

WORK ENVIRONMENT FACTORS AND JOB PERFORMANCE: THE CONSTRUCTION PROJECT MANAGER'S PERSPECTIVE

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ABSTRACT

Project performance is a critical issue for the construction industry. Project deliverables such as timely completion and client satisfaction are often used as yardsticks to determine success. More often than not, the success of a construction project hinges on the ability of the construction project manager to effectively perform his job functions with the intended efficacy. As such this paper intends to firstly identify the relationship between work environment factors and job performance and secondly to rank these work environment factors in the order of importance. Respondents comprising of project managers in construction firms throughout the northern region of Peninsular Malaysia were selected as the sample population. Questionnaires were then distributed and collected. From the analysis conducted on the gathered data, it was found that the performance level of the project manager had a very high correlation with the level of authority as well as the type of client within a specific project. Job satisfaction also influenced work performance and it was discovered that the importance ranking of work environment factors were dominated by factors attributed to the projects being undertaken. The findings of this paper advocate that a more deliberate attention be given to these work environment factors in the hopes of enhancing job performance of the construction project manager. This in turn will undoubtedly make project success a more ubiquitous phenomenon rather than an uncommon occurrence.

Keywords: Work Environment Factors, Job Performance, Construction Project Managers

1. INTRODUCTION AND BACKGROUND OF STUDY

The construction industry is one of the more important economic activities that contribute towards the economic growth of any nation. This industry is often seen as a very important generator towards a nation's Gross Domestic Product (GDP). The construction industry is generally defined as economic activities that focus on the construction of physical projects, such as buildings and infrastructure, regardless of the construction being land or marine based

(Omar Osman, 2006). The success of a project is a very critical issue in the industry. Research has been vigorously done on successful projects in the hopes to discover the factors that contribute towards achieving project success. Sayles and Chandler (1971) have listed five critical success factors for construction projects, which are namely, the efficiency of the project manager, the appropriate scheduling of activities, a systematic responsibility and monitoring approach, project supervision and finally continuous project involvement. Martin (1976) on the other hand has identified eight success factors of a project, entailing comprehension of objective, the organizational philosophy, management support, apt job delegation and scope, selection of project team members, sufficient allocation of resources, a practical information mechanism and a review of project planning.

Morris and Hough (1987) through their study have come up with nine project success factors. These factors include a clear project objective, innovativeness towards technological change, community participation, priority based scheduling, finance, legal requisites, contractual ties and problem solving. It is clear that there are numerous factors that can be attributed to project success with a few factors that are mutually emphasized by various researches. These common factors are task and activity scheduling as well as the clear comprehension of a project's objectives. What this study intends to do is to extend these factors to include a vital cog in the implementation of any construction project, i.e., the project manager. This study delves on the individual capacities of the project manager and how work environment factors may influence his job performance.

Fryer (1985) has listed skills that a project manager should possess in influencing the success of project, namely skills pertaining to social interaction, decision-making, problem handling, adeptness in identifying opportunities and the ability to adopt managerial change. But the fact remains, a majority of projects still report poor performance even with the presence of capable project manager. This leads to the notion that individual capacity and inherent skills of the project manager alone is insufficient to guarantee project success. Therefore, the environment in which the project manager operates and practices during his project tenure should be delved into to ascertain how it influences the performance of the project manager. The work environment in this context, refers to the perception of the environment and is continuously changing from one project to another (Low and Quek, 2005).

1.1 Problem Statement and Objectives

The success or failure of a project is usually based upon the quality of the end product as well as the achievement of the initial project objectives in terms of functionality and its intended usage. A project is deemed successful if it is completed within the contracted period and allotted budget and vice versa, if these targets are not met, a project will more often than not be categorized as being a failure. In Malaysia, there have been numerous cases of development projects that have failed to achieve their intended objectives, for example the 1998 Commonwealth Games Monorail Project (fully completed only in 2003), the Kuching International Airport Project, the General Forces Project in Batu Kawa as well as dozen other projects which have reported critical defects after completion. This long list of problematic projects shows there is a clear need to identify the real causal factors. The factors may come from various sources, external and internal to the project environment. This study intends to

investigate more on the factors emanating from the actual work environment which in turn influence the project manager's work performance.

