

ADVANTAGES AND EFFECTIVENESS OF PROJECT IMPLEMENTATION  
THROUGH NOMINATED SUB-CONTRACTOR IN JKR BUILDING  
CONSTRUCTION PROJECT

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*“My dearest mum, family, Dr. Nik and friends”*

This is for all of you

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## ABSTRAK

Isu kelewatan penyiapan projek seringkali dilapor dan dibincangkan diperingkat pengurusan atasan di JKR. Sehubungan dengan itu terdapat isu yang dibangkitkan semasa pembentangan didalam Mesyuarat Pegawai Kanan JKR tahun 2016 yang menyatakan punca kelewatan projek yang dilaksanakan di JKR adalah disebabkan daripada kelewatan untuk melantik nominated sub-contractor (NSC). Cadangan penyelesaian kepada masalah tersebut adalah dengan melaksanakan skop kerja pakar secara pakej kepada kontraktor utama. Tujuan kajian ini adalah untuk mengenalpasti keberkesanan serta kelebihan bagi projek yang dilaksanakan secara NSC. Kaedah yang digunakan dalam kajian ini adalah gabungan diantara analisa kualitatif dan kuantitatif. Terdapat banyak kajian lepas yang telah menyenaraikan beberapa faktor umum terhadap kejayaan projek. Namun demikian, kajian khusus faktor yang melibatkan sub-kontraktor bagi projek-projek JKR amat jarang ditemui. Disamping mendapatkan faktor-faktor yang berkaitan daripada kajian yang lepas, kajian ini juga menggunakan sesi temuramah terhadap responden yang berkaitan bagi memperoleh lain-lain faktor yang lebih hampir dengan skop kajian. Bagi kaedah kualitatif, ia menggunakan borang soal selidik yang telah diedarkan kepada responden yang berkaitan bagi mendapatkan maklumbalas. Analisa kemudiannya dilaksanakan dengan menggunakan Statistical Package for the Social Sciences (SPSS) bagi mendapatkan korelasi bagi bagi menguji hubungan diantara pembolehubah tidak bersandar kepada pembolehubah bersandar dalam kajian ini. Lima hipotesis yang telah dibagunkan bagi menguji faktor pembolehubah tidak bersandar adalah diterima. Selain daripada itu, analisa lanjut turut mendapati faktor komunikasi diantara kontraktor utama dan sub-kontraktor adalah merupakan penumbang yang paling utama kearah mencapai penyerahan projek yang cemerlang.

## ABSTRACT

The issue of delay in the completion of the project is often reported and discussed at the top management level in JKR. In relation to that, there was an issue raised during the presentation in the JKR Senior Officials Conference (SOC 2016) stating the cause of the delay in the project implemented in JKR was due to the delay in appointing the nominated sub-contractor (NSC). The proposed solution to the problem is to implement the expertise scope of work by package to the main contractor. The purpose of this study is to identify the effectiveness and advantages of projects undertaken by NSC. The method used in this study is a combination of qualitative and quantitative analysis. There are many past studies that have listed several of the most common factors towards the project success. However, the specific study of factors involving sub-contractors for JKR projects is rarely found. Besides getting the relevant factors from the previous researches, this study also uses an interview session with the relevant respondents to obtain other factors closer to the scope of the study. For the qualitative method, it uses a questionnaire that has been distributed to the relevant respondents for getting their feedback. The analysis was then carried out using the Statistical Package for the Social Sciences (SPSS) to obtain the correlation value that can be used to establish the relationship between the independent to the dependent variables in this study. Five hypotheses testing that have been developed to test independent variables are acceptable. In addition, further analysis also found that communication factors between the main and sub-contractor contractors were the most important contributors to achieving excellent project submissions.

