THE DETERMINANTS OF PROJECT SUCCESS

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untuk memenuhi sebagian persyaratan
mencapai derajat Sarjana S-2

diajukan oleh
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12300/IV-3/0982/99

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THE DETERMINANTS OF PROJECT SUCCESS

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telah dipertahankan di depan Dewan Penguji

pada tanggal 30 JULI 2001

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THE DETERMINANTS OF PROJECT SUCCESS

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`Studi ini bertujuan untuk mengetahui faktor-faktor penentu kesuksesan proyek. Faktor-faktor ini mencakup aspek-aspek perilaku manusia. Studi ini merupakan hasil replikasi penelitian yang dilakukan oleh kolaborasi Pinto dan Covin serta Pinto dan Slevin. Faktor-faktor ini adalah misi proyek, dukungan manajemen atas, jadual, konsultasi klien, kemampuan teknis, penerimaan klien, komunikasi, monitoring dan pemberian umpan balik dan penyelesaian masalah.

Kesembilan faktor tersebut bertindak sebagai *independent variables*. dan kesuksesan proyek dianggap sebagai *dependent variable*. Kesuksesan proyek dijelaskan ke dalam dua dimensi yaitu dimensi keefektifan dan efisiensi. Dimensi keefektifan dijelaskan melalui aspek kepuasan klien sedangkan dimensi efisiensi dijelaskan melalui dua aspek yaitu aspek tepat waktu dan anggaran.

Dari penelitian terdahulu ditemukan bahwa beberapa variabel sebagai faktor penentu kesuksesan proyek hanya relevan untuk sejumlah subyek tertentu saja. Dalam hal ini, sebuah proyek terdiri dari anggota-anggota yang berupa klien, manajer proyek dan konsultan. Mereka memiliki peranan yang tidak sama. Variabel-variabel misi proyek, konsultasi klien dan penerimaan klien sebagai *independent variables* hanya relevan untuk klien sedangkan dimensi keefektifan bertindak sebagai *dependent variable*. Variabel-variabel dukungan manajemen atas, jadual, kemampuan teknis, komunikasi, monitoring dan pemberian umpan balik dan penyelesaian masalah sebagai *independent variables* hanya relevan untuk manajer proyek sedangkan dimensi efisiensi bertindak sebagai *dependent variable*.

Berkaitan dengan metodologi penelitian, responden yang digunakan dalam penelitian ini meliputi dua jenis yaitu klien dan manajer projek. Proyek-proyek yang dipilih adalah proyek-proyek konstruksi yang berada di Daerah Istimewa Yogyakarta. Alat analisis yang digunakan dalam penelitian ini adalah regresi berganda.

Dari hasil penelitian ditemukan bahwa semua faktor penentu kesuksesan proyek dengan dimensi keefektifan mempunyai pengaruh positif. Misi proyek, konsultasi klien dan penerimaan klien mempunyai hubungan positif terhadap kepuasan klien. Hanya beberapa faktor penentu kesuksesan proyek dengan dimensi efisiensi mempunyai pengaruh positif. Jadual, kemampuan teknis dan komunikasi mempunyai hubungan positif terhadap ketepatan waktu dan biaya pelaksanaan proyek. Faktor dukungan manajemen atas, monitoring dan pemberian umpan balik serta penyelesaian masalah diketahui tidak mempunyai hubungan positif terhadap ketepatan waktu dan biaya pelaksanaan proyek.

CHAPTER I

THE INTRODUCTION

A. The Background of the Research

The demand for project management has increased dramatically. Several of companies such as construction company, pharmaceutical company, chemical and nuclear company, research and development, computer software and hardware development and aircraft manufacturing company have performed their business activities through a project to improve their performance (Hutchins. 1999; Pitagorsky, 1997). Project activity can overcome the barrier of organizations to provide better services and products for their customers. Project management can lead to flexibility and attack the hierarchy of organization (Bounds. 1998)

As the result of the importance of a project activity, many studies in project management are conducted to gain more understandings of project management field. One of the studies concerns some factors how to support the project success. The main issue in project management literature that has become the center of interest since several years ago is project critical success factors (Baccarini. 1999: Jaafari, 2000).

Pinto and Slevin (1987) have proposed some critical factors used to be a prediction of a successful project management. These factors are inherently more behavioral than technical but it is essential that the project manager will be able to understand and monitor a project implementation. These factors are as equally important as the harder technical aspects such as Gantt charts and critical path method.

The critical success factors do not only concern the short-term measures of project success but also concern the longer-term measures. The concept consists of international standards that have been well proved to project success (Meredith & Mantel, 1995). The critical issues of the behavioral side for project success are project mission, top management support, project schedule, client consultation, quality of project team personnel, technical task, client acceptance, monitoring and feedback, communication and trouble shooting.

There are some driving factors why this study still concerns and focuses on these factors.

Firstly, the concern to apply longer-term measures interests project doers. Many project managers have had an interest in applying a new tool to measure project success. They consider that the traditional measure is not adequate anymore. It has to be equipped with other measures. Many project

activities in Indonesia especially in Yogyakarta have focused on other more behavioral measures. Project managers consider that the harder technical aspects including project evaluation, program evaluation review technique, Gantt charts and critical path methodologies are only used to track costs, schedules, and performance of a project.

Project managers with the harder technical aspects only obtain the punctuality of a project that has to be finished in a certain of a period time and precise budget. If a project can be finished in a determined period of time and precise budget, a project can be considered as a successful project. These technical aspects focus more on the result. The result does not regard the long-term profitability and customer satisfaction. In other words, many project activities with short-term measures focus only on profitability. They do not consider other aspects such as internal and external clients. It does not matter to the quality of a project. The concern of a project matters to on time and on budget. This activity only achieves the short-term profitability. [1]

The interest to apply a longer term measure is supported by Tippet and Waits. They (1994) argue that the traditional measurement of project success is still well applied in a project but it has to be equipped with the longer term measure such as the effectiveness of a project. In many ways, the traditional

[1] The information was gathered by having an interview with some personnel working at the selected construction firms in Yogyakarta.

project management environment fosters a result at any cost attitude among project managers. This does not encourage Total Quality Management principles. They also add that the most extreme case is harried project managers have been known to use an abusive management style. It will demoralize team with a negative attitude and low morale. As we can see from the field, many project managers race to finish a project quickly in order to come on schedule and budget.

Kumalaningrum (2000) has found that many business activities in Indonesia depend on the statistical control to monitor business activities. The statistical control emphasizes the result. Consequently, many companies are not able to produce world class products. The activity does not consider the process. Process is more important than result. Process would identify problems and causes and review the result by doing communication among members and group dynamics (Pitagorsky, 2000). The process can create a recheck of the activities and a constant review. The reassessment can gain an accurate picture of a project at any point in time. Moreover, the good process is subordinate to project success (Baccarini, 1999).

The critical success factors involve some aspects focusing on process (Pinto & Mantel, 1990). Client consultation for example creates a chance for clients to seek information about project development from the beginning of a

project until the end of a project. It requires more time and energy but this condition can enhance the satisfaction both sides- project team and clients.

Secondly, the strong appeal for the application of the total quality management in conducting business activities to enhance quality and increase total customer satisfaction is dramatically increasing. Most customers are now well educated. They are able and powerful to choose which company can provide better services for them. Furthermore, in the face of globalization where the economic industry is open to all new business doers especially from foreign countries. Business managers are not supposed to only use the quantitative methodologies, management techniques, statistics, economics and system engineering tools and methods to control the production and service processes to fulfill the requirements but qualitative methodologies concerning total quality dimensions have to be paid attention seriously (Edosomwan & Moore, 1991).

The qualitative methodologies such as leadership, customer satisfaction and good quality are increasingly important. Barkley and Saylor (1993) also note that customer driven project management has demonstrated a significant role for a total quality. This management offers project team members for continually assessing the clients' needs and delivering superior products and services for them. In Indonesia, any business and project activities are

suggested not only to apply the quantitative methodologies but also the qualitative methodologies in order to achieve a long-term profitability and to survive in a severe competition of economic industry.

The critical success factors can guide any business activities and project activity to achieve total quality. Monitoring and feedback as one of the ten critical success factors can lead to total quality by emphasizing a continuous improvement. This control mechanism allows project managers to be alert in any real or potential problem, to oversee corrective measure continuously and to prevent deficiencies from being overlooked. Though a feedback meeting is time consuming, it can be used as a mechanism to provide both favorable and unfavorable feedback to team members and management. An unfavorable feedback can be used to challenge and motivate project team members.

Thirdly, the critical success factors enable project doers to achieve project success with multidimensional aspects. In the old paradigm, project success is measured with three main aspects-on time, on budget and on specification (Scotto, 1994). In the new paradigm, project success has to involve beyond the three main aspects. Pinto and Slevin (1988 a, 1994) argue that project success is not only measured with the factors of time, budget and project performance, but the satisfaction and welfare of the client have to be included as measurement factors. This matters to the long-term orientation.

The new paradigm holds a thought that a project cannot be completely considered successful if client's satisfaction is not measured at once. In this case, not only a project is expected to come on time and budget but also a project is expected to fulfill the client's need. By so doing, a project can create welfare for all project doers.

Client satisfaction becomes the important aspect of project success. The industry competition has resulted in a much more competitive market place in which a customer has a wider range of options in selecting projects and company with which to deal. As the result, clients are more often interested in maintaining contracts with the past firm that can create satisfaction for them. [2]

Fourthly, the critical success factors leading to project success also have the long-term orientation. Client acceptance, for example, has a long-term orientation. It creates a condition that clients are ensured that they are willing to accept the project result. They are given the opportunity to know the progress of a project. They are not left behind. Any presentation concerning the project activity will be held for them, so project doers will understand whether they agree or not. This condition will make clients satisfied because

[2] The information was gathered by having an interview with some personnel working at the selected construction firms in Yogyakarta.

they are kept in touch with the project activity being done. Once a client is satisfied, he will come to the company that can provide a successful project.

B. The Previous Research

This study attempts to make a replica of Pinto and Slevin's concept of critical success factors of their research in 1987 with a modification. The study explored the classification of the critical success factors into two distinct sub-groups: planning and tactical factors. The planning dimensions consisted of the critical success factors of project mission, top management support, schedule/plans and client consultation. The tactical dimensions included personnel, technical tasks, client acceptance, monitoring and feedback, communication and trouble shooting. The taxonomy of strategic versus tactical dimensions was based on several elements such as level of conduct, information needs, time horizons, completeness and detail.

The research of Pinto and Slevin has also shown that the critical success factors become the determinant of project success. The project success involved two dimensions namely efficiency and effectiveness. Each dimension acted as the dependent variables of the critical success factors. The efficiency variables had some indicators: on-schedule and on budget. Meanwhile the effectiveness variables concerned the client satisfaction. It

consisted of some indicators: project workability, usage by clients, benefit for clients, solving users' problem, the usage of projects for related clients, acceptability to users, improving decision making, positive impact for clients, improving activities.

For the methodology of the research, project managers were used as the respondents for the research. They were assumed to know the whole project activities. The research did not use the clients as the respondents.

Hardani (1998) also conducted the influence of strategic and tactical critical success factors in the project implementation adopted from Pinto and Slevin's model. In this research, the strategic and tactical success factors were also focused on project success. This study only used the project managers as the respondents and did not include the clients as the respondents. The model proposed in this study was similar to Pinto & Slevin's model. In this study, project success was only measured with the efficiency, which concerned the on time and, on budget and team member satisfaction indicators.

C. The Present Research

In this study, the critical success factors are still adopted with some modifications. The critical success factors are not classified into two dimensions; both planning/strategic and tactics but they are classified into two

dimensions based on the project members. The classification is based on the research conducted by Pinto and Covin in 1989. Pinto and Covin conducted the research concerning critical success factor in the construction and research development projects.

