University of Southern Queensland
Faculty of Engineering and Surveying

Relationship Contracting In Malaysia

A dissertation submitted by

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Abstract

Relationship contracting is a form of contract system where management of relationship is given precedent over the dictate of a standard form of contract. It emphasises on trust, teamwork, sharing of profit or loss, sharing of risks and alignment of interests.

Contract based on relationship is yet to be fully explored and utilised in Malaysia. Most construction companies are accustom to traditional contracts such as lump sump, turn key and cost per unit contracts.

The research project focuses on developing a process to evaluate the suitability of applying relationship contracts in Malaysia's construction industry.

The following points outline the researches accomplished in this project:

- Undertake literature review on relationship contracting system including aspects of procurement, management processes, range and benefits of relationship contracts.
- Develop a research methodology to assess the advantages and issues associated with delivering civil engineering projects in Malaysia by both relationship and traditional contracts.
- Conduct survey, using a questionnaire approach, on civil engineering contracts to attain professional feedback.
- Analyse the results of study and develop a decision making process to implement relationship contracts in Malaysia
- Test and evaluate the decision matrix

The studies indicated that relationship contracts are applicable to local construction industry. However, it is still at its immature stage in Malaysia and greater promotion of such contracts is vital to encourage its usage. The decision process would serve as an important screening tool for the clients. It helps them to decide the suitability of applying relationship contracts in their construction projects.

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Date

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Chapter 1 Introduction

Relationship contracting is not a new form of contract. It has been available as a style of infrastructure delivery since early 1980s. Implementation of traditional contracting systems in construction industries frequently lead to confrontations and unresolved issues associated with different commercial alignment of individual parties. Hence, the modern type of contracting systems emerges, hoping to replace and sealed up the adversarial traditional style of management.

According to a publication by Alan McLennan Strategic Services (n.d., p.15), an alliance network company in Australia, relationship contracting is a term applied to contracting arrangement where management of relationship is given precedence over the dictate of a standard form of contract. It is a strategic alliance between organisations to achieve mutual benefits. Relationship contracting is based on trust, appropriate risk allocation, teamwork, sharing of profit or loss and most importantly the alignment of goals.

Basically, relationship contracting falls into two broad categories. They are either project based or long term strategic alliance. Project based contracts are commonly known as project-specific partnering and the arrangement will last until the end of the project. The arrangement is between the principal and a few contractors. The other form would be a long-term partnering or more likely to be termed as alliancing because it usually last for years between the principle and the main contractor.

1.1 Background

The primary purpose of the research project is to develop a system or a method to evaluate the suitability of adopting relationship based contracting system in civil engineering contracts in Malaysia. Relationship contracting is still a new paradigm for many construction firms in Malaysia regardless of their scale. Nevertheless, the successfulness of applying relationship contracting in the construction of the Kuala Lumpur International Airport (KLIA) has proved to be a good start and an excellent example for further consideration of applying such contracting system in future development. Rashid (2002, p.157) mentioned that the application of project-based partnering during the construction of KLIA is said to be among the key factors that enable the mega airport project to be completed in record time.

The traditional form of contracts emphasises the separation of roles in the parties involved and a rather unbalance allocation of risks. The standard form of contract encourages self-interest and protection of individual positions (McLennan, n.d., p.2). It handles the contracts in a mechanical ways, indicating the time span, obligations and other notices in writing. It ignores some of the crucial aspects dealing with behaviours and commitments such as trust, honesty, fair dealing, good faith and open communication.

According to Scott (2001, p.10), the limitations of traditional contracting are:

- Misalignment between the owner and the individual contractors
- Misalignment between the individual contractors
- Lack of access to the contractors' skills and expertise at a time when they can best and most influence the eventual outcome

Traditional contracting tends to escalate the project time and targeted cost due to unforeseen circumstances such as dispute between client and contractors. Moreover, the contractors have no interest or intention to reduce the overall project cost and construction schedule. There is no incentive or benefit for them to gain.

On the other hand, relationship contracting offers an approach to encourage cost savings and reduction in construction time through systematic contracting procedures. At worst, it contains schedule overruns and cost. The relationship based contracts is designed to overcome the limitation of traditional contracting. It opens up the doorway to continuous improvement in performance, communication, trust, risk management and future collaboration.

As defined by the Australian Constructors Association (1999, p.10), relationship contracting is founded on the principle that there is a mutual benefit to he client and the contractor to deliver the project at the lowest cost – when cost increases both the contractor and the client are worse off. The core values of the relationship rely upon commitment, trust, respect, innovation, fairness and enthusiasm.

1.2 Aims

The aim of the research project is to study the benefits of relationship contracting and evaluate the suitability of applying relationship based contracts in Malaysia.

1.3 Objectives

The specific objectives identified are:

- To undertake literature review on relationship contracting on various aspects including the fundamental and types of relationship contracting, its limitation, potential barriers and the benefits of relationship based contracts.

- Develop a research methodology, using a questionnaire approach, for assessing the benefits, costs and issues associated with delivering civil engineering projects in Malaysia by relationship based contracting and traditional contracts methods.

- Conduct studies on at least six civil engineering contracts in Malaysia, preferably three of which are using relationship based contracts, using the research methodology. The studies should focus on collecting information on civil engineering contract delivery processes and comparing the traditional contracting system with the relationship based contracting system.

- Analyse the results of the study to determine the benefits, cost and issues in undertaking projects in Malaysia by relationship contracting.

- Develop a process for successful implementation of relationship contracting in Malaysia based on the finding of the analysis.

- Report the research results to peer group via oral presentation and in the required written format.

As time permits:

- Test the process developed with principals in Malaysia and assess the test results.

- Evaluate the use of the process in the award and management of at least one particular civil engineering project.

Chapter 2 Research Discussion

2.1 Research information on relationship contracting

Information gathering on relationship contracting was carried out at the beginning of the research project. The data collected focuses on issues ranged from the formation of relationship contracts till the execution of the contracting system. Information pertinent to common contracting system adopted in the construction industry of Malaysia was also reviewed. The overall information gathered was for comparison purposes that may lead the understanding of the pro and cons of using relationship contracting instead of conventional contracting system in Malaysia.

Sources of information were obtained from a local library (University Putra Malaysia), USQ library and through the Internet. The scope of the literature review revolved around the resources gathered.

Before stepping into introducing the new contracting system to the construction industry in Malaysia, an understanding of the construction procurement processes in Malaysia is vital. Rashid (2002) described these construction procurement processes in detail. The specific processes of construction procurement in Malaysia have seven elements. The first five elements were initiation/promotion, funding, design, statutory approval and tendering. These elements were categorised under the processes of construction

procurement during pre construction stage. The last two elements, construction and risk allocation, were categorised under the processes of construction procurement during construction stage.

Rashid has identified the dominant procurement system in Malaysia. They were the traditional lump sump system, design and build or turnkey system and management contracting. The traditional lump sump system was favoured in Malaysia before the introduction of the turnkey system in 1983. Now, the design and build or turnkey is one of the frequently selected procurement systems in Malaysia.

Relationship contracting has been generally accepted in many countries including countries in Europe for quite sometime. Scott (2001) explained about the understanding of partnering/alliancing based on the experience of the contracting systems in Europe. He contrasted the limits of traditional contracts to the relationship based contracts. Limitation of traditional contracting were such as the misalignment between the owner and contractors, and misalignment between individual contractors

Scott (2001) provided a practical guide to implementing the main steps in setting up an alliance. The tool-kit comprises of two distinct phases. The initial phase was the project development and definition (informal alliance) and the secondary phase was the project execution (formal alliance). At the development and definition phase, there were four stages namely the owner decision to alliance, owner preparatory steps, alliance partner selection and alliance development alignment and commitment. The project execution phase comes after the final approval from the owner to proceed with the project. In this phase, the alliance parties developed and sustained the alliance. Further details could be found in subtopic 3.3.

A publication by the Australian Constructors Association (1999) discussed about relationship contracting as a method to optimise project outcomes. ACA encouraged the change of the existing adversarial contractual relationship to a contractual relationship that delivers maximum benefits to all parties. It noticed the traditional risk transfer

strategy which often failed due to poor risk allocation and compared it to the risk manage system in relationship contracting. Relationship contracting allocates the project risks to party best suited to manage them.

Rashid (2002), Scott (2001) and the Australian Constructors Association (1999) expressed the benefits of utilising relationship contracting in construction contracts. They stressed on the need to form a strategic contracting system to overcome the adversarial traditional contracting system. A relationship based contracting system that promotes cooperation, trust and most importantly the alignment of commercial interests and goals.

Chapter 3 What is Relationship Contracting?

Relationship contracting is…

3.1 Fundamentals of Relationship Contracting

Relationship contracting is a business relationship formed to improve the performance of delivering projects. According to the publication titled 'Relationship Contracting – Optimising Project Outcomes' by the Australian Constructors Association (1999, p.10), relationship contracting is founded on the principle that there is a mutual benefit to the client and the contractor to deliver the project at the lowest cost. When costs increase both the contractor and the client are worst off.

The fundamentals of relationship contracting described by the Australian Constructors Association (ACA) are listed below:

- Alignment of goals
- Risk allocation
- Clearly defined scope
- Form of contract
- Integrated project team
- Gain share / Pain share

- Open honest communication / Behaviour / Change of attitude
- Public sector issues
- Facilitators
- Legal Advisers
- Third party advisers

3.1.1 Alignment of Goals

Relationship contracting focus on establishing a common goal among all parties involved (ACA 1999, p.16). The alignment of goals between the client and the contractors is vital in facilitating effective teamwork and communication. Project risks are shared between the client and contractors. Risks sharing help to reduce overall cost and promote cooperation between the client and contractors. With common goals in mind, dispute can be avoided or resolved in the shortest possible time as mentioned by Rashid (2002, p.159)

In traditional contracting approaches, commercial misalignments frequently exist between the client and the contractor, and between contractors on the same project (Scott 2001, p.5) Client and contractors have different commercial interests. The client would expect the most out of their investment in the project while contractors have no interest to reduce cost or improve the project outcome. Introduction of relationship based contracts have created a commercial alignment that links the return of all alliance parties to the overall project outcome rather than individual performance of contractors.

3.1.2 Risk Allocation

The allocation of risk in construction contracts is a function of the system of procurement (Rashid 2002, p.119). Risk cannot be eliminated but can be allocated to the parties involved in the procurement process.

The traditional risk management adopted by clients are to transfer as much risk as possible to others (ACA 1999, p.8) Clients transfer the risk to designer and contractors as they are within control. The procurement systems commonly used to allocate such risks are the traditional lump sump system, schedule of rates and turnkey system. However, as explained in the ACA publication, the traditional risk transfer strategies often failed due to poorly defined objectives, inadequate documentation, inadequate time and cost planning, unreasonable risk allocation and inadequate project staff.

The allocation of risk should take into consideration the ability of each of the parties to manage that risk and the incentive available for absorbing the risk (Rashid 2002, p.118). Risk could transfer in part by the client to another party or parties in the procurement process and the client retains the rest.

As stated in the ACA publication, relationship contracting provides the approach whereby the various project risks are allocated to the party best suited to manage them. The agreement relies on the realistic and sensible expectation on both sides. The agreement will fail if clients attempt to transfer all project risks to the contractor, or if the contractor seeks higher return without accepting a greater portion of project risk (ACA 1999, p.16).

3.1.3 Clearly Defined Project Scope

Relationship contracting arrangement is mainly between the client and the main contractor. It also includes nominated sub-contractors, suppliers and other relevant parties in the project. They directly or indirectly influence the overall outcome of the project. Therefore it is important to define the project goals and project scope in a complete and unambiguous manner. The parties involved should know clearly the extend of the work to be covered in the project.

3.1.4 Form of Contract

In relationship based contract project, the contractual arrangements ensure the physical delivery of the project according to the requirements of the client as to traditional contracts. In addition, it expresses the specific aspect of the alliancing arrangement.

In partnering, the specifics of the partnering arrangement are usually given expression in a partnering charter, which is not legally binding. In an alliance, the specific aspects are incorporated in a legally binding contract, which covers the standard contracts and alliance arrangements (Scott 2001, p.64). This will be further discussed in the following chapter.

3.1.5 Integrated Project Team

The Integrated Project Team consists of senior members from the parties involved in the project and the client himself. An example of an integrated team structure used on an alliance project in shown in figure 2.1 from Scott (2001, p.6)

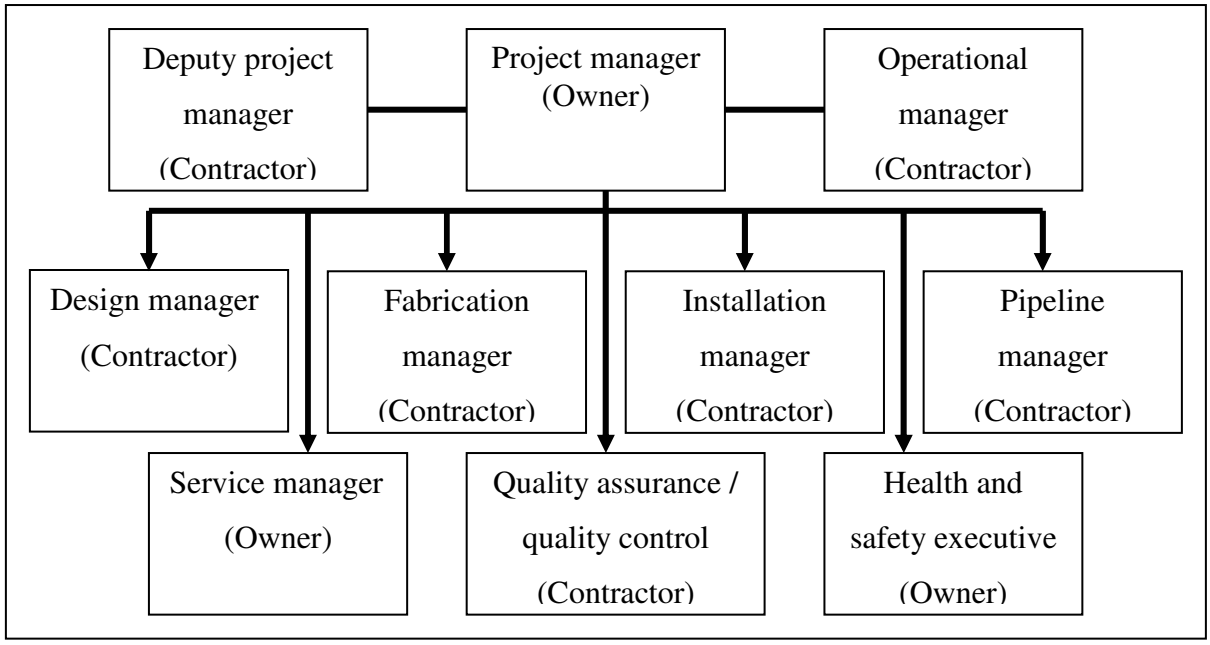

Figure 3.1 – An example of an integrated team from Scott (2001)

Team members are accountable for delivering the part of the project assigned to them such as design, fabrication and construction. Nevertheless, there exists a collective responsibility for the delivery of the entire project. The collective responsibility helps to eliminate duplications of functions in planning, cost control, procurement, technical and safety audits. The integrated team often reduces the manpower resource allocated to the project and offers a more transparent process.

The Integrated Project Team must be committed to achieving the project goals. It must operate on mutual trust that puts the best interest of the project ahead of purely self-centred gains, achieving a single and unified team (ACA 1999, p.18)

Alignment and commitment do not occur naturally. Scott (2001, p.7) noted that investing in an experienced consultant "facilitator" with specific skills in this area proved to be the successes of many alliance teams.

3.1.6 Gain share / Pain share

The profit and loss sharing is at the heart of the relationship contracting. It is important for all parties involved in the project not only to align their goals but also to share their business interests in the project success.

The alignment of interests among the alliance parties is formed through incentive schemes. The incentive schemes create a direct link between the reward and the total outcome of the project rather than relying on individual contractor's performance. The alliance members are able to gain through the scheme by efficient joint execution of the project rather than through leveraging their own position via individual work contracts. It is designed to encourage collaboration in implementing efficient ways to execute the project.

In the incentive scheme, a gain and pain sharing mechanism is formulated to assess the distribution of rewards or loss based on the Project Target Cost. The Project Target Cost is negotiated at the early stage of the scheme between the owner and the contractors. The scope of the Project Target Cost includes the owner's own costs, the cost of contractors, subcontractors and suppliers not within the alliance. The profit of the parties reduces if the Project Target Cost is exceeded. If the actual cost is lesser then the targeted cost there will be sharing of profit between the parties according to the agreed formulae.