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**LIST OF ABBREVIATIONS**

PWD	-	Public Work Department
NSC	-	Nominated Sub-Contractor
CPC	-	Certificate Of Practical Completion
PM	-	Project Manager
HOPT	-	Head Of Project Team
HODT	-	Head Of Design Team
JKR	-	Jabatan Kerja Raya
SO	-	Superitending Officer
SKALA	-	Sistem Kawal Dan Lapor
SPSS	-	Statistical Package For Social Science
IV	-	Independent Variables
DV	-	Dependent Variable
ANOVA	-	Analysis Of Variance

**LIST OF SYMBOL**

$n$	-	Sample size
$N$	-	Population size
$r$	-	Pearson
$R^2$	-	Coefficient of Determination
$X$	-	Independent variable
$Y$	-	Dependent variable
$\beta$	-	Regression weight

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Introduction**

Jabatan Kerja Raya (JKR) or Public Works Department (PWD) was formed in 1872 with Major J.F.A McNair as the first head of the organization. JKR is a federal government department under the Ministry of Works Malaysia (MOW) which is responsible for construction and maintenance of public infrastructure throughout the Peninsular Malaysia. JKR Malaysia is headed by a Director of Public Works and who is assisted by three Deputy Directors. The Public Works Department is comprised of separate bodies which are placed under the administration of the respective states government's jurisdiction, however, all departments are still subordinates to the parent department – the headquarter in Kuala Lumpur.

Due to the privatization of the roads and highway maintenance and construction, the department's current predominant source of financial is from building projects. There are several branches in JKR headquarters which are dealing with expert work, infrastructure work and also building work in JKR projects. At the JKR's Headquarters, departments are managed by major sectors with 20 branches and 1 unit. Further information on the sectors and branches in JKR is as below:

#### Portfolio Management

- Centre of Excellent For Engineering & Technology (CREaTE)
- Integrated Asset Planning Branch

### Building Sector

- General Building Work Branch 1
- General Building Work Branch 1
- Education Work Branch
- Health Care Work Branch
- Safety Work Branch
- Building Facilities maintenance Branch

### Expert Sector

- Geotechnical Engineering Branch
- Environmental and Energy Efficiency Branch
- Contract and Quantity Surveying
  
- Electrical Engineering Branch
- Mechanical Engineering Branch

Each branch is administered by respective directors in which each members of the branch will operate as a functional organizational structure. When involving high-complexity projects, such as the construction of a new hospital or university, a new organization structure will be formed to smoothen the administrative work. Some officers will be stationed or collocated at the site office as a project team starting from the construction start date until it was delivered to the clients. Currently, JKR functions as the project manager whereas the construction work will be conducted by the contractors. This research will study about the project implementation methods involving; 1) the building works which is civil and structure, 2) the expertise work like architecture, mechanical engineering, electrical engineering and 3) the contract and quantity surveying. Throughout the establishment of JKR, the department has provided extensive technical services for the nation's infrastructure development. Among the largest contributions of JKR is the construction of roads and highway, as well as most of government buildings in throughout Malaysia.

In the early stages of their establishment, JKR had enough workforce and machineries required hence it was possible for all the scope of work in construction to be handled internally. However, over time, JKR's role has evolved as they expands their scope of work, which then involves both construction and maintenance of most



government assets. Thenceforth, JKR no longer carry out construction and maintenance work with the internal staffs. Gradually, the work was outsourced to the contractors. From then on, JKR transformed as an organization that fully executes project management in which it manages contractors with various disciplines to conduct their respective scope of work. JKR is divided into branches according to specific expertise one of them being the Head of Design Team (HODT). Other than that, the Head of Project Team (HOPT) is another branch that is in charge of the coordination of all disciplines - the officers from this branch are usually appointed as the project managers.

JKR moves laterally with the circulation and development of the country, according to the plans that have been drafted by the government. Therefore, JKR is also in charge of the planning and execution of the projects that have been announced during the New Economic Policy (NEP) as well as the Malaysia Plan (RMK). The latest Malaysia Plan has entered the 11<sup>th</sup> phase (RMK-11). Each phases of the government development embroils detailed planning and focus on specific areas. For example, there is a phase where the government focuses on agriculture hence JKR is required to provide sufficient knowledge to their officers to serve and fulfil the government's need. Many of high-tech factories and machineries need to be supplied and inspected so that they comply with the required specifications. Other than that, there was another government phase that focuses on education, thus many schools and universities were built all over the country. JKR is in charge of providing expertise that are relevant pertaining to the construction work in order to complete the project. In regard to this, it is also JKR's task to ensure the sufficiency of expertise and readiness of the contractors before they are appointed for the project implementation in order to deliver the project successfully. The procurement procedures must be passed before the qualified contractors are selected to implement the specified scope of work.