Pinto and Covin used project managers and clients of a construction project as the respondents. A project manager is defined as a person who uses their capability to enhance project success (Pinto & Slevin, 1989 a). In this study, project managers are the people who working at the construction firm. Meanwhile the clients here refer to anyone who will ultimately be making use of the result of the project (Pinto & Slevin, 1987 a & b). In line with the emergence of the new paradigm of thinking, a project can be considered completely successful if clients are invited to measure the project success.

Pinto and Covin (1989) conducted a field study to understand the critical success factors over the project life cycle in the construction firms. The factor played an important position in achieving project success. The result indicated that the relative importance of several critical factors changed significantly based on the stages of project life cycle. The factor changed at every stage because of the characteristics of the project life cycle. Each stage required different resources both personnel and non-personnel. In addition to it, both clients and project managers had a different role at each stage. Pinto

and Covin's research indicated that in the construction projects, some variables were more relevant for project managers and the others were for clients. In other words, both clients and project managers handled different critical success factors.

Furthermore, by looking at the items of questionnaires carefully, each critical success factor as the independent variable has some indicators that showing which variables are focused on project managers and clients. By so doing, some variables of critical success factors can be classified both for project managers and clients. Project mission (consistency), client consultation (accessibility) and client acceptance are the question variables for the clients while top management support, schedule, technical task, monitoring and feedback, communication and trouble shooting are for the project managers. Meanwhile, the efficiency and effectiveness variables as the dependent variables also act a different role. The items of the questionnaires of efficiency are fit for the project managers while the effectiveness are fit for the clients.

In summary, this study uses the model that is proposed firstly by Pinto and Slevin. However, the taxonomy of the independent variables is not based on the strategic and tactical dimension, the taxonomy is based on the respondents which proposed by Pinto and Covin. The latter model is considered more comprehensive in explaining the predictors of project success.

In order to understand the similarities and difference between the previous and the present research, in the following section, there is a short summary concerning it.

Table 1.1. The Summary of the Similarity and Difference of the Previous Research and Present Research

No	The Name of the Research Article	The Previous research	The Present Research
1	Critical Success Factors in Effective Project Implementation by Pinto & Slevin published in *Sloan Management Review*, Fall 1987.	1. The critical success factors as the independent variables are broken down into two aspects; planning and tactical aspects. 2. The respondents are project managers 3. The project sample: system development, product development, research and development, hardware development.	1. The critical success factors as the independent variables are broken down into two aspects; based on the project members. 2. The respondents are project managers and clients 3. The project sample: construction projects

2	Critical Factors in Project Implementation: A comparison of Construction and R & D Projects by Pinto & Covin, published in *Technovation,* Elsevier Science, September 1989.	1. The critical success factors as the independent variables are classified into two aspects: project managers and clients 2. The analysis uses the stepwise regression because it is to identify the most important critical success factors for predicting project success	1. The critical success factors as the independent variables are classified into two aspects: project managers and clients 2. The analysis uses the multiple regression because it is to confirm the Pinto and Covin's model in predicting project success.
3	Pengaruh Strategi dan Taktik terhadap Kesuksean Tahap Operasionalisasi Proyek by Hardani, unpublished thesis, 1998.	1. The critical success factors as the independent variables are broken down into two aspects; planning and tactical aspects. 2. The respondents are project managers 3. The construction project sample is derived from 1991-1996.	1. The critical success factors as the independent variables are broken down into two aspects; based on the project members. 2. The respondents are project managers and clients 3. The construction project sample is derived from 1997-2000.

D. Problem Formulation

This study deals with two distinctive aspects namely the classification of critical success factors and project members. Based on this consideration, the problem formulation is stated as follows:

1a. Does Project Mission has a positive relation on project success with the effectiveness dimension?

1b. Does Client Consultation has a positive relation on project success with the effectiveness dimension?

1c. Does Client Acceptance has a positive relation on project success with the effectiveness dimension?

2a. Does Top Management Support has a positive relation on project success with the efficiency dimension?

2b. Does Schedule has a positive relation on project success with the efficiency dimension?

2c. Does Technical Task has a positive relation on project success with the efficiency dimension?

2d. Does Monitoring and Feedback have a positive relation on project success with the efficiency dimension?

2e. Does Communication has a positive relation on project success with the efficiency dimension?

2f. Does Trouble Shooting has a positive relation on project success with the efficiency dimension?

E. Research Objectives

1. The study aims at seeing the overall behavioral influences on the project success. In the project implementation, human behavior acts the great role in determining project success. Most the project activity is filled with the intense interaction among project doers and clients.
2. The study presents the fact that project success cannot be evaluated on a narrow aspect such as on time and on schedule. However, it has to be beyond it. The client satisfaction must be included in the measurement of project success because eventually, clients are the users of the project result. If the project result fails to satisfy the clients, the project is considered unsuccessful.
3. This research also shows that critical success factors can help project doers achieve project success with the long-term orientation. The long-term orientation focuses on the client satisfaction both internal and external customers. The internal customers mean the company, which provides

services while the external customers mean someone who will make use of the project. If a project is executed well, the service providers will create satisfaction for customers. By so doing, in the future, customers will come to the company if they have a project to do.

CHAPTER II

THEORETICAL FRAMEWORK

A. Review of Related Literature

Before discussing the critical success factors, it will be presented a short look of the definition of a project. A project is defined as a unique and nonrepetitive endeavor that is done by relatively a small group of individuals who must put into place of resources, structures and processes (Adam & Thomas, 1990). A project consists of a series of tasks that have several distinguishing characteristics: a) a project has specific starting dates and ending dates; b) it has well-defined objectives; c) it achieves a specified product or result; d) cost, time schedules and resources are consumed; e) project members have different roles (Duncan, 1996; Sharad, 1993; Spinner, 1997).

A project has a life cycle. The life cycle of a project consists of four stages; conceptualization, planning, execution and termination. Project life cycles generally define what technical work should be done in each phase and who should be involved in each phase (Duncan, 1996). The characteristics of each stage demand a different treatment such as resources and personnel.

Moreover, Duncan adds that project life cycle descriptions share a number of common characteristics such as a) cost and staffing levels are low at the start and higher toward the end; b) the probability of successful completion generally obtains progressively higher as the project continues; c) the cost of changes and error correction generally increase as the project continues. Each stage has some different activities to do as follows:

a. Conceptualization- It refers to the initial determination of a goal for a project along with exploring the availability of the means to accomplish the goal. Preliminary goals and alternatives are specified as well as the possible means of accomplishing the goals (Adams & Barndt, 1988). Conceptualization often involves an initial feasibility decision requiring project team members or clients to answers question such as what is the problem, will the development of a project solve that problem, will the solution satisfy both internal and external clients and do we have the resources to create and support the projects.

b. Planning- In this stage, once goals have been agreed upon, a more formal set of plans is developed in order to accomplish the goals. It concerns some activities such as implementing schedule, budgeting and allocating specific tasks and other resources, conducting studies and analyses, designing

system, building and testing prototypes, analyzing results and obtaining approval for project.

c. Execution- In this phase, the actual work is performed. During this stage, the activities deal with procuring materials, building, developing and supporting requirement, verifying performance and modifying as required. Personnel involved interact one another to do the job based on schedule that has been determined. In this stage, the resource requirements including both quantitative and qualitative resources increase rapidly compared with the two previous stages (Pinto & Prescott, 1988).

d. Termination- It is important because it has a future impact (Hormozi, McMinn and Nzeogwu, 2000). When it fails, it will have an impact on future projects as well as the organization image. Project team members in the termination stage will increase their loyalty and commitment if they feel success. At the end of a project, a post report will be prepared to summarize the project and provide a recommendation for similar projects in the future.

B. Project Critical Success Factors

Many authors have written topics on project management. They have developed sets of critical success factor to improve project implementation. These factors can be of great benefit to project success. However, these critical

success factors are less empirically proven. Pinto and Slevin (1987) argue that these factors are time consuming to generate. These factors are often theory derived and a single-case study.

Table 2.1. Critical Success Factors in Project Implementation

Martin	Locke	Cleland and King	Sayles and Chandler	Baker, Murphy and Fisher
-Define goals -Select project organizational philosophy -General management support -Organize and delegate authority -Select project teams -Allocate sufficient resources -Provide for control and information mechanisms -Require planning and review	-Make project commitments known -Project authority from the top. -Appoint competent project manager -Set up communication and procedures -Set up control mechanism -Progress meetings	-Project summary -Operational concept -Top management support -Financial support -Logistic requirements -Facility support -Market intelligence -Project schedule -Executive development and training of personnel -Manpower and organization -Information and communication channels -Project review	-Project manager's competence -Scheduling -Control system and responsibility -Communi-cation -Monitoring and feedback -Continuing involvement in the project.	-Clear goals -Goal commitment of project team -On-site project manager -Adequate funding to completion -Adequate project team capability -Accurate initial cost estimates -Minimum start-up difficulties -Planning and control techniques -Task orientation -Absence of bureaucracy.

Table 2.1. The Critical Success Factors in Project Implementation (Pinto & Slevin, 1987)

Babcock (1996) and Kerzner (1984) also write critical success factors to foster project success and to avoid projects from failure. They are as follows:

Table 2.2 Critical Success Factors for Avoiding Projects from Failure

Babcock	Kerzner
-Adequate project manager skills -Good coordination and rapport with the client -Good coordination and rapport with the parent organization -Sufficient of project team participation and team spirit -Good project control -Realistic schedule, adequate change procedures and progress reports -Good relations with public officials	-Corporate goals are understood at the lower organization levels. -Plans encompass much time -Financial estimates are good -Financials are based upon sufficient data -Attempt is made to systematize the planning process -Everybody knows the ultimate objective -Everybody knows the staffing requirements. -Everybody knows the major milestone dates including written reports. -Project estimates are based upon standards -People are working toward the same specifications,

Table 2.2. Critical Success Factors for Avoiding Projects from Failure (Babcock, 1996 & Kerzner, 1984)

It is possible to determine similarities between critical success factors listed previously. The factor lists vary in degree of comprehensiveness ranging from general guidelines to specific points of a consideration. Pinto and Slevin (1987 a) also summarize the specific points of critical success factors for project success as follows: 1) clearly defined goals; 2) competent project manager; 3) top management support; 4) competent project team members; 5) sufficient resource allocation; 6) adequate communication channels; 7) control mechanism; 8) feedback capabilities; 9) responsiveness to clients.

From the consideration of these specific points, Pinto and Slevin tested these conceptually generated factor lists to determine whether there was indeed

an empirical basis for the critical success factors. Pinto and Slevin conducted the study to test these factors. The study was performed at the University of Pittsburgh using part-time evening MBA students as the sample. They were also members of a project team in their organization within last two years. They were asked to label successful project. The ten critical success factors represented activities were found to be critical to project success.

1) Project mission-initial clarity of goals and general direction;
2) Top management support-willingness of top management to provide the necessary resources and authority or power for project success;
3) Project schedule/plan-detailed specification of the individual action step required for project implementation success;
4) Client consultation-communication with and active listening to all affected parties;
5) Personnel-recruitment, selection and training of the necessary personnel for the project team;
6) Technical tasks-availability of the required technology and expertise to accomplish the specific technical action steps;
7) Client acceptance-the act of selling the final project to its intended users;
8) Monitoring and feedback-timely provision of comprehensive control information at each stage in the implementation process;

9) Communication-provision of an appropriate network and necessary data to all key actors in the project implementation;

10) Trouble shooting-ability to handle unexpected crises and deviations from plan.

Pinto and Slevin (1994) argue that the ten factors are in the right direction. The factors are sequential and interdependent. The model could be monitored in order to determine where a project is in a term of its life cycle and how progressively it is moving ahead. The ten critical success factors allow project managers to determine the status of a project in relation to its human element. Furthermore, the factors give project managers an opportunity to focus some of their attention on the strategic issues of a project.

