A STUDY OF CAUSES AND EFFECTS OF CONFLICT IN CONSTRUCTION INDUSTRY

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I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree.

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Dedicated to my parents

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ABSTRACT

Nowadays, conflict seems like common and inevitable in the construction industry. Construction industry is a larger project which is complex since it involves variety of parties who are related to the project. Due to the multidisciplinary of the project participants, conflict becomes unavoidable issue in the construction industries. Internal conflicts that commonly involved the parties that directly participate in the project such as project developers, project consultants, and project contractors. Internal conflict can break the relationship among the participants, affect the work quality and productivity, and may lead to project fail if it is not manage in well. Thus, this research aim to identify the causes and effects that lead to internal conflict among three categories of the respondents, which are Developer, Contractor and Consultant. The survey questionnaire had been used in collecting the data from 134 of the respondents. The literature review in this study highlighted 4 main causes such as Contractual problems, Design/scope related problems, Management problems and Behavioural problems; and 4 main effects which are Time, Cost, Productivity and Quality, and Organization and its reputation related effects. Based on the analysis result from the collected data, the 4 most significant causes are Error and Omission in Project Design, Ambiguities in Contract Documents, Error and Omissions in the Contract Terms and Improper Planning and Scheduling, whereas most significant effects of internal conflict are Delay in Project Duration, Lost of Profitability, and Project Cost Overruns. Besides this, the Pearson Correlation Coefficient Analysis and Spearman Rank Correlation Analysis had been used to test the strength of relationship between causes and effects of internal conflict, and test the degree of agreement between 3 categories of respondents to the causes and effects. In overall, the correlation between causes and effects shown moderate positive in relationship, and there is no same agreement among that 3 categories of respondents.

ABSTRAK

Pada masa kini, konflik dikenali biasa dan tidak dapat dielakkan dalam industri pembinaan. Industri pembinaan dikenali sebagai projek yang kompleks disebabkan penglibatan daripada pelbagai pihak yang berkaitan. Oleh sebab penglibatan mereka, konflik telah menjadi isu yang tidak dapat dielakkan dalam industri pembinaan. Konflik dalaman yang biasanya melibatkan pihak yang terlibat secara langsung dalam projek adalah seperti pemaju projek, perunding projek, dan kontraktor projek. Konflik dalaman boleh memecahkan hubungan di kalangan peserta, memberi kesan kepada kualiti kerja dan produktiviti, dan boleh menebabkan projek gagal jika ianya tidak dilupuskan dengan baik . Oleh itu, kajian ini bertujuan untuk mengenal pasti punca dan kesan yang manyebabkan konflik dalaman di kalangan tiga kategori responden iaitu Pemaju, Kontraktor dan Perunding. Soal selidik kajian telah digunakan dalam mengumpul data dari 134 responden. Kajian literatur dalam kajian ini menekankan 4 punca utama seperti masalah Kontrak , masalah Design / skop, masalah pengurusan dan masalah tingkah laku; dan 4 kesan utama iaitu tentang Masa, Kos, Produktiviti dan Kualiti, dan berkaitan dengan Organisasi dan repuatasinya. Berdasarkan hasil analisis daripada data yang dikumpul , 4 sebab yang paling penting adalah Kesilapan dalam Projek Rekabentuk , Ketidakjelasan dalam Dokumen Kontrak , Kesilapan dalam Kontrak Terma dan Ketidakwajaran dalam Perancangan dan Penjadualan, manakala kesan yang paling ketara dalam konflik dalaman adalah Tempoh Projek dilewatkan, Keuntungan dikurangkan, dan Kos Projek yang melebihi. Di samping itu, Korelasi Pearson Analisis Pekali dan Rank Askar Lembing Korelasi Analisis telah digunakan untuk menguji kekuatan hubungan antara punca dan kesan konflik dalaman , dan menguji tahap pembandangan antara 3 kategori responden kepada sebab-sebab dan kesan. Dalam keseluruhan , pertalian antara sebab-sebab dan kesan-kesan ditunjukkan sederhana positif dalam hubungan, dan pembandangan di kalangan 3 kategori responden adalah tidak serata.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This chapter includes the research problem background to explain what the background to the problem is; problem statement to describe what exact problems is; research objective which extends to interpret the aims of do the research; and the research questions. The scope of the study, significance of study, operational definition and expected result also include in this chapter to clarify the phenomena of the research.

1.2 PROBLEM BACKGROUND

Nowadays, the complexity of construction project becomes increase in the nature (Shuib et al., 2011). Construction projects typically involve multidisciplinary and variety of organisations with different loyalties and priorities (Ness, 2007). Shuib et al. (2011) stated that construction project itself is intricate and conflicts easily occur among the parties. The construction industry had undergone heaps of time of costly and time-consuming legal conflicts historically. Until today, the conflict problems are still remaining, irresolvable even go beyond months and years, and often occur in construction industry (Shin, 2000).

Conflict is one of the causes that lead to construction project failure. Conflict can cause project delay, project cost overrun, productivity decrease, profit lost or impact in business relationship (Shuib et al., 2011). Shin (2000) stated that sometimes, it is time consuming to manage the conflict than build the project. There is a need to take prominent action to resolve the negative issue in the project. Thus, this research will identify what factor had lead to conflict in construction project and the effects of the conflict to the construction industry.

1.3 PROBLEM STATEMENT

Construction industry is intricate, complex and involves various parties with its life cycle (Leong et al., 2011). According to Shin (2000), conflict becomes ordinary in construction project because it had involved a lot of complex and lengthy process in designing and building.

Conflict management should be implementing during project operations because conflicts in construction projects can be said as commonplace. Conflict management is a mechanism that designed to manage the conflict which will cause negative effect. We need to identify the factors that lead to conflict to resolve the problems. If we find out early, the problems can be cure immediately. We also need to identify the effects of conflict to the project in construction industry, to resolves the issues. However, factors and effects of conflicts in construction project cannot be effectively identified without a proper framework of proven methodology and data. Personal knowledge and experience is need in predicting conflicts in construction projects.

Thus, the research aims to identify on how the conflicts occur in construction projects and what kind of critical impacts of the conflict towards the successful of the project, to provide more knowledge about the conflicts to effectively conduct the conflict management. They also ignore how critical impacts of the conflict towards a construction project. From these two kinds of problem we can see that there is less people actual concern on the conflict issues that occur in the construction industry.

Thus, the research aims to identify on how the conflicts occur in construction projects and what kind of critical impacts the conflict towards the successful of the project, to provide more knowledge about the conflicts to whole parties.

1.4 RESEARCH OBJECTIVES

The research objectives for this study:

i) To investigate the causes of internal conflict in construction industry.

ii) To identify the effects of internal conflict in construction industry.

iii) To examine the relationship between causes and effects of conflict in construction industry.

1.5 RESEARCH QUESTIONS

The research questions for this study:

i) What are the causes of internal conflict in construction industry?

ii) What are the effects of internal conflict in construction industry?

iii) What type of relationship between causes and effects of conflict in construction industry?

1.6 SCOPE OF STUDY

The scope of study for this research is to analyse the causes and effects of conflicts in construction industry. This research respondent will involve the contractor, consultant and developers in the construction industry. 135 construction companies are targeted in this research. The study will use survey questionnaire by mail post to the related construction-based companies. The research will conduct in Kuantan, Pahang construction industry. Type of survey of this study is quantitative survey and the likert scale will be used in the survey questionnaire.

1.7 SIGNIFICANCE OF STUDY

The significance of study is extends to explain why important the research is, and how it benefit to related parties and industry. This finding of study is important in to help identify the real problems that cause the conflict occurs among the stakeholders in construction industry. It is also benefit in find out the critical impact of conflict towards construction project. The information obtained through this study can help in resolve or reduces the occurrence of conflict in construction industry.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION- WHAT IS CONFLICT?

Conflict occurs when there are one party disagree or negatively affect the interest of another party. It involves opposition and different perspective towards others opinion (Wall and Callister, 1995). Deutsch (1973) stressed that conflict is an incompatible activity which occurs when there are interfere or obstruction of one party's actions by another party's behaviour. According to Fink (1968), conflict process will involve more than one party. Thus, it can be said that conflict is the struggle of conflicting ideas between two or more parties. According to Pike (2009), every industry have different view towards the conflict, some of them view conflict as negatively, and think on avoid it as possible. Conflicts can be said as common in nowadays, it may positive and negatively affect the project depending on how to manage it (Cheung and Chuah, 1999). It can be concluded that if the conflict can be manage well, the negative impact to the project is still can under control.

Conflict is inevitable in the project-oriented industry, admittedly, construction projects are no exception. This is due to the involvement of multidisciplinary in the complex nature of construction project (Yusof et al., 2011). In construction project, conflict is unavoidable due to it facing a lot of uncertainties (Whitfield, 1994). According to Shuib et al. (2011), conflict involve the communication problems which may affect the relationship between two or more parties and impact on the effectiveness of the job of the project. Therefore, the construction stakeholders think that it should be

take action immediately to resolve the negative conflict. According to Albogamy et al., one of the causes of project delay is due to the conflict among the parties involved in construction project. When conflict occurs in construction project, it will cause the divergence of opinion among parties involved, debate occurs, and affect the project task and its progression. The construction stakeholders are desire to reduce these kind of problem as soon as possible. This is due to conflict can cause the project delay.

2.2 INTERNAL CONFLICT IN CONSTRUCTION INDUSTRY

A construction project is complicated due to its involved variety of activities and parties (Yang et al., 2009). From the study of Awakul and Ogunlana (2002), there are two types of conflicts that normally occur inside the large construction projects, which are internal conflicts and interface conflicts. Internal conflicts are involved participants inside of the project; whereas interface conflicts are involved the parties outside the project. In this study, it will focus on internal conflict that encountered in the internal stakeholder of the construction project, such as developers, contractors and consultants.

There are various parties that participate in the construction project. The parties involved in the project are called project stakeholders. Project stakeholders can be defined as the individuals or groups who are involved actively in the project which their preferences are affected both positively and negatively and result to project completion success (Project Management Institute, 1996). Normally, the main parties that involved in construction projects are the project developers, contractors and consultants. The interactions and interrelationships between these parties are greatly affected the whole construction project performance, and have the significant responsibility for ensure the project success (Takim, 2009).

Winch (2002) had think that the stakeholder participated in the construction industry can be categorize in two, internal stakeholders and external stakeholders. Internal stakeholders are people who have legally related with the client and embrace the client on the demand side, such as employees, customers, end-users and financiers; and on the supply side like architect, engineers, contractors, trade contractors and

material suppliers. Other hands, external stakeholders are constituted by private and public actors. The examples of private actors are local residents, landowners, environmentalists, and archaeologists, whereas the public actors are from regulatory agencies, and local and national government. The internal stakeholders will largely be in support of the project and external stakeholders may be preference, insignificant (Winch, 2002). According to Olander (2003), the stakeholders depict in Figure 2.1 may be found in a construction project.

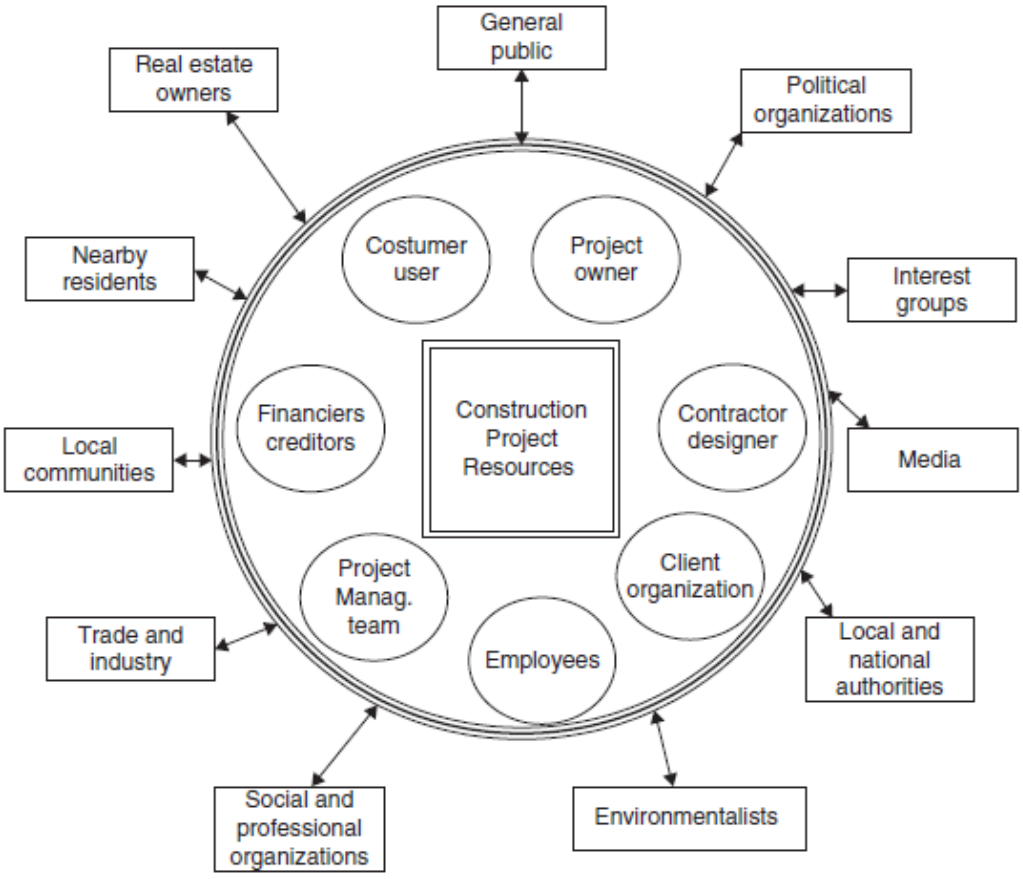


Figure 2.1 Construction project stakeholders.

(*Source*: Adapted from Olander, 2003)

According to Awakul and Ogunlana (2002), internal conflicts occur among the parties involved in the project team of the construction project in which the achievement of solution can be done within the project site. Internal conflicts that commonly involved the parties that directly participate in the project such as project developers,

project consultants, and project contractors. Thus, internal conflict can be said as the conflict among the internal stakeholders of the project. Certain common internal conflicts that occur among the internal stakeholders can be seeing through the construction projects. For example, conflict caused by poor communication amongst project team members, low price mentality in engagement of contractors and designers (Fenn et al., 1997), architect or engineer dissatisfy on the work progress of main contractor, and non-payment to sub-contractors by main contractors (Cheung and Yiu, 2007). These problems had lead to internal conflicts among the internal stakeholders of construction projects.

Internal conflict belongs to disputes, which can make the difficulties in communication, break relationships, and reduce productivity among the internal stakeholders of the project (Shuib et al., 2011). In order to resolve these problems, its need to identify the critical factors that had lead to internal conflict among the project stakeholders, and determine the possible affects that will impact on the performance of construction project.

2.3 CAUSES OF INTERNAL CONFLICT IN CONSTRUCTION INDUSTRY

In order to avoid conflict, the first vital action is we need to take is trace to the root cause of the problems (Mitropoulos and Howell, 2001). Several academic research papers have addressed a lot of variables regarding to the causes that lead to conflict in construction project. Shapiro (2005) stated that typical conflicts arise among project developers, design professionals and contractors are caused by errors and omissions in project design, incomplete scope definition, poor communications between project participants, uncertainty, unrealistic and incompatibility of interests. Another research by Shuib et al. (2011) had identified three large root causes that lead to conflict which are contractual problems, behavioural problems and technical problems. Research by Leong et al. (2011) show that defective in contract, payment dispute, communication problems, the absence of team spirit among the participants, deficient management, supervision and co-ordination efforts on the part of project participants, unrealistically low bid by contractors are the sources that caused conflict in construction industry.

According to Bvumbwe and Thwala (2011), the major causes of disputes in construction project are clients' failure to settle claims brought on by the contractor, use of defective drafted contracts, extension of time claims, variations, delay in complete, poor workmanship, poor communication, use of incomplete designs during tender, under pricing of the tender, mismanagement of funds by contractors, poor planning and budget estimating, poor record keeping and final accounts disagreements. From these previous study, the causes of conflict can be summarize and categorize in four types of groups in this research, such as Contractual problems, Behavioural problems, Technical problems and Management problems.

2.3.1 INTERNAL CONFLICT CAUSES DUE TO CONTRACTUAL PROBLEMS

According to Shapiro (2005), construction contracts can be said as the major source that caused conflicts in construction industry today. Almost 95% of all the claims are closely linked to contractual relationships among the project participants of the construction project. A contract in construction industry can be defined as an agreement that specified the work needed to carry out by the contractors and the required payment for them by the employer. In the contract, it contain the statement about work specified to be done by contractors or sub-contractors, quality of work, time for completion the project task, payment, and responsibilities of parties involved towards the project (O'Reilly, 1999).

Contractual conflict is defined as a dispute which includes interpretation, clarification and construed of the contract (Shuib et. al, 2011). Contractual conflict occurs when there are disagreements or divergence of opinion on the defective contract terms. From the previous studies of Chua et al. (2003); Cheong et al. (2000) and Long et al. (2004), one of the obstacles faced in large construction industry, which will cause claims and dispute if cannot manage well is contractual arrangement. The contractual problems which are commonplace in leading to conflict in most of the construction

project are unclear of contract terms, scope and design changes and payment problems (Shapiro, 2005; Motsa, 2006; Shuib et al., 2011).

2.3.1.1 Ambiguities in Contract Documents

According to Shuib et al. (2011), contract documents are the major causes that lead to disputes. The involvement of variety of parties in a project is administrated by a contract which has the function of clarify the trade-off of construction materials and services with money. Contractual problems caused significant impacts to construction disputes (Diekmann and Girard, 1995). One of the contractual problems is ambiguities in contract documents. Ambiguities in contract documents indicate that there are defective in contracts terms and it clause. Ambiguity means the existing of more than one or double meaning (Doughty, 2004). According to Berry et al. (2003), an ambiguous contract can lead to conflict among parties. Ambiguity in contract documentation may be not specific clearly the activities, responsibilities and risks involved. It can cause errors and risk to the project that may lead to dispute. It is due to the unwillingness of parties to recognise or accept the error or omission in the project (Gyulay, 2003), and blaming the fault on each other.

2.3.1.2 Errors and Omissions in the Contract Terms

The errors and omission in the contract documentation is one of the causes of contractual claims and disputes. According to Lopez et al. (2010), errors can be considered as mistake in interpretations and calculation, and omissions. For example, developers often tend to shift the risk of any defects in the plan and specifications onto contractor, they intend to insert exculpatory clauses which clearly clarify that he or she should not under any circumstances if there are any errors or omissions in the plans and specifications. Therefore, developers are required to specific clearly the exculpatory clauses in the contract. If the exculpatory clauses are omitted in the contract, the risk that may happen can lead to over cost. At the same time, developers and contractor will put blame on each other about the risk happen. The excess cost that used to remedy the

design error is called ancillary costs. Shuib et al. (2011) stated that ancillary costs to solve the problems are always excess the direct cost of the project. Thus, the conflict occurs among the contractor and developers due to they are unwilling to burden the excess cost.

2.3.1.3 Unclear payment terms

According to O'Reilly (1999), a construction contract comprise of the payment that need to pay for the work and the date of the payment need to be made. It also included any additional and reduced payment which has been computed in that project. A clear contract document must include the clauses that specify the payment terms. According to Erickson et al. (2002), many disputes arise due to payment issues, thus it is significant to have a well-drafted payment clauses to state clearly on the process of payment by contractor. Developers will delay the payments if there are ambiguities of the payment statement in contract. Ambiguities of contract in payment terms can cause project encountered lost of profit. This may due to some of the developers refuse to pay for the completed work because there are not mention clearly the proper payments in the contract. Unclear payment terms can lead to dispute and claims.

2.3.2 INTERNAL CONFLICT CAUSES DUE TO DESIGN/ SCOPE RELATED PROBLEMS

2.3.2.1 Scope changes/ changes order by designer or contractor

Nowadays, change is a main challenge in the construction industry (Charkhakan and Heravi, 2012). The Project Management Institute (2008) defined the project scope as the work that need to be performed to deliver a unique product, service, or result. Kuprenas and Nasr (2003), define the scope of a project as a basis for the design. According to Maddaloni (2011), project scope will be vary depends on the project types. It is developed in the early stage of the projects and will undergo any rectify and updates throughout the project lifecycle. However, changes are inevitable and it is better

that if all parties are recognize that fact as soon as well (Rubin, 1999). Cheung et al. (2010) agreed that on the design changes are the major root of construction disputes. Changes in scope or design changes give significant impacts to the entire project participants. It can cause loss profit to contractors, delay operations and loss of revenues to the project developers due to the over budget from the accumulate impacts (Bonhomme-Delprato, 2008). According to Sinha and Wayal (2008), scope changes are caused by additions, deletions, omissions, or changes in the work that need to perform. According to Al-Dubaisi (2000), changes in scope are the major factors lead to claims and disputes. This is due to all the specific work had agreed upon and list in the contract. The examples of scope changes are change in contract price and term, increase in building area, an increase or decrease in the number of floors. The contractors intend to avoid the extra cost, and will look for reduce the cost (Al –Dubaisi, 2000). Therefore, they may make some changes in scope without inform to developers. This will lead to conflict between developers and contractor due to the dissatisfaction of developers on the intention of contractors in changing scope without discuss with them.

2.3.2.2 Error and omission in project design

Shuib et al. (2011) stated that the set of drawings plan will not perfect as without any errors. It is impossible 100% error free in the design (Al-Dubaisi, 2000). The errors can be incorrect reading and measurement and missing of particular details. According to Sinha and Wayal (2008), the errors are caused by insufficient knowledge, carelessness and negligence, and intent which will exist anytime in project life cycles. Errors and omissions can be identified during construction and also during the design and advertising phases. Once the project starts, it will costly to do correction if it is late to identify the design errors. Errors by design consultant may cause difficult to achieve peer's acceptance level (Shuib et al., 2011). When the errors and omission in design are not acceptable by others stakeholders like developers and contractor, the divergence of opinion will arise. Blaming to design consultant appear and conflict occurs. Design consultants may impute the fault to others aspect or parties. Parties will not recognize or accept their responsibilities when they are make mistake, and this can lead to claims and disputes (Gyulay, 2003).

2.3.2.3 Design Change due to Variations of Developers

Developer is one of the key internal stakeholder involve in the construction project. Developer is defined as buyer of construction services who decide the construction, making payment, manipulate the contract documents in design and construction stages and select the contractors they want. Carr (2000) stated that major developer have the authority in insert and enforce adequate contract clause. This shows that their significant role and power had significant impacts to the construction project. One of the impacts is on the design change due to their variations. According to Keane et al. (2010), variation is the alteration or change in a concerted or well-defined scope or plan of works. Variation of owner may due to financial problems, stubborn of owner and inappropriate objectives. Variation can cause cost-related and quality related effects (Keane et al., 2010). Developers who faced financial problems may want to change the project schedule and its design to minimize the cost. For example, they tend to change the good quality of materials to low cost and inferior quality materials. However, this can cause the work quality being affected. The risk may appear due to low quality. Contractor and designer may disagree on the design change requirement of developers due to the possible risk. Thus, the conflict appears due to the dispute caused by failure to achieve consistent idea (Motsa, 2006).