The objectives of this study are therefore centered on the following:

- To identify the relationship between work environment factors and the job performance of a construction project manager.
- To rank in order of importance the said factors which influence how a construction project manager performs.

1.2 Scope and Limitations of Study

This study was conducted to seek the outlined objectives based on responses from construction project managers currently working in the states of Penang, Kedah and Perlis within Peninsular Malaysia. As such this study was limited and focused only in these northern states. Response and co-operation from the respondents were at times lacking and wanting, but necessary measures and steps have been taken during the data collection and analysis process to ensure the findings of this study are valid and sufficient to answer the outlined research questions within the area of study.

2. THE PROJECT MANAGER AND PROJECT PERFORMANCE

2.1 The Performance of the Construction Project Manager

A project manager co-ordinates the activities of every project team member in ensuring they realize their intended tasks within an appropriate time frame, which in turn will contribute towards a more efficacious project team (Gido and Clements, 2003). This is akin to the project manager being a conductor if the project team were members of an orchestra. The project manager is entrusted with and responsible for allocating the necessary project resources, monitoring of actual physical work progress as well as motivating and inspiring the project team members (Gido and Clements, 2003). According to Cooke-Davies (2001), the performance of the project manager hinges on his ability to control and monitor the processes and systems which make up the project. Low and Quek (2005) surmise based on their research that traditionally the success of a project indirectly infers to the capable performance of the project manager with emphasis on the achievement of time, cost and quality objectives. Nevertheless, there are still various others factors that can still be used to gauge the performance of a project manager within the context of today's construction industry.

Sinha (2004) explains that job performance is related to the willingness and openness to try and achieve new aspects of the job which in turn will bring about an increase in the individual's productivity. Howell (2004) on the other hand, states that job performance is actually related to the importance of social standing within the vocation and to a certain extent this opinion is similar to the earlier views put forth by Greenberg and Baron (2000) who point out a positive relationship between job performance and the status of the vocation itself. This positive relationship is brought on by the perks and benefits normally associated with a high

standing occupation such as a higher remuneration, a more flexible working condition as well as an occupation which is less dependent on physical labour.

2.2 Project Performance

It goes without saying that the success of a project is the ultimately the aim of every project manager. The means to achieve this success is normally done through the use of appropriate project management tools and techniques. Traditionally, the success of a project is measured through the accomplishment of time, cost and quality objectives. However, the definition of project success over the years has come to include other more comprehensive aspects. Baker *et al.* (1983) define project success by including the elements of achieving the desired technical specification as well as the accomplishments of the intended objectives. Baker *et al.* (1983) go on to add that success in a project will also be defined by the level of satisfaction of all important stakeholders, namely the client and the end-user. This definition brings into the fray the aspects of technical achievement as well as customer satisfaction.

Therefore, as Freeman and Beale (1992) conclude, the definition of project success will be based on different things for different individuals, usually dependent on their role and responsibilities within a certain project. Liu and Walker (1998) share similar views as they state that the concept of project success is open to interpretation as it is reliant on individual perception. These differences in viewing success may often lead to protracted arguments whether a specific project is truly successful or otherwise. Lim and Mohamed (1999) state that the perceived success or failure of a project can be categorized into two sets of views. The first is the macro level perception which pertains to the achievement of the original and basic objectives of the project. Secondly, the micro level perception that deals with the accomplishment of smaller components within the same project. Lim and Mohamed (1999) analogize these two different perceptions by comparing them to a forest and a tree, i.e., is the measure of success gauged from the forest or from the trees?

Therefore, there are two distinct ways to gauge project success. One would be by evaluating the end product of the construction process while the other would look more into the aspects of the process itself. Literature relating to construction research normally attempts to incorporate both these elements to act as one single entity in terms of measuring project performance (Baccarini, 1999). It is however more effective if these two elements were seen as different but complementing aspects and the measure of project success needs to be tailored to be able to cater for both this macro and micro level elements. It is in the element of the process that the role of project manager comes in. In executing his roles and responsibilities, the project manager is undoubtedly influenced by his work circumstances and environment. As such, it is only pertinent that job environment factors that can affect the effectiveness of the project manager be studied and reviewed.