1. The Classification of Critical Success Factors Based on the Taxonomy of Strategic versus Tactical Issues

Pinto and Slevin (1987 a) conducted the research with the critical success factors. The research explored the classification of the critical success factors into two distinct sub-groups: planning and tactical factors. Pinto and Prescott (1990) also conducted the research using critical success factors with the strategic and tactical issues. The strategic dimensions consisted of the critical success factors of project mission, top management support,

9) Communication-provision of an appropriate network and necessary data to all key actors in the project implementation;

10) Trouble shooting-ability to handle unexpected crises and deviations from plan.

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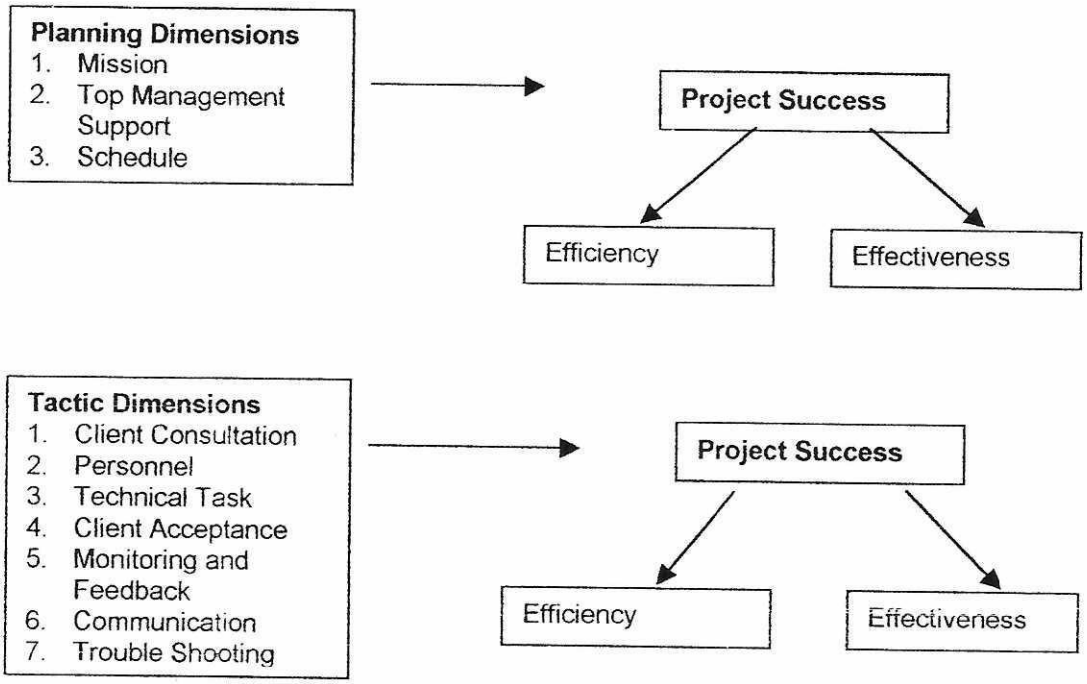
schedule/plans and client consultation. The tactical dimensions included personnel, technical tasks, client acceptance, monitoring and feedback, communication and trouble shooting. The model can be seen as follows:

Figure 2.1. Pinto & Slevin's Research Model



The taxonomy of strategic versus tactical dimensions was based on several elements such as level of conduct, information needs, time horizons, completeness and detail. The detail can be seen as follows:

Table 2.3. Taxonomy of Strategy versus Tactical Issues

No		Strategy	Tactics
1	Level of conduct-level within the organization at which project activities are performed	Top Management	Mid-to-lower levels of management
2	Information Need	Large amount of information needed	Need for internally generated, specific information
3	Time Horizon-the scope or time frame of management's vision in implementing and evaluating the project	Long-term	Short-term
4	Completeness	Covers the entire scope of the organizations	Concerned only with the suborganizational unit involved
5	Detail	Broad and general	Narrow and problem specific

Taxonomy of Strategic vs. Tactical issues (Pinto & Slevin, 1988 c ,in David & King, Project Management Handbook).

2. The Classification of Critical Success Factors Based on the Project Members

Generally, a project consists of some members. They are clients, project managers (contractors) and consultant. Each member has a different role. In

line with the characteristics of project life cycle, each member has a prominent role in each phase (Adam & Barndt, 1988). Clients have a great role in any stage of project life cycle. However, their greatest role lies in the conceptualization of project life cycle (Pinto & Covin, 1989). Clients create project mission which concerns questions such as what is the problem, what the project has to be accomplished, will the project solve the problem, will the project satisfy the whole member of organizations and do we have the resources to create and support the projects (Cleland, 1988).

Furthermore, clients develop schedule and budget and also allocate specific task and resources in the planning. In this process, consultants are usually invited to help clients in the phase. The next phase is execution or operationalization phase. In this phase, project managers or contractors have a greater role. They are actively involved in the real project activity. They execute the schedule developed by clients (Pinto & Covin, 1989).

Project life cycle may also specify the level of efforts and resource requirements (Pinto & Prescott, 1988). During the early conceptualization and planning stages, efforts and resource requirements are minimal. It will be increasingly rapid during the late planning and project termination. A set of critical success factors and personnel are considered as the resource requirements at each stage of project life cycle.

Pinto and Covin (1989) conducted a field study to understand the critical success factors over the project life cycle in the construction firms. The factor played an important position in achieving project success. Result indicated that the relative importance of several critical factors changed significantly based on the stages of project life cycle. In addition to it, both clients and project managers had a different role at each stage. In other words, both clients and project managers handled different critical success factors.

In the conceptualization stage, project mission was shown to critical to project success. Clients created their own project mission. Project mission provided guidance for all project members to implement project activity such as implementing schedule and allocating budget and task.

In the research of Pinto and Covin (1989), client consultation and client acceptance were also found to be critical in the execution stage. Because a project is intended for the client's benefit, the best thing to understand client is intensively done in the execution stage. Kersey (1999) pointed that at this stage, a good consultation that truly understands clients should make a daily routine with them. A project manager has to be careful of analyzing clients' need and accurate in determining if clients' need are already met. Client acceptance was also important in this stage. The client acceptance concerned the function of trying to sell ideas to clients (Pinto & Slevin, 1989 a). Clients

are given opportunity to accept the ideas of project managers. This was done through a good presentation to clients.

Relating to Pinto and Covin' research, project managers had a greater role in the execution and termination stage. Top management support, schedule, technical task, monitoring and feedback, communication and trouble shooting were found to be critical at this stage. At this stage, the critical success factors were increasingly needed.

In addition to the study result of Pinto and Covin, the questionnaires also show that items of questionnaires for some variables are more relevant for the clients while the others are for the project managers. This can be seen in the following table.

Table 2.4. Some Items of the Questionnaires

No	Variables	Items of Questionnaires	Clients	Project Manager
	Independent Variables			
1	Project Mission	1. The goals of the project are in line with the general goals of the organization 2. The results of project will benefit the parent organization.	v	
2	Top Management Support	1. Upper management is responsive to our request for additional resources, if the need arises.		v

		2. Upper management will support me in a crisis		
3	Schedule	1. There is a detailed plan for the completion of the project. 2. There is a detailed budget for the project.		v
4	Client Consultation	1. The clients were given the opportunity to provide input in the project development. 2. The client's are kept informed of the project's progress.	v	
5	Technical Task	1. The project engineers and other technical people are competent. 2. The technology that is being used to support the project works well.		v
6	Client Acceptance	1. An adequate presentation of the project has been developed for clients. 2. Clients know whom to contact when problems or questions arise	v	
7	Monitoring & Feedback	1. Regular meeting to monitor project progress and improve the feedback to project team are conducted. 2. All important aspects of the project are monitored including measures that will provide a complete picture		v
8	Communication	1. The results of planning meetings are published and distributed to applicable personnel. 2. When the budget or schedule is revised, the changes and the reasons		v

		for the changes, are communicated to all members of the project team.		
9	Trouble Shooting	1. In case of project difficulties, project team members know exactly where to go for assistance. 2. I am confident that problems arising can be solved completely.		v
	Dependent Variables			
1	Efficiency	1. The project has come in on schedule. 2. The project has come in on budget.		v
2	Effectiveness	1. I was satisfied with the process by which the project was completed. 2. The project will directly benefit the intended users.	v	

Sources: Critical Success Factors in Effective Project Implementation by Pinto & Slevin published in Sloan Management Review, Fall 1987.

C. Project Success

As the rule of thumb, project success is often rated as successful because they have come in on or near budget and schedule and obtained an acceptable level of the performance. This method is usually used because they are easiest to quantify. However, project success is not only measured with the factors of time and budget, but the satisfaction and welfare of the client have to be given the priority. Many project organizations have included the client satisfaction in their assessment of project success (Pinto & Slevin 1988 a).

Baker, Murphy and Fisher (1988) develop the scope of project success. They conclude: " In the long run, what really maters is whether the parties associated with and affected by a project are satisfied. Good schedule and cost performance mean very little in the face of a poor performing end product". Not only does the scope of project success encompass the objective standards-completed on time, completed within budget and all technical specification, but the scope also involves perceived success of a project.

Moreover, they argue that a perception plays a strong role here. Perceived success of a project is translated into the high level of satisfaction concerning the project outcome among stakeholders including key people in the parent organization, key people in the client organization, key people in the project team and key users. A project manager has to pay attention to these factors because while meeting its objectives within time and budget constraints, a project has to fulfill the needs of stakeholders (Duncan, 1996; Pitagorsky, 1997).

Pinto and Slevin (1988 a) state that the traditional measures of project success-on time and on budget are still important. De Witt (1988) also notes that project management success should encompass the consideration of how efficiently the project has been managed. The efficiency criteria are cost and time. However, they are not sufficient to quantify the project success. Client

satisfaction has a great deal to do with the perceived success or failure of the project. Two key themes of project success namely project and client are proposed (Pinto & Slevin, 1988 a & b; De Witt, 1988).

Project as the internal measure means a project itself must be technically correct and perform in the manner intended. The areas of project are a) time-the project has to be on time; b) cost- the project has to be on budget; c) performance-the project has to work well. Client as the external measure means the project team must interface effectively with the client to optimize the likelihood of acceptance. The areas of clients are a) use-the project is used by intended clients; b) satisfaction-the client must be satisfied with the completed project; c) effectiveness- the project has to benefit the intended users directly.

Pinto and Slevin (1987 a) and Pinto and Prescott (1990) define project success. Project success has multidimensional aspects, which involve efficiency and effectiveness measurement. Efficiency dimensions consist of items: 1) on schedule and 2) on budget. The efficiency dimension matters to the resources allocation such as time, money and efforts to achieve an optimal result. The items of the efficiency dimension are relevant because a project has some characteristics as follows: a) a project has specific starting dates and ending points and b) cost. time and resources are consumed.

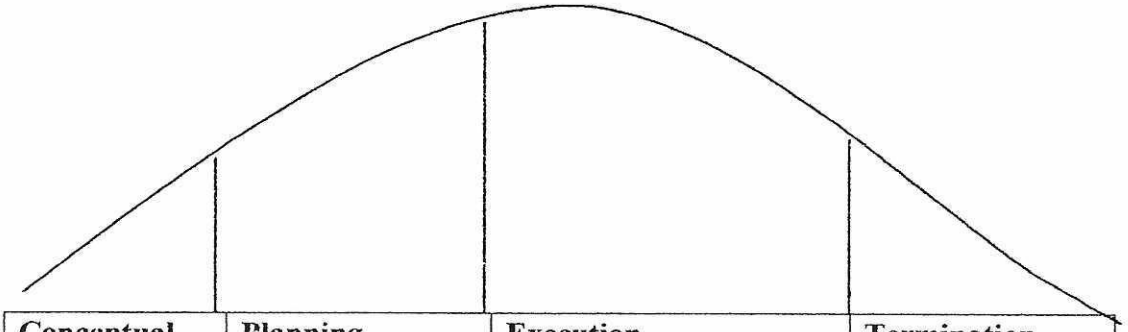
Meanwhile the effectiveness dimensions consist of items 1) project workability, 2) use by clients, 3) benefit for clients, 4) solves users' problem, 5) the usage of projects for related clients, 6) acceptability to users, 7) improved decision making, 8) positive impact, 9) improved activities. The effectiveness dimension relates to the main thing namely a project can achieve the determined goals. In this case, the goal is about how the project has a benefit for the intended users.

