information in relation to; sales, demand forecasting and production planning. MW1 had other significant gaps in trust with some supply partners not having a high standard of work in their business and not being polite and respectful when dealing with their company. There were also some problems with supply chain partners not attending promptly to the needs and requests of their company in a timely manner. MW1 also rated the flow of real time point of sale information as a low expectation in their business.

MW1 had only one sight gap concerning technology adoption. This related to MW1 not adopting new technology when other supply chain members wished then to take up a new technology. MW1 had a low rating for trialability as most of the technology they install is proven already and the supplier of the technology will not provide free trials.

Appendix 8.11: Case study - Meat Wholesaler Two

OVERVIEW

The data relating to Meat Wholesaler Two (MW2) was collected in an interview with the domestic sales manager of the organisation.

COMPANY BACKGROUND

MW2 commenced business with two offices, one in Melbourne and the other in Brisbane. MW2's core business is the wholesaling of various types of meat products with beef being the major product line to butchers, and supermarkets but not to restaurants.

Table 8.11.1 illustrates that the business has been established for between five to ten years and is a private unlisted company, which employs less than 50 people. The financial year 2004 group assets and annual turnover were not available.

Table 8.11.1: Company details MW2

Case study and number	Year established	Company structure	Company assets	Annual turnover	Number of employees
MW [Meat wholesaler] 2	5-10	Unlisted private	NA	NA	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.11.2 shows the various formal and informal supply chain partnerships that MW2 has created in their supply chain.

Table 8.11.2: Partnerships MW2

Case Sector and Number	Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MW [Meat wholesaler] 2	Both	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

The vertical supplier partnerships with the processors and the abattoirs are informal. The vertical customer partnerships with butchers and supermarkets are also informal. They have informal horizontal supply chain agreements with other meat wholesalers who supply them with other meat products from time to time as the situation arises.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.11.3 illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.11.3: Ratings of trust MW2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	3	6	-3
2	Our partners always show a high level of honesty and integrity in our business dealings	3	6	-3
3	Our partners demonstrate a high standard of work in their business	5	7	-2
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	4	6	-2
5	Our partners have shared values and goals similar to our company	3	6	-3
6	Our partners are polite and respectful when dealing with our company	4	7	-3
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	2	6	-4
9	Our partners attend promptly to our needs and requests handling these in a timely manner	3	7	-4
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	6	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	6	-2
12	Our partners regularly share real time POS information with our company	6	7	-1

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.11.4) is designed in exactly the same way as the trust analysis.

Table 8.11.4: Ratings of technology adoption MW2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	6	7	-1
14	Our company will adopt new technology when there is a need to improve the current technology	6	7	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	5	0
16	Our company will adopt new technology if it is compatible with our type of business	5	5	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	2	2	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	7	7	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	7	7	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for MW2 was providing good service to suppliers and customers. This meant supplying customers with products that are of suitable quality to them and following through on every business transaction with suppliers and customers to ensure they are satisfied with the quality of the product.

Technology

The most successful technology adoption in the supply chain for MW2 has been email, mobile phone and facsimile to provide improved communication in the supply chain.

Government

MW2 consider the government partnerships did not play a part in improving the meat supply chain in the wholesale meat sector.

Outsourcing

MW2 have no outsourcing partnerships.

Traceability

MW2 use a manual paper document system to trace meat products in cartons and do not expect to up grade technology in the near term to electronically scan and track cartons of meat. However this manual system ensures MW2 can trace cartons through their business.

SUMMARY

The MW2 case study shows that for this case study organisation the vertical upstream and down stream partnerships were informal as was the horizontal partnerships in their supply chain.

The MW2 case study illustrates there were a number of gaps in trust in their supply chain. The first two major gaps related to their supply chain partners not being reliable and could not be depended upon to deliver on their promises. The other major gap concerned problems with supply chain partners not attending promptly to the needs and requests of their company in a timely manner. MW2 had four other significant gaps with their supply chain partners relating to the level of confidentiality, honesty and integrity, sharing the same values and goal and not being polite and respectful in their business dealings. Three other gaps were recognised in the supply chain concerning partners needing to improve the standard of work in their business. There was a lack of regularly exchange information with their company in relation to: sales, demand forecasting and production planning. There was a high concern about partners being friendly, warm, and caring when dealing with their company.

MW2 had two small gaps concerning technology adoption. They consider they could adopt new technology more when asked to do so by other supply chain partners and

could improve and upgrade their technology more frequently. MW2 had a low rating for the adoption of technology through trialability as rarely do they have the opportunity to trial technology in their business.

Appendix 8.12: Case study - Meat Wholesaler Three

OVERVIEW

The data relating to Meat Wholesaler Three (MW3) was collected in an interview with the general manager of the organisation.

COMPANY BACKGROUND

MW3 commenced business with offices in Melbourne, Sydney and Brisbane.

MW3's core business is the wholesaling of various types of meat products with beef being the major product line to butchers, supermarkets and portion cutters of steaks.

Table 8.12.1 illustrates that the business has been established for between five to ten years and is a private unlisted company, which employs less than 50 people. During the financial year 2004, MW3 had group assets between \$1 million and \$20 million and an annual turnover between \$1 million and 20 million.

Table 8.12.1: Company details MW3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
MW [Meat wholesaler]	3	5-10	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	<50

(**Source:** Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.12.2 shows the various formal and informal supply chain partnerships that MW3 has created in their supply chain.

Table 8.12.2: Partnerships MW3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MW [Meat wholesaler]	3	Both	Supplier informal	Customer informal

(**Source:** Developed for this research from field data by the author)

MW3 has vertical informal supply chain partnerships with their suppliers of various meat products in the abattoir sector. MW3 also has vertical informal partnerships with their customers, which are butchers and supermarkets. They have informal horizontal supply chain agreements with other meat wholesalers who supply them from time to time as the situation arises.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.12.3 (See page 284) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.12.3: Ratings of trust MW3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	4	6	-2
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	6	6	0
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	5	6	-1
5	Our partners have shared values and goals similar to our company	6	6	0
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	5	6	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	6	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	6	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	6	-2
12	Our partners regularly share real time POS information with our company	6	6	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.12.4) is designed in exactly the same way as the trust analysis.

Table 8.12.4: Ratings of technology adoption MW3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	4	4	0
14	Our company will adopt new technology when there is a need to improve the current technology	4	5	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	6	6	0
19	Our company will reject new technology if it is too expensive or complex to understand	5	6	-1
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	6	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for MW3 have been the collaborative communication with their customers to understand their requirements. Continuity in supplying customers with what they want has created customer loyalty. Predictability has been a success factor in the supply chain of MW3 to build relationships and this has also built confidence in the supply chain members.

Technology

The most successful technology adoption in the supply chain for MW3 has been the meat packaging technologies that have extended the shelf life of meat products.

Government

MW3 consider the government could do more to help partnerships promote meat at the retail end of the supply chain. They do not assist the wholesale meat sector.

Outsourcing

MW3 have outsourcing partnerships with service providers of refrigerated road transport service, information technology, refrigeration maintenance and security.

Traceability

MW3 consider traceability in the meat supply chain is a positive initiative to trace any defective product back to a supplier. They maintain a manual tracing system for cartons of meat.

SUMMARY

The MW3 case study shows that for this case study organisation the vertical upstream and down stream partnerships were informal as was the horizontal partnerships in their supply chain.

The MW3 case study illustrates there were a two major gaps in trust in their supply chain. The first major gap in their supply chain partnerships related to the level of confidentiality in their business dealings. The other gap in the supply chain concerned a lack of regular information exchange with their company in relation to: sales, demand forecasting and production planning. The other small gap in trust related to partners not being friendly, warm, and caring when dealing with their company.

MW3 had two slight gaps concerning technology adoption. They consider they could adopt new technology more frequently to improve the current technology. MW3 felt they needed to reject new technology if it was too expensive or complex to understand in the future.

Appendix 8.13: Case study - Meat Butcher One

OVERVIEW

The data relating to Meat Butcher One (MB1) was collected in an interview with the owner of the organisation.

COMPANY BACKGROUND

MB1 commenced business in urban Brisbane in 2004. MB1's core business is the retailing of meat products with beef being a major product line to the public. MB1 also supply cut steaks to supply some small delicatessens, supermarkets and restaurants.

Table 8.13.1 illustrates that the business has been established for less than five years and is a private unlisted company, which employs between 50 and 100 people. During the financial year 2004 MB1 had group assets over \$1 million and an annual turnover in excess of \$1 million.

Table 8.13.1: Company details MB1

Case study and number	Year established	Company structure	Company assets	Annual turnover	Number of employees	
MB [Meat butcher]	1	<5	Unlisted private	<\$1million	<\$1million	<50

(**Source:** Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.13.2 shows the various formal and informal supply chain partnerships that MB1 has created in their supply chain.

Table 8.13.2: Partnerships MB1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MB [Meat butcher]	1	Vertical	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

All the supply chain partnerships of MB1 are informal partnerships. The vertical supply chain partnerships with the suppliers of various meat products from the meat processors are informal. However, the meat products from some processors are being marketed under the supplier's brand names in the shop display cabinet. MB1 also purchase beef from a beef wholesaler in Brisbane. The informal downstream vertical partnerships are with retail customers and restaurants.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology are presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.13.3 (See page 288) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.13.3: Ratings of trust MB1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	7	7	0
14	Our company will adopt new technology when there is a need to improve the current technology	4	7	-3
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	7	7	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	5	5	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	7	7	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	7	7	0

(Source: Analysis of field data)

Technology

The data collected on the technology adoption factors (Table 8.13.4) is designed in exactly the same way as the trust analysis.

Table 8.13.4: Ratings of technology adoption MB1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	6	0
2	Our partners always show a high level of honesty and integrity in our business dealings	7	7	0
3	Our partners demonstrate a high standard of work in their business	7	7	0
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	7	7	0
5	Our partners have shared values and goals similar to our company	7	7	0
6	Our partners are polite and respectful when dealing with our company	7	7	0
7	Our partners are highly experienced and qualified in their fields and business	7	7	0
8	Our partners are reliable and can be depended upon to deliver on their promises	5	7	-2
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	7	-2
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	7	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	6	7	-1
12	Our partners regularly share real time POS information with our company	6	7	-1

(Source: Analysis of field data)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for MB1 has been the confidence in the suppliers of their meat products. MB1 consider their most successful partnerships have been achieved through confidence in partners having well trained and committed people. The people they deal with from the suppliers and the quality of the products they supply underpin this confidence. These factors in the relationship have built high trust.

Technology

The most successful technology adoption in the supply chain for MB1 has been the electronic scales, which produce a barcode label for retail packaging.

Government

MB1 consider private industry was driving the supply chain with little assistance from government. However, the Food Safe initiative by government had improved the quality of handling meat products generally.

Outsourcing

MB1 have outsourcing partnerships with service providers of refrigerated road courier transport to deliver meat to restaurant customers.

Traceability

MB1 consider the Meat Standards Australia (MSA) quality grading system had improved traceability in the meat supply chain was a positive initiative to trace any defective product back to a supplier.

SUMMARY

The MB1 case study shows that for this case study organisation the vertical upstream and down stream partnerships were informal and they did not have any horizontal partnerships.

The MB1 case study illustrates there were two major gaps in trust in their supply chain. The first major gap related to their supply chain partners not being reliable and could be depended upon to deliver on their promises. The other major gap concerned problems with supply chain partners not attending promptly to the needs and requests of their company in a timely manner. There were three factors of trust with slight gaps. These concerned the lack of regular exchange of information with their company in relation to; sales, demand forecasting and production planning, partners not always providing customising business solutions. MB1 admits at times their advice to suppliers about point of sale information could be improved.

MB1 had one major gap concerning technology adoption. They consider they needed to adopt new technology more frequently in the future to upgrade and improve the current technology in their business. MB1 rated trialability a little lower in their technology adoption as they rarely have an opportunity to trial technology before they buy it.

Appendix 8.14: Case study - Meat Butcher Two

OVERVIEW

The data relating to Meat Butcher Two (MB2) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

MB2 is a meat butcher with premises located in rural Queensland. MB2's core business is the retailing of meat products with beef being a major product line to the public. MB2 has won many awards in a number of categories in the meat retailing business in Queensland over a number of years.

Table 8.14.1 illustrates that the business has been established from between five to ten years and is a private unlisted company, which employs less than 50 people. During the financial year 2004 MB 2 had group assets in over \$1 million and an annual turnover between \$1 million to \$20 million.

Table 8.14.1: Company details MB2

Case study and number	Year established	Company structure	Company assets	Annual turnover	Number of employees	
MB [Meat butcher]	2	5-10	Unlisted private	<\$1million	\$1million - \$20 million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.14.2 shows the various formal and informal supply chain partnerships that MB2 has created in their supply chain.

Table 8.14.2: Partnerships MB2

Case Sector and Number	Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal	
MB [Meat butcher]	2	Both	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

MB2 has many informal supplier partnerships for various types of meat from all over Australia. These informal supplier partnerships are with abattoirs and meat wholesalers. MB2 has a long-term informal supplier relationship with one abattoir that supplies MSA standard beef. MB2 sells their meat products to retail customers only, which is an informal partnership and comprises many long-term retail customers. MB2 has an informal horizontal partnership with members of the national red meat working group which share general technical trade information relating to retail butchering and was an initiative of Meat and Livestock Australia.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.14.3 illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust rating how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.14.3: Ratings of trust MB2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	7	-1
2	Our partners always show a high level of honesty and integrity in our business dealings	7	7	0
3	Our partners demonstrate a high standard of work in their business	6	7	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	5	6	-1
5	Our partners have shared values and goals similar to our company	4	6	-2
6	Our partners are polite and respectful when dealing with our company	5	6	-1
7	Our partners are highly experienced and qualified in their fields and business	4	6	-2
8	Our partners are reliable and can be depended upon to deliver on their promises	5	6	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	6	0
11	Our partners regularly exchange information with our company in relation to: sales, demand forecasting and production planning	3	3	0
12	Our partners regularly share real time POS information with our company	6	7	-1

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.14.4) is designed in exactly the same way as the trust analysis.