Figure 3.2 show an example of gain and pain sharing model obtained from ACA (1999, p.19). The gainshare / painshare split between the parties are generally based on a 50% allocation to the client and 50% dividend in proportion to the other parties' contribution in the Project Target Cost (ACA 1999, p.18).

Capital Cost Incentive Scheme

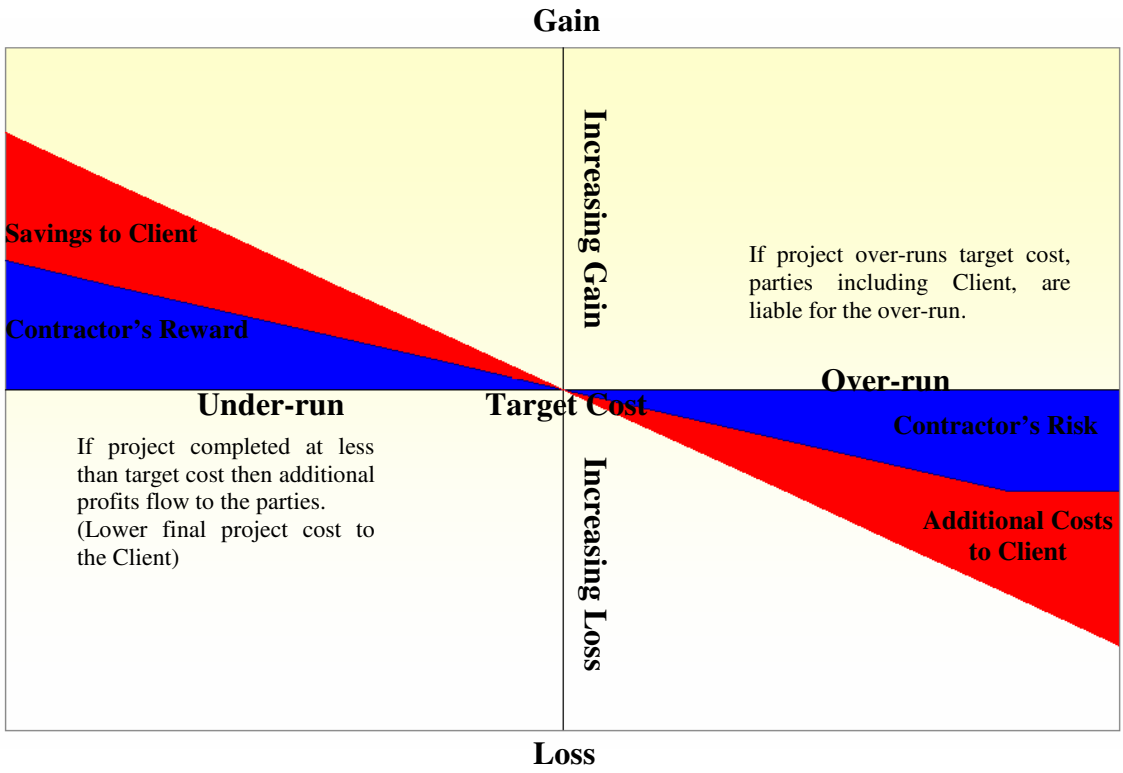

Figure 3.2 – Gainshare / Painshare Model from ACA (1999)

3.1.7 Open Honest Communications / Behaviour / Change of Attitude

Open and honest communication between all parties promotes all the key behavioural aspects of alliancing. It encourages everyone to confront issues and differences from the perspective of developing solutions rather than allowing them to escalate into disputes. Individuals will believe that they belong to the team and the entire team is focused on achieving the aligned goals.

For the relationship contracting to be successful, all parties needed to have positive change in attitude and behaviour towards the project outcome and towards one another. Trust is an essential element of success in the project. The Construction Industry Institute define trust as the confidence and reliance one party has in the professional competence

and integrity of the other party (parties) to contribute to the successful execution of a project in a spirit of openness, fairness and cooperation (Scott 2001, p.7).

The open honest communication and change of attitude is achieved through project aligned goals, Integrated Project Team and implementation of training techniques and skill development to sustain a team building environment. The team building environment is sustained through several approaches identified by ACA (1999) as listed below:

- Comprehensive induction of all new members joining the team
- External coaching and guidance to assist and reinforce the team approach
- Workshop sessions to identify concerns and pinpoint key issues, which need resolution, and setting stretch targets.

3.1.8 Public Sector Issues

The selection of tenders on the delivery systems in a relationship based project is not entirely rest upon "hard dollar" tendering. The delivery system is based on a cooperative environment, a philosophy of no blame and no dispute, and a containment of costs within estimated target cost of the project. It provides an effective guarantee of value for money compared to traditional system that has higher tendency of conflicts, claims and price blowouts.

The public sector should ensure that the selection criteria and process is clearly communicated and transparent to all parties involved and monitored by a probity auditor. The duty of a probity auditor is to serve as an independent observer of the decision making process in the evaluation of expressions of interest or tenders.

3.1.9 Facilitators

A small-scale survey of nine alliance projects described by Scott (2001, p.109) showed promising results in aligning behaviours of team members when external facilitators are used. Although it is not compulsory to utilised external consultants, there are several reasons why their used should be seriously considered:

- They can more readily introduce a common language into the project team (which consist of several companies each with their won culture). This helps to define a project culture that is distinct from any of the individual company cultures. Jointly defining common terminology also generates common understanding of the purpose, goals and targets of the alliance itself.
- It is difficult for project managers to be discharging their operational responsibility a day and leading a team-building type session the next. The required styles are rather difficult and will introduce role conflict in the individual, and confusing messages may be given to the project team.
- Project managers attempting to facilitate multiparty sessions will not be seen as impartial or neutral in their case, however close they may be to impartiality. A consultant can bring this impartiality.
- Consultants help project leaders see and acknowledge their own shortcomings and weaknesses.
- Consultants are more likely to accelerate the alignment and integration of the team. Speed of integration is crucial if performance improvements are to be realised within the relatively short lifetime of a single project.

The Australian Constructors Association (1999, p.20) concurred with benefits of hiring facilitators and reminded that the facilitators are to assist and work with the Integrated Project Team to:

- Build best practice behaviours.
- Develop an environment of trust, cooperation and open communication.
- Develop the goal of achieving excellent results.
- Maintain a focus on common project goals and the team.

3.1.10 Legal Advisers

The traditional role of lawyers in drafting and negotiation of construction contracts documentation often lead to a single sided perspective. Their role is to protect their client's interests (whether it be the owner or the contractor), particularly in the risk allocation of the project.

In the new relationship contracting approach, lawyers have to recognise the type of documentation and language used to assist in the development of open and honest relationship between the client and the contractors that ultimately optimising the project outcomes. It involves a substantial shift in perspective with regard to advising the clients and contractors.

The key successful relationship contracting will be to ensure the form of contract documentation is appropriate to the business relationship between the clients and the contractors and which assists in administration of the contract and achievement of project outcomes (ACA 1999, p.21). The contract documentation should operate as a management tool design to facilitate the business relationship. The documentation needs to provide sufficient forum for discussion, team work as well as open and honest communication.

3.1.11 Third Party Advisers

As briefly mentioned earlier under the sub-topic facilitators, third party adviser or external consultants contribute to the final outcomes of the project. The specific role of third party advisers stated by ACA (1999, p.21) are typically:

- Reviewing the operation of proposed commercial arrangements between parties to the relationship contracting project delivery strategy.
- Advising on suitable contractual and commercial arrangements including allocation of responsibilities and the structure of risk or reward sharing mechanism.
- Implementing workshop approaches for developing a group approach to identification of goals and objectives, stakeholder interests, functional performance requirements, and risk and constrains
- Reviewing and reporting on progress and achievement of outputs during the projects.

3.2 Types of Relationship Contracting

Generally, relationship contracting can be separated into two broad categories namely partnering and strategic alliance. The significant differences between them are the duration and the legal binding aspect of the contracts. Their core values are still intact – the alignment of goals to reach a win-win outcome through teamwork, trust and fairness among the contract partners.

- Project based partnering

  Project based partnering contracts only last for the period of a single project. The arrangement is commonly between the client and several contractors but sometime it is between a single main contractor. In partnering, the aspects of the partnering arrangement are usually given in a partnering charter, which is not legally binding. It attempts to create a cooperative team and shifting the daily working condition out of

the adversarial contract frame. However, project partnering usually adopts a traditional hard-dollar contract agreement where the interests of the partners are not coherent and a win-lose outcome is possible. Therefore, it strongly relies on the building of relationship between the partners. It encourages them to focus on the final outcome of the project rather than thinking to gain short-term benefits due to self-interests.

- Long-term strategic alliance

  Long-term strategic alliance usually lasts for a specific period of years. The arrangement is generally between the client and the main contractor. In an alliance, the specific aspects are incorporated in a legally binding contract. It can be a single legally binding contract that covers both the physical delivery of the project and all aspects of the alliance arrangement. The second option is to form a standard contract to cover the physical delivery of the project and an alliance agreement to cover alliance arrangement. The long-term alliance contract not only emphasises on alignment of the project goal but more importantly to balance the risks and rewards so that a win-win outcome can be achieved. Figure 3.3 shows the general aspects stated in the standard contract and the alliance agreement given by Scott (2001, p.65):

The standard contracts:

- Defined the services to be provided by the contractor
- Establish the rights and obligations of the owner and the contractor
- Define functionality, quality and other appropriate requirements
- Provide for payments to the contractor for goods and/or services provided
- Incorporate specific and general terms and conditions

The alliance agreement:

- Defines the details of the incentive scheme which links the parties' rewards to the total project outcome
- Express the 'objective' of the alliance
- Details the 'principle' which will govern the working relationship of the parties
- Establishes any organisational structures specifically related to the alliancing arrangement (e.g. many alliance arrangements make provision for the establishment of a so-called alliance board which is composed of senior executives of the parties)

Figure 3.3 – Aspects in the standard contracts and alliance agreement from Scott (2001)

3.3 Forming and Managing an Alliance / Partnership

The formation of an alliance or partnership involves many development stages. The first being the informal alliance and the latter is a formal alliance. An example of the stages of development by a number of successful alliance projects are outlined in figure 3.4. The success of an alliance form cannot be guaranteed by a step-wise application of a linear recipe. Once it begins, many of the activities and processes within each of the main steps will overlap with activities and processes associated with subsequent steps (Scott 2001, p.42). The form is a guideline to attain optimal results and overcome the adversarial environment in traditional contracting process. Therefore, appropriate processes and procedures could be adopted to match the requirements of specific project. When doing so, fundamental of relationship contracting should be retained.

	Alliance Development Stage	Key Activities and Issues
Project development and definition phase (Informal alliance)	**Owner decision to alliance**	▪ Understanding alliancing concept and requirements ▪ Suitable circumstances ▪ Business needs / drivers ▪ Evaluation of alternative strategies ▪ Senior management alignment and commitment
	Owner preparatory steps	Internal alignment: • Identify champions / project leaders • Business team / project team alignment • Owner competencies and role • Owner team Establish alliance contracting / formation strategy: • Alliance design • Timing of selection • Contract structures • Remuneration terms • Selection process (open, restrict, negotiated) Alliance contractor selection process: • Establish selection criteria • Prepare selection (tender) documentation • Prepare selection evaluation plan
	Alliance partner selection	▪ Owner communication of intent to potential alliance contractors ▪ Issues selection (tender) documents ▪ Evaluate responses and select
	Alliance development, alignment and commitment	Build alliance relationships: • Apply facilitation, training, coaching and team building • Develop and apply communication processes • Apply / design other alignment mechanisms

		• Develop and institute performance improvement and innovation processes Jointly develop: • Project technical definition • Execution plans and programmes (schedules) • Costs estimates • Risks analyses Finalise works contracts for execution phase Development and finalise alliance agreement: • Projects objectives • Principles of relationship • Project performance measures • Incentive scheme • Roles, responsibility and decision-making • Dispute resolution Design and establish integrated projects organisation Identify / develop common processes and procedures Build relationships with other parties: • Non-alliance companies • External authorities • Miscellaneous
Owner's final approval to proceed with project		
Project execution phase (formal alliance)	**Develop and sustain alliance**	Establish team delivery targets Monitor and modify project organisations as appropriate Monitor relationship quality Continue: • Performance improvement and innovation processes • Facilitation, training, coaching and team building • Building and sustaining relationships with others Monitor and report performance against incentive scheme targets

Figure 3.4 – Alliance formation and management processes Scott (2001)

3.4 Principles, Values, Concepts and Practices of Partnering and Alliances

Members of the alliance have their own principles, concepts, values and practices in running their business. When they are put together to form a partnership or alliances, those criteria have to be aligned or merged to a certain extend for the benefit of the team members.

Principles uphold by the parties must be universal and non-specific to any faith, culture, country or business sector to prevent conflict of interests. It should consists of basic principles like fairness, trust, faith, integrity, honest, equality, human dignity, service, excellence and growth. If any alliance party members have opposite principles, it would be disastrous to the firmness of the relationship.

Values vary between the organisations of the parties. Nonetheless, they should encompass leadership, collaboration, innovation, safety, teamwork, quality and continuous improvements. They are human qualities used to achieve the common goal.

The concepts or ideas in an alliance or partnering are based on sharing. Information and strategies needed to be shared openly to team members to facilitate better understanding and make substantial progress in the project. More importantly, party members should have a joint vision and a common performance indicator. All members should be prepared to venture into a new paradigm shift with new rules, new boundaries and new strategy in problem solving in order to benefit the most out of the relationship. Figure below represents the connection between the principles, values, concepts and practices.

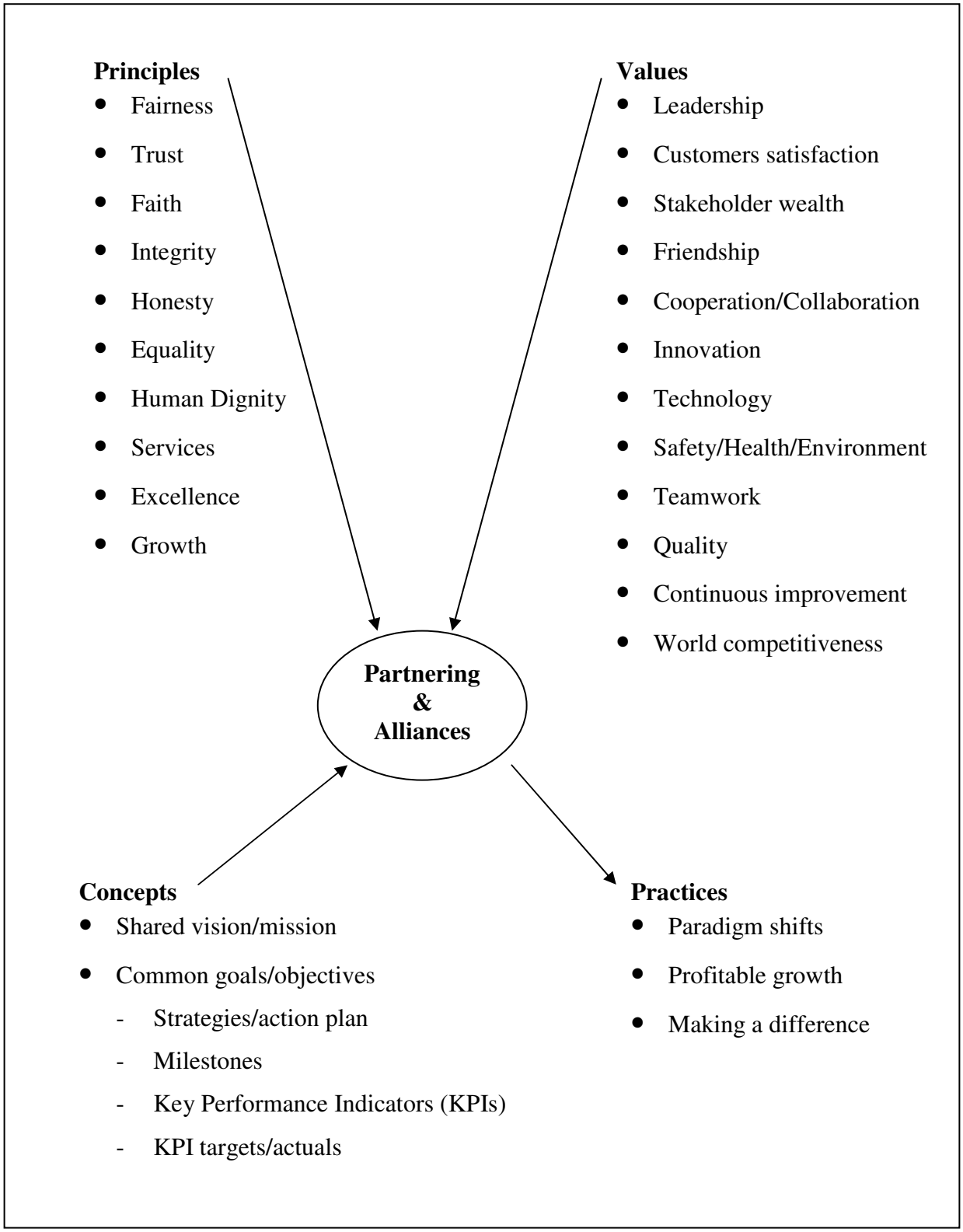

Figure 3.5 – Partnering and alliances: principles, values, concepts and practices from Lendrum(2003)

Chapter 4 Why Use Relationship Contracts?