In this study, personnel factor is dropped. The research result of Pinto and Prescott in 1988 and Pinto and Covin in 1989 indicated that though there was a significant correlation interrelationship, personnel factor was not a dominant variable for project success at any of the life cycle of a project. The possible explanation was the items comprising the personnel scale were not useful for assessing the factor of personnel and it was a given factor. It means that trained and qualified project team personnel were a rule than the exception.

D. The Research Model and Hypotheses

The research of Pinto and Covin (1989) showed that at the construction projects, some critical factors were more relevant for clients and some of them were for project managers. Each of them had a different role at each stage of project life cycle. Clients had a role at any stage. Their role increased in the conceptualization stage and operationalization. Meanwhile, project managers had the greatest role in the execution stage. The research also provided the result that each critical success factor was subject to dramatic changes at different phases in the project life cycle. The results were as follows:

Table 2.5. The Study Result of Pinto and Covin (1989)

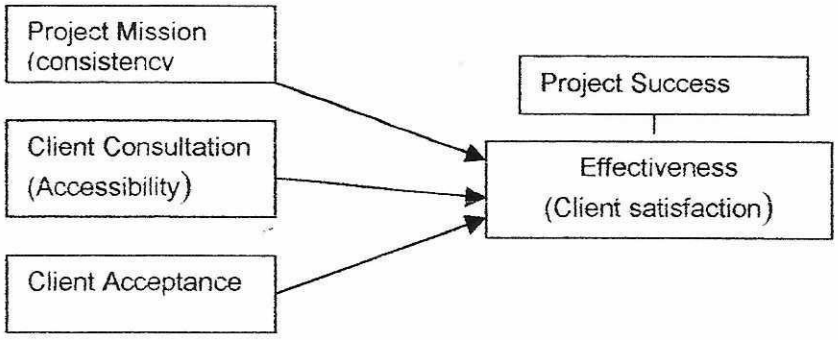


Conceptual	Planning	Execution	Termination
Project Mission	***Project Mission***	***1. Project Mission*** 2 Top Management Support 3 Schedule 4 Technical Task 5 Communication 6 Monitoring and Feedback ***7 Client Consultation*** ***8 Client Acceptance***	***1. Project Mission*** ***2. Client Consultation***

Note: the bold and italic letters are referred to clients while the not ones are referred to project managers

1. The Research Model

Figure 2.2. The Present Study Variables for the Clients



Model adopted from Pinto & Covin' Research (1989)

2. The Critical Success Factors for Project Success with the Effectiveness Dimension

a. Project Mission

Project mission does not only mater to the short-term goal but it also matters to the long-term goal. Cleland (1988) has written much on the strategic fit of projects with an organization's overall strategy. In other words, there is not a good reason to initiate a project if it does not fit in with the organization's overall mission. A project mission is not simply its preliminary goal. Project mission concerns some questions such as a) why are we doing this? b) what are we doing? c) what are the key deliverables? and d) to whom the project is for?. The project mission needs to be apparent not to a few selected members of the project team, but to all project team members.

Project mission is the important factor related to project success at any stage, especially in the conceptualization stage. (Pinto and Slevin, 1988 b; Pinto & Covin, 1989). The study result suggests the need to keep the purposes of the project being implemented always in the forefront. It tries to avoid the deviance from the determined purpose. The clear mission can give a precise direction for all members of the project team how to manage the project in order to create project success.

As it has been stated previously, project mission determines what the project is trying to accomplish. Project mission provides guidance for project teams in making schedule, budgeting and allocating specific tasks. Project mission gives the grand guidance. When it comes to making schedule and budget, it talks about the real thing. In making the schedule, it tries not to deviate from project mission. In this case, project mission concerns the project success with the effectiveness dimension.

At the last period of project activity, project mission cannot be neglected. The research conducted by Pinto and Slevin (1989 a) suggests that if project mission is forgotten or becomes increasingly unclear over the life of project, the probability of project failure is high. In the last stage, project mission functions as guidance for all project members. The result of project has to be in line with the purpose, which has been stated in the project mission. If any deviance, it will be improved immediately.

In a summary, clients have developed their own project mission. Project activities should be managed in accordance with the project mission. The project mission provides a clear guidance where the project is taken to. Frequently, a project is not appropriate to be implemented. Furthermore, in the reality many deviancies happen. Unless clients are kept informed, they will be dissatisfied.

Hypothesis 1: Project Mission will significantly be related to the project success with the effectiveness dimension

b. Client Consultation

Client consultation is critical for project success. The client is referred to here as anyone who will ultimately be making use of the result of the project (Pinto & Slevin 1987 a & b). Because a project is intended for the client's benefit, the best thing to understand client is a must (Kersey, 1999). At any point, he adds that a good consultation that truly understands his or her client should make a daily routine with their clients along the project life.

Client consultation shows the necessity of taking into account the needs of the future clients or users of a project (Pinto & Slevin, 1988 a; Hayes, 2000). A project manager has to be careful of analyzing client's need and accurate in determining if client's needs are already met. The clients' need also concerns the aspect of time and budget. A project manager has to understand when a project should be finished and how much money is needed.

Client consultation is vital not only at the beginning of the development process but throughout the project implementation (Pinto & Covin, 1989, Pinto & Slevin, 1994). Clients are given chances to give their input to improve the project implementation. Oppeland and Kolf (in McKeen, Guimaraes &

Wetherbe, 1994) found that client participation in project system implementation creates a better real problem understanding. Moreover, users who participate in project execution tend to value the project result more highly than those users who do not participate. Participation in a project execution by actively involved in the field, formal approval of specifications and continuous review of systems is directly related to user satisfaction (McKeen, Guimaraes & Wetherbe, 1994).

Client consultation still plays an important role in the termination stage. An organization has a primary responsibility to have a duty of client consultation in the termination stage (Hormozi, McMinn & Nzeogwu, 2000; Pinto & Covin, 1989; Pinto & Prescott, 1988). The result of the project in this stage will be transferred to clients. In this stage, clients still have an opportunity to consult if there is an improvement concerning the project implementation. The emphasis lies in the continual communication with clients for whom the project is intended throughout the development of the project. More importantly, it tries to create client satisfaction.

Hypothesis 2: Client consultation will significantly be related to the project success with the effectiveness dimension.

c. Client Acceptance

Client acceptance concerns the functions of trying to sell the ideas or goals of projects to clients (Pinto & Slevin, 1988 a, 1989 a). Client acceptance is the next step to do after client consultation. After listening to clients and receiving ideas from clients, a project manager formulates ideas whether the input is acceptable or not. When finished, project managers re-deliver the idea to their clients for obtaining their agreement.

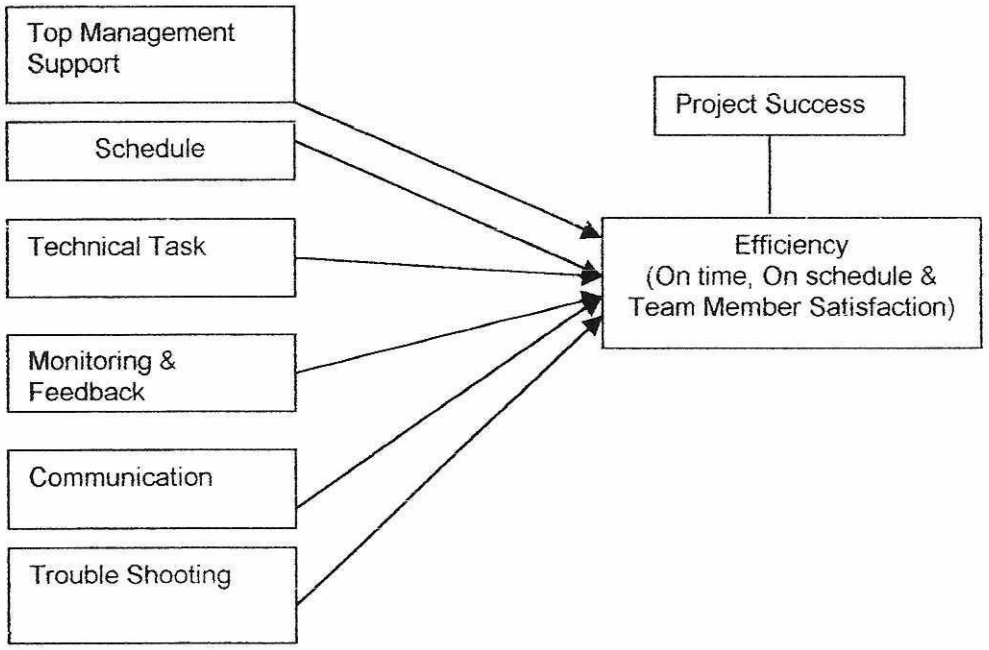
When clients have already accepted the project planning, they will support the project implementation by being actively involved. This condition can enable project teams to do the project in accordance with the schedule (Pinto & Slevin, 1988 a, 1994). A project manager cannot neglect this factor otherwise a client will not be satisfied with the project result. This is related to project success with the effectiveness dimension.

The client acceptance is not only a matter of the idea agreement, but it is beyond it (Pinto & Prescott, 1988). When a project activity is executed, there has to be a routine meeting by giving a clear and precise presentation to let clients know how progress the project is. This activity can provide vivid information for clients. By so doing, clients can obtain clear understanding about the project activity. If they accept the project activity, the project managers can keep on running the project.

Hypothesis 3: Client acceptance will significantly be related to the project success with the effectiveness dimension.

3. The Research Model

Figure 2.3. The Present Study Variables for the Project Managers



Model adopted from Pinto & Covin's Research (1989)

4. The Critical Success Factors for Project Success with the Efficiency Dimension

a. Top Management

Top management can be a critical resource for project success (Owens, 1988; Beck, 1988). Top management support is defined as the commitment to demonstrate its continuing commitment to a project involving aspects such as allocation of sufficient resources- financial; manpower; time (Pinto & Slevin, 1987 a).

Pinto and Covin (1989) argue that it would appear that the necessity of demonstrating top management becomes vital during the execution stage as a project attempts to ascertain the availability of sufficient monetary, human, raw material and other resources in order for the project to succeed.

Top management support is needed to give their contribution and to foster the project implementation. Without it, the project will not achieve their ultimate success. The commitment of top management by allocating resources such as sufficient monetary and material for project implementation is related to project success. The project success is indicated with the on time and on budget aspects.

Hypothesis 4: Top Management Support will significantly be related to the project success with the efficiency dimension.

b. Project Schedule

Project schedule is needed to provide a statement of the goal and direction of the project as well as further information concerning the project environment and guide for project execution (Duncan, 1996). Project can successfully be implemented or executed if there is a well-laid-out and detailed specification of the individual action steps (Pinto & Covin, 1989; Pinto & Slevin, 1994).

Project schedule is the real implementation of project mission. Based on the research Pinto and Covin (1989), the schedule represents a highly important and necessary element to successful project execution. During the actual work of the project, the schedule often functions as the sole feedback mechanism to many project members in assessing how the project is proceeding. In reality, without a clear schedule, a contractor cannot do the job well. They do not know what they have to build, what the specifications are required, when the project has to be finished and how much money is spent. With the clearly defined schedule, project managers can implement a project well. This can achieve project success with the efficiency dimension.

