# A STUDY ON THE ISSUES OF CONSTRUCTION DISPUTES IN MALAYSIA AND SINGAPORE

**CHUA SHU CING**

**UNIVERSITI TUNKU ABDUL RAHMAN**

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**CHUA SHU CING**

**A project report submitted in partial fulfilment of the requirements for the award of the degree of Bachelor (Hons.) of Quantity Surveying**

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**Universiti Tunku Abdul Rahman**

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## DECLARATION

I hereby declare that this project report is based on my original work except for citations and quotations which have been duly acknowledged. I also declare that it has not been previously and concurrently submitted for any other degree or award at UTAR or other institutions.

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Name : _____

ID No. : _____

Date : _____

## APPROVAL FOR SUBMISSION

I certify that this project report entitled **"A STUDY ON THE ISSUES OF CONSTRUCTION DISPUTES IN MALAYSIA AND SINGAPORE"** was prepared by **CHUA SHU CING** has met the required standard for submission in partial fulfilment of the requirements for the award of Bachelor of Science (Hons.) Quantity Surveying at Universiti Tunku Abdul Rahman.

Approved by,

Signature : _____

Supervisor : Dr. Tan Hai Chen

Date : _____

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## ABSTRACT

Construction dispute is found to be a very common issue in construction industry and it has brought negative impacts to each of the participants in a construction project. Therefore, this research study was carried in order to investigate the causes, impacts and disputes resolutions related to the disputes in construction industry. A questionnaire survey involving 60 respondents was conducted in order to assess the research objectives based on the perspective of construction players in Malaysia and Singapore, the research objectives are: (1) To identify the causes of disputes arising from construction projects, (2) To discover the impacts caused by cases of construction disputes, and (3) To study the existing disputes resolution in construction industry. The survey questionnaire was carried out through a series closed-ended question. After conducted an analysis based on the returned questionnaires, 10 most significant causes of construction dispute were identified from a list of 17 different causes, which are: (1) Finance and payment issue, (2) Disagreement on claims, (3) Variation orders, (4) Time overrun, (5) Cost overrun, (6) Delay in issuing information, (7) Design errors, (8) Incomplete information, (9) Discrepancies or mistakes in contract document, and (10) Additional works. Moreover, this study also identified 4 most significant impacts out of 8 different impacts of construction dispute. The 4 most significant impacts are: (1) Project delays, (2) Increase project costs, (3) Poor client satisfaction, and (4) Damage business relationship. On top of that, there are also 4 most significant dispute resolutions were commonly being practicing in construction industry out of 8 different types of alternative dispute resolutions, which are: (1) Negotiation, (2) Arbitration, (3) Expert determination, and (4) Mediation.

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# CHAPTER 1

# INTRODUCTION

## 1.1 Rationale

The nature of construction industry is such that will always be disputes between various contracting parties. Disputes are something construction project personnel will have to face several times during the life of a project and it may continue long after a project has ostensibly finished (Carmichael, 2002).

Singh (2009) found that the contracting parties in construction project are basically working for a common target of completing the project which shows that they are not in competition with each other, but, difference of opinions and conflicts do arise at times. Immaturity and unhealthy discussions do expedite the parties into conflicts and disputes (Singh, 2009).

Richbell (2008) argued that a conflict is actually a catalyst which can create dialogue, promote creative thinking, and inspire people to sustainable solutions if a conflict is able to be well-handled. Singh (2009) has the same thought that a conflict or dispute can be settled by a free frank discussion if it is handled expeditiously in a mature, non-emotional manner with a judicious approach.

A conclusion states the construction industry is a risky business is given by Ashworth and Hogg (2007). This is because, Ashworth and Hogg (2007) found that even apparently identical construction projects that have been constructed on

different sites create their own special circumstances, are subject to the vagaries of different site and weather conditions, use labour that may have different trade practices and result in costs that are different, thus, disputes can therefore arise, even on projects that have the best intentions.

Therefore, Cox and Thompson (1998) contend that disputes should be avoided. If it is not possible to be avoided, disputes must be minimized or resolved as efficiently as possible because disputes are always wasteful an organization's resources (Cox and Thompson, 1998).

Dispute prevention, flexibility, early dispute intervention, use of alternative dispute resolution methods, and a predetermined plan as to how disputes will be handled are identified as the best practices for resolving construction disputes by Winkler and Chiumento (2009).

## 1.2 Problem Statement

Various participants in construction industry are involved in a dispute. However, what are the main causes that lead them into a construction dispute? What are the impacts of construction disputes may bring? Besides that, the disputes resolutions available in construction industry also will be studied in this study.

## 1.3 Aim and Objectives

The aim of this research is to investigate the causes, impacts and disputes resolutions related to the disputes in construction industry.

The following objectives are set in order to achieve the aim of this research:

1. To identify the causes of disputes arising from construction projects.
2. To discover the impacts caused by cases of construction disputes.

3. To study the existing disputes resolution in construction industry.

## 1.4 Research Methodology

Quantitative approach is adopted to analyze the factors which leading to construction disputes. By this approach, questionnaires are set based on the comprehensive literature review of causes and impacts of construction dispute.

The respondents for questionnaires will be selected randomly within the people in construction industry. The questionnaires was aimed to collect the opinions from various participants in construction industry such as clients, consultants, contractors and etc. in regards to the issues of the construction disputes.

## 1.5 Chapter Outline

This study consists of five chapters, which are described as following:

- Chapter 1 – Introduction. This chapter presents a brief background of construction disputes, problem statement, aim, research objectives and research methodology of this study.

- Chapter 2 – Literature Review. The contents of this chapter are based on existing literature and research work related to the issue of disputes in construction industry. The definition of construction disputes, causes and impacts of construction disputes and the dispute resolution available in construction industry is presented in this chapter.

- Chapter 3 – Research Methodology. This chapter focuses on the design and method of research, data collection methods, questionnaire design and data

analysis. Besides that, the way of implement the chosen approach for this research and the targeted respondents will be discussed under this chapter.

- Chapter 4 – Result and Discussion. In this chapter, proposed analysis of the findings from the questionnaires is presented based on the results by using Statistically Package for Social Science (SPSS) software. The most significant causes and impacts of construction disputes will be discussed.

- Chapter 5 – Conclusion and Recommendations. The last chapter of this research covers the summary and conclusion of this research. Limitations and recommendations for further research also included in this chapter.

# CHAPTER 2

# LITERATURE REVIEW

This chapter covers the definition of construction disputes, identifies causes leading to construction disputes, studies impacts associated with the arising of construction disputes, and defines the dispute resolutions available in construction industry.

## 2.1 Definition of Construction Disputes

Brown and Marriot (1993) defined a dispute as a class or kind of conflict, which manifests itself in distinct and justifiable issues. However, Fulton (1989) alleged that conflict and dispute are not synonymous although the two words are used interchangeably. Conflict means an inter-reaction between people who are pursuing incompatible or competing claims, and in fact conflict is the precursor to a dispute (Fulton, 1989).

In a dispute, it is tempting to force or expect others to change their basic orientation or behavioral style (Kindler and Keppler, 1996). According to Murdoch and Hughes (2000), a dispute arises when a conflict becomes an altercation, or when one or both of the parties becomes intransigent, but definitely when the argument revolves around rights and is justiciable.

A contractual dispute arises when one party claims something, and the other party rejects the claim, or disagrees over liability either expressly or by conduct (Carmichael, 2002). Kumuraswamy (1997) also stated that, when a claim or assertion

made by one party is rejected by the other party and that rejection is not accepted, there is a dispute arises.

## 2.2 Causes of Construction Disputes

The issue of construction disputes is inevitably in construction industry. There are numbers of factors may arise a dispute in any construction projects. The causes of construction disputes including the following:

### 2.2.1 Adversarial relationship

The construction industry has had a poor reputation in relation to its adversarial nature of relationships for many years (Bower, 2003).

Construction Industry Research for the 21st Century (1996) has reported that the adversarial attitude between principal players is developed from the beginning of the construction project by the reason: Contentious attitude which leading to the parties involved becoming adverse to the acceptance of liability, and the diffused specialization with numerous numbers of sub-contractors which leading to conflicts of interest on a project.

Pryke (2009) has revealed that the construction supply chain has become increasingly fragmented and the construction industry has become less trusting, more self-interested and adversarial. Consequently, performance and innovation in construction are significantly hindered by the adversarial relationships and fragmented processes (Pryke, 2009). Apart from that, Cox and Thompson (1998) also agree that the construction industry performance is detrimentally impacted by the adversarial behavior.

According to Chartered Institute of Building (2002), the risk of disputes can be minimized by avoiding an adversarial relationship through partnering project.

This is because partnering can promote better value for money by encouraging clients and contractors to work together and hence reduces the adversarial relationship between them.

### 2.2.2 Time overrun

Benton and McHenry (2010) identified that time is one of the most critical factors in construction operations and has significant legal consequences. Time is an irreplaceable resource and this is the reason why time is often the most important objective of all in construction project (Lock, 2004).

Sambasivan and Yau (2007) stated the factors such as inadequate planning by the contractors, improper site management by the contractors, inadequate project handling experience of contractors, and delay in the payments for work completed directly affect the completion of the project and result in overrun of time.

Total construction time is a consequence of design as more complex structures will almost certainly take longer time to complete. Although it is possible to work on site for extensive hours or to increase resources, but it is not always possible to achieve directly resulting productivity due to the law of diminishing returns will have an influence of the limited space and the nature of traditional construction methods such as concreting and bricklaying (Morledge, Smith and Kashiwagi, 2006).

In fact, The Chartered Institute of Building (2011) conducted a study on the management of time in complex projects. They found that simple, repetitive and low-rise projects had a higher chance of success within traditional and time-management. Therefore, complex buildings and engineering projects were likely to be substantially delayed in their completion without a scientific approach to time management.

### 2.2.3 Cost Overrun

Cretu, Stewart and Berends (2011) defined a cost overrun is the difference between low bid and the actual incurred costs at the time of construction completion. They also stated the major culprits in cost overruns, which are: (1) lack of proper risk analysis in developing estimates, (2) poorly defined scope at the time initial project budgets were developed and (3) larger public projects which are prone to intentional underestimation due to political pressure.

On top of that, Doloi (2011) identified that the uncertainties at the tendering stage which include: (1) the change of tender climate, (2) emergence of unforeseen factors, (3) change of client's requirements, (4) competition of sub-contractors, (5) quality and level of documentation and (6) lack of market knowledge will increase the likelihood of cost overruns. Apart from that, the chances of cost overruns on a project increased when a contractor with a previous history of cost overruns was performing the project (Schwartzkopf, 2004).

Fenn and Gameson (1992) concluded that the potential cost overrun is always one of the essences of a construction dispute. Therefore, better prepared and more comprehensive bid documents are essential to eliminate or to reduce significantly the opportunities for cost overruns.

### 2.2.4 Disagreement on Claims

Raj (2009) revealed that construction claims are becoming more and more prevalent around the world as it has become a common occurrence on projects.

Raj (2009) contends that construction claims are usually submitted by contractors or sub-contractors for the purpose of recovering additional sums or money, or for extending the original duration of the contract due to delay or disruption to their works caused by the acts of the other contracting party. As a result, disputes sometimes arise between the owner and the contractor during construction

period, and if such claims cannot be settled harmoniously during the construction period, they must either be dropped by the contractor or be settled by arbitration, appeal boards, or the courts (Sears, Sears and Clough, 2008).

Fenn and Gameson (1992) found that the management of claims such as notification, submission procedure and processing by contractors or sub-contractors may have a strong relationship with the frequency and severity of claims. The way to manage the claims will not just affect the occurrence and value of claims, but it may also affect the method of settlement of claims (Fenn and Gameson, 1992).

O'Brien (1998) suggested that the most important step in avoiding construction claims is to eliminate the unrealistic attitude that "There won't be any change orders on my job!" due to there is no set of contract documents is perfect, and hence all parties must realize that revisions and unanticipated situations will be encountered in every project.

### 2.2.5 Variation order

Lock (2007) defined variation order as the changes by the customers which affect price, delivery or any other aspect of the original purchase order or contract require formal documentation.

As expressed by Barrie and Paulson (1992), there is few construction contracts are completed without change. The designer, owner, regulatory agencies, the contractors and others may initiate the changes or causes for change. However, most minor changes are resolved on the job between the owner's representative and the contractor and then a change order is added to the contract after a mutual agreement is achieved.

Oladapo (2003) conducted a study of the cost and time impact of variation orders on construction projects. It was found that variation had a significant impact on project cost and time overruns. Whereas, the size and type of project did not

significantly affect the contribution of variations to project cost and time overruns. A good understanding of the real impact of variation on project performance is essential for reducing the occurrence of variation orders.

According to Arain and Low (2007), the basic principles of variation management system is to anticipate, recognize, evaluate, resolve, control, document, and learn from past variations in ways that support the overall viability of the project and this is the key to help professionals in taking proactive measures for preventing potential variations.