2.3.2.4 Differing Site Conditions

According to Copley (2002), disputes arise due to emerge of large amounts of unanticipated rock problems or bad subsurface of conditions during the excavation process. Unanticipated of subsurface conditions during construction often lead to litigious and acute conflict between project developers and contractors (Ahlers, 2012). Differing site conditions indicate when the physical site conditions are different with what had shown in the contract or agreed upon plans (Diekmann et al., 1985). When the site conditions are awful and no as well as the conditions indicated in the contract document, the extra work are needed such as find another contractor to remove the rock in site conditions. This can cause extra in cost and time, and may lead to dissatisfaction of developers and contractors. The imputation of fault to each other occurs due to they

do not recognizes or accept their responsibilities (Gyulay, 2003). Thus, it had lead to conflict among developers and contractors.

2.3.3 INTERNAL CONFLICT CAUSES DUE TO MANAGEMENT PROBLEMS

2.3.3.1 Poor contract management

Ayudhya (2011) stressed that a construction contract should consists of risk allocation among the project developers, contractor and consultant. Improper risk allocation in contract will lead to disputes among the contracting parties and may drag in to court settlement. The study of Patience (2008) show that one of the major construction cost factor that all developers, consultants and contractors agreed is poor contract management. Most of the projects are awarded to the lowest bidder (Mansfiled et al. 1994). However, in order to successfully bid the projects, the bidders (contractor) must professional in written the contract. Poor management of contract can lead by lack of management skills, less concern on contract plans, cost control, and site and resources management (Patience, 2008). Poor contract management may lead to time overrun. If the projects delay, it will result in negative impacts such as dispute between contractors and developers, over costs, loss of productivity and profit and contract break off (Mohammed and Isah, 2012).

2.3.3.2 Lack of Quality Assurance/ Quality Control

Quality assurance or quality control is also a key factor of internal conflict in construction site. Quality assurance is defined as what we had plan and organized actions necessary to assuring that a product or service will achieve the requirement of quality (Low, 1992). According to Gunaydin and Arditi (1997), quality control refers to the related activities that need to implement in quality assurance program. Effective quality control can avoid conflict and dispute which caused by changes, mistakes and omission. Construction quality assurance or quality control purposely to assure the specific project

activities are performed consistent with the contract terms, or standard regulations (Khan et al., 2008). The lack of quality assurance can caused quality deviation in construction industry such as the on-site construction activities (concrete, piping, welding, roofing, painting and electrical work) faced trouble quality problems; and contract claims due to design error (Ledbetter, 1983; Diekmann and Nelson, 1985 and Burati et al., 1992). According to PMI (2000) and Khan et al. (2008), the project fail to meet the quality requirements will confront with the serious impact for project stakeholders. For example, the differing site conditions due to lack of inspection can lead to conflict among contractors and developers. Thus, effective quality control can avoid conflict and dispute which caused by changes, mistakes and omission (Juran, 1998; Gunaydin and Arditi, 1997).

2.3.3.3 Improper Planning and Scheduling

Mohamed and Isah (2012) stated that projects delay can result in dispute between contractors and developers. Based on the study of Chan and Kumaraswamy (1997), project consultants think that most significant factor that lead to project time overrun are facing problems of cash flow during construction stage, concurrent work caused time overlap, and the slow response from developers. Project developers think that the major factors of time overrun are shortage of labour and poor labour skills. These two project stakeholders opinion can proof that there are improper planning and scheduling in the project work. Construction project planning is identifying what task need to be do, how it can be done, by who and how much will the costs are. Scheduling is determining when the project should start, which come up one planning complete (Marco, 2011). Improper planning and scheduling can result in over costs in construction planning. Project time and costs overrun may lead to conflict among the developers, consultants and contractors. Thus, contractors should be allocate and utilize the resources efficiently (Patience, 2008), by proper planning and scheduling.

2.3.3.4 Deficient management, supervision and co-ordination efforts on the part of project participants

Construction project had involved various of stakeholders. It is important for a project to possess an efficiency management, supervision and coordination effort on the project parties. When the project work is not coordinate, manage and supervise properly, the conflict and dispute will arise (Rimmington, 2002). Deficient management or coordination can be seen through the allocation of project parties into a specific works. Deficient coordination of project parties can be inadequate allocate the suitable amount of labours in the specific work, which can lead to labor shortage. Labor shortage may required to resolve by adjustment of the labor working time, resulting in compress the work schedule to solve the labor shortage problems. However, scheduling compress will interfere the normal use of resources which will leads to labor productivity become lower, and resulting in dispute between developers and contractors. (Alagarsamy, 2011)

2.3.3.5 Concurrent of Design and Construction

Concurrent design and construction has been lauded for streamlining projects in terms of time. However, this approach may actually make the projects become more uncertain and complex. One of the risk that have been identified with concurrent design and construction are project may undergo unanticipated errors and changes and may produce subsequent impacts on project performance (Lee et al, 2005). According to Anumba et al (1997), concurrent design and construction process requires higher restraint in the production, manipulation and design information communication. It has involved the combination or collaboration with others particularities with different roles, different level of training and experience. Due to the different participated expert, there may have communication issues encountered during the concurrency in design and construction project, such as conflict. For example, some of them may lack of specific knowledge will make error since they need to manage more than one project simultaneously. They may confuse or mix up the several projects, like error and omission in the project design or documents. This may lead to dissatisfaction of the developers and conflict occurs.

2.3.4 INTERNAL CONFLICT CAUSES DUE TO BEHAVIORAL PROBLEMS

2.3.4.1 Poor communication among parties

Construction industry can be said as complex due to it involved various parties with different of interests and knowledge. The business relations and arguments which related to contractual or social had increased since there is an increase in the number of project participants with different culture background. This had lead to dispute in construction (Cakmak et al., 2013; Kumaraswamy and Yogeswaran, 1998). Among so many professionals, each may have different point of view, interests or aim to their profession; however, their main aim is to complete the project within the given plan and specifications. Conflict between project stakeholders arise due to there are inconsistent of point of view or disagreement of ideas among them. Poor communication can lead to misunderstanding among project participants. For example, in the stage of organizational design, it is important to have good communication and sharing understanding due to every activities are interdependencies to each other. Conflict occurs when there are misunderstandings, prior beliefs or assumptions or failure in communication between developers and contractors (Gardiner and Simmons, 1998).

2.3.4.2 Contractor over Claim Costs for Progress Acceleration

Acceleration is shorter the project duration than as planned for an unpaid contract works to reduce the time extension problems by contractor or others. (Maritz and Schutte, n. d). Contractor will claim cost for any of the progress of acceleration. The contract is the source of information for any claim between the project parties since the contract contained the specific requirements for the claim. However, there are some of the unscrupulous contractors aimed in over claim the acceleration cost. According to Jaafar et al (2011), fraud and faith is one of the causes of disputes. Construction conflict arise is due to the people involved have their own needs. Contractor's needs are usually money or profit related. (Camicheal, 2002). Thus, they intend to seize the chance to take benefit from over claim the acceleration cost. Their fraud action is the behavioural problems which may lead to dispute with the project developers, and it may lead to damage in relationship.

2.3.4.3 Clients Order Extra without Providing Proper Cost Reimbursement

Client is one of the sources in construction disputes (Cakmak, P. and Cakmak, E., 2013). There are always change orders in construction project by the client like additions, deletions, and omissions scope or design (Love et al, 2008). However, some of the clients have made change in project scope of design by order extra without providing proper cost reimbursement. The payment problems had lead to construction disputes (Cushman and Myers, 1999). The clients are obligate to make payments consistent with the contract clauses regarding to payments. If the clients refuse to make payment or reimburse the cost for extra work, there is a possibility there will be disputes (Chua, 2012).

2.3.4.4 Delay in Progress Payments by Developers

In the opinion of Loosemore (2000), construction works invest large amounts of money and it is 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 developers since there is inadequate cash flow to support construction expenses of (Chua, 2012). This may lead to dissatisfaction of the contractor since it may cause the project duration prolong and lead to project cost overruns. Thus, conflict may arise between developers and contractors due to this tendency.

2.3.4.5 The absence of "team spirit" among the participants

Due to there are multidisciplinary involved in the construction project, especially developers, consultants and contractors; there must be cooperation among them in order to achieve the project goals. They can be said as work in a "team" since they all work collaboratively to reach the objective in particular construction project. However, previous studies show that lack of "team spirit" among the project participants can lead to conflict (Bristow and Vasilopoulos, 1995; Fenn et al., 2007).

Lack of team spirit in the project team can lead to conflict among contracting parties. Dispute may arise if the differences among the parties are not properly managed or eliminate speedily. It can lead to delay in agenda, stress and damage in relationships (Chan, 1997; Cheung and Suen, 2002; Vorster, 1993; Chan, 2004). For example, UAE construction industry had used the hierarchy of roles in managing the project team based on level of authority. This had lead to separation among team members. It cause mistrust within them, low productivity and lack of synergy due to clash in authority. This situation had lead to conflicts and there was nobody resolved the conflicts (Lohiya, 2000).

2.3.4.6 Negligence

Negligence of the contractor can be the sources of dispute.From the study of Vee and Skitmore (2003), there are 67% of the respondents had witnessed or experienced negligence in the industry. Mostly, the construction projects undergo change due to errors and omission in the project design or contract documents. A perfect design work is difficult to achieve due to it requires a great deal of experience to be done well (Herren and Cooper, 2000). Therefore, some of the contractors or designer which is lack of specific experience may be negligence in manage the project design or document. It can lead to project error and omission, in which can resulted in the impacts of additional costs to complete the work (Cushman and Loulakis, 2001). The extra cost for project completion may lead to dissatisfaction of the clients and arise of the conflict.

2.4 EFFECTS OF INTERNAL CONFLICTS IN CONSTRUCTION INDUSTRY

Conflict in project caused postpone in the execution duration and work suspension. It will lead to high expense in finance, individual, time, and opportunity costs and destroy the relationships among projects stakeholders (Mahato and Ogunlana, 2011). The effects caused by internal conflict in construction industry can be categorised as 4 groups, such as time-related effects, cost-related effects, productivity and others effects.

2.4.1 TIME RELATED EFFECTS CAUSED BY INTERNAL CONFLICTS

2.4.1.1Interruption in work progress

According to Archaya, Young and Hae (2006), project conflict can lead to delay in work implementation, work time break off and work suspend from time to time. For instance, the dispute among consultant and contractors on the risk due to ambiguity of contract or payment problems can lead to work progress suspend. This is resulted by there are extra time required in resolving the claims and risk. The extra time is much more compared to the specific project task duration (Chua, 2004). The work may just be able to continue after the settlement of the risk and claims.

2.4.1.2 Extra Time for Rework and Demolition

Rework is defined as "the unnecessary effort of redoing a process or an activity that was incorrectly implemented in the first time" (Love and Edwards, 2004). From the study of the Oyewobi and Ogunsemi (2010), the causes lead to rework in construction is lack of harmonious relationship among project participants and conflicting opinions between participants. Conflict between project participants can lead to degradation in productive working relationships and consume time and money (Chua, 2012). If the working relationships become worst, the project parties may tend to work in casualness. Meanwhile, the quality of work may be affected. It can lead to rework or demolition of the worst quality of work. In short, it is required additional time for construction rework.

2.4.1.3 Delay in Project duration

Samantha (2005) stated that delay in construction project is the project not completed in the duration as specified in the contract.

> "…There are many important causes of delay related to owner involvement, contractor performance, and the early planning and design of

> the project. Important causes are financial problems, changes in the design and scope, delay in making decisions and approvals by owner, difficulties in obtaining work permit, and coordination and communication problems…"
>
> Assaf and Al-Hejji (2006)

From the study of Assaf and Al-Hejji (2006), it stated that one of the causes lead to project delay is communication problems. Communications problems can be said as failure in communicate among parties. Conflict occurs when there is failure in communication between project stakeholders (Gardiner and Simmons, 1998). According to Chua (2004), disputes resolution always spends a lot of time of construction parties than specific time. For example, the process of risk settlement or legal claim issue among contractor and consultants or developers may consume much more time, which is often exceeds the project specific time. Based on Mohsin (2012) study, he shows that claims may lead to effects of delay in payment, time extension and work become suspend. The data from his research show that time extension caused by claims is 75%, work suspension is 15%, whereas 10% is payment delay. Claim can be defined as a disagreement includes in extension of conflict which can compensate the loss (Archaya et al., 2006).

2.4.2 COST RELATED EFFECTS CAUSED BY INTERNAL CONFLICTS

2.4.2.1 Additional Expense in Managerial and Administration

Due to project delay resulted by claims or risk settlement, the contractor may be speed up all the construction work to make sure that whole the works can complete in the specific time. This is called acceleration. According to Samantha (2005), acceleration is caused by delay. A contractor will accelerate the work than what he or she had planned originally in the schedule. Acceleration may lead to developer denial on the time extensions, and lead to claims on breach of contract, and also will pay additional costs to contractor for increase the workload in available time. The additional

costs can be rework costs, additional worker's hiring costs, overtime costs, costs for speed up material delivery, additional supervision and also equipment (Samantha, 2005). Therefore, conflict had led to project delay, and delay caused the acceleration in construction project. Acceleration result in additional expense in managerial and administration or overhead costs in order to ensure the project complete in a given duration.

2.4.2.2 Project cost overrun

The construction conflict can caused contractor confront the problems of additional expenses in labor costs, cost in extension time for equipment usage, additional construction finance cost, overhead cost, and loss of profit (Rossi, 1991; Chua, 2004). As mentioned as above, the project which undergoes delay caused by claims and dispute may require acceleration of work. The acceleration is speed up the work in a specific time. However, most of the project will not able complete in that specific time. This will lead to project cost overrun resulted by project time extension. It can be said that delays and cost overruns close relationship, since delay in project either acceleration or extension can result in additional cost (Ramanathan et al., 2012).

2.4.2.3 Rework and Demolition Cost for Resources

Lack of harmonious relationship among project participants and conflicting opinions between participants can lead to rework in construction (Oyewobi and Ogunsemi, 2010). Palaneeswaran (n.d) discuss that rework required additional costs for covered, additional materials, additional labor and related extension of supervisor manpower. Once the conflict lead to poor quality in project work, rework and demolition are required as a remedy. Thus, the construction project may undergo higher extra costs since the demolition of poor quality product and the reworks are necessary to achieve the safety requirement and client's goal.

2.4.3 PRODUCTIVITY AND QUALITY EFFECTS CAUSED BY INTERNAL CONFLICTS

2.4.3.1 Reduce work efficiency

Conflict occur during construction work can lead to work disruption. Work disruption can lead to low work efficiency among the parties. Disruption can be defined as loss of productivity and contractors normal working ways are being interrupted and disturbed, which will lead to work become lower effectiveness (Nelson, 2011). When there are conflicts among parties, it will cause project duration delay. In order to complete the project in specific time, the contractors may accelerate the project works. Normally construction project duration must be reduced and work must be accelerated to ensure the project can complete on time or earlier than originally scheduled. Acceleration of works can lead to absenteeism and low productivity of labor due to stress (Love et al., 2012). One of the traditional methods for acceleration is overtime. Overtime means increase the labor working time to achieve schedule. However, overtime can affect the labor productivity (Hanna et al., 2005). When there is low productivity among labors, the work efficiency will become reduced.

2.4.3.2 Quality Degradation

The study of Jha and Iyer (2006) discuss that the conflict among team members and conflicts between project manager and top management are considered as the impacts of the work quality degradation. Achievement of project quality is a team effort. For example, if a team of project members having conflicting in opinions and not working in unison, it may lead to adverse effects on the quality of a construction project. Poor quality of construction project may lead to extra cost and time to rework.

2.4.4 ORGANIZATION AND ITS REPUTATION-RELATED EFFECTS CAUSED BY INTERNAL CONFLICTS

2.4.4.1 Loss of professional reputation

Dispute arise when there are unwillingness of parties to recognise or accept the error or omission in the project also will lead to developers dissatisfied (Gyulay, 2003). The contractors and developers will impute the faults and shift the risk to each others. The dispute can lead to dissatisfied of developers and they may loss of confidence and break down the work with contractors. It can lead to loss of client, loss of profit, and the loss of reputation. Partnering is important in construction project to improve the relationships among contracting parties to achieve the project goals (Black et al., Wong and Cheung, 2003). Successful partnering is to establish trust which is difficult to achieve in the project (Hawke, 1994). Therefore, if the dispute and claims lead to mistrust of the developers, the partnering can be said as failure in construction project. The construction company is loss of reputation without trustworthy of client or developers and failure in partnering.

2.4.4.2 Loss of profitability

Mohsin (2012) stated that claims can cause payment delay, project time prolonged and work suspension. Claim is defined as a disagreement includes in extension of conflict which can compensate the loss (Archaya et al., 2006). The output of claim is money and/or time that one party required from another party in the construction contract procedure (Mohsin, 2012). Claims can cause loss of profit to a construction project. For instance, there are claims arise among developers and contractors due to the delay of project delivery. The developers will engage claim towards contractors based on the contract, due to they cannot complete the work in a given time. The contractors encountered the problems of compensation to the extra time, and also the additional overhead costs for the additional works. These had caused they faced the problems of loss profit in the project due to that claims.

2.4.4.3 Loss of professional relations and business viability

Conflict that common occurs in the construction industry is caused by poor management and contractual problems. Both of these are close related to the contractors. During construction stages, contractors and consultant that had poor in planning, error in design due to mistake or insufficient experience can caused developers dissatisfy on their work performance. Sometimes, it may require rework and demolition. Rework result in project time prolonged and over costs in construction project (Chan and Kumaraswamy, 1997; Love, 2001 and Love 2002). Project cost and time overrun can lead to dissatisfaction of developers. They may loss of confidence on the performance of contractors or consultants. Other than that, the unwillingness of parties to recognise or accept the error or omission in the project also will lead to developers dissatisfied (Gyulay, 2003). Their attitude can be said as irresponsible. Thus, they may not collaborate or partnering with them again in the next time of project.

2.4.4.4 Diminution of respect among parties

Conflict occurs in construction industry may lead to legal claims and risk settlement if it is not well manage. Yousefi (2009) states that the parties involved in the construction industry are usually bound contractually. Thus, the contract is the essential document used in the submission and evaluation of claims. If there is failure to claim the extra cost based on the contract, there will be a litigation or mediation between the conflicts parties. However, there may have diminution of respect among conflicting parties if the mediation is failure, and they will tend to no collaboration in the future.

2.4.4.5 Deterioration of relationship and may lead to break down in cooperation

According to Gardiner and Simmons (1992), conflict and dispute are the main factors that impact on the relationships among professionals within the construction industry. It can influence the relationship quality among project parties by mistrust, dissatisfy and affect on parties involvement (Roberts et al., 2003). Damage in business

relationships and reputations can be said as intangible costs of consume time by executive personal and business opportunities (Chern, 2008). When there are intensive conflict between contractors and developers, the relationship among them will corrupt. The developers may break down their cooperation with the contractors due to they cannot reach a same consensus on that project. Thus, it is important to resolve quickly if found the disagreement in the construction project to prevent dispute develop (Wright, 2004).

2.5 CORRELATION FRAMEWORK

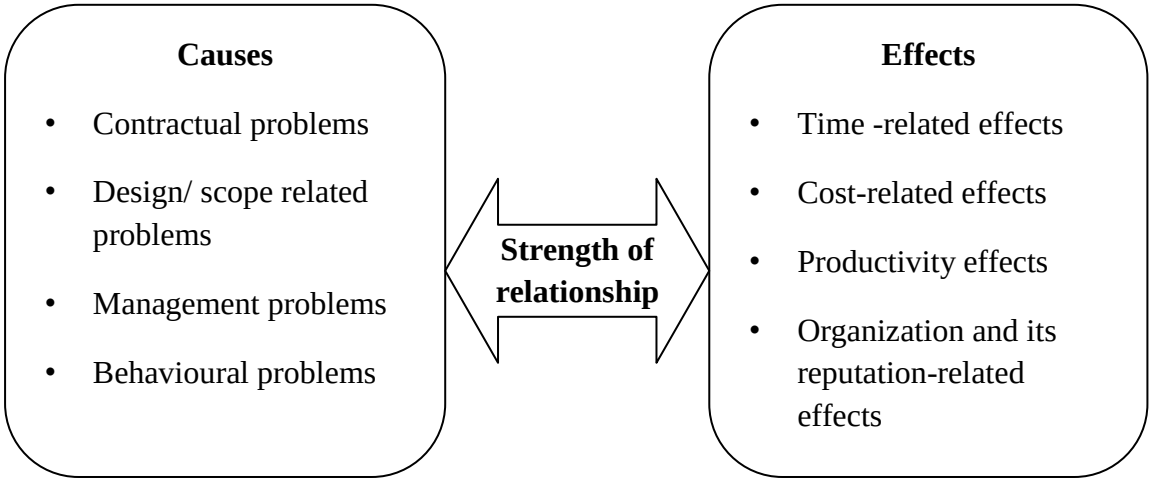


Figure 2.2 Correlation Framework of Causes and Effects of Internal Conflict in Construction Industry.

Figure 2.2 shows the correlation framework of the relationship between causes and effects of internal conflict in construction industry. The correlation framework examines the variables in a situation and how their relationships can be built up. The variable of causes had categorized into 4 major groups, which are contractual problems, design/ scope related problems, management problems and behavioral problems. The variable of effects had also been categorized into 4 major groups such as Time related effects, Cost related effects, Productivity and quality effects, and Organization and its reputation-related effects. The research framework shows the strength of the relationship between causes and effects of internal conflict in construction industry,

which is aim to determine how strong the relationship between the causes and effects of internal conflict.

2.6 SUMMARY

In conclusion, this research had overview the possible causes and effects of conflict in construction industry. The causes that result in conflict among internal stakeholders can be categorized in 4 major groups such as contractual problems, design/ scope related problems, management problems and behavioural problems. Contractual problems such as ambiguity in contract document, unclear payment terms and errors or omission of contract terms can result in dispute among developers and contractor. Design or scope change problems caused by contractors, developers and consultants can be design change, error and omission in project design and change in scope and so on. Insufficient management also can lead to dispute and claims among them, such as management in contract, quality, project parties and etc. Behavioral problem like poor communication among stakeholders is the common and major factors in construction conflict. On the other hand, conflict result in 4 major effects which are time-related effects, cost-related effects, productivity effects, others effects. Time-related effect in which the construction project will face the project duration prolonged and work interruption. Costs overrun and additional overhead costs are the consequences of dispute. Dispute will lead to productivity low and lack of efficiency among parties involved. Organization and its reputation-related effects such as reputation and business relation also will affect by conflict.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

According to Kumar (2008), research methodology is a path to solve the research question systematically. This chapter will present the method used in collecting and analysing the data of the research. The data collection question had based on the problem statement and research objectives, which is to identify the causes, effects of conflict in construction industry, and also both of the relationship. This section includes the research design, research method, data collection technique, development of measurement, and data analysis method.