JKR is relatively different from other organizations in Malaysia as it emphasizes some certain standards in each scope of work that has been given to the contractors, as well as regarding the expert work. This is because expert work involves the functionality and operation of a building. Therefore, compliance with the prescribed standards is very important to ensure that the installed system can operate

safely without causing harm to any users. Moreover, JKR is the agency that is responsible for the development of government buildings, where the building's daily affairs involve the public.

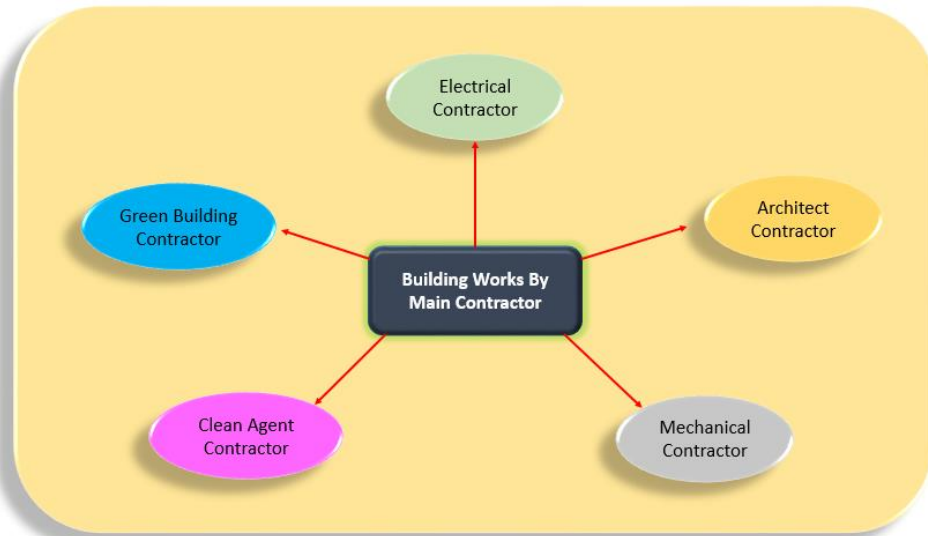
Therefore, it is important for JKR to get the right contractors who understand the JKR standards and specifications which then will result in the excellence of the project implementation. In a typical project implementation method, JKR Cawangan Pakar is in charge of carrying out contractual procurement of expert work where each technical requirement for a scope of work is assessed in detail. Apart from that, some other factors will also be taken into account in the procurement process of subcontractors such as the financial status of the company, the performance of the contractor based on their previous work and also the current projects in hand to ensure the appointed contractor is focused on completing the scope of work for the contract.

