

# Project Management Application in the Construction Industry in Sabah, Malaysia

**Dhanasegaran Ramiah,**

43 Taman Mutiara,  
90000 Sandakan, Sabah, Malaysia

## **Abstract**

This paper explores into the extent of application of project management methods among the contractors who have carried out Government-awarded infrastructural projects in Sabah. The data were collected through face-to-face interviews, involving contractors, consultants, CIDB officers and Government directors. The findings of the research reveal that project management methods are not utilized by the contractors and that the Government's representatives and the consultants are not familiar with project management method. Nonetheless, there is common consensus among the contractors, consultants and Government's representatives that the application of project management methods is beneficial, and that it would have averted most of the problems faced by the construction industry.

**Keywords:** *Project Management, Construction, Infrastructure, Sabah, Malaysia*

## **1. Introduction**

Construction is an important industry in Sabah, as it generates considerable infrastructural development and provides substantial employment opportunities in the state. The development works were

accelerated in the 9th Malaysia Plan and 10th Malaysia Plan, and were further reinforced with the provision of the "Stimulus Package" between 2008 and 2009. As a result, the construction industry contributed to about 5% of the Gross Domestic Product (GDP) and employed 9.3% of the overall workforce (MPC, 2016). The role of the construction industry and its contribution to the socio-economic development and well-being of the country cannot be underestimated, considering that it involves billions of ringgit worth of funding and expenditures.

The construction industry has a strong influence on growth because of its extensive backward and forward linkages with the rest of the economy (Ofori, 1990). In spite of being one of the most contributive sectors in developing the economy of a country, there is still lack of appropriate attention given to the development of the industry and its contractors (Abu Bakar, 2005).

Whilst the construction industry is a major player in the socio-economic development and well-being of Malaysia, it is also well-known that the industry has been plagued with notorious publicity on cost overrun, uncontrolled and unrealistic schedules, poor workmanship, and abandonment of construction works. The

image is further worsened when it involves additionally relatively phenomenal amount of money and extra time to revive “sick” projects that have been much delayed or abandoned. In addition, the problems faced by the construction industry are also exacerbated by the fact that construction projects are inherently borne with risks, for instance, the risks of price fluctuation of construction materials and in the recent years the more frequent onslaught of adverse weather.

On the other hand, it was considered that a proper and coordinated application of project management methods over the many elements involved in a project will not only minimize, if not entirely remove, the associated risks but will also contribute to the success of the project (Pons, 2008; Archibald & Archibald, 2016; Turner, 2016)

Project Management thus offers various tools, techniques and methods in planning, managing and controlling a project entirely from conception to implementation through to delivery (PMI, 2007). The application of project management tools, techniques and methods is intended to eliminate potential problems and challenges before the implementation of a project. When projects are underway, the application of project management tools, techniques and methods will provide a means to control problems that are arising, and in turn minimize their impacts (Larson & Gray, 2010; Scott, 2016)

The application of project management methods, with the benefits it acclaims, in the construction industry in Sabah is not only warranted but is also urgently required, for a peculiar reason. Sabah, well-known as one of the poorest states in Malaysia, is also lagging much behind in terms of infrastructural and socio-economic developments compared with most of the other states in Malaysia. If Sabah were to realize the Vision 2020

(Mahathir, 1991) of a developed nation on a par with the rest of Malaysia, particularly Selangor, Wilayah Persekutuan and Johor, the infrastructural and socio-economic developments in Sabah need to be accelerated with every dollar and cent well-spent. Under such circumstances, it is considered that the importance of the application of project management methods in the Government-funded sector of the construction industry in Sabah cannot be ignored.

Project management, and its tools and techniques, are not novel and have not been unknown. The concept and the methods have been well-documented and practiced in many parts of the world. However, in the local context, there appears to be a lack of awareness of the role and importance of the application of the methods as well as a lack of appreciation of the benefits the application will bring.