Table 8.14.4: Ratings of technology adoption MB2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	6	7	-1
14	Our company will adopt new technology when there is a need to improve the current technology	6	7	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	6	-1
16	Our company will adopt new technology if it is compatible with our type of business	5	5	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	7	-1
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	6	7	-1
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	-1
20	Our company is using technology to ensure our products have full traceability in the supply chain	4	5	-1

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for MB2 has been the confidence in the suppliers of their meat products to consistently provide the correct specification. The other factor was having partners that provided continuity of supply for the domestic market. This was important in MB2's supplier partnerships that they did not stop supplying the domestic market in preference to the export market when prices were better overseas. Reducing supply to the domestic causes shortage, disruption and stock outages at times which can affect the business relationships.

Technology

The most successful technology adoption in the supply chain for MB2 has been electronic computer banking and email technology to order meat products from suppliers.

Government

MB2 consider the government did little to assist the domestic retail sector. The major positive factor was the government's policies on quarantine to keep exotic animal diseases from entering Australia that would greatly affect the supply chain and the business of MB2.

Outsourcing

MB2 have outsourcing partnerships with service providers for bookkeeping and accounting services.

Traceability

MB2 consider the meat traceability system NLIS had done nothing for their business. They had a limited tracing systems to their retail customers. However, through Meat Standards Australia's quality grading system they can trace meat products back to suppliers if the retail customers return any defective product.

SUMMARY

The MB2 case study shows that for this case study organisation the vertical upstream and down stream partnerships were informal and they did have an informal horizontal partnership.

The MB2 case study illustrates there were a two major gaps in trust in their supply chain. The first major gap related to their supply chain partners not having shared values and goals similar to theirs and some partners were not as experienced and qualified in their fields and business as MB2 would prefer.

MB2 had slight gaps in all areas of technology adoption. MB2 will consider adopting different unrelated technology at times if they can identify a positive advantage in doing so.

Appendix 8.15: Case study - Meat Butcher Three

OVERVIEW

The data relating to Meat Butcher Three (MB3) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

MB3 is a meat butcher located in urban Brisbane Queensland. MB3's core business of involves two butcher shops, which retail various types of meat products to the public and a small wholesale business serving some specialty restaurants.

Table 8.15.1 illustrates that the business has been established for less than five years and is a private unlisted company, which employs less than 50 people. During the financial year 2004 MB3 had group assets over \$1 million and an annual turnover between \$1 million to \$20 million.

Table 8.15.1: Company details MB3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
MB [Meat butcher]	3	<5	Unlisted private	<\$1million	\$1million - \$20 million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.15.2 shows the various formal and informal supply chain partnerships that MB3 has created in their supply chain.

Table 8.15.2: Partnerships MB3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MB [Meat butcher]	3	Vertical	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

MB3 has a number of vertical informal supplier partnerships with wholesalers and abattoirs all on an informal basis. All of the retail trade with customers is an informal partnership.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.15.3 illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.15.3: Ratings of trust MB3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	3	3	0
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	6	7	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	6	0
5	Our partners have shared values and goals similar to our company	7	7	0
6	Our partners are polite and respectful when dealing with our company	7	7	0
7	Our partners are highly experienced and qualified in their fields and business	6	7	-1
8	Our partners are reliable and can be depended upon to deliver on their promises	7	7	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	6	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	7	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	6	6	0
12	Our partners regularly share real time POS information with our company	6	7	-1

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.15.4) is designed in exactly the same way as the trust analysis.

Table 8.15.4: Ratings of technology adoption MB3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	5	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	7	7	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	4	7	-3

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for MB3 has been the confidence in the suppliers built, on their commitment to provide consistent quality meat products. The retail customers look for honesty, product knowledge and prices that show value for money. The export market has a big impact on supply chain partnerships concerning the domestic market. The strength and demand of the export market had a significant effect on the supply of various products and could result in big swings in availability for the domestic market and strain supply chain partnerships.

Technology

The most successful technology adoption in the supply chain for MB3 has been the vacuum packing machine to extend the shelf life of meat and the automatic feeding meat mincer.

Government

MB3 consider the government did little to assist the domestic retail sector. The government created a bureaucracy and extra paper work.

Outsourcing

MB3 do not have any outsourcing partnerships.

Traceability

MB3 consider meat traceability helped improve the business with feedback to the producer. The retail customer does not mention traceability and does not know what the Meat Standards Australia quality grading system means to them.

SUMMARY

The MB3 case study shows that for this case study organisation the vertical upstream and down stream partnerships were informal and they did not have a horizontal partnership.

The MB3 case study illustrates there were four slight gaps in trust in their supply chain. MB3 would like slight improvements with their supply chain partners in the standard of work in their business, to be more experienced and qualified in their fields and business and provide customised business solutions to meet the requirements of MB3 more often. MB3 consider they could slightly improve their sharing of real time point of sale information with their supplier partnerships.

MB3 had one major gap in technology adoption, which related to improving their business by using technology more to trace products in their supply chain.

Appendix 8.16: Case study - Meat Restaurant One

OVERVIEW

The data relating to Meat Restaurant One (MR1) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

MR1 is a specialist beef restaurant with its premises located in Brisbane, Queensland. The core business involves serving diners high quality grassfed beef.

Table 8.16.1 illustrates that the business has been established for less than five years and is a private unlisted company, which employs less than 50 people. During the financial year 2004, MR1 had group assets under one million and an annual turnover below one million.

Table 8.16.1: Company details MR1

Case study and number	Year established	Company structure	Company assets	Annual turnover	Number of employees	
MR [Meat restaurant]	1	<5	Unlisted private	<\$1million	<\$1million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.16.2 shows the various formal and informal supply chain partnerships that MR1 has created in their supply chain.

Table 8.16.2: Partnerships MR1

Case Sector and Number	Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal	
MR [Meat restaurant]	1	Both	Supplier formal	Customer informal

(Source: Developed for this research from field data by the author)

MR1 has a formal verbal partnership with their vertical supply chain partner who produces their beef. MR1 has a strong collaboration with this beef supplier to provide the required specification every time. MR1 had a specialist spend time training staff at the beef supplier to prepare the steaks to MR1 specifications. MR1 and the beef supplier regularly visit each other's premises to understand respective requirements. The beef supplier had their staff spend time in the MR1 kitchen understanding the

quality required for the cooking process MR1 uses. The beef supplier also packs MR1 steaks in their own packaging. They have an informal horizontal partnership with another steakhouse that has a similar core business strategy. Their supply chain arrangements are all informal with their customers.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.16.3 (See page 301) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.16.3: Ratings of trust MR1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	7	7	0
2	Our partners always show a high level of honesty and integrity in our business dealings	6	7	-1
3	Our partners demonstrate a high standard of work in their business	5	7	-2
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	4	6	-2
5	Our partners have shared values and goals similar to our company	5	7	-2
6	Our partners are polite and respectful when dealing with our company	5	6	-1
7	Our partners are highly experienced and qualified in their fields and business	7	7	0
8	Our partners are reliable and can be depended upon to deliver on their promises	4	7	-3
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	7	-2
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	6	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	5	6	-1
12	Our partners regularly share real time POS information with our company	7	7	0

(Source: Analysis of field data)

Technology

The data collected on the technology adoption factors (Table 8.16.4) is designed in exactly the same way as the trust analysis.

Table 8.16.4: Ratings of technology adoption MR1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	1	1	0
14	Our company will adopt new technology when there is a need to improve the current technology	5	7	-2
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	7	-2
16	Our company will adopt new technology if it is compatible with our type of business	5	7	-2
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	1	1	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	7	7	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	5	7	-2

(Source: Analysis of field data)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for MR1 has been the collaboration and communication with their beef supplier to produce and deliver the consistent quality specification demanded by MR1. The partnership with the beef supplier has been successful due to their commitment to servicing the partnership. MR1 attribute the partnership success to well-trained staff, combined with simple processes and systems.

Technology

The most successful technology adoption in the supply chain for MR1 has been the vacuum-sealing machine to extend quality and shelf life.

Government

MR1 consider government do little to assist the restaurant sector of the meat industry supply chain. The Food Safe initiative by government was the only involvement from the government. The government supports the producer level more than the restaurant sector.

Outsourcing

MR1 have outsourcing partnerships with an Internet web site provider.

Traceability

MR1 consider traceability in the meat supply chain is a positive initiative. They have traceability back to their sole beef supplier and can trace most customers from meal dockets.

SUMMARY

The MR1 case study shows that for this case study organisation the vertical upstream partnership is a formal agreement. The vertical down stream partnerships with

customers is informal and there was an informal horizontal partnership in their supply chain.

The MR1 case study illustrates there was one major gap in trust in their supply chain. The major gap concerned some partners not being reliable and could not be depended upon to deliver on their promises. There were three other significant gaps concerning some supply chain partners not attend promptly to the needs and requests of their company in a timely manner, not sharing the same values and goal as MR1 and not being polite and respectful enough in their business dealings with MR1.

MR1 had a number of major gaps concerning technology adoption. MR1 consider they could improve and upgrade their current technology more frequently and would like to adopted technology in the future that was less complex. The other major gap concerned adopting technology in the future was the desire to purchase more compatible technology in the future. MR1 would like to improve their technology to trace products to customers in the future. MR1 rated the adoption of technology low in two areas. MR1 do not trial technology in their business and rarely adopt technology that is forced on them by supply chain partners unless they wish to have the technology themselves.

Appendix 8.17: Case study - Meat Restaurant Two

OVERVIEW

The data relating to Meat Restaurant Two (MR2) was collected in an interview with the catering manager of the organisation.

COMPANY BACKGROUND

MR2 is a specialist beef restaurant that is located in Brisbane Queensland.

Table 8.17.1 (See page 304) illustrates that the business has been established for over 20 years and is a subsidiary of a public listed company, which employs between 101 and 500 people. During the financial year 2004 the value of the group assets was not available but the annual turnover was between \$1 million to \$20 million.

Table 8.17.1: Company details MR2

Case study and number	Year established	Company structure	Company assets	Annual turnover	Number of employees	
MR [Meat restaurant]	2	>20	Listed public	NA	\$1million - \$20 million	101-500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.17.2 shows the various formal and informal supply chain partnerships that MR2 has created in their supply chain.

Table 8.17.2: Partnerships MR2

Case Sector and Number	Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MR [Meat restaurant]	2	Both	Supplier formal Customer informal

(Source: Developed for this research from field data by the author)

MR2 has formal annual contracts with its beef suppliers. All of the retail customer partnerships are informal. MR2 is a subsidiary of the public listed company that owns a number of steak outlets. Each of these steak outlets operates in a different manner but they have a formal horizontal partnership through the parent holding company.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.17.3 (See page 305) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.17.3: Ratings of trust MR2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	7	7	0
2	Our partners always show a high level of honesty and integrity in our business dealings	6	7	-1
3	Our partners demonstrate a high standard of work in their business	6	7	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	7	-1
5	Our partners have shared values and goals similar to our company	6	7	-1
6	Our partners are polite and respectful when dealing with our company	6	7	-1
7	Our partners are highly experienced and qualified in their fields and business	6	7	-1
8	Our partners are reliable and can be depended upon to deliver on their promises	6	7	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	7	7	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	7	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	7	7	0
12	Our partners regularly share real time POS information with our company	6	6	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.17.4) is designed in exactly the same way as the trust analysis.

Table 8.17.4: Ratings of technology adoption MR2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	5	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	6	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	6	-1
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	5	6	-1
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	6	-1
19	Our company will reject new technology if it is too expensive or complex to understand	4	6	-2
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	7	-1

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for MR2 has been 'respect'. Respect between MR2 and their supplier's has been built up over a long period of time. Good communication and confidence in partnerships was built around beef products that have consistent quality specification demanded by MR2.

Technology

The most successful technology adoptions in the supply chain for MR2 have been the computerised till, improved cooking equipment, and improved gas supply in Brisbane.

Government

MR2 consider government do little to assist the restaurant sector of the meat industry supply chain. The Food Safe initiative by government was the only involvement from the government.

Outsourcing

MR2 have outsourcing partnerships with a confectionery supplier.

Traceability

MR2 consider traceability in the meat supply chain has been good for the industry. The initiative has made the industry more professional and accountable to the customers.

SUMMARY

The MR2 case study shows that for this case study organisation the vertical upstream partnership is a formal agreement. The vertical down stream partnerships with customers is informal and there is a formal horizontal partnership other similar restaurants owned by the same holding company.

The MR2 case study illustrates there are a number of slight gaps in trust with their supply chain partners. Whilst MR2 is very happy with their supply chain partners they have rated trust highly to seek the best supply chain partnerships possible.

MR2 has one major gap concerning technology adoption, which relates to rejecting new technology if it is too expensive or complex to understand in the future. MR2 believe in the past they have adopted some new technology, which was expensive and too complex for the staff to manage.

Appendix 8.18: Case study - Meat Restaurant Three

OVERVIEW

The data relating to Meat Restaurant Three (MR3) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

MR3 is a restaurant with its premises located in Brisbane Queensland. MR3's core business involves serving diners high quality selected beef and other different dishes.