3.2 RESEARCH DESIGN

According to Rajasekar et al. (2006), research design builds up the basis for the entire research. It will make the task performed easily and systematically. In this research, problem background and problem statement is determined. They clarified on what had actually happened to enforce in doing this research, which is what kind of problems had lead to investigate the study of conflict in construction industry. The research objectives, research questions and hypotheses had also identified in this

research. They cover the causes, effects and the relationship between these two variables of conflict in construction industry.

The research also consists of literature review, which is important to find out the related and appropriate information regarding to research title to assist the study through journal or others relevant information to support the ideas. In this part, the definition of conflict, the types of conflict, the causes and effect of internal conflict will be covered. The next step is to identify the target respondent and data collection method of the research. The target research respondents are the Developers, Consultants and Contractors of the construction companies in the Kuantan, Pahang, which the numbers will then be determined in population and sampling. The quantitative method approaches used to collect the data is survey questionnaire. The survey questionnaire will be distributed to the respondents by e-mailing and mail posting.

The collected data had been analysed using Reliability Analysis, Normality Analysis, and Correlation Analysis (Pearson Correlation Coefficient Analysis and Spearman's Rank Correlation Analysis). After that, the discussion had been made based on the data collected result. And the last step is come out the conclusion and recommendation regarding to the research. The design framework of this research is shown as Figure 3.1.

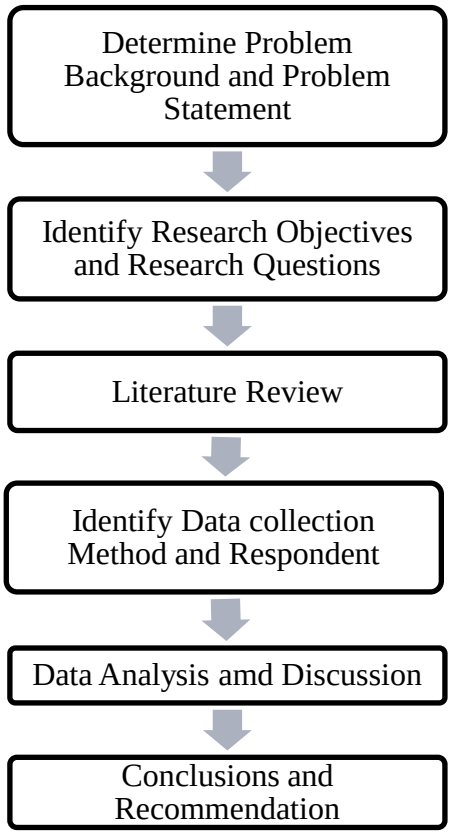


Figure 3.1 Research Design framework

3.3 RESEARCH METHOD

Research methods and techniques are defined as the way that researcher used in performed their research operations (Kumar, 2008). The method that will be used in this research is quantitative research. Quantitative research is aim to examine the relationship between causes and effects. The quantitative research designs can be categorized in two, descriptive and experimental. In descriptive research, the subjects are usually measured once (Hopkins, 2000). Descriptive research includes surveys and fact-finding enquiries of different kinds (Kumar, 2008; Kothari, 2008). Hopkins (2000) stressed that in order to accurate predict the relationship between variables, a descriptive study is usually require a sample of hundreds or even thousands subjects to investigate. The result is less likely to be biased if there are high participation rate in a selected sample form population.

Descriptive research design consists of 3 basic types, which are survey method, observational method and case study method. In this research, the survey method will be used. Survey method can be classified to face-to-face interview, telephone interview, internet questionnaire and mail questionnaire. This research will use online survey questionnaire and mail-post questionnaire to collect the data from respondents. Besides this, this research had involved two major data collection method, primary data and secondary data. Primary data collection method is the used of questionnaire, which had been mentioned detail as above. Secondary data collection method had been used during searching the related information for the literature review of the internal conflict in construction industry. Such the related information is acquired from the previous research data, articles, journal from internet, website document and books.

3.4 POPULATION AND SAMPLING

According to Bartlett et al (2001), common objective of performing the survey research is to collect data which represent a population. The researcher uses data collected from the survey to generalize their findings from a drawn sample of a population, within the limits of random error. In order to obtain a sample, it must be defined the target population first. The target population is the respondents that the survey applies to answer the question for the research. Sampling is defined as a representative subset of the target population. There are two major types of sampling methods, Probabilistic Sampling methods and Non-Probabilistic Sampling method (Kitchenham and Pfleeger, 2002). A probabilistic sample data is one in which the chance of selection of each item in the population is known before the sample is picked. Non-probabilistic sample is one in which the judgment of the experimenter, the method in which the data are collected or other factors could affect the results of the sample. It can be classified into Judgment samples, voluntary samples and convenience samples. In this research, the sampling method to be used is judgment sampling of non-probabilistic sampling.

In order to determine the sample size, there are three criteria need to consider and specified in determining the appropriate sample size which includes level of

precision or margin of error, the level of confidence or risk, and the degree of variability in the attributes being measured ((Miaoulis and Michener, 1976; Israel, 2009). According to Israel (1992), level of precision range is often expressed in percentage points, (e.g., ±5 percent). In case of the degree of variability, due to the proportion of .5 (50%) indicates the maximum variability in a population, it is often used in determining a more conservative sample size. Therefore, in this research, the level of precision used is ±5 %, level of confidence is 95%, and the degree of variability used will be .5 (50%).

Slovin's formula recommended by Ghozali (2006) will be used to determine the sample size in this research:

$$n = \frac{N}{1 + N\ (e)^2}$$

Note: n = Sample Size

N= Population Size

e = Margin of error (Level of Precision/ Sampling Error)

The targeted population for this research is Developers, Consultants and Contractors from the construction companies around Kuantan, Pahang area. 134 of the companies will be chosen as population in this research. The sample size of 101 will be drawn from 134 populations by using Slovin's formula. The calculation with the desired confidence level is 95% is shown as follow:

$$n = \frac{N}{1 + N\ (e)^2}$$

$$n = \frac{134}{1 + 134\ (0.05)^2}$$

$$n = 100.37 \approx 101$$

Another way to determine sample size can be rely on published tables which provide the sample size for a given set of criteria. Table 3.1 can provide a useful guide for determining the sample size, in which attributes being measured are distributed normally or nearly so (Israel, 1992).

Table 3.1 Sample size for ±5%, ±7% and ±10% Precision Levels Where Confidence Level is 95% and P=.5.

Size of Population	Sample Size (n) for Precision (e) of:		
	±5%	±7%	±10%
100	81	67	51
125	96	78	56
150	110	86	61
175	122	94	64
200	134	101	67
225	144	107	70
250	154	112	72
275	163	117	74
300	172	121	76
325	180	125	77
350	187	129	78
375	194	132	80
400	201	135	81
425	207	138	82
450	212	140	82

Source: Israel (1992)

3.5 DATA COLLECTION TECHNIQUE

This research will use survey questionnaire to collect the data from respondents. The survey questionnaire will be distributed to Developers, Consultants and Contractors (G7) of the construction-based company in the Kuantan, Pahang area. The questionnaire had been distributed by mail posting, and online survey. The respondents will be given a specific duration to complete the questionnaire. Survey questionnaire is most common

to use in performing the research. Survey questionnaire has benefit to be used in which it had been extensively tested at the time of first use. It is good indicators to the researchers and they are fairly confident on their concepts of interests. Moreover, it is least cost consuming compared to the others research method (Hyman et. al, 2006).

3.6 DEVELOPMENT OF MEASURE: DESIGN OF QUESTIONNAIRE

The questionnaire design for this research used is closed-end question. Close-ended questions limit the respondent to the set of alternatives being offered, while open-ended questions allow the respondent to express an opinion without being influenced by the researcher (Foddy, 1993). The open-ended questions will elicit qualitative data, while closed-ended questions will elicit quantitative data.

The questionnaire of this research is designed based on the research objectives and research questions, which consists of 3 sections:

i. Section A: General information of respondents.

   The questions related to demography will be asking, such as age, gender, position in the company, types of organization, number of year of working experience, and the highest level of education.

ii. Section B: Causes lead to conflict in construction industry.

   This section consists of questions related to the causes that lead to internal conflict in construction industry. The causes will be categorized into four major groups, which are contractual problems, design/scope related problems, management problems and behavioural problems.

iii. Section C: Effects caused by conflict in construction industry.

   This section consists of question related to the effects of internal conflict in construction industry. The effects will be categorized into four major groups, which are time, cost, productivity and quality, and organization and its reputation related effects.

Measurement of scale used in this research is nominal scale in section 1 of the questionnaire, and interval scale in section 2 and 3. Nominal scale will classifies data into mutually exclusive (non-overlapping), exhausting categories in which no order or ranking can be imposed on the data. It deals with qualitative differences. Interval scale ranks data, and precise differences between units of measure do exist; however, it does not have an absolute zero point. The interval scale possesses the properties of the ordinal scale and has equal intervals between adjacent units. The rating scale will be used in the section 2 and 3 is Likert scale. According to Vogt (1999), a Likert scale involves a series of statements that respondents may choose from in order to rate their responses to evaluative questions. The five-point scale of "Extremely important", "Important", "Moderately important", "Somewhat important" and "Not very important" will be used in the questionnaire for interval scale part.

3.7 DATA ANALYSIS METHOD

Before the distribution of the questionnaire, it will be tested the reliability through Reliability analysis by using Statistic Package for Social Sciences (SPSS). . Reliability refers to the extent to which a scale procedures consistent results if repeated measurement are made. In order to measure the scale reliability, Cronbach's Alpha coefficient will be used. According to Brown (2002), Cronbach alpha is used to estimate the proportion of variance that is systematic or consistent in a set of test scores. The Cronbach's Alpha coefficient range can hold a value of 0 to 1. The closer the Cronbach's Alpha coefficient value gets to 1, the higher is the internal consistency reliability (Sekaran, 2003, and Gliem, J and Gliem, S. 2003).

Normality test will be used to determine whether distribution of data population has normal distribution or not. There are two ways to in determining the normality test, which are graph analysis and statistic analysis. Graph analysis is looking the histogram chart, normal Q-Q plot, box-plot and stem-and-leaf plot to check the normality of the data. Statistic analysis can be done by looking at the value of kurtosis and skewness values. The value of z statistics for each of kurtosis and skewness compared with the z table. If the count value of z <z table it can be said that the data have the normal

distribution. The most common normality test software in Statistic analysis is Shapiro-Wilk (SW) test, Kolmogorov-Smirnov (KS) test, Anderson-Darling (AD) test and Lilliefors (LF) test.

Other than that, the descriptive statistic analysis method will also be used in this research. Descriptive statistic summarizes the data using measures of central tendency, such as the mean, median, variance, standard deviation and frequency. This analysis method will be used to analyses the data of Section A in questionnaire, which is the demography of the respondents. Mean is the average of all the data values. Median is the value in the middle when the data items are arranged in ascending order. Variance is a measure of variability that utilizes all the data. Standard deviation measured in the same units as the data, making it more easily interpreted than the variance.

The Regression analysis method had not been used in this research data analysis, since it is used to identify the relationship between one dependent variable with one or more independent variables; and it is possible to predict the value of dependent variable from the values of independent variables (Greasley, 2008). However, Correlation Analysis had been used in this research since it is aim to examine the direction and strength of relationship between both variables of causes and effects, to determine whether or not it is statistically significant; which is unlikely to have occurred by chance. In order to test the relationship between causes and effects of conflict in construction industry, the Pearson Correlation Coefficient Analysis will be used in this research. Pearson Correlation Coefficient Analysis is used to identify and test the strength of a relationship between two sets of data. Two set of data, causes and effects will be tested to check whether both of these variables has related to each other or not. If the ranks of both variables increase together, it can be said as a positive correlation, while if the ranks of one variable increase as the ranks of the other variable decrease, it will show negative correlation. A correlation of +1 or -1 will arise if the relationship between the two variables is exactly linear. A correlation close to zero means there is no linear relationship between the ranks (Altman, 1991).

Spearman Rank Correlation Analysis used to identify and examine the strength of a linear relationship between two sets of data. If r_s = 1 or -1, means that there is a

perfectly linear relationship between both set of variables. Other than that, r_s close to zero means that there is no correlation between both variables. The positive correlation made both variables increase corresponding; whereas negative correlation of rank show one variable goes up and one goes down. In this research, the spearman rank is used to test the degree of agreement between the three categories of the respondents (Developers, Contractors and Consultants) as to the causes and effects of conflict. The correlation coefficient which shows higher value indicates that there is a high degree of agreement between the 3 categories of respondents (Sambasivan and Yau, 2006)

Other than that, the ranking of mean had been used in ranking the causes and effects of conflict. The advantage of using mean is that it takes all of the scores into account, where this makes it a sensitive measure of central tendency. Mean is one acceptable measure of central tendency for interval and ratio data (Harper (n. d.)). Once after the mean for the causes and effects had been calculated, each of them will be ranked separately accordingly in order to determine the highest causes and highest effects.

On the whole, all the data collected had been analysed by using Statistical Package for the Social Sciences (SPSS) and Microsoft Excel.

CHAPTER 4

DATA ANALYSIS

4.1 INTRODUCTION

This chapter will discuss the quantitative findings of the research study. This chapter including pilot test, demographic analysis, reliability analysis, normality analysis, mean ranking, Pearson Correlation analysis, and Spearman's Correlation analysis. Statistical Package for the Social Sciences (SPSS) and Microsoft Excel had been used for analyzing the data collected.

There are 134 respondents in this research, which 78 of them from contractor companies of group 7, 45 form developer companies and 9 from consultants companies. From the total 134 questionnaires, 84 had been distributed by mail posting and 50 by e-mailing. Then, 44 questionnaires had success collected from the 134 of the respondents, which consists of 15 from developers companies, 22 contractor-base companies and 7 from the consultant companies. Overall, the research had achieved 32.84% response rate. It shows that the return rate of 30% is consider as acceptable, adequate and can be used with confidence (Cavana et al, 2001; Chatman, 2007).

4.2 PILOT TEST

The purpose of conduct pilot test is to test the logistic of the survey and check the data quality of the research study. In this study, 10 of the questionnaires had been distributed to the respondents of the construction companies from the Johor and Malacca area. Questionnaires had been collected and analyze by using SPSS to test the data. Two data analysis way had been used in the pilot test, which are reliability analysis and normality analysis.

4.2.1 Reliability Analysis for Pilot Test

In the reliability test, Cronbach's Alpha coefficient is used to measure the internal consistency of a test or scale (Tavakol and Dennick, 2011). The Cronbach's alpha value within 0.5 to 0.7 is considered as acceptable and will be good level if the Cronbach's alpha value more than 0.7 (Yusoff, 2012). The internal consistency is higher if the Cronbach's alpha coefficient is closer to 1.0 (Gliem. J and Gliem. R, 2003).

The table 4.1 shows the Cronbach's Alpha coefficient value of both causes and effects variables, which range from 0.735 to 0.947. The Cronbach's Alpha coefficient of the four main causes groups and four main effects group were under acceptance level. Since all the variables' value is more than 0.7, thus the element had continued to analysis without any variable deleted. The Productivity and quality effects has the highest value, 0.947; second highest is 0.845, cause of Behavioural problems; third highest cost related effects (0.793), following by Management problems (0.778), Time related effects (0.772), Designed/Scope related problems (0.759), Organization and its reputation-related effects (0.743), and Contractual Problems (0.735).

Table 4.1: Cronbach's Alpha for pilot test

Variables	Cronbach' s Alpha	Number of Items	Number of Items deleted
Causes			
1) Contractual Problems	0.735	3	-
2) Design/ Scoped related Problems	0.759	4	-
3) Management Problems	0.778	5	-
4) Behavioural Problems	0.845	6	-
Effects			
1) Time related effects	0.772	3	-
2) Cost related effects	0.793	3	-
3) Productivity and quality effects	0.947	2	-
4) Organization and its reputation related effects	0.743	5	-

4.2.2 Normality Analysis for Pilot Test

Table 4.2: Test of Normality for Pilot test

Varibles	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
C1	0.213	10	0.200*	0.932	10	0.463
C2	0.158	10	0.200*	0.942	10	0.573
C3	0.150	10	0.200*	0.920	10	0.353
C4	0.217	10	0.199	0.877	10	0.121

E1	0.153	10	0.200*	0.932	10	0.473
E2	0.188	10	0.200*	0.930	10	0.449
E3	0.159	10	0.200*	0.914	10	0.307
E4	0.130	10	0.200*	0.982	10	0.975

*. This is a lower bound of the true significance.

The normality analysis had been used in pilot test. The Shapiro-Wilk was used to test the sample size between 3 to 50 respondents (Shapiro & Wilk 1965). Ahad et al (2010) state that when the significant value (*p*-value) is less than the significance level (α=0.05), the null hypothesis was rejected and the data is considered as not normal. Table 4.2 shows the normality analysis of the pilot test. The result shows that the significant value of all major causes and effects are more than 0.05, which means that all the data for pilot test is normally distributed. Variables C1 to E4 indicate the major causes and major effects which shown as below:

C1- Contractual problems
C2- Design/Scope related problems
C3- Management problems
C4- Behavioural problems
E1- Time related effects
E2- Cost related effects
E3- Productivity and quality effects
E4- Organization and its reputation-related effects

4.3 RESPONDENTS'DEMOGRAPHIC ANALYSIS

Table 4.3: Demographic Analysis

Variables	Frequency	Percentage (%)
Age		
1) 21-30	12	27.30
2) 31-40	14	31.80
3) 41-50	9	20.50
4) 51-60	9	20.50
Gender		
1) Male	27	61.40
2) Female	17	38.60
Position in Company		
1) Project Executive	4	9.10
2) Project Manager	11	25.00
3) Quantity Surveyor	6	13.60
4) Manager	9	20.50
5) Engineer	3	6.80
6) Project Director	5	11.40
7) Others (Group Chief Operating Officer, Technical Executive, and Project coordinator)	6	13.60
Types of Organization		
1) Developer	15	34.10
2) Consultant	7	15.90
3) Contractor	22	50.00

Working Experience		
1) Less than 5 years	9	20.50
2) 5 to 10 years	9	20.50
3) 11 to 15 years	12	27.30
4) More than 15 years	14	31.80
Highest Level of Education		
1) SPM	1	2.30
2) STPM	1	2.30
3) Bachelors Degree	22	50.00
4) Masters Degree	7	15.90
5) PHD	2	4.50
6) Others (Diploma, Certification Civil Engineering, and Advisor Diploma in Building Technology)	11	25.00

Table 4.4: Statistic Analysis of Demographic Data

Variables	Mean	Median	Mode	Standard Deviation
Age	2.34	2.00	2	1.098
Position in Company	3.27	3.00	1	2.039
Types of Organization	1.82	2.00	2	0.691
Working Experience	2.70	3.00	4	1.133
Highest Level of Education	3.93	3.00	3	1.371

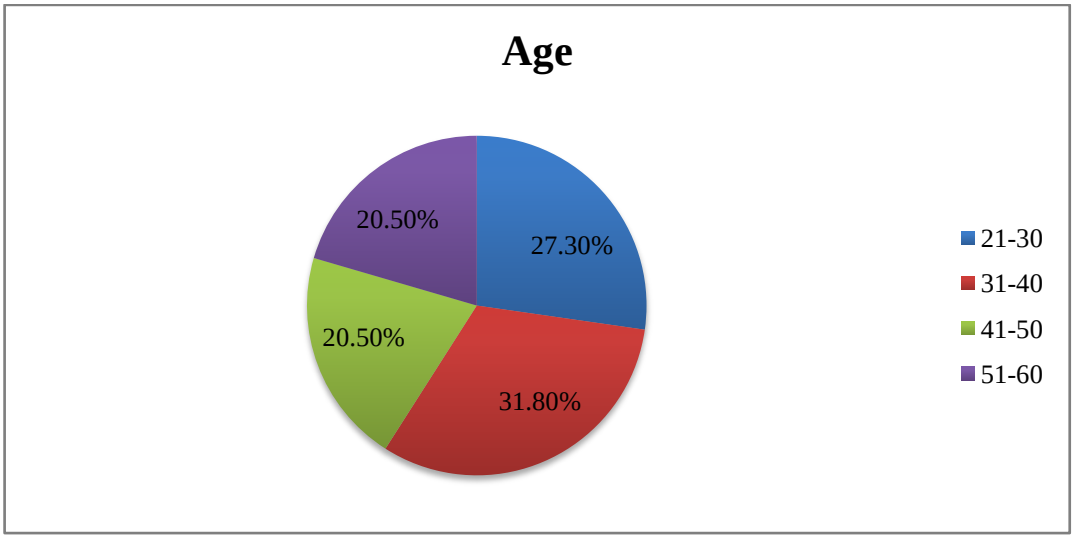


Figure 4.1 Age of respondents

Figure 4.1 shows the percentage of age of respondents. The age are categorized in 4 groups, which are 21-30 years old, 31-40 years old, 41-50, and 51-60 years old. 27.30% of the respondents (12 people) are between 21-30 years old; whereas 31.80% (14 people) is the respondents of age between 31-40 years old, which occupied the highest percentage from the total 44 respondents. The rest of the age groups are 41-50 and 51-60 years old, which both of this group have the same percentage, 20.50% (9 people). Based on the Table 4.4 Statistic Analysis of Demographic Data, the mean, median, mode are 2.34, 2.00, and 2 respectively.

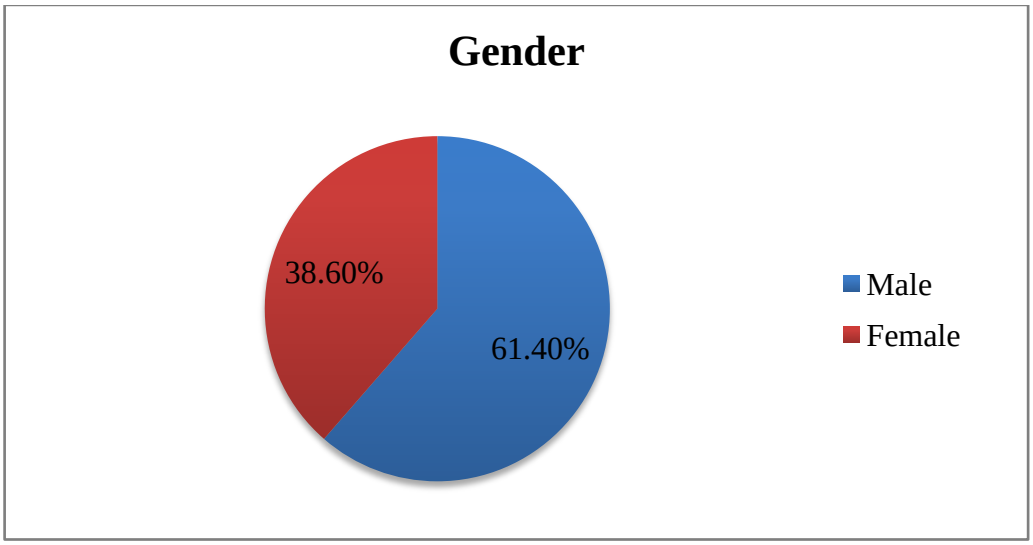


Figure 4.2: Gender of respondents

Figure 4.2 shows the percentage of gender of the respondents. Male respondents had occupied the highest percentage from the total 44 of respondents, which is 61.40% (27 people). Another 38.60% is female respondents (17 people). It seems that there are more males involved in construction industry compare with females.