- Problem Statement

The problems highlighted by the Government above are not inconsistent with researches that have been carried out by others. According to Dayang Sabariah (2009), the most frequent causes of project delays in Sabah are inadequate planning, slow decision-making, poor site management or supervision, changes in drawings or specifications, and contractor’s financial difficulties. Dayang Sabariah also listed the factors causing severe impact on a project as slow payment of completed work, contractor’s financial difficulties, poor site management or supervision, shortage of manpower and unforeseen site conditions. Her findings also included an emphasis that planning at the early stage of construction is crucial to minimizing any major risk or difficulties during the execution of works, particularly in projects funded by the Government.

In a separate research, Selvester (2012) added that the problems associated

with the construction works in Sabah are attributable to poor construction materials, lack of supervision, poor workmanship, and other factors related to the client and contractor. These problems have often affected the quality and condition of building structures, taking a heavy toll on the clients and contractors alike in terms of financial losses and tarnished reputation.

Successful implementation of a project is subject to satisfying the triple constraints of schedule, scope and budget of construction. Besides, the risks associated with construction, which are by and large complex and unique, also need to be managed in order to complete the project satisfactorily. From limited literature that is available on construction projects in Sabah, there is evidence to support that the problems and failures experienced by “sick” projects are largely attributable to the lack of application of project management methods, and that the application of project management methods should minimize, if not entirely eliminate, most of the setbacks faced by the construction industry in Sabah.

- **Significance of the Study**

Most construction projects funded by the Government in Sabah are infrastructural works, such as roads, bridges, water treatment plants, dams, hospitals, schools and low-cost housing. Successfully implemented projects that satisfy the triple constraints of schedule, scope and budget by and large benefit the public, and reaffirm the Government as one that values its people and performance. Projects completed within schedule allow the public to be benefited from the use of the infrastructural facilities on time, which in turn are likely to spin off a multitude of socio-economic activities that will richly benefit the communities. These include provision of roads that catalyzes agricultural or mining

activities as product and goods can now be easily transported to demand areas or for export, while hospital and clinics that care for and maintain a healthy population yield a healthy and productive workforce, and schools and higher learning centers that equip the population with knowledge and skills develop a nation that is competitive in the local and global arena. In addition, projects completed within scope and within budget enhance the credibility and reputation of the contractors and normally entail repeat invitation for future bids and projects. Similarly, the Government will also be benefited with high opinion poll as an Administration of good governance and prudent public spending.

As discussed, the benefits of successfully implemented Government-funded construction projects to the public as well as the Government and the different organizations involved in the project are not inconsiderable. However, it cannot be denied that the potential benefits to be realized are dependent upon the implementation of the projects that satisfies the triple constraints of schedule, scope and budget. In turn, it is also known that fulfilling the triple demands of schedule, scope and budget is subject to a satisfactory application of the project management methods. Thus, this study will look into the relationship of the application of project management methods, or the lack of it, in Government-funded construction projects in Sabah.

## **2.0 Materials and Methods**

Exploratory and qualitative research was carried out to determine the extent of project management application by grade 7 contractors in Sabah whom had carried out construction works worth more than RM 10 million.

The paper examines the aspects of:

- (i). Project management practices by the contractors in Sabah,
- (ii). Action needed by Government to ensure successful implementation of project management methods,
- (iii). To query whether project failures could have been averted if project management methods were applied by the contractors in Sabah.

Information were gathered by conducting face-to-face interview involving consultants, contractors, authorities and regulators who are party to infrastructural projects awarded by the Government.

A total of 35 respondents participated in the study. They were interviewed at their office for convenience and comfort. The respondents comprise of 31 contractors, 2 were the Director of Water Department and Director of Public Works Department, and 2 were from CIDB. The 31 were contractors' representatives exercising management roles and actively involved in infrastructure projects awarded between 2011 and 2016.

