IMPROVING CONSTRUCTION PROJECT PERFORMANCE THROUGH THE PROJECT MANAGER: AN INDONESIAN EXPERIENCE

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Abstract:

The project manager's responsibilities are to plan and control company resources efficiently and to complete the project on schedule, within the budgeted costs and specified quality towards making the project a success. However, many reports show the opposite. Studies on this issue are pointing toward the poor understanding of good practice as a basic problem for the failures in project management. The objective of this paper is to study good practice of project management tools and techniques that can be applied by project managers in construction projects. This paper also measures how these tools and techniques were applied in construction projects. Using the case study approach which was carried out in Medan, Indonesia, three large projects were chosen, namely RSU Pirngadi, Plaza Medan Fair and the Redevelopment of Pasar Petisah. The data was collected as well as obtained from and through project reports, questionnaires and interviews with the project managers of the relevant projects. The variables were then separated into two classifications that could be defined as either success or failure. The findings of the research found that good project management practices result in a higher project performance.

Keywords: Project Management, Project Manager, Construction Industry, Performance, Medan, Indonesia

INTRODUCTION

There are some companies that have built reputations for being able to consistently manage projects effectively (Gay & Layson, 2003). However, the vast majority of organizations have a more spotty reputation. These are some characteristics that can be used to point out the need for project management:

- Project completed late, over budget, or not meeting the functionality requirements of the client.
- Weak standards, process and techniques used inconsistently by project managers
- Project management is reactive and not seen as providing value
- The time required to manage projects proactively is not built into the work plan, since it is considered as an additional 'overhead'

- Projects are successful in spite of a lack of planning and project management, through heavy stress and overtime work throughout the project life cycle

Effective project management techniques are important to ensure successful project performance. A poor strategy or incorrect budget or schedule forecasting can easily turn an expected profit into loss. This is especially true for the construction industry where projects have a relatively short life cycle and the project activities are non-repetitive with rather complex interrelationships, so that there is little opportunity to improve a wrong strategy.

The most common constraints in the construction industry in developing countries are the oversupply of unskilled labor and a restricted supply of management manpower. According to Abu Bakar (2002) what is vital in management is the ability of managers who are able to manage risks that occur in construction sectors. It is important to take note that upgrading the management capability is vital for growth and expansion in the construction industry.

The appointment of the best project team will better ensure the success of the project. But the best project team must be led by a good leader, which is the project manager. The assignment of a single project manager responsible for all aspects of a project has been recognized as a critical factor in the success of any design or construction project (Anderson & Tucker 1994; Goodwin, 1993).

RESEARCH OBJECTIVES

The objectives of the study were to:

- Study the good practices of project management tools and techniques;
- Identify the project performance standard in practice; and
- Identify the competency skills that a project manager should have to influence a successful project performance.

PROJECT PERFORMANCE

Projects can be considered as a set of activities that must be completed in accordance to specific objectives which involve the utilization of a company's resources. Gay and

Larson (2003) define a project as a complex, non routine, one time effort limited by time, budget, resource and performance specification designed to meet customer needs. It also can be defined as a temporary endeavor, having a definitive beginning and definitive end, undertaken to create a unique product or service (Project Management Institute, 2000).

Project success can be described as a complex and often illusory construct, but nonetheless it is of crucial importance to effective project implementation (Pinto and Slevin, 1989). It is also seen as a strategic management concept where project efforts must be aligned with the strategic long term goals of the organization (Shenhar et al, 1996). Rad (2003) noted that to put the issues in perspective, when someone pronounced a project success or failure, the judgment is usually based on some factual evidence, although not everyone uses the same data. Even when the same data is used, not the same set of evaluation indices is used by all parties in arriving at a basis of evaluation for the degree of project success.

According to Munns and Bjeirmi (1996) a project can succeed despite the failure of project management but successful project management implementation can increase the potential for success on an overall project scale.

PROJECT MANAGEMENT

The Project Management Institute (2004) defines project management as a set of processes that are applied to a project to deliver a product or service. It was designed to provide sustained, intensified and integrated management of complex ventures and to pull together a combination of human and non human resources into a temporary organization to achieve a specified objective (Adams and Barnt, 1988).

Project management in construction encompasses a set of objectives which may be accomplished by implementing a series of operations subject to the constraints of resources. There are potential conflicts between the stated objectives with regards to scope, cost, time, quality and the constraints imposed on human material and financial resources. These conflicts should be resolved at the onset of a project by making the necessary tradeoffs or creating new alternatives (Hendrickson & Au, 1998).