Table 8.18.1 illustrates that the business has been established for between 11 to 20 years and is a private unlisted company, which employs between 101 and 500 people. During the financial year 2004 MR3 had group assets between \$1 million to \$20 million and an annual turnover between \$1 million to \$20 million.

Table 8.18.1: Company details MR3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
MR [Meat restaurant]	3	11-20	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	101-500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.18.2 (See page 308) shows the various formal and informal supply chain partnerships that MR3 has created in their supply chain.

Table 8.18.2: Partnerships MR3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MR [Meat restaurant]	3	Both	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

MR3 has informal long-term vertical upstream partnerships with many meat wholesalers who supply the company with beef and other meat products. The customers of MR3 are all informal partnerships. MR3 has formal integrated horizontal partnerships with other restaurants that are owned by the company. The company has a strong horizontal partnership with the restaurant and catering association of Australia.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology are presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.18.3 (See page 309) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.18.3: Ratings of trust MR3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	3	3	0
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	6	6	0
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	4	7	-3
5	Our partners have shared values and goals similar to our company	7	7	0
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	5	7	-2
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	7	7	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	7	7	0
12	Our partners regularly share real time POS information with our company	7	7	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.18.4) is designed in exactly the same way as the trust analysis.

Table 8.18.4: Ratings of technology adoption MR3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	6	6	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	7	7	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	7	7	0
19	Our company will reject new technology if it is too expensive or complex to understand	5	5	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	7	-1

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for MR3 has been partnering with suppliers that provide the consistent quality specification demanded by MR3.

Good communication and collaboration has assisted these partnerships through restaurant staff attending abattoirs that supply the meat to understand each other business. The partnership relationships have been built around integrity between the partners.

Technology

The most successful technology adoptions in the supply chain for MR3 have been the computerised till, improved cooking equipment and cold chain management.

Government

MR3 consider government has only been involved in the Food Safe initiative in the restaurant sector of the meat industry supply chain.

Outsourcing

MR3 have outsourcing partnerships with service providers for cleaning, information technology, advertising, graphics and printing.

Traceability

MR3 consider traceability in the meat supply chain has a high rating in the restaurant sector. Traceability in the meat business has consumer awareness and was a risk management tool.

SUMMARY

The MR3 case study shows that for this case study organisation the vertical upstream and downstream partnerships are informal agreements. MR3 has both informal and formal horizontal partnership in their supply chain.

The MR3 case study illustrates there was one major gap in trust in their supply chain. This major gap with their supply chain concerned partners not having a high concern for being friendly, warm, and caring when dealing with their company. The other significant gap concerned partners needing to be more reliable and dependable in delivering on their promises.

MR3 had only one slight gap concerning technology adoption. MR3 considers they could improve their technology to trace products and customers better in the future.

Appendix 8.19: Case Study - Horticulture Nursery Seed Producer One

OVERVIEW

The data relating to Horticulture Nursery Seed Producer One (HNS1) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

HNS1 is located in rural Queensland. HNS1's core business is growing vegetable seedlings for the Australian vegetable industry. HNS1 has also diversified and expanded as a vertically integrated supply chain company in its own right with the formation of a business that grows, harvests, packages and markets baby salad mixes to major retail food outlets.

Table 8.19.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs between 101 to 500 people. During the financial year 2004 HNS 1 had group assets between \$21 million and \$51 million but the annual turnover figure was not available.

Table 8.19.1: Company details HNS1

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HNS [Horticulture nursery & seeds]	1	>20	Unlisted private	\$21 million - \$50 million	NA	101-500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.19.2 shows the various formal and informal supply chain partnerships that HNS1 has created in their supply chain.

Table 8.19.2: Partnerships HNS1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HNS [Horticulture nursery seeds]	1	Both	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

HNS 1 has informal vertical customer supply chain partnerships with various growers on the east coast of Australia. They have informal vertical supplier partnership with various organisations that provide different products to the company to produce seedlings. They also have informal horizontal partnerships with other plant nurseries in Australia and overseas relating to information sharing about seedling types. They have formal outsourcing agreements with chemical companies on seedling research and development.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.19.3 (See page 313) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.19.3: Ratings of trust HNS1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	7	7	0
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	2	6	-4
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	6	0
5	Our partners have shared values and goals similar to our company	2	6	-4
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	3	6	-3
8	Our partners are reliable and can be depended upon to deliver on their promises	6	6	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	6	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	3	7	-4
12	Our partners regularly share real time POS information with our company	5	7	-2

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.19.4) is designed in exactly the same way as the trust analysis.

Table 8.19.4: Ratings of technology adoption HNS1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	1	1	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	5	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	6	6	0
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	7	-1

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HNS1 was that their business was built on 80 percent relationship and 20 percent production. They feel that honesty in a partnership is very important and once lost it is hard to regain. Close collaborative and communication with partners in developing technology built strong binding relationships.

Technology

The most successful technology adoption in the supply chain for HNS1 was improved seedling quality through collaborating with partners in their supply chain involved in seedling growing technology.

Government

HNS1 consider the government partnerships need to promote management in the agribusiness model of supply chain management, especially in the grower sector of the chain as this sector is expected to shrink dramatically over the next ten years.

Outsourcing

HNS1 main outsourcing partnerships relate to scientific technology input into the seedling research and development.

Traceability

HNS1 consider traceability was important. They consider that traceability saves money in the long run on staff numbers, legal costs, and food scares. Traceability provides accountability from the seed to the fruit and ultimately the consumer.

SUMMARY

The HNS1 case study shows the vertical upstream and down stream partnerships were informal. HNS1 have a formal outsourcing agreement and informal horizontal partnerships in their supply chain.

The HNS1 case study illustrates there were four major gaps in trust in their supply chain. The first major gap related to the irregular exchange of information by partners in relation to: sales, demand forecasting and production planning. The second gap was partners not sharing the same values and goal in their business as HNS1. The third gap concerned some partners needing to improve the standard of work in their business. The fourth gap related to some partners not being as highly experienced and qualified in their fields and businesses as HNS1 would prefer.

HNS1 had one slight gap concerning technology adoption. They consider they could adopt new technology to improve traceability in their supply chain. HNS1 has rated partners forcing technology on them low as they consider they are the leaders in technology in their field. In fact they may be forcing technology or change on their supply chain partners.

Appendix 8.20: Case study - Horticulture Nursery Seed Producer Two

OVERVIEW

The data relating to Horticulture Nursery Seed Producer Two (HNS2) was collected in an interview with the Chief Executive Officer of the organisation.

COMPANY BACKGROUND

HNS2 is a seed company with its head office in rural Queensland. HNS2 has offices in rural New South Wales, Victoria, South Australia, and Western Australia. HNS2's core business involves the breeding, production and marketing of seed for the vegetable and grain planting industry in Australia and the international market. Included in the core business is the continued research and development technology on seeds to provide growers with high yields and satisfy the needs of end customers.

Table 8.20.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs between 101 to 500 people. During the financial year 2004 HNS2 had group assets between \$1million to \$20 million and an annual turnover over \$51 million.

Table 8.20.1: Company details HNS2

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HNS [Horticulture nursery seeds]	2	>20	Unlisted private	\$1million - \$20 million	>\$51million	101-500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.20.2 shows the various formal and informal supply chain partnerships that HNS2 has created in their supply chain.

Table 8.20.2: Partnerships HNS2

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HNS [Horticulture nursery seeds]	2	Both	Supplier both	Customer both

(Source: Developed for this research from field data by the author)

HNS2 have annual formal vertical supplier partnerships with contract seeds growers who produce the breeding seed that is used for the production of seed grain. They also have annual formal vertical supplier partnerships with chemical providers. These chemicals are used in the production of seed for the vegetable and grain industry. HNS2 have informal and formal vertical customer partnerships with national and regional merchandise agents to market their seeds to growers. HNS2 have a horizontal informal collaborative partnership with the Queensland Department of Primary Industry.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.20.3 illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.20.3: Ratings of trust HNS2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	7	-1
2	Our partners always show a high level of honesty and integrity in our business dealings	6	7	-1
3	Our partners demonstrate a high standard of work in their business	5	6	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	5	5	0
5	Our partners have shared values and goals similar to our company	6	7	-1
6	Our partners are polite and respectful when dealing with our company	6	7	-1
7	Our partners are highly experienced and qualified in their fields and business	7	7	0
8	Our partners are reliable and can be depended upon to deliver on their promises	5	7	-2
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	7	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	7	7	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	7	-3
12	Our partners regularly share real time POS information with our company	1	1	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.20.4) is designed in exactly the same way as the trust analysis.

Table 8.20.4: Ratings of technology adoption HNS2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	6	-1
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	7	-1
16	Our company will adopt new technology if it is compatible with our type of business	6	7	-1
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	5	0
19	Our company will reject new technology if it is too expensive or complex to understand	5	5	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	7	7	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HNS2 was fairness and revenue sharing between the different partners. They consider success in the supply chain is a “Win, win, win, and win exercise for all partners in the supply chain to eventually benefit the end customer”. The handling of conflict within supply chain partnerships by the use of open discussion based on fairness had also advanced their supply chain.

Technology

The most successful technology adoption in the supply chain for HNS2 was the innovation in pallets. HNS2 use ten to 15 different types of pallets in their business, which has improved efficiency. The breeding technology area of their business has improved productivity and germination.

Government

HNS2 consider government partnerships were too bureaucratic. Government required more than their fair share of the rewards and after time they share the technology with others so they are not the greatest partners.

Outsourcing

HNS2's main outsourcing partnerships were with computer software technology providers.

Traceability

HNS2 consider traceability was important and the company uses barcoding and lot numbers to trace seeds from the seed growers to the farmers that plant the seed.

SUMMARY

The HNS2 case study shows that for this case study organisation they have both informal and formal vertical upstream and down stream partnerships. HNS2 also has informal horizontal partnerships in their supply chain.

The HNS2 case study illustrates there were two major gaps in trust in their supply chain. The first major gap related to the irregular exchange of information by partners in relation to: sales, demand forecasting and production planning. The second gap concerned the issue of some partners not partners being reliable and could not be depended upon to deliver on their promises. Apart from these two major gaps HNS2 had a number of slight gap in trust where they wished to achieve the best partnerships possible.

HNS2 had two slight gaps concerning technology adoption. The first gap related to adopting new technology a little more frequently in line with other supply chain partner's requests in the future. The other gap was adopting more technology in the future that was more compatible with their business.

Appendix 8.21: Case study - Horticulture Nursery Seed Producer Three

OVERVIEW

The data relating to Horticulture Nursery Seed Producer Three (HNS3) was collected in an interview with the national marketing manager of the organisation.

COMPANY BACKGROUND

HNS3 is a seed company with offices in rural locations in all states of Australia except the Northern Territory. HNS3's core business involves the wholesale distribution of seed for the vegetable and nursery industry in Australia and the international market. Included in the core business is continued research and development technology with seed breeders to provide growers with high yields and satisfy the needs of end customers.

Table 8.21.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs between 101 and 500 people. During the financial year 2004 HNS3 had group assets over \$51 million and an annual turnover between \$21 to \$50 million.

Table 8.21.1: Company details HNS3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HNS [Horticulture nursery seeds]	3	>20	Unlisted private	>\$51million	\$21 million - \$50 million	101-500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.21.2 shows the various formal and informal supply chain partnerships that HNS3 has created in their supply chain.

Table 8.21.2: Partnerships HNS3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HNS [Horticulture nursery seeds]	3	Both	Supplier both	Customer both

(Source: Developed for this research from field data by the author)

HNS3 have annual formal and informal vertical supplier partnerships with contract seed breeders who supply seed from all over the world. They have both formal and

informal customer partnerships with farmers and nursery customers. HNS3 has formal horizontal supply chain partnerships with other seed growers and informal horizontal partnerships through seed industry associations.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.21.3 (See page 322) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.21.3: Ratings of trust HNS3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	6	0
2	Our partners always show a high level of honesty and integrity in our business dealings	4	7	-3
3	Our partners demonstrate a high standard of work in their business	5	6	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	5	5	0
5	Our partners have shared values and goals similar to our company	4	6	-1
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	5	5	0
8	Our partners are reliable and can be depended upon to deliver on their promises	4	6	-2
9	Our partners attend promptly to our needs and requests handling these in a timely manner	4	6	-2
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	5	+1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	6	6	0
12	Our partners regularly share real time POS information with our company	6	6	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.21.4) is designed in exactly the same way as the trust analysis.

Table 8.21.4: Ratings of technology adoption HNS3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	5	0
14	Our company will adopt new technology when there is a need to improve the current technology	4	6	-2
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	5	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	6	6	0
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	2	4	-2

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HNS3 was communication and understanding the needs of customers in developing seed products.

Technology

The most successful technology adoption in the supply chain for HNS3 was the use of digital cameras, which can visually convey the characteristics of fruit and vegetables appearance to supply chain partners.

Government

HNS3 consider the government partnerships were a non-event. The Australian Quarantine Department was not industry savvy and was over regulated. The Departments of Primary Industry in Australia were also out of touch with industry.

Outsourcing

HNS3's main outsourcing partnerships were with computer software technology providers.

Traceability

HNS3 consider traceability was important and the company uses lot numbers to trace seeds from the seed growers to the farmers that plant the seed. Traceability was a risk management tool.

SUMMARY

The HNS3 case study shows that for this case study organisation they have both informal and formal vertical upstream and down stream partnerships. HNS3 also has informal and formal horizontal partnerships in their supply chain.