### 3.0 Research Findings

It is notable that most of the contractors undertaking Government-awarded projects were not of the group with formal education but rather their skill and knowledge were acquired through experience over the years with limited and narrow contract administration methodology and financial mastery. Whereas, the consultants and Government department regulators are in this instance all from engineering background, possessing a minimum of a bachelor degree and membership of the Institution of Engineers, Malaysia, with professional engineer's certification, and/or membership of chartered institutions overseas while registered with the Board of Engineer, Malaysia to practice in this country. These engineers are aware of project management methods which they acquired during their training at university

level but have not been put into practice because there has been no insistence on it nor obligation to comply with it.

The other notable finding concerning the local contractors is their preference in almost all cases to outsource or subcontract projects to specialist subcontractors who are better versed in their fields of expertise. In projects involving relatively large contract sum and new technology, the beneficiaries are often West Malaysian construction companies.

The role of the consultants, other than to produce design drawings and specifications, is limited to assisting the contractors to produce the s-curve. It emerges that the s-curve is by and large the only project management tool that is required by the Government regulators in Sabah. While there are several types of s-curve, only the cost versus time s-curve is utilized.

- ISO 9001 Accredited Contractors

It emerges that less than 50% of the grade 7 contractors in Sabah are accredited. Interviews with the consultants also revealed that the contractors who are accredited with ISO 9001: 2000 (or 2008) indeed apply quality management, but one which is generic and not project specific. The application merely means that the contractors follow a set of procedures, without the ownership of ensuring the quality of the construction project nor carrying out proper communication with the stakeholders.

CIDB mandates that all contractors be ISO 9001 accredited in order to improve workmanship in construction projects. The QMS is concerned with understanding customer's requirements, in this case, the requirements of the Government. Based on this understanding, the management processes are developed to deliver the construction project as required.

- **Project Quality Management**

During project planning, it emerges that quality management plan is seldom or never prepared by the consultants or Government representatives, because it is neither mandatory nor expected. Quality assurance is thus limited to ISO 9001 documentation, which is generic. The content is usually as minimal, as the sole purpose is meeting the ISO 9001 accreditation requirement sufficiently enough to maintain it.

There is misconception or misinterpretation between quality and grade by the contractors. When quality is mentioned, the Contractors construe it as the contract specifications, which in most cases are limited to the project specifications of the Architect Association of Malaysia. The cut-and-paste culture without originality also appears to have hindered wholesome specifications, and in turn, the required quality of construction works, to be bespoken.

As for the contractors who are not ISO 9001 accredited, project quality management is foreign. Quality to them is simply meeting the technical specifications and completing the project, and nothing more. Project Quality Management as a project management method, and its application by the contractors undertaking Government-awarded infrastructural projects in Sabah, is much to be desired.

An issue is that all of these companies awarded with Government projects are civil contractors, and that it appears to be a norm to subcontract the mechanical and electrical portion of the works to local specialist contractors. In most cases, such projects are water supply schemes, irrigation works or building construction.

There have been a significant number of projects in Sabah, from small value to huge contract sum, in the public as well as private sectors in the recent years. As a result, the demand for specialist contractors

exceeded their availability. Whilst West Malaysian specialist contractors may be engaged, the main contractors in Sabah have avoided it due to considerable mobilization cost that will have to be borne. Under such circumstances, specifying and delivering quality are thus not an easy task.

Ensuring or maintaining quality on construction site is considerably limited, and that it is largely dependent on the resident engineer (RE) or clerk of works deployed on site by the project consultants. The lack of experience of the RE and his or her team also affects the quality of the products to be delivered.

Besides, poor workmanship, changing material specification without prior approval and failure of project to function to the intended criteria, led to much reworking or recasting or reinstallation with resultant delay and cost overrun in many projects in Sabah.

- **Project Communication**

The identification and registration of stakeholders, together with a stakeholder management plan, has emerged to be non-existent in the projects. Similarly, no communication plans are drawn up, while distribution of project information are limited to technical drawings, and progress meetings and progress reports. Furthermore, progress reports are generally limited to updating the Gantt chart, s-curve and progress claims to be submitted to the Government's representatives.