4.1 Limitations of Traditional Contracting

Current practice of traditional contracting has some limitations that impact the performance of the project. There are three principle areas identified by Scott (2001, p.10) as shown below:

- Misalignment between the owner and the individual contractors

  The owner is primarily concerned with the delivery of the project as a whole where as contractors only focus on the completion of the work they are paid for. They have no further interest in the project once their service has been completed. The contractors hardly have any incentive to design and build the project in an economical as well as optimal way. This shows a misalignment between the owner and the contractors as they have separate commercial objectives.

- Misalignment between contractors

  Traditional contracting structures often lead to misalignment between individual contractors because each contractor has the financial interest in its own performance only. They do not see any benefits in working proactively to improve the efficiency of the project as a whole. Moreover, the inefficiency of others might allow one to institute claims, blaming the failure to perform of others has caused their inability to fulfil their contractual obligations.

- Lack of access to contractor expertise

  The strength and expertise of contractors are rarely effectively utilised by the owner in traditional contracting. The failure to engage key contractors in the early stage imposed potential penalties for the owner such as a more uncertain cost estimates, greater uncertainty in the project execution schedules and less comprehensive knowledge on the total risk profile of the entire project.

4.3 Potential Barriers to Alliancing

There are several barriers to overcome before the relationship contracting can be successfully implemented. Most clients and contractors are settled in the mindset of the traditional contracting environment that is of course adversarial. Though it might not be the best solution for them but it is within their comfort zone and they are familiar with the terms and obligations within the traditional context. When a relationship contract is to be adopted, they must be committed to adapt to the new changes and embrace the challenges ahead in order to achieve mutual benefits. Figure 4.1 shows the summarised form of attitudes and behaviours that the contracting parties should be prepared to face:

Relationship Attitudes and Behaviours Critical to Relationship Contracting	
Traditional (Adversarial): Attitudes and Behaviours: (Old Paradigm)	**Relational Attitudes and Behaviours Suitable for Relationship Contracting: (New Paradigm)**
× self-serving	✓ customer service view ✓ best-for-project outlook
× mindless adherence to traditional outputs	✓ breakthroughs, learning and creative outcomes
× little feedback	✓ open feedback
× shunning change; avoiding creativity	✓ eager to improve yesterday's solutions
× "turf" protection	✓ best person for the job
× cautious, mistrustful	✓ trust and trustworthiness
× blame culture	✓ accept responsibilities ✓ supportive, learning culture
× "them and us" attitude	✓ co-operative; partnering
× adversarial outlook	✓ sharing, supportive
× power and status	✓ professionalism and ethical values
× risk; contract out all risks	✓ equitable sharing of risk
× Prescriptive solution directed × input focussed	✓ outcomes based/performance ✓ outcome focussed
× resist client involvement	✓ client involvement sought
× dispute resolution processes	✓ issue resolution that manages disputes
× need-to-know basis × hierarchical communication	✓ open communication
× projects administered	✓ client leadership of change
× check-the checkers mentality	✓ self-regulation
× bureaucratic adversarial processes	✓ co-operative processes for problem solving
× QA inspection	✓ continuous improvement ✓ total quality approach
× dependence on legal processes to solve problems × fear of legally untested processes	✓ desire to prevent problems and to avoid legal processes
× delegation	✓ empowered project team members
× profit undesirable	✓ profit necessary for all
× low-bid selection	✓ selected on outcomes

Figure 4.1 – Attitudes and Behaviours from Alan McLennan Strategic Services

4.4 Paradigm Shift

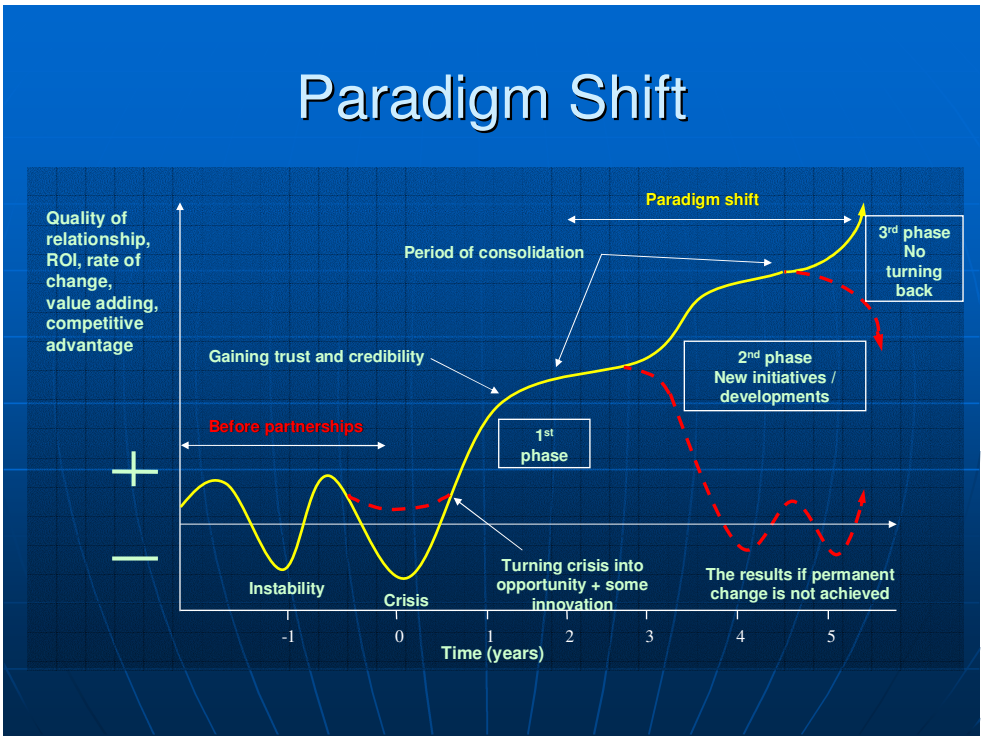

Figure 4.2 – Partnering / Alliance Curve from Lendrum (2003)

Figure 4.2 shows the partnering / alliance curve which represent the phases of shift from a traditional based contracting system to a relationship contracting system. The curve outlines the progression of partnership and their possible impact over time on some crucial performance criteria such as quality of relationship, rate of investment, adding value and competitive advantage.

There are basically three phases during the transition process. At the initial stage of a partnering or alliance, all the contract partners have to learn how to trust one other. All their 'attitudes and behaviours' as mentioned earlier would need to shift towards a new paradigm, a paradigm that promote credibility and trust. If this fails, the failure of the relationship would be imminent.

The building of relationship begins to consolidate if the partnering or alliance sustain through the first phase. After the second phase, the consolidation process would have

been completed. The contract partners would be able to see significant improvements in performance and relationships. Not forgetting, partnerships and alliances are dynamic living things whose rate of progress and direction can be changed by myriad internal and external factor (Lendrum 2003, p.48). For this reason, different partnerships and alliances develop at a different rate and the continuos improvement is not linear over time.

4.5 Relationship Maintenance

Maintaining the developed relationship between all parties is vital in ensuring the sustainability of the alliance in long term. Lendrum (2003, p.94) has suggested several approaches to maintain the relationship of all members involved. The relationship maintenance is categorised in four broad category namely breakdown maintenance, preventive maintenance, predictive maintenance and design-out maintenance. Predictive and design-out maintenance are where the competitive advantage lies. It promotes innovation, reducing costs and other encouraging factors. Prevention maintenance has becomes the minimum requirements that keep the business in competitive pack. Breakdown maintenance is becoming unfavoured due to problematic consequences such as high fixing cost, poor client and supplier relationship, and constant disputes and complaints. Hence to maintain a robust relationship throughout the project, the predictive and design-out maintenance would be the best approach. Figure 4.2 shows the summary of the pro and cons of different types of maintenance from Lendrum (2003, p.95):

The Four Stages of Relationship Maintenance

1. Breakdown (the quick fix)
   - The traditional way
   - 'Fire fighting culture'
   - High cost and/or little value adding
   - Poor customers/supplier relationship
   - Reactive vs proactive to complaints/problems/developments

2. Prevention (rather than cure)
   - TQM approach
   - Value adding and/or cost reducing
   - Medium/long-term focus
   - Quality supplier/customer relationship

3. Prediction (rather than prevention)
   - Creates competitive advantage through innovation and differentiation
   - Value adding and cost reducing
   - Long-term approach to strategic relationship and partnerships
   - Beyond TQM

4. Design-out (a system change) – Paradigm shift
   - World-class innovation and 'everything else'
   - Long-term strategic focus outside the traditional frame of reference
   - Process re-engineering is the norm
   - The outcome of successful partnerships
   - Reinvention of people roles, processes, organisation
   - Doing things fundamentally different

Figure 4.3 – Relationship maintenance: four stages from Lendrum (2003)

4.6 Benefits of Relationship Based Contracts

The most important question to be answer with regard to relationship contracting is why. Why there is a need for the client to adopt relationship contracting as compared to traditional contracts? The question could be easily answered by looking at the benefits of using relationship contracting.

Benefits offered by relationship contracting as described by ACA (1999, p. 15):

- Cost
  - Optimum project life cycle cost
  - Reduce capital expenditure costs
  - Acceptable financial results for both clients and contractors commensurate with their inputs and the risks undertaken by each party
  - Improve operating performance
  - "cost of change" curve will be significantly flatter

- Time
  - Certainty of project time
  - Reduced project delivery time

- Risks
  - Better management of inherent risks
  - Clearly defined risk allocation / sharing at outset

- Relationships
  - Enhance business relationships
  - Establishment and achievement of common / aligned goals
  - Improvement behaviour of the parties to the contract, especially where the contract experiences practical and / or financial difficulties

- A greater personal satisfaction for all projects parties
- Avenue for repeat business with resulting benefits to clients and contractors

- Technology / Innovation
  - Greater incentive and encouragement to innovate in design, technology, systems, processes and techniques
  - Greater incentive and encouragement to apply the latest technology

- Optimum standard
  - Optimum standards of quality, safety, industrial relations, community relations and environmental performance during the project execution and in operation
  - Development of the industry's professionals and workforce
  - Increase industry research and development as a result of improved financial certainty
  - World best standards of project delivery
  - Increase flexibility to match changing project requirements

Chapter 5 Project Methodology

Step 1: Develop Research Methodology Using Questionnaire Approach

Before proceeding any further in this research project, a sounding methodology is required in order to meet the aim and objectives of the project. The first part of the main objective of my research project is to study the benefits of relationship contracting in Malaysia. Surveys on local companies using traditional contracts are carried out. After reviewing the work of a previous undergraduate (Dugdale, 2003) who had done a similar type of research project and consulted with my supervisor, I realised that the most effective method in carrying out the survey is through a questionnaire approach. The survey scope will cover the following criteria:

- Type of contractual relationship / Procurement system adopted
- Distribution of risk under the procurement system
- Benefits of contracting system in terms of:

i) Cost

ii) Time

iii) Risks distribution

iv) Relationships

v) Innovation

vi) Standards of quality and safety

- Other comments from clients and contractors

Step 2: Search for Suitable Civil Engineering Contracts

Identification of appropriate civil engineering contracts is required before the commencement of survey. Suitable contracts of at least six (6) civil engineering contracts preferably three (3) are using relationship contracting will be short-listed. The short-listing processed is formulated below:

i) Collecting contacts of construction companies through online searches, Prime College, Institution of Engineers Malaysia (IEM) and other sources.

ii) Contact the companies stating the intention of the call / email and obtain approval for conducting interview.

iii)Locate at least six (6) engineering contracts, both traditional and relationship contracting systems.

Step 3: Conduct Study / Interviews

Set up a time for the interview. The respondents were clients and main contractors of each project. The interviews were carried out either face to face, through phone conversation or using electronic mailing system. It depends on the locality of the respondents and other factors. A set of questionnaire was presented to each respondent for better communication purposes during the interviews.

Step 4: Analyse Study Results

The study results were analysed and compared to assess the benefits, cost and issues in undertaking projects in Malaysia by relationship contracting. Detail explanation of the analysis could be read in chapter 6.

Step 5: Creating Decision Process

The results and conclusions from those surveys were used to develop a process for successful implementation of relationship contracting in Malaysia. The decision process is only meant to 'kick start' the consideration of the suitability of adopting relationship contracting in future projects. Detailed decision processes are beyond this survey project because it may require years to come to a sensible conclusion with multiple trials on construction process. The complexity of such decision processes is due to the knowledge required in law, economics and civil engineering field.

Step 6: Test and Evaluate Process Developed

The decision process was tested with principals participated in the survey. I began by asking their opinion on the appropriateness of weighting assigned to the statements. Feedbacks were noted, compared and proper adjustments were made to improve the decision spreadsheet. Further explanations could be read under chapter 7 – Decision spreadsheet.

Chapter 6 Results of Survey

Surveys were carried out from early July till September. It began once the proposed questionnaire was finalised. Several approaches have been used throughout the survey processes to obtain feedbacks from both clients and contractors. This would be further explained in the following subtopics.

6.1 Develop Questionnaire

The questionnaire consists of three distinct parts – the introduction, rating questions, ranging from very good to very poor and a section which requires more detail explanations. The main purpose of setting out the questionnaire in such structure is to create an ease of understand and respond to the questions.

The introduction was design to give the respondents the required knowledge to answer the questions and to give them a brief understanding of relationship contract. Then they would proceed to answer questions in rating form. The rating has five selections ranging from very good, good, satisfactory, poor and very poor. Questions covered in this section have been classed into six criteria. The criteria were as follow:

- Costs
- Duration

- Risks
- Relationships
- Innovation
- Quality and Safety Standards

The rating system was meant to obtain personal opinions from both clients and contractors regarding about their construction project. It gave them a chance to reflect on the overall performance and standard of the project. Furthermore, the grading could show the true face of the contract adopted. It helps to answer some doubts on the efficiency and effectiveness of the contract used. By comparing the responds from both major contract parties, indication of alignment of interests, risk and cost distribution, and other factors could be analysed.

The following section of the questionnaire requires direct respond from the clients and contractors. This section has six main criteria namely:

- Contract Form
- Duration
- Risks
- Innovation
- Improvement
- Comments

Detailed understanding of the contract in areas as mentioned above was necessary in order to further strengthen the analysis in the rating section and provide a clearer picture to the performance of the contract adopted. More importantly, it gets a feedback on the acceptability and suitability of local construction companies in using relationship contract in the near future.

6.2 Distribute Questionnaires and Conduct Interviews

The surveyed commenced in early July. Contacts of local companies were obtained through multiple resources. During the initial stage of the survey, approval to conduct the survey was gained from relevant construction companies. The approvals were obtained mainly through phone calls and emails. The clients and contractors of the respective companies were interviewed either in person, through phone conversations or using electronic mailing system. Their respond were recorded accordingly.

The survey was tedious and I have encountered many difficulties throughout the process. At the end, it proves to be a rewarding process after all. I have requested more than twenty companies to conduct the interview. Among all those requests, nine companies have accepted my survey after constant persuasions. Many felt insecure due to sensitivity issues in contracts. Out of the six questionnaires shown in appendix B, three have been completed by both the clients and the contractors whereas others were feedbacks from only one of the contract parties. All of the contracts were traditional based contracts. Extent of applying relationship contracts in Malaysia's construction industry is very limited. Most construction companies still rely heavily on Lump Sump or Design and Build Contracts, both of which are traditional contracts.

Below are the names of the local companies involved in the survey. The names of participants in this survey have been replaced by LCs (Local Companies) in the questionnaires to protect their privacy and confidentiality. The list of names shown below are not arrange in any particular order.