## **1.2 Background**

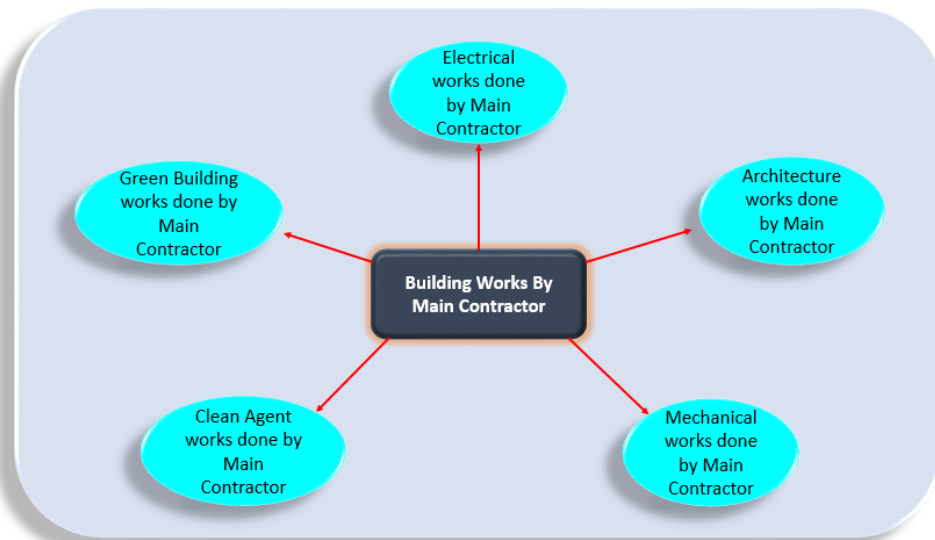
In the implementation of building projects that involves expertise work, there are two common methods implemented by JKR; 1) implementation through Nominated Sub-Contractor (NSC), 2) packaging the work to the main contractor or general contractor. A main contractor is a company that seeks to do business by obtaining contracts and carrying the project out. Being a contractor is similar to being a business owner that negotiates deals, works for themselves, has clientele and is rewarded on their own merits. Subcontractor is a type of contractor that works on a contractual basis, each subcontractor offers the customer a particular set of expertise in their work. The key point on the subcontractors is that they form agreements with the contractor, not with the customer. Subcontractors often specialize in one specific area of construction then try to network with contractors who negotiate for larger jobs within the area of specialty.

Previously, all expertise work was implemented by nominated sub-contractors because most of contractors in Malaysia did not have suitable licence that permit them to do job scope in various disciplines. Normally the civil contractors are only interested

to have the license type that is relevant to their expertise. But currently, contractors are competing to hold as many expertise license types which enables them to gain higher chances of getting more jobs which also will increase their company income.



**Figure 1.1:** Project implementation through nominated sub-contractor



**Figure 1.2:** Project implementation through package basis

Figure 1 and figure 2 show the illustration of the overview of both project implementation methods. For the Nominated Subcontractor project, the main contract, which is related to the main building work, is handled by a company, whilst several other smaller contracts pertaining to the expertise work will be administered by other

companies which are expert at the particular job scope. Whereas for the package basis project implementation, all the job scopes in the construction project is executed by a single company.

In the current construction market, subcontractors execute significant portions of construction work. The reliance of general contractors on subcontractors to handle major portions of construction work makes the success of construction projects highly susceptible to the performance of these subcontracting organizations.

For the past two decades, subcontracting has been utilized extensively in the construction industry. It is common to subcontract 80% to 90% of the construction work to subcontractors (Hinze & Tracey, 1994; Kumaraswamy & Matthews, 2000). Shash (1998) implied that general contractors commonly function as the construction management agents while subcontracting a large amount of their work to the subcontractors.

Subcontractors assist general contractors in addressing issues related to the special needs of expertise, lack of resources and financial constraints (Elazouni and Metwally, 2000). Due to the limited average of the general contractors' operation, they are not able to obtain full-time employment of the skilled workers for all the specific scope of work required (Arditi and Chotibhongs, 2005). Subcontracting allows general contractors to use minimum labor in construction projects while promoting specialization. It utilizes the industry expert skills and and copes with the fluctuating construction demand (Ng et al., 2003).

Quality control and labor management problems on construction projects have become less complicated for general contractors who use specialized trading subcontractors in project implementation to provide all of their own craft workers. The cause and effect of this evolution have precipitated a redistribution of project risks. Through subcontracting, the general contractor will affix the working segment cost during the project securing with the expertise subcontractor who is responsible of the overrun cost.

