

Preliminary Studies of Delays in Construction Projects

Tan Chin Keng^{1*}, Amalin Sofia Ismail¹ and Yeoh Kah Ching²

¹Department of Quantity Surveying, Kulliyah of Architecture and Environmental Design, International Islamic University Malaysia, Kuala Lumpur, Malaysia

²Department of Business and IT, New Era University College, Kajang, Selangor, Malaysia

*Corresponding author's email:
tckeng@iium.edu.my

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ABSTRACT

Project delays are referred to a situation where the project is not completed within the schedule. Projects can be delayed for a large number of reasons and usually will contribute to the cost and time overruns. Project delays are considered as one of the common problems in the construction industry and usually, causing negative effects on the project in terms of performance, time and cost. In relation to the construction projects in Malaysia, the objectives of the study are as to identify the factors causing project delays and to suggest solutions to reduce project delays. The researcher conducted three (3) semi-structured interviews to collect data to achieve the objectives. The interview sessions were conducted among three contractors chosen from different companies to access about their experience involving the project delays. The respondents were requested to comment to the factors for project delays and to suggest approaches for overcoming the problems of project delays. The research findings indicate that financial constraints, delay in subcontractors' works and improper project planning are the major causes of project delays. The findings of the research suggest that manage financial resources efficiently, clients to pay progress payment to contractors on time, effective communication between contractors and labours, motivate labours through proper training, and proper project planning can help to reduce project delays.

INTRODUCTION

In any construction project, the parties will have specific goals or objectives to be achieved. Elbeltagi (2009) said the goal of a construction project is to build something and what differentiate the construction industry from other industries is that its projects are large, built on-site and generally unique. Then, originally construction project have specific properties and additional constraints in terms of specifications, project duration and processes (Drewer, 2001). Since the construction industry is complex, having many impacts and constraints, it can be said that project delays are a common phenomenon.

Project delays are commonly related to the parties who involved directly in construction projects. As defined by Aibinu and Jagboro (2002), project delays are a situation where a contractor and the project owner jointly or severally contribute to the non-completion of the project within the original or the stipulated or agreed contract period. Besides that, Stumpf (2000) stated that a delay is an act or event that extends the time required to perform the tasks under a contract. It was further supported by Sanders and Eagles (2001) that define delay as an event that causes extended time to complete all or part of a project. In other words, delay can be simply referred to a situation where the project is not completed within the schedule or in the fixed time.

Delays in construction projects happen because of various factors or causes. These causes lead to the delays in construction completion and some negative effects on the construction project (Haseeb et al., 2011). In addition, there are two categories of causes of delays; internal causes and external causes. Internal causes arise from the parties to the contract (e.g. contractor, client, and consultant) while external causes arise from events beyond the control of the parties. These include the act of God, government action, and material

suppliers (Ahmed et al., 2003). Since many stakeholders in construction are becoming increasingly concerned about the duration of construction projects because of increasing interest rates, inflation, commercial pressures (Nkado, 1995), thus it is important to avoid any possibilities of delays from happening and to find the way to reduce the delays in the construction projects.

PROBLEM STATEMENT

Project delays are one of the most common, costly, complex and risky problems encountered in construction projects (Alaghbari et al., 2005). Projects can be delayed for a large number of reasons and usually will contribute to the cost and time overruns. Project delays are considered as one of the common problems in the construction industry and usually, causing negative effects on the project in terms of performance, time and cost.

Sambasivan and Soon (2007) reported that in 2005, about 70.3 percent of 417 government's contract in Malaysia were delayed or abandoned for more than three months.

Most of the project delays create the negative consequences either during or after the construction phase. There must be reasons for delays to happen in any construction projects. It might be caused by any project member especially the contractor who is the main player during the construction process. Intan (2012) said that the project delays can make the disruption of works and loss of productivity, completion of the project are late, increased of time-related costs, third party claims, abandonment or even termination of the contract.

Many small and large size contractors have voiced their concerns over the difficulty to overcome the problem of project delays.

The main reason is because the contractors have no ability to identify the causes of delays (Alwi et al., 2003). Due to a large amount of small and medium contractors available in the construction industry, the competition in bidding for tenders is often very high forcing small and medium contractors to estimate the costs and margin in an overly optimistic term minimising the overall tendered price. The issues above often lead to additional construction problems such as poor quality of the final output, poor productivity due to insufficient labour, materials and even equipment on site. Thus, this overly optimistic estimated cost often as well leads to improper means and method of construction leading to project delays and additional amendments required (Smith and Bohn, 1999).

These contractors have limited personnel in terms of both availabilities and abilities. They normally employ a very limited number of employees due to a small amount of projects bid (Thwala and Phaladi, 2009). Because of unaffordability to hire proficient personnel, so their employees possess limited abilities, particularly sophisticated skills. Poor coordination on site and poor communication system can lead to more problems arising upon undertaking a project that lead to project delays.

The need to control the factors of delays during the construction process is because the the number of the project delays are increasing from time to time. Malaysia has no exception in this problem, it is important to study on the factors and effects of causing project delays before finding the solutions to resolve the problem. Chang (2002) suggested that identifying factors is usually the first step when addressing a problem and then corrective actions can be taken.