The HNS3 case study illustrates there was one major gap in trust in their supply chain. This major gap related to partners not always showing a high level of honesty and integrity in business dealings. There were two other significant gaps in trust with their partners, the first concerning some partners not being reliable and could not be depended upon to deliver on their promises. The second significant gap in trust related to some partners not attending promptly to needs and requests of HNS3 and handling these in a timely manner. HNS3 had one positive gap where they considered their company over-customises their products at the requests of the customers they supply. HNS3 believe their products could be more standardised.

HNS3 had two gaps concerning technology adoption. The first gap related to adopting new technology more frequently to improve and upgrade the current technology. The other gap was adopting more technology in the future that could provide full traceability in the supply chain of their seeds. However HNS3 would not put a major urgency on traceability as this factor only had a moderate rating.

Appendix 8.22: Case study - Horticulture Grower One

OVERVIEW

The data relating to Horticulture Grower One (HG1) was collected in an interview with a joint owner of the organisation.

COMPANY BACKGROUND

HG1 is a vegetable grower located in rural Queensland. HG1's core business involves the growing, packing and marketing vegetables for the domestic market.

Table 8.22.1 (See page 325) illustrates that the business has been established for between 11 to 20 years and is a private unlisted company, which employs less than 50 people. During the financial year 2004 HG1 had group assets between \$1 million to \$20 million and an annual turnover between \$1 million to \$20 million.

Table 8.22.1: Company details HG1

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HG [Horticulture grower]	1	11-20	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.22.2 shows the various formal and informal supply chain partnerships that HG1 has created in their supply chain.

Table 8.22.2: Partnerships HG1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HG [Horticulture grower]	1	Vertical	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

HG1 had only vertical supply chain partnerships, which are on an informal basis with both suppliers and customers in their supply chain.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.22.3 (See page 326) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.22.3: Ratings of trust HG1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	6	0
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	6	6	0
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	4	6	-2
5	Our partners have shared values and goals similar to our company	5	6	-1
6	Our partners are polite and respectful when dealing with our company	5	7	-2
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	4	7	-3
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	7	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	6	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	6	6	0
12	Our partners regularly share real time POS information with our company	6	6	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.22.4) is designed in exactly the same way as the trust analysis.

Table 8.22.4: Ratings of technology adoption HG1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	6	6	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	6	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	4	4	0
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	4	4	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HG1 was information sharing, with timely and accurate communication. HG1 wished to see more formal supply chain agreements in the future rather than informal alliances. They felt that some of their partnerships were one-sided, with opportunistic behaviour occurring and power dependency being an issue. They felt that conflict handling was one-sided and that the partnerships were not a win, win situation with the customers. The conflict-handling was only lip service. There was limited benevolence in the customer partnerships. Some of these partnerships with customers were dictatorial in relation to the terms of trade, which changed from time to time subject to the customer's company policy.

Technology

The most successful technology adoption in the supply chain for HG1 was the mobile phone. However, at the business site they could not use the mobile phone, as they did not have reception in that area.

Government

HG1 felt the government on a local, state and federal level had helped industry a lot with various initiatives that in turn indirectly helped the supply chain they were in.

Outsourcing

HG1 use outsourcing services for transport delivery of their products.

Traceability

HG1 have full traceability on their products through their quality assurance systems but they do not use RFID or other technology to track the product from source to the end-user. They use barcoding and EAN on cartons and packaged units. HG1 had no intention to adopt any new technology for traceability at this time.

SUMMARY

The HG1 case study shows that for this case study organisation they have informal vertical upstream and down stream partnerships.

The HG1 case study illustrates they have one major gap in trust in their supply chain. This major gap concerning some partners not being reliable and could not be depended upon to deliver on their promises. There are two other significant gaps in trust with their partners, the first concerning some partners not being polite and respectful when dealing with their company. The second significant gap in trust related to partners not having a high concern for being friendly, warm, and caring when dealing with their company.

HG1 did not have any gaps concerning technology adoption. However they rated two factors lower than the others. The first gap related to adopting new technology through observation. This was given a low rating as HG1 designed and manufactured most of their own technology for growing their product. The other issue concerned full traceability in the supply chain. HG1 principally manage traceability as they grow the products from source and delivered direct to the retailer and not through wholesalers or distributors.

Appendix 8.23: Case study - Horticulture Grower Two

OVERVIEW

The data relating to Horticulture Grower Two (HG2) was collected in an interview with the managing director of the organisation.

COMPANY BACKGROUND

HG 2 is a vegetable grower located in rural Queensland. HG2's core business involves the growing, packing and marketing of vegetables for the domestic and export market.

Table 8.23.1 (See page 329) illustrates that the business has been established for between 11 to 20 years and is a private unlisted company, which employs between 50 and 100 people. During the financial year 2004 HG2 had group assets between \$21 million and \$50 million and an annual turnover between \$1million to \$50 million.

Table 8.23.1: Company details HG2

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HG [Horticulture grower]	2	11-20	Unlisted private	\$21 million - \$50 million	\$1 million - \$20 million	50-100

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.23.2 shows the various formal and informal supply chain partnerships that HG2 has created in their supply chain.

Table 8.23.2: Partnerships HG2

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HG [Horticulture grower]	2	Vertical	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

HG2 has long-term informal vertical supplier partnerships with suppliers of seed, fuel, fertilisers and chemicals. HG2 has vertical informal customers supply chain partnerships with their export customers of who purchase approximately 60 percent of the crop. On the domestic market HG2 has vertical informal supply chain partnerships with customers who are wholesalers in the fruit markets in Brisbane or interstate and vegetable processors. HG2 does not have any horizontal supply chain partnerships but may do in the future with other vegetable growers.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology are presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.23.3 (See page 330) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between

the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.23.3: Ratings of trust HG2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	5	5	0
2	Our partners always show a high level of honesty and integrity in our business dealings	5	6	-1
3	Our partners demonstrate a high standard of work in their business	5	6	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	4	5	-1
5	Our partners have shared values and goals similar to our company	4	6	-2
6	Our partners are polite and respectful when dealing with our company	5	5	0
7	Our partners are highly experienced and qualified in their fields and business	4	6	-2
8	Our partners are reliable and can be depended upon to deliver on their promises	5	6	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	6	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	6	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	3	5	-2
12	Our partners regularly share real time POS information with our company	3	6	-3

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.23.4) is designed in exactly the same way as the trust analysis.

Table 8.23.4: Ratings of technology adoption HG2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	4	4	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	5	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	5	0
19	Our company will reject new technology if it is too expensive or complex to understand	5	5	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	7	7	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HG2 was having partners that were reliable, stable in their business and predictable. HG2 has achieved good partnerships through providing customers with consistent product.

Technology

The most successful technology adoptions in the supply chain for HG2 were: the use of GPS land levelling, mechanical harvesting, robotic packing of vegetables, and modified atmosphere packaging.

Government

HG2 consider the government partnerships with agribusiness have been positive with the National Food Industry Strategy (NFIS), and the Queensland Government Trade and Investment Offices situated overseas to assist exporters.

Outsourcing

HG2 has outsourcing partnerships with computer software technology, crop monitoring services, work place, health and safety consultants and human resources providers.

Traceability

HG2 consider traceability was a principal vision of the organisation. Food safety was critical to their business.

SUMMARY

The HG2 case study shows that for this case study organisation they have informal vertical upstream and down stream partnerships. They do not have any horizontal supply chain agreements at the moment but may do so in the future.

The HG2 case study illustrated there was one major gap in trust in their supply chain. This major gap concerning some partners not regularly sharing real time POS information with their company which leads to supply planning issues. There were three other significant gaps in trust with their partners. The first was some partners not regularly exchanging information with HG2 in relation to: sales, demand forecasting and production planning. The second gap in trust related to partners not sharing the same values and goals as HG2 in their business processes. The third gap in trust related to some partners not being as highly experienced and qualified in their fields and business as HG2 would prefer.

HG2 did not have any gaps concerning technology adoption. However, they rated one factor lower than the others. This factor related to being forced by other supply chain partners to adopt new technology. HG2 consider they are a leader in the adoption of technology in their specific vegetable product and rarely are they asked by their partners to adopt technology.

Appendix 8.24: Case study - Horticulture Grower Three

OVERVIEW

The data relating to Horticulture Grower Three (HG3) was collected in an interview with the owner and director of the organisation.

COMPANY BACKGROUND

HG3 is a vegetable grower located in rural Queensland. HG3's core business involves the growing of vegetables for the domestic market.

Table 8.24.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs less than 50 people. During the financial year 2004 HG3 had group assets between \$1 million and \$20 million and an annual turnover between \$1 million and \$20 million.

Table 8.24.1: Company details HG3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HG [Horticulture grower]	3	>20	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.24.2 shows the various formal and informal supply chain partnerships that HG3 has created in their supply chain.

Table 8.24.2: Partnerships HG3

Case Sector and Number		Partnerships		Supply Partnerships		Customer Partnerships	
		Vertical	Horizontal	Informal	Formal	Informal	Formal
HG [Horticulture grower]	3	Both		Supplier informal		Customer both	

(Source: Developed for this research from field data by the author)

HG3 has long-term informal vertical supplier partnerships with suppliers of seed, fuel, fertilisers, machinery and chemicals. HG3 has a long-term vertical informal customer supply chain partnership with a packinghouse that packages and markets vegetables for the retail trade. They have long-term formal and informal vertical customers in the supply chain that purchase a single crop from them for processing. HG3 has a formal

horizontal supply chain partnership with a group other local vegetable growers to supply a fruit and vegetable processing company.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.24.3 illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.24.3: Ratings of trust HG3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	4	6	-2
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	6	7	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	5	6	-1
5	Our partners have shared values and goals similar to our company	5	6	-1
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	6	7	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	7	7	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	6	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	6	-2
12	Our partners regularly share real time POS information with our company	3	3	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.24.4) is designed in exactly the same way as the trust analysis.

Table 8.24.4: Ratings of technology adoption HG3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	6	6	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	6	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	4	4	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	4	6	-2
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	5	0
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	3	3	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HG3 were partners that provided reliable, practical and technical information. HG3 has been successful as a supply chain partner as they have provided a consistent supply of vegetables to their customers. They have also grown vegetables that are competitively priced for the other supply chain members downstream.

Technology

The most successful technology adoption in the supply chain for HG3 was the mobile phone for ease of communication while around the farm and transport in the farm with the technology innovation of the four-wheel motorbike.

Government

HG3 consider the government partnerships with agribusiness have been positive with research and development grants and assistance to HRDC and Ausveg. Likewise the Queensland Department of Primary Industry was still a good support to growers.

Outsourcing

HG3 has outsourcing partnerships with soil testing and agronomy service providers.

Traceability

HG3 consider traceability important to manage risk between company to company in the supply chain for food safety. Traceability has driven the production and use of softer chemicals for application on vegetable crops. The traceability system has helped people's awareness of undertaking an integrated pest management system. However, traceability has not improved or driven quality improvements and the grower has not received any more income due to the introduction of traceability.

SUMMARY

The HG3 case study shows they that for this case study organisation have informal vertical upstream partnerships. They have both informal and formal down stream partnerships. They also have a formal horizontal supply chain agreement.

The HG3 case study illustrates they have two significant gaps in trust in their supply chain. The first gap concerns some partners not regularly sharing real time POS information with their company, which leads to supply planning issues. The other significant gap in trust with their partners relates to the level of confidentiality in business dealings.

HG3 had one main gap concerning technology adoption. This gap related to the opportunity to trial new technology in sections of their business, which they would like to do more of in the future. They rated one factor lower than the others, which concerned the use of technology to trace the vegetables. They consider the quality system they have at present does not require any further technological advancement.

Appendix 8.25: Case study - Horticulture Processor One

OVERVIEW

The data relating to Horticulture Processor One (HG1) was collected in an interview with the Chief Executive Officer of the organisation.

COMPANY BACKGROUND

HP1 is situated in rural New South Wales and Queensland. HP1's core business includes growing, processing, wholesaling, retailing, logistics and distributing of horticultural products in Australia and overseas. HP1 grow a substantial quantity of the Australian products they process but they also purchase a significant quantity of their raw material from other growers.

Table 8.25.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs between 101 to 500 people. During the financial year 2004 HP1 had group assets over \$51 million and an annual turnover between \$21 to \$50 million.

Table 8.25.1: Company details HP1

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HP [Horticulture processor]	1	>20	Unlisted private	>\$51million	\$21 million - \$50 million	101-500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.25.2 shows the various formal and informal supply chain partnerships that HP1 has created in their supply chain.

Table 8.25.2: Partnerships HP1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HP [Horticulture processor]	1	Vertical	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

HP1 has informal vertical supplier and customer supply chain partnerships. They do have formal agreements with partners relating to brokerage and distribution agreements. HP1 have outsourcing partnerships with companies involved in the heavy

machinery industry to supply, lease and maintain this machinery used in the farming sector of their business.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.25.3 illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating

Table 8.25.3: Ratings of trust HP1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	7	-1
2	Our partners always show a high level of honesty and integrity in our business dealings	5	7	-2
3	Our partners demonstrate a high standard of work in their business	5	7	-2
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	4	7	-3
5	Our partners have shared values and goals similar to our company	5	7	-2
6	Our partners are polite and respectful when dealing with our company	6	7	-1
7	Our partners are highly experienced and qualified in their fields and business	6	7	-1
8	Our partners are reliable and can be depended upon to deliver on their promises	5	7	-2
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	7	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	4	7	-3
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	6	7	-1
12	Our partners regularly share real time POS information with our company	7	7	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.25.4) is designed in exactly the same way as the trust analysis.