### 2.2.6 Poor communication

Construction projects involve with many different people which are drawn from many social backgrounds, and who have different agendas. The concept of the development ‘team’ does not translate in reality, it is more a collection of groups which are brought together, often for the first (and only) time, for a specific purpose. Consequently, communication is the fundamental skills to be acquired by construction managers, designers and project administrators for a project run smoothly (Emmitt, 2002).

According to Richbell (2008), poor communication is by far the major reason for problems escalating into disputes and hence the lined of communication need to be established from the start. Therefore, Sambasivan and Yau (2007) have suggested that a proper communication channels between various parties in a project such as client, consultant, contractor and sub-contractor must be established during the planning stage.

Sommerville and Craig (2006) stated that construction project depends heavily upon the timely and traditional transfer of information such as face to face meetings, phone calls and the exchange of drawings and associated paper documents. Hence, poor communication may result in a quality of service delivery and buildings

that fail to meet the specified standards and performance requirements (Emmitt and Gorse, 2003).

In a nutshell, the best construction project results, to a large intent, is obtained through good communications among project team members and this can be achieve by identified the incipient problems, brought out into the open, discussed, and solved before they become serious (Atlas, Huber and Trachte-Huber, 2000).

### 2.2.7 Design Errors

In the opinion of Herren and Cooper (2000), design work is not easy and it requires a great deal of experience to be done well hence it is better not to change the design after construction has started. However, if errors in design become obvious during construction, design modifications must be made.

Cushman and Loulakis (2001) found the significant additional risk brought by the design-builder's design error or omission will resulted in several impacts, which include (1) increased costs to complete the work, (2) costs of repairing work rendered deficient by defective design, and (3) the owner's consequential damages due to the defective design. In the same way, they also identified some potentially consequential damages which are: (1) extended inspection costs, (2) financing costs during any delay in completing the work, (3) loss of manufacturing income, (4) loss of rental income, and (5) the cost of providing substitute facilities to maintain the owner's operations during the delay period.

According to Bramble (1995), the prevalence of disputes can be minimized by actions taken in the design and preconstruction phases, especially design errors, utility conflicts, unknown site conditions, and other common types of disputes encountered by transportation agencies.

### 2.2.8 Inclement Weather

A Contract normally will set out the conditions which the Contractor is entitled to claim an extension of time for Practical Completion. For instance, the Contract may provide that the Contractor is entitled to an extension of time for "exceptionally adverse weather conditions". However, it depends on the local climate and time of the year to constitute "exceptionally adverse weather conditions" (Loots and Charrett, 2009).

According to The American Institute of Architect (2008), there is something will probably occur during the life of the project to change its course regardless of how well the initial differences are negotiated, and no matter how well the architecture firm performs its services. As an example, any changes of site condition and the uncertainty of climate may add surprises that no one could reasonably predict, and therefore can lead to conflicts among the stakeholders.

Mincks and Johnston (2004) also identified that bad weather often is not adequately anticipated, and it will forcing changes in schedules, production, and damage to completed work. Apart from that, they also agreed that poor weather will caused the productivity to decrease, which is depending upon the severity of the weather and the work tasks, and some construction materials may be affected by the weather too.

### 2.2.9 Finance and Payment Issues

Unlike the manufacturing and service industries, the construction industry tends not to operate from a fixed location yet moves from site to site wherever work is available. Therefore, the argument for financing construction projects is considerably weakened when assets are examined together with other problems, such as one-sided contracts or delays in payment. Furthermore, most of the international construction projects face additional problem such as fluctuating exchange rates or import

restrictions. This is because of the additional risks make the raising of finance for international projects a difficult and complex process (Price, 1995).

Cushman and Myers (1999) stated that the payment problems have a much greater likelihood of resulting construction disputes. This is because of the owner has the obligation to make payments consistent payments consistent with the contract provisions regarding payment. If the owner is being very difficult in approving and paying periodic payment applications, or is unaccountably cutting payment applications, or is slow in paying moneys due, or refuses to address and pay for extra work, there is a possibility there will be disputes.

In the opinion of Loosemore (2000), construction works involve huge amounts of money and most of the contractors find it very difficult to bear the heavy daily construction expenses if the payments are delayed. For instances, work progress can be delayed due to the late payments from the clients since there is inadequate cash flow to support construction expenses.

### 2.2.10 Unforeseen Site Condition

Basically, differing site conditions clause is most often invoked for subsurface condition. Levin (1998) defined differing site conditions are usually thought to be subsurface physical conditions such as geological configurations, water levels, or suitability of soils than unforeseen and differ from those implied by the contract documents. However, differing site conditions can also include man-made sire conditions from previous or concurrent construction activities.

In general, the owner conveys the information regarding subsoil and current conditions to the contractor in order for him to prepare a reasonable bid. Nevertheless, when the conditions encountered differ from those expected, the contractor may incur additional costs, in terms of changed conditions and delay (Cushman and Myers, 1999). Under these circumstances, the only way to minimize

the potential of encountering differing site conditions is to conduct a comprehensive subsurface investigation (Edgerton, 2008).

### 2.2.11 Poor Workmanship

Emmitt (2002) defined the quality of work on site should be exemplary, given the extent of the details, specifications, standards and knowledge brought to bear on a construction project. Unfortunately, the quality produced in sometimes below that required, or expected, which is poor in workmanship.

Sawczuk (1996) identified that there are numbers of construction disputes arise in relation to poor workmanship and design failures. Sometimes, the employer may have expectations beyond those designed and specified by the consultants. Therefore, the consultants are necessary to justify the specifications which were probably selected due to financial constraints by the employer. In other words, it is in everyone's interest to take steps in order to avoid the potential risk of poor workmanship and design failures.

In the opinion of Griffin (2010), the project manager is the one who controls the quality of the workmanship through inspections, hence she must inspect the work as it is done to ensure that it meets specifications outlined in the project plan. One of the best tools that a project manager can use to inspect work is a checklist, and it must be customized for each construction project, as each project has its own design and challenges. In short, a checklist can be created fairly easily and offer a great tool for ensuring quality workmanship.

The project manager is also concerned with making sure the project management meets a high standard. In another words, poor management typically shows itself in poor workmanship which means a project that is poorly managed will be poorly executed (Griffin, 2010).

### 2.2.12 Incomplete Information

Emmitt (2002) stated that incomplete information may be a direct result of poor communication and ineffective project management during the design stage which can lead to communication breakdown and disputes.

In the opinion of Olawale and Sun (2010), lack of detailed design specification may leads to the contractor pricing the risk but also looking for every loophole in the specification document in order to increase cost, reduce specification and etc.

According to Baster et al. (2000), incomplete information may have several reasons which include: (1) insufficient site investigation which fails to provide the information necessary to create an accurate model of conditions, (2) failure to locate and take account of the information in the case which the information is in the form of old maps, aerial photographs or previous site investigations, and (3) interpretation of the information or analysis of the information is incorrect. Thus, an accurate position of probable features cannot be established if the limitations of information and analysis techniques were existed.

### 2.2.13 Delay in Issuing Information

Sommerville and Craig (2006) stated that a construction project is a highly complex activity involving various bodies and organizations such as clients, designers, consultants and contractors. Therefore, they concluded that management of the construction project and in particular management of information and documentation therefore needs to be structured in a logical order using a system or a combination of systems that ensures the project participants have instantaneous access to all project information.

Slow processing or issuing of requests for information, submittals and decision-making by any of the parties are the typical causes of delays in project

delivery (Dykstra, 2011). On top of that, if the delay in the shop drawing approval was caused by errors in the plans and specifications, the delayed submittal process can be entitled to claim for delay (Sido, 2006).

Consequently, in the opinion of Sommerville and Craig (2006), the use of project databases and the Internet will encourage and facilitate the free transfer of information between all construction parties within the contract before finally processing the finished product through the necessary formal channels.

### 2.2.14 Additional Works

The owner or architect-engineer may decide to add additional work or change certain contract requirements, and this sort of changes can result in work extra to the contract, extensions of contract time, and claims for additional costs (Clough, Sears, G. A. and Sears, S. K., 2000).

According to Murdoch and Hughes (2008), variation is defined as changes to the design, to the material specification, additional of work or removal of work properly executed, and changes relating to access to the site and working conditions. Apart from that, variation also includes the alteration of the kind of standard of any of the materials or goods to be used in the works.

However, the contract is simply lump sum when the contract is simply lump sum, and this will sometimes mean a difficult negotiation. When a variation to the contract becomes apparent, it should always be agreed in writing or preferably with a firm agreement on price or at least an agreed rate. This is because the likelihood of a major part of a dispute when the final account is being agreed variations (Snow, 2002).

### 2.2.15 Unfair Allocation of Risk

Smith (1995) stated that the contract is the vehicle for risk allocation. Whether the contract is for construction, construction engineering and inspection, design, or design-build, or some other aspect of highway construction management, the contract by defining roles and responsibilities assigns risks (Smith, 1995).

Hibberd and Newman (1999) identified that the allocation of risk is always a major issue addressed by the contracting parties in construction industry and the event of unfair allocation of risk often leads to disputes and indeed conflict.

Cushman and Myers (1999) found that occurrence of misallocation or misperception of risks have resulted in owners paying more than necessary for many projects, due to bid contingencies and unanticipated involvement in dispute resolution by owners' staffs, consultants, and attorneys.

Nevertheless, realistic risk allocation in construction projects improves productivity on the job, lowers costs, and creates better owner-contractor, owner-designer, and general contractor-subcontractor relationships (Atlas, Huber and Trachte-Huber, 2000). By achieving a realistic risk allocation, Atlas, Huber and Trachte-Huber (2000) stated that the result in nearly all cases will be fewer disputes and a greater chance for project success.

### 2.2.16 Slow Client's Response

According to Boyd and Chinyio (2008), clients are the reason that the construction industry exists as clients are always in the industry's thoughts. Jha (2011) stated that the client is usually the person or an organization which will manage the facilities or structures upon completion of the project, and he is the one who in a position to decide the use of funds to execute the project and they are at his discretion.

The importance of timely client decisions or responses can be assessed, tested and agreed in a thorough manner only if there is a period during the preconstruction phase when the client and main contractor can work together to establish and agree the key dates and periods for critical client decisions, with the conditions that these are then set out in a suitable document forming part of the construction phase building contract (Mosey, 2009).

Levy (2007) also agreed that the slow response from the construction players is one of the greatest external challenges to improve productivity. In addition, good clients will manage their project risks in a proportionate and considered manner. This is because their decisions and approach to a construction project always have a significant impact on the health and safety standards and determine: (1) the time, money and other resources available, (2) the project team members and their competence when they are appointed, (3) whether the team is encourages to work together effectively, (4) whether the team has the information that it needs about the site, and (5) the arrangements for managing and coordinating the work (House Builders Health & Safety Manual, 2008).

### 2.2.17 Discrepancies or Mistakes in Contract Document

Chappell et al. (2001) defined discrepancies as differences or inconsistencies. For instances, if a contract drawing showed bricks for a particular situation to be rustic facings and the contract bills gave the bricks for the same situation to be smooth-faced engineering bricks, there would be a discrepancy between the drawings and the bills.

According to Loots and Charrett (2009), there would also be a discrepancy in Contract document if there are works which is not included in the entire Contract documents. For example, where work is shown on one of the Contract drawings and not on another, in this case the Contractor will sometimes argue that this is a discrepancy and is entitled to claim for a variation. Moreover, the Contractor may also be entitled to an extension of time for Practical Completion.

On the other hand, Callahan (2005) argued that there is no design is ever perfect. He highlighted that architecture and engineering are not exact sciences. A set of contract documents may contain hundreds of thousands of design decisions and details, spread out over dozens or perhaps hundreds of separate drawings sheets and detailed schedules, and hundreds of pages of specifications, all of which need to be coordinated with each other. The alteration of merely one detail during the course of drafting and design may affect countless other details. Consequently, designs, drawings, and specifications can be expected to contain ambiguities, gaps, discrepancies, and even conflicts.

## 2.3 Impacts of Construction Disputes

Construction industry has the nature of disputes incidence between various contracting parties. A dispute can brings about numbers of negative effects towards the construction industry and every project participants in the industry. The impacts of construction disputes including following:

### 2.3.1 Damage business relationship

Wright (2004) states that a disagreement in any of a construction project must be settled quickly before it develop into a dispute. Emmitt (2010) also found that conflict is necessitate to be managed so that it does not suppress information or become personal and dysfunctional and damage relationships.

Chern (2008) found that the hidden costs of disputes is the damage to reputations and commercial relationships, the cost of time spent by executive personnel and the cost of lost business opportunities. A legal dispute making project management becomes more difficult by affects personal relationships between the construction participants (Wright, 2004).

According to Murdoch and Hughes (2008), contractors are very keen to preserve a good relationship with clients. Therefore some of the parties will often seek effective and quick resolution of points of disagreement even if that implies giving up a claim that would have good chances to succeed in court for the sake of future business (Murdoch and Hughes, 2008).