OBJECTIVES

In relation to the construction projects in Malaysia, the objectives of the study are as follows:

- (a) To identify the factors causing project delays
- (b) To suggest solutions to reduce project delays

LITERATURE REVIEW

Factors Causing Delays in Construction Projects

Delays in construction projects are considered one of the most common problems causing a multitude of negative effects on the project and its participating parties. Therefore, it is essential to identify the actual causes of delays in order to minimise and avoid the delays and their corresponding expenses. There are two categories of causes for delays in construction projects which is external causes and internal causes. Internal causes of delays include the causes arising from four parties involved in the project. These parties include the owner, designers, contractors, and consultants. Other delays, which do not arise from these four parties, are based on external causes for example from the government, materials suppliers, or the weather (Ahmed et al., 2003).

According to Toor and Ogunlana (2008), although the principle reasons for delays are comparable across developing countries, several factors pertaining to local industry, social-economic, cultural issues and project characteristics also contribute to delays. Delays may occur as a result of the actions or inaction on the part of owner, contractor, subcontractors, consultants or the government. In addition, delays are always interrelated which led to the more complicated situation.

Internal Causes

A construction plan created for a project relies on the performance of owners, designers, contractors, subcontractors, and suppliers, as well as the co-ordination among them. A single event that deviates from the plan, such as a change in the scope of the project, can disturb the overall performance and can create turbulence among the parties (Varghese, 2015). Sambasivan and Soon (2007) also reported that the factors of delays are due to the lack of communication between parties and mistakes made during the construction stage. It was also found that financial problems are some of the most critical factors that can trigger project failure in terms of delays (Alaghbari et al., 2007; Sweis et al., 2008). This is due to incessant increases in construction cost by contractors during construction which often leads to delays in payment and subsequent interruption of cash flow mechanisms.

Contractors Factor

In most cases, projects are awarded to the lowest bidder. Some of the lowest bidders may lack management skills and less attention is paid to contractor's plan, cost control, overall site management, and resource allocation (human, financial and material resources). Ogunlana and Olomolaiye (1989) and Wahab (1997) postulated that many contractors in developing countries are entrepreneurs who are in the business of making money at the expense of good management. They pay low wages, submit very low bids and have very little if any, the ability to plan and coordinate contracts.

Due to financial constraints, main contractors always make delay in payment to sub-contractors. This will discourage those sub-contractors to finish work on time and then resulting in delays (Varghese, 2015). Apart from that, even though contractor managed

to get new projects but they could not afford to bear the additional staffs. In this situation will put contractor into a condition that contractors could not implement the projects smoothly and will lead to a problem in fixing sufficient staffs into new project site. Arditi et al. (1985) found that most of the contractors quite slow in improving the good practices with relating to change of times and number of projects obtained. Most of the contractors also did not interest to take the competent technical and management staffs. This was due to their unawareness of the potential benefits that can be obtained. Also, there are unable to analyse the job requirement, risk management, marketing, financial control, work organisation, quality control and preparation of reasonable tender.

Oglesby et al. (1989) found that lack of planning and lack of knowledge in project control and also a lack of record keeping contribute to delay of project completion. Most of the contractor did not familiar with the modern practice to arrange works, plan, critical- path analysis and control technique. Contractors sometimes have resources, but due to lack of planning will cause them fail to achieve scheduled target.

Odeh and Battaineh (2002) identified the most important causes of delays in construction projects with the traditional type of contracts and among the factors including inadequate contractor experiences and subcontractors. This study also supported by Sambasivan and Soon (2007) that identified the delays factors resulted from contractor related were: (1) contractor's improper planning, (2) contractor's poor site management, (3) inadequate contractor experience. In addition, Varghese (2015) stated that inadequate of experience sometimes may affect the quality of work and can lead to re-correction of finished work due to errors.

Other Parties Factor

Delays caused by the client such as late submission of drawings and specifications, frequent change orders, and inadequate site information generates claims from both main contractors and subcontractors which involved huge financial repercussions. Client's inadequate financial resources and payments for completed work also can result in a delay of contractors working (Sambasivan and Soon, 2007).

Besides that, the clients or owners, particularly those new to construction are often so intent on cutting costs and speeding up schedules that they expect that hiring their own contractors will work miracles. This is one of the problems involving the owner that can contribute to delays. Some of the researchers also mentioned the possible factors causing delays by other parties (excluding contractor) during the construction are consultants, owners and labour (Ahmed et al., 2003; Alaghbari, 2005; Varghese, 2015).

External Causes

The external causes usually are unpredictable and do not involve the construction parties. It can be due to the economic condition or political stability in one country that continuously changes that will affect the estimated overall cost of construction. In other situation, the delay can happen because of the unforeseeable event i.e. natural disaster (earthquake, flood, etc.). As stated by Varghese (2015), a typical construction project suffers from high risks associated with schedule delays and time-based disputes, since time is of the essence of the construction contract. Other than that, Ahmed et al. (2003), Alaghbari (2005) and Varghese (2015) also determined the external factors that causing delays as follows:

- (a) Supplier and Material
- (b) Government/Authority
- (c) Environmental conditions
- (d) Economic conditions

Among other factors mentioned above, the category of material related to delays was identified as one of the causes of delays in construction projects. Okpala and Aniekwu (1988) found that lack of construction materials in the market always became an excuse for delay in project completion.

According to Fugar et al. (2010), material group delay factors were ranked the second most important factors responsible for construction delays in Ghana. The shortage of material problem was related to the ability of the client to honour certificate. This caused of unavailability of materials on site at right time was due to the suppliers were reluctant to supply materials on credit because contractors could only pay them once the contractor had received the payment from the client.