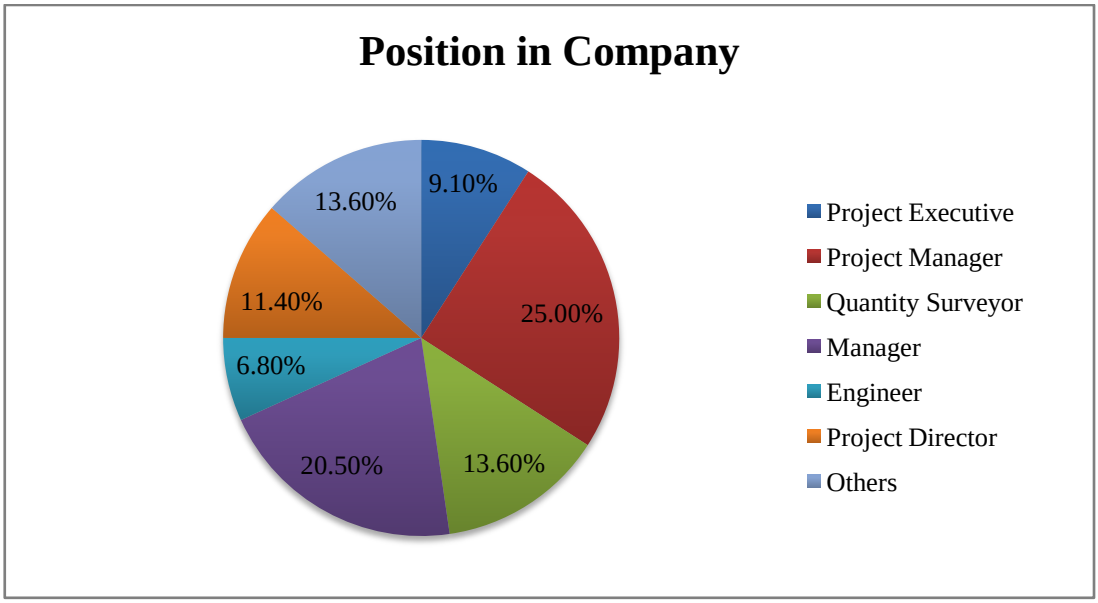


Figure 4.3: Position of respondents in Company

Figure 4.3 shows the position of respondents in their company. The position had categorized in 7 groups, such as Project Executive. Project Manager, Quantity Surveyor, Manager, Engineer, Project Director and Others. There are 9.10% (4 people) of project executive from the total 44 of respondents; 25.00% (11 people) of project manager, which is the highest percentage from the overall position; 13.60% (6 people) of quantity surveyor, and 20.50% (9 people) of Manager. Besides that, engineer position shows the lowest percentage among the respondents, which is 6.80% (3 people). The remaining of the respondents consist of 11.40% of project director and 13.60% (6 people) from others position such as Group Chief Operating Officer, Technical Executive, and Project coordinator. The mean, median and mode of this variable is 3.27, 3.00 and 1 respectively.

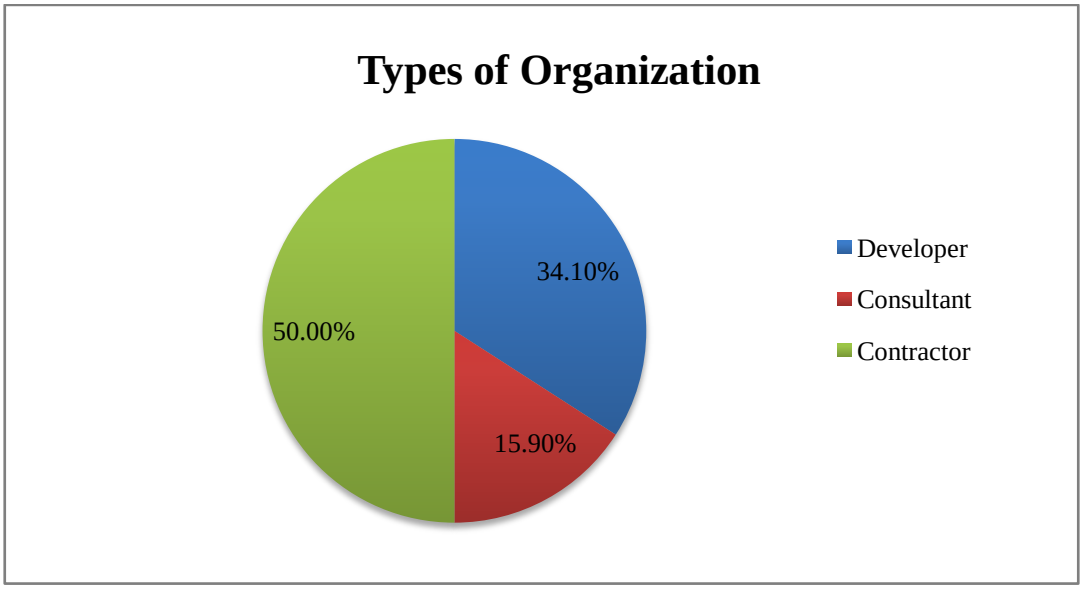


Figure 4.4: Types of organization

Figure 4.4 shows the types of organization of the respondents. From the total 44 of the respondents, half of them are from the contractor types companies, which occupied 50.00% (22 people). The remaining are developer companies, 34.10% (15 people) and 15.90% of consultant companies (7 people). The types of organization show the mean of 1.82, median of 2.00 and mode of 2.

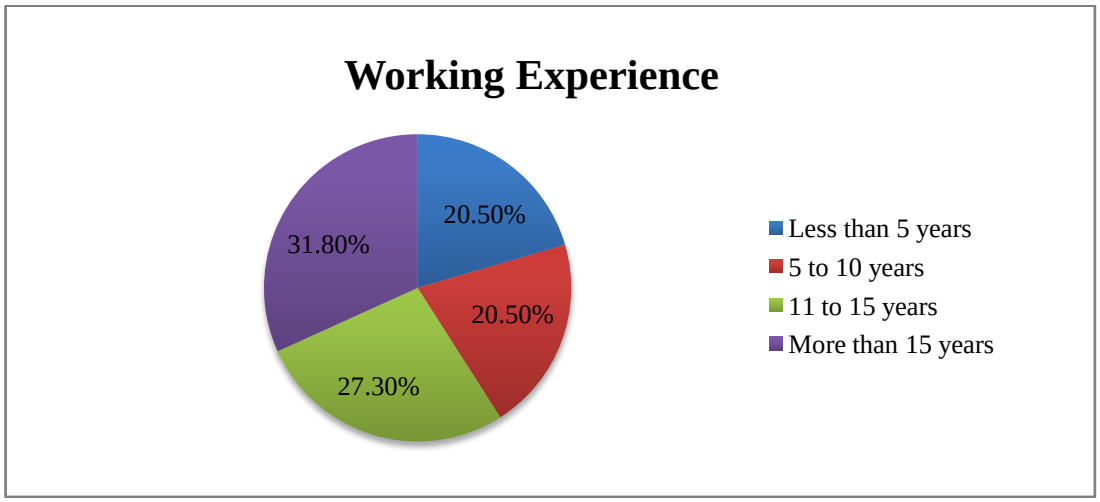


Figure 4.5: Working experience of respondents

Figure 4.5 shows the working experience of respondents in the construction field. From the total of 44 respondents, there are 31.80% (14people), which is the highest

percentage of respondents, had involve more than 15 years in the construction field industry. 27.30% of the respondents had involved 11 to 15 years; whereas the remaining respondents whose working experience in construction industry of years range from less than 5 years and years range from 5 to 10 years had shown same percentage, 20.50% (9 people). The working experience of respondents had shown the mean of 2.70, median of 3.00 and the mode of 4.

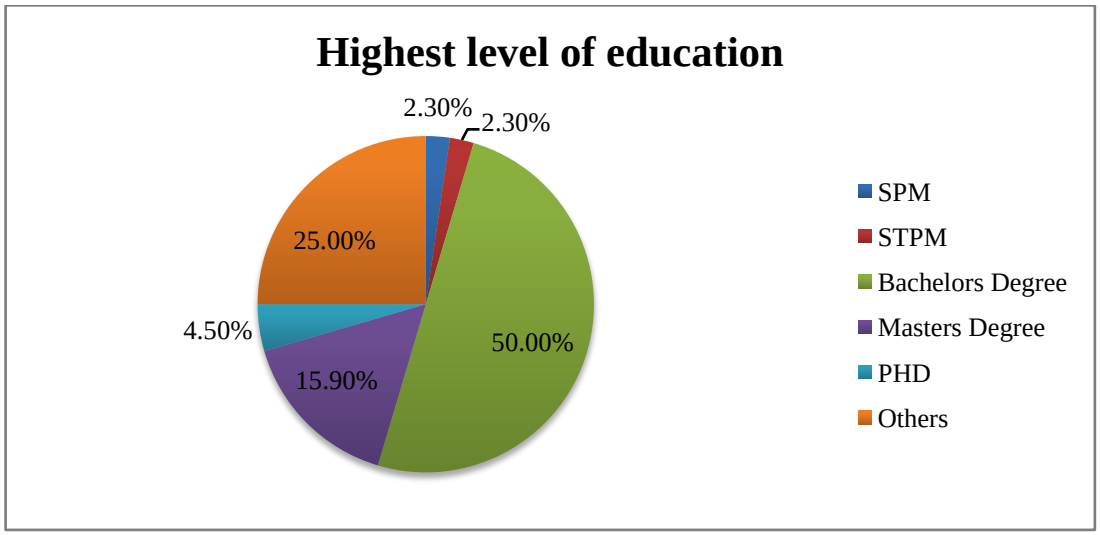


Figure 4.6: Highest level of education of respondents

As shown in figure 4.6, there are half of the total 44 of the respondents hold Bachelors degree qualification, 50.00% (22 people). The respondents which hold the SPM and STPM level of qualification are 2.30% respectively (1 people). 15.90% (7 people) of the respondents hold Masters Degree, whereas 4.50% (2 people) hold PHD qualification. The remaining of the respondents consists of other education level such as Diploma, Certification Civil Engineering, and Advisor Diploma in Building Technology, which contribute 25.00% (11 people) from the overall. This variable had shown the mean of 3.93, median of 3.00 and mode of 3.

4.4 RELIABILITY ANALYSIS

The reliability analysis will be carried out once again after collected total of 44 data from the respondents. Similarly to the pilot test, Cronbach's Alpha coefficient had been used to measure the internal consistency of the data. Yusoff (2012) stated that the Cronbach's alpha value within 0.5 to 0.7 should be considered as acceptable and will be good level if the Cronbach's alpha value more than 0.7. The internal consistency is higher if the Cronbach's alpha coefficient is closer to 1.0 (Gliem. J and Gliem. R, 2003).

Table 4.5: Cronbach's Alpha for collected data

Variables	Cronbach' s Alpha	Number of Items	Number of Items deleted
Causes			
1) Contractual Problems	0.530	3	-
2) Design/ Scoped related Problems	0.516	4	-
3) Management Problems	0.621	5	-
4) Behavioural Problems	0.637	6	-
Effects			
1) Time related effects	0.565	3	-
2) Cost related effects	0.578	3	-
3) Productivity and quality effects	0.649	2	-
4) Organization and its reputation-related effects	0.713	5	-

The Table 4.5 shows the Cronbach's Alpha for the 44 set of the collected data. The organizational and its reputational–related effects had shown the highest Cronbach's Alpha value compare to the others variables, which is 0.713, considered as a good level. While the Cronbach's Alpha value of the other variables is within 0.516 to 0.649. Design/ scope related problems had shown the lowest value, 0.516; following by Contractual problems, 0.530; Time related effects, 0.565; Cost related effects, 0.578; Management problems, 0.621; Behavioural problems, 0.637, and Productivity and quality effects, 0.649, the second highest in Cronbach's Alpha value. Overall, the Cronbach's Alpha value of four major groups of causes and four major groups of effects is considered as acceptable, although it shows lower value when compared with the reliability analysis of pilot test.

4.5 NORMALITY ANALYSIS

The normality analysis had been retest once again after collected 44 of the data from the respondents. The Shapiro-Wilk had been used to test for the small sample size, which is the about 3 to 50 sample (Shapiro & Wilk 1965). The data is considered as not normal if the significant value (*p*-value) is less than the significance level (α=0.05), and the null hypothesis was rejected (Teh et al, 2010).

Table 4.6: Normality Analysis of collected data

Variables	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
C1	0.205	44	0.000	0.883	44	0.000
C2	0.198	44	0.000	0.907	44	0.002
C3	0.182	44	0.001	0.950	44	0.055
C4	0.123	44	0.095	0.964	44	0.188
E1	0.232	44	0.000	0.844	44	0.000
E2	0.172	44	0.002	0.931	44	0.012
E3	0.164	44	0.004	0.904	44	0.001
E4	0.164	44	0.004	0.924	44	0.006

As shown in the Table 4.6, the variables which have the significant value greater than 0.05 are C3 and C4, 0.055 and 0.188 respectively. Meanwhile, both of these variables are normally distributed. Other than that, the remaining variables such as C2, E2, E3, and E4 had shown the significant value less than 0.05, which are 0.002, 0.012, 0.001 and 0.006 respectively. C1 and E1 both shown 0.000 significant value (*p*-value<0.05), which means these variables are not normally distributed. In overall, the data of this research is not normally distributed. Variables C1 to E4 indicate the major causes and major effects which shown as below:

C1- Contractual problems
C2- Design/Scope related problems
C3- Management problems
C4- Behavioural problems
E1- Time related effects
E2- Cost related effects
E3- Productivity and quality effects
E4- Organization and its reputational-related effects

4.6 CAUSES OF INTERNAL CONFLICTS IN CONSTRUCTION INDUSTRY

This section contains four major groups including 18 causes that lead to internal conflict in construction industry. The four major groups of causes was being classified are contractual problems, design/scope related problems, management problems and behavioural problems. Besides this, the respondents were being classified into 3 categories such as Developer, Contractor and Consultant. The mean and ranking way was being used since mean is one acceptable measure of central tendency for interval data (Harper, 2012), in order to identify which of the causes is most influence towards the conflict in construction industry.

4.6.1 Contractual Problems

Table 4.7: Ranking of Contractual Problems

Causes	Developer		Contractor		Consultant		Overall	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Ambiguities in contract documents (C1)	4.33	1	4.32	2	4.43	1	4.34	2
Error and omission in contract terms (C2)	4.33	1	4.45	1	4.14	2	4.36	1
Unclear payment terms (C3)	4.13	2	4.00	3	4.14	2	4.07	3

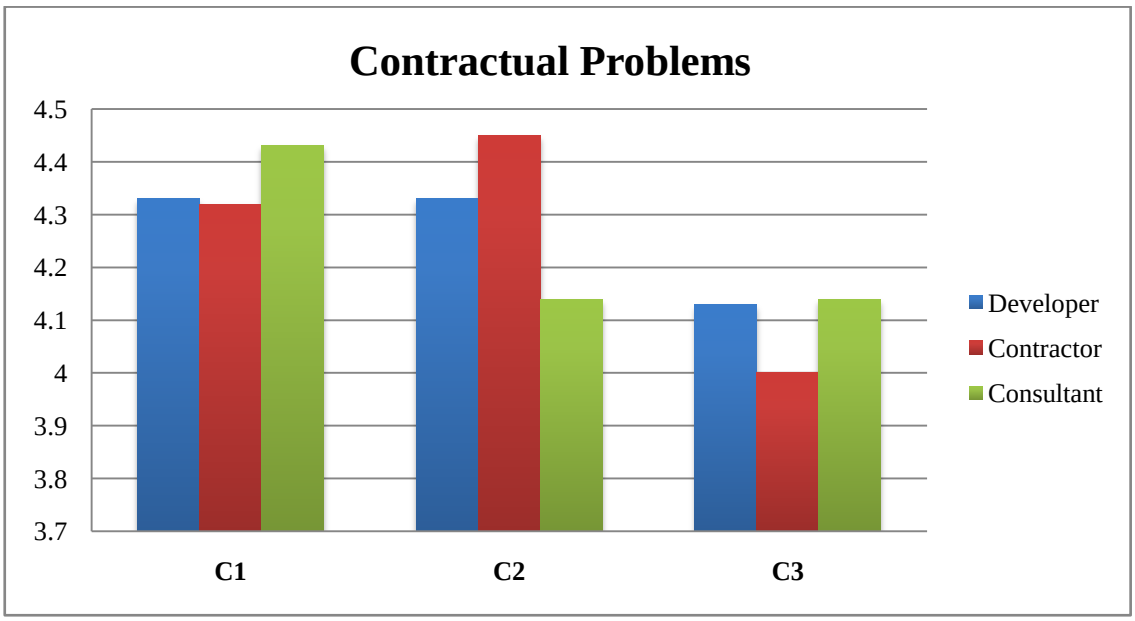


Figure 4.7: Histogram of Contractual Problems according to categories

Table 4.7 and Figure 4.7 show the ranking of the Contractual Problems among the 3 categories of the construction companies. Developer had achieved same mean in

both causes of C1 and C2, which is 4.33, the highest among the 3 causes, whereas the second highest ranking of mean is 4.13 in C3. According to Contractor, the highest mean is rank at C2, 4.14; second highest mean is C1, 4.32, and the third highest in ranking of mean is 4.00, at C3. Consultant shows 4.36 of mean in the cause of C1, which is the highest rank among three causes; whereas second highest ranking of mean is 4.14 at C2 and C3.

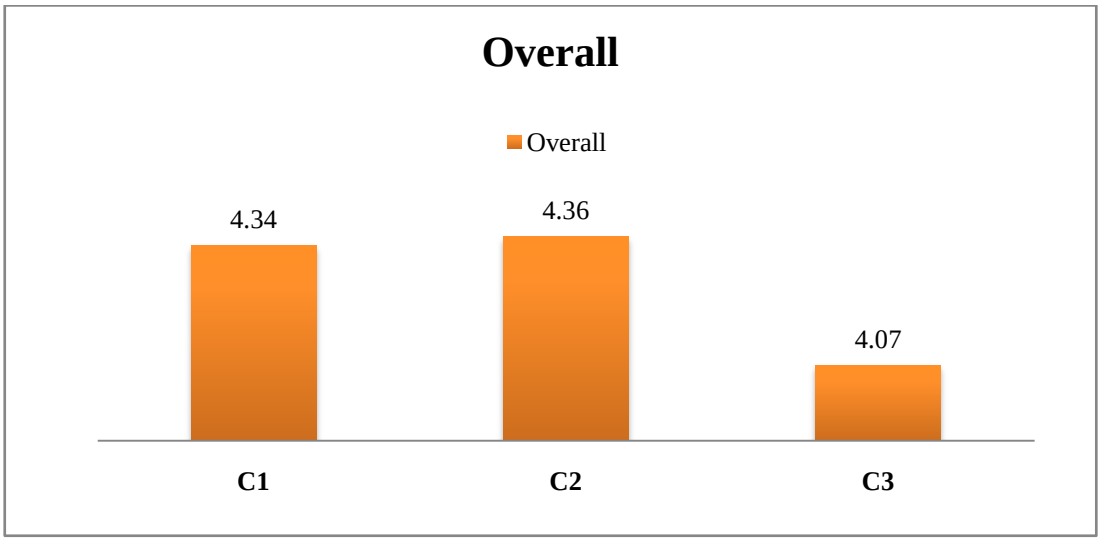


Figure 4.8: Histogram of Overall ranking of Contractual Problems

As shown in Figure 4.8, C2 achieve highest ranking of mean, which is 4.36, C1 achieve second highest ranking of mean , 4.34, whereas C3 achieve 4.07 in mean, third highest ranking. Overall, the respondents agree that C1 is the main causes in Contractual Problems.

4.6.2 Design/ Scope related Problems

Table 4.8: Ranking of Design/ Scope related Problems

Causes	Developer		Contractor		Consultant		Overall	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Scope changes/ changes order by designer or contractor (C4)	3.93	3	4.50	1	4.29	2	4.27	2
Error and omission in project design (C5)	4.40	1	4.36	2	4.43	1	4.39	1
Design change due to variations of developers (C6)	4.13	2	4.09	3	4.43	1	4.16	3
Differing site conditions (C7)	4.13	2	3.95	4	4.00	3	4.02	4

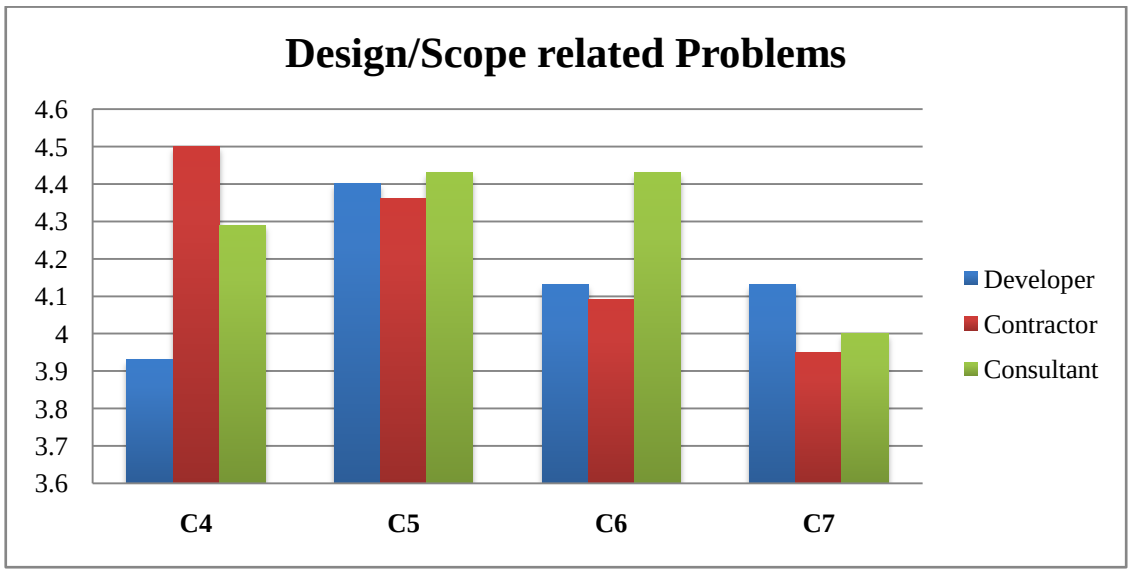


Figure 4.9: Histogram of Design/ Scope related Problems according to categories

Table 4.8 and Figure 4.9 shows the mean ranking of Design/ Scope related Problems among 3 categories of respondents. Developer achieves the ranking of mean of 3.93 in C4, 4.40 in C5, 4.13 in both C6 and C7. C5 show the highest ranking of mean among the four causes by Developer. According to Contractor, C4 achieve 4.50 of mean, which is the highest rank compare to remaining of 3 causes. Second highest is at C2, following by C3 and C4, which are 4.36, 4.09 and 3.95 respectively. Besides this, the highest ranking of mean show by Consultant is 4.43, in both C5 and C6; whereas the C4 show 4.29 of mean, and C7 show 4.00, the third highest ranking of mean.