### 2.3.2 Increase project costs

Disputes are wasteful of a firm's resources and therefore should be avoided, wherever possible (Cox and Thompson, 1998). This is because, Feld and Carper (1997) has found that the nature of disputes is costly, lengthy, and complex and eventually the cost of resolving the dispute always exceeds than amount of the initial claim.

Although an early resolution of a dispute helps to limit the ultimate cost overrun, but it does not eliminate it entirely (Fenn and Gameson, 1992). Fenn and Gameson (1992) contend there still are increased in total project costs due to the resulting extended project duration.

Rossi (1991) discussed that an owner will suffered the additional costs such as increased financing costs, increased architectural and engineering costs, lost revenue, and incurrence of a delay claim from the contractor for his increased costs of performance if a dispute is not resolved efficiently. On the other hand, as the impact of construction dispute, a contractor will also suffered additional costs such as increased labor costs, costs of extended equipment usage, additional construction financing expenses, additional cost of extended home and field office overhead, and lost revenue (Rossi, 1991).

### 2.3.3 Project Delays

Resolution of disputes always consumes much more of the construction professional's time than is usually justifies. From the point of filing of a legal claim by a contractor, the time required to follow the legal settlement process consumes valuable time that can usually be spent more profitably in other areas of the organization's work (Stephenson, 1996).

Edgerton (2008) also agreed that the contract disputes are lengthy and costly to all of the contracting parties in nature. These adversarial disputes severely degrade productive working relationships and consume time and money.

Apart from that, Brown-West (2008) also stated contract dispute is one of the issue among several project characteristics and issues that could prolong project duration. The others characteristics and issues which are: (1) design and construction changes, (2) work scope expansions and add-ons, (3) contract disputes, (4) poor project performance, (5) constructability, (6) stakeholder interference in project management, (7) third party complaints, and (8) project financing or funding.

### 2.3.4 Undermine Team Spirits

Bunting (2005) stated that disputes are tend to impact on employee relations within an organization. Barnes (1990) also agreed that the disputed claims can be an unnecessary drag on effective management of construction projects as they tend to absorb a massive quantity of the time and energy of trained staff in unproductive activity and lean to destroy the spirit of co-operation which should be exist between members of the project team.

According to Spence, Macmillan and Kirby (2001), effective teamwork will not occur naturally and it may be undermined by several of problems, such as misunderstanding, inadequate participation in and procedures for problem solving.

The difficulties to achieve and maintain effective teamwork may be due to the team members in construction projects are typically drawn from different disciplines.

Therefore, as design issues arise that demand a particular expertise or skill, the person with that skill provides the team with the solution. Otherwise, the problems may be solved by the team as a whole, and where members are willing and are encouraged in order to contribute ideas and suggestions in areas that lie beyond their own profession's traditional boundaries (Spence, Macmillan and Kirby, 2001).

### 2.3.5 Damaging Company Reputation

Bower (2003) stated that reputations and brand names not only indicate quality, they also give the buyer a means of retaliation if the quality of goods or services does not meet expectations. In fact, reputation can act as a bond to ensure performance and plan as a key role in ensuring contract compliance.

Bunting (2005) found that disputes can create negative publicity. This is because time is needed to be allocated in order to prepare for any tribunal proceedings which resulting from a dispute and there will also be disruption to work, which in turn affect the company's image or reputation.

In addition, complaints may be resulted from disputes or claims and it is crucial that complaints to be dealt with timely and effectively in order to safeguard a company's reputation and its operations. Apart from that, complaints may be related to employment conditions and terms, labor disputes, business arrangements and contracts, damage resulting from accidents and etc. (Blyth, 2009).

### 2.3.6 Dispute Escalation (Chain Reaction)

In the opinion of (Pinnell, 1998), it is very often to see the disputes between contractors and owners escalate into litigation, or the contractors may absorb a major loss in order to avoid lengthy disputes proceedings and damaged business relationships.

Edgerton (2008) encouraged for the disputes to be resolved at the lowest possible level so that the dispute escalation may be eliminated. For example, a dispute might first be taken to the superintendent or the inspector at the field level. Then, it would be escalated to the project level and the project manager to resolve in the case that they could not resolve the particular dispute. Next, if it still could not be resolved at that level, the dispute could move to the executive level. Subsequently, the final step would be arbitration or litigation with an outside party facilitating resolution.

According to Chinyio and Olomolaiye (2010), in an effort to avoid the escalation of a dispute between the owner and the contractor could be an independent third party who may be agreed for settling disagreements soon after they occur. However, dispute resolution which involving external stakeholders are much less structured and the risk of dispute escalation to litigation is much higher.

### 2.3.7 Poor Client Satisfaction

Clients are playing a role as the driving force in the construction industry and they have led to repeated calls for the construction industry to deliver better value-for-money to its clients. Overall project success is one of the determinants of the client satisfaction in a construction project. There are several factors which are critical for overall critical project success: (1) project organization, (2) design, (3) construction and (4) quality of materials (Kamaea, Anumba and Evbuomwan, 2002).

In the opinion of Brooker and Wilkinson (2010), the parties such as clients should be satisfied, at least with the procedures of a dispute-resolution method that ends in a win-lose outcome, the party who loses is most likely to be dissatisfied with the outcome. However, establishing satisfaction with the dispute resolution process as opposed to satisfaction with the outcome may result in more dispute-resolution methods being classified as 'successful'.

### 2.3.8 Project Abandonment

Project abandonment is common due to the uncertainties inherent in the construction process. Some clients even refuse to pay for services that have been performed by their design professional when it occurs (Sweet and Scheneier, 2008).

Construction disputes usually consume massive time and costs to achieve a successful dispute resolution. Therefore, a case which construction dispute leads to project abandonment is not rare. However, in the absence of any contract provision giving the owner the power to abandon or any common law power to abandon based on changed circumstances or frustration of purpose, abandonment by the client is consider as a breach of contract (Sweet and Scheneier, 2008).

On the other hand, Hess et al. (2007) suggested that many abandoned projects, construction claims, and cost overruns can be eliminated or at least minimized if the owner makes the required investment in time and resources to complete the pre-design phase. This is because changes made to the scope during pre-design stage have minimal adverse financial consequences.

## 2.4 Dispute Resolutions

Conflict management is important to prevent a conflict turn into a dispute. However, disputes are still occurring as a result of conflict escalation. Therefore, dispute resolutions play a crucial role at most of the time, especially in construction industry which is widely known as a risky business.

### 2.4.1 Adjudication

Simmonds (2003) defined adjudication as a process when a dispute between contracting parties arises, a neutral party who has no connection with either side is engaged to examine the arguments of the parties and to decide the dispute. Moreover, under certain types of contract, adjudication is a mandatory pre-step before final process may be commenced.

The adjudication process usually commences when one party to a dispute that it is unlikely that more is to be achieved by discussion and negotiation, and that the issue is important enough to warrant the time and expense of adjudication. In addition, the dispute may involve matters claimed by either or both parties (John, 2008).

Ashworth and Hogg (2007) has stated the benefit of adjudication which is that it can often lead to a settlement without the matter going any further due to the party that has lost in adjudication will think very carefully before proceeding with very expensive litigation or arbitration. And they might well lose again, with the additional penalty of paying the other side's costs.

### 2.4.2 Arbitration

Feld and Carper (1997) state that binding arbitration is by far the most often used alternative to litigation in construction disputes, and arbitrated construct on hearings usually involve two parties who are having a contract dispute and an arbitrator they jointly choose to resolve the dispute.

Feld and Carper (1997) found that an arbitrator is usually someone familiar with the construction industry and most large claims involve three arbitrators instead of one. Arbitration in construction is usually performed by experts in the construction industry such as architects, engineers, or construction management professionals Mubarak (2010).

Wright (2004) identifies that the arbitration is a better route than litigation for solving serious disputes because an arbitrator with appropriate knowledge and experience must always have a greater chance of understanding the complex engineering or process questions that are likely to arise than a court.

Ashworth and Hogg (2007) also identified the arbitration has the advantages of quicker proceedings, cheaper in costs and greater confidentiality is ensured by arbitration than litigating in the courts.

### 2.4.3 Dispute Review Board (DRB)

According to Edgerton (2008), dispute review board is a panel of three experts from construction industry who follow the progress of a construction project by visiting the site and attending project meetings. The conditions precedent for establishing DRB are usually described in the contract documents. The owner, contractor and members of dispute review board have to sign a three-party agreement before using the DRB to resolve any disputes while construction is ongoing.

Selection of the DRB members is critical and several selection processes are available. Normally the board members themselves will choose the chairperson. By reaching this consensus process, the perception of any board members being biased can be avoided (Edgerton, 2008).

There are several benefits to adopt DRB as a dispute resolution, which includes: (1) the board members are respected by the parties due to the members of the board are impartial, technically proficient, project-knowledgeable and mutually selected; (2) there will be improvement in relationships of parties by creating atmosphere of communications and trust since they know that disputes are going to be resolved expeditiously and fairly; (3) the board's familiarity with the particular project makes a DRB is simple, straightforward, fair and efficient (Levin, 1998).

### 2.4.4 Expert Determination

Expert determination is carried out primarily in a 'technical' nature of disputes. The expert is required to use his or her own skills and knowledge to make necessary enquiries or conduct their own investigations. The process of expert determination usually provides a fast and final solution to the matters in dispute and has been used successfully for many years in property disputes concerning valuations (Ramsey et al., 2007).

The use of expert determination has been encouraging, particularly for single issue, essentially technical or valuation and disputes. This is because an expert can bring his experience and professional knowledge directly to bear on resolving a dispute. Moreover, technical issues can prove extremely difficult for a legal arbitrator or arbitral tribunal, even when assisted by expert witnesses (Institution of Chemical Engineers, 2007).

Ramsey et al. (2007) has highlighted that expert determination is unlike an arbitral award, it may only be challenged in certain limited circumstances of fraud or

collusion, or where the expert has departed from their instructions. Otherwise, the expert's determination will be final and binding on the parties.

### 2.4.5 Litigation

Traditional litigation in the courts is the most structured approach to construction dispute resolution (Feld and Carper, 1997). Ashworth and Hogg (2007) explained that litigation is a dispute procedure which takes place in the courts and it involves third parties who are trained in the law, generally solicitors and barristers, and a judge who is appointed by the courts.

However, traditional litigation is costly, lengthy, and complex (Feld and Carper, 1997). This is further explained by Egbu, Ellis and Gorse (2004), the costs associated with litigation are often disproportionate to the problem first presented.

Ashworth and Hogg (2007) state the general rule of litigation rule is that the defendants must be made aware of the proceedings against them which means a typical action is usually started by the issuing of a writ.

Although referring matters to Court can be very costly and time consuming, but litigation still has its own advantages than others such as the decisions made are final, subject to appeal (Egbu, Ellis and Gorse, 2004).

### 2.4.6 Mini-trial

Jones (1998) gives definition of mini-trial as a voluntary, expedited, non-binding, informal, non-judicial process through which senior management officials for each party meet to resolve disputes.

According to Jones (1998), flexibility is the key to the mini-trial process because the parties involved in mini-trial must agree to a process that meets their needs and is appropriate for the dispute or claim at hand.

The mini-trial method is best suited to large disputes and complex litigation, such as cases involving breaches of complex contracts, particularly if there are intricate technical issues, patent or antitrust cases, major construction cases, and product liability cases (Cooley and Lubet, 2003).

According to Cooley and Lubet (2003), although mini-trials is relatively more expensive if compared to other methods of dispute resolution, but it still has the advantages of curtail much of the discovery process and mini-trials involve high-level business persons early in the dispute resolution process.

### 2.4.7 Mediation

Mediation is a method of dispute resolution involving a neutral third party who tries to assist the disputing parties in reaching a mutually agreeable solution (Klinger and Susong 2006).

Mubarak (2010) reveals that the mediator can be an individual or a team. A preliminary meeting will be arranged by the neutral to discover the substance of the dispute and to decide how best to proceed a mediation (Ashworth and Hogg, 2007). Mubarak (2010) highlighted that the mediator must demonstrate neutrality and patience, and must collect all the facts before making any recommendation.

Fenn, O'Shea and Davies (1998) found that the mediation has proven to be most effective when used immediately after the parties have determined that conflict management techniques have failed and it has been highly successful in resolving construction disputes at a fraction of the time and expense required for litigation.

### 2.4.8 Negotiation

Carmicheal (2002) defined negotiation as the art of reaching an agreement or understanding through bargaining since there are no formal rules for negotiation, though there are culturally accepted styles.

Since there are no formal rules, the procedures of negotiation started by set up a forum so that the parties can attempt to find a way out of the problems, look for mutual benefits that can be gained from resolving the problem in a different way, or the parties that look for compromises in order to overcome the problem (Egbu, Ellis and Gorse, 2004).