Approaches to Reduce Delays in Construction Projects

The prevention of delays is possible when all the project stakeholders work as a team to ensure the success of the project. It is also important for the client to employ a proactive consultant, freeze the design and details before the commencement of the project and employ well reputed contractors for the project.

The delays can be controlled by improving productivity and factors that affect productivity are dealt with the purpose of further increasing productivity and thereby reducing delays. The conclusion of the investigation is ranking of the factors and factor categories that are considered by various project stakeholders. The areas of disparity between the stakeholders are indicated by their experiences, prejudices and ineffective communication. Thus, the project scope factors can be supported by effective communications between all stakeholders (Asif, 2009).

In a study conducted by Aibinu and Jagboro (2002), they identified two methods to minimise or if possible, eliminate time overrun.

There was an acceleration of site activities and contingency allowance. Odeh and Battaineh (2002) also suggested some approaches reduce the delays: enforcing liquidated damage clauses; offering incentives for early completion; developing human resources through proper training; and adopting new approaches to contracting, such as design-build and construction management types of contracts.

Proper Planning

According to Thomas et al. (2007), planning is an essential function of project management. The planning and analysing the details can be done by interactive planning which includes an integrated program that defines key milestones, constraints and identifies the major issues that may affect the project. The importance of pre-project planning and its effect on the success of the project has been recognised even though the process varies with organisations, pre-project planning process varies significantly throughout the construction industry from one organisation to another, and from one business sector to another (Gibson et al., 2006).

Further, a detailed project execution schedule needs to be developed in coordination with the project team that includes inputs from the team members. This will enable to get a commitment from the project team and everybody will have the knowledge of the requirements. Special attention has to be given to the coordination of inter-discipline works and their sequence. The responsibilities also have to be identified for the project (Asif, 2009).

Risk Allocation

According to Barati and Mohammadi (2008), the allocation of risks in construction projects is towards the supplier and this increases the cost of government projects compared to

the private sector. For every project whether it is a mega project or a small sized project, the identification of all risks for that project is essential in initial stages. This will help in developing action plans to meet those risks and the make all the stakeholders aware of their effects if not attended to at the initial stages itself. Risks and uncertainty are intrinsic for all projects. The success of any project is determined by the fact as to how the risks associated with the project are managed throughout the entire lifecycle of the project. The application of risk management equips team members with the ability to develop a formal process of systematically identifying, analysing, and formulating an effective risk management strategy. A risk management strategy will mitigate the potential for loss and monitor risk events from the conceptual development of the project throughout its life cycle (Gawad et al., 2008).

Preparing Work Schedule

Projects undertaken have to prepare a schedule of works in which the activities have to be sequenced in a logical manner to demonstrate as to how the works would be undertaken. The aspect of allowing a logical sequence of works to proceed in a modular way is the best way to ensure the success of any project. The project duration is normally fixed when the contract is signed. The details related to the individual activities durations are based on the elements like the quantities and other variables which can impact the estimate for the duration of the activity (Asif, 2009). Thus, the project should implement a system that would integrate all the elements of the work and ensure that these are monitored for the performance.

Influences of Construction Parties

Assaf and Al-hejji (2006) in their research has determined some points in order to minimise and control delays in construction projects influencing both owners and contractors.

Owners should give special attention to the following factors:

- (a) Pay progress payment to the contractor on time because it impairs the contractor's ability to finance the work;
- (b) Minimise change orders during construction to avoid delays;
- (c) Avoid delays in reviewing and approving of design documents than the anticipated;
- (d) Check for resources and capabilities, before awarding the contract to the lowest bidder.

The contractors should consider the following factors:

- (a) Shortage and low productivity of labour: enough number of labours should be assigned and be motivated to improve productivity;
- (b) Financial and cash flow problems: contractor should manage his financial resources and plan cash flow by utilising progress payment;
- (c) Planning and scheduling: they are continuing processes during construction and match with the resources and time to develop the work to avoid cost overrun and disputes;
- (d) Site management and supervision: administrative and technical staff should be assigned as soon as the project is awarded to make arrangements to achieve completion within specified time with the required quality, and estimated cost.

METHODOLOGY

The researcher conducted three (3) semi-structured interviews to collect data to achieve the objectives. The interview sessions were conducted among three contractors chosen from different companies to access about their experience involving the project delays. The respondents were requested to comment to the factors for project delays and to suggest

approaches for overcoming the problems of project delays.

Data Collection

Interview Session 1

The first interview session was with the manager of Company A. This company has been registered with Grade 3 of CIDB registration to run the small project of building works, mainly owned by the government. This interviewee had already 14 years of experience in dealing with projects, so he is considered as very experienced with any issue or problem in the construction industry. Besides of being eligible to be interviewed, he is quite informative and willing to spend time and share his experience for contribution to this study.

Factors Causing Delays in Construction Projects

During the beginning of interview session, the interviewee has highlighted that two parties which mostly contributed to project delays are both owners and contractors. For the first factor, he agreed that financial constraints of contractors can cause project delays. However, this issue might happen because owners of projects also have problems with financing. They are directly related to each other in the construction project. For instance, deposits should be paid to contractors to initiate the project and then the contractors are continuously being paid based on progress work done monthly. Since owners of projects have insufficient money to pay a monthly payment to contractors, thus it creates problems especially to small and medium contractors to buy materials and equipment and also to pay wages to their workers. Because of that, delays can happen in the construction project.