Hypothesis 5: Project Schedule will significantly be related to project success with the efficiency dimension.

c. Technical Task

Technical task, one of the critical success factors, refers to the necessity of not only having the necessary personnel for the project implementation, but also ensuring that they possess the necessary technical skills and have adequate technology to perform their tasks. (Pinto & Slevin, 1987 a & b, 1994; Pinto & Covin, 1989). A project cannot achieve the desired goal, if skilled people do not foster it. Skilled people mean they understand what they exactly to do, how to manage a project, and how to apply the technology in the project implementation.

Skill affects a major part of one's job that correlates with performance on the job that can be measured against well-accepted standards and that can be improved via training and development (Parry, 1998). Besides, the success of a modern project cannot be separated from the role of technology. Moreover, the appropriate technology is the means to succeed project execution (Pinto & Slevin, 1989 a). The technology includes hard machine and

modern equipment. This technology can also facilitate and enable the project managers to do the project in a certain period of time.

The research of Pinto and Prescott (1988) and Pinto and Covin (1989) also show that technical task can be used in the form of project review and evaluation to assess relative successes and failures, their likely causes and possible corrective actions in case they occur again. This factor may assist project members to verify and provide corrective action.

Hypothesis 6: Technical task will significantly be related to the project success with the efficiency dimension.

d. Monitoring and Feedback

It refers to project control process. Key personnel receive feedback on how the project is comparing to the initial goal. These factors are also useful in the implementation process because project managers are able to see the potential problems and to prevent them while key project members receive feedback on how the project is progressing (Pinto & Slevin, 1994).

Throughout this period, the actual progress of the project in terms of cost, schedule and performance is monitored (Hormozi, McMinn and Nzeogwu, 2000). This activity can sustain project success with the efficiency

dimension. Meanwhile, Pinto and Slevin (1987 b) add that performance of project team members is also monitored. If a deviance occurs, it can easily be corrected without letting the project get the worse result. This action is done because it avoids the project from failure and tries to achieve the project success in term of on-time and on-schedule aspects.

Hypothesis 7: Monitoring and feedback will significantly be related to the project success with the efficiency dimension.

e. Communication

Effective team communication is one of the major challenges to a project success (Pinto & Slevin, 1994; Kelly, Thomas &Tucker, 1999). The multidisciplinary nature of project requires management and execution by highly skilled, task-organized project teams whose members are drawn from both customer and contractor organizations. The diverse background and dynamic composition of this team hinder the development of critical communication for these technically complex and schedule-driven projects.

In the execution stage of a project, most project managers find that they spend at least half of their time talking to people-getting information,

delegating, clarifying directives and resolving conflicts. Project managers have to maintain the communication among project members (Stuckenbruck, 1988).

Kelly, Thomas and Tucker (1999) provide critical categories of communication for project team members. They are 1) accuracy-the accuracy of information received as indicated by the frequency of conflicting interactions, poor communications and lack of coordination; 2) procedures- the existence, use and effectiveness of formally defined procedures, outline scope and methods; 3) barriers- the presence of barriers interfering with communications between supervisors or other groups; 4) understanding- an understanding of information expectations with project manager and project members; 5) timeliness-the timeliness of information received including design and schedule changes; 6) completeness- the amount of relevant information received.

If related project success with the efficiency dimension, it will be clear enough. Project team members understand when the project has to be finished and how it works. A project manager has to give a clear information by communicating to project members frequently (Pinto & Covin, 1989). At the other side, by doing a good communication, project members can obtain information about the revised schedule or budget and the real problems of a project. They are not left behind from the project progress.

Hypothesis 8: Communication will significantly be related to the project success with the efficiency dimension.

f. Trouble Shooting

Problem areas exist in almost the project implementation. Problems in the project implementation can be personal and non-personal. Pinto and Covin research show (1988) that personnel of project interact with other personnel having diverse background intensively. The job must actually be accomplished under a certain period of time and budget. Pressures to achieve the goals are intense in this stage (Adams & Barndt, 1988). Moreover, the probability of misunderstanding of the project goal occurs frequently. What it has been determined in the schedule, it sometimes doesn't work in reality. It needs an adjustment. When doing an adjustment, it is not an easy job. Personnel involved including clients have to make an agreement.

The non-personal problems might be the limitation of raw materials, bad condition and finance problem. Trouble shooting is needed in this case to eliminate the problems. If problems are not eliminated, a project will fail to meet the success with the efficiency dimension. The project will not come on time and on budget

Hypothesis 9: Trouble shooting will significantly be related to the project success with the efficiency dimension.

CHAPTER III

METHODOLOGY

A. Sample

1. Project Sample

The project sample is construction projects. All projects are executed in Daerah Istimewa Yogyakarta. The construction firms in Central Java (Semarang, Yogyakarta and Solo) handle the projects. They are members of the Contractor Federation of Indonesia (GAPENSI). There are some underlying reasons why this study uses construction projects as the project sample.

- Since 1997, some big construction firms in Central Java with Qualification B (big qualification) have started to apply for the certificate of ISO 9001/9002. Therefore, in the project implementation, they have to implement some quality principles in order to achieve client satisfaction. Consequently, if they have conducted good project activities, they deserve to the certificate. The certificate is a meaningful symbol for construction firms that they are able to do qualified projects.
- There is a good tendency in the construction project in Central Java to use other measurements that can explain the total project success. Many construction project developers have complained that the old measurement

is not adequate anymore to measure project success. Client satisfaction aspect must be included in the measurement of project success. Project developers have realized that the construction firms in Central Java are completely competitive. The number of project is limited while the number of construction firms is abundant. They have to compete one another in order to obtain clients. A client has a wider range of options in selecting projects and company which to deal with. As the result, clients are more often interested in maintaining contracts with the past firm that can create satisfaction for them. The powerful tool to gain the clients is that the construction firms have to show that they commit to the quality principles.

The characteristics of selected projects in this study are as follows:

- The projects are categorized as class A (with the nominal value more than 1 billion rupiah).
- The scope of works are water supply (increase of water supply capacity including development and renovation of existing pipe and construction of central ground water reservoir), water treatment (chemical waste water treatment plant, supply and install of incinerator), civil works (construction of access road and parking), architectural (housing and education buildings).

- The project period is the year of 1997 to the year of 2000. This period is chosen because if the project managers are given the questionnaires to evaluate the projects before 1996, it will make difficult for them to remember the performance of the projects they have headed. Though the economic crisis has occurred since 1997, some selected projects are still done. It is caused by the urgency of the project.
- The selected projects are special projects because the projects have special and unique characteristics that are different from other common projects. The project usually sets certain criteria to be fulfilled in terms of a special specification. The underlying reason using the criteria is people involved in the project will give their attention totally to the project implementation. The project becomes critical for them.

2. Unit Analysis

The unit analysis consists of two kinds of the respondents namely clients and project managers. A project consists of some project members. They are clients, project managers and consultants. Each of them has a significant and distinctive role in a project. In this study, clients and project managers are chosen as the respondents.

a. Clients

The questionnaire is distributed to clients of the projects. The questionnaire consists of the three critical success factors as the independent variables; project mission, client consultation, client acceptance and one dependent variable; effectiveness. The clients are assumed to know what factors are critical for the whole project activities. The questionnaires require the clients to understand a project, which they have been involved recently. The project is their frame of reference. Initially, the critical success factors are introduced to them so that they gain much comprehension of the research objectives.

b. Project Managers

The questionnaire is also distributed to project managers of the project. The questionnaire consists of the six critical success factors as the independent variables; top management support, schedule, technical task, communication, monitoring and feedback and trouble shooting and one dependent variable; efficiency. The project managers are assumed to know what factors are critical for the whole project activities. The questionnaires require the project managers to understand a project, which they have completed recently. The project is their frame of reference. Initially, the critical success factors are

introduced to them so that they gain much comprehension of the research objectives.

3. The Method of Sampling

The method of sampling is purposive sampling (nonprobability sampling). It is necessary to obtain information from specific targets-people who will able to provide the desired information and they conform to some criteria set by the researchers (Sekaran, 1992). Though the generalizability of the result is low, the data are quickly to obtain and the choice of subjects is considered as the best position to provide the information required.

B. The Data Collection Method

The data collection method includes two ways namely personally administered questionnaires and interview. The personally administered questionnaires help to establish rapport with the respondents while introducing the survey, provide clarifications sought on the spot and collect the questionnaires immediately after they are completed (Sekaran, 1992).

Moreover, the multi methods lend rigor to research. The bias in one method can be reduced in another method. The items in the questionnaires can be clarified or explained in more detail in the interview. This method can give

more precise description what the researcher tries to present. The researcher will have more faith in the goodness of data. However, this method is costly and time consuming.

C. Instrument

1. The Questionnaires

Pinto and Slevin (1987 a) propose the questionnaire named Project Implementation Profile. Each of the critical success factors consists of five items. Each critical success factor has some main things to discuss.

- Project mission concerns some main things as follows; the general goal of the project, the benefit of the project, the chance for success of the project, the consequence of the project to the organization.
- Top management concerns some main things as follows; the responsiveness of upper management to the project, the responsibility of upper management, the support of upper management.
- Project schedule concerns some main things as follows; the allocation of time and resources, the detailed plan and budget and the contingency plans.
- Client consultation concerns some main things as follows; the input of clients and the active involvement of client in the project.

- Technical task concerns some main things as follows; the technical people, the technology and the skilled people.
- Client acceptance concerns some main things as follows; the adequate documentation of the project, the adequate presentation and preparation to determine the good project for projects.
- Monitoring and feedback concern some main things as follows; the project activity monitoring, the regular meeting and the project review.
- Communication concerns some main things as follows; the publication of planning meetings, the giving of feedback and information for one another.
- Troubleshooting concerns some main things as follows; problem brainstorming, the immediate action of problems and problem solution.

Pinto and Slevin (1987 a) also propose the measurement of project success. They are twelve items, which are classified into two dimensions; efficiency and effectiveness.

- The efficiency dimension consists of schedule and budget.
- The effectiveness dimension consists of items; solves users' problem, improved decision making, positive impact and improved activities, project workavailability, use by clients, client benefits, the usage of projects for related clients and acceptability to users.

To measure variable in each factor, the Likert Scale is applied to indicate the magnitude of differences. The research indicates 7 point scales and utilizes the anchors; strongly disagree, disagree, rather disagree, neither disagree nor agree, rather agree, agree and strongly agree (Cooper & Emory, 1995).

2. The Interview

In this case, there is no formal reference to use However there are some topics that can be used to explore some more information from project team related real project implementation at the field. Some topics concern the critical success factor in the questionnaires and some external factors such as economics and politics, the cost of materials, and the capability of project team members.

D. Data Analysis

In doing a research, the goodness of measure is needed. The instruments used in the research do measure the variables they are supposed to measure (David & Consenza, 1988). The two main criteria for testing the goodness of measures are validity and reliability test. The research data are also not useful

if the measurement instrument used does not have the validity and reliability (Cooper & Emory, 1995).

1. Validity Test

Validity test is used to measure the particular concept it is supposed to measure. Validity concerns whether a researcher is measuring the right concept (Sekaran, 1992). The validity test in this study concerns the construct validity. Construct validity testifies how well the results obtained from the use of the measure fits the theories around which the test is designed (Sekaran, 1992; Emory, 1995). The validity test can be established through the use of the measure that has better validity and is also more frequently used.

In addition to construct validity, this study uses confirmatory factor analysis. There are some considerations why this study uses confirmatory factor analysis. First, confirmatory factor analysis enables the researcher to have a complete control over the specification of indicators for each construct (Hair, et.al). Second, the most common problem that may occur such as the indicator having two or more constructs can be minimized. In other words, confirmatory factor analysis is useful in the validation of scales for the measurement of specific constructs.

2. Reliability Test

Reliability concerns the accuracy in measurement. Reliability also includes stability and internal consistency in measurement (Sekaran, 1992). Reliability tests how consistently a measuring instrument measures whatever concept it is measuring. This study will test the internal consistency. Cronbach's Alpha coefficient (α) is commonly used to assess the internal consistency of the data. The minimum standard of Cronbach's Alpha coefficient (α) is .7.