2.3 Work Environment Factors That Influence the Effectiveness of the Project Manager

According to a research done by Mustapha and Noam (1997), there are basically five main categories of factors that will influence or affect the overall performance of a project manager. These five categories are as follows:

- Factors related to individual and personal characteristics
- Factors related to work conditions
- Factors pertaining to nature of the project and its characteristics
- Factors concerning the environment
- Organizational factors

For the purpose of this study, focus will be given towards the factors of work conditions, nature of project and organizational factors. Work conditions factors as researched by Katz (1971) as well as Stewart (1967) incorporate the variables of remuneration, job satisfaction, security issues, working hours as well as available project information. The second group of factors concerning the nature of project consists of variables pertaining to project environment, project size, available project duration, project complexity, project team relationships as well as materials and resources. Factors within the organization are made up of variables concerning company size, level of power/authority and type of client.

2.4 Project Performance

Due to its inherent nature and characteristics, measuring the success of a construction project is a complex and complicated endeavour. Theoretically, the measure of productivity and level of quality may appear simple enough but in practice it may be very hard to replicate. Omar Osman (2006) explains that due to this complexity in measuring project success, the bigger context should then be used, which is to say, a success of a project should be dependent on the satisfaction of the client in realizing his or her intended objectives. These objectives would normally centre on cost, time and quality. However, Shenhar *et al.* (1997) point out that sometimes project success for one party often comes at the expense of another party. The case in point is when project management success neglects or overlooks project product success. A project may have been objectively and appropriately managed but the overall goals of the client may still have not been achieved.

Kometa *et al.* (1996) lists criteria which may generally be used to measure and evaluate a project. These criteria include time, cost, aesthetics, function, quality, customer satisfaction and team relations. This view is somewhat shared by Pinto and Slevin (1988) who state that the use of the cost-quality-time triangle alone to measure success is too simplistic in nature and that the element of customer satisfaction should take precedence above all else. Freeman and Beale (1992) on the other hand propose five other criteria to gauge project success, namely technical performance, excellence of execution, management and organizational elements, self development and finally business and productivity capacity. It is therefore vital that the project manager as well as the project participants and stakeholders be aware of the different success measures in order to partake a more holistic and comprehensive approach when it comes to managing projects.

2.5 Project Success Factors

Project success and failure factors were initially introduced by Rubin and Seeling (1967), where they identified that the experience of the project manager has a relationship with the success or failure of the project. They concluded that a project manager's past experience has minimal effect on the project performance while the size of past managed projects will influence the performance of the project manager. In the study to identify sources of project failure, Avots (1969) surmised that the key causal factors of failure are the wrong choice of a project manager, unscheduled project cancellation and lack of support from top management. Hayfiels (1979) further expands the study on the success factors and lists the following as key elements for project success:

- A realistic and precise project brief
- Efficient project implementation
- Understanding of the project environment
- Choice of implementing organization
- Clear project policies
- Strong project organization
- Selection of project team leader
- Dynamic management control and monitoring
- Reliable information and communication systems

Might and Fischer (1985) conducted a research of the main factors that are considered to affect the success of a project. These factors included organizational structure, level of power designated to the project manager and project size. They discovered that there was a weak correlation between organizational structure and project success but evidently no relationship between the size of a project and its success. On the aspects of the failure of a project, Hughes (1986) concludes that project failure is caused by inappropriate managerial principles as well as a weak communication and delivery system. Pinto and Slevin (1988) report that the critical success of a project is dependent on ten factors as follows:

- Clear project vision
- Ample support from top management
- Project schedule
- Consultations with the client
- Staff acquisition
- Technical specifications
- Client's acceptance
- Monitoring and reporting
- Communication
- Problem solving

Anton (1988) goes on further and elaborates on the factors that may improve project success, which include planning efforts during design and construction phases, a committed and objective project manager, motivation of the project team, the technical capabilities of the project manager, work and scope definition as well as control systems. Another view comes

from Belassi and Tukei (1996) who categorize success factors into four main groups relating to the project manager, organization and external environment. As it can be seen that different researches have resulted in numerous factors that can contribute towards the success of a project, this study will mainly focus on the aspects centred on the project manager in relation to his work environment within the project organization.