Verbal communication is the most common type of communication practiced in construction projects in Sabah. Written communication, with the exception of progress reports and claims for payment of progress of works or variation, is shunned as it is culturally considered undiplomatic. With little documentation of communication, verification of what has been instructed, discussed or agreed or to be followed up is highly problematic. The

practice is not conducive to the implementation of a project.

The contractors should not entirely be blamed for the problems of communication in projects. The local consultants ought to own up to a bigger share of the problems. In Sabah, it is not uncommon to have a last minute design change or instruction, and the issuance of construction drawings or revised drawings at the “eleventh hour”. The practice has a spiraling effect not only on subcontractors but also suppliers. The delay and associated cost overrun ultimately affect all stakeholders, including promoters and end-users without exception.

### 3.1 PM Knowledge Areas

In a nutshell, all the respondents were not practicing formal project management and the reason being they are not familiar with the methods, and that they do not see the benefits of utilizing such elements. In addition, there is the perception that utilizing project management methods will restrict flexibility or freedom in management because they appear to be too formal and will incur cost to implement them. Furthermore, there are no requirements by the Government that the elements of project management must be applied or adhered to. There is thus no motivation or obligation for the project management elements to be used.

There is a general consensus among the contractors that the complexity of projects is rapidly increasing due to growth in new knowledge. The contractors agree that there is a need to apply project management to remain competitive because project management focuses on achieving project objectives.

- Project Integration Management

The absence of a project management plans is detrimental in managing projects. Without a plan, the contractors resorted to rely solely on the Gantt chart in project

execution. This led to multiple problems which require extended time and additional human and financial resources to tackle and resolve as the project progresses. At these hustle-and-bustle junctures of the project, the contractors would normally find it additionally demanding and difficult to direct and manage the construction work. Without the means of tracking, reviewing and reporting the progress of the project adequately, they were frequently unable to appreciate the problems promptly and implement corrective or preventive measures at the earliest opportunity. Consequently, performance of the project was adversely affected, and deviation from the project objectives inevitable.

Structured change management is little or never practiced. Changes are seldom or never documented, with decision on changes made on site given minimal or zero deliberation with stakeholders.

Lack of project management plans also often leads to poor planning in procurement of materials, mobilization of constructional plant and equipment and deployment of human resources. The main decision-making platform appears to be commonly the monthly progress meeting, where all parties to the project sit together, hold critical discussion and make major decisions. The lack of constant and prompt decision-making, as limited by the progress meeting generally held one a month, is slowing the contractors down and is not conducive to them in delivering the project within time and budget.

Both contractors and Government’s representatives are familiar with the closure and handing-over of projects, involving the signing-off of completion documents or commonly known as Completion Certificate. However, lessons learnt are seldom or never documented for reference or application in future projects.

- Project Scope Management

The scope of projects is defined by the Government, commonly in what is called the need statement or terms of reference. Once an inception or conceptual proposal based on the scope of the project has been submitted and approved by the Government department in principle, the consultant proceeds to carry out detailed engineering design and preparation of tender drawings and documentation, which includes bills of quantities. However, since systematic WBS is not commonly practiced, missing or overlooked deliverables are normally encountered in the contract drawings, bills of quantities and specifications. Whilst building one's work by referring to what has been drawn, specified and itemized in bills of quantities in other projects by other people is permissible, copying or wholesale recycling without originality and thorough consideration is not professional and is risky to the execution of a project. What is not tailored into a dedicated set of contract documents is likely to be missed out or overlooked in the drawings, specifications and bills of quantities. Addressing these as they surface at a later stage is usually associated with adverse time and financial implications.

Indeed, the contractors acknowledge that the multiple small scope changes are part-and-parcel of project life that they have come to accept. However, they have not realized that multiple scope creeps can accumulate into a large compound project scope change, which would inevitably overwhelm them with additional work that upset their approved timescale and devour their approved budget. On diminishing profit or even losses, this is particularly the case since they do not normally recourse to extra claims on small scope changes.