Wright (2004) identified that negotiation is always going to produce the best chance of a satisfactory solution to any dispute since it is quick and the bruising encounters that come with arbitration, litigation or adjudication has been avoided. If there is an event of complete satisfaction could not be reached, the objective of negotiation is to reach a solution that will be acceptable to both parties (Mubarak, 2010).

The advantage of negotiation is the cost of both sides is very much less if compared to other dispute resolutions and the money that does not have to go in legal fees can then go towards funding the settlement (Wright, 2004).

# CHAPTER 3

# RESEARCH METHODOLOGY

The purpose of this chapter is to obtain a comprehensive analysis based on the data collected related to the aim and objectives of this research. This chapter covers the definition of research, research strategy, data collection method, research design, and analysis method.

## 3.1 Definition of Research

According to Vyhmeister (2008), research is a method of study through careful investigation of all evidence bearing on a definable problem and then arrives at a solution. Moreover, the process of research cannot take place without proper analysis and synthesis and the results of research must be presented in a clear and concise way.

Sharp, J. A., Peters, J. and Howard, K. (2002) stated that research is a process by which researchers extend their knowledge and possibly that of the whole community. Apart from that, Vyhmeister (2008) also highlighted that a research is not the presentation of one's own opinions, but it demands showing facts, data and information.

Therefore, it can be concluded that research is a process of collect information or evidence concerning a particular issue in order to provide a better understanding and interpretation.

## 3.2 Research Strategy

Naoum (2007) gives definition of research strategy as the way in which the research objectives can be questioned and it can be categorized into two types which is ‘qualitative research’ and ‘qualitative research’.

### 3.2.1 Quantitative research

Naoum (2007) concluded quantitative research is ‘objective; in nature. Researchers who using a quantitative approach rely on structured observation, experiments, and survey research because this method usually focuses on a limited number of predefined variables that generate primarily data (Krysik and Finn, 2010).

### 3.2.2 Qualitative research

Qualitative research is ‘subjective’ in nature (Naoum, 2007). Krysik and Finn (2010) explained that qualitative research is holistic in its approach, and the data tend to be rich narrative descriptions. Therefore, the main sources of data for qualitative research are unstructured observation and in-depth interviews, and the questions used in qualitative research do not ask participants to select from a number of predefined responses (Krysik and Finn, 2010).

## 3.3 Data Collection Method

There are two approaches of data collection were adopted in a study. Fieldwork research is the primary data collection and the other one is desk study which is the secondary data collection (Naoum, 2007).

### 3.3.1 Fieldwork

Naoum (2007) identifies three main practical approaches may be adopted in a fieldwork research:

1. The survey approach – Large numbers of respondents are required within a limited time frame in order to gather data for a survey;
2. The case study approach – Researcher intends to support his/her arguments by an in-depth analysis of a person, a group of persons, an organization or a particular project;
3. The problem-solving approach (action research) – Researcher reviews the current situation, identifies the problem, gets involved in introducing some changes to improve the situation, and maybe evaluates the effect of the changes.

### 3.3.2 Desk study

According to Naoum (2007), desk study approach also called as secondary data collection method because the data are obtained from other sources, which mean they are not obtained first hand. Secondary information can be stored either in a statistical or descriptive format (Naoum, 2007). Naoum (2007) defines statistical format as the official statistics collected by the state and its agencies, and these statistics are normally available in public libraries and in most university libraries. On the other

hand, descriptive format is to analyse and critically appraise the contents of an archival document such as diaries, newspaper, observations, etc. (Naoum, 2007).

## 3.4 Research Design

In this research, quantitative research was adopted by using questionnaires to collecting the sufficient data due to the consideration for time constrain. The data will be collected by using survey approach. The survey questionnaires have been distributed to those clients, contractors and consultant firms by hand and through an online survey software and questionnaire tool – SurveyMonkey™.

### 3.4.1 Survey Questionnaire

Questionnaires are a common method of gathering data (Sharp, Peters and Howard, 2002). According to Krysik and Finn (2010), survey research, which relies on questioning, is a systematic way of collecting data from a number of respondents.

Tayie (2005) states that, the flexibility of survey has made it become one of the most widely used methods of media research. The purpose of approach, questionnaire design, sampling, and the way to analyze and interpret data has to be considered before a survey is conducted (Tayie, 2005).

According to Krysik and Finn (2010), survey research is a popular method of gathering data in social work research. It relies on questioning and is a systematic way of collecting data from a number of respondents. They stated that survey can be used to determine what respondents know, believe, or feel or how they say they behave. Other than that, some surveys also ask respondents to describe what they have done or how they felt in the past, or to speculate about their future intentions (Krysik and Finn, 2010).

### 3.4.2 Questionnaire Design

There are total of 8 questions which have been categorized into 3 sections in the survey questionnaire. Section A (Question 1 to 5) is demographics information which are intended to solicit respondent's information and such information will be used to determine the profile of respondents. The respondents are requested to answer question pertaining the location of their company based in, the type of their organization, their profession in construction industry, their working experience in construction industry and the primary type of projects which they are involved in.

Among various types of approach to scaling responses in survey research, Likert scale approach has been adopted for the following questions in the questionnaire (Section B, Section C and Section D). There are basically five point method in Likert scale approach, which are: (1) Strongly disagree, (2) Disagree, (3) Neutral, (4) Agree and (5) Strongly disagree. Section B is asking about the causes that may lead to construction disputes, Section C is asking about the impacts that may be caused by construction disputes, and Section D is asking about dispute resolutions based in its commonness in practicing in construction industry.

The survey questionnaire is designed in the format of close-ended question in order to ease the respondents to answer since there is no writing required in close-ended question. Moreover, since the close-ended question is asking for a short answer, therefore it will save the respondent's time and thus they will be less reluctant to participate in this survey questionnaire.

## 3.5 Data Analysis Method

Statistical Package for Social Sciences (SPSS) is the software which designed to carry out the data analysis with comprehensive statistical tests. The collected data from the survey questionnaire will be analyzed by using SPSS in order to carry out the data analysis in this research.

### 3.5.1 Descriptive Statistic Method

Descriptive statistic method is the simplest method of analysis. This method provides a general view of the results and it will either analyze the responses in percentages or will contain actual numbers (Naoum, 2007). In this research, Section A (Question 1 to 5) will be analyzed by using this descriptive statistic method.

### 3.5.2 Cronbach's Alpha Coefficient

The purpose of reliability test is to measure of how well each individual item in a scale correlates with the sum of remaining items. It measures consistency reliability among individual variables in a scale. The Cronbach's alpha coefficient is used to indicate the internal consistency reliability. The Cronbach's alpha is greater than or equal to 0.700 indicates that the strength data is normally distributed and it shall be accepted.

### 3.5.3 Spearman Rank Correlation Coefficient

According to Naoum (2007), the spearman (rho) correlation is a non-parametric test for measuring the difference in ranking between two groups of respondent's scoring a number of issues, attributes or factors.

In this research, the Spearman (rho) rank correlation coefficient was conducted for question in Section B (causes of construction dispute), Section C (impacts of construction dispute) and Section D (construction dispute resolutions) in order to measure the degree of agreement between two groups of respondents which are Malaysia's respondents (group 1) and Singapore's respondents (group 2).

The mean value of each variable were ranked and examined by using the SPSS in order to generate the Spearman's rank correlation coefficient. The

correlation coefficient varies between +1.000 and -1.000, where +1.000 indicates a perfect positive relationship (agreement), whereas -1.000 implies a perfect negative relationship (disagreement). In other words, the closer the correlation coefficient to zero means the weaker the association between the ranks. However, it is important to highlight that statistical significance does not indicate the strength of the Spearman rank-order correlation. This is because the significance test is just for the purpose of investigating whether you can accept or reject the null hypothesis.

After analyze the degree of agreement in terms of causes of construction dispute, impacts of construction dispute and dispute resolutions, the relevant results will be discussed in the next chapter.

# CHAPTER 4

# RESULTS AND DISCUSSIONS

## 4.1 Introduction

The purpose of this chapter is to interpret, analyze and summarize the result of research based on the results obtained from survey questionnaires. A total of 60 out of 200 questionnaires were returned for this research. In other words, there is 30% of the construction companies replied. The main objective of the questionnaire is to obtain the construction players' view of opinion regarding the causes, impacts and resolution of disputes in construction industry. The analysis is carried out based on the 60 returned questionnaires have been collected and discussions based on the results were made.

## 4.2 Respondents' Demographics

This section is to assess the respondent's information, which includes the location of their company, type of their organization, their profession or role in the project, their experience involved in construction industry and the primary type of projects they involved in.

### 4.2.1 Country of Respondents' Company Based In

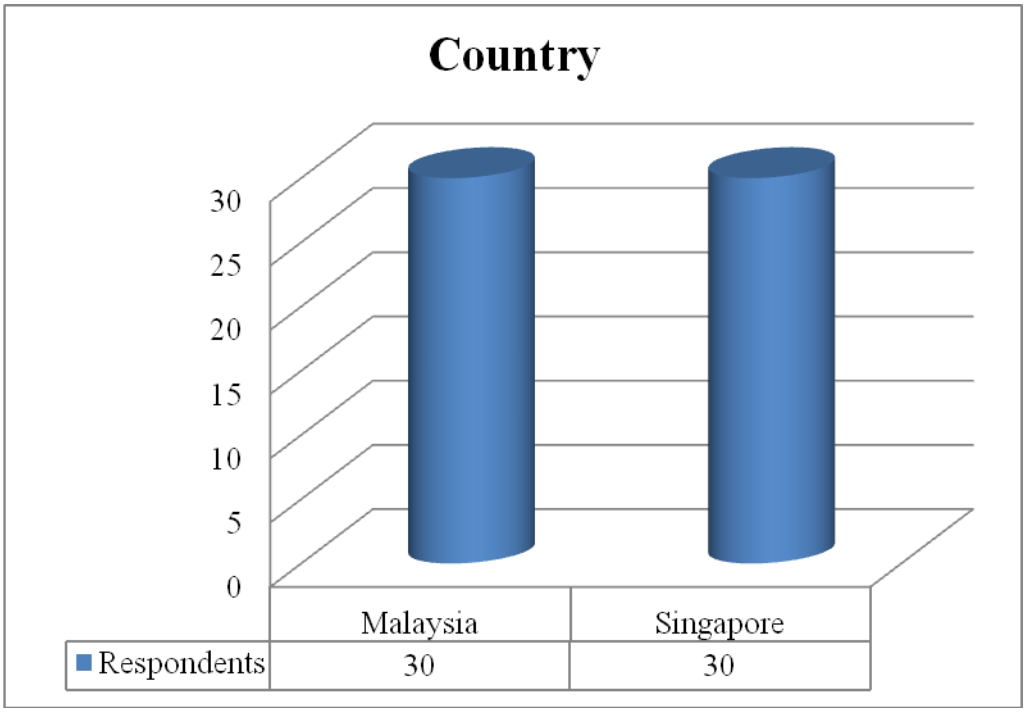


Figure 4.1: Country of Respondents' Company Based In

Survey questionnaires were sent out to the respondents who are working in construction industry in Malaysia and Singapore. According to 60 sets of returned questionnaire, there are total 30 respondents (50%) are working in Malaysia and another 30 respondents (50%) are working in Singapore.

### 4.2.2 Types of Organisation

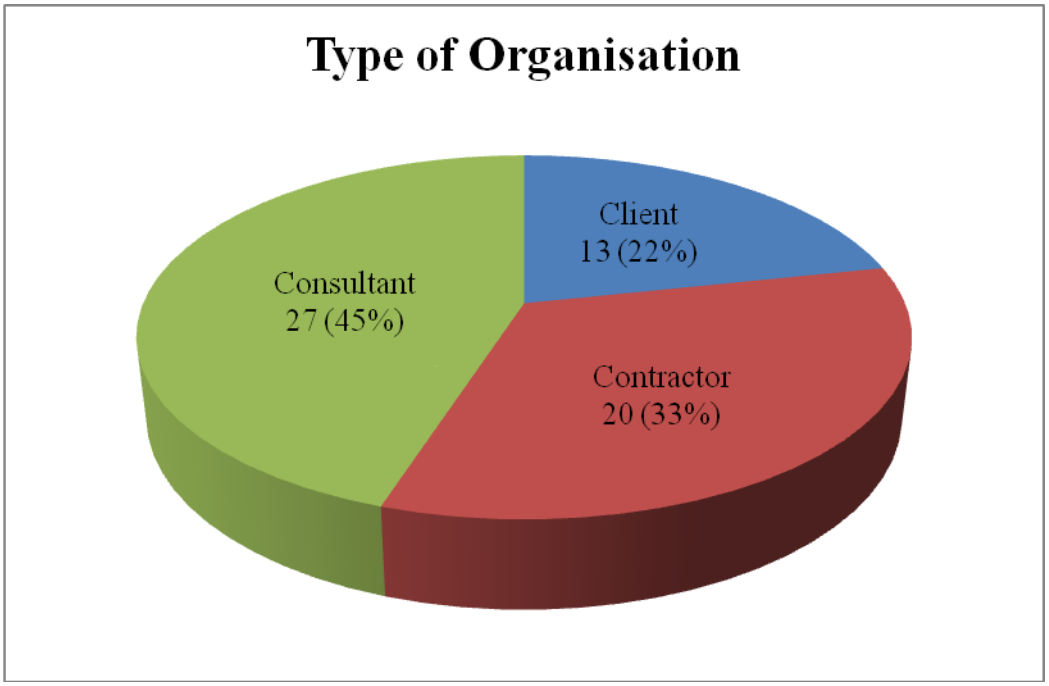


Figure 4.2: Types of Organisation

The pie chart above shows that the 60 sets of returned questionnaires consist of three main types of organisation, which includes consultant, contractor and client. According to the result, most of the respondents were consultant firms, which is 45% (27 out of 60). Then, it followed by the contractor firms, which is 33% (20 out of 60) and the clients consist of the least percentage which is 22% (13 out of 60).