In other cases, delays can happen when contractors are detected to be involved in any criminal or bribe cases at the time of projects

carried out. Usually, bribery cases always happen among the contractors in order to get more money and other advantages. These kind of social problems are even bigger than any other problem as these can cause bad reputation to contractors and perhaps leading to bankruptcy. The interviewee agreed on this issue as another reason of insufficient money of contractors. Besides the contractors have to settle problems regarding the social problems, they also have to deal with unfinished projects and have to pay debts or compounds to owners of causing trouble. In fact, contractors have to be responsible for bearing any profit and loss during the construction, especially regarding their own faults.

Furthermore, the interviewee did not agree much on the delay of materials delivery as one factor in delays. It is because, as long as the contractors make early agreement and quotation to order materials and equipment, there should be no problems for the suppliers to supply materials on site quickly. It depends on the deposit paid by contractors. If money paid earlier, then the materials ordered also will be delivered earlier. Even if there are delays from suppliers because of their mistakes, then the suppliers need to pay compensation to contractors and this case is rarely happening in any construction project. However, sometimes, the problems only arise when contractors did not receive advance payment from owners quickly to make an early order of materials. In this case, it may delay time of deliveries from suppliers.

Regarding with the next factor which is a delay in approving drawings, the interviewee agreed that this delay is related with consultants' problems in getting approval from the authorities called Pihak Berkuasa Tempatan (PBT). It is either the projects owned by governments or private bodies, there are still requirements to get permission from the authorities such as Majlis Bandaran, Syarikat Bekalan Air, Tenaga Nasional Berhad, etc. There are two reasons that leading to delay

in approving drawings. The first reason is because of the problems between consultants and PBT in making an agreement to construct the project. Sometimes, the consultants also involved in corruption with PBT in order to get early approvals. If no payment or compulsion made, there will be problems in getting early approvals. It means no service offered if no excess payment made. In other cases, if there are late preparations or improper approvals' documents, whether it is caused by owners or consultants, it also results in further problems to get approvals timely. Thus, this matter can actually affect the contractors to start the project as soon as possible.

In other situation, the second reason is that the interviewee said the consultants sometimes make mistakes in making drawings. Although the interviewee is not directly related to structural designs, he had experience in receiving false drawings from the consultants. It is only realised when the contractors want to continue with construction buildings. Usually, there will be problems with drawings when there is further variation order from owners. This problem may happen because of misrepresentation from the actual information received by clients. One who makes changing to drawings can be a different person who received an order from the clients. Thus, there will be a further delay in approving drawings in the correction to the mistakes in the drawings. Despite the correction to drawings will cause further delays in approving from the chief of architects, it is not too obvious as the first reason which related to PBT.

Based on the interviewee, sub-contracting is not a big problem as long as owners or main contractors make adequate payment to sub-contractors as per agreement in the contract. So, he did not totally agree with this factor as causing delays in the construction projects. Adequate payment does not mean that they must be fully paid before the works are done but it refers to sufficient advance payment made to sub-contractors to delegate

works accordingly and continued being paid monthly. Generally, delays of works among sub-contractors happen only when they are not paid sufficiently or late payment made. In case if there are issues or problems with the current contractors that causing delays, owners or main contractors have right to directly hire other contractors to continue suspended works in order to avoid further delays.

Interviewee agreed with the last factor as improper project planning can cause delays in the construction project. Actually, it is compulsory for any project to be provided with cash flow and better work programme. Since the schedule is properly followed, then there will be no problems in work progress. However, poor project planning might happen when there are sudden changes of works. It might be because of lack of communication and misunderstanding between parties in doing works. The plan cannot be proper since not all parties agree on certain matters. For instance, project planning can be problems if there are disputes between main contractors and nominated sub-contractors. The argument always happens between them because NSC usually hired by owners. Thus, it will be a misunderstanding in term of working at the same location. Main contractors might blame sub-contractors of disturbing their work progress. In fact, improper project planning may result because of poor work coordination between project teams because different parties create a different project planning to cater the clients' needs. When there is no cooperation in planning and management of the project, there will be problems in completing the project on time.

As stated earlier, the interviewee said that both owners and contractors are actually the main reason that leading to project delays. Besides financial problems, if they have no commitment and cooperation from the beginning of the project, there will be high possibilities for delays to happen within the construction period.

Approaches to Reduce Delays in Construction Projects

The interviewee suggested that the contractors need to manage financial efficiently. In case both of contractors and developers did not have enough capitals, it is better for them not to run the project until they are eligible to be involved in tendering the construction project. It is inappropriate also for the contractors to run many projects in one time especially on building works if they have an insufficient number of labours all things are being handled by themselves. It is enough for them to only focus on one big project and several sub-contracts works and the most important thing is the project is delivered successfully on time. The interviewee said, the total of RM500,000.00 is the minimum amount required for developers to initiate the project and yet, it is still not enough to consider for the future additional cost for any loss and increasing of market price.