### 1.3 Problem Statement

Currently, the JKR's norms of expertise work implementation in the building construction are done by Nominated Sub-contractors. This means that each branch in expert sector will closely monitor the work done by the NSC respectively. However, there are advantages and disadvantages involved for both methods of project implementation which are the Nominated Sub-Contractor or building contractor's packages. The advantages and disadvantages are also very subjective and subjected to various factors. The influential factor that significantly affects the effectiveness of both methods is the readiness of the main contractors to carry out projects on a package. To elaborate, this is the stage where they need to provide certain expertise before they can implement all of the scope of works in a particular project. The main elements related to this issue are the communication between main contractors and the nominated sub-contractors. To emphasize, the communication of the packaged projects is of inter-communication due to the fact that all of the staff involved in the project belongs to one respective company. Whereas for NSC's project implementation, it involves intra-communication. The most severe issue related in the project implemented through package basis concerns the lack of monitoring, especially to the expertise work. This is due to the reasoning that it did not show a clear role to the JKR Expert Sector in the monitoring of the project in comparison to the conventional nominated sub-contractor method of project implementation. There are several disadvantages when lack of monitoring occurs in the project. The most important problem is regarding the lesser quality of the products. Additionally, it may affect future operations if it does not meet the standards of the clients and end users.

Lately, there are emerging disputes from the contractor and subcontractors specifically on the matters of the effectiveness of both project implementation methods. From the main contractor's perspective, it is more convenient for them to perform all project scopes on their own as a package project in which all the work is done exclusively by one particular company. It is also advantageous for them to select this project implementation method because it only involves their own staffs which is more convenient for the management of the company's existing administrative rules and regulations. In contrast to the implementation of a nominated sub-contractor project, the main contractor needs to manage several companies that have been

appointed to be a part of the main contract. Therefore, communication is more effortful and implicated due to the involvement of outside companies throughout the contract's duration. Additionally, there are also situations in which the NSC companies are more influential than the main contractor. This will complicate the communication which will further hinder the implementation of achieving the project's goal. This type of situation will obstruct the project management which results in a less successful project delivery that affects the customers' satisfactory level.

Previously, there was a paper presented in the JKR Senior Officials Conference (SOC) which raised the issues concerning the delay of project completion due to the late of appointing the nominated sub-contractors. It was revealed that this delay resulted in the obstruction of the contractor's progress. The presenter has suggested that the solution to this issue is through the implementation of expertise works in a package to the main contractor. (Refer slide presentation) Furthermore, there is a necessity to further study the proposals presented as there are advantages and disadvantages regarding the implementation of the project on a package basis. Perhaps, it is not an absolute solution to overcome the issue as there are also other impacts that may arise in implementing the package basis project. Apart from that, Mechanical Engineering Branch along with Electrical Engineering Branches have been asked to study about the needs to develop a guideline on project implementation by a package basis. The instruction has been raised in the Expert Sector Meeting on 15 June 2017 chaired by the Deputy Director of the Expert Sector, Sr. Ratna binti Hj. Mahyuddin. (Refer minute meeting) The instructions were issued based on the many requests made by the contractors to carry out specialist work on a package basis. The Mechanical Engineering Branch that currently serves as a manager for mechanical expertise feels that this situation does not follow the norms of the previous project implementation and many negative impacts will arise if many specialist works are carried out on a package basis. From the statistic project delivered to the client in 2016 from JKR project monitoring system SKALA, it was revealed that there are 137 projects that have been delivered to the client. From that figure, there were 106 projects that were not able to be completed within the original contract hence necessitating an extension of time (EOT). A further study needs to be conducted from these statistic findings to identify the significant factor behind the request in extension of time. These factors

could be related to the project implementation methods, which can be either nominated sub-contractors or package basis.

#### **1.4 Research Aim**

1. To identify the effectiveness of project implementation through nominated sun-contractor (NSC) compared to package basis.

#### **1.5 Research Question**

1. How was the performance of project delivered in 2016 in both project implementation methods?
2. What are the advantages and disadvantages in project implemented through Nominated Sub-contractor?
3. How was the relationship among the predicted factors to the project success?
4. What are the solution and strategies to be used in project implementation to enhance the success of project delivery?

