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The Importance of Project Manager, Project Team Towards and Project Related Factors towards Environmental Management Practices (EMP) Success

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Abstract

Most of the construction stakeholders around the world especially in developing countries are not really aware of the Environmental Management Practices (EMP) for their construction projects. Previous studies reported that EMP issues received less attention from the construction industry stakeholders compared to construction costs and time related issues. However, this trend has changed due to the depletion of non-renewable resources, greenhouse gas emissions and global warming. Based on these issues, construction stakeholders worldwide have given wider attention to EMP in their construction projects. Many efforts are being directed to build greener construction projects through proper application of EMP. The focus of this research is to introduce the concept of EMP in achieving sustainability in the Malaysian construction industry. The main objective of this research is to identify the importance of Project Manager and Project Team role for the successful implementation of EMP in the Malaysian construction industry. By using the survey method, questionnaires were sent to the Malaysian construction stakeholders that included consultants, contractors and clients, and 122 questionnaires were analysed. This study found that most of the construction stakeholders agreed that project team commitment, project manager's leadership skills and communication system effectiveness are very important to ensure the success of EMP. The results further demonstrate that three of the independent variables - Project Manager and Project Team Competency, Project Management aspects, and Procurement Related Factors have significant relationships with EMP Success.

INTRODUCTION

Regulations, rising costs, awareness of the ecological effects of business activities, and stakeholder pressures have forced firms to re-evaluate their strategic approach towards Environmental Management Practices (EMP) (Rugman and Verbeke, 1998). Many firms have re-evaluated the way they do business as a result of becoming more aware of the environmental consequences of their operations. Proper implementation of EMP could reduce the impact of construction project on natural environment (Agung, 2009).. EMP in the construction industry seems to have a high potential to reduce waste and to improve the sustainable project performance. The relationship between EMP and profit may differ depending on the regulatory regime in a country, the cultural setting, customer behaviour, the type of industries, size of companies analysed or the time span. According to Zhang,Shen and Treloar (2000), there are many benefits in pursuing better EMP, not only for the environment directly but also for the industry financially. The link between being `green' and being an economically successful project has been a core topic of the corporate EMP literature for some years (Wagner and Wehrmeyer, 2001). According to Vanegas, DuBose, and Pearce (1996), EMP additionally incorporates four new elements, each a response to a specific sustainability challenge.

These four elements are :

i. natural resource management addresses the need to manage the extraction of renewable natural resources from the environment (air, sea, land) in a way that ensures that the supply will always exceed the demand, and at the same time, monitor and control the use of non-renewable natural resources to prevent their total depletion;
ii. resource recovery addresses the need to reduce the amount of waste that requires disposal by recovering selected resources and products from waste, including direct reuse, remanufacture of reusable components, reprocessing of recycled material, and monomer/raw material generation;
iii. waste management recognizes that a certain amount of waste is inevitable, and thus will require disposal in ways that are not detrimental to the environment; and
iv. environmental technologies address the need to incorporate proactively, within every element of the system, strategies and mechanisms that mitigate environmental impacts at the root (i.e., before the impact happens, through the application of preservation, pollution prevention, avoidance, monitoring, assessment and control strategies and mechanisms), and also to implement corrective actions such as remediation or restoration when some damage to the environment already has been done.

However, it has been stated so many times that company management often does not pay enough attention to the fact that environmental issues have become very important (May, Cheney and Roper, 2007). Presently, lack of application of natural resources management practices (Hill, 2000), waste management practices (Vanegas, DuBose, and Pearce, 1996) resource recovery processes (Tse, 2001) and the application of green technologies (Vadhavkar, Pena, and Mora, 2000) are among the barriers of EMP success. Comparing to other industries, the construction industry give a slower response to the issues of the EMP. In the developing countries, the awareness on the issues of EMP could be considered as very low. Work on the EMP in the construction industry especially in the developing countries should be undertaken as a matter of urgency. Most of the developing countries faced problems of expertise constraints and prevention works seem to be very importance in order to achieve the sustainability in the construction industry. Further actions should be undertaken to understand the phenomena. In the developing countries, the government plays a very important role due to the reluctance of private construction stakeholders to address the issues of environmental management. Through the government initiatives, the public and private construction stakeholders should be encouraged to improve their working approaches.

CRITICAL SUCCESS FACTORS

Researchers define CSFs as those elements that are required to deliver the success criteria. These elements are the set of circumstances, forces, facts or influences, levers, essential activities and key variables. These also include knowledge, skill, trait, motive, attitude, value or other personal characteristics essential to perform the required task. Some other researchers define CSFs the set of standards, level of performance, and dimensions to deliver success.