Furthermore, factoring and loan is another approach recognised to help contractors in carrying out project smoothly. Factoring is one method of financing which involved third party transaction. It is important to increase cash flow and reduce the debt of contractors. Then, loan usually made with Majlis Amanah Rakyat (MARA) in order to support contractors in financing the project. The percentage amount of loan that can be made also depends on the total of construction cost and volume of projects taken. However, loans made cannot totally cover 100% of construction cost. Then, contractors also can share money with business partners by having personal agreements. For instance, a business partner who is investor has 40% of profit share while contractors who run project agree to have 60% of profit share. Sometimes, investment can be made as a capital to run the project. Instead of other loan or sharing money made, it is more beneficial for the contractors to have strong financial assets of companies. It is important to ensure the owners believe with

the contractors to run the projects and also can protect contractors from any future loss.

Then, for the second factor, the interviewee suggested for the consultants to make early application for drawing approvals from authorities. Quick process with completed documents filled up can help the drawings being approved early. It is also important to ensure there are no problems with drawings that can cause further delays from authorities. It means that consultants have to prepare realistic drawings by considering all matters including the size of site location, watering system, electrical system, sewerage system, telecommunication system, etc. Following up with authorities also can help in getting approvals quickly so that the contractors can initiate the project as soon as possible.

Besides that, the consultants also have to make sure the drawings are prepared on time and avoid any mistakes of drawings by making regular checking from their leaders and also further confirmation from owners to avoid frequent change of drawings later. When the drawings are prepared according to appropriate standard especially from the organization, delays regarding this matter can be reduced.

Furthermore, having proper project planning is important to ensure further good management of the site as well as proper controlling of the site. It means planning should be incorporated by all project teams to avoid any disputes or misunderstanding in the future. Having good communication between all individuals especially between main contractors and sub-contractors can help to improve better planning and management on site. In any activity, there should be one leader to plan, manage and control other employees. In the case of nominating sub-contractors, for instance, should be clear in term of their task and time hours to do work in order to avoid any disturbance to main contractors' works.

Interview Session 2

The second interview session was with the managing director of Company B. This company has been registered with Grade 4 of CIDB registration to run the project of building works including schools, houses, roads, mosques etc. which also involves in many public projects. This interviewee is quite experienced with 11 years of involvement in dealing with construction projects. He is considered as friendly and also informative since he shared problems in construction projects specifically by giving attachment to the problems of delays.

Factors Causing Delays in Construction Projects

According to interviewee, delays can happen in any construction project. He agreed that financial constraints are the main problems with contractors. Because of a very high competition among contractors to acquire project in today competitive market, it is not easy for contractors to maintain their cash flow and have strong financial resources without proper concern regarding this matter. Because of that, the contractors are willing to bid tender in much lower cost to be awarded in any project. However, owners did not only look at lower tendering cost that exactly close to the figure required by them but also to consider contractors' background in term of strong finance capabilities and had run previous projects successfully. This interviewee said different owners or clients will have a different requirement in choosing contractors. For instance, in one project, owners required only about 3.0% difference between tender costs offered by one contractor with the amount needed by them in order to match the contract cost closely.

When the contractors want to start construction projects, they will refer to work programme to manage time efficiently. It is not all works are to be done by main contractors,

but they also have divided some works to their sub-contractors to do any specialised works like plumbing, painting, glazing, etc. At the same time, sub-contractors need deposit payment from main contractors to initiate the work. It maybe 30.0% or 40.0% of the actual amount of payment that have to be paid to sub-contractors. In fact, it is insufficient for contractors to just depend on advance payment made by owners. Before paying to sub-contractors, general contractors have to make an early order of materials and at the same time, they have to pay the suppliers some deposits. Sometimes, the suppliers want very high deposits from contractors because of specialised materials which are not available by other suppliers. Thus, suppliers make this chance to be highly paid by contractors. In case owners have made late advance payment to contractors, there will be problems to contractors to take further action to initiate the project as soon as possible.

The delays can happen if contractors did not have their own financing or loans to start the project immediately. For instance, the construction of the mosque is only based on the budget from collected money of zakat which is an obligatory payment made under Islamic law and also money from committee members of the mosque. If there is further variation order from owners, there will create delays in completing this construction since the mosque is constructed with a limited budget. The contractors who involved in such project cannot totally depend on payment made by owners but need to do loan or factoring.

In other cases, contractors have problems to pay a monthly payment to subcontractors during the construction stage because, at the same time, they have to face the pressure to settle issues for another project. Besides that, the unpredictable matters such as increasing price of materials in the market will eventually affect the financial cash flow of contractors. Since the contract cost has already

fixed, the contractors need to bear the loss for increasing cost of materials. It can be said that financial constraints are not the small matters to contractors and need to be seriously figured out for the further approach in order to reduce delays.

Besides contractors, actually, the financial problems arise because owners also cannot provide money to contractors during the beginning of construction. Usually, contractors wait for payment from owners to initiate the projects because they have to pay labours and at the same buy materials. Since owners cannot provide early payment to contractors, it will disturb cash flow of contractors and thus cause delays of commissioning of the project. Financial constraints seem to be related not only to contractors but also owners of the project. Similarly, with the first interview session, the interviewee also gave similar situation regarding the project.

The interviewee also agreed with the second factor since he has experienced in dealing with suppliers regarding delivery of materials. As mentioned earlier, normal deposits to be paid to suppliers are about 30.0% and the suppliers will not consider early materials delivery if late payment made by contractors. In the case of specialised materials need to be ordered with limited suppliers in this country, deposits will be much higher. It can be even 50.0% as initial payment to them.

