



# Effects of Environmental Factors of Project Managers on Project Success in Vietnam

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**A**bstract: This paper aims at identifying factors of working environment of project managers and criteria for assessing the project success, and at the same time, identifying degrees of effects of working environment on the project success. This paper is limited to infrastructure projects in Vietnam. Data are gathered from 233 project managers relating to the infrastructure projects in Vietnam.

In the study model, criteria for assessing the project success comprise cost, time, technical performance and customer satisfaction have been employed by previous studies (Shenhar, 1997; Pheng and Chuan, 2005; and Cao Hào Thi, 2006). Principal environmental factors of project managers are based on factors built by Pheng and Chuan (2005) comprising job condition, organization environment and project characteristics. Relations in the study model are analyzed by employing the multiple regression techniques with SPSS software. Results of the study ascertain the working environment has positive effects on the project success.

Keywords: working environment, project

success, infrastructure project in Vietnam

## 1. Introduction

Project success is always vital to any project. Many researches have studied the project success and factors affecting the project success. Pheng and Chuan (2005) introduced four following criteria for measuring the project success: time, cost, performance and customer satisfaction.

Mustapha and Noam (1997) studied five groups of factors relating to project managers that affect the project success. These groups comprise factors relating to personality, macro-economic environment, job conditions, organization environment and project characteristics. Of these factors, person-related factor on the project success was ascertained by previous researches, such as the research by Colinson and Hearn (1996) on quality of project managers, by Kets de Vries (1991) on psychological dynamic of project managers, by Tunner and Muller (2005), and by Charlotte Neuhauser (2007) on leadership behavior of the project manager, by Dov Dvir, Arik Sadek and Ayala Malach-Pines

(2006) on personality of the project manager and its effects on the project success. Effects of the macroeconomic environment on the project success have been also ascertained by many previous studies, such as the research by Belassi and Tukul (1996); but companies can hardly affect the macro environment.

At present, effects of three remaining factors (job conditions, organization environment and project characteristics) on the projects are not studied well. Pheng and Chuan (2005) called them environment factors of project managers, and they are referred here as working environment. In Vietnam in particularly, failures of many projects, such as PMU 18, Văn Thánh 2 Bridge, and Cần Thơ Bridge, etc. had a lot to do with working environment of project managers, therefore, studying effects of the working environment on the project success in Vietnam become necessary.

This paper aims at taking a close look at effects of the working environment on the success of infrastructure projects in Vietnam, including ones in construction, electricity and telecommunications, thereby helping companies and project managers identify role of each components of the working environment affecting the project success and work out appropriate policies.

## 2. Theoretical basis

This part provides an overview of previous studies on criteria for assessing the project success and environmental factors. This is a basis for building the study model.

### *a. Measuring the project success:*

Wateridge (1995) argues that the project success is the success of project managing process. Freeman and Beale (1992) suggest seven main criteria for assessing the project success. The most frequently-used criteria are: technical performance, efficiency of execution, managerial and organizational implications (customer satisfaction), personal growth, manufacturability, and business performance. Shenhar et al. (1997) reported that the project success includes two components: success of product and success of project management process. The success of project management is

measured by cost, time and quality, which could be seen as a measurement of internal efficiency while the success of product is connected to external efficiency of the project. From this viewpoint, four criteria – time, cost, quality and customer satisfaction – are used for measuring the project success (Shenhar, 1997; Pheng và Chuan, 2005; Cao Hào Thi, 2006).

### *b. Working environment:*

According to Pheng and Chuan (2005) the working environment includes factors relating to job condition, project characteristic and organizational environment. Explanation of these factors in more detail is as follows:

- Job condition: Pheng and Chuan (2005) examined five factors – wage, job satisfaction, job security, working hour and availability of information. In this paper, the said five factors are also examined and called “job condition related factors.” In addition, two job condition related factors in Vietnam are examined: promotion and learning chance because in Vietnam they are considered as a kind of extra-wage income.

- Project characteristic: According to Pheng and Chuan (2005), seven factors under consideration are: project environment, project scope, schedule, project complexity, colleague relations in project, materials and supplies, and total time for project implementation. Belassi and Tukul argue that project investor, project budget and organizational structure of the project also affect the project success. The paper gathers 10 project characteristic related factors suggested by the two above-mentioned studies and divide them into two groups of variables: (1) project state comprises project environment, schedule, complexity, colleague relation, materials and supplies and total time for implementation; and (2) project attribute related factors are: project investor, project scope, budget and organizational structure.