3. Hypotheses Test

Multiple regression is used in this study. This method analyzes how much of the variance in the dependent variables is explained by a set of predictors. The equation model in this study is as follows:

a. Project Success with the Effectiveness Dimension

$$Y1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \in$$

Y1 = effectiveness
X1 = project mission
X2 = client consultation
X3 = client acceptance
$\in$ = an error term

b. Project Success with the Efficiency Dimension

$$Y1 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \in$$

Y1 = efficiency
X1 = top management support
X2 = project schedule
X3 = technical task
X4 = monitoring and feedback
X5 = communication
X6 = trouble shooting
$\in$ = an error term

CHAPTER IV

DATA ANALYSIS

A. The Data Collection Method

The data collection method took two ways; personally administered questionnaires and interview. This study used this questionnaire method because the survey was only confined to a local area. With this method, the research topic could be introduced to the respondents at once. Consequently, respondents could be willing to give the true answer based on the facts.

The questionnaires were given to them and the respondents were asked to fill the questionnaires on the spot. This study did not find any difficulty to meet the project managers. Furthermore, the respondents were willing and helpful to respond the questionnaires at the workplace. So, the completed responses could be collected within a short period of time. Any difficulties regarding the questions in the questionnaires could be clarified immediately.

The data collection method was also done with an interview. When the data were completely collected, the interview was conducted to obtain more relevant information concerning the project activity. The interview activity was getting more intense when the data seemed to be dissatisfying. This activity was done to know exactly what it was really going at the field. The interview

was structurally arranged. The questions were written out clearly because the researcher could focus on the important information. Frequently, the researcher could ask other relevant questions which were not on the schedule. This process could identify other relevant and important factors affecting the project success. When a sufficient number of interviews was conducted and the sufficient number of information was gathered, the researcher stopped the interview.

B. The Response Rate

1. Clients

The clients chosen in this study varied one another. Many of them were working as staff in the university while the rests were working at Irrigation Department, hospital, and bank. The clients were actively involved in a project. Their company usually chose them to handle a project. In other words, they were the reseprentatives of their company.

The number of distributed questionnaires was 60. The average number of clients who were actively involved in one project was 5. Meanwhile, the number of selected projects in this study was 13. The frequency rate for response was 50 (83.3%). This response rate was good because the questionnaires were collected immediately after they were completed.

2. Project Managers

The number of construction firms chosen as the project sample was 5. The construction firms were located in Semarang, Yogyakarta and Solo. Each construction firms at least conducted 2 projects with the nominal value more than 1 billion rupiah per year from the period of 1997/1998, 1998/1999 and 1999/2000. Each firm had more than 20 project managers.

The questionnaires were given to the project managers who headed a project. The number of distributed questionnaires was 70. The limited number of the big project with the nominal value at least 1 billion rupiah was crucial to determine the number of project managers to act as the respondents. From the year 1997 to 2000, the number of project in Daerah Istimewa Yogyakarta (DIY) was very limited. Based on the data released by GAPENSI, the number of executed projects with the nominal value at least 1 billion rupiah per year in DIY was more or less 4. The total number of project from 1997 to 2000 was more or less 16.

Furthermore, the number of selected projects was 13 while the number of construction firms who executed the projects was 5. Some construction firms could handle more than 1 project. Some of their project managers handled one project while the others handled another project. The project managers of Perwita Karya for example handled the hospital building at Panti

Rapih while the other project managers handled the Taman Budaya building. In other words, the project managers who acted as the respondents from the same company were different. The average number of project managers as the respondents for one project was 5.

The frequency rate for response was 57 (81.4%). This response rate was good because the questionnaires were collected immediately after they were completed. There were some other reasons of the high response rate. The project managers as the respondents had great willingness to share their information concerning project activities. They realized that by giving the accurate information concerning project activities they would obtain feedback for project performance improvement. At the same time, the construction firms where the project managers worked at were applying the certificate of ISO. By achieving the feedback of the research, they would improve the project activities for the better one.

C. The Validity Test

Validity tests how well an instrument that is developed measures the particular concept it is supposed to measure. In other words, validity concerns whether the research is measuring the right concept (Sekaran, 1992). The validity test in this study concerned the construct validity. Construct

validity testifies how well the results obtained from the use of the measure fits the theories around which the test is designed (Sekaran, 1992; Cooper & Emory, 1995).

The validity test can be established through the use of the measure that has better validity and is also more frequently used. Pinto and Slevin (1987 a) have developed the critical success factors as the measure of this study. The nine variables as the independent variables and the two variables as the dependent variables have been frequently used by other researchers in the project management field (Meredith & Mantel, 1995). In other words, the measure of this study was not developed by itself but used the acceptable measure that had been developed by previous researchers.

The confirmatory factor analysis was also conducted for each of the nine critical success factor and in every case only one factor emerged. The result suggested that the use of the measure fitted the theories around which the test was designed. The t value, which was shown with C.R. for all items within one variable, was more than 2. All items in each independent variables; project mission, top management, schedule, client consultation, technical task, client acceptation, monitoring and feedback, communication and trouble shooting were valid. All of items were retained in each variable. The confirmatory

factor analysis of dependent variables also showed the good results. All items had critical ratio more than 2.

Table 4.1: The Result of Confirmatory Factor Analysis with the Effectiveness Dimension

ITEMS	ESTIMATE	S.E	C.R
Pm1	1.000		
Pm2	1.101	0.131	8.383
Pm3	0.962	0.138	6.974
Pm4	0.906	0.117	7.764
Pm5	0.646	0.124	5.207
Clicon1	1.000		
Clicon2	1.233	0.210	5.866
Clicon3	1.283	0.238	5.380
Clicon4	1.294	0.231	5.590
Clicon5	1.333	0.229	5.819
Cliacc1	1.000		
Cliacc2	1.064	0.126	8.469
Cliacc3	0.944	0.135	6.997
Cliacc4	1.127	0.131	8.573
Cliacc5	0.906	0.133	6.825
Effect.1	1.439	0.263	5.474
Effect.2	1.000		
Effect.3	0.647	0.149	4.332
Effect.4	0.818	0.176	4.651
Effect 5	0.519	0.158	2.172
Effect 6	1.364	0.234	4.490
Effect 7	1.236	0.135	4.761
Effect 8	0.645	0.160	2.431
Effect 9	1.135	0.123	4.268

Table 4.2. The Result of Confirmatory Factor Analysis with the Efficiency Dimension

ITEMS	ESTIMATE	S.E	C.R
Tm1	1.000		
Tm2	1.006	0.134	7.504
Tm3	0.902	0.114	7.921

Tm4 Tm5	0.938 0.771	0.135 0.112	6.936 6.906
Sche1 Sche2 Sche3 Sche4 Sche5	1.000 0.849 1.023 0.970 0.682	0.158 0.152 0.140 0.163	5.379 6.710 6.941 4.199
Tech1 Tech2 Tech3 Tech4 Tech5	1.000 0.934 0.914 0.861 0.704	0.145 0.151 0.118 0.122	6.453 6.037 7.295 5.755
Monfee1 Monfee2 Monfee3 Monfee4 Monfee5	1.000 1.279 1.018 0.970 0.971	0.172 0.156 0.144 0.154	7.438 6.525 6.716 6.308
Communi1 Communi2 Communi3 Communi4 Communi5	1.000 0.881 1.221 1.168 1.041	0.128 0.130 0.140 0.122	6.904 9.369 8.343 8.506
Troub.shoot1 Troub.shoot2 Troub.shoot3 Troub.shoot4 Troub.shoot5	1.000 1.185 1.174 1.080 1.026	0.136 0.137 0.118 0.107	8.733 8.558 9.167 9.556
Effi 1 Effi 2	1.000 1.285	0.230	5.578

Note:

pm	= project mission
tm	= top management
sche	= schedule
clicon	= client consultation
tech	= technical task
cliacc	= client acceptation
monfee	= monitoring and feedback
communi	= communication
troub.shoot	= trouble shooting
effi	= efficiency
effect	= effectiveness

D. The Reliability Test

Reliability tests how consistently a measuring instrument measures whatever the concept it is measuring. In other words, reliability concerns the stability and consistency (Sekaran, 1992). The reliability test in this study concerned the internal consistency of measure. The internal consistency of measure was indicative of the homogeneity of the items in the measure that tap the construct (Sekaran, 1992). The internal consistency was tested through interitem consistency reliability.

The most popular test of interitem consistency reliability is the Cronbach's coefficient alpha. The result indicated that the Cronbach's alpha for most independent and dependent variables was over .8. In general, the internal consistency reliability of the measure used in this study could be considered to be good.

Table 4.3. The Internal Consistency Reliability with the Effectiveness Dimensions

NO	VARIABLE	THE CRONBACH'S ALPHA
1	Project Mission	.9010
2	Client Consultation	.8903
3	Client Acceptance	.9148
	Effectiveness	.7448

Table 4.4. The Internal Consistency Reliability With the Efficiency Dimensions

NO	VARIABLE	THE CRONBACH'S ALPHA
1	Top Management	.9107
2	Schedule	.8609
3	Technical Task	.8802
4	Monitoring and Feedback	.8925
5	Communication	.9187
6	Trouble Shooting	.9319
	Efficiency	.8160

E. The Data Analysis

1. The Multicollinearity Test

One difficulty with the multiple regression is that of multicollinearity-the situation where some of all the independent variables are highly correlated (Cooper & Emory, 1995). When this condition exists, the estimated regression coefficients can fluctuate widely from sample to sample, making it risky to use the coefficients as an indicator of the relative importance of predictor variables.

The multicollinearity can be detected by Pearson correlation (lower than .80), Variance Inflation Factor (approaching 1) and Tolerance value (approaching 1). Multicollinearity can be addressed through 1) choose one of

the variables and delete others and 2) create a new variable that is a composite of the highly inter correlated variables (Cooper & Emory, 1995).

As it can be seen in the following tables, all the independent variables for project success with the effectiveness and efficiency dimension were not collinear. The Pearson correlation showed that most of independent variables were less than .80, it meant that there was no multicollinearity problem.

Table 4.5. Pearson Correlation for the Effectiveness Dimensions

Correlations

		CLIACC	CLICON	PROMIS
Pearson Correlation	CLIACC	1,000	,633**	,584**
	CLICON	,633**	1,000	,487**
	PROMIS	,584**	,487**	1,000
Sig. (2-tailed)	CLIACC	.	,000	,000
	CLICON	,000	.	,000
	PROMIS	,000	,000	.
N	CLIACC	50	50	50
	CLICON	50	50	50
	PROMIS	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.6. Pearson Correlation for the Efficiency Dimensions

Correlations

		COMUNI	MONFEE	SCHEDULE	TECHTASK	TOPM	TROUBLE
Pearson Correlation	COMUNI	1,000	,594**	,490**	,496**	,772**	,635**
	MONFEE	,594**	1,000	,545**	,548**	,556**	,682**
	SCHEDULE	,490**	,545**	1,000	,427**	,590**	,413**
	TECHTASK	,496**	,548**	,427**	1,000	,451**	,673**
	TOPM	,772**	,556**	,590**	,451**	1,000	,540**
	TROUBLE	,635**	,682**	,413**	,673**	,540**	1,000
Sig. (2-tailed)	COMUNI	,	,000	,000	,000	,000	,000
	MONFEE	,000	,	,000	,000	,000	,000
	SCHEDULE	,000	,000	,	,001	,000	,001
	TECHTASK	,000	,000	,001	,	,000	,000
	TOPM	,000	,000	,000	,000	,	,000
	TROUBLE	,000	,000	,001	,000	,000	,
N	COMUNI	57	57	57	57	57	57
	MONFEE	57	57	57	57	57	57
	SCHEDULE	57	57	57	57	57	57
	TECHTASK	57	57	57	57	57	57
	TOPM	57	57	57	57	57	57
	TROUBLE	57	57	57	57	57	57

**. Correlation is significant at the 0.01 level (2-tailed).

2. Data Analysis

a. The Project Success with the Effectiveness Dimensions

The study tried to analysis the data with the multiple regression analysis. The purpose of the hypotheses **1, 2 and 3** was to determine if each of the critical success factors was significantly related to project success with the effectiveness dimension. The ability of each critical success factor in predicting the project success was shown in the following table.