Table 8.25.4: Ratings of technology adoption HP1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	7	7	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	7	7	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	4	4	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	5	7	-2

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HP1 were partners that shared real time point of sale information with them. However they felt that some of their partnerships were one-sided with opportunistic behaviour occurring. Power dependency was sighted as being an issue with the duopoly in the retail supermarkets in Australia. There was limited benevolence in the customer partnerships and the major customers used their power; changing purchasing staff regularly and never allowing a relationship to build up between the supplier and the customer.

Technology

The most successful use of technology adoption in the supply chain for HP1 was installing technology that manufactured products that could be differentiated in the market. HP1 considered their organisation was an early adopter of technology that has a cost benefit. HP1 has successfully used video conferencing technology for national

and international meetings and business. Fax technology was still a strong communication system logistically with growers who carry the hard copy with them during the day for reference.

Government

HP1 have many interactions with government agencies in their supply chain. They consider government are not partnering with them effectively. HP1 always needs to follow them up for responses. They consider there is a very low level of trust between the agribusiness sector and the government particularly on water access.

Outsourcing

The main outsourcing used by HP1 relates to transport providers.

Traceability

HP1 have a commitment to traceability in their supply chain. They use EAN barcoding on cartons and packaged units to provide traceability in the supply chain and are looking at RFID technology in the future.

SUMMARY

The HP1 case study shows that for this case study organisation they have informal vertical upstream and down stream partnerships.

The HP1 case study illustrates there were two major gaps in trust in their supply chain. The first major gap related to their supply chain partners not having a high concern for being friendly, warm, and caring when dealing with their company. The second major gap involved partners not providing suitable customised business solutions to meet the unique requirements of their company. HP1 had four other significant gaps with their supply chain partners. The first concerned partners needing to improve the standard of work in their business. The second gap in trust concerned the level of honesty and integrity shown by some partners. The third gap in trust related to some partners not sharing the same values and goal as HP1. The fourth gap in trust involved some partners not being reliable and could not be depended upon to deliver on their promises.

HP1 had one main gap concerning technology adoption. This gap related to the HP1 wishing to adopt technology to trace their products in the supply chain better in the future.

Appendix 8.26: Case study - Horticulture Processor Two

OVERVIEW

The data relating to Horticulture Processor Two (HP2) was collected in an interview with the manager for growers for the organisation.

COMPANY BACKGROUND

HP2 is a fruit and vegetable processing company situated in Queensland. HP2's core business involves the processing of horticultural products and beverages.

Table 8.26.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs over 500 people. During the financial year 2004 HP2 had group assets over \$51 million and an annual turnover in excess of \$51 million.

Table 8.26.1: Company details HP2

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HP [Horticulture processor]	2	>20	Unlisted private	>\$51million	>\$51million	>500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.26.2 shows the various formal and informal supply chain partnerships that HP 2 has created in their supply chain.

Table 8.26.2: Partnerships HP2

Case Sector and Number		Partnerships	Supply Partnerships	Customer Partnerships
		Vertical Horizontal	Informal Formal	Informal Formal
HP [Horticulture processor]	2	Vertical	Supplier both	Customer informal

(Source: Developed for this research from field data by the author)

HP2 has formal vertical supplier chain partnerships with fruit and vegetable growers. They also have a number of vertical informal supplier partnerships with organisation that supply other raw material such as packaging, pulps, concentrates and other services for the group. HP2 has informal vertical customer supply chain partnerships with both the domestic and international customers. On the domestic market HP2 has informal customers supply chain partnerships with retailers and supermarkets. HP2 is also a food wholesaler of its products to the food service industry customers. The company has informal customer partnerships to supply bulk pulps to other food manufacturers who use HP2 food products in part of their manufacture. HP2 supplies import partners internationally with various processed horticultural products.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.26.3 (See page 343) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.26.3: Ratings of trust HP2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	5	5	0
2	Our partners always show a high level of honesty and integrity in our business dealings	5	6	-1
3	Our partners demonstrate a high standard of work in their business	4	5	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	3	5	-2
5	Our partners have shared values and goals similar to our company	5	6	-1
6	Our partners are polite and respectful when dealing with our company	3	6	-3
7	Our partners are highly experienced and qualified in their fields and business	4	6	-2
8	Our partners are reliable and can be depended upon to deliver on their promises	4	6	-2
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	6	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	6	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	2	6	-4
12	Our partners regularly share real time POS information with our company	3	6	-3

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.26.4) is designed in exactly the same way as the trust analysis.

Table 8.26.4: Ratings of technology adoption HP2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	6	6	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	7	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	5	0
16	Our company will adopt new technology if it is compatible with our type of business	6	7	-1
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	5	6	-1
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	6	7	-1
19	Our company will reject new technology if it is too expensive or complex to understand	5	5	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	5	6	-1

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for HP2 have been their openness, honesty and information sharing with their supply chain partners.

Technology

The most successful technology adoption in the supply chain for HP2 was the mobile phone, which can provide the option to speak to growers when they are on tractors away from their home or office. Email technology has provided the opportunity to quickly share detailed plans and photographs to communicate information and data. However, the use of email technology with some agribusiness suppliers was failing due to the gap in email technology knowledge and computer technology.

Government

HP2 consider the government has been involved in buzzwords and spending money on trendy supply chain partnerships as a facade rather than resolving policy problems on trade. The government has attempted to create a level playing field in international agribusiness that does not exist. The government has placed more and more demands on the supply chain partners for food safety, work place health and safety, environment management and managing this is putting some partners into overload.

Outsourcing

The main outsourcing used by HP2 relates to formal transport outsourcing both for inward fruit and vegetable products from growers and for finished goods, which are delivered to retailers, food service and manufacture industries.

Traceability

HP2 believe traceability has improved and is about as good as it needs to be. They see the traceability issue as one of handling the risk of legal liability. Traceability was also using up scarce resources in the business to maintain this standard.

SUMMARY

The HP2 case study shows that for this case study organisation they have informal and formal vertical upstream partnerships with suppliers. HP2 also has informal downstream partnerships with customers. In addition to this HP2 have formal outsourcing partnerships.

The HP2 case study illustrates there were three major gaps in trust in their supply chain. The first major gap related to their supply chain partners not regularly exchanging information with their company in relation to; sales, demand forecasting and production planning. The second major gap in trust concerned problems with supply chain partners not regularly sharing real time POS information their company. The third major gap in trust referred to some partners not being polite and respectful when dealing with their company. There were three other significant gaps in trust with their partners not being reliable and dependable to deliver on their promises, not being friendly, warm, and caring towards their company, and some partners not being as highly experienced and qualified in their fields and business as HP2 would prefer.

HP2 had five slight gaps concerning technology adoption to achieve the best possible supply chain partnerships. HP2 wished to adopt new technology more frequently to improve current technology and trace their products better in the supply chain through technology in the future. HP2 wanted to adopt technology more in the future by trialing technology in the business and observing technology working elsewhere here and overseas that could be used in the business. Finally HP2 wanted to adopt technology that was more compatible with their type of business in the future.

Appendix 8.27: Case study - Horticulture Processor Three

OVERVIEW

The data relating to Horticulture Processor Three (HP3) was collected in an interview with the managing director of the organisation.

COMPANY BACKGROUND

HP3 is a vegetable processor situated in rural Queensland. HP3's core business is the processing and marketing of vegetable products in Australia and overseas.

Table 8.27.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs between 101 and 500 people. During the financial year 2004 HP 3 had group assets between \$21million to \$50 million and an annual turnover between \$21million to \$50 million.

Table 8.27.1: Company details HP3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HP [Horticulture processor]	3	>20	Listed public	\$21 million - \$50 million	\$21 million - \$50 million	101-500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.27.2 shows the various formal and informal supply chain partnerships that HP3 has created in their supply chain.

Table 8.27.2: Partnerships HP3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HP [Horticulture processor]	3	Vertical	Supplier both	Customer both

(Source: Developed for this research from field data by the author)

HP 3 has long-term vertical formal supplier contracts with vegetable growers. They also have a number of informal long-term supplier chain relationships with suppliers of raw materials used in the processing of the vegetables. HP3 has formal supply chain partnerships with customers which can be for one or two years in Australia and overseas. They also have many informal customer relationships with customers in Australian and overseas. HP3 has no informal or formal horizontal partnership.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.27.3 (See page 347) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors.

The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.27.3: Ratings of trust HP3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	4	6	-2
2	Our partners always show a high level of honesty and integrity in our business dealings	4	6	-2
3	Our partners demonstrate a high standard of work in their business	5	6	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	5	6	-1
5	Our partners have shared values and goals similar to our company	5	5	0
6	Our partners are polite and respectful when dealing with our company	5	6	-1
7	Our partners are highly experienced and qualified in their fields and business	5	6	-2
8	Our partners are reliable and can be depended upon to deliver on their promises	6	7	-2
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	7	-2
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	3	5	-2
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	3	7	-4
12	Our partners regularly share real time POS information with our company	2	7	-5

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.27.4) is designed in exactly the same way as the trust analysis.

Table 8.27.4: Ratings of technology adoption HP3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	4	3	+1
14	Our company will adopt new technology when there is a need to improve the current technology	5	6	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	4	4	0
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	3	4	-1

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HP3 has been their long-term reliability to supply their customers domestically and overseas. HP3 and their supply chain partners have concentrated on producing the best quality product in the world and becoming an internationally recognised brand for the benefit of the supply chain members.

Technology

HP3 has the most sophisticated processing technology for their product in the world. The most successful technology adoption in the supply chain for HP3 has been the use of laser technology for grading. HP3 have significant mechanisation for the cutting and sorting of the premium products they market. These technologies have made the product more cost effective and competitive by using less manual labour.

Government

HP3 consider the government has been helpful in their supply chain through the export market development grant scheme initiative and the services of the Queensland Environmental Protection Agency Department who collaborated with the management of HP3 on water conservation in their processing facility.

Outsourcing

The main outsourcing used by HP3 relates to off-site packaging of materials, public relations and information technology software.

Traceability

Traceability has not assisted their business. It has been an added extra cost to their suppliers.

SUMMARY

The HP3 case study shows that for this case study organisation they have informal and formal vertical upstream partnerships with suppliers. HP3 also has informal and formal down stream partnerships with customers. HP3 have informal outsourcing partnerships.

The HP3 case study illustrates there were two major gaps in trust in their supply chain. The first major gap related to their supply chain partners not regularly exchanging information with their company in relation to: sales, demand forecasting and production planning. The second major gap in trust concerned problems with supply chain partners not regularly sharing real time POS information their company. There were six other significant gaps in trust with their partners. The first gap involved some partners not being reliable and dependable to deliver on their promises. The second gap concerned a lack of confidentiality in their business dealings with some partners. The third gap involved some partners not being as highly experienced and qualified in their fields and business as HP2 would prefer. The fourth gap concerned some partners not having a high level of honesty and integrity in their business dealings. The fifth gap related to some partners not attending promptly to the needs and requests of HP3 and handling these in a timely manner. The last gap

referred to some partners not providing suitable customised business solutions to meet the unique requirements of HP3.

HP3 had two slight gaps concerning technology adoption to achieve the best possible supply chain partnerships. HP3 wished to adopt new technology more frequently to improve current technology and trace their products better in the supply chain through technology in the future. However, HP3 had one area concerning technology adoption, which they were going to reduce; they are not going to taking on some of the technology requested of on them by other supply chain partners in the future.

Appendix 8.28: Case study - Horticulture Wholesaler one

OVERVIEW

The data relating to Horticulture Wholesaler One (HW1) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

HW1 is a licensed primary fruit and vegetable wholesaler in Brisbane, Queensland. HW1's core business involves the wholesaling of fruit and vegetables on behalf of growers to the retail and food processing industry.

Table 8.28.1 illustrates that the business has been established for between 11 to 20 years and is a private unlisted company, which employs less than 50 people. During the financial year 2004 the value of the group assets were not available but the annual turnover was between \$21to \$50 million.

Table 8.28.1: Company details HW1

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HW [Horticulture Fruit market agent]	1	11-20	Unlisted private	NA	\$21 million - \$50 million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.28.2 (See page 351) shows the various formal and informal supply chain partnerships that HW1 has created in their supply chain.

Table 8.28.2: Partnerships HW1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HW [Horticulture Fruit market agent]	1	Both	Supplier informal	Customer both

(Source: Developed for this research from field data by the author)

HW1 had long-term informal vertical supplier partnerships with growers who supply produce for them to sell in the Brisbane fruit market. They have informal and formal vertical partnerships with a number of different customers. The informal partnerships with customers are retail fruit shops, supermarkets, provedores, exporters and secondary wholesalers. The formal partnerships are with customers who are food-processing companies. HW1 also has horizontal supply chain partnerships with other wholesalers in the market and other fruit markets in other states of Australia.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.28.3 (See page 352) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.28.3: Ratings of trust HW1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	7	7	0
2	Our partners always show a high level of honesty and integrity in our business dealings	7	7	0
3	Our partners demonstrate a high standard of work in their business	6	6	0
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	6	0
5	Our partners have shared values and goals similar to our company	6	6	0
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	6	6	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	6	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	7	7	0
12	Our partners regularly share real time POS information with our company	5	6	-1

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.28.4) is designed in exactly the same way as the trust analysis.

Table 8.28.4: Ratings of technology adoption HW1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	4	4	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	6	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	6	-1
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	6	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HW1 has been their long-term relationship with suppliers and customers built on openness, honesty, trust, regular communication, responsibility and respectfulness.

Technology

HW1 consider the most successful technology adoption in their supply chain was palletisation and refrigeration.