THE ROLE OF PROJECT MANAGER

As afore mentioned, the assignment of a single project manager responsible for all aspects of a project has been recognized as a critical factor in the success of any design or construction project (Goodwin, 1993; Anderson & Tucker, 1994). According to Chen (1997) being an effective project manager is among the most challenging jobs in industry. In most cases, a single project manager is accountable for the success of a project and is responsible for its planning, allocating, directing and controlling functions. Ideally, each project manager would be assigned one and only one project and each project manager would have ample opportunity to use their skills to resolve all project issues.

Gransberg (2002) in his journal highlighted the issue of roles and responsibilities of the project manager as follows: Construction management is literally, “where the rubber meets the road”. All the planning, preparation, design and cost estimating is put to the test in this fast paced phase of the project’s life cycle. This phase begins after the award of the construction contract and continues through construction close out. Walton (1994) believes that the most important responsibilities of a project manager are project evaluation, setting up the team, setting up systems, planning, monitoring, control, negotiating contract conditions, training and communication. In their study, Turner and Muller (2006) found that a project manager’s success at managing his or her project is dependent on their competence, particularly their leadership style comprising emotional intelligence, management focus and intellect.

ESSENTIAL SKILLS OF A PROJECT MANAGER

In order to meet the objectives of modern projects, with an increasingly complex nature, it is essential for the project managers to be able to use a variety of managerial skills (Ogunlana et al., 2002). To conclude what are the most important skills that a project manager should have, the following will be discussed.

a. Conceptual skill

According to Katz (1974) conceptual skill is the ability to see the enterprise as a whole and recognize how the various functions of the organization depend on one another and how a change in any one part affects the other. The diversity of the project system and the need to ensure that all the elements function together as an integrated whole

requires a high degree of conceptual skill on the part of the project manager (Goodwin, 1994; Burke, 1995).

b. Management Skills

PMBOK (2000) stated that general management is a broad subject dealing with every aspect of managing an ongoing enterprise. General management skills provide much of the foundation for building project management skills. They are often essential for project managers. These skills are:

i. Finance and accounting, sales and marketing, research and development, and manufacturing and distributions.
ii. Strategic planning, tactical planning and operational planning.
iii. Organization structures, organizational behavior, personnel administration, compensation, benefit and career paths.
iv. Managing work relationships through motivation, delegation, supervision, team building, conflict management, and other techniques.
v. Managing oneself through personal time management, stress management and other techniques.

c. Human Skills

In order to meet the project objectives, the project manager is dependent on other people to accomplish project tasks within the frame work of the project schedule, budget, and performance specifications. Human skill is in fact, the ability to work with and through other people (Katz, 1974). Chen (2002) stated that these skills encompassed leadership, communication and team building skills.

d. Negotiation Skills

PMBOK (2002) identified this negotiating skill to be an essential skill. Many of the tasks comprising project implementation processes are governed by agreement, either formal or informal. All these agreements need to be negotiated and the project manager will certainly be involved in the negotiation for major agreements (Oberlender, 2002).

e. Technical Skills

Katz (1974) defined technical skills as an understanding of and proficiency in, a specific kind of activity, particularly one involving methods, processes, procedures, or techniques. It involves specialized knowledge, analytical ability within specialty, and facility in the use of tools and techniques of a specific discipline. Chen (2002) stated that technical knowledge greatly enhances project management capability.

f. Business Expertise

Chen (1997) recommended additional skills to project managers, which is business expertise. On small projects, this can be a tough challenge because project managers are also managing the project control function.

METHODOLOGY

This paper is based on a case study approach. In this paper, the researcher are using the descriptive approach supported by quantitative data where questionnaires were used for getting primary data. The questionnaires were divided into two sets. The first questionnaire was for project managers that cover; respondent background, project performance details, project objectives and the tools and techniques in project control. The second questionnaire is for project teams that cover; respondent background, project performance details, project objectives and assessment of the project manager. The second questionnaire had been distributed to 28 respondents among the project team population. From 28 questionnaires, only 22 or 79% of the questionnaires had been collected back completely answered. The case study was conducted on three large construction projects in Medan, Indonesia as follows:

a. Case study A, Hospital Pirngadi

Respondent is represented by the contractor. Interviews on this case study were done with the project manager and twelve in-house project teams who were involved completely from the beginning to the end of project and also those who understood the entire project progress.

b. Case study B, Plaza Medan Fair

Data collected was through the client's side. Interviews on this case study were done with the project manager and ten in-house project teams involved completely from beginning to end of the project and also those who understood the whole project progress.

c. Case study C, Redevelopment Phase II

Respondent is represented by the consultants. The project was being executed without an appointed project manager but was only supervised by a site supervisor. So, interviews on this case study were done with the site supervisor.