3. RESEARCH METHODOLOGY

The underlying and driving context of this study was on the pretext that work environment factors do have an influence on the performance of the construction project manager. The research model for this study was based on the relationships between identified variables in terms of work environment and project performance. Figure 1 below illustrates the relationship between these variables which formed the basis of this study's research model.

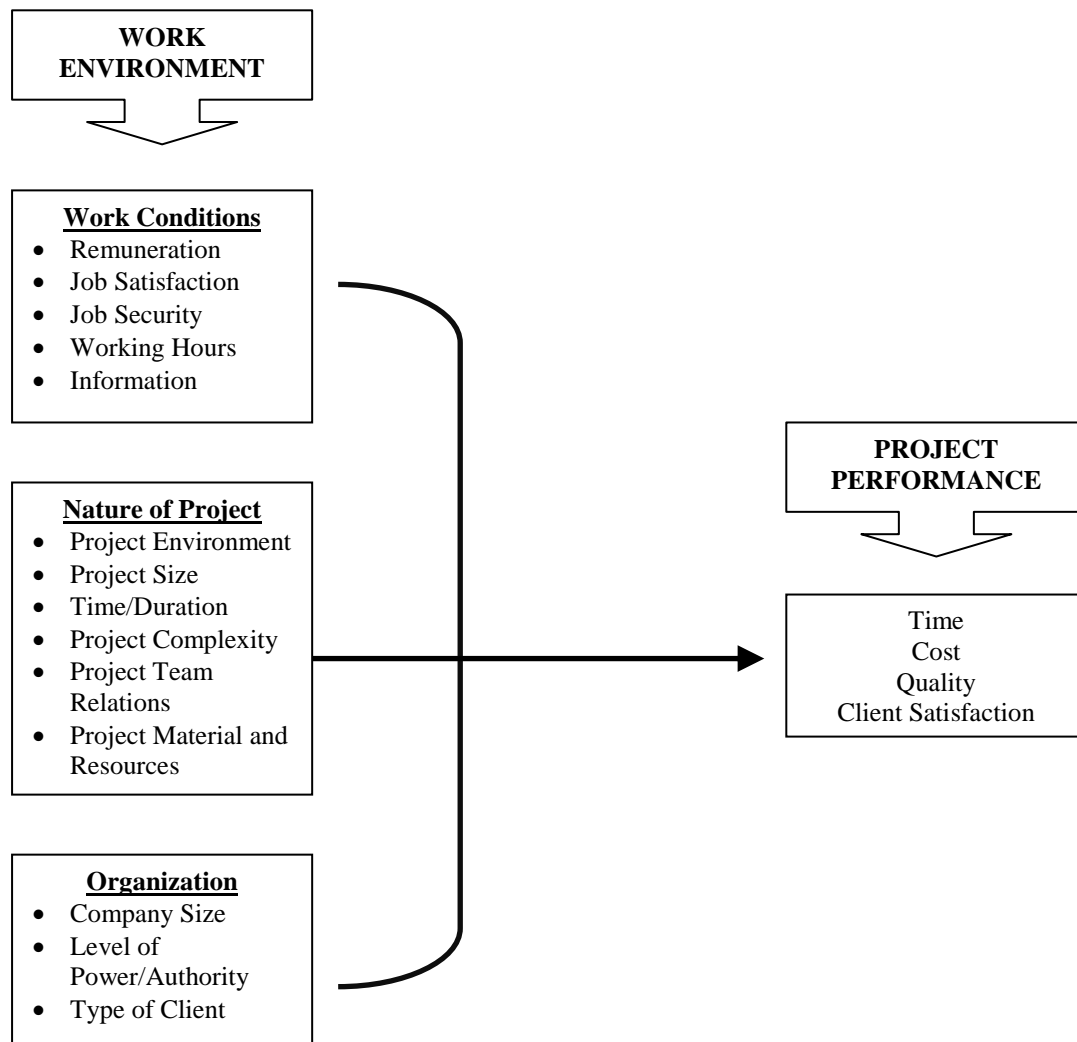


Figure 1: Relationship between Factors of Work Environment and Project Performance

Data for this study was collected through the distribution of questionnaires to the randomly selected parties. The identified parties were 80 construction firms employing project

managers, registered as Pusat Khidmat Kontraktor (PKK) Class A, B and C contractors currently operating in the states of Penang, Kedah and Perlis in the northern region of Peninsular Malaysia. The method of questionnaire dispersion was a combination of delivery through postal mail (for 60 questionnaires) and hand delivery for the remaining 20 forms. As many as 26 forms were duly filled and returned, representing a response rate of 32.5% which was anticipated as the normal response rate for questionnaires here in Malaysia is relatively low. Nevertheless, analysis was done to thoroughly vet, review and extract the necessary information and findings.