I. Mentari Housing Development Sdn. Bhd.
II. IJM Plantation
III. Setegap Bhd.
IV. PWC Corporation
V. Malaysian Workshop Engineering

VI. MMC-Gamuda

VII. PakarPave Sdn. Bhd.

VIII. Tekun Bina Sdn. Bhd.

IX. Loh & Loh Construction Sdn. Bhd.

6.3 Analysis of Feedback

All the feedbacks from several local companies were compiled and compared. The results were analysed and discussed as follow:

6.3.1 Form of contract

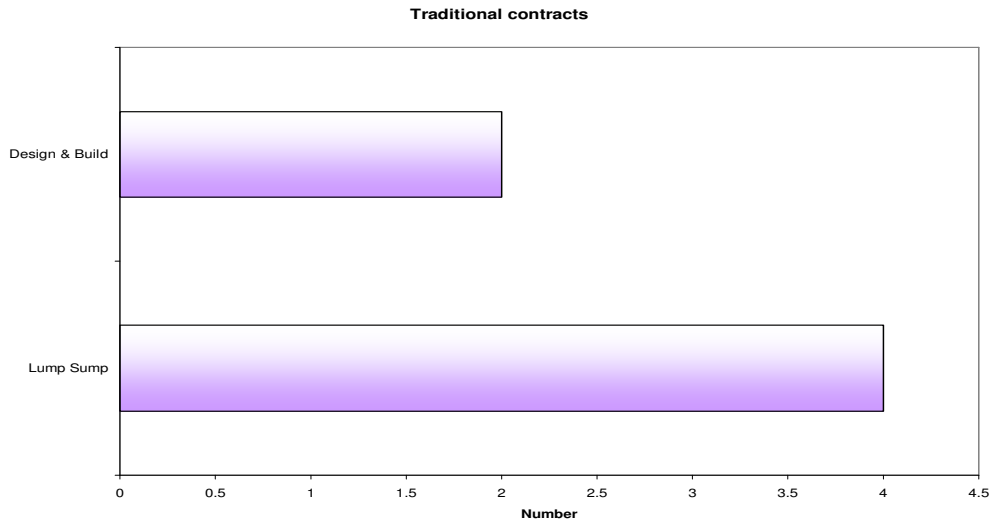

Figure 6.1 – Form of contract used in the construction project

Only the contracts between clients and contractors were considered in the survey. Out of the six contracts, two used design and build contract and the other four used lump sump contract. Traditional lump sump contract has remained as the most common type of procurement system used in Malaysia.

For lump sump contract, invitation to tender is made at the beginning. Then a successful contractor is selected based on the criteria such as tender price,

construction period, financial capability, technical capability and track records. The advantages of traditional lump sump contract are that a fixed price is set before the construction commences and the designer has absolute control over the design process. Nevertheless, lump sump contract has lead to longer development period and adversary between the parties. This would be further discussed in the analysis of other criteria mentioned in the questionnaire.

6.3.2 Costs

All the clients were satisfied with the final cost of the construction project (figure 6.2). On the contrary, two of the contractors were not satisfied with the final cost of the project. One of the reasons given was that the material prices have increased. Contractors have to absorb the extra cost.

From the survey, all the contractors responded to an increase in cost price (figure 6.3). This is due to the fluctuation of prices in raw materials, especially steel products. The fluctuation of the price has exceeded the initial estimation even though the tender price has been slightly marked up. I was informally told that a marked up of 5 to 10 percent in the bid is usual to cushion against any unpredictable risks. Other causes would be the extension of construction period, deferment of actual work from the design and some other unforeseen circumstances.

Looking at the responds from both clients and contractors, I have concluded that there seems to be a transferring of responsibility in absorbing cost by clients to the contractors. Contractors have to take in the risk of uncertainty in cost estimation. Through the survey, results have also shown that many of the contractors suffered a certain level of loss due to the soaring price of steel products. If relationship contract were to be considered, terms of sharing the price fluctuation in raw material could be negotiated between the contract

partners. If so, contractor would bear fewer losses as the risk is shared among the contract partners.

Table 6.1 – Dollar amount of contract and changes in cost

No.	Project Description	Cost of Project	Cost Changes from Original
1.	Low medium cost apartments & car parks	RM80 mil	+ RM14 mil
2.	Upgrading of Sabang palm oil mill	RM 7.3 mil	+ RM0.2 mil
3.	Rehabilitation & upgrading of KL-Karak Highway	RM20 mil	+ RM4 mil
4.	Stormwater Management & Road Tunnel project (SMART)	RM2.5 bil	+ RM200 mil
5.	Electrified double tracking project	RM5.8 mil	+ RM0.87 mil
6.	Infrastructure work in Putrajaya	-	-

(Note: + indicates increase and – indicates decrease)

Further information concerning the costs was gathered after the initial survey, the data was tabulated as shown in table 6.1. One of the project costs was not available due to confidentiality issue. According to Rashid (2002, p.167), cost of projects exceeding RM5 million are worth to consider using relationship contracts. The possible benefits and saving gain from using a relationship contracting in a high cost project are significant. Most of the construction projects surveyed have fulfilled this requirement. Therefore, the client could consider entering into relationship contract instead of relying on traditional contract. It is not a must but more of an additional option for client whom seeks for improvement in project delivery and possible cost saving.

6.3.3 Duration

All the clients are satisfied on the time taken to complete the projects (figure 6.4). On the other hand, one of the contractors was not satisfied due to late

delivery of the project. The clients from three of the construction project concluded that their project completion period did not reduce and two of the projects have surpassed the given timeline (figure 6.5).

In short, from the contractors' point of view, three out of six of the projects were delayed (figure 6.6). The delay was caused by factors such as oversight of consultant in providing work items, unforeseen ground conditions and deferment of actual work from original design. One of the contractor expressed that the magnitude of saving of the project could come up to RM 100,000 (approximately AU$ 33,000) if the project can be completed a month earlier.

The survey clearly shows some misalignments between client and contractor. Some of the factors causing the delay of those projects might have been avoided if client is able to engage the main contractor during the initial phase of the project. For instance, one of project design has to be altered sometime after the construction has begun. The amendment causes loss in both time and money. If client has sought advice and discussed with the contractor early on, deferment of actual work from original design might not have occur. As described by Scott (2001, p.14), lack of access to contractor expertise at the early stage in many traditional based contract often lead to late project delivery.

Table 6.2 – Duration of project

No.	Project Description	Project Duration
1.	Low medium cost apartments & car parks	16 months or 1.3 years
2.	Upgrading of Sabang palm oil mill	12 months or 1 year
3.	Rehabilitation & upgrading of KL-Karak Highway	12 months or 1 year
4.	Stormwater Management & Road Tunnel project (SMART)	54 months or 4.5 years
5.	Electrified double tracking project	60 months or 5 years
6.	Infrastructure work in Putrajaya	24 months or 2 years

The duration of the surveyed projects were presented in the table 6.2. According to Rashid (2002, p.159), long-term strategic alliance is applicable to project that requires more than 2 years of construction period whereas project specific partnering would be suitable if the project duration is short. Nonetheless, some case studies provided by ACA proved that the cost takes precedence over the duration. One of the case studies in ACA has shown the used of an alliance agreement in a 22 months mining project. The project period was less than 2 years but the project cost was around AU$270 million. Therefore, the significant cost has prompted the client and contractor to go into an alliance contract.

The same concept could be applied in Malaysia. The client would begin by looking at the cost followed by the duration of the project. Take the construction of the apartments in the survey for example, the project cost is in excess of RM5 million thus the client could consider adopting relationship contracting. The question now is which type of relationship contract is suitable? The final decision lies between the cost and duration. Although the duration of the project is only 16 months, the significant amount of investment in the project (RM80 million) means that it is worth going into an alliance rather than partnering. Alliance contract is legally binding and it promotes a win-win outcome though it involves many tedious processes and some extra costs.

In partnering, the partnering charter has no legal position and a hard-dollar contract is used resulting in possible win-lose situation. If the client is seeking for improvement in relationship among contract partners and the cost of the project does not favour the usage of an alliance contract, then partnering would be a good choice.

6.3.4 Risks

The clients are rather satisfied with the risks taken by them where as several contractors were not. Some of the contractors would like to reduce their risks by fixing the material price with suppliers and shared the liability of certain risks, such as constant fluctuation of material price, with the client. Evidence of unfair risks distribution and poor risk management has brought about dissatisfaction in the contractors. This concur with statements provided by ACA (1999, p.8), client in traditional contract often try to transfer as much risk as possible to others thus creating an adversarial climate and overall poor performance.

In contras, relationship contracting promotes the sharing of risks by both client and contractor. It encourages client to embrace certain risks when appropriate and transfer the rest to the party best suited to manage them. At the same time, gain share/ pain share model in relationship contract further strengthen their confidence in absorbing certain risks. They have a common goal of completing the project at less than targeted cost because the greater the saving in cost of project, the greater their shared profit would be.

6.3.5 Relationships

Business relationship between clients and contractors was fairly good (figure 6.8). Both the clients and contractors have established certain degree of business relationship with one another. They are able to communicate well and have no problem in exchanging thoughts.

Likewise, all respondents demonstrated a significant level of openness in sharing information between the contract partners (figure 6.12). This reflects a good sign in the current practice of sharing information in traditional contract. Since they are willing to share information in traditional contract, they would not face much difficulty in accepting the ‘open book’ concept in relationship

contract. Again, they have established certain level of trust between them (figure 6.13). Trust is another important issue if relationship contracting was to be successfully implemented.

On the contrary, three out of nine of the contractors were disappointed with the cooperation given by the client (figure 6.10). They felt that their contract partner are lacking in teamwork. Moreover, some respondents have pointed out that the alignment of interests between the client and contractor are poor (figure 6.11). The lack of teamwork and alignment of interests illustrate the disadvantages of traditional contracting. This could be further supported by Scott (2001, p.5) as the author mentioned that the client and the contractors have different commercial interest once contracts have been awarded. In addition, partners in traditional contracting do not form an integrated project team to enhance the cooperation and performance of the project. Hence, this indicates that relationship contracting could have been considered to facilitate teamwork and alignment of interests.

6.3.6 Innovation

Innovation and technology used in most of the surveyed project are up to standard but not impressive. Generally, the clients and contractors were satisfied with the use of technology, construction methods and design in the construction projects (figure 6.14). Some significant innovation and technology applied were the use of Polymer binder (a special type of bitumen) for the road construction work and deployment of two advance tunnel boring machines (TBM) in the SMART project. For other projects, there were no report of unique innovation in the design, processes and techniques. Referring to Scott (2001, p.10), the writer claim that in traditional contracting system contractors normally have no real incentive to design and build the projects to an optimal and economical standard from the client's perspective. They are only paid to complete their part of the project. On the other hand, one of the benefits of relationship contracting

revealed by ACA is that the incentives provided by the contracting system encourage innovation and the use of latest technology.

6.3.7 Standard of Quality and Safety

The standard of quality of the projects was ranked from satisfactory to very good by the respondents (figure 6.16). The clients and contractors were content with the overall project performance as expected in their current projects.

In terms of safety performance, one of the construction projects has not met the standard or expectation by both client and contractor. From the interview, they admitted that the safety rules and regulation at site was poor. To improve the safety at site, they would have to put up with extra cost but at the moment the project is already tight in budget. Furthermore, site safety regulations in Malaysia are less stringent compared to Australia and other developed countries.

Respondents from other projects said that they have ensured their project safety performance has achieved the current standard (figure 6.15). Therefore, the overall standard of quality and safety in those projects are acceptable. From the survey, I found out that some construction companies might not equip themselves with sufficient safety regulations. They perceive it as extra budget since certain safety equipments are not strictly required by the local authorities but merely recommended to improve site safety.

In relationship contracting, quality of project and safety of the workforce are crucial to the success of the project. When the work, health and safety of the workforce are well taken care of, they would have higher level of confident, security and ability to perform better. This agrees with one of benefit listed by ACA (1999, p.15) - relationship contracting assists in the development of professionals and workforce in the construction industry. It also states that relationship contracting has the advantage of delivering optimum standard of

quality, safety, industrial relations, community relations and environmental performance during the project execution and in operation.

6.3.8 Improvements and Comments

From the clients and contractors' respond, a few of them are not aware of the existence of relationship contracting system in the construction industry (figure 6.17). One of the respondent mentioned that there are limited usage of relationship base contract in Malaysia. Relevant authorities such as Public Works Department (JKR) and Construction Industry Development Board (CIDB) play important roles in promoting the concept.

When asked whether they would consider using relationship contracting in future projects to improve the outcome of the project and achieve a win-win situation, many gave positive feedback. It seems like the clients and contractors are open minded in accepting new form of contracting system. They are attracted to the benefits of relationship contracting. The benefits they are looking forward to in relationship contracting are:

- To achieve cost savings
- Speedier project completion or complete within schedule
- Appropriate quality control over the project
- Compliance with professional work ethics
- Better cooperation
- Easy justification of work performance (KPI)
- Capable of finding right partners
- Minimise dispute
- Better cost control

Although they are willing to consider adopting relationship contracting, some of the contractor reminded me that they have to consider the terms and conditions

stipulated in the contract as well. If they are able to negotiate and attain fair terms and conditions, they would sign the agreement.

One of the contractors was not keen to try out the new type of contract. The main reason given was that he does not believe relationship contracting could bring about trust among the contract parties. This is an example of unwillingness in taking the 'leap of faith'. It poses a potential barrier to relationship contract. As mentioned by Scott (2001, p.25), ingrain distrust present in traditional working environment is an obstacle to relationship contracting. The only method to overcome this issue is to nurture the trust among contract partners through a period of time. The parties involve in relationship contracting must be able to accept the 'leap of faith' at the initial transition phase from traditional environment to relationship environment. Suffice to say, trusts among the contract parties have to be earned and accumulated gradually.

Chapter 7 Decision Process

The decision in selecting suitable contracting system is crucial. Substantial considerations are needed before the client could reach a final decision. In this research project, I have develop a decision making process after analysing the survey results. The decision making process is meant to be used by the client interested in adopting relationship contracting. In lieu of staying in the comfort zone of traditional contracting environment, client seeking for improvement in the overall delivery of project could try out relationship contracting. Of course, there is no certainty that relationship contracting will deliver significant benefits to the project. However, studies from several reliable resources have shown that relationship contracting has optimises the final outcome of many projects. The resources are as listed below:

- Alan MCLennan Strategic Services, Relationship in project delivery.
- Australian Constructors Association (ACA), 1999, Relationship contracting – Optimising project outcome.
- Lendrum,T 2003, The strategic partnering handbook – The practitioner's guide to partnerships & alliances, 4th edition.
- Rashid K, 2002, Construction procurement in Malaysia – Process and systems, constrains ad strategies.
- Scott B, 2001, Partnering in Europe – Incentive base alliance for projects.

The resources also provide case study on projects that have undertaken relationship contracting. From these case studies, I noticed a common trend that lead to the successful implementation of relationship contracting. All the projects tend to have three critical factors, the sharing of risks and rewards, openness and teamwork.

7.1 Decision Matrix

The decision process is modified from the strategic partner evaluation spreadsheet shown in Lendrum (2003, Figure 6.5, pg 181). Other references made prior to the development of the decision spreadsheet were from the books titled - Partnering in Europe (Scott B.), Construction procurement in Malaysia (Rashid K.) and Relationship contracting (ACA). The previous research project done by Dugdale has proven to be invaluable. The project has a well tabulated example of decision making processes.

The decision matrix consists of two sections. The first section is the decision charter and the latter is the decision spreadsheet. An example of the decision matrix is included in appendix D. The decision matrix is developed for client to evaluate the suitability of adopting relationship contracting in any particular construction work. It also examines the capability of the client's own organisation and the capability of the contractor in undertaking relationship contracting.

The advantage of the matrix is that the client would be able to select the best suitable contractor to partner with. The nominated contractor should have qualities recognised by the client. They would have established a certain level of trust and confidence in previous projects. This is important as previous perception on the contractor could lead to improvement or degradation of relationship in future collaboration.

Since the awarding of contract is a selective process, it limits the competition among other contractors. This could be a disadvantage of the decision process. Contractors without prior cooperation with the client will not have a chance to tender for the contract. Nonetheless, I would still recommend the client to carry out a selective process from a pool of reputed contractors that have previous experience with the client. If the client already has a good impression on the contractor, a relationship contract would further enhance their ability to cooperate and excel in the project. For other contractors, they would need to build up their relationship with the client through traditional contracting system. Only then, they would have chance to qualify for a relationship contract. It would be a risky move if the client was to accept an unfamiliar contractor recommended by others and directly enters into a relationship contract.

After developing the decision matrix, I have presented it to two different representatives from the client side. Both of them have participated in the survey carried out earlier. From there, I obtained feedback regarding about appropriateness of the weightings given to each statements. It is vital to do so as they have years of experience in the construction industry and their professional opinions would help to improve the quality of the decision matrix. They have given valuable thoughts on the suitable weighting to be assigned to the statements based on Malaysia's construction practices. In their point of view, the criteria in each value statements are adequate. Improvements and changes on the initial decision matrix were made to acquire a more precise outcome. The decision matrix shown in appendix D is the final version.

7.2 How to use Decision Matrix?

The decision matrix is developed using Microsoft Excel program. Hence, it is best if the client is able to use it in its original format. The matrix involves tedious calculations which could easily be computed if the original program is used.