Moreover, Industrialised Building System (IBS) seems to be a fast method of construction. In the case of one project which requires 75.0% of IBS materials to construct structural buildings, there should be problems in making quotation to find limited suppliers. Besides it is quite difficult to find related suppliers, the materials price would also be expensive. Some of the limited materials also required time to be produced. Because of that, it is quite difficult for the contractors to make a decision in choosing the best supplier who can

offer much lower cost than others and at the same time can be produced quickly.

Then, delay in approving drawing is not a big deal and not really caused by project consultants but sometimes it can contribute to delays when related to a problem with authorities. He also stated that drawing approval is directly related with Pihak Berkuasa Tempatan (PBT). Since consultants have made approval called Kebenaran Merancang from Majlis Daerah and also endorsement with other related bodies such as Syarikat Bekalan Air Selangor (SYABAS) regarding piping system, Tenaga Nasional Berhad (TNB), Indah Water Konsortium (IWK) regarding sewerage system, etc., then there should be no problems in getting early approvals. However, there are minor cases where these related bodies such as SYABAS took advantage from consultants to join the piping system with another project to be taken nearby in order to make their jobs easier without considering the current project that needs to be carried out quickly.

The next factor agreed by interviewee includes delays of sub-contractors works. This problem also related to financial problems of owners and sub-contractors. It is because sub-contractors will delegate works only if being paid. Generally, there will be problems with nominated sub-contractors (NSC) hired by owners which have no direct relation with contractors. Main contractors usually complain about NSC because they disturb the progress of work done by main contractors. Since NSC is not employed by contractors, then there will be a lack of communication between them. Since the problem is not settled by owners or project managers on site, then it causes disturbance and thus resulting in delays of main contractors' works.

For the last factor, the interviewee opined that it is not true for one project to have improper planning because every project will be based on work programs prepared by contractors. Usually, work programs are

prepared by experienced contractors, so they can predict a number of working days with the work to be carried out. It only becomes problems to the initial planning when the cash flows are disturbed due to the sudden problem of finance.

Approaches to Reduce Delays in Construction Projects

The interviewee suggested some approaches for the first factor, which is regarding financial problems faced by contractor in early commissioning on site. He said that contractors can make loans by making credit facilities or factoring since after they are awarded projects. However, they need to make early application in order for the loan to be approved early. Such loan can be borrowed from Majlis Amanah Rakyat (MARA) that support small and medium contractors in the construction project and also from a local bank. In the case of factoring, contractors as debtor need to deal regarding with selling of invoices to third parties known as a factor. Generally, the amount granted for factoring is 80.0% of the overall total of construction cost. Then, there will be 3.0% of invoice values to be claimed by factors. Such invoices of factoring are quite similar with the interest fee made from the bank.

Then, to minimise delays and to protect the parties from being cheated, there are some protections in the construction contract.

For the second factor which is a delay in materials delivery, it was suggested to make early orders since after the quotations made to clients have been approved. The contractors also did not need to depend on early payment made by clients because they can still make loans to initiate the project as soon as possible. In the case of IBS materials, the interviewee gave further situation when he has experienced in searching supplier for Glass-fiber Reinforced Concrete (GRC) dome to construct a mosque. In Malaysia, there is only one GRC dome supplier available with a very

expensive cost and it takes time about 5 to 6 months to make such dome. He was finally found the real supplier which is available in Singapore at much lower cost than previous suppliers. It is important to find related suppliers quickly in order to make an early order of materials.

Furthermore, the best solution to deal with the relationship between main contractors and NSC is by owners' concerns. Owners should address this issue during site meeting. Besides that, there should be project managers on the behalf of owners which are responsible for managing site to avoid any argument happen between project teams. It is important to ensure the projects are carried out based on the plan and finished on time.

Interview Session 3

The last interview session was with the director of Company C. This company has been registered with CIDB registration as Grade 5 contractor. This interviewee had already 18 years of experience in dealing with many construction projects and now they are more focusing on constructing electrical substations since they have been contracted with the government. This person is quite generous due to his willingness to spare time and give input to contribute to study.

Factors Causing Delays in Construction Projects

According to the interviewee, financial constraints are the biggest issues in the construction projects that have to be faced especially among small and medium contractors. Many contractors involved in debts since the finance is not properly managed. Such debts include of the previous projects that being abandoned or delayed which cause many compensations that have to be paid to owners of projects. It is true that some of the contractors have a lack of experience in dealing with projects, thus it

is logically accepted that they did not have strong financial capabilities. However, in other cases, he said that experienced contractors also seem to have financial problems because of their own characters. Such corruptions are commonly happened among contractors to be assigned to new projects. Gambling is another social issue among contractors as they think it is the fast-track in generating money without realising of any other negative consequences.

Another reason that gives clear views about financial constraints is because of inadequate payment made by owners to contractors. It is due to shortage of money or budget of owners, especially during the economic crisis. Although there is fix amount of contract cost, sometimes, owners make late payments to contractors. Since owners cannot make an early payment, then delays can happen because contractors usually will perform based on money paid. It is not necessities for the contractors to do the job without being paid to avoid any cheating from the owners.

Both delay in materials delivery and delay in approving drawings have not much affected the contractors based on this interviewee's opinion. It is because all people work for money. Delivery of materials can be fast when contractors pay advanced payment first to suppliers to be transported to site. Then, approving drawings is something to deal with the government bodies. As long as procedures are followed including paying for services and provide completed documents, then the drawings can be approved easily.