CSFs as those few key areas of activity in which favourable results are absolutely necessary for managers to reach their goals (Rockart, 1982). He further explained that CSFs are the few key areas where 'things must go right' for the business to flourish and for the managers' goals to be attained. However Saraph, Benson, and Schroeder, (1989) viewed CSFs as those critical areas of managerial planning and action that must be practised in order to achieve effectiveness. According to Rowlinson, (1999), CSFs are those fundamental issues inherent

in the project which must be maintained in order for team working to take place in an efficient and effective manner. Despite the wide acknowledgment of the CSF approach in previous studies, no fixed rules have been developed for the identification of CSFs. Freund (1988) defined CSFs as those things that must be done if a company is to be successful and it is worthwhile exploring the CSFs as it could ensure success (Isik et. al. 2009). According to Westerveld (2003), CSFs could be defined as "what to achieve" and "how to achieve".
CSFs have close relationships to an organization's objectives. Like other strategic planning elements that affect strategy indirectly, CSFs affect strategy through their effect on the organization's achievement of its objectives and their ability to enable the success of the mission.

PROJECT MANAGER AND PROJECT TEAM RELATED FACTORS AND PROJECT RELATED FACTORS

Walker and Vines (2000), Chua, Kog, and Loh (1999) and Chan and Kumaraswamy, M. M., (1997) have grouped CSFs into 2 groups which are project manager and project team related factors and project related factors. These factors are related to the project manager and project team members which include client's experience, nature of client, size of client's organization, project team leaders' experience, technical skills of the project team leaders, planning skills of the project team leaders, organizing skills of the project team leaders, coordinating skills of the project team leaders, motivating skills of the project team leaders, project team leaders' commitment to meet cost, time and quality, project team leaders' early and continuous involvement in the project, project team leaders' adaptability to changes in project plan, project team leaders' working relationship with others and support and provision of resources.

Bayliss (2002) in his report mentioned that delivering success requires the concerted effort of the project team to carry out the various project activities and project manager who, at the centre of the project network, is responsible for orchestrating the whole construction process. Project manager and project team related factors are very important towards delivering success. The project manager is key stakeholder in a construction project and his competence is a critical factor affecting project planning, scheduling, and communication (Belassi and Tukel,1996). While project team, could be defined as the key stakeholders which include the client, contractor, consultants, subcontractors, suppliers, and manufacturers. The skills and knowledge of the project team is important as they can work together according to their background expertise in each area (Cameron and Meyer,1998). This factor can be regarded as the willingness of the involved parties to integrate continuously to solve problems (Cheng, Li and Love 2004). Teamwork by all the involved parties is expected to balance the attainment of short-term objectives with long term goals and achieve both individual and joint missions without raising the fear of opportunistic behaviour (Romancik, 1995). The importance elements of project manager and project team related factors are the knowledge, skills, abilities, and experience of the team as well as selection of the right team members, which should not only be technologically competent but also to understand the company and its business requirements (Kapp, 1998). This was further supported by Baccarini, (2003) where they agreed with this assertion and notes that comprehension, commitment, competence and communication are fundamentally essential for organization success.

For the project related factors, these factors related to the project are including type of project, nature of project, complexity of the project, size of the project, communication system, control mechanism, feedback capabilities, planning effort, developing an appropriate organization structure, implementing an effective safety program, control of subcontractors works and overall managerial actions.

IDENTIFICATION OF ENVIRONMENTAL MANAGEMENT PRACTICES SUCCESS FACTORS

According to Lim and Mohamed (1999), single set of CSFs may not be suitable for all industries. Liu and Walker (1998) suggested that as industries operate differently and a set of CSFs may not be transferable from one to another. Generally, the success of CSFs depends on the number of factors, such as project complexity, contractual arrangements, and relationships between project participants, the competency of project managers, and the abilities of key project members. For this study, a systematic procedure was applied based on Chau, Kog, and Loh (1999) and Shen and Liu (2003). Based on these two previous studies, they have adopted systematic procedures for this purpose.

The procedures proposed in these studies can be summarized and presented as :

i. identify a full set of selected success factors (SSFs)
ii. conduct a survey to investigate each SSF's importance,
iii. calculate each factor's importance index value based on the survey data,
iv. extract CSFs from the pool of SSFs according to the value of importance index
v. interpret and analyse the extracted CSFs

As mentioned above, this research had identified two most critical success factors towards EMP success which are project manager and project team related factors.