Table 4.7. The Regression Result of the Ability of Each Critical Success Factor to Predict Project Success with the Effectiveness Dimension

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,427	,489		2,917	,005
	CLIACC	,319	,098	,386	3,235	,002
	CLICON	,258	,089	,322	2,906	,006
	PROMIS	,191	,079	,257	2,426	,019

a. Dependent Variable: EFFECTIV

As it can be seen from Table 4.7, ***the three critical success factors, which were used in the study, were significantly ($p < .1$) related to project success with the effectiveness dimensions.*** Both the beta value and t statistics represented the strength of the relationship, which existed between each critical success factor and project success. The client acceptance variable with beta value .386, *t* value 3.235 and sig.*t* value .002 was significantly related to project success with the effectiveness dimension. The client consultation variable with beta value .322, *t* value 2.906 and sig.*t* value .006 was significantly related to project success with the effectiveness dimension. The project mission variable with beta value .257, *t* value 2.426 and sig.*t* value .019 was ignificantly related to project success with the effectiveness dimension.

b. The Project Success with the Efficiency Dimensions

The study tried to analysis the data with the multiple regression analysis. The purpose of the hypotheses **4, 5, 6, 7, 8, and 9** was to determine if each of the critical success factors was significantly related to project success with the efficiency dimension. The ability of each critical success factor in predicting the project success was shown in the following table.

Table 4.8. The Regression Result of the Ability of Each Critical Success Factor to Predict Project Success with the Efficiency Dimension

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,313	,569		2,308	,025
	COMUNI	,298	,120	,373	2,489	,016
	MONITOR	,105	,113	,112	,927	,358
	SCHEDULE	,208	,086	,277	2,417	,019
	TECHNICA	,256	,107	,313	2,382	,021
	TOPM	-6,13E-02	,104	-,087	-,588	,559
	TROUBLE	-1,89E-02	,106	-,025	-,178	,860

a. Dependent Variable: EFICIENT

As it can be seen from Table 4.8, ***three of the critical success factors, which were used in the study, were significantly ($p < .1$) related to project success with the efficiency dimensions.*** They were communication, schedule

and technical task variables. Both the beta value and t statistics represented the strength of the relationship, which existed between each critical success factor and project success.

The communication variable with beta value .373, *t* value 2.489 and sig.*t* value .016 was significantly related to project success with the efficiency dimension. The schedule variable with beta value .277, *t* value 2.417 and sig.*t* value .019 was significantly related to project success with the efficiency dimension. The technical task variable with beta value .313, *t* value 2.382 and sig.*t* value .021 was significantly related to project success with the efficiency dimension.

Meanwhile the three other variables; monitoring & feedback, top management and trouble shooting ***which were used in the study, were insignificantly (p < .1) related to project success with the efficiency dimensions.*** The monitoring and feedback variable with beta value .112, t value .927 and sig. *t* value .358 was insignificantly related to project success with the efficiency dimension. The top management variable with beta value -.087, *t* value -.588 and sig. *t* value .559 was insignificantly related to project success with the efficiency dimension. The trouble shooting variable with beta value -.025, *t* value -.178 and sig. *t* value .860 was insignificantly related to project success with the efficiency dimension.

3. The Multiple Regression Analysis

a. The Effectiveness Dimensions

The multiple R (.820) in the table 4.9. was the correlation of the independent variable with the dependent variable. The R Square (.673) was actually the square of the multiple R (.820). What this meant was that 67.3 percent of the variance in project success with the effectiveness dimension was significantly explained by project mission, client consultation and client acceptance variable. In fact, 32.7 percent of the variance in project success with the effectiveness dimension was still not explained in this study.

Table 4.9. Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,820[a]	,673	,651	,1662

a. Predictors: (Constant), PROMIS, CLICON, CLIACC

b. The Efficiency Dimensions

The multiple R (.792) in the table 4.10 was the correlation of the independent variable with the dependent variable. The R Square (.627) was actually the square of the multiple R (.792). What this meant was that 62.7 percent of the variance in project success with the efficiency dimension was significantly explained by top management support, schedule, technical task,

communication, monitoring and feedback and trouble shooting. In fact, 37.3 percent of the variance in project success with the efficiency dimension was still not explained in this study.

Table 4.10. Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,792[a]	,627	,582	,1746

a. Predictors: (Constant), TROUBLE, SCHEDULE, TOPM, TECHTASK, MONFEE, COMUNI

4. The Explanation of Significant Variables for Project Success

a. Project Success with the Effectiveness Dimensions

(1) Project Mission Variable

Hypothesis 1: Project Mission will significantly be related to the project success with the effectiveness dimension was supported. . The result reinforced the previous research of Pinto and Covin (1989) and Pinto and Prescott (1988). The support for this hypothesis was not a surprising finding. Intuitively, project mission should have an important impact on project success.

In the construction projects, clients created project mission particularly early in the project life cycle because clients themselves possessed the project. It was undeniable that they knew some questions such as what was the

problem, would the development of a project solve the problem, what were the specific goals of the project and did they have the resources to support.

The project mission provided a long-term guidance for all project members especially project managers. This aimed at giving a concrete direction for project managers to do the project activity. In reality, any activity concerning the project was not allowed to deviate from the project mission extremely. Project managers were supposed to do the project on the right track in order to limit the client's complaints and dissatisfaction.

(2) Client Consultation Variable

Hypothesis 2: Client consultation will significantly be related to the project success with the effectiveness dimension was supported. The result reinforced the previous research. It was interesting to note that to maintain continual communication with the clients for whom the project was intended throughout the development of the project was very critical to client satisfaction. Clients were kept informed with the project progress. By so doing, clients were able to know what changes happened at the project field.

From the research result, it was found that client consultation involved some main activities such as communication, listening and feedback. Clients had an opportunity to communicate their ideas, while the project managers

listened to them. In the real project implementation, project managers had to inform the project progress. If any change, clients were informed. This research was in line with Pinto and Covin' research (1989) showing that client consultation consisted of three main aspects namely communication, listening and feedback.

(3) Client Acceptance Variable

Hypothesis 3: Client acceptance will significantly be related to the project success with the effectiveness dimension was supported. . The result reinforced the previous research of Pinto & Covin (1989). The research result showed that after the project managers listened to all clients' ideas and input, they had to comprehend and formulate the ideas. In this case, project managers did not only to do the project based on client's wants, but they had to accommodate with their own capabilities. Then the project managers had to present and to make adequate documentation of some changes to the clients. Most of the changes concerned the materials and resource allocation.

The presentation for the clients also aimed at giving adequate information for the clients. Moreover, the presentation asked for the agreement of the clients about the project development and confirmed whether the clients were satisfied with the project and would make use of the project. Throughout

this activity, project managers were able to catch the clients' need. Eventually, this activity was critical to client satisfaction.

b. Project Success with the Efficiency Dimensions

(1) The Communication Variable

The Hypothesis 8: Communication will significantly be related to the project success with the efficiency dimension was supported. The result reinforced the previous research. It was clear that communication was significant to the project success with the efficiency dimension. Effective team communication was the important predictor to a project success (Pinto & Slevin, 1994; Kelly, Thomas &Tucker, 1999). Most project managers spent at least half of their time talking to people-getting information, delegating, clarifying directives and resolving conflicts. Project managers had to maintain the communication among project members.

If related project success with the efficiency dimension, it would absolutely be clear. Project team members had to understand when the project had to be finished, how much money was needed and how it worked. A project manager had to give this information by communicating to project members frequently. Based on the interview, communication was frequently done in the form of a regular meeting every week. Project managers and clients carried out

this meeting. In this meeting, recent and fresh information of the project progress was shared to other project members, so all project members could gain important information relating the project. The information of the project progress could be the left time to accomplish the project, input from the clients, the way to accomplish the project, difficulties of running the project including the scarce materials, inability to negotiate with suppliers and the high production cost.

Communication could make all project members understand what was going on at the project field. Every individual knew what it had to be done. If the problems existed, they would find out the solution. They did not want to delay because it could create more serious problems. Therefore communication enabled project members to run the project based on the scheduled time and the estimated budget.

(2) The Schedule Variable

Hypothesis 5: Project Schedule will significantly be related to project success with the efficiency dimension was supported. This hypothesis supported the previous research conducted by Pinto and Covin (1989) and Pinto and Prescott (1988). Project could easily be implemented if project managers had well-laid-out and detailed specification of the individual

action steps. Moreover, the research of Duncan (1996) showed that a project schedule provided a statement of the goal and direction of the project as well as further information concerning the project environment and guide for project execution.

It was not surprising, schedules were used as a check against project development. The schedule could give information such as time schedule, manpower and resource requirement. Moreover, in construction projects, scheduling project was a key to success. Scheduling in construction projects including ordering materials and sequencing sub-contractor interventions could have a major impact on the successful execution of construction projects.

(3) The Technical Task Variable

Hypothesis 6: Technical task will significantly be related to the project success with the efficiency dimension was supported. The result reinforced the previous research. It was clear that technical task was significant to the project success with the efficiency dimension. Technical task referred to the necessity of not only having the necessary personnel for the project implementation, but also ensuring that they possessed the necessary technical skills and had adequate technology to perform their tasks (Pinto & Covin, 1989; Pinto & Slevin, 1987 a & b, 1994). A project could not achieve the

desired goal, if skilled people did not foster it. Skilled people meant they understood what they exactly to do, how to manage a project, and how to apply the technology in the project implementation.

Besides, the success of modern project could not be separated from the role of technology. In addition, the appropriate technology was the means to succeed project execution (Pinto & Covin, 1989). The technology included hard machine and modern equipment. The selected project in this study was classified as the big projects with the nominal value more than 1 billion rupiah. The project implementation needed highly technological tools to accomplish the project. If they were not available, it would be difficult for project members to run the project. The modern technology could make the project easily be accomplished. Moreover, the result of the project with the modern technology would be much better. This factor was needed because the project members tried not to dissatisfy the clients. Clients had already trusted the project developers. It they did the project in a bad way, clients would get upset.

If related to the project life cycle, technical tasks played a crucial role in the termination stage. The research of Pinto and Prescott and Pinto (1988) and Slevin (1988 a) showed that technical task was important in this stage. The activity in this stage included the form of project review and evaluation to assess relative successes and failures, their likely causes and possible

corrective actions in case they occur again. This factor may assist project members to verify and provide corrective action. This was relevant to the findings from the interview. In the finishing section, the technical task was really needed to improve the necessary things. Frequently, clients' inputs came later. They needed some improvements or additional building of a project.

5. The Explanation of the Insignificant Variables

Three of critical success factors, as the independent variables for project success with the efficiency dimensions were insignificant of project success. They were top management, monitoring and feedback and trouble shooting variables.

a. The Top Management Support Variable

Based on the research Pinto and Covin in 1989, the role of top management was crucial for project success. However, an important caveat of this study bore mention at this point. As it was found in the research, the role of top management varied one another. The characteristics of construction projects were different from other kinds of project.

Pinto and Prescott (1988) wrote that the characteristics of construction project were predictable than other projects such as research and development

projects. The role of top management to support the availability of resource support was done before the project was executed. In the real project activity, top management support was less important. From the interview, it was also found that the role of top management support was further needed before the project was executed. The support concerned the allocation of resources such as main materials and machines.