### 4.2.3 Types of Profession

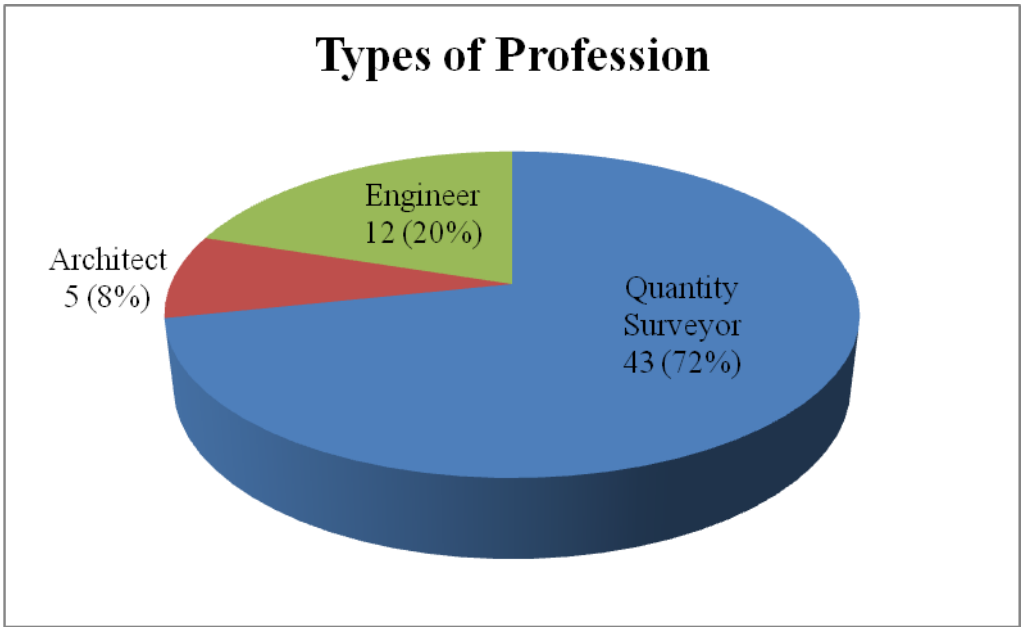


Figure 4.3: Types of Profession

The data analysis was demonstrating the respondents' profession involving in construction project. Based on 60 returned questionnaires, the greatest number of the respondents' profession is quantity surveyor which is total 43 respondents (72%). Apart from that, there is total 12 respondents (20%) are working as engineers in construction project and it was followed by the architect, which is total 5 respondents (8%).

### 4.2.4 Years of Experience in Construction Project

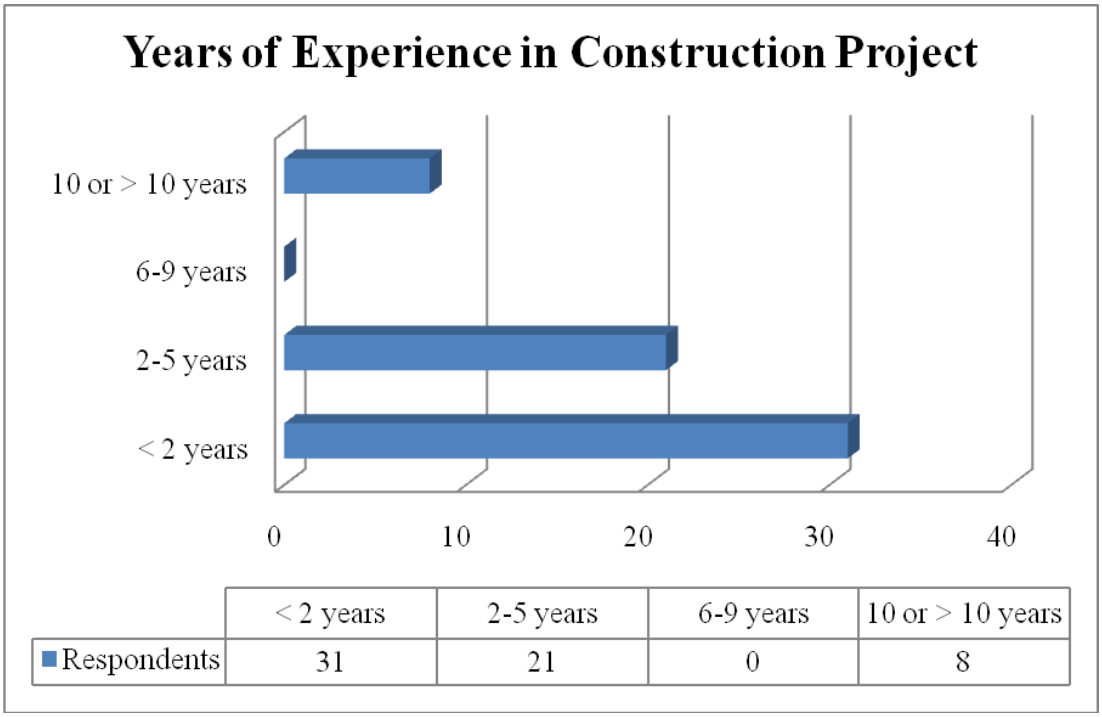


Figure 4.4: Years of Experience in Construction Project

Based on 60 returned questionnaires, the result indicating the greatest number of respondents' working experience in construction project is at the range of less than 2 years which is 52% (31 out of 60). On the other hand, there is no respondent is falling in the range of working experience between 6 to 9 years. Additionally, 35% of respondents has working experience range of between 2 to 5 years (21 out of 60) and 13% of respondents has working experience at the range of 10 or more than 10 years (8 out of 60).

### 4.2.5 Types of Project

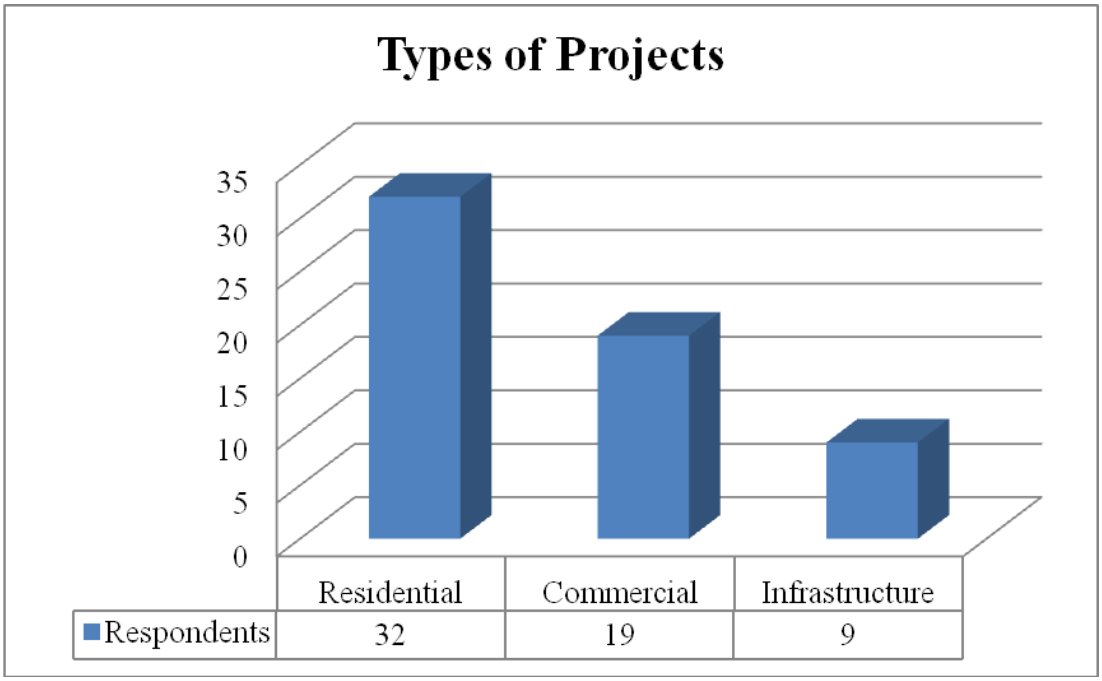


Figure 4.5: Types of Project

In order to facilitate the respondents to select primary type of projects that they have involved, there are 3 types of project has been indentified during the design of questionnaire, which includes residential, commercial and infrastructure.

According to the result, the most primary project type that they have involved is residential project, which are total 32 respondents out of 60 (53%). On top of that, there are total 19 respondents out of 60 selected commercial projects (32%) and it was followed by the infrastructure, which is a total 9 respondent out of 60 (15%).

## 4.3 Reliability Test Analysis

Cronbach's Alpha was carried out to measure of internal consistency or reliability among individual items in a scale. Cronbach's Alpha which equal or greater than 0.700 often regarded as satisfactory, it also indicating that the items may be measures of much the same attribute. However, a value in excess of 0.800 is preferable, and 0.900 or 0.950 is desirable (Abramson, J. and Abramson, Z. H., 2008).

**Table 4.1: Reliability Test Result**

| Reliability Statistics | | |
|---|---|---|
| Factors | Cronbach's Alpha | N of items |
| Causes of Construction Dispute | 0.795 | 17 |
| Impacts of Construction Dispute | 0.820 | 8 |
| Dispute Resolutions | 0.703 | 8 |

The Cronbach's Alpha for the 'Impacts of Construction Dispute' is 0.820 which indicated a highest level of internal consistency or reliability among the total 3 groups of variables. Then, it is followed by the "Causes of Construction Dispute' which has scored 0.795 in the Cronbach's Alpha. Lastly, Cronbach's Alpha for the 'Dispute Resolution' is 0.703 which indicated a lower level of internal consistency or reliability among the 3 factors. Concisely, the 3 categories of variables are reliable since all of the Cronbach's Alpha are greater than 0.700.

## 4.4 Discussion

Data collected from survey questionnaire is divided into two categories, which are under Malaysia's respondents and Singapore's respondents in order to discuss the correlation relationship between both groupings. The discussion of the results is divided into three main categories, which are causes of construction dispute (4.4.1), impacts of construction dispute (4.4.2) and dispute resolutions (4.4.3).

### 4.4.1 Causes of Construction Disputes

The primary data collected from the Section B of the questionnaire was analyzed based on the overall perception from the respondents from Malaysia and Singapore. The mean for each cause has been computed and tabulated in order to establish the ranking of each cause that may lead to construction disputes. Thus, the most significant causes of construction dispute based on perception of the overall respondents were identified as shown in Table 4.2. Additionally, the ranking of causes of construction dispute based on the perceptions of Malaysia's respondents and Singapore's respondents were show in Table 4.3.

From the above list, it is interesting and worth to compare these 2 groups of respondents in terms of the ranking and significance of causes that may lead to a construction dispute. Therefore, Spearman's rank order correlation coefficient test is conducted in order to measure the strength and direction of association that exists between two groups of respondents as to the causes of construction dispute.