The decision matrix has two parts, the decision charter and the decision spreadsheet. The following subtopics would explain each part of the decision matrix.

7.2.1 Decision Charter

The idea of the decision charter came from the well-known partnering charter. Example of partnering charter could be found in many books including the references in this research project. Purpose of the decision charter is to identify the objectives and goals of the proposed construction project. It gives the client an opportunity to thoroughly think through various aspects of the project and list down the intended goals to be achieved. It also aligns vision of the client's organisation to the project and state the mission of the project.

The following steps outline the documentation procedures of the decision charter:

i. Company name -
   Name of the client's organisation
ii. Description of contract -
   Describe the scope of proposed project
iii. Vision -
   Long term goal of the client's organisation or a statement of client's organisation fundamental purpose
iv. Mission -
   Short term goals to be achieve in order to realise the vision or end result of the proposed project
v. Objectives and Goals -
   Results to be attained for the criteria listed such as cost, duration, risks, relationships, innovation and standard. Additional criteria could be

added to further define the goals and objectives to be achieve by the project.

Some recommendations or guidelines are listed at the end of the charter to help the client in making decision. The recommendations or guidelines are shown below:

Recommendation / Guidelines:

1) Relationship contracting is worth adopting when the cost of the project is more than RM5 million.
2) Partnering is suitable if the project duration is less than 2 years and/or the costs of the project are consider to be low.
3) Alliance is suitable if the cost of the project is high (Duration is not as important in this case).

The guidelines were based on the analysis results of the survey. Further information could be read in the subsections 6.3.2 Cost and 6.3.3 Duration.

7.2.2 Decision Spreadsheet

The decision spreadsheet is an important form to be filled during the decision making processes. The spreadsheet helps to demonstrate the readiness of both the client and contractor to undertake relationship contracting. The form consists of value statements and delivery statements. Delivery statements are sub-statements branching from the value statements.

Each statement has its own weighting. The weightings are distributed according to the importance of the statements. The final distribution of the weightings is also based on the professional opinion of two participants from the survey on top of guidance from my supervisor.

Generally, the total of all the value statements would sum up to 100 %. Weighting of a particular value statement is equally divided among its delivery statements. In another word, each delivery statement has weighting similar to one another if they fall under the same value statement. The assumption made was that individual delivery statements under the same group are equally important.

The evaluation begins by grading all the statements according to the scoring system of 1 to 5. The evaluator is required the assign points under the raw score column of the client's organisation and the raw score column of the selected contractor. Detail descriptions of the performance scale are provided in table 7.1:

Table 7.1 – Description of performance scale

Score	Performance	Detail Description
1	Unsustainable	Financial condition extremely unstable, never deliver in time, very poor risks management capability, extremely poor relationship (frequent conflicts and disputes that are hard to resolve), not innovative, unacceptable work, health and safety standard (WHS)
2	Poor	Unstable financial condition, often fail to deliver in time, risks management capability not up to standard, poor relationship (conflicts and disputes that sometimes are hard to resolve), little innovation, poor work, health and safety standard (WHS)
3	Satisfactory	Stable financial position, usually deliver in time, moderate risks management capability, satisfactory relationship (seldom have conflicts and disputes), innovative, acceptable work, health and safety standard (WHS)
4	Good	Strong financial position, always deliver in time,

		outstanding risks management capability, good relationship (minor conflict and dispute), very innovative, recommended work, health and safety standard (WHS)
5	Excellent	Superior financial position, always deliver in time and occasion early delivery, exceptional management capability, excellent relationship (minor and easily resolved dispute, trustworthy and dependable), highly innovative, world class work, health and safety standard (WHS)

When the grading of the statements has been completed, the spreadsheet would show the average score. The final score demonstrates the capability of both client and contractor in partnering or alliance. The benchmark is set a score of 3. This means that the overall performance of the company must be at least satisfactory.

There are several possible scenarios or outcomes:

1) If the client's organisation could not achieve the benchmark, the client is not ready to utilise relationship contracting. Unless improvement has been made to improve the quality of those statements that falls below the satisfactory level, use of relationship contracting is not advisable.
2) If the client's organisation achieves the benchmark but the selected contractor fails, the contractor is not suitable for relationship contracting. Another contractor would need to be selected.
3) If both client and contractor achieve the benchmark, the client has found a suitable candidate for relationship contracting.

The process becomes complicated if the client plans to evaluate several contractors at one time. Suffice to say, the contractor that outperforms others would be the winner.

7.3 Testing Decision Matrix

The decision matrix was tested on two construction projects. One of the projects has already been completed whereby the other is a proposed project. By doing so, I would be able to determine if the previous project could have adopted relationship contracting. It also enables me to decide the likelihood of applying relationship contracting in any future project in Malaysia.

Both evaluators have participated in the survey prior to the development of the decision matrix. The completed decision matrixes are presented in appendix D. Their assessments show promising results. The clients and contractors do have certain level of capability to enter into relationship contracting.

Many projects in Malaysia use traditional contracting system because of the lack of awareness and knowledge on the new form of contracting system. If the concept and benefits of relationship contracting are promoted in Malaysia, it would encourage more application of relationship contracting in future projects.

Due to time constrain, the decision matrix was not offered to be used in the awarding and management of construction project. If possible, evaluation on the outcomes of the project after the actual use of decision matrix is recommended in future research project.

Chapter 8 Conclusions

8.1 Achievement of aims and objectives

Relationship contracting indeed has numerous benefits despite having some barriers in achieving good end results. When compared with traditional form of contracts, relationship based contracts offer benefits of which could hardly exist in the conventional contracting system. Some distinctive benefits found in relationship contracting are reduction in project delivery time, significant cost saving, better risks management strategies, improvement in business relationships, wise use of advance technology, innovative and optimum standards of quality.

Investigation on contracting systems adopted in Malaysia shows that most projects still rely on traditional contracts. Through a questionnaire approach, analysis on the benefits, costs and issues pertinent to the contract methods used in Malaysia were performed. The analysis reveals the existence of adversarial nature in the traditional contracting systems. Nearly all the projects interviewed have reported delayed in project delivery and increase in overall construction costs. Many have argued that the increase in costs is due to the surge in global oil price and the unexpected yield of price in steel products.

A decision matrix was successfully developed to evaluate the suitability of applying relationship contracting in particular construction project in Malaysia. The decision matrix has been review and revised by the project supervisor and two other local

professionals in the construction industry. This is to improve the quality of the decision matrix and aligned the decision processes to suit the local requirements.

Subsequent step taken during the research process was to test the decision matrix. Two participants from the previous surveyed were invited to test out the decision matrix. Each has selected a construction project for the evaluation. To test the current and future prospect of applying relationship contracting in Malaysia, one of the participants was requested to assess on a completed project and the other was asked to evaluate on a proposed project.

The results of the tests suggested that both projects are capable of applying relationship contracting. The test has proven the possibility of adopting relationship contracting in local construction project. The current construction industry in Malaysia is ready to enter into a new phase of contracting system. Although not all projects are suitable to undertake relationship based contracts, those which are suitable should do so.

In conclusion, the research project has achieved its aims and objectives of studying the benefits of relationship contracting and evaluating the suitability of applying relationship based contracts in Malaysia.

8.2 Further Work

This project has provided substantial information on the concept of relationship contracting and the potential of its application in Malaysia. It is hoping that the research would open up the door to further introduction and promotion of relationship contracting in Malaysia. Further work that could be carried out in future research is listed below:

- Obtain the latest development in relationship contracting through various resources.
- Conduct a survey with large sample size and a variety of construction projects in different sectors.

- Continuous testing, evaluating and refining the decision matrix to ensure it is up to date.
- Apply the decision matrix in actual project and evaluate the use of the process in the award and management of the civil engineering project.

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Appendix A – Project Specification

University of Southern Queensland
Faculty of Engineering and Surveying

ENG 4111/4112 Research Project
PROJECT SPECIFICATION

FOR	:	**LIM CHUAN JYE**
TOPIC	:	Relationship contracting in Malaysia
SUPERVISOR	:	Dr. David Thorpe
ENROLMENT	:	ENG 4111 – S1, X, 2005 ENG 4112 – S2, X, 2005
PROJECT AIM	:	To study the benefits of relationship contracting and evaluate the suitability of applying relationship based contracts in Malaysia.
SPONSORSHIP	:	Faculty of Engineering and surveying
PROGRAMME	**:**	**Issue C, 23 October 2005**

1. Undertake a literature review on relationship contracting, including :
   - the contract formation and management process
   - the fundamentals of relationship contracting
   - the various types of relationship contracting, such as partnering and alliance contracting
   - the limitations of traditional contracting
   - understand the potential barriers to relationship contracting and the maintenance of relationship
   - the transition from traditional environment to the successful implementation of relationship based contract
   - the benefits, costs and issues associated with delivering civil engineering projects using relationship contracting as compared with traditional forms of contract

2. Develop a research methodology, using a questionnaire approach, for assessing the benefits, costs and issues associated with delivering civil engineering projects in Malaysia by relationship based contracting and traditional contract methods.
3. Using this research methodology, conduct a study on at least six (6) civil engineering contracts in Malaysia, preferably three (3) of which are to be delivered using relationship based contracts, to:
    - gather data on the contract delivery processes used for civil engineering projects in Malaysia
    - compare and contrast relationship management approaches for civil engineering projects in Malaysia for compared with traditional project and contract management.
4. Analyse the results of this study to assess the benefits, costs and issues in undertaking projects in Malaysia by relationship contracting.
5. Using the findings of the analysis, develop a process for successful implementation of relationship contracting in Malaysia.
6. Report findings to peer group via oral presentations and in the required written format.

As time permits:

7. Test the process developed with principals in Malaysia and assess the test results.
8. Evaluate the use of the process in the award and management of at least one particular civil engineering project.

AGREED:

_____	_____
(Student)	(Supervisor)
___ / ___ / ___	___ / ___ / ___

Appendix B - Project Questionnaire

Project Questionnaire 1

Student : **Lim Chuan Jye**
Research Project : **Relationship Contracting in Malaysia**
Supervisor : **Dr. David Thorpe**

Project Aim:

To study the benefits of relationship contracting and evaluate the suitability of applying relationship based contracts in Malaysia.

Background:

Relationship contracting has been available as a style of infrastructure delivery since early 1980s. It is a term applied to contracting arrangement where management of relationship is given precedence over the dictate of a standard form of contract. It is a strategic alliance between organisations to achieve mutual benefits based on trust, appropriate risk allocation, teamwork, sharing of profit or loss and most importantly the alignment of goals. Traditional contracting systems in construction industries frequently lead to confrontations and unresolved issues associated with different commercial alignment of individual parties which tends to escalate the project time and targeted cost. On the contrary, relationship contracts offer an approach to encourage cost savings and reduction in construction time through systematic contracting procedures thus overcoming the limitations of traditional contracts.

Contract : **Traditional contract**
Company : **LCs**
Project Description : **4 Block Low Medium Cost Apartments (18 Storeys) & 2 Block Car park**
Dates : **1st August & 15 July 2005**
Respondents : **Client** ☐ **Contractor** ☽

Criteria	Question	Very Good	Good	Satisfactory	Poor	Very Poor
Costs	What was your opinion on the final cost of the project? (If applicable)			(□No Comment) ❫		
Duration	How was the delivery of the project according to the schedule?		□	❫		
Risks	How do you justify the adequacy of risks assigned to you?			□	❫	
Relationships	How was your business relationship with your contract partner?		□ ❫			
	How was the efficiency of communication between you and with your contract partner?		□ ❫			
	How was the cooperation or teamwork with your contract partner in the project?			□	❫	
	What do you think of the alignment of interests between you and your contract partner? For example, in term of quality and profitability of the work.		❫		□	

	How was the openness in sharing of information between you and your contract partner?		□	)		
	How was the degree of trust between you and your contract partner?		□)			
Innovation	How was the level of innovation in the construction project? For example, the use of new technology, construction techniques and design.		□)			
Standard	How was the safety performance of the construction project compared with that normally expected for this type of project?				)	□
	How was the quality of the overall project compared with that normally expected for this type of project?		)	□		

Criteria	Question	Respond
Contract Form	What was the form of contract used? e.g., Lump sump, Design & build/Turnkey, Partnering or Alliances.	*Design & Built*
	Did your cost increases, reduces or remains the same as the estimate?	☐ *Same* ☑ *Increases*
	What caused the changes in the cost? (If applicable)	☐ *Not applicable* ☑ *Price fluctuation (increase) in raw material especially on the steel products*
Duration	Project commences	*1st Jun 2004*
	Project ends	*31st Oct 2005*
	Was there any reduction in overall construction time?	☐ *No* ☑ *No*
	Was there any overall delay in project delivery?	☐ *Maybe* ☑ *Yes*
Risks	Are there any suggestions on certain risks that should be handed to others who are better at managing them?	☐ *No comment* ☑ *Contract should include the sharing of liability if costs of materials fluctuate beyond a certain limit.*

Innovation	Describe any significant innovations in this project.	☐ *Proper organisation / management* ☑ *Application of post tension cable at the floor above the lobby area. The lobby area needs extensive span without the support of column.* ☑ *Reinforce concrete gutter was used for drainage instead of conventional hollow steel gutter which rust easily.*
Improvement	For traditional contract:	
	Have you used or heard of relationship contracts in previous projects?	☐ *No* ☑ *Yes*
	Would you consider using relationship contracts (partnering/alliances) to improve the outcome of the project and achieve a win-win situation if possible?	☐ *Yes* ☑ *Yes*
	Why and why not?	☐ *Cost and time saving, quality control.* ☑ *Yes. Used when I don't have sufficient capital to undertake the project. No. When I have enough capital to handle the project on my own because I can gain more profit and I'm able to be the decision-maker.*

	For relationship contract:	
	How was the overall improvement of the project compared to using traditional contractual procedures?	
	Would you give some examples of substantial improvements?	
	Would you consider adopting relationship contract again?	*Yes / No*
	Why and why not?	
	What would you do differently next time you had a relationship contract?	
Comments	Other comments?	*No comment* *Hope the project would finish faster than the estimated time because I can save about RM100, 000 per month.* *Would like the increase in cost be bear by both developer and contractor (include in the initial contract)*

Project Questionnaire 2

Contract : **Traditional contract**

Company : **LCs**

Project Description : **Capacity Upgrading of Sabang Palm Oil Mill**

Dates : **2nd August 2005 & 23rd August**

Respondents : **Client** □ **Contractor** ❩

Criteria	Question	Very Good	Good	Satisfactory	Poor	Very Poor
Costs	What was your opinion on the final cost of the project? (If applicable)			□ ❩		
Duration	How was the delivery of the project according to the schedule?		□	❩		
Risks	How do you justify the adequacy of risks assigned to you?			□ ❩		
Relationships	How was your business relationship with your contract partner?	❩	□			
	How was the efficiency of communication between you and with your contract partner?		□ ❩			

	How was the cooperation or teamwork with your contract partner in the project?		□			
	What do you think of the alignment of interests between you and your contract partner? For example, in term of quality and profitability of the work.			□		
	How was the openness in sharing of information between you and your contract partner?			□		
	How was the degree of trust between you and your contract partner?			□		
Innovation	How was the level of innovation in the construction project? For example, the use of new technology, construction techniques and design.			□		
Standard	How was the safety performance of the construction project compared with that normally expected for this type of project?		□			

	How was the quality of the overall project compared with that normally expected for this type of project?		□ ❍			

Criteria	Question	Respond
Contract Form	What was the form of contract used? e.g., Lump sump, Design & build/Turnkey, Partnering or Alliances.	*Lump sum*
	Did your cost increases, reduces or remains the same as the estimate?	□ *Increases* ❍ *Increases*
	What caused the changes in the cost? (If applicable)	□ *Oversight by consultant in not providing certain work items* ❍ *Material price increase*
Duration	Project commences	*June 2003*
	Project ends	*May 2004*
	Was there any reduction in overall construction time?	□ *No* ❍ *Yes*
	Was there any overall delay in project delivery?	□ *No* ❍ *No*

Risks	Are there any suggestions on certain risks that should be handed to others who are better at managing them?	☐ *No* ☐ *No*
Innovation	Describe any significant innovations in this project.	☐ *No* ☐ *Not significant*
Improvement	For traditional contract:	
	Have you used or heard of relationship contracts in previous projects?	☐ *No* ☐ *Yes*
	Would you consider using relationship contracts (partnering/alliances) to improve the outcome of the project and achieve a win-win situation if possible?	☐ *Yes* ☐ *Depends on term and conditions*
	Why and why not?	☐ *If relationship contracts can bring about better cooperation, cost savings and speedier project completion without losing out on work quality or compromising on professional work ethics, I would definitely consider it in future.* ☐ *Depends on terms and conditions*
	For relationship contract:	
	How was the overall improvement of the project compared to using traditional contractual procedures?	