Government

HW1 consider the government partnerships do not show initiative and impose unnecessary regulation on the industry, such as the proposed code of conduct in marketing fruit and vegetables. The proposed code of conduct regulation was a cost impost for a grading system that would create red tape and do nothing to help promote the industry.

Outsourcing

The main outsourcing used by HW1 relates to external quality assurance consultants and quality assurance auditing.

Traceability

HW1 believes traceability has not assisted the supply chain in relation to country of origin labelling. The products that are imported into this country from overseas are not subject to the same conditions, rules, regulations and costs as in this country. These products are cheaper due to the lesser requirements in the importers country and hence disadvantage our growers in Australian.

SUMMARY

The HW1 case study shows that for this case study organisation they have informal vertical upstream supply chain partnerships. They have both informal and formal down stream partnerships. HW1 has a number of informal horizontal supply chain partnerships.

The HW1 case study illustrates there was only one slight gap in trust in their supply chain. This gap involved a slight improvement in problems with supply chain partners not regularly sharing real time POS information their company.

HW1 had one slight gap concerning technology adoption. This gap related to the HW1 wishing to adopt technology through more observation of technology in Australia and overseas.

Appendix 8.29: Case study - Horticulture Wholesaler Two

OVERVIEW

The data relating to Horticulture Wholesaler Two (HW2) was collected in an interview with the managing director of the organisation.

COMPANY BACKGROUND

HW2 is a licensed primary fruit and vegetable wholesaler in urban Brisbane, Queensland. HW2's core business involves the wholesaling of fruit and vegetables on behalf of growers to the retail food industry.

Table 8.29.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs less than 50 people. During the financial year 2004 HW2 had group assets between \$1 million and \$20 million and an annual turnover between \$21 to \$50 million.

Table 8.29.1: Company details HW2

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HW [Horticulture Fruit market agent]	2	>20	Unlisted private	\$1million - \$20 million	\$21 million - \$50 million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.29.2 shows the various formal and informal supply chain partnerships that HW2 has created in their supply chain.

Table 8.29.2: Partnerships HW2

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HW [Horticulture Fruit market agent]	2	Vertical	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

HW2 has long-term informal vertical supplier partnerships with growers who supply produce for them to sell in the Brisbane fruit market. HW2 has long-term informal vertical supplier partnerships with growers and exporters from overseas, who they act as principals for, to sell their produce, in the Brisbane fruit market. HW2 has informal vertical partnerships with a number of different customers. The informal partnerships are with retail fruit shops, supermarkets, exporters and country wholesaler customers. HW2 do not have horizontal supply chain partnerships with other wholesalers in the market.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.29.3 (See page 356) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.29.3: Ratings of trust HW2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	5	5	0
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	5	5	0
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	6	0
5	Our partners have shared values and goals similar to our company	6	6	0
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	6	6	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	5	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	6	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	6	6	0
12	Our partners regularly share real time POS information with our company	6	6	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.29.4) is designed in exactly the same way as the trust analysis.

Table 8.29.4: Ratings of technology adoption HW2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Perception	Expectation	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	5	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	5	0
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	6	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HW2 has been their long-term relationship with suppliers and customers built on honesty. HW2 consider their truth in market appraisal by advising a price expectation promptly to the growers was important to the growers who supported their supply chain. The payment of sales proceeds as promised to the growers on time by HW2 has built confidence in their supply chain partnerships.

Technology

HW2 consider the most successful technology adoption in their supply chain was cool chain technology through refrigeration, and the mobile phone to speed communication in the supply chain. The initiative of industry to grow improved varieties through genetic engineering has provided the supply chain with products that have improved quality and shelf life.

Government

HW2 consider the government partnerships do nothing to assist the wholesale fruit and vegetable sector. The Queensland Department of Primary Industry has provided a good partnership link with growers.

Outsourcing

The main outsourcing used by HW2 relates to service providers of computer software, transport and pallets.

Traceability

HW2 consider traceability is about risk management and is an acceptable requirement on industry. HW2 maintain and record product history for traceability purposes.

SUMMARY

The HW2 case study shows that for this case study organisation they have informal vertical upstream and downstream supply chain partnerships. They do not engage in horizontal supply chain partnerships.

The HW2 case study illustrates there was no gaps in trust in their supply chain. Likewise they had no gaps concerning technology adoption.

Appendix 8.30: Case study - Horticulture Wholesaler Three

OVERVIEW

The data relating to Horticultural Wholesale Three (HW3) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

HW3 is a licensed primary fruit and vegetable wholesaler in urban Brisbane, Queensland. WH3's core business involves the wholesaling of fruit and vegetables on behalf of growers and packinghouses to the retail food industry.

Table 8.30.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs less than 50 people. During the financial year 2004 HW3 had group assets between \$1 million and \$20 million and an annual turnover between \$21 to \$50 million.

Table 8.30.1: Company details HW3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HW [Horticulture Fruit market agent]	3	>20	Unlisted private	\$1million - \$20 million	\$21 million - \$50 million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.30.2 (See page 359) shows the various formal and informal supply chain partnerships that HW3 has created in their supply chain.

Table 8.30.2: Partnerships HW3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HW [Horticulture Fruit market agent]	3	Both	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

HW3 has long-term informal vertical supplier partnerships with growers and pack houses that supply produce for them to sell as agents in the Brisbane fruit market.

HW3 has long-term informal vertical supplier partnerships with growers and exporters from overseas. HW3 acts as an agent to sell their produce in the Brisbane fruit market. HW3 has informal vertical partnerships with a number of different customers. The informal partnerships are with retail fruit shops, supermarkets, exporters and country wholesaler customers. HW3 has informal horizontal supply chain partnerships with other wholesalers in the market.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.30.3 (See page 360) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust rating depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.30.3: Ratings of trust HW3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	6	0
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	6	6	0
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	6	0
5	Our partners have shared values and goals similar to our company	5	5	0
6	Our partners are polite and respectful when dealing with our company	4	4	0
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	6	6	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	4	4	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	6	-2
12	Our partners regularly share real time POS information with our company	4	6	-2

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.30.4) is designed in exactly the same way as the trust analysis.

Table 8.30.4: Ratings of technology adoption HW3

No	Questions - Technology Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	7	7	0
14	Our company will adopt new technology when there is a need to improve the current technology	5	6	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	5	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	5	7	-2

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factor relating to partnerships for HW3 have been their customer service and availability to communicate with supply chain members 24 hours a day, seven days a week when required. HW3 has built confidence with their growers based on their competence to make a quick decision about a product and price in the market on a daily basis. HW3 has a strong commitment to their supply chain members and engages in open and regular communication with their supply chain partners.

Technology

HW3 consider the most successful technology adoptions in their supply chain was cool chain technology through refrigeration, and the mobile phone to speed communication in the supply chain. The introduction of forklift handling equipment was a significant development in technology for handling produce in the supply chain.

Government

HW3 consider the government partnerships do nothing to assist the wholesale fruit and vegetable sector.

Outsourcing

The main outsourcing used by HW2 relates to service providers of forklift equipment and refrigeration technology.

Traceability

HW3 consider traceability is a risk management tool and was not growing the business.

SUMMARY

The HW3 case study shows that for this case study organisation they have informal vertical upstream and downstream supply chain partnerships. They have a number of informal horizontal supply chain partnerships.

The HW3 case study illustrates there were two significant gaps in trust in their supply chain. The first gap related to their supply chain partners not regularly exchanging information with their company in relation to: sales, demand forecasting and production planning. The second gap in trust concerned problems with supply chain partners not regularly sharing real time POS information their company

HW3 had one significant gap concerning technology adoption. This gap related to the HW3 wishing to adopt technology that would trace more of their products in the future in the supply chain.

Appendix 8.31: Case study - Horticulture Fruit Retailer One

OVERVIEW

The data relating to Horticulture Fruiterer (HF1) was collected in an interview with the owner of the organisation.

COMPANY BACKGROUND

HF1 is an award winning fruit and vegetable retailer located in rural Queensland. HF1's core business involves the marketing of fruit and vegetables to domestic retail consumers.

Table 8.31.1 (See page 363) illustrates that the business has been established for over 20 years and is a private unlisted company, which employs less than 50 people. During the financial year 2004 the group assets value for HF1 was not available and the annual turnover was less than \$1 million.

Table 8.31.1: Company details HF1

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HF [Horticulture fruit retailer]	1	>20	Unlisted private	NA	<\$1million	<50

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.31.2 shows the various formal and informal supply chain partnerships that HF1 has created in their supply chain.

Table 8.31.2: Partnerships HF1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HF [Horticulture fruit retailer]	1	Both	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

HF1 has informal vertical supplier partnerships with a restricted number of preferred wholesalers in the Brisbane fruit market. They also have a restricted number of preferred local growers who supply produce directly to HF1 and not through the Brisbane fruit market. The majority of HF1 vertical supply chain customers are retail consumers who live in a 30-kilometre radius of the shop. HF1 also has a vertical informal supply chain partnership with a customer who is a major local tourist destination. HF1 have an informal horizontal supply chain partnership with some other retailers in the area but this is a sporadic relationship.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.31.3 (See page 364) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on

the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.31.3: Ratings of trust HF1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	6	0
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	5	6	-1
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	3	3	0
5	Our partners have shared values and goals similar to our company	6	6	0
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	5	6	-1
8	Our partners are reliable and can be depended upon to deliver on their promises	7	7	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	5	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	6	-2
12	Our partners regularly share real time POS information with our company	6	6	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.31.4) is designed in exactly the same way as the trust analysis.

Table 8.31.4: Ratings of technology adoption HF1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	5	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	6	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	5	5	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	6	6	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	6	6	0
19	Our company will reject new technology if it is too expensive or complex to understand	5	5	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	6	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for HF1 has been suppliers who are reliable and provide good quality produce. Creating good relationships with their retail customers was critical.

Technology

HF1 consider the most successful technology adoption in their supply chain was cool chain technology integrity through the supply chain from the grower to the retail shop.

Government

HF1 consider the government partnerships do nothing to assist the retail fruit and vegetable supply chain. Some of the government small business initiatives have been of assistance to their business.

Outsourcing

HF1 do not outsource any business activities.

Traceability

HF1 consider traceability is a significant issue with their retail customers. The customers are interested in country of origin and wish to know if the produce is locally grown in their region, Australian or imported. The power of the media has a significant impact on consumer's views on imported products and country of origin labelling.

SUMMARY

The HF1 case study shows that for this case study organisation they have informal vertical upstream and downstream supply chain partnerships. They have some informal horizontal supply chain partnerships.

The HF1 case study illustrates there was one significant gap in trust in their supply chain. This gap related to their supply chain partners not regularly exchanging information with their company in relation to: sales, demand forecasting and production planning. They have two other slight gaps in trust. The first gap involved some partners not being as highly experienced and qualified in their fields and business as HF1 would prefer. The other gap concerned the fact that some partners did not have a high standard of work in their business.

HF1 did not have any gaps concerning technology adoption.

Appendix 8.32: Case study - Horticulture Fruit Retailer Two

OVERVIEW

The data relating to Horticulture Fruiterer (HF2) was collected in an interview with the director of the organisation.

COMPANY BACKGROUND

HF2 is an award winning fruit and vegetable retailer located in rural Queensland. HF2's core business involves the marketing of fruit and vegetables to domestic retail

consumers. Table 8.32.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs between 101 and 500 people. During the financial year 2004 HF2 had group assets between \$21 million to \$50 million and an annual turnover between \$21million to \$50 million.

Table 8.32.1: Company details HF2

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HF [Horticulture fruit retailer]	2	>20	Unlisted private	\$21 million - \$50 million	\$21 million - \$50 million	101-500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.32.2 shows the various formal and informal supply chain partnerships that HF2 has created in their supply chain.

Table 8.32.2: Partnerships HF1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HF [Horticulture fruit retailer]	2	Both	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

HF2 has long-term informal vertical supplier partnerships with a restricted number of preferred wholesalers in the Brisbane fruit market. They also have a restricted number of preferred growers who supply produce directly to HF2 and not through the Brisbane fruit market. HF2 has a number of regional fruit and vegetable shops, which have long-term informal vertical supply chain retail customers who live in a 50 kilometre radius of the shop. HF2 also has a vertical informal supply chain partnership with regional supermarket customers as a secondary wholesaler. HF2 has a formal horizontal supply chain partnership as a member of the Brisbane fruit market.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.32.3 illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.32.3: Ratings of trust HF2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	7	-1
2	Our partners always show a high level of honesty and integrity in our business dealings	6	7	-1
3	Our partners demonstrate a high standard of work in their business	4	6	-2
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	5	5	0
5	Our partners have shared values and goals similar to our company	6	6	0
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	5	6	-1
9	Our partners attend promptly to our needs and requests handling these in a timely manner	5	6	-1
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	4	6	-2
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	4	6	-2
12	Our partners regularly share real time POS information with our company	5	6	-1

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.32.4) is designed in exactly the same way as the trust analysis.

Table 8.32.4: Ratings of technology adoption HF2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	5	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	6	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	4	4	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	6	6	0
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	6	0

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for HF2 has been building long term purchasing relationships with a select group of suppliers based on loyalty. In return for this loyalty, HF2 enjoys priority service by these suppliers. HF2 consider paying their accounts on time with suppliers has built trust in the partnership. HF2 also consider the supply chain partners being open and honest with each other on produce quality has provided sound conflict resolution processes and benevolence in mediating quality problems.