**Table 4.2: Ranking of Causes of Construction Dispute (based on overall)**

| Causes | Percentage of respondents scoring | | | | | Mean | Rank |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | | |
| Adversarial culture | 0.0 | 23.3 | 46.7 | 23.3 | 6.7 | 3.13 | 17 |
| Time overrun | 1.7 | 1.7 | 18.3 | 55.0 | 23.3 | 3.97 | 4 |
| Cost overrun | 0.0 | 8.3 | 18.3 | 46.7 | 26.7 | 3.92 | 5 |
| Disagreement on claims | 0.0 | 1.7 | 15.0 | 50.0 | 33.3 | 4.15 | 2 |
| Variation orders | 0.0 | 8.3 | 15.0 | 38.3 | 38.3 | 4.07 | 3 |
| Poor communication | 0.0 | 16.7 | 21.7 | 41.7 | 20.0 | 3.65 | 13 |
| Design errors | 1.7 | 1.7 | 30.0 | 41.7 | 25.0 | 3.87 | 7.5 |
| Inclement weather | 1.7 | 18.3 | 50.0 | 21.7 | 8.3 | 3.17 | 16 |
| Finance and payment issues | 0.0 | 5.0 | 18.3 | 28.3 | 48.3 | 4.20 | 1 |
| Unforeseen site condition | 0.0 | 5.0 | 38.3 | 41.7 | 15.0 | 3.67 | 12 |
| Poor workmanship | 0.0 | 8.3 | 31.7 | 43.3 | 16.7 | 3.68 | 11 |
| Incomplete information | 0.0 | 6.7 | 16.7 | 60.0 | 16.7 | 3.87 | 7.5 |
| Delay in issuing information | 3.3 | 3.3 | 18.3 | 51.7 | 23.3 | 3.88 | 6 |
| Additional works | 0.0 | 8.3 | 25.0 | 55.0 | 11.7 | 3.70 | 10 |
| Unfair risk allocations | 0.0 | 18.3 | 33.3 | 35.0 | 13.3 | 3.43 | 15 |
| Slow client's response | 1.7 | 20.0 | 11.7 | 51.7 | 15.0 | 3.58 | 14 |
| Discrepancies or mistakes in contract document | 1.7 | 8.3 | 21.7 | 48.3 | 20.0 | 3.77 | 9 |

**Table 4.3 Mean and ranking of causes of construction dispute**

| Causes | Malaysia | | Singapore | |
|---|---|---|---|---|
| | **Mean** | **Rank** | **Mean** | **Rank** |
| Adversarial culture | 3.20 | 17 | 3.07 | 16.5 |
| Time overrun | 3.87 | 7 | 4.07 | 4 |
| Cost overrun | 4.00 | 3.5 | 3.83 | 7 |
| Disagreement on claims | 4.17 | 1 | 4.13 | 3 |
| Variation orders | 3.97 | 5 | 4.17 | 2 |
| Poor communication | 3.73 | 11.5 | 3.57 | 11 |
| Design errors | 3.83 | 9 | 3.90 | 5.5 |
| Inclement weather | 3.27 | 16 | 3.07 | 16.5 |
| Finance and payment issues | 4.13 | 2 | 4.27 | 1 |
| Unforeseen site condition | 3.57 | 15 | 3.77 | 9.5 |
| Poor workmanship | 3.83 | 9 | 3.53 | 12 |
| Incomplete information | 3.83 | 9 | 3.90 | 5.5 |
| Delay in issuing information | 4.00 | 3.5 | 3.77 | 9.5 |
| Additional works | 3.93 | 6 | 3.47 | 14 |
| Unfair risk allocations | 3.67 | 13.5 | 3.20 | 15 |
| Slow client's response | 3.67 | 13.5 | 3.50 | 13 |
| Discrepancies or mistakes in contract document | 3.73 | 11.5 | 3.80 | 8 |

#### 4.4.1.1 Discussion on Agreement to Causes of Construction Dispute

The Spearman's Rank Order correlation coefficient was run to determine the relationship between the Malaysia's respondents and Singapore's respondents.

**Table 4.4: Spearman's rank correlation coefficient of the ranking of Malaysia's respondents and Singapore's respondents for causes of construction dispute (17 causes)**

| | | Malaysia | Singapore |
|---|---|---|---|
| **Malaysia** | Correlation Coefficient | 1.000 | .736** |
| | Sig. (2-tailed) | . | .000 |
| | N | 17 | 17 |
| **Singapore** | Correlation Coefficient | .736** | 1.000 |
| | Sig. (2-tailed) | .000 | . |
| | N | 17 | 17 |

**. Correlation is significant at the 0.01 level (2-tailed).

The Spearman's rho correlation test statistic was 0.736 and SPSS indicates that it is significant at the 0.01 level (99% confidence level) for a two-tailed prediction. Thus, the results indicated that there was a high, positive correlation between the rankings of both groups. In other words, this means that there was a high degree of agreement between the respondents and no significant difference in ranking of causes between Malaysia's respondents (group 1) and Singapore's respondents (group 2).

According to the ranking results as shown in Table 4.3, there are 7 agreements on causes of construction disputes between Malaysia's respondents and Singapore's respondents are quite similar. In other words, it means that there are quite consistent agreements between both groups of respondents on these particular factors that may lead to disputes in construction industry, such as:

(1) *Adversarial culture*

Performance and innovation in construction industry are significantly hindered by the adversarial relationships and fragmented processes (Pryke, 2009). However, according to Chartered Institute of Building (2002), the risk of disputes can be minimized by avoiding an adversarial relationship through partnering project. Therefore, both parties may have same opinions that adversarial culture is not the most important causes of construction disputes.

*(2) Disagreement on claims*

If there is any claims issue arise between owner and the contractor and it cannot be settled harmoniously during the construction period, they must either be dropped by the contractor or be settled by arbitration, appeal boards, or the courts (Sears, Sears and Clough, 2008). This may be the reason why both groups of respondents agree that the disagreement on claims is one of the significant causes may lead to construction disputes.

*(3) Poor communication*

The respondents from Malaysia and Singapore both have similar agreement that poor communication contributed to the construction disputes. This is because construction project depends heavily upon the timely and traditional transfer of information such as face to face meetings, phone calls and the exchange of drawings and associated paper documents (Sommerville and Craig, 2006). Therefore, good communication needs to be established from the start in order to prevent the problems escalating into disputes (Richbell, 2008).

(4) *Inclement weather*

Both of the parties have quite similar agreement that inclement weather is the least important cause may lead to construction disputes. Nevertheless, poor weather is usually unanticipated and hence will forcing changes in schedules, production and damage to completed work. Apart from that, bad weather also will caused the productivity to decrease, which is depending upon the severity of the weather and the work tasks, and some construction materials may be affected by the weather too (Mincks and Johnston, 2004).

*(5) Finance and payment issues*

This is one of the most important causes of construction disputes due to Malaysia's respondents and Singapore's respondents given high scores for this factor. Both groups of respondents agreed that finance and payment issues have a much greater likelihood of resulting construction disputes. For instances, if the owner is being very difficult in approving and paying periodic payment applications, or is unaccountably cutting payment applications, or is slow in paying moneys due, or refuses to address and pay for extra work, there is a possibility there will be disputes (Cushman and Myers, 1999).

*(6) Unfair allocation of risks*

Allocation of risk is always a major issue addressed by the contracting parties in construction industry and the event of unfair allocation of risk often leads to disputes and indeed conflict (Hibberd and Newman, 1999). However, Malaysia's and Singapore's respondents may have same opinion that realistic risk allocation can be achieved through negotiation thus it is not the most important causes of project cost overrun.

*(7) Slow client's response*

The ranking for this factor between Malaysia's and Singapore's respondents are quite similar. They have almost same agreement that slow client's response is considerably significant to cause construction disputes. This is because slow response from the construction players is one of the greatest external challenges to improve productivity (Levy, 2007).

In the contrary, the respondents from Malaysia and Singapore have some different opinion regarding to the other causes of construction disputes. Such different agreement between Malaysia's respondents and Singapore's respondents to be discussed as follows:

*(1) Time overrun*

The agreement between Malaysia's respondents and Singapore's respondents for this factor has no significant different opinion, but respondents from Singapore have given slightly higher scores compared to the respondents from Malaysia.

Time overrun may have ripple effect which leads to other critical issues such as cost overrun. Time has been identified as one of the most critical factors in construction operations and has significant legal consequences (Benton and McHenry, 2010).

*(2) Cost overrun*

There is no significant different opinion between both groups of respondent although Malaysia's respondents have given higher point if compared to Singapore's respondents. This may due to the currency and import tax are different for each country and therefore resulted in the differences in cost of labours and building materials.

Potential cost overrun is always one of the essences of a construction dispute. Therefore, better prepared and more comprehensive bid documents are essential to eliminate or to reduce significantly the opportunities for cost overruns (Fenn and Gameson, 1992).

*(3) Variation orders*

The ranking result show that the Singapore's respondents have given higher points for this factor which means they are more agree that variation orders may lead to construction disputes if compared to Malaysia's respondents.

Oladapo (2003) conducted a study and found that variation had a significant impact on project cost and time overruns. However, a good understanding of the real impact of variation on project performance is essential for reducing the occurrence of variation orders.

*(4) Design errors*

The respondents from Singapore also given higher point for this factor compared to Malaysia's respondents. In other words, Singapore's respondents have agree that design errors may lead to construction dispute but the Malaysia's respondents may have opinion other factors are more important.

Design work is not easy therefore it is better not to change the design after construction has started, yet design modifications must be made if errors in design become obvious during construction (Herren and Cooper, 2000). The

differences in the rules and regulations between Malaysia and Singapore may be the reason why the Singapore's respondents given higher scores for this factor.

*(5) Unforeseen site condition*

The agreement for this factor between both groups of respondent is slightly different. The Singapore's respondents are more agree that unforeseen site condition may lead to construction disputes while the Malaysia's respondents were not.

Malaysia's respondents may in the opinion that potential unforeseen site conditions can be avoided by conducting a comprehensive subsurface investigation. Therefore, this may be the reason why the Malaysia's and Singapore's respondents did not reach a consensus in the agreement for this factor.

*(6) Poor workmanship*

The agreement between Malaysia's respondents and Singapore's respondents for this factor has no significant different opinion. However, Malaysia's respondents are more agree that poor workmanship is one of the causes to construction disputes if compared to Singapore's respondents.

Sawczuk (1996) identified that there are numbers of construction disputes arise in relation to poor workmanship and design failures. Therefore, it is everyone's interest to take steps in order to avoid the potential risk of poor workmanship and design failures. However, Singapore's respondents may think that a stricter progress monitoring by project participants may reduce the likelihood of poor workmanship and this may be the reason why their ranking for this reason is lower than Malaysia's respondents.

*(7) Incomplete information*

Malaysia's respondents also more agree that incomplete information may lead disputes in construction industry if compared to Singapore's respondents. Incomplete information may be a direct result of poor communication and ineffective project management during the design stage which can lead to communication breakdown and disputes (Emmitt, 2002). Construction project in remote area is apparently more common in Malaysia than in Singapore, therefore, effective communication is rather more difficult to achieve for those project participants who involved in such projects.

*(8) Delay in issuing information*

Based on the ranking result, respondents from Malaysia have given higher score for this factor, which means they are more agree that delay in issuing information is one of the causes lead to construction disputes if compared to Singapore's respondents.

According to Sommerville and Craig (2006), the use of project databases and the Internet will encourage and facilitate the free transfer of information between all construction parties within the contract before finally processing the finished product through the necessary formal channels. This may be the reason why Singapore's respondents given lower points for this factor since the use of project databases and the Internet are probably more common in Singapore.

*(9) Additional works*

The agreement for this factor between Malaysia's and Singapore's respondents is different. Malaysia's respondents are much more agree that this is causes of construction disputes and the Singapore's respondents were in the contrary.

Variation is defined as changes to the design, to the material specification, additional of work or removal of work properly executed, changes relating to access to the site or working conditions, and alteration of the kind of standard of any of the materials or goods to be used in the works (Murdoch and Hughes,

2008). Design or material specification may be varying according to the market trend. In short, market trend may be different between Malaysia and Singapore and hence resulted a significance difference in opinion between both groups of respondent.

*(10) Discrepancies or mistakes in contract document*

The agreement between respondents from both countries for this factor has no significant different opinion. Singapore's respondents have given slightly higher point for this factor compared to the Malaysia's respondents.

Callahan (2005) stated that there is no design is ever perfect. However, the differences in rules and regulations, and the different standard form of contract being adopted in Malaysia and Singapore may be the reasons why they have not reach a consensus in this factor.

### 4.4.2 Impacts of Construction Disputes

The primary data collected from the Section C of the questionnaire was analyzed based on the overall perception from the respondents from Malaysia and Singapore. The mean for each impact has been computed and tabulated in order to establish the ranking of each impact that may be caused by construction disputes. Thus, the most significant impacts of construction dispute based on perception of the overall respondents were identified as shown in Table 4.5. Additionally, the ranking of impacts that caused by construction dispute based on the perceptions of Malaysia's respondents and Singapore's respondents were show in Table 4.6.

From the above list, it is interesting and worth to compare these 2 groups of respondents in terms of the ranking and significance of impacts that resulted by construction dispute. Therefore, Spearman's rank order correlation coefficient test is

conducted in order to measure the strength and direction of association that exists between two groups of respondents as to the impacts of construction dispute.