Hypotheses

HO : Variance Population between case study A and B is significant in achieving project success, meaning both case study A and B achieved success in project performance.

HA : Variance Population between case study A and B is not significant in achieving project success, meaning that it is possible that case study A or B may or may be successful.

These hypotheses were analyzed using independent sample T-Test. The objective of using an independent group T-Test is to compare between 2 groups that are not related to each other. There are 2 types of decision making in independent sample T-Test analysis which is:

1. By Levena Test, testing that population variance between 2 samples is significant or not significant.
    a. If Sig.> 0.05, means HO is acceptable
    b. If Sig.< 0.05, means HO is rejected
2. By T – test, further testing from Levena Test to make more accurate decisions.
    a. If Sig.2> 0.05, means HO is acceptable
    b. If Sig.2< 0.05, means HO is rejected

ANALYSIS

1) Descriptive Results

a. Respondent Background

Respondent A is an in–house project manager. He joined the firm in 1994 and up to now, had managed over 10 large projects in Indonesia. He is a university graduate and has also enhanced his knowledge as a project manager with related knowledge concerning technical and management knowledge. Respondent B is also an in-house project manager. Graduated in 1986, he worked with several companies. Until today, he has experience in managing and leading construction projects for over 18 years. Respondent C is not acting as a project manager. He is an in-house site supervisor with working experience over 15 years. Respondent C is not a university graduate. Till today, he has never attended neither informal nor formal education to enrich his knowledge. Having been working mostly for government projects, his role in the projects were only following project guidelines as well as the contract. Even though he is equipped with most of the tools and techniques to manage a project, he did not have enough authority to fully apply all those tools and techniques.

b. Project Performance

Case study A: Hospital Pirngadi

This project was completed in 12 months. The original schedule was for a 10 month completion period. In terms of project cost performance, the project manager stated that at completion, his project cost 5% less from the estimated budget. In terms of project quality performance, the project manager said that quality control during execution was done frequently and following the contract standard. For good and effective project quality control, the project manager scored very well on his project quality performance. The last criteria regarding project performance in this study was project safety performance. The safety record for this project was considered excellent. In terms of safety standard, the project manager applied the company standard. There was a safety and health inspector appointed during execution of the project. As further observation on this issue, some workers were interviewed on this aspect. All of them agreed that the safety standard for this project was excellent.

Case Study B: Medan Fair Plaza

It was completed 1 month behind the schedule. This late completion was acceptable as there was an agreement for an Extension of Time for one more month. In terms of project cost performance, the project manager stated that his project was 5% less from the estimated budget at the point of completion. In terms of project quality performance, the project manager said that quality control during execution was done frequently and followed the contract standard. For good and effective project quality control, the project manager scored very well on his project quality performance. The last criteria regarding project performance in this study was project safety performance. The safety record for this project was considered as very well also. In terms of company standard, the project manager had applied the related standards. There was a safety and health inspector appointed during the execution of the project.

Case Study C: Redevelopment of Pasar Petisah.

As this research was being conducted, the project was delayed 7 months behind schedule with percentage delay being -23% over contract schedule with progress at 98.154%. Project schedule performance of this project was not satisfactory. At the same time, cost performance was similarly over budget, being 10% over the estimated budget. In terms of project quality performance, the site supervisor said that quality control during execution was done frequently and following the contract standard. But from interviews and reviewing project documents, there is no documented proof that refers to any quality standard. Even though the site manager scored project quality control on this project as excellent, it was not supported by the actual performance and the public opinion. The last criteria regarding project performance in this study is project safety performance. Similar with the missing quality standard, the project safety performance was also missing the standards. Seemingly, project delivery using traditional approach showed poor performance. Overall, the project was completed 7 months behind schedule with many rework done and relatively poor quality.

Based on descriptive analysis it can be stated that Project A and Project B, which on overall used the tool and techniques of project management, are successful projects. Following is the statistical analysis which observed the role of project managers over the two case studies, namely case study A and case study B.

2) Statistical Analysis

a. Respondent Background

From the analysis, the job designations of the respondents are mainly engineers (36%), followed by site supervisors (32%), design team (18%), secretary (9%) and finance (5%). Most of the respondents are university graduates (72.7%) and the rest are not graduates. In terms of years of experience, it was shown that most of the respondents are fresh graduates, followed by employees who had experience for over 20 years, then 16-20 years experience and finally 11-15 years of experience.

b. Project Performance

According to table 1, statements a, b and c are significant. Hypothesis saying both case study A and B achieved success in project performance is acceptable.