Prior to the distribution of questionnaires, a pilot study involving 3 project managers respectively from Class A, B and C registered construction companies was conducted via interviews. The draft version of the questionnaire was tested and refined through this pilot study process. The final questionnaire was made up of 5 main sections as follows:

- Section A: Respondent's Background
- Section B: Project Performance
- Section C: Work Environment in relation to Work Conditions
- Section D: Work Environment in relation to Nature of Project
- Section E: Work Environment in relation to Organization

Primary data obtained through the questionnaires were then analyzed using computer software via statistical analysis such as frequency, reliability, bivariate correlation and non-parametric tests.

4. DATA ANALYSIS

4.1 Background of Respondents

Out of the 26 project managers that returned the completed questionnaires, 84.6% or 22 individuals were male while the age breakdown showed that a majority (26.9%) of the project managers in this survey were above 41 years of age. In terms of academic qualification, half of the respondents possessed a bachelor's degree. 73.1% of the respondents, representing 19 individuals, had an engineering background, followed by 15.4% with quantity surveying/construction management background. The remaining 11.5% were from other diverse backgrounds. 34.6% of the project managers in this survey have a working experience of between 6 to 10 years and this group of 9 individuals was the majority in terms of work experience. In terms of years of service in the current company however, the majority of respondents (38.5%) had only been there for less than 5 years while those who had served more than 21 years within the same organization only recorded a 7.7% representing 2 individuals.

4.2 Reliability Test

To assess the reliability of the testing instrument in this study, Cronbach's alpha was used with the analysis output as shown in Table 1 below. Overall, it was found that the testing instrument of the study demonstrates reliability as all items related to project performance

(dependent variables) registered an alpha of 0.8 whereas the independent variables of work environment returned an alpha of between 0.3 and 0.8. This is based on Hinkin's (1984) proposition that whenever the alpha value is equal or more than 0.4, the corresponding variable should then be deemed as reliable data. Therefore, from the 14 variables pertaining to work environment factors contained in the questionnaire, only 12 variables registered reliability to be used for further analysis. These variables are remuneration, job satisfaction, job security, project environment, project size, duration/time, project complexity, project team relationships, project material and resources, company size, level of power/authority and type of client.

Table 1: Cronbach's Alpha Reliability Test on the Survey Instrument Variables

DESCRIPTION	ITEMS	CRONBACH'S α
DEPENDENT VARIABLES		
1. Project Performance	4	0.8
INDEPENDENT VARIABLES		
1. Work Conditions		
a. Remuneration	3	0.5
b. Job Satisfaction	3	0.8
c. Job Security	3	0.5
d. Working Hours	3	0.3
e. Information	3	-0.1
2. Nature of Project		
a. Project Environment	3	0.8
b. Project Size	3	0.6
c. Time/Duration	3	0.7
d. Project Complexity	3	0.4
e. Project Team Relationship	3	0.8
f. Project Material and Resources	3	0.8
3. Organization		
a. Company Size	3	0.5
b. Level of Power/Authority	3	0.8
c. Type of Client	3	0.6

4.3 Environment Factors That Influence the Performance of the Project Manager

In order to identify the work environment factors that have an effect on the performance of the project manager, correlation analysis was conducted where the correlation coefficient illustrates the relationship between two variables. A strong correlation is represented by a coefficient exceeding the value of 0.5 whereas a medium or modest correlation is when the coefficient has a value of between 0.5 and 0.2. Any coefficient possessing a value less than 0.2 will be deemed as showing a weak correlation. Table 2 that follows depicts the correlation between work environment factors and the performance of the project manager. It was discovered that there are two factors that show a strong correlation, namely level of power/authority and type of client. It can then be surmised that these two factors have a very

strong influence towards the performance of the project manager. Apart from these two strong factors, the third ranking factor which registered a high medium correlation is job satisfaction.