	Would you give some examples of substantial improvements?	
	Would you consider adopting relationship contract again?	Yes / No
	Why and why not?	
	What would you do differently next time you had a relationship contract?	
Comments	Other comments?	*No* *No*

Project Questionnaire 3

Contract : **Traditional contract**
Company : **LCs**
Project Description : **Rehabilitation & Upgrading of KL-Karak Highway**
Dates : **8th August & 16th August**
Respondents : **Client** □ **Contractor** ❍

Criteria	Question	Very Good	Good	Satisfactory	Poor	Very Poor
Costs	What was your opinion on the final cost of the project? (If applicable)			□	❍	
Duration	How was the delivery of the project according to the schedule?			□ ❍		
Risks	How do you justify the adequacy of risks assigned to you?			□ ❍		
Relationships	How was your business relationship with your contract partner?		□	❍		
	How was the efficiency of communication between you and with your contract partner?		□ ❍			

	How was the cooperation or teamwork with your contract partner in the project?		□	)		
	What do you think of the alignment of interests between you and your contract partner? For example, in term of quality and profitability of the work.			□	)	
	How was the openness in sharing of information between you and your contract partner?			□)		
	How was the degree of trust between you and your contract partner?			□)		
Innovation	How was the level of innovation in the construction project? For example, the use of new technology, construction techniques and design.			□)		
Standard	How was the safety performance of the construction project compared with that normally expected for this type of project?		)	□		

	How was the quality of the overall project compared with that normally expected for this type of project?		❍	□		

Criteria	Question	Respond
Contract Form	What was the form of contract used? e.g., Lump sump, Design & build/Turnkey, Partnering or Alliances.	*Lump Sum Contract*
	Did your cost increases, reduces or remains the same as the estimate?	□ *Increases* ❍ *Increases*
	What caused the changes in the cost? (If applicable)	□ *Actual work defer from original design* ❍ *Cost of resources increase and extension of time*
Duration	Project commences	*15th August 2004*
	Project ends	*31st August 2005*
	Was there any reduction in overall construction time?	□ *No* ❍ *No*
	Was there any overall delay in project delivery?	□ *Yes (2 months)* ❍ *Yes*
Risks	Are there any suggestions on certain risks that should be handed to others who are better at managing them?	□ *No* ❍ *To mitigate risk in delaying the works, subcontractors who are in the best position to handle the risks would be included as part of the project team.*

Innovation	Describe any significant innovations in this project.	☐ *No* ☑ *Introduction of a special type of bitumen (Polymer binder) for pavement construction and to give better quality pavement.*
Improvement	For traditional contract:	
	Have you used or heard of relationship contracts in previous projects?	☐ *Yes* ☑ *Yes*
	Would you consider using relationship contracts (partnering/alliances) to improve the outcome of the project and achieve a win-win situation if possible?	☐ *Yes* ☑ *Yes*
	Why and why not?	☐ *Easy justification especially on their performance in handling project.* ☑ *To ensure project could complete on time, within budget and achievement of objective as well as quality.*
	For relationship contract:	
	How was the overall improvement of the project compared to using traditional contractual procedures?	
	Would you give some examples of substantial improvements?	

	Would you consider adopting relationship contract again?	*Yes / No*
	Why and why not?	
	What would you do differently next time you had a relationship contract?	
Comments	Other comments?	*There was not much improvement in this project especially at the implementation level. At the moment, there is nothing to be changed from the current practice as all are in good order.* *To my knowledge, not many have adopted the relationship contracting in Malaysia. The relevant authorities like Public Works Department (JKR) and Construction Industry Development Board (CIDB) play an important role in promoting the concept.*

Project Questionnaire 4

Contract : **Traditional and Relationship contract**

Company : **LCs**

Project Description : **Stormwater Management & Road Tunnel (SMART)**

Dates : **9th August 2005 (Contractor)**

Respondents : **Client** □ **Contractor** ❍

Criteria	Question	Very Good	Good	Satisfactory	Poor	Very Poor
Costs	What was your opinion on the final cost of the project? (If applicable)		❍			
Duration	How was the delivery of the project according to the schedule?		❍			
Risks	How do you justify the adequacy of risks assigned to you?			❍		
Relationships	How was your business relationship with your contract partner?	❍				
	How was the efficiency of communication between you and with your contract partner?	❍				

	How was the cooperation or teamwork with your contract partner in the project?	)				
	What do you think of the alignment of interests between you and your contract partner? For example, in term of quality and profitability of the work.	)				
	How was the openness in sharing of information between you and your contract partner?	)				
	How was the degree of trust between you and your contract partner?	)				
Innovation	How was the level of innovation in the construction project? For example, the use of new technology, construction techniques and design.	)				
Standard	How was the safety performance of the construction project compared with that normally expected for this type of project?	)				

	How was the quality of the overall project compared with that normally expected for this type of project?	❍				

Criteria	Question	Respond
Contract Form	What was the form of contract used? e.g., Lump sump, Design & build/Turnkey, Partnering or Alliances.	*Joint Venture (JV) between MMC and Gamuda (Main contractors)* *Fixed Lump Sum contract with contractors* *Design & Build contract with client*
	Did your cost increases, reduces or remains the same as the estimate?	❍ *Increases*
	What caused the changes in the cost? (If applicable)	❍ *Unforeseen ground condition i.e. sinkholes treatment, crack repairs to the completed tunnel etc.*
Duration	Project commences	*June 2002*
	Project ends	*December 2006*
	Was there any reduction in overall construction time?	❍*Yes*
	Was there any overall delay in project delivery?	❍*No*
Risks	Are there any suggestions on certain risks that should be	❍ *Risks are best laid in the hand of the owner.*

	handed to others who are better at managing them?	
Innovation	Describe any significant innovations in this project.	*Implementation of 2 Tunnel Boring Machine of 3.6m diameter*
Improvement	For traditional contract:	
	Have you used or heard of relationship contracts in previous projects?	*Yes*
	Would you consider using relationship contracts (partnering/alliances) to improve the outcome of the project and achieve a win-win situation if possible?	*Yes*
	Why and why not?	*To ensure a successful project is to marry a right partner who can deliver and who have sufficient cash flow and influence with the authority. Background of the company is very important to determine the right partner for any project*
	For relationship contract:	
	How was the overall improvement of the project compared to using traditional contractual procedures?	*N/A*
	Would you give some examples of substantial improvements?	*N/A*

	Would you consider adopting relationship contract again?	☐ *Yes*
	Why and why not?	☐ *N/A*
	What would you do differently next time you had a relationship contract?	☐ *N/A*
Comments	Other comments?	☐ *No*

Project Questionnaire 5

Contract : **Traditional contract**

Company : **LCs**

Project Description : **Electrified Double Tracking Project (Yard Lighting)**

Dates : **9th August (Contractor)**

Respondents : **Client** □ **Contractor** ❍

Criteria	Question	Very Good	Good	Satisfactory	Poor	Very Poor
Costs	What was your opinion on the final cost of the project? (If applicable)			❍		
Duration	How was the delivery of the project according to the schedule?				❍	
Risks	How do you justify the adequacy of risks assigned to you?				❍	
Relationships	How was your business relationship with your contract partner?			❍		
	How was the efficiency of communication between you and with your contract partner?			❍		

	How was the cooperation or teamwork with your contract partner in the project?				)	
	What do you think of the alignment of interests between you and your contract partner? For example, in term of quality and profitability of the work.			)		
	How was the openness in sharing of information between you and your contract partner?			)		
	How was the degree of trust between you and your contract partner?			)		
Innovation	How was the level of innovation in the construction project? For example, the use of new technology, construction techniques and design.				)	
Standard	How was the safety performance of the construction project compared with that normally expected for this type of project?			)		

	How was the quality of the overall project compared with that normally expected for this type of project?			❍		

Criteria	Question	Respond
Contract Form	What was the form of contract used? e.g., Lump sump, Design & build/Turnkey, Partnering or Alliances.	❍ *Lump Sum*
	Did your cost increases, reduces or remains the same as the estimate?	❍ *Increases*
	What caused the changes in the cost? (If applicable)	❍ *Time Delay*
Duration	Project commences	*Dec 2001*
	Project ends	*Dec 2006*
	Was there any reduction in overall construction time?	❍ *No*
	Was there any overall delay in project delivery?	❍ *Yes*
Risks	Are there any suggestions on certain risks that should be handed to others who are	❍ *Security risk (Rampant theft at site)*

	better at managing them?	
Innovation	Describe any significant innovations in this project.	*No*
Improvement	For traditional contract:	
	Have you used or heard of relationship contracts in previous projects?	*No*
	Would you consider using relationship contracts (partnering/alliances) to improve the outcome of the project and achieve a win-win situation if possible?	*No*
	Why and why not?	*Based on your statement, this type of contract depends a lot on trusts on the people involved. The current trend of modern development is much different from the old ways. Even with a normal contract, there seems to be a lot of problems.*
	For relationship contract:	
	How was the overall improvement of the project compared to using traditional contractual procedures?	
	Would you give some examples of substantial improvements?	

	Would you consider adopting relationship contract again?	*Yes / No*
	Why and why not?	
	What would you do differently next time you had a relationship contract?	
Comments	Other comments?	*No*

Project Questionnaire 6

Contract : **Traditional contract**
Company : **LCs**
Project Description : **Infrastructure Works in Putrajaya**
Dates : **2nd September 2005**
Respondents : **Client** □ **Contractor** ❍

Criteria	Question	Very Good	Good	Satisfactory	Poor	Very Poor
Costs	What was your opinion on the final cost of the project? (If applicable)			❍		
Duration	How was the delivery of the project according to the schedule?		❍			
Risks	How do you justify the adequacy of risks assigned to you?			❍		
Relationships	How was your business relationship with your contract partner?		❍			
	How was the efficiency of communication between you and with your contract partner?		❍			

	How was the cooperation or teamwork with your contract partner in the project?		)			
	What do you think of the alignment of interests between you and your contract partner? For example, in term of quality and profitability of the work.		)			
	How was the openness in sharing of information between you and your contract partner?		)			
	How was the degree of trust between you and your contract partner?		)			
Innovation	How was the level of innovation in the construction project? For example, the use of new technology, construction techniques and design.	)				
Standard	How was the safety performance of the construction project compared with that normally expected for this type of project?		)			

	How was the quality of the overall project compared with that normally expected for this type of project?		✓			

Criteria	Question	Respond
Contract Form	What was the form of contract used? e.g., Lump sump, Design & build/Turnkey, Partnering or Alliances.	✓ *Traditional Tender Contract*
	Did your cost increases, reduces or remains the same as the estimate?	✓ *Increases*
	What caused the changes in the cost? (If applicable)	✓ *Inflation in material prices such as steel bars, matters etc*
Duration	Project commences	*2 years*
	Project ends	-
	Was there any reduction in overall construction time?	✓ *Yes*
	Was there any overall delay in project delivery?	✓ *No*
Risks	Are there any suggestions on certain risks that should be	✓ *Lock in all the prices with suppliers and*

	handed to others who are better at managing them?	*subcontractors*
Innovation	Describe any significant innovations in this project.	*Redesign or alternative design*
Improvement	For traditional contract:	
	Have you used or heard of relationship contracts in previous projects?	*No*
	Would you consider using relationship contracts (partnering/alliances) to improve the outcome of the project and achieve a win-win situation if possible?	*Yes*
	Why and why not?	*To minimise dispute and better cost control*
	For relationship contract:	
	How was the overall improvement of the project compared to using traditional contractual procedures?	
	Would you give some examples of substantial improvements?	

	Would you consider adopting relationship contract again?	*Yes / No*
	Why and why not?	
	What would you do differently next time you had a relationship contract?	
Comments	Other comments?	*Negotiate for fair terms and conditions when relationship contract is adopted*

Appendix C – Charts Results

Chart Results

Costs

What was your opinion on the final cost of the project?

Figure 6.2 – Cost of project from client and contractor's perspective

Did your cost increases, reduces or remain the same as the estimate?

Figure 6.3 – Difference between actual and estimated cost

Duration

How was the delivery of the project according to schedule?

Figure 6.4 – Project delivery timeline from client and contractor's perspective

Was there any reduction in overall construction time?

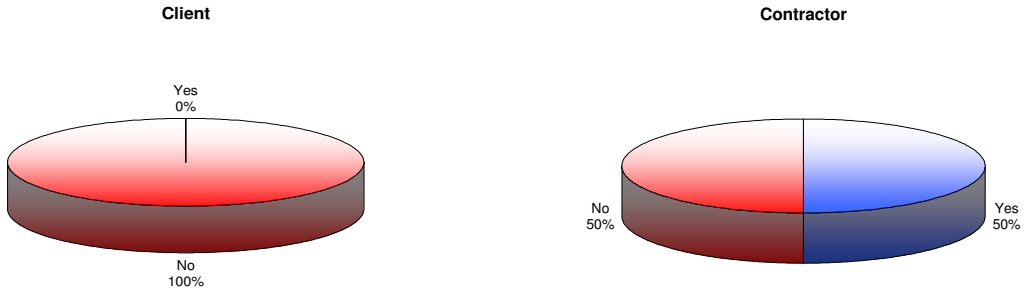

Figure 6.5 – Reduction in construction time

Was there any overall delay in project delivery?

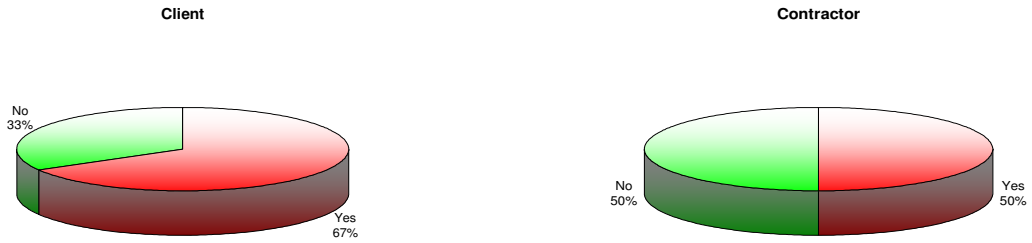

Figure 6.6 – Delay in construction time

Risks

How do you justify the adequacy of the risks assigned to you?

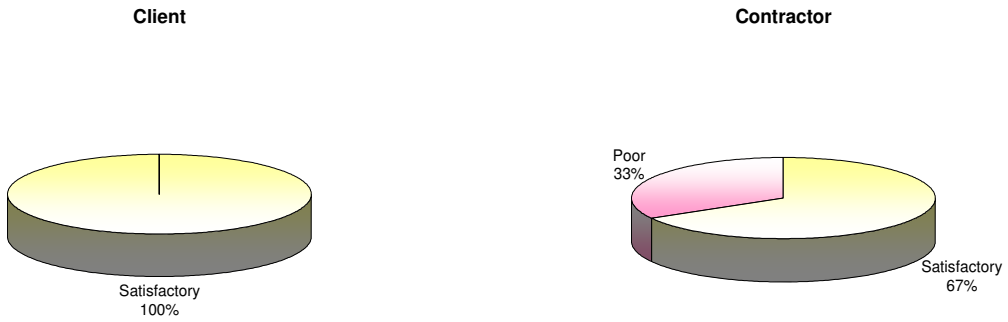

Figure 6.7 – Risks on client and contractor's perspective

Relationship

How was your business relationship with your contract partner?

Figure 6.8 – Business relationship from client and contractor's perspective

How was the efficiency of communication between you and your contract partner?

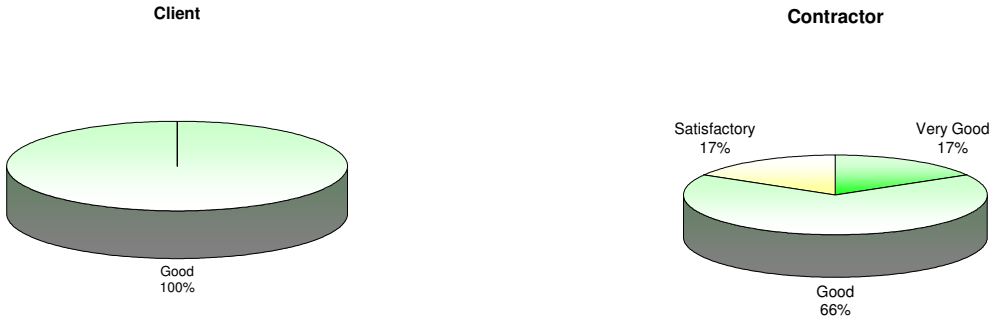

Figure 6.9 – Communication from client and contractor's perspective

How was the cooperation or teamwork with your contract partner in the project?

Figure 6.10 – Cooperation from client and contractor's perspective

What do you think of the alignment of interests between you and your contract partner?