Technology

HF2 consider the most important technology adoption that has changed the industry communication has been the use of the mobile phone. Improvements to the cool chain from grower to consumer have been a positive technology adoption, with retail shops

having different temperatures for different products and air-conditioned shops. This improvement has provided better quality produce and longer shelf life.

Government

HF2 consider the government partnerships have been positive in the retail fruit and vegetable sector relating to food safety and work place health and safety legislation. The regulation of road transport in the supply chain has also been positive. However HF2 is concerned with the taxes in the supply chain on labour that are adding on costs to production.

Outsourcing

HF2 outsource refrigerated road transport, computer software and accounting services.

Traceability

HF2 consider traceability is a significant issue with their retail customers. The customers are very aware of the subject of country of origin and wish to know if the produce is local, Australian or imported. Imported horticultural products are perceived by some customers as unsafe.

SUMMARY

The HF2 case study shows they have informal vertical upstream and downstream supply chain partnerships. They have some informal horizontal supply chain partnerships.

The HF2 case study illustrates there was three significant gaps in trust in their supply chain. The first gap related to their supply chain partners not regularly exchanging information with the company in relation to: sales, demand forecasting and production planning. The second gap concerned some partners that did not have a high standard of work in their business. The third gap involved some supply chain partners not providing suitable customised business solutions to meet the unique requirements of their company.

HF2 did not have any gaps concerning technology adoption.

Appendix 8.33: Case study - Horticulture Fruit Retailer Three

OVERVIEW

The data relating to Horticulture Fruiterer Three (HF3) was collected in an interview with the merchandise manager of the organisation.

COMPANY BACKGROUND

HF3 is a fruit and vegetable retail chain with over ten stores located in urban Brisbane Queensland. HF3's core business involves the marketing of fruit and vegetables to domestic retail consumers.

Table 8.33.1 illustrates that the business has been established for over 20 years and is a private unlisted company, which employs between 101 to 500 people. During the financial year 2004 HF3 had group assets between \$21 million to \$50 million and an annual turnover between \$21million to \$50 million.

Table 8.33.1: Company details HF3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HF [Horticulture fruit retailer]	3	Both	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.33.2 shows the various formal and informal supply chain partnerships that HF3 has created in their supply chain.

Table 8.33.2: Partnerships HF3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HF [Horticulture fruit retailer]	2	>20	Unlisted private	\$21 million - \$50 million	\$21 million - \$50 million	101-500

(Source: Developed for this research from field data by the author)

HF3 has informal vertical supplier partnerships with a restricted number of preferred wholesalers in the Brisbane fruit market. They also have a restricted number of preferred local growers who supply produce directly to HF3 and not through the Brisbane fruit market. The majority of HF3 vertical supply chain customers are retail consumers who live in a five-kilometre radius of the shop. HF3 have an informal

horizontal supply chain partnership with some other retailers in the area but this is a sporadic relationship.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.33.3 (See page 373) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust rating depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.33.3: Ratings of trust HF3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	4	7	-3
2	Our partners always show a high level of honesty and integrity in our business dealings	3	7	-4
3	Our partners demonstrate a high standard of work in their business	4	7	-3
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	7	-1
5	Our partners have shared values and goals similar to our company	4	6	-2
6	Our partners are polite and respectful when dealing with our company	6	7	-1
7	Our partners are highly experienced and qualified in their fields and business	6	7	-1
8	Our partners are reliable and can be depended upon to deliver on their promises	3	6	-3
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	6	7	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	6	7	-1
12	Our partners regularly share real time POS information with our company	5	6	-1

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.33.4) is designed in exactly the same way as the trust analysis.

Table 8.33.4: Ratings of technology adoption HF3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	4	4	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	7	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	4	4	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	5	0
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	4	6	-2

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for HF3 has been building long term relationships with partners built on trust, patience, understanding, commitment, communication and genuineness.

Technology

HF3 consider the most successful technology adoption has been the scanner and computerised till at the checkout which can provide the input for daily orders. The data from the computer for the daily orders is dispatched to the suppliers between one pm and three pm every day.

Government

HF3 consider the government partnerships have not assisted the fruit and vegetable retail sector.

Outsourcing

HF3 outsource a number of activities including refrigerated road transport, computer software and support, pest control, trolley collection, maintenance and human resources recruitment.

Traceability

HF3 consider traceability is a risk management tool based on a market concept, which they manage.

SUMMARY

The HF3 case study shows that for this case study organisation they have informal vertical upstream and downstream supply chain partnerships. They have some informal horizontal supply chain partnerships.

The HF3 case study illustrates there was four major gaps in trust in their supply chain. The first major gap concerned a lack of confidentiality in their business dealings with some partners. The second major gap concerned some partners not having a high level of honesty and integrity in their business dealings. The third major gap in trust involved some partners not being reliable and dependable to deliver on their promises. The fourth major gap involved some partners not having a high standard of work in their business. HF3 had one significant gap and a number of slight gaps in trust in their supply chain. The significant gap concerned some supply chain partners not sharing values and goals similar to their company.

HF3 had one significant gap concerning technology adoption. This gap related to the HF3 wishing to adopt technology that would trace more of their products in the future in the supply chain. HF3 had another slight gap in the technology adoption, which concerned upgrading and adopting new technology more frequently in the future to improve the current technology.

Appendix 8.34: Case study - Horticulture Restaurant One

OVERVIEW

The data relating to Horticulture Restaurant One (HR1) was collected in an interview with the joint owner of the organisation.

COMPANY BACKGROUND

HR1 is a restaurant with a focus on serving commercial and organic fruit and vegetables on its menu. HR1's core business involves serving wholesome fruit and vegetables dishes to the retail public who dine in or takeaway.

Table 8.34.1 (See page 376) illustrates that the business has been established for less than five years and is a private unlisted company, which employs less than 50 people. During the financial year 2004 HR1 the value of the group assets were unavailable and the annual turnover was less than \$1 million.

Table 8.34.1: Company details HR1

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HR [Horticulture restaurant]	1	<5	Unlisted private	NA	<\$1million	<50

(**Source:** Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.34.2 shows the various formal and informal supply chain partnerships that HR1 has created in their supply chain.

Table 8.34.2: Partnerships HR1

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HR [Horticulture restaurant]	1	Both	Supplier informal	Customer informal

(**Source:** Developed for this research from field data by the author)

HR1 has informal vertical supplier partnerships with a select number of preferred fruiterers in their local area. They also have an informal vertical supply chain partnership with an organic wholesaler in Brisbane. HR1 have a vertical informal customer partnership with their retail customers who dine in or take away. These customers have a strong relationship with the restaurant because of their beliefs and cultures relating to vegetarian food. HR1 have an informal horizontal supply chain partnership with some other retailers who they supply special vegetarian food, coffee and juice.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology are presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.34.3 (See page 377) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between

the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.34.3: Ratings of trust HR1

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	4	6	-2
2	Our partners always show a high level of honesty and integrity in our business dealings	6	6	0
3	Our partners demonstrate a high standard of work in their business	4	7	-3
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	6	0
5	Our partners have shared values and goals similar to our company	5	6	-1
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	7	7	0
8	Our partners are reliable and can be depended upon to deliver on their promises	3	5	-2
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	6	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	5	5	0
12	Our partners regularly share real time POS information with our company	2	6	-4

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.34.4) is designed in exactly the same way as the trust analysis.

Table 8.34.4: Ratings of technology adoption HR1

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	4	4	0
14	Our company will adopt new technology when there is a need to improve the current technology	5	6	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	4	4	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	4	4	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	6	-1
19	Our company will reject new technology if it is too expensive or complex to understand	7	7	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	7	-1

(**Source:** Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for HR1 has been the creation of ethical business relationships with partners. The supply chain partners have common goals on organic products and philosophies. The major suppliers of fruit and vegetables are located extremely nearby the restaurant and have a flexible delivery service with flexible payment and pricing arrangements.

Technology

HR1 consider the most successful technology adoption has been the sound system they use in the restaurant.

Government

HR1 consider the government partnerships have assisted their business and supply chain by the small business initiatives that help support employers of the long- term unemployed, Torres Strait and Aboriginal people to work in their business.

Outsourcing

HR1 do not outsource any core activities.

Traceability

Traceability is very important to the customer's philosophy and the culture of HR1. The customers are very particular about the origins of the fruit and vegetables and if they are derived from commercial or organic producers.

SUMMARY

The HR1 case study shows that for this case study organisation they have informal vertical upstream and downstream supply chain partnerships. They have some informal horizontal supply chain partnerships.

HR1 had two major gaps in trust in their supply chain. The first major gap in trust concerned problems with supply chain partners not regularly sharing real time POS information their company. The second major gap involved some partners not having a high standard of work in their business. There were two significant gaps in trust. The first significant gap concerned a lack of confidentiality in their business dealings with some partners. The second significant gap involved some partners not being reliable and dependable to deliver on their promises.

HR1 had two slight gaps concerning technology adoption. The first gap concerned the need to adopting new technology more frequently in the future to improve the current technology. The second gap related to HR1 wishing to adopt technology that would trace more of their products in the future in the supply chain.

HR1 consider their most successful partnerships have been built the creation of ethical business relationships with partners. The supply chain partners have common goals on organic products and philosophies. The major suppliers being located extremely

nearby the restaurant who provide a flexible delivery service, payment and pricing terms.

HR1 consider the most successful technology adoption in their supply chain has been the sound system they use in the restaurant.

HR1 consider the government partnerships have not assisted their supply chain through small business initiatives that help support employers of the long- term unemployed, Torres Strait and aboriginal people.

HR1 consider traceability is very important to the customer's philosophy and the culture of supply chain particularly about the origins of the fruit and vegetables and if they are derived commercial or organic producers.

Appendix 8.35: Case study - Horticulture Restaurant Two

OVERVIEW

The data relating to Horticulture Restaurant Two (HR2) was collected in an interview with the director of purchasing and systems of the organisation.

COMPANY BACKGROUND

HR2 is a restaurant chain that has a focus on serving fresh fruit and vegetables on its menu. HR2 has outlets, located in urban and rural New South Wales, Western Australia and Queensland. The core business involves serving wholesome food dishes of various types with a specific market segments focused on fresh fruit and vegetables to the retail public that dine in their restaurants.

Table 8.35.1 (See page 381) illustrates the business has been established over 20 years and is a private unlisted company, which employs over 500 people. During the financial year 2004 HR2 had group assets over \$51 million with an annual turnover over \$51 million.

Table 8.35.1: Company details HR2

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HR [Horticulture restaurant]	2	>20	Unlisted private	>\$51million	>\$51million	>500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.35.2 shows the various formal and informal supply chain partnerships that HR2 has created in their supply chain.

Table 8.35.2: Partnerships HR2

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HR [Horticulture restaurant]	2	Both	Supplier informal	Customer informal

(Source: Developed for this research from field data by the author)

HR2 has informal vertical supplier chain partnerships with a select number of preferred fruit wholesalers in various regions near their restaurants who supply whole fruit. They have a long-term informal vertical supplier partnership with a company that produces prepared cut and washed salad mixes nationally. HR2 has a vertical informal supply chain partnership with their retail customers who dine in. These customers have a strong relationship with the restaurant because of their beliefs and cultures relating to fresh fruit and vegetable philosophy in food. HR2 have a formal horizontal supply chain partnership with some other restaurants in the USA and Australia concerned industry-benchmarking studies.

DATA COLLECTION

In this section data relating to perceived *levels* and *importance* of trust and technology are presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.35.3 (See page 382) illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust rating depicts how the interviewee currently rates each of the 12 trust

factors. The expectation *importance* rating depicts how the interviewee considers the related trust factors should rate now or in the future. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 8.35.3: Ratings of trust HR2

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	6	6	0
2	Our partners always show a high level of honesty and integrity in our business dealings	7	7	0
3	Our partners demonstrate a high standard of work in their business	6	6	0
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	6	0
5	Our partners have shared values and goals similar to our company	6	6	0
6	Our partners are polite and respectful when dealing with our company	7	7	0
7	Our partners are highly experienced and qualified in their fields and business	7	7	0
8	Our partners are reliable and can be depended upon to deliver on their promises	7	7	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	7	7	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	7	7	0
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	7	7	0
12	Our partners regularly share real time POS information with our company	7	7	0

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.35.4) is designed in exactly the same way as the trust analysis.

Table 8.35.4: Ratings of technology adoption MR2

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	3	3	0
14	Our company will adopt new technology when there is a need to improve the current technology	7	7	0
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	5	5	0
16	Our company will adopt new technology if it is compatible with our type of business	7	7	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	5	0
19	Our company will reject new technology if it is too expensive or complex to understand	5	5	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	4	6	-2

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for HR2 has been relationships with partners 'who know our business'. The supply chain partnerships are built upon mutual trust and the predictability of an assured of supply of produce to an assured market every day of the year. The products that are supplied are quality assured. The products supplied use the latest technology and the distribution system provides quick delivery speed to the outlets.

Technology

HR2 consider the most successful technology adoption has been the use of electronic invoicing systems with suppliers.

Government

HR2 consider the government partnerships have no effect on their business. HR2 have good partnerships with the various government departments that relate to the different sectors of business.

Outsourcing

HR1 outsource distribution and transport services. A number of the whole vegetables that are used in the restaurants are processed through outsourcing.

Traceability

Traceability in the business is improving and will continue in the future.

SUMMARY

The HR2 case study shows that for this case study organisation they have informal vertical upstream and downstream supply chain partnerships. They have a formal horizontal supply chain partnership with other restaurant chains.

HR2 had no gaps in trust in their supply chain.

HR2 had one slight gap concerning technology adoption. This gap related to HR2 wishing to adopt technology that would trace more of their products in the future in the supply chain.