#### **1.6 Research Objectives**

1. To analyse the performance of project delivered in 2016 comparatively between nominated sub-contractors and package basis.
2. To identify the advantages and disadvantages to NSC project implementation.
3. To examine relationship between successes factor for project involve with subcontractor and excellence project delivery.
4. To examine the most influence factor reflect to the excellent project delivery.

## **1.7 Scope Of The Study**

The main focus of this research is to study and compare the effectiveness of two different types of project implementation. The first type is defined as the package to the main contractor and the other type is the implementation of expert works by the nominated sub-contractor (NSC). This study will only investigate past data of JKR's RMK-10 building construction projects which started in 2010 until 2015. The main reason to use the RMK-10 is because it was the latest RMK phase in which all of the projects were delivered to the clients. RMK-11 is already new and most of the project is at the planning or construction stage.

The related respondents to provide the feedback to the survey of this study were selected from the project stakeholders. This consists of JKR staffs who were involved in project management and project monitoring. Initially, an interview will be conducted for the purpose of obtaining opinions from all stakeholders relating to both project implementation methods. It also consists of JKR staffs, main contractors as well as sub-contractors who were previously involved with JKR's project. This was done in order to achieve a wider perspective and clarity of this issue that may enhance the significance of this study. This research will obtain the feedback from the JKR staff throughout Malaysia from various disciplines and grade (J29 – JUSA).

## **1.8 Significant Of The Study**

The findings of this study can provide great contribution in the assistance of Mechanical Engineering Branch and also JKR for the evaluation of effectiveness in project implementations. The comparative findings of both project implementation methods through the NSC and package basis can serve as statistical proof for future studies and use.

The study will also show the validity of implementation of specialist work by NSC to improve the punctuality in deliverance of project. The study is also expected



to be a reference to the JKR for consideration of project implementation, as there is a growing demand for package basis in the future.

The effort is seen as critically crucial in the deliverance of a successful project to the clients. This in line with the desire of the Director of Public Works Dato' Seri Ir. Dr. Roslan bin Md. Taha, whom contends that 2017 is the year of delivery. This study is of great significance to the JKR as statistical proof that the role of JKR is highly relevant in the delivery of government projects. Therefore, the method of project implementation should be appropriate to avoid any emerging problems during the construction phase that could affect project progress on site. This situation will certainly be the reason why the project cannot be delivered effectively to the client especially to meet the scope, time, cost and quality that has been initially agreed.

If the finding of this study is proven to be practical and viable, then it will be presented to the top management of JKR as a reliable source of information that provides a real scenario of the performance and effectiveness of project implementation through either the implementation of NSC or package basis for previous projects in RMK-10. In addition to that, the findings of this study is of great significance for Pakar Department - especially the Mechanical Engineering Branch in which their role and duties in the management of the NSC are highlighted as their roles are very important towards the excellency of the project delivery.

## **1.9 Definition Of Terms**

### **1.9.1 Project stakeholder**

According to the Project Management Institute (PMI), the term of project stakeholder refers to, "individual, group, or organization, which may affect, be affected by, or be affected by the results, activities, or outcome of the project" (Project Management Institute, 2013).

Stakeholders are defined as the individuals whose interests relies in the project and are affected by its progress. There are many types of stakeholders, which are defined as internal, external, positive, negative, high power, low power, and many more. For the successful completion of a project, there is a necessity to manage and meet the expectations of all stakeholders. Failure to do so will result in a less successful project delivery. Project stakeholders can be divided into two main categories that are internal and external stakeholders. Examples of both categories are as follows:

Internal stakeholders are internally within the organization:

- A sponsor
- An internal customer or client (if the project arose due to an internal need of an organization)
- A project team
- A program manager
- A portfolio manager
- Management

These stakeholders are external to the organization:

- An external customer or client (if project arises due to a contract)
- An end user of project's outcome
- A supplier
- Subcontractors
- The government
- Local communities
- The media

The project stakeholders are also described as individuals or organizations interested in the project's financial matter or other related decisions. This indicates that stakeholders can also be sponsors, creditors, company members, shareholders as well as state and publicity (political parties, associations, media etc.). The influential group is also considered as a stakeholder. They can either exist inside or outside the company, but both are of great importance in the company's activities.