- **Project Time Management**

As discussed earlier, work breakdown structure is seldom or never performed in projects. The only time management that is

applied is limited to the major activities in the Gantt chart. The absence of work breakdown structure prevents project activities to be accurately defined and time cannot be allocated to the activities. Without a work breakdown structure, project activities cannot be sequenced correctly, and valuable information are deprived from being available to estimate resources required to carry out the activities. Performance evaluation review techniques (PERT) or critical path method (CPM) is non-existent. This prevents the contractors from monitoring the status of the project adequately and carrying out the correct update on the actual progress. The availability and application of the PERT or CPM would have allowed the contractors to effectively manage the changes to the baseline of the project.

As mentioned earlier, and similarly the case here, the only time management method used by the contractors in projects is merely the monitoring of progress against the s-curve. The sole purpose of the s-curve that is applied is purely to present to the Government's representatives on the progress of works that has been achieved for the specific goal of making progress claims for payment.

- **Project Cost Management**

The total contract sum of a project is usually arrived at from the grand total of priced bills of quantities submitted by the successful bidder. As stated by the contractors, and in many cases and from past experience, the prices entered in the bills of quantities were significantly inflated to offset uncertainty in the cost of materials and goods. The uncertainty arises because most materials and equipment for permanent installation have to be purchased from West Malaysia, while certain plants have to be imported overseas, with the added risk of foreign exchange fluctuation.

There is another phenomenon. As steel bars are imported from West Malaysia, and there is regularly a shortfall of them, the contractors are forced to compete for steady supply. The purchaser who is willing to pay the higher price normally gets the supply priority!

Another interesting material is cement. Whilst it is manufactured in Sabah, demand frequently outweighs production. It had occurred where Contractors with strong financial back-up were able to buy clean the entire stock of cement produced in Sabah, leaving the less fortunate contractors with no choice but to acquire them from West Malaysia at a much higher premium.

According to the contractors, there had been cases where the prices they had entered in the bills of quantities turning out to be much lower than the prevailing cost of materials due to abnormal price fluctuation. Whilst not condoned, the contractors had resorted to balancing the cost overrun of the project by reducing the quality and quantity of usually non-load bearing items in the bills of quantity.

- Project Human Resources Management

As most of the project works are subcontracted, the main contractors only keep key personnel to oversee the contract during project execution, closure and maintenance. In effect, the main contractors become nominal in the administration of the contract, as the bulk of the execution of the project is passed on or “abdicated” to the subcontractors.

Whilst the need to employ competent project manager is vital to the survival and continuity of construction companies, the contractors are not putting this into practice because they are bogged down by the problems of availability, suitability and continuity of such candidate in their organization. Firstly, most of the experienced and competent project

managers are already working in West Malaysia or overseas as pay-scale and career development are considerably more attractive. Secondly, those who are locally available are primarily civil engineers with design and site backgrounds, where proper project management experience and skills are very limited. Thirdly, unlike country like the United Kingdom, the construction industry there is sustained by a steady and stable number of large construction companies, with strong financial back-up, human resource pool and experience and relatively reliable volume of works.

In Sabah, most construction companies become dormant or dissolved typically after undertaking the first few projects. With certain exception, being continuously awarded with projects, let alone over long term, is few and far between for most contractors. Thus, the service of the project manager will sooner or later be terminated, or he or she just moves on to “greener field” across the sea or overseas.

- Project Risk Management

The practice of risk management is phenomenally alien to the contractors in Sabah, although certain Sabah-based consultants with projects in Labuan or West Malaysia have been exposed to, and superficially involved in, risk management because risk management documentation is mandated in these jurisdictions.

Whilst both Government’s representatives and contractors in Sabah agree that risk management is beneficial to them individually in contract implementation, there is also a general misconception that implementing risk management will increase the cost of projects, stifle flexibility as risk management plan is construed as bureaucratic, and introduce unnecessary hindrances to smooth project execution and implementation. In addition, the lack of



qualified personnel skilled in risk management is also deterrent to the plan from being implemented.