Appendix 8.36: Case study - Horticulture Restaurant Three

OVERVIEW

The data relating to Horticulture Restaurant Three (HR3) was collected in an interview with the procurement manager of the organisation.

COMPANY BACKGROUND

HR3 is a restaurant chain that has a focus on serving fresh fruit and vegetables on its menu. HR3 has outlets in every state in Australia in various urban and rural locations. HR3's core business involves serving wholesome food dishes of various types with a specific market segments focused on fresh fruit and vegetables for dine in or take away customers.

Table 8.36.1 illustrates that the business has been established for between 11 to 20 years and is a private unlisted company, which employs over 500 people. During the financial year 2004 the value of the group assets of HR3 was unavailable and the annual turnover was between \$21 to \$50 million.

Table 8.36.1: Company details HR3

Case study and number		Year established	Company structure	Company assets	Annual turnover	Number of employees
HR [Horticulture restaurant]	3	11-20	Unlisted private	NA	\$21 million - \$50 million	>500

(Source: Developed for this research from field data by the author)

PARTNERSHIPS

Table 8.36.2 shows the various formal and informal supply chain partnerships that HR3 has created in their supply chain.

Table 8.36.2: Partnerships HR3

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HR [Horticulture restaurant]	3	Vertical	Supplier formal	Customer informal

(Source: Developed for this research from field data by the author)

HR3 has formal vertical supplier partnerships with approved fruit wholesalers in various regions near their restaurants who supply whole fruit. They have formal vertical supplier partnerships with various approved suppliers who produce prepared cut and washed vegetables. HR3 has a vertical informal supply chain partnership with their retail customers who dine in and take away. These customers have a strong relationship with the restaurant because of their beliefs and cultures relating to fresh fruit and vegetable philosophy in food. HR3 did not have any horizontal supply chain partnership.

DATA COLLECTION

In this section, data relating to perceived *levels* and *importance* of trust and technology is presented. The difference between these perceived *levels* and *importance* is illustrated by a gap rating, which is also discussed in this section.

Trust

The data collected on trust in Table 8.36.3 illustrates the ratings of the perceived *levels* and *importance* of trust in their supply chain. The perception rating *level* of trust depicts how the interviewee currently rates each of the 12 trust factors. The expectation *importance* rating illustrates the *importance* the interviewee places on the trust factors in the supply chain. The gap is measured by the difference between the ratings of perceptions for the current *level* and *importance* of trust. The critical gaps in the supply chain are established by comparing the trust factors with the highest gap rating and the highest expectation *importance* rating.

Table 7.36.3: Trust Partnerships HR3

No	Questions - Trust Rating system: - 1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
1	Our partners maintain a high degree of confidentiality in our business dealings	5	7	-2
2	Our partners always show a high level of honesty and integrity in our business dealings	5	7	-2
3	Our partners demonstrate a high standard of work in their business	7	7	0
4	Our partners have a high concern for being friendly, warm, and caring when dealing with our company	6	6	0
5	Our partners have shared values and goals similar to our company	6	6	0
6	Our partners are polite and respectful when dealing with our company	6	6	0
7	Our partners are highly experienced and qualified in their fields and business	6	6	0
8	Our partners are reliable and can be depended upon to deliver on their promises	6	6	0
9	Our partners attend promptly to our needs and requests handling these in a timely manner	6	6	0
10	Our partners provide suitable customised business solutions to meet the unique requirements of our company	5	6	-1
11	Our partners regularly exchange information with our company in relation to; sales, demand forecasting and production planning	6	7	-1
12	Our partners regularly share real time POS information with our company	5	6	-1

(Source: Developed for this research from field data by the author)

Technology

The data collected on the technology adoption factors (Table 8.36.4) is designed in exactly the same way as the trust analysis.

Table 8.36.4: Ratings of technology adoption HR3

No	Questions - Technology Rating system: -1 = Lowest rating, 7 = Highest rating	Level	Importance	Gap
13	Our company will adopt new technology when it is forced upon us by other supply chain members or the government	5	5	0
14	Our company will adopt new technology when there is a need to improve the current technology	6	7	-1
15	Our company will adopt new technology provided it is not extremely complex and difficult to understand	6	6	0
16	Our company will adopt new technology if it is compatible with our type of business	6	6	0
17	Our company will normally only adopt new technology if we can trial the new technology in a section of our business	7	7	0
18	Our company will normally only adopt new technology if we can see the technology is successfully working elsewhere	5	5	0
19	Our company will reject new technology if it is too expensive or complex to understand	6	6	0
20	Our company is using technology to ensure our products have full traceability in the supply chain	6	7	-1

(Source: Developed for this research from field data by the author)

INTERVIEWEE COMMENTS

During the interview the interviewee was invited to provide views on what were considered to be the most successful factors in their supply chain concerning partnerships, technology, government, outsourcing and traceability.

Partnerships

The most successful factors relating to partnerships for HR3 has been relationships with partners who supply the required produce to specification consistently during the year. The supply chain partners must be cost efficient in the produce they supply. Partners must also be receptive to research and development partnerships on different products and specifications.

Technology

HR3 consider the most successful technology adoption was the use of the Internet for daily on-line ordering of products to be delivered to the restaurants.

Government

HR3 consider the government partnerships have no affect on their business. HR3 have been working with the government to eliminate packaging material where possible to reduce environmental pollution of this material.

Outsourcing

HR3 outsource service providers of quality assurance auditing, product testing laboratories and market research agencies.

Traceability

HR3 considered traceability important to provide transparency in the food supply chain to build consumer confidence in the business and the supply chain.

SUMMARY

The HR3 case study shows that for this case study organisation they have formal vertical upstream partnerships however their downstream supply chain partnerships are informal. They do not have any formal horizontal supply chain partnerships.

HR3 show two moderate gaps in trust, with the first gap concerning a lack of confidentiality in their business dealings with some partners. The second gap concerns some partners that have a lower level of honesty and integrity in their business dealings than HR3 would prefer. HR3 has three slight gaps in trust. The first gap referred to some partners not providing suitable customised business solutions to meet the unique requirements of their company. The second gap related to their supply chain partners not regularly exchanging information with their company in relation to: sales, demand forecasting and production planning. The last gap in trust concerned problems with supply chain partners not regularly sharing real time POS information with their company.

HR3 had two slight gaps concerning technology adoption. This gap related to HR3 wishing to adopt technology that would trace more of their products in the future in the supply chain. HR3 wanted to adopt technology more frequently to improve current technology in the future.

Appendix 9.0: Meat and horticulture industry case study background

Appendix 9.1: Meat Industry – Case study background

Case study and number		Years established	Company structure	Company assets	Annual Turnover	Number of Employees
MP [Beef producer]	1	11-20	Unlisted private	>\$51million	\$21 million - \$50 million	50-100
MP [Beef producer]	2	5-10	Unlisted private	>\$51million	\$21 million - \$50 million	50-100
MP [Beef producer]	3	>20	Unlisted private	>\$51million	>\$51million	101-500
MF [Meat feedlotter]	1	5-10	Listed Private	\$21 million - \$50 million	>\$51million	<50
MF [Meat feedlotter]	2	11-20	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	<50
MF [Meat feedlotter]	3	>20	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	<50
MA [Meat abattoir]	1	>20	Unlisted private	>\$51million	>\$51million	>500
MA [Meat abattoir]	2	>20	Unlisted private	NA	NA	101-500
MA [Meat abattoir]	3	>20	Unlisted private	>\$51million	>\$51million	>500
MW [Meat wholesaler]	1	11-20	Unlisted private	NA	\$21 million - \$50 million	<50
MW [Meat wholesaler]	2	5-10	Unlisted private	NA	NA	<50
MW [Meat wholesaler]	3	5-10	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	<50
MB [Meat butcher]	1	<5	Unlisted private	<\$1million	<\$1million	<50
MB [Meat butcher]	2	5-10	Unlisted private	<\$1million	\$1million - \$20 million	<50
MB [Meat butcher]	3	<5	Unlisted private	<\$1million	\$1million - \$20 million	<50
MR [Meat restaurant]	1	<5	Unlisted private	<\$1million	<\$1million	<50
MR [Meat restaurant]	2	>20	Listed public	NA	\$1million - \$20 million	101-500
MR [Meat restaurant]	3	11-20	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	101-500

(Source: Analysis of field data)

Appendix 9.2: Horticulture Industry – Case study background

Case study and number		Years established	Company structure	Company assets	Annual Turnover	Number of Employees
HNS [Horticulture nursery & seeds]	1	>20	Unlisted private	\$21 million - \$50 million	NA	101-500
HNS [Horticulture nursery & seeds]	2	>20	Unlisted private	\$1million - \$20 million	>\$51million	101-500
HNS [Horticulture nursery & seeds]	3	>20	Unlisted private	>\$51million	\$21 million - \$50 million	101-500
HG [Horticulture grower]	1	11-20	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	<50
HG [Horticulture grower]	2	11-20	Unlisted private	\$21 million - \$50 million	\$1million - \$20 million	50-100
HG [Horticulture grower]	3	>20	Unlisted private	\$1million - \$20 million	\$1million - \$20 million	<50
HP [Horticulture processor]	1	>20	Unlisted private	>\$51million	\$21 million - \$50 million	101-500
HP [Horticulture processor]	2	>20	Unlisted private	>\$51million	>\$51million	>500
HP [Horticulture processor]	3	>20	Listed public	\$21 million - \$50 million	\$21 million - \$50 million	101-500
HW [Horticulture Fruit market agent]	1	11-20	Unlisted private	NA	\$21 million - \$50 million	<50
HW [Horticulture Fruit market agent]	2	>20	Unlisted private	\$1million - \$20 million	\$21 million - \$50 million	<50
HW [Horticulture Fruit market agent]	3	>20	Unlisted private	\$1million - \$20 million	\$21 million - \$50 million	<50
HF [Horticulture fruit retailer]	1	>20	Unlisted private	NA	<\$1million	<50
HF [Horticulture fruit retailer]	2	>20	Unlisted private	\$21 million - \$50 million	\$21 million - \$50 million	101-500
HF [Horticulture fruit retailer]	3	11-20	Unlisted private	NA	NA	101-500
HR [Horticulture restaurant]	1	<5	Unlisted private	NA	<\$1million	<50
HR [Horticulture restaurant]	2	>20	Unlisted private	>\$51million	>\$51million	>500
HR [Horticulture restaurant]	3	11-20	Unlisted private	NA	\$21 million - \$50 million	>500

(Source: Analysis of field data)

Appendix 9.3: Meat industry partnerships

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
MP [Beef producer]	1	Vertical	Supplier both	Customer both
MP [Beef producer]	2	Vertical	Supplier informal	Customer informal
MP [Beef producer]	3	Vertical	Supplier both	Customer informal
MF [Meat feedlotter]	1	Vertical	Supplier both	Customer informal
MF [Meat feedlotter]	2	Vertical	Supplier informal	Customer both
MF [Meat feedlotter]	3	Vertical	Supplier formal	Customer formal
MA [Meat abattoir]	1	Both	Supplier both	Customer both
MA [Meat abattoir]	2	Both	Supplier informal	Customer informal
MA [Meat abattoir]	3	Vertical	Supplier both	Customer both
MW [Meat wholesaler]	1	Both	Supplier informal	Customer informal
MW [Meat wholesaler]	2	Both	Supplier informal	Customer informal
MW [Meat wholesaler]	3	Both	Supplier informal	Customer informal
MB [Meat butcher]	1	Vertical	Supplier informal	Customer informal
MB [Meat butcher]	2	Both	Supplier informal	Customer informal
MB [Meat butcher]	3	Vertical	Supplier informal	Customer informal
MR [Meat restaurant]	1	Both	Supplier formal	Customer informal
MR [Meat restaurant]	2	Both	Supplier formal	Customer informal
MR [Meat restaurant]	3	Both	Supplier informal	Customer informal

(Source: Analysis of field data)

Appendix 9.4: Horticulture industry partnerships

Case Sector and Number		Partnerships Vertical Horizontal	Supply Partnerships Informal Formal	Customer Partnerships Informal Formal
HNS [Horticulture nursery & seeds]	1	Both	Supplier informal	Customer informal
HNS [Horticulture nursery & seeds]	2	Both	Supplier both	Customer both
HNS [Horticulture nursery & seeds]	3	Both	Supplier both	Customer both
HG [Horticulture grower]	1	Vertical	Supplier informal	Customer informal
HG [Horticulture grower]	2	Vertical	Supplier informal	Customer informal
HG [Horticulture grower]	3	Both	Supplier informal	Customer both
HP [Horticulture processor]	1	Vertical	Supplier informal	Customer informal
HP [Horticulture processor]	2	Vertical	Supplier both	Customer informal
HP [Horticulture processor]	3	Vertical	Supplier both	Customer both
HW [Horticulture Fruit market agent]	1	Both	Supplier informal	Customer both
HW [Horticulture Fruit market agent]	2	Vertical	Supplier informal	Customer informal
HW [Horticulture Fruit market agent]	3	Both	Supplier informal	Customer informal
HF [Horticulture fruit retailer]	1	Both	Supplier informal	Customer informal
HF [Horticulture fruit retailer]	2	Both	Supplier informal	Customer informal
HF [Horticulture fruit retailer]	3	Both	Supplier informal	Customer informal
HR [Horticulture restaurant]	1	Both	Supplier informal	Customer informal
HR [Horticulture restaurant]	2	Both	Supplier informal	Customer informal
HR [Horticulture restaurant]	3	Vertical	Supplier formal	Customer informal

(Source: Analysis of field data)