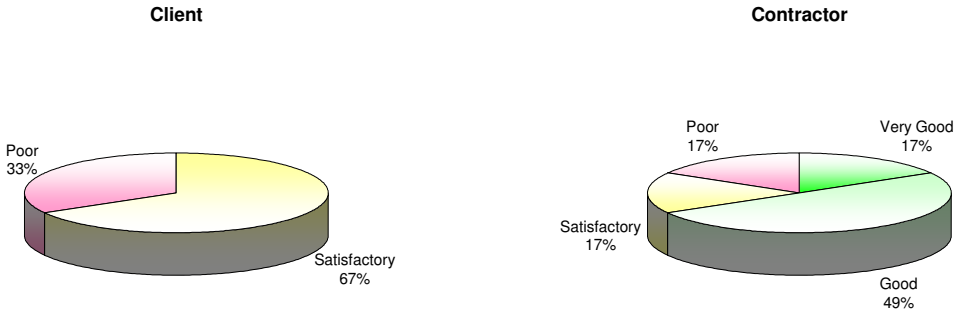

Figure 6.11 – Alignment of interest from client and contractor's perspective

How was the openness in sharing of information between you and your contract partner?

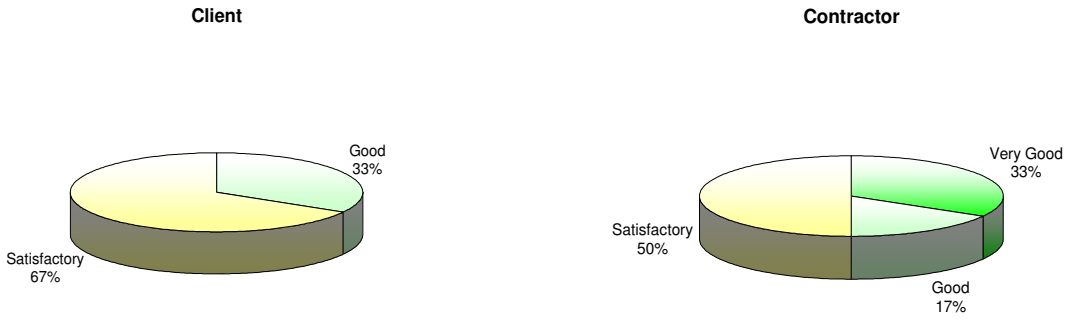

Figure 6.12 – Openness from client and contractor's perspective

How was the degree of trust between you and your contract partner?

Figure 6.13 – Trust from client and contractor's perspective

Innovation

How was the level of innovation in the construction project? Examples are the use of technology, construction techniques and design.

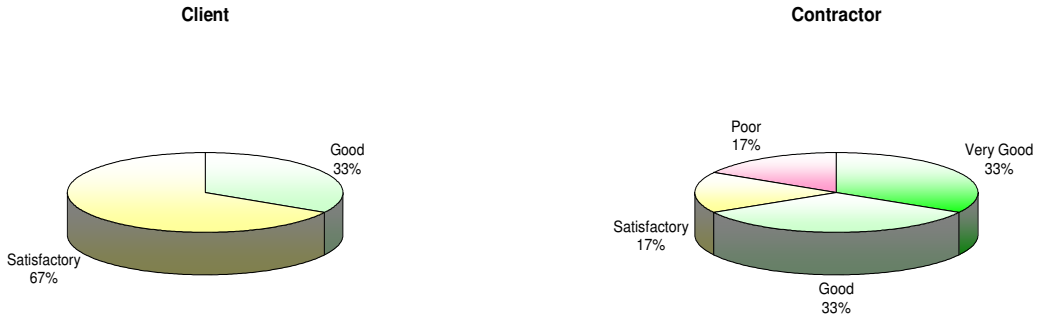

Figure 6.14 – Innovation from client and contractor's perspective

Standard

How was the safety performance of the construction project compared with that normally expected for this type of project?

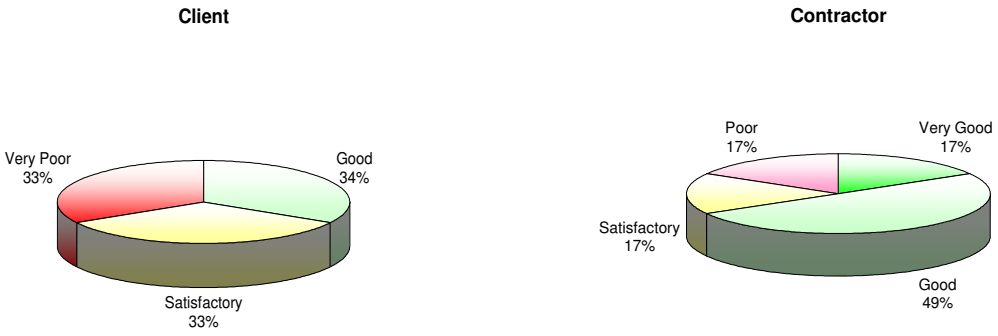

Figure 6.15 – Safety standard from client and contractor's perspective

How was the quality of the overall project compared with that normally expected for this type of project?

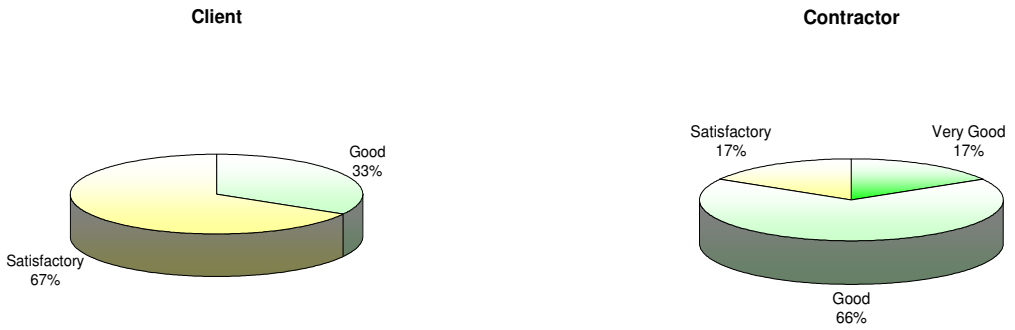

Figure 6.16 – Quality from client and contractor's perspective

Improvement

Have you used or heard of relationship contracts?

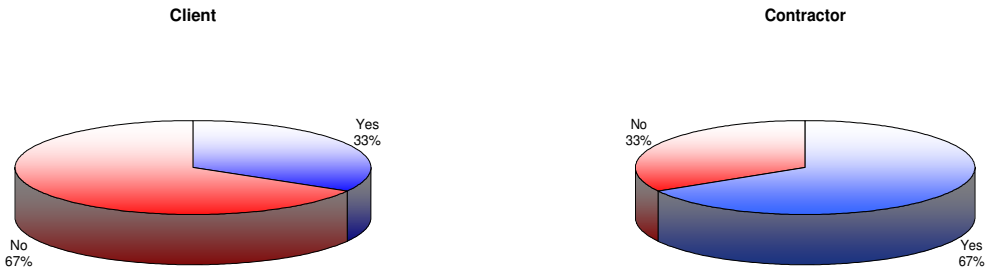

Figure 6.17 – Knowledge of relationship contract

Would you consider using relationship contracts to improve the outcome of the project and achieve a win-win situation if possible?

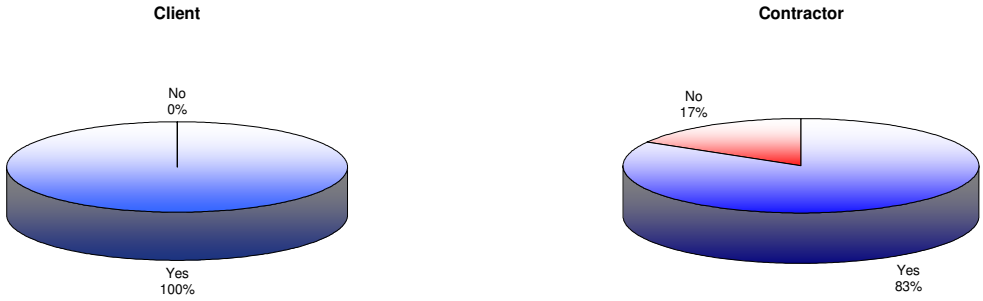

Figure 6.18 – Acceptability on using relationship contract

Appendix D – Decision Matrix

Table D.1: Performance Scale

Score	Performance	Detail Description
1	Unsustainable	Financial condition extremely unstable, never deliver in time, very poor risks management capability, extremely poor relationship (frequent conflicts and disputes that are hard to resolve), not innovative, unacceptable work, health and safety standard (WHS)
2	Poor	Unstable financial condition, often fail to deliver in time, risks management capability not up to standard, poor relationship (conflicts and disputes that sometimes are hard to resolve), little innovation, poor work, health and safety standard (WHS)
3	Satisfactory	Stable financial position, usually deliver in time, moderate risks management capability, satisfactory relationship (seldom have conflicts and disputes), innovative, acceptable work, health and safety standard (WHS)
4	Good	Strong financial position, always deliver in time, outstanding risks management capability, good relationship (minor conflict and dispute), very innovative, recommended work, health and safety standard (WHS)
5	Excellent	Superior financial position, always deliver in time and occasion early delivery, exceptional management capability, excellent relationship (minor and easily resolved dispute, trustworthy and dependable), highly innovative, world class work, health and safety standard (WHS)

Decision Charter

Company Name:	
Description of contract:	
Vision: **Mission:**	
Objectives and Goals	
Cost	
Duration	
Risks	
Relationships	
Innovation	
Standard	

Note:
Additional objectives and goals can be added when necessary

Recommendations/Guidelines:

1) Relationship contracting is worth adopting when cost of the project is more than RM5 million
2) Partnering is suitable if the project duration is less than 2 years and/or the costs of project are consider to be low
3) Alliance is suitable if the cost of the project is high (Duration is not as important in this case)

Decision Spreadsheet

Definitions:
%WA = % Weighting for value statements
%WB = % Weighting for delivery statement
%TW = %WA x %WB = Total weighting A x B

Scoring (1-5 performance Scale)
1 = Unsustainable
2 = Poor
3 = Satisfactory
4 = Good
5 = Excellent

						Client's Organisation				Contractor* Name:	
A. Value Statement	**%WA**		**B. Delivery Statement**	**%WB**	**%TW**	**Raw Score**	**Weighted Score**	**%WB**	**%TW**	**Raw Score**	**Weighted Score**
1. Cost	20%	1.1	Profitability of project	14.3	2.86		0.00	14.3	2.86		0.00
		1.2	Capital available to undertake the project	14.3	2.86		0.00	14.3	2.86		0.00
		1.3	Strength of balance sheet	14.3	2.86		0.00	14.3	2.86		0.00
		1.4	Willingness in 'open book' budget exchanges	14.3	2.86		0.00	14.3	2.86		0.00
		1.5	Sharing of profit/loss	14.3	2.86		0.00	14.3	2.86		0.00
		1.6	Financial management capability	14.3	2.86		0.00	14.3	2.86		0.00
		1.7	Availability of human resources	14.3	2.86		0.00	14.3	2.86		0.00
				100	**20.00**		**0.00**	**100**	**20.00**		**0.00**
2. Duration	20%	2.1	Proposed construction period	50.0	10.00		0.00	50.0	10.00		0.00
		2.2	Track record of delivery in time	50.0	10.00		0.00	50.0	10.00		0.00
				100.0	**20.00**		**0.00**	**100.0**	**20.00**		**0.00**
3. Risk	20%	3.1	Equitable risk/reward sharing model (Usually higher risk, higher reward)	25.0	5.00		0.00	25.0	5.00		0.00
		3.2	Risk management capability	25.0	5.00		0.00	25.0	5.00		0.00
		3.3	Readiness in new risk transfer strategy	25.0	5.00		0.00	25.0	5.00		0.00
		3.4	Readiness in new embrace strategy	25.0	5.00		0.00			N/A	N/A

						Client's Organisation				Contractor* Name:	
A. Value Statement	**%WA**		**B. Delivery Statement**	**%WB**	**%TW**	**Raw Score**	**Weighted Score**	**%WB**	**%TW**	**Raw Score**	**Weighted Score**
		3.5	Willingness to put profit at risk based on over/under-performance against agreed KPIs			N/A	N/A	25.0	5.00		0.00
				100.0	**20.00**		**0.00**	**100.0**	**20.00**		**0.00**
4. Relationship	25%	4.1	Business relationship	9.1	2.27		0.00	9.1	2.27		0.00
		4.2	Alignment of interest	9.1	2.27		0.00	9.1	2.27		0.00
		4.3	Level of trust	9.1	2.27		0.00	9.1	2.27		0.00
		4.4	Level of cooperation	9.1	2.27		0.00	9.1	2.27		0.00
		4.5	Language (ability to communicate)	9.1	2.27		0.00	9.1	2.27		0.00
		4.6	Willingness to share information	9.1	2.27		0.00	9.1	2.27		0.00
		4.7	Ability to form an integrated project team	9.1	2.27		0.00	9.1	2.27		0.00
		4.8	Clear understanding of individual and collective responsibility	9.1	2.27		0.00	9.1	2.27		0.00
		4.9	Long term commitment	9.1	2.27		0.00	9.1	2.27		0.00
		4.10	Customer care/satisfaction	9.1	2.27		0.00	9.1	2.27		0.00
		4.11	Previous partnering/alliancing experience	9.1	2.27		0.00	9.1	2.27		0.00
				100.0	**25.00**		**0.00**	**100.0**	**25.00**		**0.00**
5. Innovation	10%		Innovation and capability of								
		5.1	Design	20.0	2.00		0.00	20.0	2.00		0.00
		5.2	Technology	20.0	2.00		0.00	20.0	2.00		0.00
		5.3	Systems (Monitor, review and report)	20.0	2.00		0.00	20.0	2.00		0.00
		5.4	Techniques (plan, coordinate & workshopping)	20.0	2.00		0.00	20.0	2.00		0.00
		5.5	Achieving stretch targets	20.0	2.00		0.00	20.0	2.00		0.00
				100.0	**10.00**		**0.00**	**100.0**	**10.00**		**0.00**
6. Standard	5%	6.1	Safety standard	33.3	1.67		0.00	33.3	1.67		0.00
		6.2	Health and environmental standard	33.3	1.67		0.00	33.3	1.67		0.00
		6.3	Quality standard	33.3	1.67		0.00	33.3	1.67		0.00

			100.0	**5.00**		**0.00**	**100.0**	**5.00**		**0.00**
Value statements 1 to 6	100%	Demonstrate partnering/alliance capability		**100**		**0.00**				**0.00**

Note:

N/A = Not applicable

*Number of column for contractor can be added to accommodate the evaluation of several contractors

(1) Relationship has the highest weighting due to its importance

(2) Value and delivery statements can be modified to suit current projects

Scoring of 3(Satisfactory) and above would be suitable to enter into relationship contract [Benchmark]

(Bechmark could be reset to suit client's expectation)

Test Results of Decision Matrix

I) Assessment of a Proposed Civil Engineering Project

Decision Charter

Company Name:	LC
Description of contract:	Road Work in Kuala Lumpur
Vision:	To become a top class civil firm in Malaysia
Mission:	To provide best services to customer in achieving the objectives of time, cost and quality for all the projects
Objectives and Goals	
Cost	Implementation of cost control procedures with the aim to maximise profit of project
Duration	Target for on-time completion of project if not early
Risks	Minimise risks by implementing risks management throughout the whole project duration
Relationships	Develop good relationship with all parties through effective communication and motivation from the top management
Innovation	Keep up to the latest trend of technology and method in construction industry
Standard	Comply with standards of requirement and the implementation of ISO

Note:
Additional objectives and goals can be added when necessary

Recommendations/Guidelines:
1) Relationship contracting is worth adopting when cost of the project is more than RM5 million
2) Partnering is suitable if the project duration is less than 2 years and/or the costs of project are consider to be low
3) Alliance is suitable if the cost of the project is high (Duration is not as important in this case)

Decision Spreadsheet

Definitions:
%WA = % Weighting for value statements
%WB = % Weighting for delivery statement
%TW = %WA x %WB = Total weighting A x B

Scoring (1-5 performance Scale)
1 = Unsustainable
2 = Poor
3 = Satisfactory
4 = Good
5 = Excellent