Subcontractors are the parties involved in the construction project to be engaged with the main contractors. It is either nominated by owners or directly hired by main contractors. Usually, the problems of communication happen between contractors and nominated subcontractors. Any orders or contemplation from main contractors is usually ignored by subcontractors since they consider main

contractors not as their employees. Ineffective communication between two parties also can create further time extension since no cooperation is made, the work progress will become slow.

The delays also can happen in case sub-contractors could not perform accordingly. The problems can happen in the project that awarded to very low cost of tender and owners tend to choose their own sub-contractors in order to paid low wages. Then, during the construction, there will be many problems of low quality, the absence of staff, slow progress due to lack of skills, etc. Since the project has been delayed, then owners will have problems in hiring new sub-contractors. It also takes the time to appoint new contractors since not many contractors are willing to continue the project left by other contractors. However, in this case, the contractors are highly paid.

Furthermore, the interviewee shows his agreement towards improper project planning as another factor of delays. Such plan may appear since the beginning of the project until the end of the construction period. It is because, in weekly or monthly site meeting, there will be updated activities discussed detect any issues or problems and also to ensure the works achieved a certain target. Improper planning can appear when it is informally planned and applied during construction activities. For instance, labours might only discuss between them to do painting on related areas without concern from the contractors as their employee. They plan to work in a group in one area to be painted without realising too many people in groups can only cause delays in works because of chatting while working. Actually, it is more practicable if only one or two person works in one painted area. This problem can cause further disputes when the contractors had known the reason of causing delays in painting works.

As an additional factor, the interviewee agreed that shortage of labours is another problem that causing delays. It is true that in this country, almost 99.9% of unskilled workers are dominated by foreign workers. However, he found this factor as a problem in term of communicating and managing them properly. Some of the workers are not committed to their works since they suddenly disappear without finishing jobs after being paid. Then, contractors always need to spare some workers to replace the other missing workers or absence workers. It also takes time for contractors to find such good workers who can do their work properly. This problem can happen because usually they are paid very low wages.

Approaches to Reduce Delays in Construction Projects

The interviewee opined that every problem regarding delays should be addressed properly by project teams so that they know their real duties to delegate work efficiently.

The interviewee believes if early payment made by clients, then it should be no problems for contractors to perform work accordingly. In this case, many small and medium contractors run the project with the money support from loan besides being paid by owners. Loan from bank or sharing with partners is quite practicable since any risk or load also are transferred between parties involved. Thus, any profit and loss are shared together. Then, for contractors who already have many experiences and have been involved in many projects, there might be easier for them to settle with financial problems since they have their own finance either from their investment or assets.

The problem with sub-contractors can be settled by providing training to improve skills and motivate them to do work efficiently. The training is not necessarily to hire another person to train, but it is enough to train the

new workers to do work on site for certain period until they have improved their skills. In term of motivation, it does not mean that the workers are given a talk, but the motivation and encouragement can be in the form of providing a living place to their workers or allowance for food. Since they are given such initiative, the problems regarding missing of workers can be reduced. Then, the early payments are promised to be paid if they perform well according to plan. Promoting such rewards is really important to contractors in hiring workers.

Then, in order to ensure good planning with project management, contractors should always supervise their labours at a construction site. Then, any orders are clearly explained and it is important for contractors to communicate in a language that easily understands by foreign workers. It is to ensure planning works are made successfully. In fact, there should

be some basic or roots before planning any activity such as planning are guided by the employee and also planning are done based on knowledge and experience from past project. Any previous success project should be as a good example in planning for new projects. For instance, planning should be done at least 3 months before project being initiated.

DISCUSSION

Factors Causing Delays in Construction Projects

This discussion focuses on factors causing delays that are identified to commonly happen in the construction industry. The following factors listed in Table 1 are among the top ranking factors based on the respondents from the previous survey.

Table 1 Factors of delays

Factors	Category	Company A	Company B	Company C
Financial constraints	Contractor	✓	✓	✓
Delay in materials delivery	Suppliers and Materials	–	✓	–
Delay in approving drawings	Consultants	✓	–	–
Delay in sub-contractors' works	Contractors	–	✓	✓
Improper project planning	Contractors	✓	–	✓

The agreed implications based on semi-structure interview above are further summarised and rated as follows:

- (a) Financial constraints (Contractors)
- (b) Delay in sub-contractors' works (Contractors)
- (c) Improper project planning (Contractors)
- (d) Delay in materials delivery (Suppliers and Materials)
- (e) Delay in approving drawings (Consultants)

From the table above, it can be seen that financial constraints are the biggest problems happen among small and medium contractors that can result in construction delays. It has

been agreed by all interviewees and further supported by Alaghbari et al. (2007) and Sweis et al. (2008) in their research. According to these previous scholars, financial problems are some of the most critical factors that can trigger project failure in term of delays. It is true that the actual reason is because of increasing of construction cost often lead to delays in payment and disturbance of cash flow.

On the other hand, two contractors agreed with delays in sub-contractors work and improper project planning as the other reason of causing project delays. Regarding with delays by sub-contractors, it is turn out to be true that contractors are the actual the

reason of causing delays in sub-contractors' works since they have fewer experiences in dealing with sub-contractors. Odeh and Battaineh (2002) identified that inadequate experiences of both contractors and sub-contractors can result in delays.