**Table 4.5: Ranking of Impacts of Construction Dispute (based on overall)**

| Impacts | Percentage of respondents scoring | | | | | Mean | Rank |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | | |
| Damage business relationship | 0.0 | 11.7 | 23.2 | 38.3 | 26.7 | 3.80 | 4 |
| Increase project costs | 0.0 | 8.3 | 10.0 | 60.0 | 21.7 | 3.95 | 2 |
| Project delays | 0.0 | 0.0 | 10.0 | 61.7 | 28.3 | 4.18 | 1 |
| Undermine team spirits | 1.7 | 5.0 | 40.0 | 45.0 | 8.3 | 3.53 | 8 |
| Damaging company reputation | 0.0 | 8.3 | 25.0 | 50.0 | 16.7 | 3.75 | 5 |
| Dispute escalation (chain reaction) | 0.0 | 3.3 | 40.0 | 45.0 | 11.7 | 3.65 | 6 |
| Poor client satisfaction | 0.0 | 6.7 | 15.0 | 61.7 | 16.7 | 3.88 | 3 |
| Project abandonment | 3.3 | 6.7 | 33.3 | 40.0 | 16.7 | 3.60 | 7 |

**Table 4.6: Mean and Ranking of Impacts of Construction Dispute**

| Impacts | Malaysia | | Singapore | |
|---|---|---|---|---|
| | Mean | Rank | Mean | Rank |
| Damage business relationship | 3.77 | 5 | 3.83 | 4 |
| Increase project costs | 3.87 | 2 | 4.03 | 2 |
| Project delays | 4.23 | 1 | 4.13 | 1 |
| Undermine team spirits | 3.57 | 8 | 3.50 | 8 |
| Damaging company reputation | 3.80 | 4 | 3.70 | 5 |
| Dispute escalation (chain reaction) | 3.67 | 6 | 3.63 | 6 |
| Poor client satisfaction | 3.83 | 3 | 3.93 | 3 |
| Project abandonment | 3.63 | 7 | 3.57 | 7 |

#### 4.4.2.1 Discussion on Agreement to Impacts of Construction Dispute

A separate Spearman's Rank Order correlation coefficient was conducted to determine the relationship between the Malaysia's respondents and Singapore's respondents regarding to the impacts of construction dispute.

**Table 4.7: Spearman's rank correlation coefficient of the ranking of Malaysia's respondents and Singapore's respondents for impacts of construction dispute (8 impacts)**

| | | Malaysia | Singapore |
|---|---|---|---|
| **Malaysia** | Correlation Coefficient | 1.000 | .976** |
| | Sig. (2-tailed) | . | .000 |
| | N | 8 | 8 |
| **Singapore** | Correlation Coefficient | .976** | 1.000 |
| | Sig. (2-tailed) | .000 | . |
| | N | 8 | 8 |

**. Correlation is significant at the 0.01 level (2-tailed).

A separate Spearman's Rank Order correlation coefficient was conducted to determine the relationship between the Malaysia's respondents and Singapore's respondents regarding to the impacts of construction dispute. The Spearman's rho correlation test statistic was 0.976 and SPSS indicates that it is significant at the 0.01 level (99% confidence level) for a two-tailed prediction. Thus, the results indicated that there was a strong, positive correlation between the rankings of both groups. In other words, this means that there was a high degree of agreement between the respondents and no significant difference in ranking of impacts between Malaysia's respondents (group 1) and Singapore's respondents (group 2).

According to the ranking results as shown in Table 4.6, there are 6 agreements on impacts of construction disputes between Malaysia's respondents and Singapore's respondents are exactly same in ranking. In other words, it means that there are same agreements between both groups of respondents on these particular impacts that may be caused by construction disputes, such as follows:

*(1) Increase project costs*

The agreement between Malaysia's and Singapore's respondents for this impact is same as they both give higher point and agreed that construction dispute will lead to increase in total project costs. This is because the nature of disputes is costly, lengthy, and complex and eventually the cost of resolving the dispute always exceeds than amount of the initial claim (Feld and Carper, 1997).

Although an early resolution of a dispute helps to limit the ultimate cost overrun, but it does not eliminate it entirely yet there still are increased in total project costs due to the resulting extended project duration (Fenn and Gameson, 1992).

*(2) Project delays*

Based on the result, both Malaysia's and Singapore's respondents given the highest points for this impact, which means they both agreed that project delays is the most important impact which lead by construction disputes.

Adversarial disputes severely degrade productive working relationships and consume time and money. This is because contract disputes are lengthy and costly to all of the contracting parties in nature (Edgerton, 2008). Thus, construction dispute cases always become the reason behind why a project cannot be completed according to the original contract period.

*(3) Undermine team spirits*

All the respondents from both countries have the same agreement that this impact is the least important impact which may lead by construction dispute. Barnes (1990) stated that disputed claims can be an unnecessary drag on effective management of construction projects as they tend to absorb a massive quantity of time and energy of trained staff in unproductive activity and learn to destroy the spirit of co-operation which should be exist between members of the project team.

However, both parties may have same opinion that construction dispute may not affect the team spirits severely due to the project based in nature of construction industry. A project team will be dismissed after they completed a project and will forming a new project team with other professionals, therefore team spirits always needed to be develop again for each new project.

*(4) Dispute escalation (chain reaction)*

Malaysia's and Singapore's respondents have same agreement that they agreed a construction dispute will have chain reaction and escalate to into litigation. According to Edgerton (2008), a dispute might first be taken to the superintendent or inspector at the field level and then escalated to the project manager at the project level. If it still could not be resolved, the dispute could move to executive level and consequently enter into arbitration or litigation with an outside party facilitating resolution. Therefore, it is encouraged for the disputes to be resolved at the lowest possible level so that the dispute escalation may be eliminated.

*(5) Poor client satisfaction*

Ranking of both parties for this impact is same as they may have same agreement that poor client satisfaction which lead by construction dispute is quite significant compared to other impacts. Moreover, poor client satisfaction will definitely result in poor reputation from consumers to particular parties that involved in the construction project.

*(6) Project abandonment*

According to the result, the agreement between Malaysia's and Singapore's respondents is consistent. They both have the same opinion that project abandonment will give lower impact compared to other impacts which lead by construction disputes. However, construction disputes usually consume massive time and costs to achieve a successful dispute resolution, therefore, a case which construction dispute leads to project abandonment is not rare (Sweet and Scheneier, 2008).

In the contrary, Malaysia's respondents and Singapore's respondents have quite different opinion on some impacts of construction disputes as shown in the results of ranking in Table 4.6, such as follows:

*(1) Damage business relationship*

Based on the result, Singapore's respondents given higher point for this impact compared to Malaysia's respondents. However, the agreement between Malaysia's and Singapore's respondents for this impact has no significant different opinion.

According to Chern (2008), hidden costs of disputes is the damage to reputations and commercial relationships, the cost of time spent by executive personnel and the cost of lost business opportunities. Therefore, conflict or dispute is necessitate to be managed so that it does not suppress information or become personal and dysfunctional and damage relationships (Emmitt, 2010).

*(2) Damaging company reputation*

According to the ranking result, the agreement between Malaysia's and Singapore's respondents for this impact has no significant different opinion. However, Malaysia's respondents given higher point for this impact compared to Singapore's respondents.

Disputes has the likelihood to create negative publicity, this is because time is needed to be allocated in order to prepare for any tribunal proceedings which resulting from a dispute and there will also be disruption to work, which in turn affect the company's image or reputation (Bunting, 2005).

### 4.4.3 Construction Dispute Resolutions

The primary data collected from the Section D of the questionnaire was analyzed based on the overall perception from the respondents from Malaysia and Singapore. The mean for each dispute resolution has been computed and tabulated in order to determine the ranking of each dispute resolution which is available in the current construction industry. Thus, the most significant resolutions for construction dispute based on perception of the overall respondents were identified as shown in Table 4.8. Moreover, the ranking of dispute resolutions based on its commonness in practicing in construction industry derived from the perceptions of Malaysia's respondents and Singapore's respondents were show in Table 4.9.

From the above list, it is interesting and worth to compare these 2 groups of respondents in terms of the ranking of commonness and significance of dispute resolutions in construction industry. Thus, Spearman's rank order correlation coefficient test is conducted in order to measure the strength and direction of association that exists between two groups of respondents as to the commonness of dispute resolutions.

**Table 4.8: Ranking of Dispute Resolution of Construction Dispute (based on overall)**

| Dispute Resolutions | Percentage of respondents scoring | | | | | Mean | Rank |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | | |
| Adjudication | 1.7 | 5.0 | 38.3 | 50.0 | 5.0 | 3.52 | 5 |
| Arbitration | 0.0 | 8.3 | 21.7 | 60.0 | 10.0 | 3.72 | 2 |
| Dispute review board | 1.7 | 8.3 | 43.3 | 41.7 | 5.0 | 3.40 | 6 |
| Expert determination | 0.0 | 3.3 | 33.3 | 58.3 | 5.0 | 3.65 | 3.5 |
| Litigation | 8.3 | 23.3 | 38.3 | 30.0 | 0.0 | 2.90 | 8 |
| Mini-trial | 1.7 | 15.0 | 55.0 | 26.7 | 1.7 | 3.12 | 7 |
| Mediation | 0.0 | 5.0 | 31.7 | 56.7 | 6.7 | 3.65 | 3.5 |
| Negotiation | 0.0 | 1.7 | 8.3 | 51.7 | 38.3 | 4.27 | 1 |

**Table 4.9 Mean and Ranking of Construction Dispute Resolutions**

| Impacts | Malaysia | | Singapore | |
|---|---|---|---|---|
| | Mean | Rank | Mean | Rank |
| Adjudication | 3.53 | 5 | 3.50 | 5 |
| Arbitration | 3.87 | 2 | 3.57 | 4 |
| Dispute review board | 3.40 | 6 | 3.40 | 6 |
| Expert determination | 3.60 | 4 | 3.70 | 2 |
| Litigation | 3.13 | 7 | 2.67 | 8 |
| Mini-trial | 3.10 | 8 | 3.13 | 7 |
| Mediation | 3.67 | 3 | 3.63 | 3 |
| Negotiation | 4.10 | 1 | 4.43 | 1 |

#### 4.4.3.1 Discussion on Agreement to Construction Dispute Resolutions

Another Spearman's Rank Order correlation coefficient was carried out to find out the relationship between the Malaysia's respondents and Singapore's respondents regarding to the commonness of dispute resolutions in construction industry.

**Table 4.10: Spearman's rank correlation coefficient of the ranking of Malaysia's respondents and Singapore's respondents for commonness of dispute resolutions in construction industry (8 dispute resolutions)**

| | | Malaysia | Singapore |
|---|---|---|---|
| **Malaysia** | Correlation Coefficient | 1.000 | .881** |
| | Sig. (2-tailed) | . | .004 |
| | N | 8 | 8 |
| **Singapore** | Correlation Coefficient | .881** | 1.000 |
| | Sig. (2-tailed) | .004 | . |
| | N | 8 | 8 |

**. Correlation is significant at the 0.01 level (2-tailed).

The Spearman's rho correlation test statistic was 0.881 and SPSS indicates that it is significant at the 0.01 level (99% confidence level) for a two-tailed prediction. Thus, the results indicated that there was a strong, positive correlation between the rankings of both groups. In other words, this means that there was a high degree of agreement between the respondents and no significant difference in ranking of dispute resolutions based on its commonness in practicing in construction industry between Malaysia's respondents (group 1) and Singapore's respondents (group 2).

According to the ranking results as shown in Table 4.9, there are 4 agreements on the commonness of construction dispute resolutions between Malaysia's respondents and Singapore's respondents are exactly same in ranking. In other words, it means that there are same agreements between both groups of respondents on these particular dispute resolutions based on its commonness in practicing in construction industry, such as follows:

*(1) Adjudication*

Both parties have same agreement for this dispute resolution. The ranking for adjudication is lower than negotiation and higher than litigation. This is because of the adjudication process usually commences when one party to a dispute that it is unlikely that more is to be achieved by discussion and negotiation, and that the issue is important enough to warrant the time and expense of adjudication (John, 2008).

Additionally, adjudication can often lead to a settlement without the matter going any further with very expensive litigation (Ashworth and Hogg, 2007).

*(2) Dispute review board*

According to Edgerton (2008), the conditions precedent for establishing dispute review board is usually described in the contract documents. As a result, this might be the reason why both respondents from Malaysia and Singapore have the same agreement that this dispute resolution is not that common to be practiced in construction industry.

*(3) Mediation*

Both Malaysia's and Singapore's respondents agreed that mediation is quite common in practicing in construction industry. The reason behind is the mediation has proven to be most effective when used immediately after the parties have determined that conflict management techniques have failed and it has been highly successful in resolving construction disputes at a fraction of the time and expense required for litigation (Fenn, O'Shea and Davies, 1998).

*(4) Negotiation*

Both Malaysia's and Singapore's respondents given highest points to this dispute resolution, which means they both have the same opinion that negotiation is the most common dispute resolution being practicing in construction industry.

The reason behind could be the negotiation is always going to produce the best chance of a satisfactory solution to any dispute since it is quick and the bruising encounters that come with arbitration, litigation or adjudication has been avoided (Wright, 2004).

In the contrary, Malaysia's respondents and Singapore's respondents have quite different opinion on the commonness of dispute resolution in construction industry as shown in the results of ranking in Table 4.9, such as follows:

*(1) Arbitration and (2) Expert determination*

Based on the result, Malaysia's respondents given higher point to arbitration, whereas Singapore's respondents given higher point to expert determination in the contrast. This may be due to the different of rules and regulations or by-laws between two countries.