						Client's Organisation				Contractor* Name: -	
A. Value Statement	**%WA**		**B. Delivery Statement**	**%WB**	**%TW**	**Raw Score**	**Weighted Score**	**%WB**	**%TW**	**Raw Score**	**Weighted Score**
1. Cost	20%	1.1	Profitability of project	14.3	2.86	4	0.11	14.3	2.86	2	0.06
		1.2	Capital available to undertake the project	14.3	2.86	3	0.09	14.3	2.86	3	0.09
		1.3	Strength of balance sheet	14.3	2.86	3	0.09	14.3	2.86	3	0.09
		1.4	Willingness in 'open book' budget exchanges	14.3	2.86	3	0.09	14.3	2.86	3	0.09
		1.5	Sharing of profit/loss	14.3	2.86	3	0.09	14.3	2.86	2	0.06
		1.6	Financial management capability	14.3	2.86	4	0.11	14.3	2.86	3	0.09
		1.7	Availability of human resources	14.3	2.86	3	0.09	14.3	2.86	4	0.11
				100	**20.00**		**0.66**	**100**	**20.00**		**0.57**
2. Duration	20%	2.1	Proposed construction period	50.0	10.00	4	0.40	50.0	10.00	3	0.30
		2.2	Track record of delivery in time	50.0	10.00	3	0.30	50.0	10.00	4	0.40
				100.0	**20.00**		**0.70**	**100.0**	**20.00**		**0.70**
3. Risk	20%	3.1	Equitable risk/reward sharing model (Usually higher risk, higher reward)	25.0	5.00	3	0.15	25.0	5.00	2	0.10
		3.2	Risk management capability	25.0	5.00	2	0.10	25.0	5.00	2	0.10
		3.3	Readiness in new risk transfer strategy	25.0	5.00	4	0.20	25.0	5.00	3	0.15
		3.4	Readiness in new embrace strategy	25.0	5.00	2	0.10			N/A	N/A
		3.5	Willingness to put profit at risk based on			N/A	N/A	25.0	5.00	3	0.15

			over/under-performance against agreed KPIs									
				100.0	**20.00**		**0.55**	**100.0**	**20.00**		**0.50**
4. Relationship	25%	4.1	Business relationship	9.1	2.27	4	0.09	9.1	2.27	4	0.09
		4.2	Alignment of interest	9.1	2.27	4	0.09	9.1	2.27	4	0.09
		4.3	Level of trust	9.1	2.27	3	0.07	9.1	2.27	3	0.07
		4.4	Level of cooperation	9.1	2.27	3	0.07	9.1	2.27	3	0.07
		4.5	Language (ability to communicate)	9.1	2.27	4	0.09	9.1	2.27	3	0.07
		4.6	Willingness to share information	9.1	2.27	3	0.07	9.1	2.27	3	0.07
		4.7	Ability to form an integrated project team	9.1	2.27	3	0.07	9.1	2.27	3	0.07
		4.8	Clear understanding of individual and collective responsibility	9.1	2.27	3	0.07	9.1	2.27	4	0.09
		4.9	Long term commitment	9.1	2.27	4	0.09	9.1	2.27	3	0.07
		4.10	Customer care/satisfaction	9.1	2.27	3	0.07	9.1	2.27	3	0.07
		4.11	Previous partnering/alliancing experience	9.1	2.27	3	0.07	9.1	2.27	2	0.05
				100.0	**25.00**		**0.84**	**100.0**	**25.00**		**0.80**
5. Innovation	5%		Innovation and capability of								
		5.1	Design	20.0	1.00	3	0.03	20.0	1.00	3	0.03
		5.2	Technology	20.0	1.00	3	0.03	20.0	1.00	3	0.03
		5.3	Systems (Monitor, review and report)	20.0	1.00	4	0.04	20.0	1.00	3	0.03
		5.4	Techniques (plan, coordinate & workshopping)	20.0	1.00	3	0.03	20.0	1.00	3	0.03
		5.5	Achieving stretch targets	20.0	1.00	3	0.03	20.0	1.00	3	0.03
				100.0	**5.00**		**0.16**	**100.0**	**5.00**		**0.15**
6. Standard	10%	6.1	Safety standard	33.3	3.33	3	0.10	33.3	3.33	4	0.13
		6.2	Health and environmental standard	33.3	3.33	3	0.10	33.3	3.33	3	0.10
		6.3	Quality standard	33.3	3.33	4	0.13	33.3	3.33	4	0.13
				100.0	**10.00**		**0.33**	**100.0**	**10.00**		**0.37**
Value statements 1 to 6	100%		Demonstrate partnering/alliance capability		**100**		**3.24**				**3.08**

II) Reassessment of a Completed Civil Engineering Project

Decision Charter

Company Name:	LC
Description of contract:	Capacity Upgrading of Sabang Palm Oil Mill
Vision:	To finish the job with minimal additional (unforeseen) work variations/orders and in accordance with the specifications.
Mission:	To complete the job within the time period allocated and with minimal cost over-run.
Objectives and Goals	
Cost	RM 7.3 million
Duration	9 months
Risks	Possible delay in completion caused by adverse weather conditions e.g. unusually heavy rainfall. This in turn could lead to loss of (potentially higher) income as the Mill will not be in a position to go for better economies of scale operation.
Innovation	Utilization of latest (fast) construction methods is encouraged as long as they are safe.
Standard	Client and Contractor should work hand-in-hand to ensure optimal standards and quality of construction.

Note:
Additional objectives and goals can be added when necessary

Recommendations/Guidelines:
1) Relationship contracting is worth adopting when cost of the project is more than RM5 million
2) Partnering is suitable if the project duration is less than 2 years and/or the costs of project are consider to be low
3) Alliance is suitable if the cost of the project is high (Duration is not as important in this case)

Decision Spreadsheet

Definitions:
%WA = % Weighting for value statements
%WB = % Weighting for delivery statement
%TW = %WA x %WB = Total weighting A x B

Scoring (1-5 performance Scale)
1 = Unsustainable
2 = Poor
3 = Satisfactory
4 = Good
5 = Excellent

						Client's Organisation				Contractor* Name: -	
A. Value Statement	**%WA**		**B. Delivery Statement**	**%WB**	**%TW**	**Raw Score**	**Weighted Score**	**%WB**	**%TW**	**Raw Score**	**Weighted Score**
1. Cost	20%	1.1	Profitability of project	14.3	2.86	4	0.11	14.3	2.86	4	0.11
		1.2	Capital available to undertake the project	14.3	2.86	3	0.09	14.3	2.86	4	0.11
		1.3	Strength of balance sheet	14.3	2.86	4	0.11	14.3	2.86	4	0.11
		1.4	Willingness in 'open book' budget exchanges	14.3	2.86	4	0.11	14.3	2.86	2	0.06
		1.5	Sharing of profit/loss	14.3	2.86	3	0.09	14.3	2.86	3	0.09
		1.6	Financial management capability	14.3	2.86	4	0.11	14.3	2.86	4	0.11
		1.7	Avaibility of human resources	14.3	2.86	3	0.09	14.3	2.86	4	0.11
				100	**20.00**		**0.71**	**100**	**20.00**		**0.71**
2. Duration	20%	2.1	Proposed construction period	50.0	10.00	4	0.40	50.0	10.00	4	0.40
		2.2	Track record of delivery in time	50.0	10.00	4	0.40	50.0	10.00	4	0.40
				100.0	**20.00**		**0.80**	**100.0**	**20.00**		**0.80**
3. Risk	20%	3.1	Equitable risk/reward sharing model (Usually higher risk, higher reward)	25.0	5.00	4	0.20	25.0	5.00	3	0.15
		3.2	Risk management capability	25.0	5.00	3	0.15	25.0	5.00	3	0.15
		3.3	Readiness in new risk transfer strategy	25.0	5.00	3	0.15	25.0	5.00	2	0.10
		3.4	Readiness in new embrace strategy	25.0	5.00	3	0.15			N/A	N/A
		3.5	Willingness to put profit at risk based on			N/A	N/A	25.0	5.00	3	0.15

			over/under-performance against agreed KPIs									
				100.0	**20.00**		**0.65**	**100.0**	**20.00**		**0.55**
4. Relationship	25%	4.1	Business relationship	9.1	2.27	4	0.09	9.1	2.27	4	0.09
		4.2	Alignment of interest	9.1	2.27	4	0.09	9.1	2.27	4	0.09
		4.3	Level of trust	9.1	2.27	4	0.09	9.1	2.27	3	0.07
		4.4	Level of cooperation	9.1	2.27	4	0.09	9.1	2.27	4	0.09
		4.5	Language (ability to communicate)	9.1	2.27	5	0.11	9.1	2.27	4	0.09
		4.6	Willingness to share information	9.1	2.27	3	0.07	9.1	2.27	4	0.09
		4.7	Ability to form an integrated project team	9.1	2.27	4	0.09	9.1	2.27	3	0.07
		4.8	Clear understanding of individual and collective responsibility	9.1	2.27	3	0.07	9.1	2.27	3	0.07
		4.9	Long term commitment	9.1	2.27	3	0.07	9.1	2.27	4	0.09
		4.10	Customer care/satisfaction	9.1	2.27	4	0.09	9.1	2.27	4	0.09
		4.11	Previous partnering/alliancing experience	9.1	2.27	4	0.09	9.1	2.27	4	0.09
				100.0	**25.00**		**0.95**	**100.0**	**25.00**		**0.93**
5. Innovation	10%		Innovation and capability of								
		5.1	Design	20.0	2.00	3	0.06	20.0	2.00	2	0.04
		5.2	Technology	20.0	2.00	3	0.06	20.0	2.00	3	0.06
		5.3	Systems (Monitor, review and report)	20.0	2.00	3	0.06	20.0	2.00	4	0.08
		5.4	Techniques (plan, coordinate & workshopping)	20.0	2.00	3	0.06	20.0	2.00	3	0.06
		5.5	Achieving stretch targets	20.0	2.00	4	0.08	20.0	2.00	4	0.08
				100.0	**10.00**		**0.32**	**100.0**	**10.00**		**0.32**
6. Standard	5%	6.1	Safety standard	33.3	1.67	3	0.05	33.3	1.67	3	0.05
		6.2	Health and environmental standard	33.3	1.67	3	0.05	33.3	1.67	2	0.03
		6.3	Quality standard	33.3	1.67	3	0.05	33.3	1.67	3	0.05
				100.0	**5.00**		**0.15**	**100.0**	**5.00**		**0.13**
Value statements 1 to 6	100%		Demonstrate partnering/alliance capability		**100**		**3.59**				**3.45**

Appendix E – Assessment of Consequential Effects

Any engineering researches contribute consequences to the public and to the field of research. In this project, the effects will be felt in the construction sector. Below are some discussions on the consequences based on the aspect of sustainability and ethical responsibility.

Aspect of sustainability

1. Possible impact of project on the usage of finite resources and waste production
    - As one of the benefits of the research project is reducing the overall construction project cost, there might be certain indirect amount saving in construction materials. Less wastage of material promotes sustainability.
    - Another benefit of the research project is to encourage innovation. Improvement in the technology usually brings in positive effects such that the finite resources are put to good use and waste productions are better managed.
    - Although the project time is saved and thus saving cost in the overall construction, this may promote faster growth in construction industry. The downfall of such development is that resources are used up much quicker than anticipated.

2. Environmental protection dimensions of project work
    - The project ensured the optimum standard is achieved in the environmental performance.

3. Global impact of research project
    - The project encourages usage of relationship based contracting in Malaysia and this might be part of the driving force for further usage of such contracting method in other countries. In broader view, the system might lead to rapid development in countries around the world. Construction is one of the keys in economic growth. By building roads factories and other infrastructures, a country

will grow faster and poverty rate will drop. Standard of living in poorer countries thus improves.

- If we look at the sustainability within a construction environment, relationship contracting encourages the creation of a 'friendly' construction atmosphere. It improves the trust among clients, contractors and other parties involved in the projects. Most importantly, there exists a chance in continuous cooperation in the near future. The adversarial traditional contracting might form a part of the lesson learned in the growing stage of the contracting system in construction industry. Nonetheless, forming a sustainable business relationship is a challenging process.

4. Precautionary approach

   - The scope of the research project does not contribute to any form of environmental degradation. Nonetheless, if we think deep enough there is a link between the project and the final outcome that might be related to environmental degradation issues. One of the benefits of relationship contracting is to enhance the standard of the construction project. This means that the impact of the development on environment is taken into consideration. It eliminates or at least reduces the possibility and effects of degradation.

5. Environmental issues

   - Everyone involved in the construction project, might it be the principal, contractors or site workers, more or less are responsible for the eventual environmental issues that follows after the completion of the development. There are chances that deforestation and land filling is required for such construction work. Again, the implementation of relationship contracting developed from the research project mark the starting point of some these construction works. As to traditional way of contracting system, environmental issues are taken into account. Relationship contracting does stress on increasing the standard of construction without jeopardising the balance of the ecosystem and its surroundings.

6. Right of access to research project

   - The set out of the research project has taken into account the convenience of reference by others. The structure of the written parts is separated into main topics and sub-topics. Language used in the appreciation and dissertation shall be easily understood by the public. Definitions of jargons are given when necessary because not all readers are engineers.

7. Potential cost of pollution

   - There is hardly any potential cost of pollution when deciding on the suitability of implementing relationship contracting in Malaysia. It is a decision matrix design to guide the principle on selecting the right choice of contracting system.

8. Impact of project on others

   - As mentioned in point 3 (global impact), the indirect impact due to the research project is in helping to curb the poverty issues in poor regions. Rapid development in construction increases the employment rate. It also reduces the differences in living standard.

9. Outcomes of project towards worldwide sustainability

   - If the concept developed in the research project is adopted in other countries, it might help to promote a sustainable outcome not only in the construction sector but also to the general community as well. It encourages innovation and use of latest technology. New entrepreneurs might have the chance to shine and grow through the opportunity given.
   - Collaboration within the government in construction sector might proved to be one of the key features in improving the living standard of a country. As cost and time are saved, more funds are available for further and faster development.

10. Contribution to international understanding of the objectives of the project

- Relationship contracting is still a new and unexplored concept in many countries including Malaysia. One of the purposes of the project is to spread the understanding and benefits of adopting such concept in the construction industry in Malaysia. Perhaps as the concept gets accepted and successfully implemented around the country in the future, other countries might give a second thought to adopt it as well.

Aspect of ethical responsibility

1. Acting in area of competence and in a careful and diligent manner
   - One of the crucial aspects of relationship contracting is the allocation of risks. All the risks identified are assigned to the party best suited to manage them. It eliminates the possibility of negligence in work as all of them all tied up to a common goal.

2. Act with honour, integrity and dignity to merit the trust of community and the profession
   - In my opinion, relationship based contracts might have significant effect in curbing corruption related issues in construction field. All parties are 'bound' together, for example, through an incentive scheme whereby the amount of profit or loss is no longer individual matters. The sharing of profit or loss depends on the final outcome of the project. It is not wise for the contractors or any parties involved to succumb to bribery as the eventual loss would be even greater.

3. Responsibility for the welfare, health and safety of the community before the responsibility to section or private interests
   - Referring back to the aspect of sustainability, the project has direct effects on the construction sector. It stresses on the change of mind set in dealing with issues on the construction development. At the same time, protection against the welfare

and safety of labour, the environment and the community is still intact. Even though the research project is sided towards the construction sector, it does not cause any harm to the community.

4. Acts with honesty, good faith and equity without discrimination towards all in the community
   - Relationship contracting does promote the values stated above. It focuses on teamwork by establishing a project team. In order for the project to be successful, all team members including the client and the contractors have to be honest and have good faith in one another.

5. Applying their skills and knowledge in the interest of their employer or client with integrity
   - In the relationship based environment, the contractors have to be at their best and not thinking of how to manipulate the contract loop holes to gain personnel profits. Their major profit is shared upon the final outcome of the project. If they do not perform up to standard, they might end up losing money in lieu of earning.

6. Take reasonable steps to inform themselves, their clients and employers, of the social, environmental, economic and other possible consequences which may arise from their actions
   - One of the criteria of a successful relationship contracting is open communication. Whether there is good news or bad, the contractors or engineers have to inform the team members. Through meetings and conference, various solutions are suggested and the best approach is selected. The timing and speed of finding a solution is crucial. Delay normally causes increase in expenditure e.g. labour fees, equipment fees and other overheads. Dispute of such kind has not been dealt with effectively in conventional contracting system. Money issues and denial of responsibility have always been the barrier behind an open communication.

7. Express opinion, make statements or give evidence with fairness and honesty and only the basis of adequate knowledge

- Each contract party is assigned to risks according to their ability to tackle them. The risk management strategy allows them to voice their concerns during the negotiation stage of the contract as compared to traditional risk transferred system whereby the client tends to allocate as much of the risk to other parties involved.

8. Continue to develop relevant knowledge, skill and expertise throughout their careers and shall actively assist and encourage those they are associated to do likewise
    - This research project is a continuous development to the relationship based contracting system. It investigates the suitability of applying relationship contracting in Malaysia and the benefits of doing so. There is potential of introducing relationship contracts to the local construction companies because it is still an unexplored alternative to many. The availability of information and expertise to this concept are limited.