Table 2: Correlation Between Work Environment Factors and the Performance of the Project Manager

INDEPENDENT VARIABLES	DEPENDENT VARIABLES: PROJECT PERFORMANCE CORRELATION COEFFICIENT
1. Work Conditions a. Remuneration b. Job Satisfaction c. Job Security	 0.056 0.454 0.319
2. Nature of Project a. Project Environment b. Project Size c. Time/Duration d. Project Complexity e. Project Team Relationship f. Project Materials and Resources	 0.221 0.101 0.155 0.258 0.366 0.110
3. Organization a. Company Size b. Level of Power/Authority c. Type of Client	 0.060 0.546 0.505

4.4 Ranking Order of Environment Factors That Influence the Performance of the Project Manager

The following Table 3 shows the order of environment factors, according to importance, that effect the performance of the project manager. A non-parametric statistical test, the Friedman Test, was used in establishing this ranking order. From the 12 variables used, it was discovered that work environment factors which are project based, dominate the top five positions, in the order of time/duration, project environment, project materials and resources, project team relationships and finally project size. This clearly indicates that project characteristics and qualities strongly influence the performance of the project manager. Coming in at the sixth position is the factor regarding level of power/authority, followed by job satisfaction and project complexity. The ninth and tenth rank is respectively the factors concerning job security and company size. The bottom two ranked factors are remuneration and type of client.

Table 3: Ranking Order of Work Environment Factors That Influence the Performance of the Project Manager

WORK ENVIROMMENT VARIABLES	MEAN RANK	RANKING ORDER
Time/Duration	13.00	1
Project Environment	10.19	2
Project Materials and Resources	9.54	3
Project Team Relationships	7.85	4
Project Size	7.77	5
Level of Power/Authority	7.50	6
Job Satisfaction	6.98	7
Project Complexity	6.19	8
Job Security	5.65	9
Company Size	5.31	10
Remuneration	4.65	11
Type of Client	2.25	12

5. FINDINGS AND CONCLUSION

Based on the analysis done though this study, it was found that work environment factors do have a strong effect and influence towards the performance of a project manager within the construction firm. This influence of his performance will undoubtedly also determine the success of the project being undertaken. The analysis has shown that from the 14 variable work environment factors derived from published literature, only three significant factors were discovered. Level of power/authority recorded the most influence towards the outcome of a project manager's performance. This is evidently proof that in order for a project manager to be truly effective in his position, he or she needs to yield an appropriate amount of authority. As it is in the best interest of the project if the project manager is given a free hand to make decisions, this factor concerning the degree of authority is indeed vital in relation to the success of the project manager is deliberating his duties.

It can be adduced from the analysis that the type of client plays a very important role in determining the level of the project manager's performance. As the project manager assumes a lot of responsibility, his ties and relationship with the client is bound to be a very critical element during the project. As the client has the final and binding say on the decisions made throughout the duration of the project, the project manager has to find the correct balance between having full responsibility and autonomy as well as keeping the client's best interest at heart. A cordial working relationship as well mutual professional respect between the client and the project manager will surely be a positive influence towards the project. What this study has simply shown is that project managers perceive the client as being important and at the same time acknowledge that the client certainly does have a strong influence in determining the success of the project. The third most important influential factor is job satisfaction. This study has shown that the performance of the project manager is reciprocal with the amount of satisfaction the project manager derives from his or her work. A content project manager will certainly perform well as his focus and concern will now be solely on

the project at hand, rather than dividing his emphasis between his professional career and personal life. The findings of the study point out that job satisfaction is one of the main criteria any construction firm should bear in mind if the success of project is of top priority.

In achieving its objectives, this study has shown that the project manager needs to operate in a conducive and favourable environment if his performance is vital in ensuring the success of a project. All the factors derived through this study, their correlation value notwithstanding, play an important part in moulding the way the project manager will act, react, respond and perform within the construction project. All these factors needs to be considered by every construction firm if it is their wish to possess effective and efficacious project managers. It is hoped that this study will be further elaborated in terms of subject matter and magnitude, with the ultimate aim of comprehending the project manager's perspective of work environment and performance, contributing towards ensuring a productive and viable construction industry.

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