Table1: Project Performance

			Sig.1	Sig.2	Levene Test	T-Test	Result
a	Project Schedule Performance	Equal Variances assumed	0.059	0.00	0.059 > 0.05	0.00	HO is accepted
b	Project Quality Performance	Equal Variances assumed	0.751	0.875	0.175>0.05	0.875>0.05	HO is accepted
c	Project Safety Performance	Equal Variances assumed	0.179	0.508	0.179>0.05	0.508>0.05	HO is accepted

c. Project Objective

According to table 2, statements a, b, c and d are significant. Hypothesis HO is accepted. Project teams from both case study A and B are considered as definitely acceptable in having a clear understanding of completion within the standard of quality, completion within schedule and budget in achieving successful project performance. The project teams of both case study A and B also do not agree that fulfilling project objective and project completion becoming future references as the major criteria to achieve success in project performance.

Table 2: Management and technical aspects

			Sig.1	Sig.2	Levene Test	T-Test	Result
a	Fulfill Project Objectives	Equal variances assumed	0.00	0.02	0.000<0.05	0.029<0.05	HO is rejected
b	Completion on quality standard	Equal variances assumed	0.61	0.71	0.616>0.05	0.712>00.05	HO is accepted
c	Completion on Shedule	Equal variances assumed	0.92	0.17	0.923>0.05	0.719>0.05	HO is accepted
d	Completion on Budget	Equal variances assumed	0.57	0.11	0.574>0.05	0.114>0.05	HO is accepted
e	Future References	Equal variances assumed	0.03	0.00	0.032<0.05	0.008<0.05	HO is rejected

According to table 3, statements *a* and *c* are significant. Hypothesis HO is accepted. Project teams of both case study A and B consider productivity and attendance of project team at site as definitely important to achieve success in project performance. Meanwhile, statements *b* and *d* are not significant.

Table 3: Team aspects

			Sig.1	Sig.2	Levene Test	T-Test	Result
a	Productivity	Equal variances assumed	0.616	0.712	0.616<0.05	0.029<0.05	HO is accepted
b	Cooperation	Equal variances assumed		1.000		0.712>00.05	Levene test is showing that HO is rejected, but by T-Test, HO has become accepted
c	Attendance	Equal variances assumed	0.23	0.941	0.23>0.05	0.719>0.05	HO is accepted
d	Professionalism	Equal variances assumed	0.023	0.060	0.023>0.05	0.114>0.05	Levene test is showing that HO is rejected, but by T-Test, HO has become accepted

From table 4, it can be seen that statements *a, b* and *d* are significant. Hypothesis HO is accepted. Project teams of both case study A and B consider that the project team's show of responsibility and discipline as well as earning the trust of the client is definitely important to achieve success in project performance. Statement *c* on the other hand is not significant.

Table 4: Client aspects

			Sig.1	Sig.2	Levene Test	T-Test	Result
a	Responsible	Equal variances assumed	0.165	0.366	0.165<0.05	0.366<0.05	HO is accepted
b	Discipline	Equal variances assumed	0.560	0.760	0.560<0.05	0.760>00.05	HO is accepted
c	Professionalism	Equal variances assumed	0.032	0.036	0.32>0.05	0.036>0.05	HO is rejected
	Trust	Equal variances assumed	0.168	0.009	0.168>0.05	0.009>0.05	HO is accepted with Levene test even though T-Test resulted in HO being rejected

d. The competency assessment of Project Managers

Hypotheses

HO : Both case study A and B are significant, meaning according to project teams of case study A and B, both skills of project managers scored highly.

HA : Both case study A and B are not significant

According to table 5, the skills of project managers regarding basic knowledge in their own field, material procurement, technical writing, planning and scheduling and productivity and cost control are definitely important to achieve success in project performance. Project teams assessed that both the project managers were good and skilled project managers. Statements *a, b, c, d* and *e* are significant. Hypothesis HO is accepted.

Table 5: Technical knowledge

			Sig.1	Sig.2	Levene Test	T-Test	Result
a	Basic knowledge own field	Equal variances assumed	0.384	0.000	0.384<0.05		HO is accepted
b	Material Procurement	Equal variances assumed	0.059	0.000	0.059>0.05		HO is accepted
c	Technical Writing	Equal variances assumed	0.699	0.000	0.699<0.05		HO is accepted
d	Planning and scheduling	Equal variances assumed	0.128	0.000	0.128<0.05		HO is accepted
e	Productivity and cost control	Equal variances assumed	0.128	0.000	0.128>0.05		HO is accepted
f	Quality Control	Equal variances assumed	0.384	0.000	0.384>0.05		HO is accepted

According to table 6, the competencies of project managers regarding time management, decision-making, negotiation, strategic planning and motivation are definitely important to achieve success in project performance. Project teams assessed that both the project managers were good and skilled project managers. Statements *a, b, c, d* and *e* are significant. Hypothesis HO is accepted. However, at the same time, statement *f* is not significant, resulting in HO being rejected.