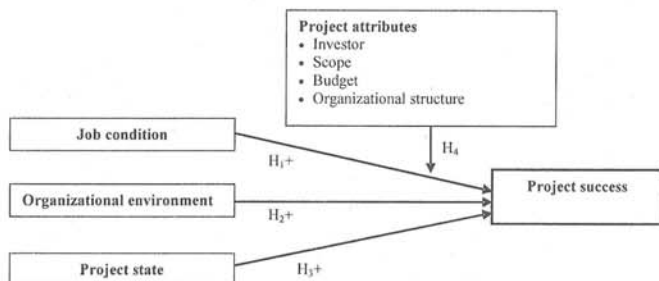
- Organizational environment: Each organization has its own environment where three relations exist: relation with its holding organization, relation between project with customer and relation between the holding organization with customer (Cao Hào Thi, 2004). Mustapha and Noam (1997) defined these relations as the

organizational environment that affects the project success. These are three factors under consideration in this paper.

### 3. Study model and hypotheses

The study model and hypotheses are presented in the following figure

Figure 1: Study model



Based on the study model, hypotheses are as follows:

H<sub>1</sub>: The better the job condition, the higher the project success

H<sub>2</sub>: Better organizational environment leads to better success

H<sub>3</sub>: The better the project state, the higher the project success

H<sub>4</sub>: Strength of relations between working environment factors and project success are affected by project attribute related variables.

### 4. Research methodology

This paper comprises two phases: preliminary and official researches. The preliminary research is based on a preliminary scale developed from the scale suggested by Pheng and Chuan (2005). In conditions of projects in Vietnam, some adjustments and additions are made by intensive interviews. Research objects are 10 project managers with 5-year experience or more in various infrastructure projects in recent years. Questionnaires, after perfection, will be used for the official research. The official research aims at checking the theoretical model, measuring effects of the working environment on the success of infrastructure projects in Vietnam. Data are gathered through questionnaires

employing the 7-point Likert scale. Points from 1 to 7 given to each question are based on remarks of project managers on job condition, organizational environment, project characteristic and project success. Respondents are managers of infrastructure projects in the Southern Key Economic Zone comprising HCMC, Đồng Nai,

Bình Dương and Bà Rịa- Vũng Tàu. After 1,500 questionnaires were sent, 253 ones were sent back, and 233 ones that met requirements are used for analyses.

### 5. Results

#### a. Descriptive analysis and correlation:

Frequency analysis is used for

describe general information about projects. Information is about kind of project, project investor, project scope, project budget, and organizational structure of the project. The biggest kind of projects is industrial factory (56 projects; 24.0%) followed by road building projects (54 projects; 23.2%). Samples include 110 public-invested projects. Over 50% of projects have 100 tasks or fewer. Some 50% of them have a budget of under US\$1 million. The most common organizational structure is functional structure (118 projects; 50.6%). All variables have certain meanings to the project success except for the variable of project complexity.

#### b. Scale evaluation:

The project success is measured by four observed variables. Cronbach's alpha reliability of this scale is 0.826. Concept of job condition, measured by seven observed variables, has a Cronbach's alpha reliability of 0.896. All correlation coefficients between variables and total are higher than 0.30. The organizational environment is measured by three observed variables and has a Cronbach's alpha reliability of 0.788. The project state is measured by six observed variables and has a Cronbach's alpha



reliability of 0.710. Results show that project complexity and project total time have correlation coefficients between variables and total smaller than the acceptable level of 0.30. After taking away two variables (project complexity and total time), the remaining four variables reach a Cronbach's alpha reliability of 0.870 and all correlation coefficients between variables and total are acceptable (0.30). Results of Cronbach's alpha reliability analyses are presented in Tables 1 and 2.

#### c. Factor Analysis:

After all scales are tested, observed variables of each scale for independent variables in the regression model are applied to the exploratory analysis. Factor analysis shows that independent variables have the KMO coefficient of 0.848 (0.5). Factor loadings of observed variables are bigger than 0.4. Running the factor analysis for dependent variables that are criteria for project success produces the KMO coefficient of 0.770 (0.5). Results of the factor analysis show that all dependent and independent variables gain acceptable values. Results in detail are presented in tables 1 and 2.

**Table 1: Result of factor analysis for independent variables**

Component	Content	Load factor
Job condition	Wage	0.624
	Job satisfaction	0.764
	Job security	0.789
	Working hour	0.724
	Availability of information	0.755
	Promotion chance	0.889

**Table 2: Results of factor analysis for dependent variables**

Component	Content	Load factor
Project success	Cost	0.780
	Time	0.853
	Quality	0.794
	Customer satisfaction	0.829

#### d. Regression analysis:

To examine relations between three factors of

working environment with project success, a multiple regression analysis is carried out. At the same time, effects of project attributes (project investor, project scope, project budget, and organizational structure of the project) are also examined as dummy variables, along with interactive components between project attributes and three working environmental factors resulting from the factor analysis. Results of the regression analysis show that three working environmental factors, two project attributes (investor and budget), and one interactive component between the organizational environment and project budget have impact on the project success.

- Direct effects on the project success: Results of the multiple regression analysis shown in the Table 3 show that working environmental factors including job condition, organizational environment and project state all have positive relations meaningful to the project success; and three hypotheses H1, H2 and H3 are not rejected. Of four variables included in project attributes, the investor and budget variables have some statistical meanings, while project scope and organizational structure of the project have no statistical meaning.