THE VARIABLES UNDER STUDY

The scores for the variables under this study are presented based on the descriptive statistics related to mean and standard deviation. These scores give the description of the respondent's feedback from the data obtained as presented in the form of tables that follow.

IDENTIFICATION OF CRITICAL SUCCESS FACTORS

The critical success factors are presented in Tables 4.3. Each table organizes each category of factors which include the Project Manager and Project Team Related Factors and Project Related Factors rated on a scale of 1 to 4. The importance rating for each factor was scored on a scale of 1 to 4 with 1 having the lowest importance and 4 the highest. To identify the significant level for each factor, the factor criticality was defined as in Table 1.

Mean Factor Score Range	**Significant Level**
< 2.0	Least significant towards EMP success
>2.0 – 3.0	Mildly significant towards EMP success
>3.0 - 3.5	Moderately significant towards EMP success
>3.5 - 4.0	Most significant towards EMP success

Table 1: Criticality Assessment Criteria

The critical success factors are presented in Tables 2 and 3. Each table organizes each category of factors which include the Project Manager and Project Team Related Factors and Project Related Factors rated on a scale of 1 to 4. The importance rating for each factor was scored on a scale of 1 to 4 with 1 having the lowest importance and 4 the highest.

Mean Factor Score Range	**Items**
3.5738	PM and project team members commitment
3.5164	PM leadership skills
3.4590	PM and project team members experience
3.3279	PM and project team members competency
3.3279	PM and project team members adaptability to changes
3.3525	PM and project team members technical capability
3.1066	PM and project team members authority

Table 2 : Mean Analysis for Project Manager and Project Team Related Factors

From the table 2 above, PM leadership skills and PM and project team members commitment are the most significant factor towards EMP success which the mean score for each item is 3.5164 and 3.5738. Other items can be categorised as moderately significant towards EMP success with the mean score range between 3.1066 to 3.4590.

Mean Factor Score Range	**Items**
3.5082	Communication system effectiveness
3.4836	Planning effort
3.4754	Decision making effectiveness
3.4590	Coordination effectiveness
3.4262	A good project delivery system (procurement method e.g. conventional, design and build)
3.3443	Effective quality assurance program
3.3279	Control mechanism effectiveness
3.2951	Incentives on every successful construction project.
3.2787	A good project bidding method (e.g. price based competitive bidding, negotiated bidding, best value bidding)
3.2623	A good project contract mechanism (e.g. lump sum, unit price, cost plus, etc.)
3.1885	Formal dispute resolution process

Table 3 : Mean Analysis for Project Manager and Project Team Related Factors

From the table 3 above, only communication system effectiveness is the most significant factor towards EMP success which the mean score for this particular item is 3.5082. Other items can be categorised as moderately significant towards EMP success with the mean score range between 3.1885 to 3.4836.

CONCLUSION

For the project manager and project team related factors, this study found that, most of the construction stakeholders agreed that project team commitment and project manager leadership skills are very important to ensure EMP success. Other items which include PM and project team members competency, PM and project team members experience, PM and project team members authority, PM and project team members technical capability, and PM and project team members adaptability to changes could be categorised as moderately important towards EMP success. This critical success factors can be rank as the following:

i. PM and project team members commitment
ii. PM leadership skills
iii. PM and project team members experience
iv. PM and project team members competency
v. PM and project team members adaptability to changes
vi. PM and project team members technical capability
vii. PM and project team members authority

For the project related factors, this study found that, most of the construction stakeholders agreed that communication system effectiveness is very important to achieve EMP success. This statement was supported by Al-Reshaid and Kartam, (2000), who mentioned that Information and Communication Technology (ICT) become very important in modern construction industry. According to Hassan and McCaffer, (2002) sustainability pressure has forced any organization to incorporate ICT into business processes. Other items which include planning effort, coordination effectiveness, a good project delivery system, control mechanism effectiveness, effective quality assurance program, incentives on every successful construction project, a good project bidding method, a good project contract mechanism and good formal dispute resolution process could be categorised as moderately important towards EMP success.

This critical success factors can be rank as the following:

i. Communication system effectiveness
ii. Planning effort
iii. Decision making effectiveness
iv. Coordination effectiveness
v. A good project delivery system (procurement method e.g. conventional, design and build)
vi. Effective quality assurance program
vii. Control mechanism effectiveness
viii. Incentives on every successful construction project.
ix. A good project bidding method (e.g. price based competitive bidding, negotiated bidding, best value bidding)
x. A good project contract mechanism (e.g. lump sum, unit price, cost plus, etc.)
xi. Formal dispute resolution process

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