## **Stakeholder classification**

### 1. Direct stakeholder

The direct stakeholders are the person or organization who are directly involved in the project. These type of stakeholders includes customers, project sponsors, project managers, project team members, technical and financial service providers, internal or external consultants, materials and equipment suppliers, site staff, contractors and subcontractors and end users (Lester, 2007). In other words, they are also known as internal stakeholders.

### 2. Indirect stakeholders

Indirect stakeholders are those who are indirectly related to the project, such as; internal managers and supporting staff who are not directly involved in the projects, national and local governments, public utilities, licensing and inspection organizations, technical institutions, professional bodies, and personal interest groups such as shareholders, labor unions and pressure groups (Lester, 2007 ). They are also known as external stakeholders.

### 3. Positive stakeholders

Positive stakeholders are those who are likely to have a good impact on a project. This person or organization also tends to be a direct stakeholder, and benefits from the success of the project. Examples are organizations that are involved in the work themselves that can benefit financially.

### 4. Negative stakeholders

Negative stakeholders are those who have the potentiality of inflicting a bad impact on a project. They tend to be the people or organizations who are not directly involved in a project, but are still affected by it in some way. For instance, this type of stakeholder are the local residents who are concerned about losing public areas to the development of new projects. (Burke, p40)

### 5. Legitimacy and power

Stakeholders are differentiated according to the strength of their legitimacy and power, hence separating those who do have these criteria from those who do not. This factor

influences the extent of how their actions can affect the project, either positively or negatively. Legitimacy is a perceived validity of the stakeholder's claim for the benefit of the project. Power is the ability of stakeholders to influence projects and parties involved in several ways, either financially, legally or with some other method of pressures (Olomolaiye & Chiniyo, 2010).

### **1.9.2 Contractors**

A contractor is a person or a company that works on a contract basis. They strive to conduct a business by acquiring a contract and executing it. In general, construction projects involves two types of contractors that are the general or main contractors and sub-contractors. The general contractor is the manager, or possibly a trader - who are employed by the customer on the advice of an architect, engineer or architectural expert or their own client if acting as manager. A general contractor is responsible for the overall coordination of the whole project. A general contractor must first evaluate project-specific documents (referred to as offers, proposals or tender documents). In the case of modifications, site visits are necessary for a better understanding of the project. Depending on the method of project delivery, the contractor will submit a fixed price proposal or bid, cost plus price or estimate. General contractors consider the cost of home office, general terms, materials, and equipment as well as labour costs to provide the owner with specific prices for the particular project.

Contract documents include drawings, project manuals (including general terms and specifications), additions or modifications issued prior to the proposal / bidding ad prepared by a design professional such as an architect. The general contractor could be the construction manager or construction manager at high risk.

Subcontractors are defined as the individuals, or in most business cases - the entity that has the authority) to approve the contract to perform part of the contractual obligations with another contract.

The subcontractor is the company previously attached to the main contract to perform specific tasks as part of the overall project. Usually, they are paid by the originating general contractor for providing the project services. Although subcontractor concept is mainly common in building and civil engineering works, there are various opportunities for subcontractors as they are likely to become the largest number that now operates in the information technology and business information sector.

The purpose of incentives to hire subcontractors are done to either reduce costs or to reduce project risks. In this way, the general contractor receives the same and better quality of service instead of providing it by itself at a lower overall risk. Many subcontractors work for the same company instead of different ones. This allows subcontractors to continue developing to ensure further enhancement to specialize their skills.

### **1.9.3 Package Basis**

In the JKR, the basic package term refers to the expertise scope of works which are undertaken by the main contractor as a whole. They manage to complete all the scope of work in the project all within their means. Package contracts or also known as lump sum contract, are a traditional way of procuring construction, and it is still the most common construction contract as of recent times. Under the lump sum contract, a single 'total' price for all work is agreed before the work begins.

The main contractor is responsible for the executing the completion of contract work for a specified amount of money.