- Interactive effects on the project success: There is only one interactive between organizational environment and project budget that has some effect of statistical meaning on the project success. Generalized model accounts for 55.7% of changes in the project success as a dependent variable (adjusted  $R^2 = 55.7\%$ ). Results are shown in the Table 3.

**Table 3: Results of multiple regression analysis**

Model	Regression coefficient		t	Sig.
	B	Std. Error		
Constant	-0.037	0.103	-0.361	0.719
Job condition	0.366**	0.044	8.296	0.000
Organizational environment	0.579**	0.063	9.195	0.000
Project state	0.166**	0.044	3.744	0.000
Project investor	-0.356**	0.111	-3.206	0.002
Project budget	0.475**	0.109	4.343	0.000

Organizational environment * Budget	-0.439**	0.089	-4.944	0.000
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Dependent variable: Project success

\*  $p < 0.05$

\*\*  $p < 0.01$

## 6. Conclusion

### a. Contributions:

Evaluation results show that scales used for the model reach required reliability and validity. The paper also introduces scales for working environment affecting the success of infrastructure projects in the Southern Key Economic Zone, such as scales for satisfaction of promotion and learning chances. This will be a useful instrument for bodies that supervise and control factors affecting project managers. The project managers can employ these results to adjust their behavior to their specific conditions.

The paper identifies factors that affect the project success. In this study model, all three factors of the working environment have effects on the project success. They are job condition, organizational environment and project state. In addition, two of project attributes also affect directly the project success: project investor and budget. The project budget, moreover, has some interactive effects on the relation between the organizational environment and project success.

Of the three working environment factors, the organizational environment has the strongest effect on the project success ( $\beta = 0.579$ ). When the organizational environment is improved, the project can be completed faster with less additional cost and higher customer satisfaction. To ensure the project success, therefore, the organization had better establish good relation with customer and project. The project management should also build good relations with the customer because it has direct and regular contact with the customer during the time of implementation of the project. The project management should gather and examine information and requirements from the customer, and exchange note with the customer to ensure cost, schedule and quality for the project.

Job condition is the second factor of the

working environment that affects considerably the project success ( $\beta = 0.366$ ). If the project managers feel satisfied with the job, they will devote themselves to the project with all of their mind and body to ensure the project success. So the organization should adopt suitable incentive schemes.

The effect of project state on the project success ( $\beta = 0.166$ ) is not great but no less important. The better the project state, the higher the project success. Therefore, the organization should examine prestige and stability of consultants, suppliers, and subcontractors before making decision on cooperation and participation in the project. The schedule must be long enough to complete the project. Short schedule may lead to shortcomings in design and construction. Relations with colleagues in the project should be good enough to ensure better coordination during the implementation of the project because it helps accelerate the implementation and overcome obstacles.

Project investors, from either public or non-public sectors, have certain effects on the project success. This reflects itself in the slope factor of the investor as a variable of -0.356. The negative value of this factor means that the project success is not high if the investor is from the public sector. This situation is common in Vietnam. State-owned companies with clumsy machinery and poor managerial skills have become obstacles to the implementation of the project and affected unfavorably all participants in the project. The lesson from this fact is that all sectors should be allowed to take part in the infrastructure projects and managerial skills of the project management bodies from state-owned companies should be improved.

Size of the project budget produces different effects on the project success. In the regression analysis, the project budget is an attribute variable. Project whose budget US\$1 million or lower is called 1, and expressed as 0 if it budget is bigger than US\$1 million. The slope factor of the budget as a variable is 0.475. The positive value of this factor shows that the project with a small budget can gain higher success. Most Vietnamese contractors are small and medium companies with limited sources of finance,

experience and managerial skill needed for participation in large-scale projects. That is why possibility of success is low when they take part in large projects. The lesson here is that companies should examine and estimate their managerial skill and financial strength before taking part in the project, and should determine how big the project budget should be so they can ensure the project success.

The project budget also affects greatly the relation between the organizational environment and the project success. This reflects itself in the slope factor of the interactive component between the organizational environment and project budget (-0.439). The negative value of this factor means that in a project with a large budget the relation between organizational environment and project success is stronger.

In most organization, delegation of task of approving the project to lower levels is usually based on the project budget. Bigger-budget projects require more approval from authorities of higher levels, this happens to both project investor and contractor. This situation requires good relations between project management and investor, and between holding organization with investor so as to accelerate the implementation of the project, gather necessary information and ensure the quality for the project. Moreover, bigger budgets require better control. Lack of good relations between the holding organization and project management can affect unfavorably cost and schedule of the project.

## b. Limit:

This paper also has certain limits. Firstly, the study is only conducted in the Southern Key Economic Zone. Its generalization will be higher if information from other zones all over the country is gathered and employed. Secondly, due to limited time and source of finance, the quota sampling is used so the study fails to represent the population and generalize larger quantities ■

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