However, arbitration is still a better route than litigation for solving serious disputes because an arbitrator with appropriate knowledge and experience must always have a greater chance of understanding the complex engineering or process questions that are likely to arise than a court (Wright, 2004).

According to Ramsey et al. (2007), expert determination is unlike an arbitral award, it may only be challenged in certain limited circumstances of fraud or collusion, or where the expert has departed from their instructions. Otherwise, the expert's determination will be final and binding on the parties. Therefore, this might the reason why the agreement for this factor between Malaysia's and Singapore's respondents is different.

*(3) Litigation and (4) Mini-trial*

For these two factors, Malaysia's respondents are more agree that litigation is more common in practicing in construction industry and Singapore's respondents have the contrasting opinions. However, these two factors are still the least common dispute resolutions if compared to other alternative dispute resolutions.

This is because of the litigation is well known in terms of costly, lengthy, and complex (Feld and Carper, 1997), and mini-trial method is normally best suited to large disputes and complex litigation (Cooley and Lubet, 2003).

# CHAPTER 5

# CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

This chapter covers the summary and conclusions with specific reference to the research objectives. Apart from that, limitations and recommendations for further study also included in this chapter in order to improve the study as well as facilitate the learning process in related future research work.

## 5.2 Conclusions

The nature of construction industry is such that will always be disputes between various contracting parties. Disputes are something construction project personnel will have to face several times during the life of a project and it may continue long after a project has ostensibly finished (Carmichael, 2002). Therefore, a research is conducted in order to get a better understanding of construction dispute.

The aim of this research is to investigate the causes, impacts and disputes resolutions related to the disputes in construction industry. Therefore the following objectives were set in order to achieve the stated aim of this research: (1) To identify the causes of disputes arising from construction projects, (2) To discover the impacts caused by cases of construction disputes, and (3) To study the existing disputes resolution in construction industry.

The potential causes, impacts and alternative dispute resolutions were identified in a thorough literature review. Then, a questionnaire was designed based on the existing comprehensive literature review, and distributed randomly in order to collect the opinions from various participants in construction industry. 200 sets of survey questionnaires had been distributed to the people within construction industry in Malaysia and Singapore and a total of 60 sets of survey questionnaire were returned.

Subsequently, the main causes of construction disputes were identified from the questionnaires were analyzed. The 8 most significant causes based on the overall respondents were:

- *Finance and payment issues*

  A construction project always involve with huge amount of money, therefore any insolvency or payment issues will easily turn into construction conflicts or disputes.

- *Disagreement on claims*

  There are many incidents of claim issues in construction works. If a claim issue cannot be solve harmoniously then it will definitely foster the likelihood of construction disputes.

- *Variation orders*

  Variation orders will directly bring the impacts of time overrun and cost overrun of a construction project and hence increase the occurrence of disputes.

- *Time overrun*

  A construction project which unable to be completed within the original contract period and without the granted of extension of time is the major cause of construction dispute.

- *Cost overrun*

  Cost overrun may lead to a construction dispute due to the final contract sum is exceeded the original contract sum and the client have to pay more than they expected.

- *Delay in issuing information*

  The construction project may not be completed on or before the original completion date if there is any delay in issuing information such as construction drawings.

- *Design errors*

  Design errors may increase the likelihood of construction defects which is a common cause to construction disputes.

- *Incomplete information*

  Complete information of a construction project is crucial for the professionals to deliver the project which comply with client's requirement as stated in contract document. Any discrepancies between the completed project and contract document will lead to a construction dispute.

Other causes of construction disputes includes: *discrepancies or mistakes in contract document, additional works, poor workmanship, unforeseen site condition, poor communication, slow client's response, unfair risk allocations, inclement weather* and *adversarial culture*.

Then, the 4 most significant impacts which resulted from construction disputes were identified based on the overall respondents, such as follows:

- *Project delays*

  Resolution of construction disputes always is a time-consuming process, therefore the construction's professionals may not be able to complete the project on time.

- *Increase project cost*

  Each type of dispute resolution will cost the parties involved a sum of money especially litigation cases since a lawyer is necessary to be engaged.

- *Poor client satisfaction*

  Construction disputes will affect the overall performance of every aspects in a construction project and therefore have an effect on client satisfaction at the same time.

- *Damage business relationship*

  If construction dispute occurred between client and construction professionals, it will certainly damage the business relationship between related parties and even lost of the future business opportunities.

Other impacts of construction disputes include: *damaging company reputation*, *dispute escalation (chain reaction)*, *project abandonment*, and *undermine team spirits*.

On top of that, the 4 most significant dispute resolutions based on the commonness in practicing in construction industry were identified based on the overall respondents, such as follows:

- *Negotiation*

  Negotiation is always the most popular dispute resolution since there are no formal rules, less time-consuming and much cheaper among all of the other alternative dispute resolutions.

- *Arbitration*

  Arbitrator with appropriate construction knowledge and experience makes the arbitration more favourable than the rest of the dispute resolutions.

- *Expert determination*

  Expert determination provides a fast and final solution to the dispute and this may be the reason behind that this is commonly practicing in industry.

- *Mediation*

  A neutral third party is engaged in this method yet a lawyer is engaged in litigation. Therefore, this is undoubtedly more efficient in terms of time and cost.

Other methods of dispute resolution available in construction industry include: *adjudication*, *dispute review board*, *mini-trial*, and *litigation*.

As a conclusion, data collected from survey questionnaires were categorized into two groups, which are under Malaysia's respondents and Singapore's respondents. Then, the agreement on the ranking in terms of causes of construction disputes, impacts of construction disputes and dispute resolutions were tested between the stated two groups of respondents. The result shown that the agreement between Malaysia's and Singapore's respondents is quite consistent and there is significant correlation between two parties in ranking of causes, impacts and dispute resolutions of construction disputes.

## 5.3 Limitations

There were some limitations and constrains being encountered in this research study, such as follows:

- Low response rate of returned questionnaire that was 30% (60 sets out of 200 sets) were collected from the targeted respondents from Malaysia and Singapore. Such low response rate may eventually affect the accuracy of the result due to the minority opinions may not reflect the real situation in construction industry.

- Questionnaire was only included closed-ended questions which designed in Likert scale. This type of questions only allowed few options of answer such as agree or disagree. Therefore, researchers only able to receive limited information since the respondents cannot provide deeper answer as the design of open-ended questions.

## 5.4 Recommendation for Future Research

After conducted this research, there are some recommendations for further study to be identified which are:

- Since the construction dispute cases are inevitably for almost every project in construction industry, the ways or efforts to be adopted by each of the construction participants can be investigated in further study, in order to find out the possible ways to reduce the impacts brought by construction conflicts or disputes.

- For further study, the alternative dispute resolutions which were not investigated in details in this research study can be conducted, in order to provide a smoother process of dispute resolution for construction disputes. At the same time, the study of dispute resolutions in detail may helps construction participants to understand each type of alternative dispute resolution and thus resolve a conflict or dispute in a lower cost and shorter time.

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# APPENDICES

## APPENDIX A: Survey Form

**UNIVERSITI TUNKU ABDUL RAHMAN**
**FACULTY OF ENGINEERING AND SCIENCE**
**SETAPAK CAMPUS**
Tel: 03-4107 9802 Fax: 03-4107 9803
E-mail: fes@mail.utar.edu.my
Jalan Genting Kelang, Setapak, 53300 Kuala Lumpur.

**TO WHOM IT MAY CONCERN**

Dear Sir/ Madam,

**RE: BACHELOR OF SCIENCE (HONS) QUANTITY SURVEYING**
**- FINAL YEAR PROJECT**

---

I am an undergraduate student from Faculty of Engineering and Science, Universiti Tunku Abdul Rahman.

I would be most obliged if you could kindly allow me to conduct the survey with you or your technical staff to learn from your company concerning some aspects of my Final Year Project entitled:

**"A Study on The Issues of Construction Disputes in Malaysia and Singapore."**

Your co-operation will be greatly appreciated and contribute tremendously to my education as well as the development of our construction industry.

Please do not hesitate to contact me for further information.

Thank you.

Yours faithfully,

_____

Chua Shu Cing

Contact number: 017-757 3377
E-mail : sherlynnchua@hotmail.com

**A STUDY ON THE ISSUES OF CONSTRUCTION DISPUTES IN MALAYSIA AND SINGAPORE**

(NOTE: Please **(√)** tick your answers.)

**Section A: Demographics Information**

The following questions are intended to solicit information that will be used to determine the profile of respondents.

1) Where is your company based in?

- ◯ Malaysia
- ◯ Singapore

2) What is the type of your organization?

- ◯ Clients
- ◯ Consultants
- ◯ Contractors
- ◯ Others:_____

3) What is your profession?

- ◯ Architect
- ◯ Engineer
- ◯ Quantity Surveyor
- ◯ Others:_____

4) How many year of working experience do you have in construction industry?

- ◯ Less than 2 years
- ◯ 2-5 years
- ◯ 6-9 years
- ◯ 10 or more than 10 years

5) What is the primary type of projects you are involved in?

- ◯ Residential
- ◯ Commercial
- ◯ Infrastructure
- ◯ Others:_____

**Section B: Causes of Construction Disputes**

Please rate the following causes that may lead to construction disputes.

| Causes | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| | 5 | 4 | 3 | 2 | 1 |
| Adversarial culture | | | | | |
| Time overrun | | | | | |
| Cost overrun | | | | | |
| Disagreement on claims | | | | | |
| Variation orders | | | | | |
| Poor communication | | | | | |
| Design errors | | | | | |
| Inclement weather | | | | | |
| Finance and payment issues | | | | | |
| Unforeseen site condition | | | | | |
| Poor workmanship | | | | | |
| Incomplete information | | | | | |
| Delay in issuing information | | | | | |
| Additional works | | | | | |
| Unfair allocation of risk | | | | | |
| Slow client's response | | | | | |
| Discrepancies or mistakes in contract document | | | | | |

**Section C: Impacts of Construction Disputes**

Please rate the following impacts that may be caused by construction disputes.

| Impacts | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| | 5 | 4 | 3 | 2 | 1 |
| Damage business relationship | | | | | |
| Increase project costs | | | | | |
| Project delays | | | | | |
| Undermine team spirits | | | | | |
| Damaging company reputation | | | | | |
| Dispute escalation (Chain reaction) | | | | | |
| Poor client satisfaction | | | | | |
| Project abandonment | | | | | |

**Section D: Dispute Resolutions**

Please rate the following dispute resolutions based on its commonness in practicing in construction industry.

| Dispute Resolutions | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| | 5 | 4 | 3 | 2 | 1 |
| Adjudication | | | | | |
| Arbitration | | | | | |
| Dispute review board | | | | | |
| Expert determination | | | | | |
| Litigation | | | | | |
| Mini-trial | | | | | |
| Mediation | | | | | |
| Negotiation | | | | | |

Name : _____

Contact Number: _____

Email : _____

Company : _____

**(Your identity will be kept anonymous)**

************End of Questionnaire, Thank You!!************

**Your information and responses will be kept private and confidential.**

**Thank you for your kind assistance.**

**APPENDIX B**

**Project Definition Document**

| | |
|---|---|
| Name of Supervisor | **Dr Tan Hai Chen** |
| Name of Student | **Chua Shu Cing** |
| Project Title | A Study on The Issues of Construction Disputes in Malaysia and Singapore |
| Aim | To investigate the causes, impacts and disputes resolutions related to the disputes in construction industry. |
| Objectives | - To identify the causes of disputes arising from construction projects.<br>- To discover the impacts caused by cases of construction disputes<br>- To study the existing disputes resolution in construction industry. |
| Research Methodology | - A comprehensive literature review of causes and impacts of construction dispute.<br>- Questionnaires and interviews to be done with the people in construction industry.<br>- Proposed analysis of the findings from the questionnaires and interviews. |
| Anticipated Outcomes | A report that cover:<br>- The review of existing literature about causes, impacts and resolutions of construction disputes.<br>- The relationship between Malaysia's respondents and Singapore's respondents to the issues of construction disputes. |
| Proposed Structure of Report | Title page<br>Approval for Submission<br>Acknowledgements<br>Abstract<br>List of Tables<br>List of Figures<br>List of Appendices |

| | |
|---|---|
| | Chapter 1: Introduction<br>Chapter 2: Literature Review<br>Chapter 3: Research Methodology<br>Chapter4: Results and Discussions<br>Chapter 5: Conclusion and Recommendations<br>References<br>Appendices |
| Program of Works | a) Submit Project I Report – Sem. 1 Week 8<br>b) Hand in Project II Report – Sem. 2 Week 12<br>c) Presentation/Viva (Project II only) |

Signature …….. Date ……

(Student)

Signature …….. Date……

(Supervisor)

**APPENDIX C**

**MEETING RECORD**