The factor of improper planning has been identified by Sambasivan and Soon (2007) as one of the contractor related factors. Previously, Oglesby et al. (1989) also found that lack of planning and knowledge in project control can contribute to delays of project completion. Although contractors have financial resources, but the lack of planning will cause them fail to achieve scheduled target. Instead of that, there is only one contractor who agreed with delays in materials delivery. The other two has shown their disagreement by stating that as long as payment made to suppliers, there will be no delays in delivery of materials. Their statement contradicts with the researches done by Ahmed et al. (2003),

Alaghbari (2005) and Varghese (2015).

Similarly with the delay in approving drawings that only agreed by a G3 contractor. Instead of only one contractor who agreed on this factor, Ahmed et al. (2003), Alaghbari (2005) and Varghese (2015) have stated about delayed and slow supervision in making decisions including approving drawings and samples as one of the delays caused by consultants.

Approaches to Reduce Delays in Construction Projects

The next discussion is based on the last objective of study which is to suggest or propose solutions to reduce project delays. The following approaches listed in Table 2 are compiled based on overall agreed explanation by three (3) related interviewees. The approaches provided aims to resolve and reduce each of delays factors identified.

Table 2 Approaches to Overcome Delays

Factors	Category	Approaches		
		Company A	Company B	Company C
Financial constraints	Contractor	<ul style="list-style-type: none"> Plan and manage financial efficiently 		<ul style="list-style-type: none"> Pay early advanced payment to contractors Share profit and loss with clients Have strong assets
		<ul style="list-style-type: none"> Make loan 		
Delay in materials delivery	Suppliers and Materials	-	<ul style="list-style-type: none"> Make early order with supplier Make early payment to suppliers 	-
Delay in approving drawings	Consultants	<ul style="list-style-type: none"> Make early application with complete supported documents for drawing approvals 	-	-
Delay in sub-contractors' works	Contractors	-	<ul style="list-style-type: none"> Improve communications between main contractors and sub-contractors 	<ul style="list-style-type: none"> Provide training Motivate labors
Improper project planning	Contractors	<ul style="list-style-type: none"> Planning incorporated by all project teams 	-	<ul style="list-style-type: none"> Plan works based on previous success project as reference Make early planning

The agreed approaches based on semi-structure interview above are further summarised and rated as below:

- (a) Manage financial resources efficiently (Contractors)
- (b) Pay progress payment on time (Owners)
- (c) Effective communication between contractors and labours (Contractors)
- (d) Motivate labours through proper training (Contractors)
- (e) Proper project planning (Contractors)
- (f) Make early order and deposit payment of materials to suppliers (Contractors)
- (g) Make early application with complete supported documents for drawing approvals (Consultants)

Based on Table 8 above, the discussion focuses on strategies or approaches to avoid and minimise delays that happen in many construction projects. Interviewees proposed contractors to make a loan as one of the efficient planning to ensure the project being initiated quickly. Then, the previous study done by Aibinu and Jagboro (2002) identified methods to reduce delays by the acceleration of site activities. It does not mean the contractors are pressured to do work as soon as possible but it is a matter of efficiency in work.

The financial problems can be overcome by having proper planning. Thomas et al. (2007) said that planning is an essential function of project management since it can define key milestones, constraints and identifies the major issues that may affect the project.

Then, regarding the disputes between contractors and subcontractors that can cause delays, interviewees suggest having clear clarifications and cooperation between them. Asif (2009) mentioned that the area of disparity between stakeholders can be supported by effective communications between stakeholders. It is also true that owners should make things clear between those two parties including describing of task and period of completion to avoid

overlapping and disturbance of works from any of the parties.

In the case of delay in approval of drawings, Assaf and Al-hejji (2006) suggested the consultants prepare and approve drawings on time. During interview sessions, this factor does not seem to fully contribute to delays. Although it is not clearly explained, it was further clarified by interviewees that stating this problem is actually arising from late approval from authorities and not because of consultants. Even though there is the contradict data between interview and past research, the interviewees suggested that the actions still need to be taken by consultants to ensure fast approval from authorities. It can be resolved by making early application and submit completed documents to be quickly approved. In fact, the delays in approving are not because of lacking skills of consultants, but it is just in term of poor management and supervision from the consultants' representative to ensure fast approval of drawings from authorities.

Furthermore, regarding the delay of materials delivery, there is an only G4 contractor who gave his opinion regarding overcome this problem. It is no other ways besides making an early deposit payment to suppliers. It seems to be logically accepted based on the experience of contractors in dealing with suppliers although the solution cannot be found in the past research.

CONCLUSION

The results obtained from the semi-structured interview show only three (3) factors that mostly contribute to construction delays. From the interview, it also indicates that contractors are the parties that mostly contribute to delays compared to others. It is further listed as below:

- (a) Financial constraints (Contractors)
- (b) Delay in subcontractors' works (Contractors)
- (c) Improper project planning (Contractors)

The following five (5) approaches represent the solutions to mitigate and reduce the project delays mentioned by interviewees. It is further listed as below:

- (a) Manage financial resources efficiently (Contractors)
- (b) Pay progress payment on time (Owners)
- (c) Effective communication between contractors and labours (Contractors)
- (d) Motivate labours through proper training (Contractors)
- (e) Proper project planning (Contractors)

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