Table 6: Management knowledge

			Sig.1	Sig.2	Levene Test	T-Test	Result
a	Time Management	Equal variances assumed	0.192	0.001	0.192<0.05	0.001	HO is accepted
b	Decision Making	Equal variances assumed	0.500	0.000	0.500>0.05		HO is accepted
c	Negotiation	Equal variances assumed	0.179	0.000	0.179<0.05		HO is accepted
d	Strategic Planning	Equal variances assumed	0.405	0.000	0.405<0.05		HO is accepted
e	Motivation	Equal variances assumed	0.168	0.000	0.168>0.05		HO is accepted
f	Promotion	Equal variances assumed	0.039	0.01	0.039>0.05	0.01<0.05	HO is rejected

According to table 7, the competencies of project managers regarding marketing/sales and knowledge of market demand are definitely important to achieve success in project performance. Project teams have noted that both the project managers are good and skilled project managers. Statements *a* and *e* are significant. Hypothesis HO is accepted. As statements *b, c* and *d* are not significant, HO is rejected.

Table 7: Business Knowledge

			Sig.1	Sig.2	Levene Test	T-Test	Result
a	Marketing and sales	Equal variances assumed	0.298	0.003	0.298<0.05	0.003<0.05	HO is accepted
b	Public relations	Equal variances assumed	0.045	0.001	0.045>0.05	0.001<0.05	HO is rejected
c	Understanding of organization	Equal variances assumed	0.000	0.047		0.047<0.05	HO is rejected
d	Understanding of law	Equal variances assumed	0.001	0.018	0.001<0.05	0.018<0.05	HO is rejected
e	Ability of market demand	Equal variances assumed	0.560	0.000	0.560>0.05		HO is accepted

According to table 8, competencies of project managers regarding integrity, being a team player, dynamic, maturity, open mindedness, specific, intuitive, diplomatic and creative are important to achieve success in project performance. Project teams have assessed that both the project managers are good and skilled project mangers. From table 8 it can be seen that statements *b, c, d, e, f, g, h* and *j* are significant. Hypothesis HO is accepted. Statement *a* is found to be insignificant and HO is rejected.

Table 8: Leadership

			Sig.1	Sig.2	Levene Test	T-Test	Result
a	Social/moral sensitivity	Equal variances assumed	0.022	0.123	0.022>0.05	0.123>0.05	HO is rejected
b	Integrity	Equal variances assumed	0.071	0.053	0.071<0.05	0.053>0.05	HO is accepted
c	Team player	Equal variances assumed	0.071	0.053	0.071<0.05	0.053>0.05	HO is accepted
d	Dynamic	Equal variances assumed	0.881	0.001	0.881<0.05	0.001<0.05	HO is accepted
e	Maturity	Equal variances assumed	0.423	0.324	0.423<0.05	0.324>0.05	HO is accepted
f	Open Minded	Equal variances assumed	0.980	0.031	0.980<0.05	0.031<0.05	HO is rejected
g	Specific	Equal variances assumed	0.515	0.034	0.515<0.05	0.034<0.05	HO is accepted
h	Intuitive	Equal variances assumed	0.384	0.000	0.384<0.05		HO is accepted
i	Diplomatic	Equal variances assumed	0.405	0.339	0.405<0.05	0.339<0.05	HO is accepted
j	Creative	Equal variances assumed	0.384	0.000	0.384<0.05		HO is accepted

CONCLUSION

Project management is the process of planning, allocating, directing and controlling company resources to complete a project within time and budget, safely and in accordance with the specified technical and quality requirement. The objective of project management is to apply skills and techniques to the organization and control all aspects of the project and to optimize the use of resources to produce a well designed and soundly constructed facility which will meet the client's requirements of function, cost and time, and future maintenance. The study looked at the role of a good project manager in carrying out better project performance by adopting the project management tools and techniques in practice. Based on the analysis, it can be stated that the hypothesis which the researchers proposed were significant. The descriptive and statistical analysis had indicated that the role of a good and educated project manager who applies the right tools and techniques of project management influences the success of project performance. From the analysis, it is also can be seen that project managers, who are eager to enrich their knowledge of good project management practices will better influence the success of a project compared to a traditional project manager. From the analysis, all hypothesis testing proved that the research objectives were significantly realized by the findings. Therefore, it can be concluded that the research objectives have been successful accomplished.

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