- **Project Procurement Management**

On procurement, the evidence is there that both Government's representatives and contractors apply a limited form of project procurement management. For instance, Government departments such as Jabatan Air Negeri Sabah specify certain brands of equipment to be used for the purpose of standardizing equipment to facilitate ease of procurement of spare parts and maintenance. Whereas with the contractors, involving those who are ISO 9000 certified, apply what is generic procurement procedures, which is limited to acquiring three (3) quotations, and selecting the supplier that meets the specifications at lowest prices. In spite of the availability of the procurement procedures, the contractors are not able to carry out a well-planned procurement program because they do not normally sequence out their project activities. This results in placing an order too early with advanced delivery requiring storage space, placing an order too late with the consequential delay and escalating cost and losses, or ordering the wrong quantities causing shortfall and further delay and rising costs, or surplus which are redundant and a loss. Besides, too early a delivery also brings forward the expiry of the warranty period of the procurements.

#### **4.0 Conclusion and Recommendations**

From the findings of this research, it is clear that the local contractors carrying out Government-awarded infrastructural projects in Sabah do not practice project management methods.

CIDB personnel who had been interviewed were oblivious to project management methods, and only barely mentioned ISO 9000 as the quality model for the construction industry. They were

able to provide neither the number of Government projects that had been awarded in Sabah nor the breakdown of the contract sum of each project. The non-availability of a list of contractors of Sabah origin with CIDB has limited the pool of contractors to be interviewed in this research only to those who had been associated with the consultants in the past.

The Government's representatives and the consultants who have been interviewed are in the opinion that project management methods at this stage where Sabah has been undergoing intense infrastructural project implementation will complicate the execution, and increase the cost, of projects. The Government's representatives conceded that they themselves are not familiar with the project management methods, and that they also lack the manpower with adequate knowledge in project management to implement it effectively, or the motivation and drive to incorporate project management methods as a requirement in all future contracts and documentation.

The overwhelming number of consultancy work in the public and private sectors in the recent years that has kept the local consultants on their toes is considered a major setback as far as the ownership, implementation and promotion of project management methods are concerned. As mentioned earlier, consultants have been struggling to maintain experienced and skilled project managers in their firms. The overwhelming workload in the recent years has stretched their professional human resources thin, with further exacerbation by a fluid workforce who would not hesitate to move on to "greener fields". Under such constraints, the consultants were not prepared to spare personnel nor time to exercise, let alone promote, the application of project management methods. As a result, the consultants in Sabah continue to lack the knowledge of project management methods, and remain comfortable to

practice mediocre “ad-hoc project management”.

- PM Knowledge

It was noted that IEM (Sabah) has intensified their promotion of the application of project management methods in the construction industry in Sabah in the recent years, while there has been a major paradigm shift with CIDB in mandating contractors to be ISO 9001 accredited to improve workmanship in construction work. In spite of the positive developments aforementioned, the findings of this research reveal a grim picture concerning the application of project management methods, or rather the lack of it, by the contractors who have undertaken Government-awarded infrastructural projects in Sabah in the recent years, as follows:

(i). Effective project management is generally not practiced in Sabah. The traditional methods of project management on ad-hoc basis are commonly used, and that the application is primarily limited to Gantt chart and s-curve. PERT and CPM are non-existent. No earned value analysis is carried out.

(ii). The widespread non-application or non-adoption of effective project management methods by the contractors is attributable to the following factors:

- a. Unlike the United Kingdom where construction companies are represented and executed by chartered engineers, the local contractors are by and large without formal education and training.
- b. The local contractors prefer to, and also out of necessity, outsource or subcontract bulk of projects to others, particularly specialist contractors. Under the arrangement, the contractors also falsely assume that they have passed on or “abdicated” the commitment and responsibilities in proper project management to the subcontractors.

c. The local consultants, who could have contributed to the application of effective project management, are not blameless as confining their role to producing design drawings and tender documentation, and assisting the contractors with the familiar s-curve, has become what appears to be a norm. Other consultants have conceded that they, including the Resident Engineer and team, are simply unfamiliar and inexperienced to take on and apply the project management methods.