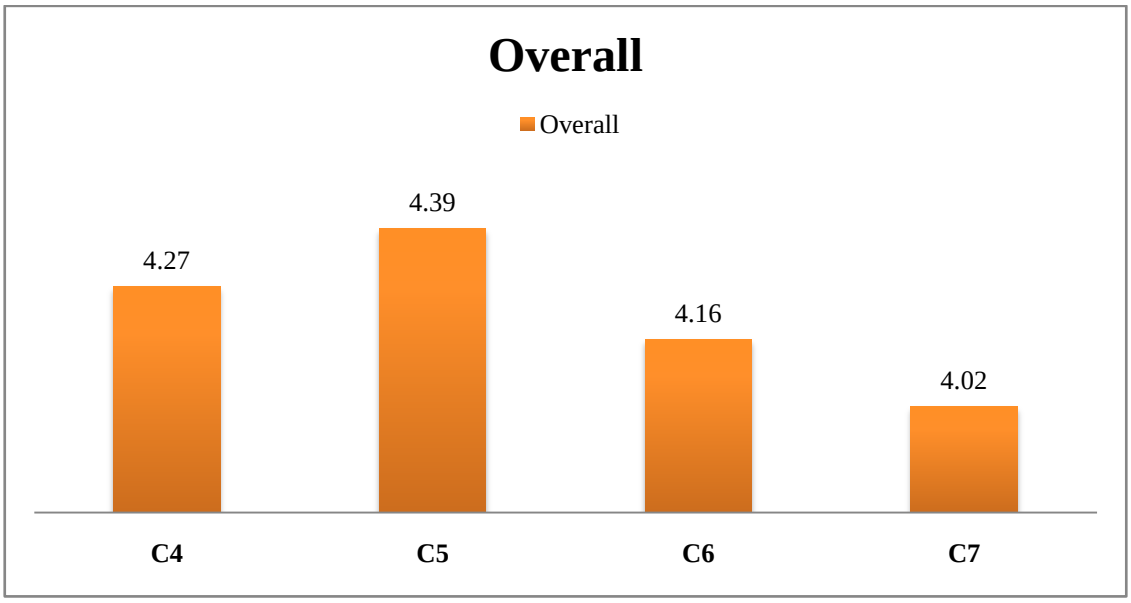


Figure 4.10: Histogram of Overall ranking of Design/ Scope related Problems

From the Figure 4.10, C5 had achieved the highest ranking of mean, 4.39; second highest of mean is shown by C4, 4.27. Following by C6 and C7, achieve 4.16 and 4.02 of mean respectively. Overall, the 3 companies agree that C5 is the main causes in Design/ Scope related Problems.

4.6.3 Management Problems

Table 4.9: Ranking of Management Problems

Causes	Developer		Contractor		Consultant		Overall	
	Mean	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**
Poor contract management (C8)	4.00	3	4.41	1	4.29	1	4.25	3
Lack of Quality Assurance/ quality control (C9)	4.13	2	3.86	4	4.14	2	4.00	5
Improper planning and scheduling (C10)	4.27	1	4.36	2	4.29	1	4.32	1
Deficient management, supervision and coordination efforts on the part of project participants (C11)	4.13	2	4.41	1	4.14	2	4.27	2
Concurrent of design and construction (C12)	3.93	4	4.05	3	4.14	2	4.02	4

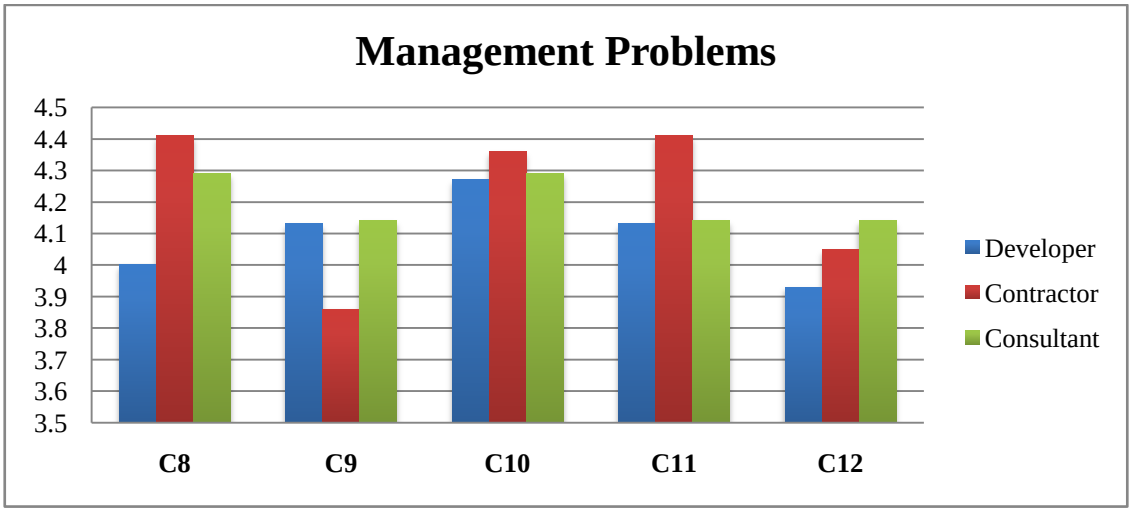


Figure 4.11: Histogram of Management Problems according to categories

Table 4.9 and Figure 4.11 show the ranking of mean of Management Problems according to 3 categories of construction companies. Based on Developer, C10 achieve the highest mean which is 4.27 compared to four other causes. C9 and C10 show same mean, which is second highest among 5 causes, 4.13 of mean. C8 show 4.00 of mean, rank in 3; whereas C12 achieve 3.93 of mean, ranking as 4 highest among the 5 causes. Besides that, Contractor achieves 4.41 in both C8 and C11, the highest ranking of mean. The second highest show by Contractor companies is at C10, 4.36 of mean. C12 and C9 are rank in 3 and 4, which the mean are 4.05 and 3.86 respectively. According to Consultant, C8 and C10 show the highest rank of mean, 4.29; whereas C9, C11 and C12 show the second highest ranking of mean, 4.14.

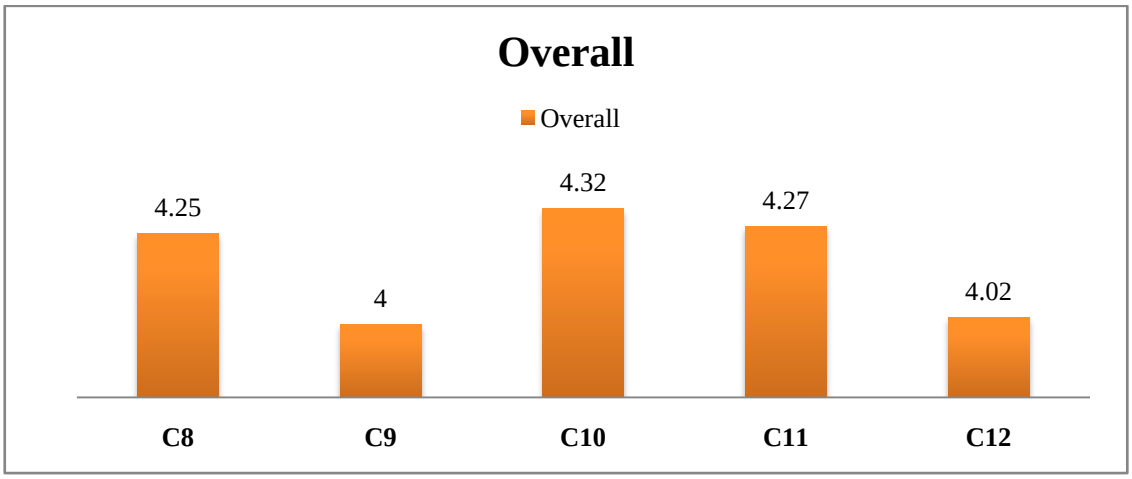


Figure 4.12: Histogram of Overall ranking of Management Problems

As shown in the Figure 4.12, overall, 3 categories of construction companies achieve highest ranking of mean in C10, 4.32; second highest is C11, 4.27; following by C8 (4.25), C12 (4.02) and C9 (4.00). Meanwhile, the respondents agree that C10 is the main causes in Management Problems.

4.6.4 Behavioural Problems

Table 4.10: Ranking of Behavioural Problems

Causes	Developer		Contractor		Consultant		Overall	
	Mean	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**
Poor communication among parties (C13)	4.27	1	4.64	1	4.29	1	4.45	1
Contractors over claim costs for progress acceleration (C14)	3.73	4	3.95	6	3.86	3	3.86	6
Clients order extra without providing proper cost (C15)	4.07	3	4.36	3	3.86	3	4.18	3
Delay in progress payments by developers (C16)	4.13	2	4.41	2	4.29	1	4.30	2

The absence of "team spirit" among the participants (C17)	3.47	6	4.18	5	4.29	1	3.95	5
Negligence (C18)	3.67	5	4.23	4	4.14	2	4.02	4

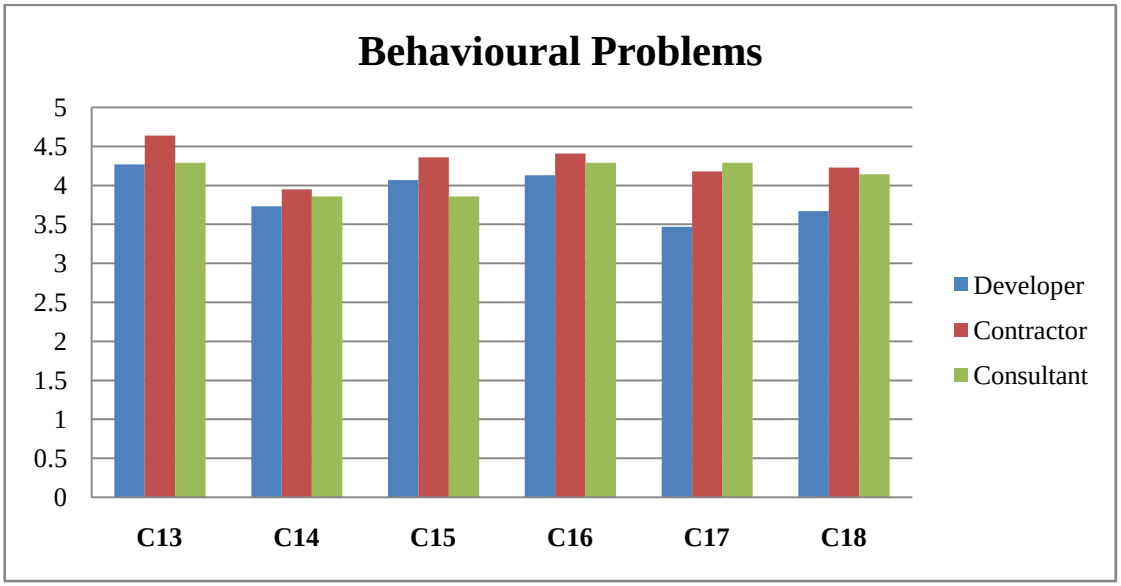


Figure 4.13: Histogram of Behavioural Problems according to categories

Table 4.10 and Figure 4.13 show the ranking of mean of Behavioural problems based on 3 categories of companies in construction industry. Developer companies achieve highest ranking of mean in C13, 4.27, second highest is 4.13 of mean, in C16, following by 4.07 in C15, 3.73 in C14, 3.67 in C18, and 3.47 of mean in C17. Other than that, Contractor show highest ranking of mean in C13, 4.64; whereas 4.41 of mean in C16, second highest of rank. Third highest of ranking in C15, followed by C18, C17, and C14, which the mean value are 4.36, 4.23, 4.18, and 3.95 respectively. According to Consultants, there are 3 causes show highest ranking in mean which are C13, C16, and C17, 4.29 of mean. C18 shows the second highest of mean, 4.14; whereas C14 and C15 show the same rank, 3.86 of mean.

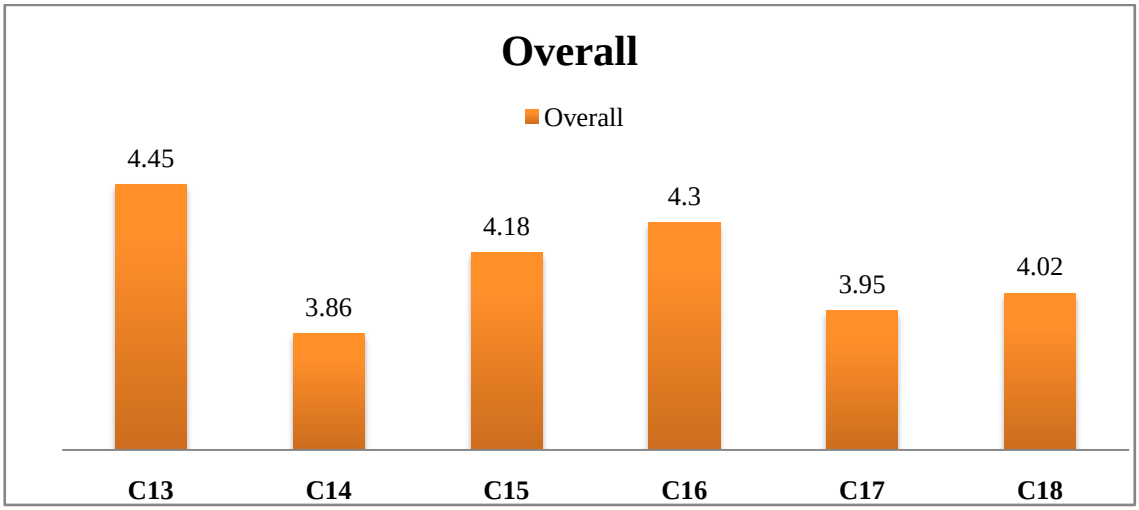


Figure 4.14: Histogram of Overall ranking of Behavioural Problems

From the figure 4.14, the overall ranking of mean which show the highest rank is 4.45 by cause of C13. C16 (4.30 of mean) is the second highest in mean ranking, followed by 4.18 (C15), 4.02 (C18), 3.95 (C17), and 3.86 (C14). It had been conclude that the cause of C13 is the main cause in the Behavioural Problems based on the 3 categories of respondents.

4.6.5 Overview Mean Ranking for Causes of Conflict

From the Table 4.11, the overall mean achieve highest ranking is Poor communication among parties (C13), 4.45 of mean. Second highest is achieve by Error and omission in project design (C5) with the mean of 4.39, whereas Error and omission in contract terms (C2) achieve third highest rank with the mean of 4.36. The fourth highest ranking of mean is achieve by Ambiguities in contract documents (C1), with the mean value of 4.34; followed by Improper planning and scheduling (C10), 4.32; Delay in progress payments by developers (C16), 4.30; Scope changes/ changes order by designer or contractor (C4) and Deficient management, supervision and coordination efforts on the part of project participants (C11), which have the same mean of 4.27; Poor contract management (C8), 4.25; and Clients order extra without providing proper cost (C15), 4.18. Then the following mean are ranked as Design change due to variations of developers (C6), 4.16; followed by Unclear payment terms (C3), 4.07; and Differing site conditions (C7), Concurrent of design and construction (C12) and

Negligence (C18), in which three of these causes have the same mean with the value of 4.02. The mean which is rank at the 13, 14 and 15 is achieve respectively by Lack of quality assurance/ quality control (C9), 4.00; The absence of "team spirit" among the participants (C17), 3.95 and Contractors over claim costs for progress acceleration (C14), with the mean value of 3.86.

Table 4.11: Overview Mean Ranking for Sub Elements of Causes

Causes	N	Mean	Rank
A) Contractual Problems			
Ambiguities in contract documents (C1)	44	4.34	4
Error and omission in contract terms (C2)	44	4.36	3
Unclear payment terms (C3)	44	4.07	11
Total Mean		**4.26**	
B) Design/Scope related Problems			
Scope changes/ changes order by designer or contractor (C4)	44	4.27	7
Error and omission in project design (C5)	44	4.39	2
Design change due to variations of developers (C6)	44	4.16	10
Differing site conditions (C7)	44	4.02	12
Total Mean		**4.21**	
C) Management Problems			
Poor contract management (C8)	44	4.25	8
Lack of quality assurance/ quality control (C9)	44	4.00	13
Improper planning and scheduling (C10)	44	4.32	5
Deficient management, supervision and coordination efforts on the part of project participants (C11)	44	4.27	7
Concurrent of design and construction (C12)	44	4.02	12
Total Mean		**4.17**	
D) Behavioural Problems			
Poor communication among parties (C13)	44	4.45	1
Contractors over claim costs for progress acceleration (C14)	44	3.86	15
Clients order extra without providing proper cost (C15)	44	4.18	9
Delay in progress payments by developers (C16)	44	4.30	6
The absence of "team spirit" among the participants (C17)	44	3.95	14
Negligence (C18)	44	4.02	12
Total Mean		**4.13**	

Table 4.12 Mean Ranking based on Major Causes

Causes	Developer		Contractor		Consultant		Overall	
	Mean	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**
A) Contractual Problems	4.26	1	4.26	2	4.24	2	4.26	1
B) Design/ Scope related Problems	4.15	2	4.23	3	4.29	1	4.21	2
C) Management Problems	4.10	3	4.22	4	4.20	3	4.17	3
D) Behavioural Problems	3.89	4	4.30	1	4.12	4	4.13	4

As shown in Table 4.12, the Developer achieve highest ranking of mean in the Contractual Problems (A), with then mean of 4.26; second highest in Design/ Scope related Problems (B), 4.15 of mean; followed by 4.10 in Management Problems (C) and 3.89 in Behavioural Problems (D). On the other side, Contractor achieve highest rank with the value of 4.30 in Behavioural Problems (D), second highest with 4.26 in Contractual Problems (A), third highest in Design/ Scope related Problems (B); with the value of 4.23; and lowest mean of 4.22 is rank in Management Problems (C). While in Consultant, the mean rank from highest to lowest is shown as Contractual Problems (A) with the value of 4.26, Design/ Scope related Problems (B) with 4.21, Management Problems (C) with 4.17, and Behavioural Problems (D) with 4.13. Figure 4.15 shows the clearer view for overall mean ranking for major causes.

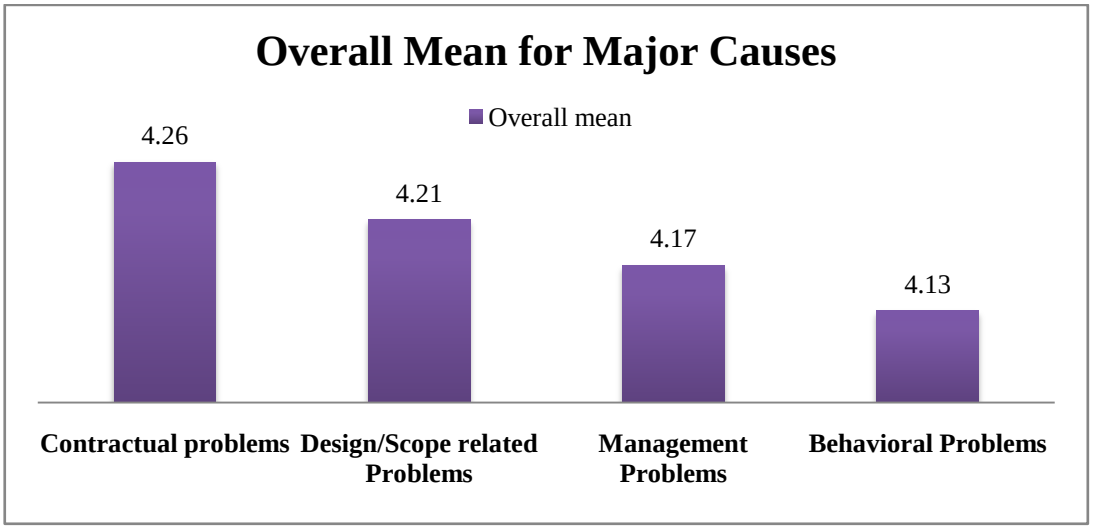


Figure 4.15: Histogram of Overall Ranking of Mean for Major Causes

4.7 EFFECTS OF INTERNAL CONFLICTS IN CONSTRUCTION INDUSTRY

4.7.1 Time related Effects

Table 4.13: Ranking of Time related Effects

Effects	Developer		Contractor		Consultant		Overall	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Interruption in work progress (E1)	4.00	2	4.05	3	4.29	2	4.07	3
Extra time for rework and demolition (E2)	3.73	3	4.36	2	4.43	1	4.16	2
Delay in project duration (E3)	4.47	1	4.41	1	4.43	1	4.43	1

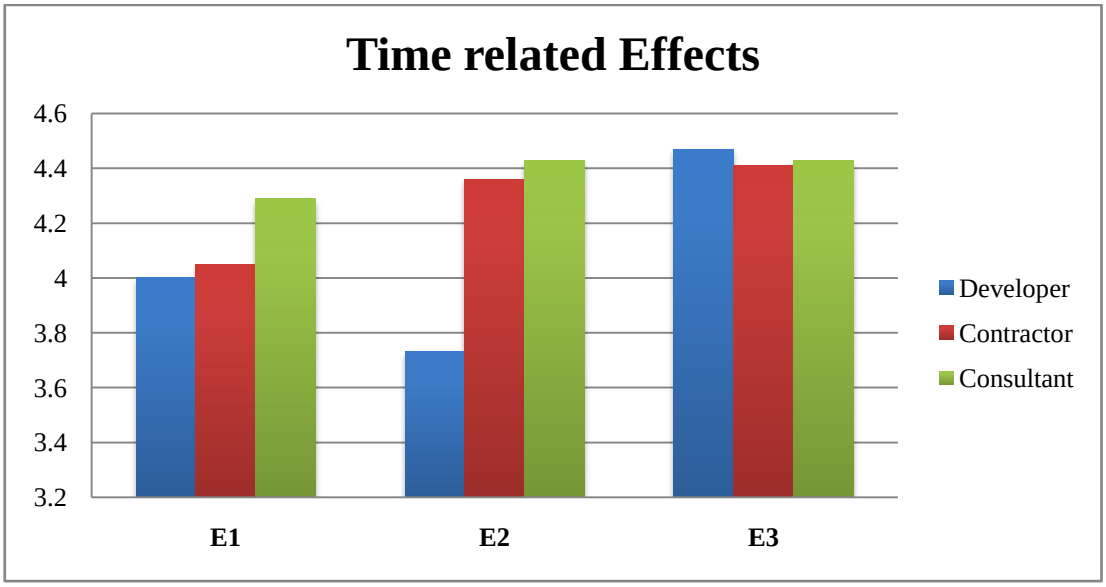


Figure 4.16: Histogram of Time related Effects according to categories

Table 4.13 and Figure 4.16 show the ranking of time related effects based on 3 categories of respondents. Developer achieve highest rank of mean in E3 (4.47), second highest in E1 (4.00), and third highest in E2 (3.73). Similarly, Contractor companies also achieve highest rank of mean, which is 4.41 in E3. However, the second highest mean rank is drop on E2 (4.36) and third is 4.05 in E1. On the other side, Consultant show highest ranking in both E2 and E3, 4.43 of mean; following by the E1, 4.29 of mean.