This is usually appropriate for well-defined projects, in which the tender is being sought and the important changes to the requirement are impossible. This means that the contractor can accurately pay the price for the required work to be executed. Lump sum contracts may not be appropriate in situations in which speed is important, or where the nature of the work is unclear. Other forms of contract that may be more appropriate under such circumstances include measurement contracts (where the work may be stated in reasonable quantities, but not for the amount), the cost of

reimbursement contract that were used in which the type of work cannot be clearly defined in initial stage, the target contract cost and other issues related to the contract cost.

#### **1.9.4 Nominated Sub-contractors**

Nominated Sub-contractor is basically a contractor that was appointed by JKR Expert Branch based on their expertise and experience in doing expert work to be a part of the main contract under the general contractor. A **nominated sub-contractor** is selected by the\_client to carry out an element of the work. **Nominated sub-contractors** are imposed to the main contractor after the main contractor has been appointed. The mechanism for nominating is the instruction related to the prime cost sum to which the main contractor is entitled to add markup and attendance costs. It allows the clients to have direct separate negotiations with major suppliers of goods or services and permit their appointment and design input into the contract after works by the main contractor have commenced.

There are mutual benefits for the client and sub-contractor using the nomination route. The client can select the specialist contractor they prefer, obtain design and value engineering input as well as the direct access of the work progress. The sub-contractor benefits by having much greater certainty of payment. There is no direct contractual relationship between the client and the nominated sub-contractor. The main contractor is instructed by the client to use a nominated sub-contractor for a particular element of the works through the inclusion of a prime cost sum (based on the nominated sub-contractor's accepted quotation) to which the main contractor is entitled to add markup and attendance costs (such as material handling, use of site facilities, scaffolding and so on).

The main contractor should specify the general preliminaries available to the nominated sub-contractor, and specific items of preliminaries will be provided by the sub-contractor. Before any order is placed the main contractor should be consulted on whether the sub-contractor's proposals are acceptable, including matters pertaining to

the preliminaries. When the nominated subcontractor's work commences, the client's cost consultant will periodically value their work, the amount properly due is then shown as a separate amount on interim certificates. This amount will also be notified to the nominated subcontractor. The contractor must then pay the nominated subcontractor the certified amount. The contract may allow the client to pay the nominated subcontractor directly if the main contractor fails to do so.

### **1.9.5 Construction Project**

Construction is the process of creating a building or infrastructure. Construction is different from manufacturing in that manufacturing usually involves with mass production of the same goods without a prescribed buyer, while construction usually occurs in locations for known client. Construction as an industry comprised six to nine percent of the gross domestic product of developed countries. Large-scale of construction requires cooperation from several disciplines. An architect usually manages the work, whilst a construction manager, design engineer, construction engineer or project manager will be in charge of the site supervision. Those involved with design and implementation must consider zoning requirements, environmental impacts of the project, scheduling, budgeting, construction site safety, availability and transportation of building materials, logistics, and difficulties to the public due to the delay of project completion. Large construction projects are sometimes referred to as megaprojects.

In order to carry out the proposed activities in the application form with aim to achieve the project objectives and deliver the results and outputs. Its success depends on internal and external factors. Among the most important aspect is well organized project teams and effective monitoring of project progress as well as related expenses for the entire project.

### **1.10 Limitation Of The Research**

Although this careful and specific steps have been taken in completing this study, there are some limitations encountered in evaluating every aspects to obtain a comprehensive study result. Howbeit, various obstacles have to be taken into account in the success of this study. Withal, the outcome of this study will contribute to a new useful information to JKR especially as it is evidenced by feedback data from JKR staff itself.

Among the limitations faced throughout this study is the very short time constraint. Furthermore, in completing the study the time has to be divided into the essential tasks in the office and master project. If full coverage can be given to this study, it can be implemented in more detailed and overall. In addition, the difficulties in obtaining the contractor and the sub-contractor involved are also limiting the study due to large and distant population studies. The position of JKR projects scattered throughout Malaysia including Sabah and Sarawak also caused difficulties in obtaining input from those involved.



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