d. Similarly, the contractors have acknowledged that the methods in project management are foreign to them. When certain requirement on quality management under ISO 9001 is applied, the application is generic rather than project specific.

e. The contractors are by and large skeptical about the benefits the application of project management methods bring and how it will offset negative impacts and losses. There is also no drive or obligation for them to change.

f. There is misconception among the contractors that the application of project management methods will restrict flexibility and freedom in managing the construction work, and that implementing it will incur additional cost on them.

g. The contractors accept that the employment of a competent project manager in their organization, who is skilled in project management methods, is vital to the survival and continuity of their companies. However, this is set back by the problems of availability, suitability and continuity of such a candidate locally. The problem is also not peculiar to the local consultants.

(iii). Project communication of the contractors is much to be desired, resulting in costly mistake and reworking. This arises as there is no systematic identification and

registration of stakeholders, stakeholder management plan and communication plan. Verbal communication, mostly conducted in Chinese, in place of written communication is risky to the project and is not likely to be conducive to the application of the project management methods. Whilst language is not a problem with the consultants, their last minute communication style to design change and issuance of drawings or instruction is causing significant havoc to the construction program and budget.

(iv). The absence of project integration management plan renders tracking, reviewing and reporting progress inadequate, and pin-pointing problems and resolving them promptly difficult. Without a plan, poor planning results in high wastage or acute shortfall in procurement and inefficient deployment of plant and equipment as well as human resources.

(v). Decision-making on site is taking too much time and is inefficient to the detriment of the project.

(vi). Work breakdown structure is not commonly practiced, leading to certain construction or installation being overlooked. Making it right at the eleven hour is normally costlier. Without structural breakdown, work cannot be accurately defined, adequately allocated time and resources and correctly sequenced. Invariably, this results in project delay and costly restoration.

(vii). A well-planned procurement program is not achievable because the contractors do not apply the work breakdown structure with proper sequencing of construction activities. At times it is beyond the control of the contractors: Unlike West Malaysia, materials such as steel and cement are not continuously aplenty with reliable supply. Under these conditions, any project procurement management plan is likely to become immaterial, at least momentarily.

(viii). Lessons learnt are neither recorded nor appreciated for application or avoidance in future projects.

- Application of PM in Construction Industry in Sabah

It has been proven in many countries that the application of project management methods ensures the triple expectation of time, budget and scope are achievable in projects. Considering that fund for the implementation of infrastructural projects promoted the Government is public money, it is natural that the Government would be most interested in ensuring that the money is well-spent. As holder of the public purse, the Government through various departments and agencies is also poised to take a leading role in promoting and implementing project management methods in all public works. To begin, the requirement to apply project management methods may be specified in the tender documentation and paid for in the bills of quantities in all Government-awarded infrastructural projects in Sabah.

As year 2020 is approaching for us to achieve and realize the status of a developed nation, we cannot afford to remain unchanged and complacent with traditional methods of project management. Proactive action should be taken by all stakeholders.

- Contribution

It is intended that the findings of this research be used by other researchers (or departments or organizations) as a source of reference in conducting future or related work into project and project management in Sabah.

The findings also paves the way for the Government to understand the value of project management methods and draw policies, if necessary statutory obligations, vital for the implementation of the application of project management methods among the contractors in Sabah.

The findings also serves to remind to the contractors in Sabah that adopting and implementing the application of project management methods is beneficial to their companies and their construction work.

• Recommendation

Infrastructural projects carried out in Sabah have been plagued by multiple problems, among them delays and cost overrun, the worst being cases of projects that have been abandoned and subsequently requiring unnecessarily injection of taxpayers' money to rescue them.

Previous researchers have identified the problems faced by the construction industry in Sabah. The problems could have been averted by managing the nine (9) project management knowledge areas. In view of this, it is recommended that the project management methods be adopted and applied in all Government-funded infrastructural projects in Sabah.

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