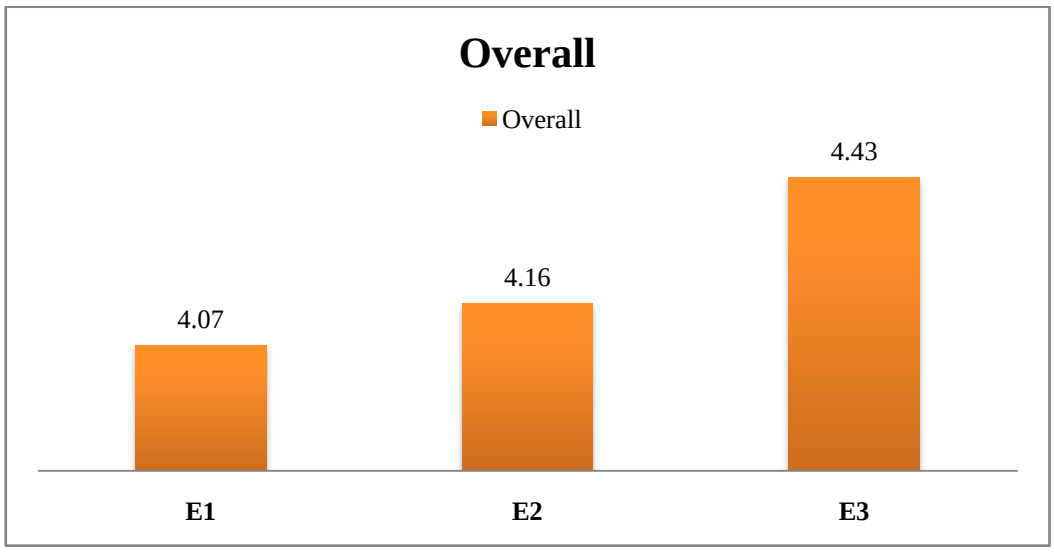


Figure 4.17: Histogram of Overall ranking of Time related Effects

As shown in Figure 4.17, the highest ranking of mean show by that 3 categories is 4.43 in E3, following by E2, which the mean is 4.16, and E1 with the overall mean of 4.07. It can be concluded that overall of the respondents agree on E3 as the main effects in the groups of Time related Effects.

4.7.2 Cost related Effects

Table 4.14: Ranking of Cost related Effects

Effects	Developer		Contractor		Consultant		Overall	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Additional expense in managerial and administration (E4)	3.87	3	3.86	3	3.86	3	3.86	3
Project cost overrun (E5)	4.20	1	4.45	1	4.43	1	4.36	1
Rework and demolition costs for resources (E6)	4.00	2	4.18	2	4.14	2	4.11	2

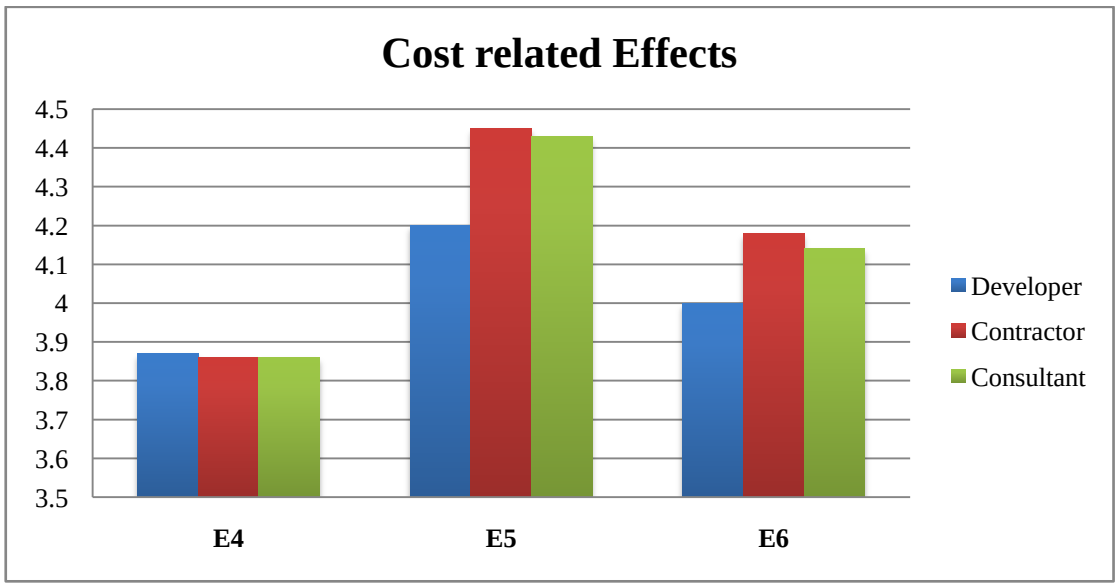


Figure 4.18: Histogram of Cost related Effects according to categories

From the Table 4.14 and Figure 4.18, it show that Developer achieve highest rank in E5 (4.20), followed by 4.00 in E6 and 3.87 in E4. Meanwhile, the Contractor and Consultant also show the highest ranking of mean in E5, which is 4.45 and 4.43 respectively; followed by second highest rank, 4.18 and 4.14 respectively in E6; and both are 3.86 of mean in E4.

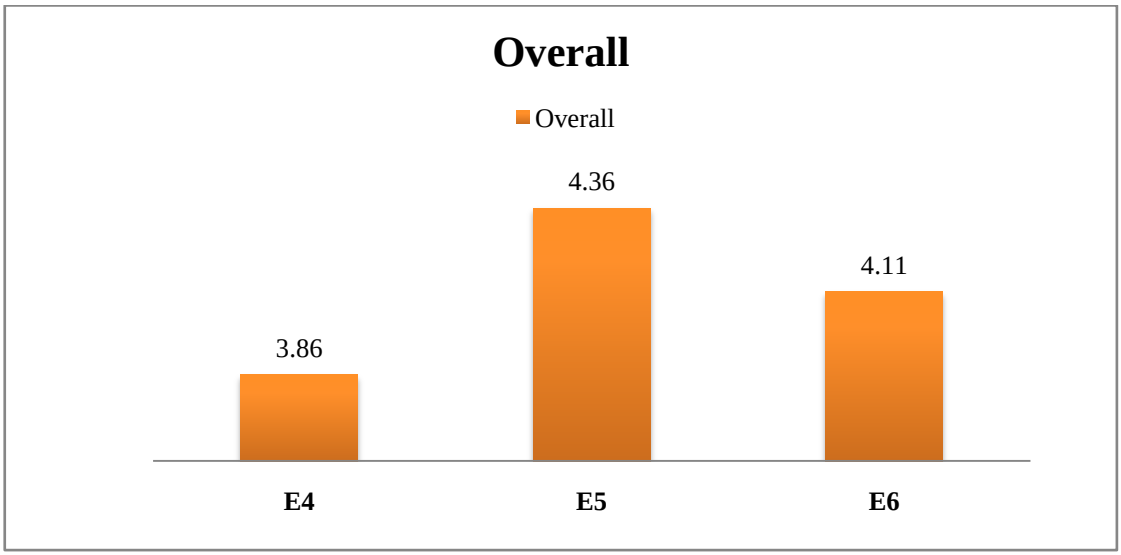


Figure 4.19: Histogram of Overall ranking of Cost related Effects

From the Figure 4.19, E5 show the highest ranking of overall mean, 4.36 compared to the other minor effects. E6 show 4.11 of mean, the second highest of rank, followed by E4, 3.86 of mean. In overall, the respondents agree on E5 as the main effects in groups of Cost related Effects.

4.7.3 Productivity and Quality Effects

Table 4.15: Ranking of Productivity and Quality Effects

Effects	Developer		Contractor		Consultant		Overall	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Reduce work efficiency (E7)	4.27	1	4.00	1	4.14	1	4.11	1

Quality degradation (E8)	4.20	2	4.00	1	4.14	1	4.09	2

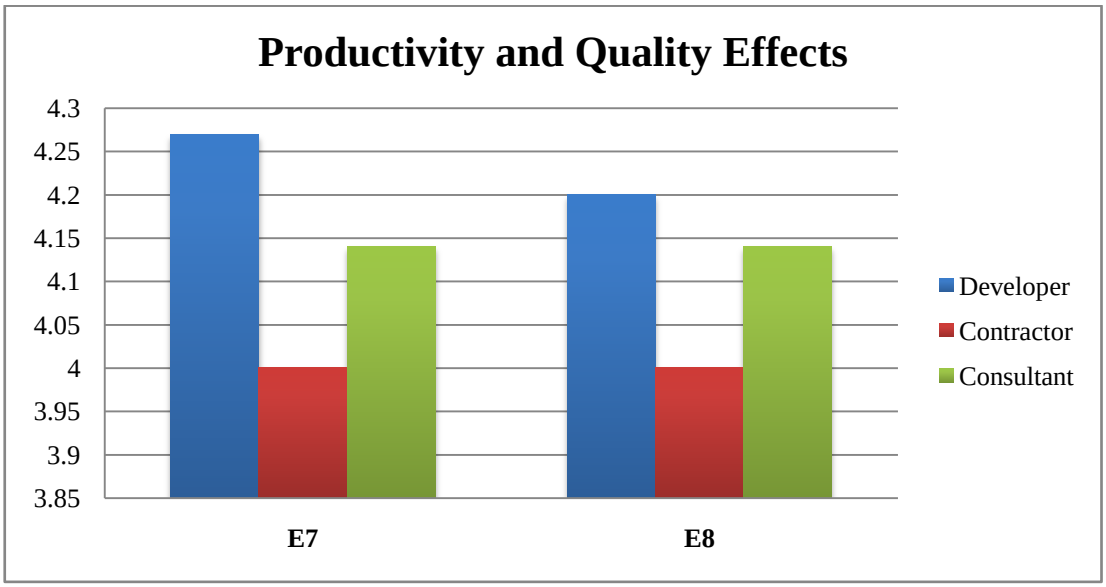


Figure 4.20: Histogram of Productivity and Quality Effects according to categories

Based on the Table 4.15 and Figure 4.20, the Developer-types companies achieve highest rank of mean in E7 (4.27); whereas the second highest is 4.20 in E8. On the other side, Contractor companies show the same rank in both E7 and E8, which is highest rank of 4.00 of mean. Similarly, Consultant achieves same highest rank in E7 and E8. The mean show is 4.14.

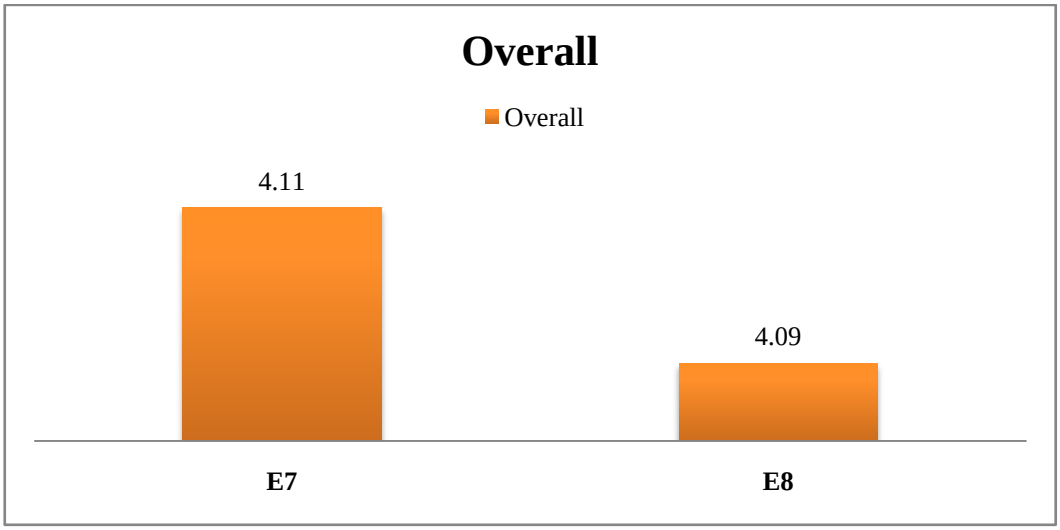


Figure 4.21: Histogram of Overall ranking of Productivity and Quality Effects

In overall, the mean achieve highest rank is E7, which is 4.11; whereas E8 is 4.09, the second highest of rank. It means that the overall respondents think that the E7 has the high influence in the Productivity and Quality Effects.

4.7.4 Organization and Reputation-related effects

Table 4.16: Ranking of Organization and Reputation-related Effects

Causes	Developer		Contractor		Consultant		Overall	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Loss of professional reputation (E9)	4.07	3	4.32	2	4.29	1	4.23	2
Loss of profitability (E10)	4.53	1	4.50	1	4.14	3	4.45	1
Poor professional relations and business viability (E11)	4.13	2	4.00	5	4.14	3	4.07	4

Diminution of respect among parties (E12)	3.73	5	4.05	4	3.86	4	3.91	5
Deterioration of relationship and may lead to break down in cooperation (E13)	4.00	4	4.27	3	4.00	2	4.14	3

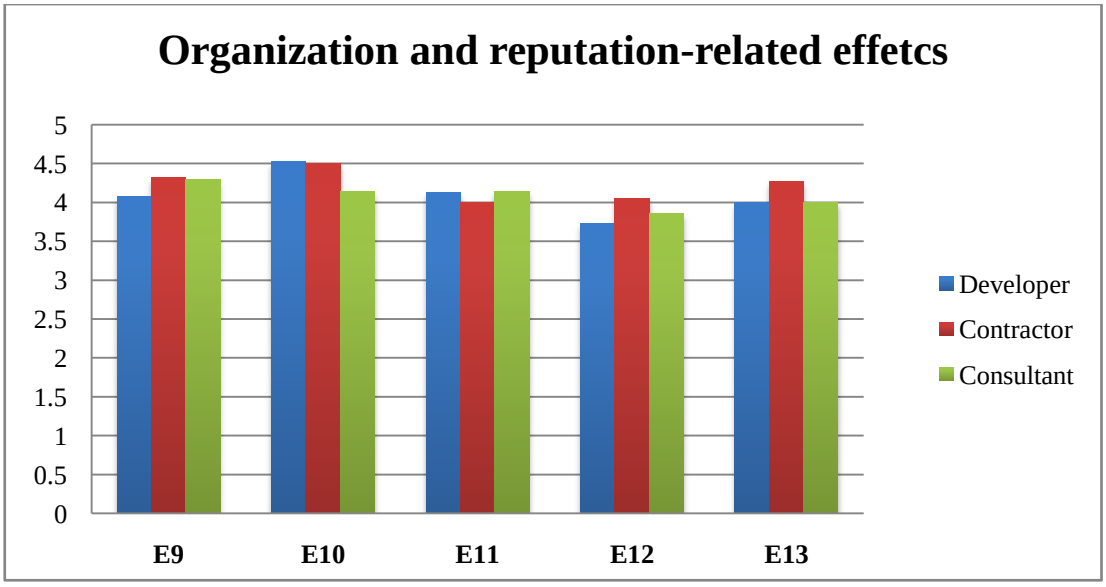


Figure 4.22: Histogram of Organization and reputation-related Effects according to categories

As shown in Table 4.16 and Figure 4.22, Developer achieve the highest ranking of mean in E10 (4.53), second highest 4.13 in E11, followed by 4.07 in E9; 4.00 in E13; and 3.73 in E12, the lowest mean ranking. Besides that, Contractor companies show the highest rank in E10 with the mean of 4.50, followed by second highest 4.32 in E9. E13 show the mean of 4.27, third highest in ranking, 4.05 in E12, and 4.00 in E11. According to Consultant companies, the highest rank is in the E9, 4.29 of mean; followed by 4.09 in E13, 4.14 in both E10 and E11, and 3.86 in E12.

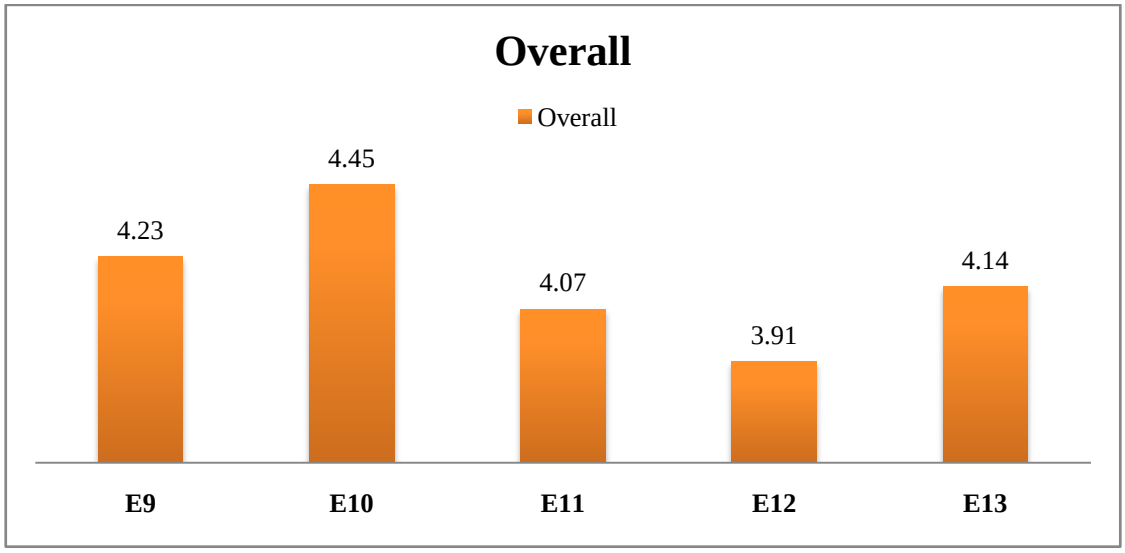


Figure 4.23: Histogram of Overall ranking of Organization and reputation related Effects

As shown in Figure 4.23, the E10 show the highest ranking of overall mean, 4.45. The second highest of mean is 4.23 in E9; followed by 4.14 in E13, 4.07 in E11 and 3.91 in E12. Overall, the respondents are agreed on E10 as the effect which has the high influence in Organization and reputation-related Effects.

4.7.5 Overview Mean Ranking for Effects of Conflict

From the Table 4.17, the overall mean achieve highest ranking is Loss of profitability (E10), 4.45 of mean. Second highest is achieve by Delay in project duration (E3) with the mean of 4.43, whereas Project cost overrun (E5) achieve third highest rank with the mean of 4.36. The fourth highest ranking of mean is achieve by Loss of professional reputation (E9), with the mean value of 4.23; followed by Extra time for rework and demolition (E2), 4.16; Deterioration of relationship and may lead to break down in cooperation (E13), 4.14, Rework and demolition costs for resources (E6) and Reduce work efficiency (E7), which have the same mean of 4.11. The mean which is rank at the eighth is achieve by Quality degradation (E8), 4.09; followed by Interruption in work progress (E1) and Poor professional relations and business viability (E11), with the same mean of 4.07, Diminution of respect among

parties (E12), 3.91; and Additional expense in managerial and administration (E4), with the mean of 3.86.

Table 4.17: Overview Mean Ranking for Sub Elements of Effects

Effects	N	Mean	Rank
A) Time related Effects			
Interruption in work progress (E1)	44	4.07	9
Extra time for rework and demolition (E2)	44	4.16	5
Delay in project duration (E3)	44	4.43	2
Total Mean		**4.22**	
B) Cost related Effects			
Additional expense in managerial and administration (E4)	44	3.86	11
Project cost overrun (E5)	44	4.36	3
Rework and demolition costs for resources (E6)	44	4.11	7
Total Mean		**4.11**	
C) Productivity and Quality Effects			
Reduce work efficiency (E7)	44	4.11	7
Quality degradation (E8)	44	4.09	8
Total Mean		**4.10**	
D) Organization and its reputation-related			
Loss of professional reputation (E9)	44	4.23	4
Loss of profitability (E10)	44	4.45	1
Poor professional relations and business viability (E11)	44	4.07	9
Diminution of respect among parties (E12)	44	3.91	10
Deterioration of relationship and may lead to break down in cooperation (E13)	44	4.14	6
Total Mean		**4.16**	

Table 4.18 Mean Ranking based on Major Effects

Effects	Developer		Contractor		Consultant		Overall	
	Mean	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**
a)Time related Effects	4.07	3	4.27	1	4.38	1	4.22	1
b) Cost related Effects	4.02	4	4.16	3	4.14	2	4.11	3
c)Productivity and Quality Effects	4.24	1	4.00	4	4.14	2	4.10	4
d) Organization and its reputation-related effects	4.09	2	4.23	2	4.09	3	4.16	2

From the Table 4.18, Developer achieve highest mean in Productivity and Quality Effects (c), with the mean value of 4.24; second highest in Organization and its reputation-related effects (d), 4.09 of mean; followed by 4.07 in Time related Effects (a), and 4.02 in Cost related effects (b). Other than that, Contractor show highest mean with the value of 4.27 in Time related Effects (a); second highest in Organization and its reputation-related effects (d), 4.23 of mean value; with the following by 4.16 in Cost related effects (b) and 4.00 in Productivity and Quality Effects (c). Consultant achieve the highest rank in Time related Effects (a), 4.38 of mean, second highest in both Cost related effects (b) Productivity and Quality Effects (c), with the same mean value of 4.14, whereas the lowest ranking is in Organization and its reputation-related effects (d), 4.09 in value. The overall mean show that the highest ranking of mean is fall under Time related Effects (a), 4.22 of mean value; with the following of Organization and its reputation-related effects (d) (4.16), Cost related effects (b) (4.11), and Productivity and Quality Effects (c) (4.10). Figure 4.24 show the clear view for the overall mean ranking of major effects.

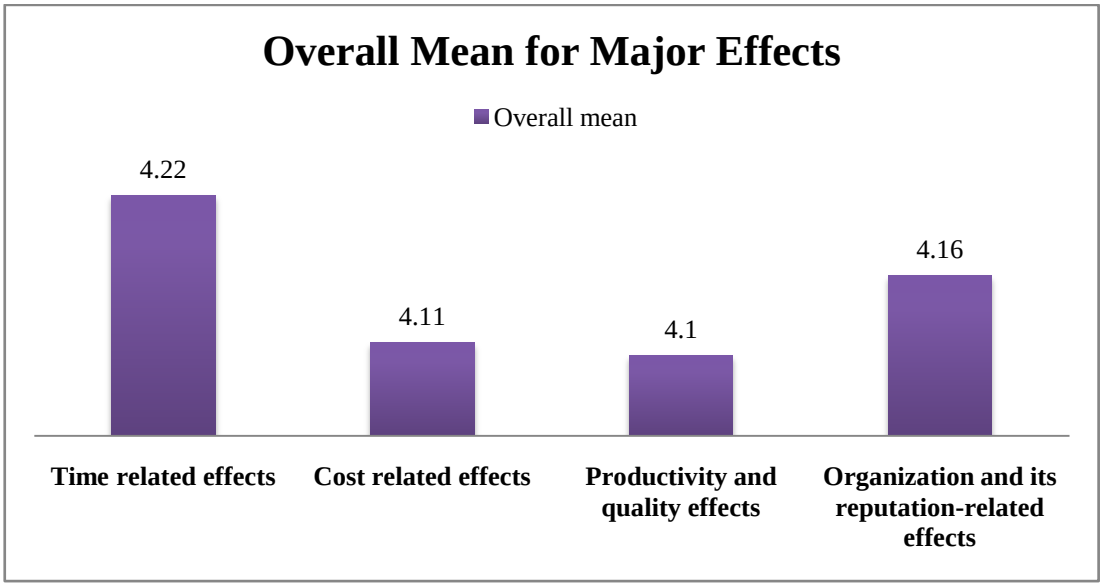


Figure 4.24: Histogram of Overall Ranking of Mean for Major Effects

4.8 CORRELATION ANALYSIS

4.8.1 Pearson Correlation Coefficient Analysis

Pearson Correlation coefficient is used to measure the strength and direction of the linear relationship between two variables. It describes the direction and degree to which one variable is linearly related to another. The Pearson correlation coefficient can take values from -1 to +1 (Lorentz and Sarana-Daniela, 2006). Taylor (1990) discuss that the closer the *r*-coefficient to the $\pm$ 1, the stronger the relationship and more linear between two variables. The positive correlation show when value of one variable increase associated by the value of another variable; negative correlation means one variable value increase associated with another variable value decrease (Greasley, 2008).

Table 4.19: Rule of Thumb for Interpreting the Size of a Correlation Coefficient

Size of Correlation	Interpretation
0.91 to 1.00 (-0.91 to –1.00)	Very strong positive (negative) correlation
0.71 to 0.90 (-.71 to -0.90)	Strong positive (negative) correlation
0.51 to 0.70 (-.51 to -.70)	Moderate positive (negative) correlation
0.31 to 0.50 (-.31 to -.50)	Weak positive (negative) correlation
0.00 to 0 .30 (.00 to -.30)	Little if any correlation

Source: Applied Statistics for the Behavioural Sciences (5th Ed.).

Table 4.20: Correlation between Contractual Problems and Time related Effects

Causes / Effects		Contractual problems	Time related effects
Contractual problems	Pearson Correlation	1	0.459**
	Sig. (2-tailed)		0.002
	N	44	44
Time related effects	Pearson Correlation	0.459**	1
	Sig. (2-tailed)	0.002	
	N	44	44

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

Table 4.20 shows the correlation between Contractual problems and Time related effects. The Pearson correlation, *r* value is 0.459, which mean that the correlation between both variables is weak positive. The significant value of the correlation show 0.002, which is less than significant level of 0.01, thus the correlation of both variables is significant.

Table 4.21: Correlation between Contractual Problems and Cost related Effects

Causes / Effects		Contractual problems	Cost related effects
Contractual problems	Pearson Correlation	1	0.321*
	Sig. (2-tailed)		0.033
	N	44	44
Cost related effects	Pearson Correlation	0.321*	1
	Sig. (2-tailed)	0.033	
	N	44	44

*. Correlation is significant at the 0.05 level (2-tailed).

From the Table 4.21, the *r*-value of the correlation between both variables is 0.321. Meanwhile, it has the weak positive correlation between both variables. The *p*-value shows 0.033, which is less than significant level of 0.05. Thus, the correlation between Contractual problems and cost related effects is concluded as significant.

Table 4.22: Correlation between Contractual Problems and Productivity and Quality Effects

Causes / Effects		Contractual problems	Productivity and quality effects
Contractual problems	Pearson Correlation	1	0.331*
	Sig. (2-tailed)		0.028
	N	44	44
Productivity and quality effects	Pearson Correlation	0.331*	1
	Sig. (2-tailed)	0.028	
	N	44	44

*. Correlation is significant at the 0.05 level (2-tailed).

As shown in Table 4.22, the *r*-value of the correlation is 0.331, which is weak positive correlation. The *p*-value of the correlation between both variables show 0.028, meanwhile it is significant, since the *p*-value is less than significant level of 0.05.

Table 4.23: Correlation between Contractual Problems and Organization and its Reputation-related Effects

Causes / **Effects**		**Contractual problems**	**Organization and its reputation related effects**
Contractual problems	Pearson Correlation	1	-0.025
	Sig. (2-tailed)		0.873
	N	44	44
Organization and its reputation related effects	Pearson Correlation	-0.025	1
	Sig. (2-tailed)	0.873	
	N	44	44

From the Table 4.23, the *r*-value shown by correlation between these two variables is -0.025, which means the correlation is little. The *p*-value of the correlation shows 0.873, which is higher than significant level of 0.05. Thus, the correlation between Contractual problems and Organization and its reputation-related effects is considered as not significant.

Table 4.24: Correlation between Design/Scope related Problems and Time related Effects

Effects	Causes	Design/Scope related problems	Time related effects
Design/Scope related problems	Pearson Correlation	1	0.362*
	Sig. (2-tailed)		0.016
	N	44	44
Time related effects	Pearson Correlation	0.362*	1
	Sig. (2-tailed)	0.016	
	N	44	44

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.24 show the 0.362 of correlation value between both cause and effect variables. The *p*-value of the correlation is 0.016; meanwhile it is less than 0.05 significant of level. Thus, the correlation of both variables is considered as significant weak positive relationship.

Table 4.25: Correlation between Design/Scope related Problems and Cost related Effects

Effects	Causes	Design/Scope related problems	Cost related effects
Design/Scope related problems	Pearson Correlation	1	0.200
	Sig. (2-tailed)		0.193
	N	44	44
Cost related effects	Pearson Correlation	0.200	1
	Sig. (2-tailed)	0.193	
	N	44	44

From the Table 4.25, the *r*-value show 0.200; which means the correlation between both variables is little relationship. On the other hand, the *p*-value shows 0.193, which is higher than 0.05 significant levels. Therefore, the correlation is not significant.

Table 4.26: Correlation between Design/Scope related Problems and Productivity and Quality Effects

Causes / Effects		Design/Scope related problems	Productivity and quality effects
Design/Scope related problems	Pearson Correlation	1	0.124
	Sig. (2-tailed)		0.424
	N	44	44
Productivity and quality effects	Pearson Correlation	0.124	1
	Sig. (2-tailed)	0.424	
	N	44	44

Table 4.26 show the little correlation between Design/Scope related problems and Productivity and quality effects. It is because the *r*-value is fall under 0.00 to 0.30 of the correlation size. Moreover, the *p*-value of the correlation shows 0.424, which is higher than 0.05 significant levels. Thus, it is concluded as insignificant of correlation.

Table 4.27: Correlation between Design/Scope related Problems and Organization and its Reputation-related Effects

Effects	Causes	Design/Scope related problems	Organization and its reputation related effects
Design/Scope related problems	Pearson Correlation	1	0.195
	Sig. (2-tailed)		0.205
	N	44	44
Organization and its reputation related effects	Pearson Correlation	0.195	1
	Sig. (2-tailed)	0.205	
	N	44	44

Table 4.27 show the little correlation between both variables, since the *r*-value shown is 0.195. On the other hand, the significant value is greater than 0.05, which is 0.205; is considered as insignificant.

Table 4.28: Correlation between Management Problems and Time related Effects

Effects	Causes	Management problems	Time related effects
Management problems	Pearson Correlation	1	0.316*
	Sig. (2-tailed)		0.036
	N	44	44
Time related effects	Pearson Correlation	0.316*	1
	Sig. (2-tailed)	0.036	
	N	44	44

*. Correlation is significant at the 0.05 level (2-tailed).

As shown in Table 4.28, the correlation between both variables is weak positive relationship, since the *r*-value is 0.316, falls under 0.30 to 0.50 correlation size. The *p*-value of the correlation is 0.036, less than 0.05 significant levels. Thus, the correlation is considered as significant.

Table 4.29: Correlation between Management Problems and Cost related Effects

Causes / Effects		Management problems	Cost related effects
Management problems	Pearson Correlation	1	0.324*
	Sig. (2-tailed)		0.032
	N	44	44
Cost related effects	Pearson Correlation	0.324*	1
	Sig. (2-tailed)	0.032	
	N	44	44

*. Correlation is significant at the 0.05 level (2-tailed).

From the Table 4.29, the *r*-value of the correlation show 0.324, which mean it is weak positive correlation. The significant value show 0.032, less than 0.05 of significant levels, therefore the correlation is considered as significant.

Table 4.30: Correlation between Management Problems and Productivity and Quality Effects

Causes / Effects		Management problems	Productivity and quality effects
Management problems	Pearson Correlation	1	0.278
	Sig. (2-tailed)		0.067
	N	44	44

Productivity and quality effects	Pearson Correlation	0.278	1
	Sig. (2-tailed)	0.067	
	N	44	44

Table 4.30 show the correlation between Management problems and Productivity and quality effects has a little relationship, since the correlation coefficient is lower, 0.278. Moreover, the *p*-value is greater, which is 0.067 higher than 0.05 of significant levels, therefore it is concluded that the correlation is not significant.

Table 4.31: Correlation between Management Problems and Organization and its Reputation-related Effects

Causes / **Effects**		**Management problems**	**Organization and its reputation related effects**
Management problems	Pearson Correlation	1	0.314*
	Sig. (2-tailed)		0.038
	N	44	44
Organization and its reputation related effects	Pearson Correlation	0.314*	1
	Sig. (2-tailed)	0.038	
	N	44	44

*. Correlation is significant at the 0.05 level (2-tailed).

As shown in Table 4.31, correlation coefficient shows 0.314, which has the weak positive correlation between both of the variables. Moreover, the *p*-value of 0.038 is less than 0.05; meanwhile the correlation is significant.

Table 4.32: Correlation between Behavioural problems and Time related Effects

Effects	Causes	Behavioural problems	Time related effects
Behavioural problems	Pearson Correlation	1	0.418**
	Sig. (2-tailed)		0.005
	N	44	44
Time related effects	Pearson Correlation	0.418**	1
	Sig. (2-tailed)	0.005	
	N	44	44

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

The *r*-value shown in Table 4.32 is 0.418, which means the correlation between the Behavioural problems and Time related effects has a weak positive relationship. In addition, the *p*-value is 0.005, which is less than 0.01 significant levels, therefore the correlation is considered as significant.

Table 4.33: Correlation between Behavioural problems and Cost related Effects

Effects	Causes	Behavioural problems	Cost related effects
Behavioural problems	Pearson Correlation	1	0.278
	Sig. (2-tailed)		0.068
	N	44	44
Cost related effects	Pearson Correlation	0.278	1
	Sig. (2-tailed)	0.068	
	N	44	44

As shown in Table 4.33, the correlation coefficient show the lower value, 0.278, which means the correlation has a little relationship. The 0.068 of *p*-value is greater than 0.05 significant levels, thus it is insignificant in correlation.

Table 4.34: Correlation between Behavioural problems and Productivity and Quality effects

Causes / Effects		Behavioural problems	Productivity and quality effects
Behavioural problems	Pearson Correlation	1	0.255
	Sig. (2-tailed)		0.095
	N	44	44
Productivity and quality effects	Pearson Correlation	0.255	1
	Sig. (2-tailed)	0.095	
	N	44	44

The correlation between Behavioural problems and Productivity and quality effects show a little in relationship. As shown in Table 4.34, the lower *r*-value of 0.255 is fall under the size of correlation of 0.00 to 0.30. In addition, the *p*-value is 0.095 which is higher than the significant levels of 0.05, thus it is insignificant.

Table 4.35: Correlation between Behavioural problems and Organization and its reputation related Effects

Causes / Effects		Behavioural problems	Organization and its reputation related effects
Behavioural problems	Pearson Correlation	1	0.293
	Sig. (2-tailed)		0.053
	N	44	44

Organization and its reputation related effects	Pearson Correlation	0.293	1
	Sig. (2-tailed)	0.053	
	N	44	44

Table 4.35 show the correlation coefficient value of 0.293, which mean little in correlation between the Behavioural problems and Organization and its reputation-related effects. The *p*-value also shows insignificant of the correlation since it is higher than 0.05 of significant levels.

4.8.2 Spearman Rank Correlation Analysis

Spearman Rank Correlation Analysis used to identify and examine the strength of a linear relationship between two sets of data. If r_s = 1 or -1, means that there is a perfectly linear relationship between both set of variables. Other than that, r_s close to zero means that there is no correlation between both variables. The positive correlation made both variables increase corresponding; whereas negative correlation of rank show one variable goes up and one goes down. In this research, Spearman Rank Correlation Analysis is aim to test the degree of agreement between the three categories of the respondents as to the causes and effects of conflict. The correlation coefficient which shows higher value indicates that there is a high degree of agreement between the 3 categories of respondents (Sambasivan and Yau, 2006).

4.8.2.1 Spearman Rank Correlation Analysis for Causes

Table 4.36: Spearman Rank Correlation of Causes between Developer and Contractor

		Developer	**Contractor**
Spearman's rho	**Developer** Correlation Coefficient	1.000	-0.200
	Sig. (2-tailed)	.	0.800
	N	4	4

Contractor	Correlation Coefficient	-0.200	1.000
	Sig. (2-tailed)	0.800	.
	N	4	4

Table 4.36 show the Spearman Rank Correlation of Causes between Developer and Contractor. The Coefficient correlation (r_s) show -0.200, which mean negative correlation. Significant value is 0.800, which is more than 0.05. Thus, the correlation is not significant.

Table 4.37: Spearman Rank Correlation of Causes between Developer and Consultant

			Developer	**Consultant**
Spearman's rho	**Developer**	Correlation Coefficient	1.000	0.800
		Sig. (2-tailed)	.	0.200
		N	4	4
	Consultant	Correlation Coefficient	0.800	1.000
		Sig. (2-tailed)	0.200	.
		N	4	4

From the Table 4.37, the correlation between Developer and Consultant shows 0.800, meanwhile it is positive correlation. However, the significant value is 0.200, which is higher than 0.05, thus it considered as no relationship between Developer and Consultant in the ranking of causes.

Table 4.38: Spearman Rank Correlation of Causes between Contractor and Consultant

			Contractor	**Consultant**
Spearman's rho	**Contractor**	Correlation Coefficient	1.000	-.400
		Sig. (2-tailed)	.	.600
		N	4	4

Consultant	Correlation Coefficient	-.400	1.000
	Sig. (2-tailed)	.600	.
	N	4	4

As shown in Table 4.38, the Coefficient correlation (r_s) between Contractor and Consultant is -0.400. It shows negative correlation between both variables. The significant value of 0.600 is greater than 0.05, thus there is no relationship between Contractor and Consultant in causes ranking.

In overall, there have no relationship between the Developer, Contractor and Consultant in the Spearman Rank Correlation of causes of internal conflict in construction industry.

4.8.2.2 Spearman Rank Correlation Analysis of Effects

Table 4.39: Spearman Rank Correlation of Effects between Developer and Contractor

			Developer	**Contractor**
Spearman's rho	**Developer**	Correlation Coefficient	1.000	-.400
		Sig. (2-tailed)	.	.600
		N	4	4
	Contractor	Correlation Coefficient	-.400	1.000
		Sig. (2-tailed)	.600	.
		N	4	4

Table 4.39 show the Spearman Rank Correlation of effects between Developer and Contractor. The Correlation coefficient is -0.400, which has the negative correlation. 0.600 of the significant value, which is greater than 0.05, show that there is no relationship between Developer and Contractor in effects.

Table 4.40: Spearman Rank Correlation of Effects between Developer and Consultant

			Developer	Consultant
Spearman's rho	**Developer**	Correlation Coefficient	1.000	0.632
		Sig. (2-tailed)	.	0.368
		N	4	4
	Consultant	Correlation Coefficient	0.632	1.000
		Sig. (2-tailed)	0.368	.
		N	4	4

As shown in Table 4.40, the Correlation coefficient shows 0.632, which mean there are positive correlation between Developer and Consultant. The significant value of 0.368 is greater than 0.05, thus, the correlation between Developer and Consultant has no relationship.

Table 4.41: Spearman Rank Correlation of Effects between Contractor and Consultant

			Contractor	Consultant
Spearman's rho	**Contractor**	Correlation Coefficient	1.000	0. 316
		Sig. (2-tailed)	.	0.684
		N	4	4
	Consultant	Correlation Coefficient	0.316	1.000
		Sig. (2-tailed)	0.684	.
		N	4	4

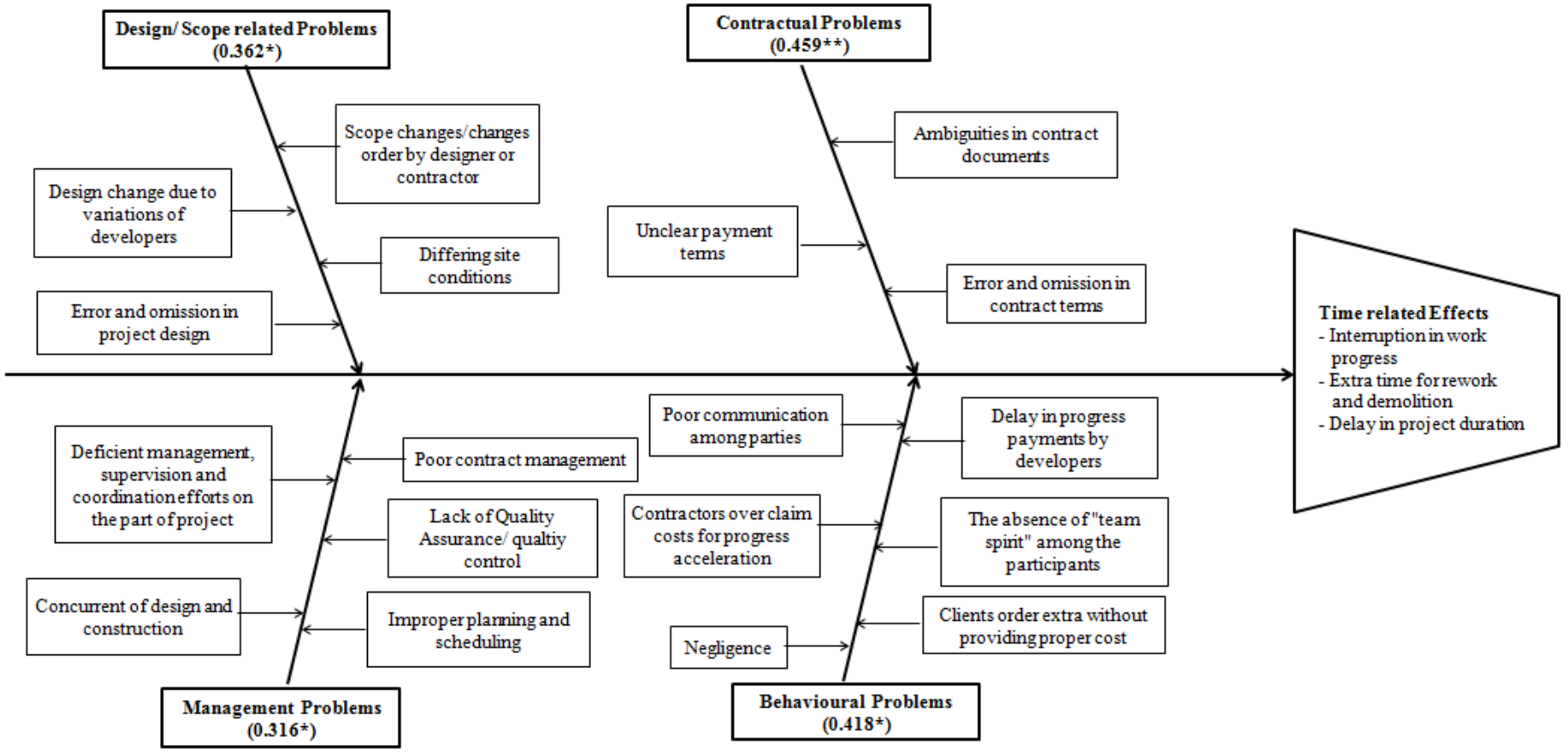
From the Table 4.41, it show that the r_s of correlation between Contractor and Consultant is 0.316, positive correlation; however, the significant value show 0.684, means it is greater than 0.05. Therefore, the correlation shows no relationship between both of the respondents.

In overall, there have no relationship between the Developer, Contractor and Consultant in the Spearman Rank Correlation of effects of internal conflicts in construction industry.

4.9 FISHBONE DIAGRAM

Fishbone diagram is a Cause-and-effect diagram, which have the function in identifying, explores and display all the causes or contributing factors (Li et al, 2000). It also known as Ishikawa diagram, which is a useful quality tools used in manage and control the quality (Noyel et al, 2013). Fishbone diagram benefit in used since it can provide easy and understanding visual in the representation of the causes, categories of causes, and effects (WBI Evaluation Group, 2007). Figure 4.25 to Figure 4.28 show that the Fishbone diagram for 4 groups of causes with the Pearson Correlation Coefficient, to the 4 groups of effects.

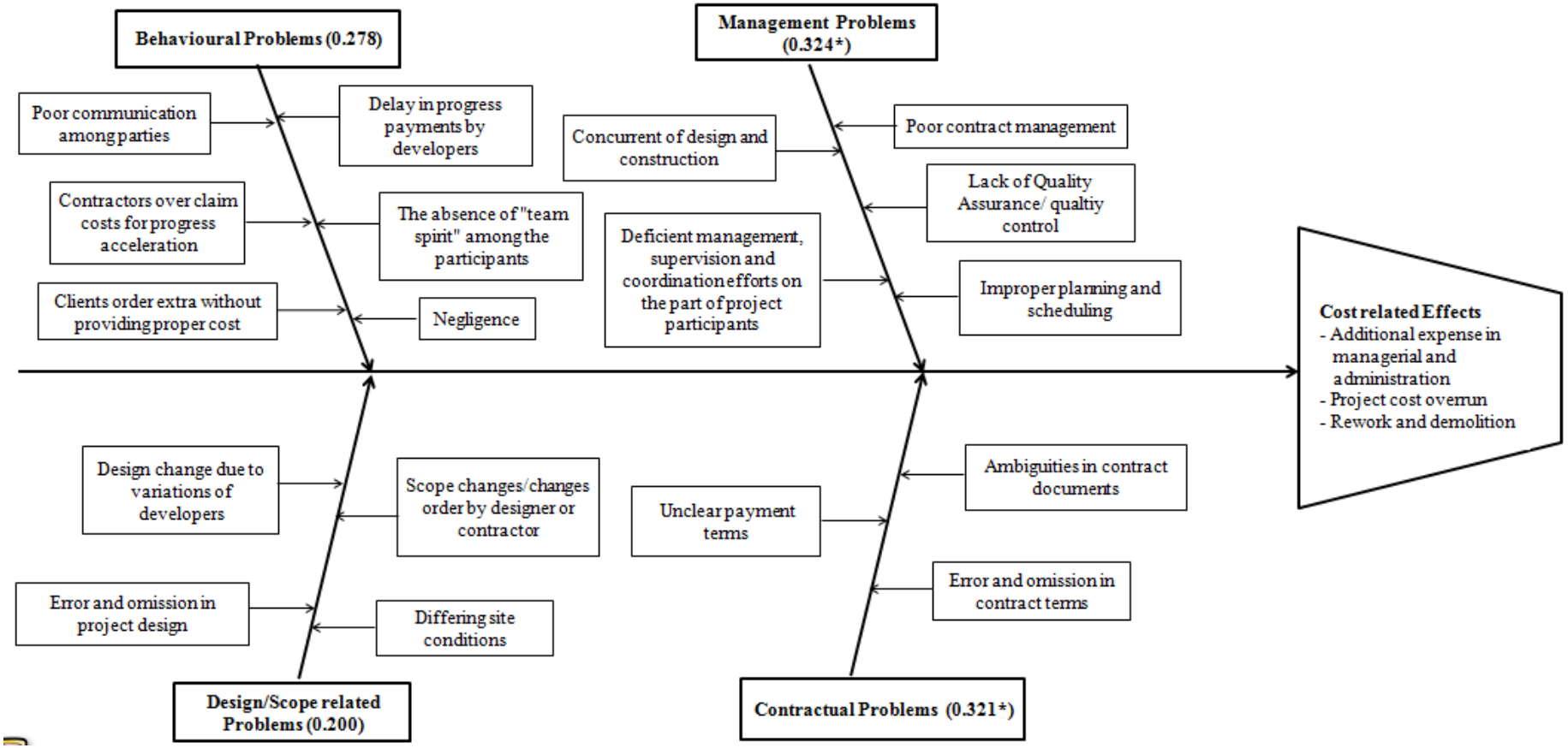
Figure 4.25: Fishbone diagram of Causes to Time related Effects



*. Correlation is significant at the 0.05 level (2-tailed).

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

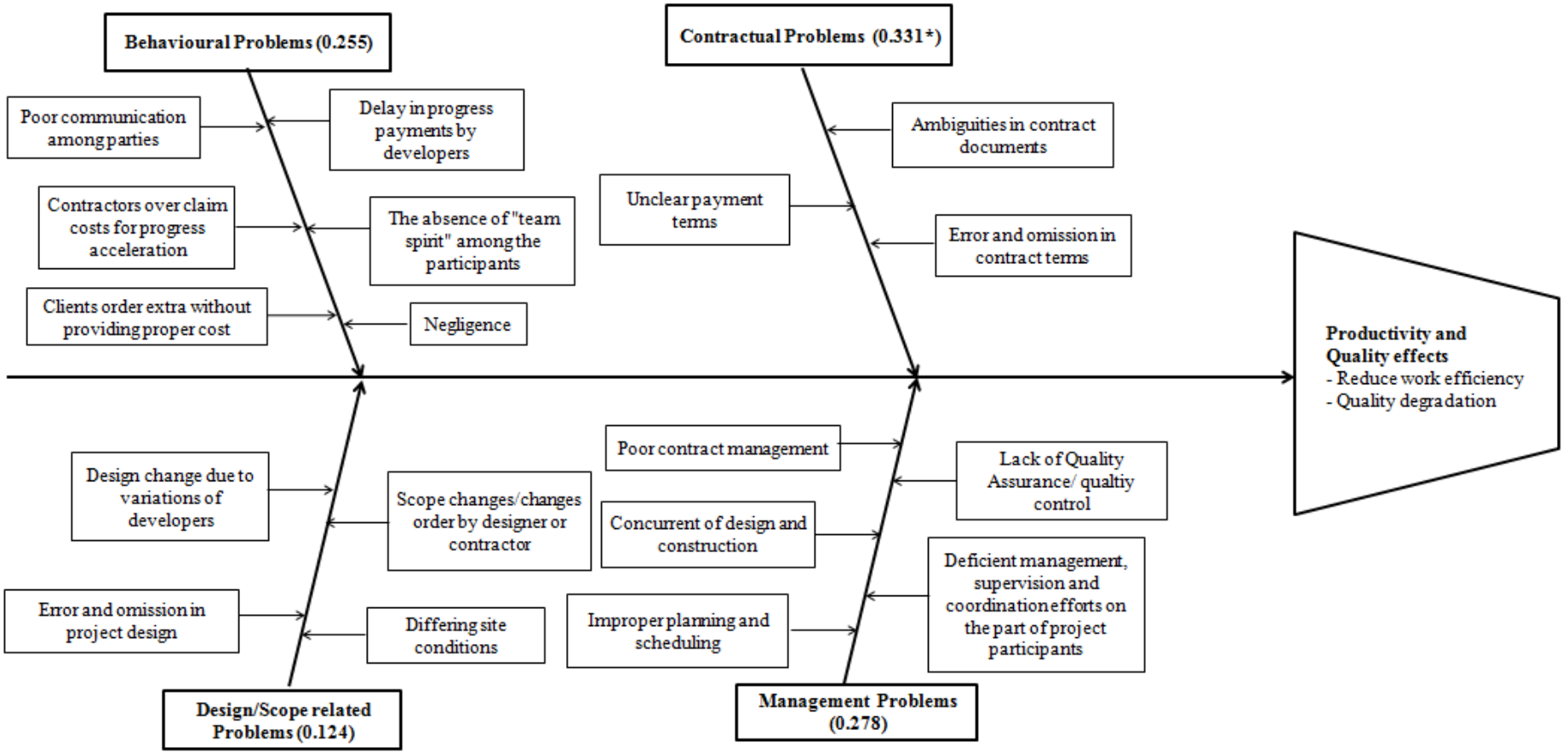
Figure 4.26: Fishbone diagram of Causes to Cost related Effects



*. Correlation is significant at the 0.05 level (2-tailed).

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

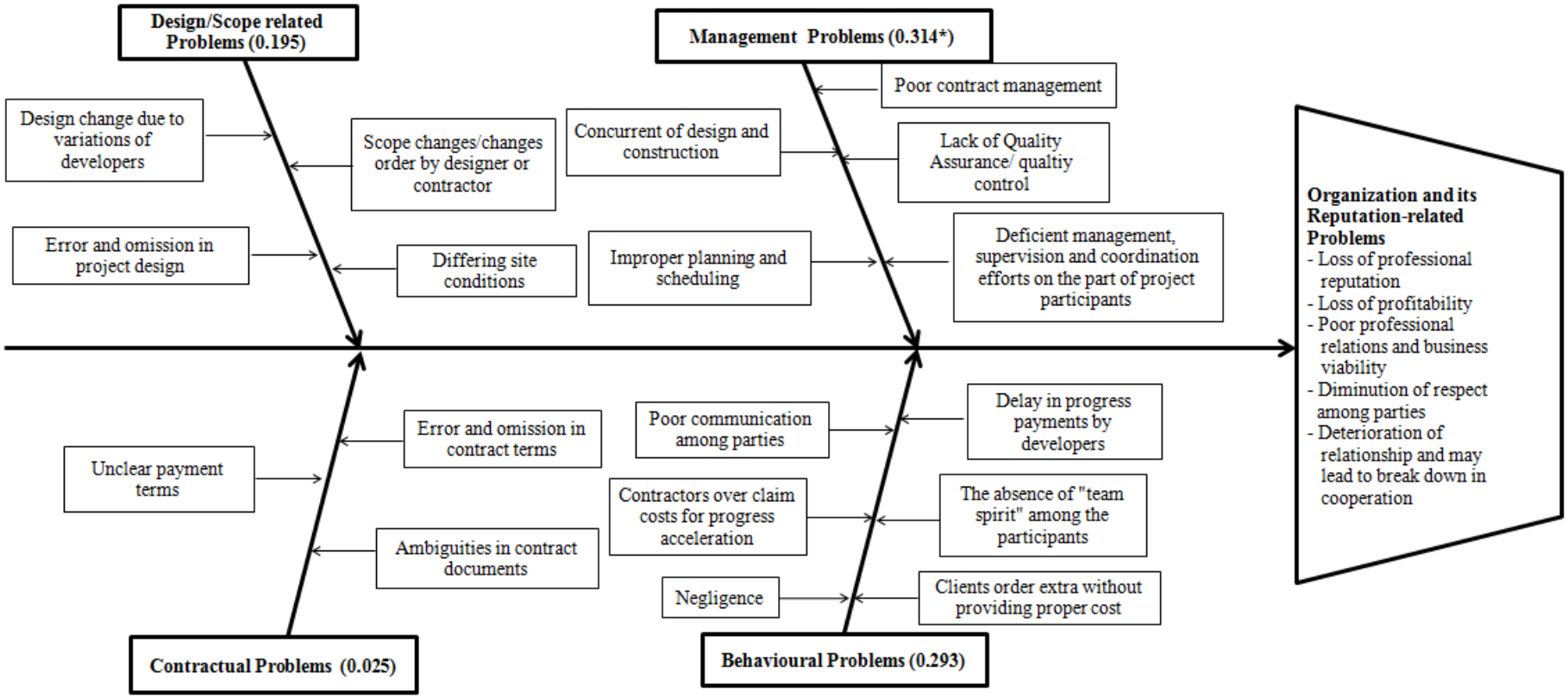
Figure 4.27: Fishbone diagram of Productivity and Quality Effects



*. Correlation is significant at the 0.05 level (2-tailed).

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

Figure 4.28: Fishbone diagram of Organization and its Reputation Effects



*. Correlation is significant at the 0.05 level (2-tailed).

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

4.10 DISCUSSION

In this research, one of the objectives is to identify the causes of the internal conflict in construction industry. In this section, the result shown by the analysis on the causes of conflict has been discussed. From the analysis, the cause with highest overall mean rank is Poor communication among parties, with the value of 4.45. The construction industry is complex since it involved various parties with different of interests and knowledge. Thus, conflict occurs due to the business relations and arguments which related to contractual or social had increased since there is an increase in the number of project participants with different culture background. (Cakmak et al., 2013; Kumaraswamy and Yogeswaran, 1998). The second highest mean ranked by the respondents is Error and Omission in Project Design, with the highest mean value of 4.39. Al- Dubaisi (2000) show that it is impossible 100% no error exist in a design. The error and omission in project design can make the project costly and may lead to cost overrun. The parties involved in the project such as developer, consultant or contractor may reject to undertake any responsible or shift the blame to others shoulder. The internal conflict arises due to they reject to recognize and accept the responsibilities if there are any mistake. Other than that, the respondents rank that Error and Omissions in the Contract Terms (mean value 4.36) as the third significant cause that lead to internal conflict. Error and omissions in the contract term may lead to ancillary cost which used to remedy any design error in the contract. Ancillary cost is the excess cost direct from the project (Shuib et al., 2011). The conflict may arise between contractor and developer due to unwilling to burden the overruns in project cost. Therefore, the project cost overrun may lead to dispute among project participants, since they are unwilling to responsible on it.

Another objective of this research is to identify the effects of internal conflict in construction industry. As the result shown in the earlier section data analysis, Lost of Profitability show the highest ranking in overall mean of effects, 4.45 of mean. For instances, when the project exists error and omission, there may lead to conflict among the project parties, and arising with the claims issue by one project party to another. Mohsin (2012) stated that the claims can be in money compensation or

extension in project duration. Claims in money may lead to large amount of compensation; therefore the parties involved may undergo loss of profit in the project. On the other hand, respondents rank that the Delay in Project Duration is the second critical effects that lead by conflict in construction industry, with the mean value of 4.43. There are some of the conflicts which are critical and may involve the process of risk settlement or legal claim issue to resolve it. The process of the conflict resolution always spends much time than as specific (Chua, 2004). Thus, it can be said that the conflict can lead to project complete duration delay. Besides that, as discuss on above that conflict in construction industry can lead to legal claim and project duration delay, both of these can make the project facing over cost problems, thus, the " Project Cost Overrun" is rank as the third highest of effects.

The third objective of this research is to examine the relationship between causes and effects of conflicts in construction industry. In order to achieve the objective, Pearson Correlation Coefficient Analysis had been used to test the relationship between two variables, Causes and Effects. From the Pearson Correlation Analysis, the correlation between the minor causes and minor effects of conflict has shown positive in relationship, which means if the causes arise, so does the effects; although the positive correlation is weak. The cause of Contractual problems shown significant and weak positive relationship with Time related effects, at significant level of 0.01; with Cost related effects and Productivity and quality effects at significant level of 0.05. Whereas there is weak positive relationship between cause of Design/scope related problems and Time related effects. On the other hand, Management problems have the weak positive and significant correlation with the effects of Time, Cost and Productivity and Quality effects, at the significant level of 0.05. Behavioural problems had also shown weak positive correlation with the Time related effects, which is significant at 0.05 levels. In other side, Spearman Rank Correlation Coefficient Analysis show that there are no relationship or no any agreement between Developer, Contractor and Consultant in the Causes and Effects ranking. Thus, it can be considered as the Developer, Contractor and Consultant hold their own views in ranking the causes and effects of internal conflict in construction industry.

4.11 SUMMARY OG RESEARCH FINDINGS

Based on the findings and data analysis, there are 31.80% from the total 44 of the respondents are falls under 31 to 40 years old. From the 44 total respondents, 61.40% are male, and 25.00% are held the project manager position in the company. There are 3 categories of respondents, which is Developer, Contractor and Consultant. From the data collected, the majority of the respondents are Contractor (50%). Besides that, among the 44 of the respondents, there are 31.80% had work more than 15 years; and 50% among the respondents hold highest education level of Bachelor Degree.

Table 4.42: The Summary of the Correlation between Causes and Effects of Internal Conflicts

Causes / Effects	Contractual problems	Design/Scope related problems	Management Problems	Behavioural Problems
Time Related Effects	0.459**	0.362*	0.316*	0.418*
Cost Related Effects	0.321*	0.200	0.324*	0.278
Productivity and Quality Effects	0.331*	0.124	0.278	0.255
Organizational and Reputational Effects	-0.025	0.195	0.314*	0.293

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

*. Correlation is significant at the level 0.05 level (2-tailed).

The Pearson Correlation Analysis is used to test the strength and the direction of the linear relationship between the causes and effects of internal conflict. Table 4.42 show the summary of the correlation of all the causes and effects of internal

conflict. In overall, there are half of the correlation have the significant weak positive in correlation; such as all the causes with the time related effects, Contractual problems with cost related effects, Management problems with cost related effects, Contractual problems with Productivity and quality effects, and Management problems with Organizational and its reputation-related effects.

Table 4.43: Summary of Spearman Rank Correlation of Causes between Developer, Contractor and Consultant

Respondents Categories	Values	Types of Correlation
Developer–Contractor	Correlation Coefficient: -0.200 Sig. (2 tailed): 0.800	No relationship
Developer–Consultant	Correlation Coefficient: 0.800 Sig. (2 tailed): 0.200	No relationship
Contractor–Consultant	Correlation Coefficient: -0.400 Sig. (2 tailed): 0.600	No relationship

Table 4.44: Summary of Spearman Rank Correlation of Effects between Developer, Contractor and Consultant

Respondents Categories	Values	Types of Correlation
Developer–Contractor	Correlation Coefficient: -0.400 Sig. (2 tailed): 0.600	No relationship
Developer–Consultant	Correlation Coefficient: 0.632 Sig. (2 tailed): 0.368	No relationship
Contractor–Consultant	Correlation Coefficient: 0.316 Sig. (2 tailed): 0.684	No relationship

Spearman Rank Correlation Analysis is used to test the degree of agreement between Developer, Contractor and Consultant; as to the ranking of causes and effects of conflict. The correlation coefficient which shows higher value indicates

that there is a high degree of agreement between the 3 categories of respondents. As shown in the Table 4.43 and Table 4.44, overall, there have no relationship between Developer, Contractor and Consultant in the Spearman Rank Correlation of the Causes and Effects ranking, since the all the significant value shown is greater than 0.05.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

This chapter highlighted the limitation and recommendation of the research study. The limitation discussed about the constraint that faced by researcher during conduct the survey; while the suggestion to reduce the limitation will be mention in recommendation. The research is then finalized by a conclusion.

5.2 LIMITATION

There are some limitation and constraints encountered in this research study. One of the limitations is low response rate of questionnaire returned by the respondents. This research achieved 32.84% of the response rate. The questionnaire return rate is low, but is considered as acceptable. However, the result shown by the data collected from this 32.84% of the response rate may be low in accuracy, since that the minority of the response may not equivalent to the real situation in the construction industry (Chua, 2012). Other than that, there is time limitation in this research. Since the response rate for the questionnaire return is low due to the by using the mail posting and emailing, it may required much time to collect more of the

data to increase the response rate. However, the time given for collecting the data has a limit, therefore researcher may only used that 32.84% of the data to do analysis.

5.3 RECOMMENDATION FOR THE FUTURE STUDY

After conducted of this research, there are some of the recommendations should be considered for the further study. Besides using mail posting and emailing the questionnaire, the researcher should distribute the questionnaires by hand in order to increase the response rate in the future study. Distribution by hand can show the sincerity of researcher and increase the credibility of the respondents, followed by answering the questionnaire with honestly. On the other hand, the questionnaire for the survey is encouraged to use open-ended question, in order to receive more of the view and suggestion from the respondents in the related topic.

5.4 CONCLUSION

The research aim in investigating the causes and effects that lead to internal conflict in construction industry and to examine is there any relationship between the causes and effects. Therefore, the research conducted analysis had interpreting and achieve all the objectives in this research. In overall, the respondents agree that the Contractual Problem is the significant causes that lead to internal conflict in construction industry, since it achieve the highest ranking of mean with the value of 4.26. Following by the Design/Scope related Problem, Management Problem and Behavioural Problems. On the other side, the most critical effects that average agreed by all the respondents is Time related Effects (4.22 of mean value), followed by Organization and its Reputation related problems, Cost related Effects and Productivity and Quality Effects. In conclusion, there have no relationship or inconsistent in the agreement among the Developer, Contractor and Consultant to the Causes and Effects; however, there have weak positive correlation between half of the Causes and Effects of internal conflict in construction industry.

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A STUDY ON THE CAUSES AND EFFECTS OF CONFLICT IN CONSTRUCTION INDUSTRY

QUESTIONNAIRE

SECTION A: GENERAL INFORMATION OF RESPONDENTS

1. Name:

2. Age:

3. Gender: ☐ Male ☐ Female

4. Position in Company: _____

5. Type of organization of your company:

   ☐ Developer
   ☐ Consultant (*Please choose type of consultant: Quantity Surveyor / Architect / Civil Engineering / Others:* _____)
   ☐ Contractor (*Please choose your grade: 1 / 2 / 3 / 4 / 5 / 6 / 7*)
   ☐ Others: (*Please state*) _____

6. Working experience in Construction industry (years):

   ☐ Less than 5 ☐ 11-15
   ☐ 5 – 10 ☐ More than 15

7. Highest Level of education: SPM / STPM / Bachelors Degree / Masters Degree / PHD / Others (*Please state*): _____

SECTION B: CAUSES LEAD TO INTERNAL CONFLICTS IN CONSTRCUTION INDUSTRY.

Please answer the questions below as accurately as possible based on your company experience. How important the causes towards the conflict in construction industry?

1- Not Very Important
2 - Somewhat Important
3 - Moderately important
4 - Important
5 - Extremely important

A) Contractual problems	**Importance scale**				
1. Ambiguities in contract documents	1	2	3	4	5
2. Error and omission in contract terms	1	2	3	4	5
3. Unclear payment terms	1	2	3	4	5

B) Design/ scope related problems	**Importance scale**				
1. Scope changes/ changes order by designer or contractor	1	2	3	4	5
2. Error and omission in project design	1	2	3	4	5
3. Design Change due to Variations of Developers	1	2	3	4	5
4. Differing Site Conditions	1	2	3	4	5

C) Management problems	**Importance scale**				
1. Poor contract management	1	2	3	4	5
2. Lack of Quality Assurance/ Quality Control	1	2	3	4	5
3. Improper planning and scheduling	1	2	3	4	5
4. Poor contract management	1	2	3	4	5
5. Deficient management, supervision and co-ordination efforts on the part of project participants	1	2	3	4	5
6. Concurrent of design and construction	1	2	3	4	5

D) Behavioural problems	Importance scale				
1. Poor communication among parties	1	2	3	4	5
2. Contractors over claim costs for progress acceleration	1	2	3	4	5
3. Client orders extra without providing proper cost reimbursement	1	2	3	4	5
4. Delay in progress payments by owner	1	2	3	4	5
5. Hostility, callousness, and cynicism are manifested by member(s) of the project team	1	2	3	4	5
6. The absence of "team spirit" among the participants	1	2	3	4	5
7. Negligence	1	2	3	4	5

SECTION C: EFFECTS CAUSED BY INTERNAL CONFLICTS IN CONSRTUCTION INDUSTRY

Please answer the questions below as accurately as possible based on your company experience. How important the effects towards the conflict in construction industry?

1- Not Very Important
2 - Somewhat Important
3 - Moderately important
4 - Important
5 - Extremely important

A) Time related effects	Importance scale				
1. Interruption in work progress	1	2	3	4	5
2. Extra time for rework and demolition.	1	2	3	4	5
3. Delay in project duration	1	2	3	4	5

B) Cost related effects	Importance scale				
1. Additional expense in managerial and administration.	1	2	3	4	5
2. Project Cost overrun.	1	2	3	4	5
3. Rework and demolition costs for resources.	1	2	3	4	5

C) Productivity/ Quality effects	Importance scale				
1. Reduce work efficiency	1	2	3	4	5
2. Quality degradation	1	2	3	4	5

D) Organization and its reputation-related effects	Importance scale				
1. Loss of professional reputation	1	2	3	4	5
2. Loss of profitability	1	2	3	4	5
3. Poor professional relations and business viability	1	2	3	4	5
4. Diminution of respect among parties	1	2	3	4	5
5. Deterioration of relationship and may lead to break down in cooperation.	1	2	3	4	5

Please attach your signature, name and phone number here (with company chop if possible) to validate the participation in answering the questionnaire.

_____

Name:

Phone number:

Thank you very much for spending your time in answering this questionnaire. Your cooperation is much appreciated.

Gantt chart for Final Year Project 1

No.	Task	Week													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Meeting with Supervisor, propose the potential title and research objectives.														
2	Confirmation and approval of research title and objectives by supervisor.														
3	Information collection from articles and journal.														
4	Preparation for Chapter 1 (Introduction).														
5	Preparation for chapter 2 (Literature Review).														
6	Preparation for chapter 3 (Research Methodology).														
7	Develop research questionnaire.														
8	Modifying, finalize and Submission of the FYP 1.														
9	Preparation of presentation (slide).														
10	PSM 1 presentation														

Gantt chart for Final Year Project 2

No.	Task	Week													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Finalize questionnaire														
2	Identify the respondents														
3	Distribute questionnaires														
4	Collect questionnaires														
5	Analyse the data collected														
6	Report the progression														
7	Modify and finalize chapter 1 to 5														
8	Submit PSM 2														
9	Prepare for presentation														
10	PSM 2 presentation														