This finding was in line with the research of Ashley, David and Lurie (1987) concerning the determinants of construction project success. The research showed that the determinants of real project construction activity focused on schedule, technology, client consultation and communication. The role of top management support was still needed but it was far less important in the real project activity.

b. The Monitoring and Feedback and Trouble Shooting Variables

According to the research of Light (1998), the monitoring and feedback and trouble shooting was the part of the communication aspects. In the communication, there were some main activities such as giving information of the activity progress, supplying feedback for groups and finding a solution of a problem. In other words, the communication variable as the predictor of

project success with the efficiency dimension had entailed some activities such as monitoring and giving feedback and shooting some problems.

CHAPTER V

CONCLUSION

A. The Conclusion

The purpose of this article is to investigate the determinants of the project success. The results support some of the theoretical and empirical works that have been done to date on the role these factors play in project success. The importance of several of these critical success factors should not intuitively be surprising to both clients and project managers.

The research result showed that some independent variables of critical success factor could become the determinants for project success with effectiveness and efficiency dimensions. Project mission, client consultation and client acceptance variables were significantly related to the project success with the effectiveness dimensions. Meanwhile, schedule, technical task and communication variables were significantly related to project success with the efficiency dimensions. It was proven that top management, monitoring and feedback and trouble shooting variables were insignificantly related to the project success with the efficiency dimensions.

The critical success factors were shown to have a powerful impact on project in some cases of the causes of successful project implementation.

These factors concerned the behavioral aspects that had to be paid attention by project doers. Especially for the construction projects, the members of this project were actively involved. The result showed that they handled some critical success factor for project success with different dimensions. For clients; project mission, client consultation and client acceptance were more relevant for them while for project managers; schedule, technical task and communication variables were more relevant for them.

In the situation where all participants were actively involved in a project activity, they would know precisely what was going on at the field. They could understand the solutions for the problems if the problem existed. The condition created the satisfaction of all participants. As Pinto and Covin (1989) argued that the level of the involvement could cause the level of participants' satisfaction.

In summary, most of the critical success factors were the determinants of project success. Project success in this study was not explained in the narrow aspect namely on budget and on time. However, it was explained beyond those aspects. Client satisfaction had to be included in the measurement of the project success. In fact, client themselves would be the users of the project. They had to be actively involved in the project implementation. In a competitive condition of the construction industry, all

participants must understand how to make the clients satisfied. All construction firms have to be able to build the relationship marketing by giving continuous attention to clients. If the construction firms could build a relationship marketing, a project would build satisfaction for clients. Clients will not choose other providers to satisfy them.

B. The Limitation of the Study

1. The Generalizability of the Results

The results only held a particular project of certain subclassess of projects. The projects were done by the construction firms that possessed Qualification B (big qualification). This study's result might not be applied for other projects, which were not the part of this study.

2. The Subjective Performance Scale

The focus of this study was designed with the emphasis on how the project managers and clients felt the project success. There would be the possibility of bias in their responses. However, the distribution of scores for the success measure was adequately wide to alleviate this concern.

3. The Common Method

The questionnaires consisted of some variables, which acted as the independent and dependent variables. The same person filled all questionnaire

items for the independent and dependent variables. This could create a bias, which tended to inflate the answer.

C. Recommendation for the Further Research

The analysis of R Square of model summary in table 4.10 indicated that 37.3 percent of the variance in project success with the efficiency dimension was still not explained in this study. In other words, there were other variables that were as important as the critical success factors in explaining project success with the efficiency dimension that were not considered in this study.

Based on the interview, it was found that there were some important variables that could explain the project managers. It was also supported by some researches relating to the variables. Many project managers of construction firms in Central Java (Semarang, Yogyakarta and Solo) argued that the role of project managers and the environmental condition were important for determining of project success. These two factors could explain the other variances in project success with the efficiency dimension. Furthermore, these factors can be recommended for the next research.

1. The Role of Project Managers

Many project managers of construction firms in Central Java (Semarang, Yogyakarta and Solo) argue that the role of project managers is very crucial in determining project success. There are some underlying reasons as follows:

a. *The responsibility of the project implementation lies in the project managers' hand.*

Due to all the responsibility of project success in the project managers' hand, they should possess the multi competency. The multi competency are not only the technical and administrative but also the ability how to handle client, solve problems, communicate, monitor, perform the technical task, be alert in environmental condition and has a good leadership. Without it, a project will fail to meet the success. The multi competency of project managers is needed because project managers are continually bombarded with a wide variety of input and information from project team members, the parent organization and clients and focus the importance of the project for intended users, top management and the rest of the impacted organization.

Crawford (2000) also supports the demand for the multi competency for the project implementation. She conducted a research based on literature concerning the criteria by which project success was judged, the factors

contributing to the success of projects and the knowledge, skills and personal attributes of project managers that were expected to lead to achievement of successful project outcomes.

b. *The intense of the project activity.*

The condition is shown by a highly competitive condition of construction industry such as the number of construction firms soar, the demand for highly qualified project is high and the cost of construction materials are increased. Exactly, this condition often occurs in Central Java. Inevitably, project managers have to be able to lobbying or using personal friendship to persuade.

The project managers here are required able to build alliance building, bargaining, using personal friendship and lobbying. Furthermore, project managers are required to have interpersonal skill and charisma to negotiate with others. This condition could support the project success in Central Java. Kjolhede (2000) also supports the requirements for project managers for being able to build alliance, bargaining, using personal friendship and lobbying. Project managers are inseparable from doing such these things. Moreover, Kjolhede argues that these abilities would be important for the intense condition of project management field.

2. The Environmental Conditions

As a matter of fact, Pinto and Slevin (1989 b) do not only propose the critical success factors concerning the behavioral items. They also propose other critical success factors that may be thought of as important variables, which are often beyond the control of the project team, yet, which could have a powerful impact on either the success or the failure of the intended projects. These exogenous factors can be defined as:

(a) Power and Politics. The degree of political activity within the organization and among organizations that the project further an organization member's self interest is in.

(b) Environmental events. The likelihood of external organizational or environmental factors affecting the operations of the project team, either positively or negatively.

These two conditions could influence the project success. Based on the interview, it is found that these two conditions could explain the condition of the project implementation in Central Java. Power and politics play a crucial role in determining project success. Among construction firms have a high competition. Many project doers have to compete against other firms to gain a project. As a matter of fact, money politics still plays in this case. Construction firms have to expend their money to pay some government institution

including Public Work Institution and banks or other construction agents to obtain the permission to do the projects. It is clearly understood why project managers have to possess multidimensional competency namely negotiation, risk taking and maintaining personal contact with important agents. By so doing, it would smooth over the complexities.

The second exogenous factor is environmental events. These factors could be economic and politic aspects. The economic condition is easily understood. This could affect the continuance of project activity. The economic condition could be described as follows: the interest rate and the currency. The economics crisis has occurred since the mid-1997. It has not ended yet. Many developers find some difficulties to obtain the loan from the banks because of the high interest rate. Even worse, the cost of construction materials soars. It is difficult project managers to determine the total project cost.

In summary, these variables can be used for the next research concerning construction project activities. Some articles concerning them are easily available.

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Appendices

NAMA PROYEK DALAM PENELITIAN			
No	**Nama Proyek**	**Perusahaan Konstruksi**	**Users**
1	Balai Kulit (1998)	Taman Indah	Badan Penelitian dan Pengembangan Deperindag, Yogyakarta
2	Gedung Laboratorium Farmasi UGM (1997)	Bi-Az	Fakultas Farmasi UGM
3	Water Treatment di Gedung Teknik Sipil (1997/1998)	Wijaya Karya	Fakultas Teknik Sipil UGM
4	Water Supply Capacity di Universitas Atmajaya (1997/1998)	Wijaya Karya	Fakultas Teknik Universitas Atmajaya Yogyakarta
5	Rehabilitasi dan Peningkatan Jaringan Irigasi Daerah Pijenan Kabupaten Bantul, DIY (1997-1998)	Perwita Karya	Department Pengairan/Irigasi Daerah Istimewa Yogyakarta
6	Pekerjaan Pembangunan Dam Penahan Sedimen Paket M-5 (Fasilitas Bangunan Pengendali Banjir Lahar di Kali Code dan Kali Krasak, 1999-2000)	Perwita Karya	Department Pengairan/Irigasi Daerah Istimewa Yogyakarta
7	Perbaikan Geometrik Runway di Bandar Udara Adisucipto-Yogyakarta (1997)	Perwita Karya	PT Angkasa Pura I Yogyakarta
8	Lanjutan Perbaikan Geometrik Runway di Bandar Udara Adisucipto-Yogyakarta (1997/1998)	Perwita Karya	PT Angkasa Pura I Yogyakarta
9	Pembangunan Gedung Kuliah dan Lab. Fakultas Teknologi Industri Universitas Atmajaya Yogykarta (1997-1998)	Perwita Karya	Yayasan Slamet Riyadi, Universitas Atmajaya
10	Pembangunan dan Pengembangan RS Panti Rapih (Pembangunan Gedung Rawat Inap 4 Lantai Tahap I 1998)	Perwita Karya	Rumah Sakit Panti Rapih Yogyakarta
11	Pembangunan Gedung Kuliah Unit 3 & 4 Universitas Sanata Dharma (1997/1998)	Perwita Karya	Universitas Sanata Dharma
12	Proyek Operasi dan Perawatan Fasilitas Kebudayaan Pekerjaan Pembangunan Restorasi Auditorium Taman Budaya Tahap I (1998-1999)	Perwita Karya	Department Pendidikan & Kebudayaan DIY
13	Gedung BNI 46 Bulaksumur (1999-2000)	PT Rudi, Solo	BNI 46

Kuesioner Untuk Klien

Saudara diminta memberi tanda silang sesuai dengan pandangan saudara mengenai faktor-faktor penting penentu kesuksesan proyek yang sudah anda tangani.

Kategori jawaban adalah sebagai berikut:

Sangat tidak setuju = sts
Tidak setuju = ts
Agak tidak setuju = ats
Netral = n
Agak setuju = as
Setuju = s
Sangat setuju = ss

	KEEFEKTIFAN							
1	Proyek ini akan digunakan oleh klien yang terkait.							
2	Proyek ini akan secara langsung memberi manfaat kepada pemakai terkait.							
3	Proyek ini adalah pemecahan masalah terbaik untuk mengatasi permasalahan yang muncul dibandingkan dengan alternatif lain.							
4	Klien-klien penting yang secara langsung terkait dengan proyek ini akan memperoleh manfaat.							
5	Proyek yang dikembangkan ini telah berjalan dengan baik.							
6	Kami percaya bahwa masalah nonteknis di awal proyek akan sedikit sebab proyek tersebut akan cepat diterima oleh klien.							
7	Penggunaan proyek ini akan secara langsung membuat keputusan yang lebih efektif bagi para klien.							
8	Proyek ini akan berpengaruh positif kepada mereka yang memanfaatkannya.							
9	Hasil proyek ini menunjukkan perkembangan kinerja yang lebih baik daripada proyek-proyek lainnya.							

No	**Misi Proyek**	Sts	ts	ats	n	A s	s	ss
1	Tujuan proyek sejalan dengan tujuan umum organisasi.							
2	Tujuan proyek disusun secara jelas bagi tim proyek.							
3	Hasil proyek akan memberikan manfaat bagi organisasi induk.							
4	Saya sangat antusias akan peluang kesuksesan proyek ini.							
5	Saya sadar dan dapat mengidentifikasi manfaat yang diperoleh bagi organisasi atas suksesnya proyek ini.							

No	**Konsultasi klien**	sts	ts	ats	n	a s	s	ss
1	Para klien diberi kesempatan untuk memberikan input pada tahap awal pengembangan proyek.							
2	Para klien selalu diberi informasi tentang perkembangan proyek.							
3	Manfaat proyek tersebut telah dibicarakan dengan klien.							
4	Keterbatasan proyek (apa yang tidak dirancang dalam proyek tersebut) dibicarakan dengan klien.							
5	Para klien diberitahu dipakai tidaknya masukan yang mereka berikan dalam rencana proyek.							

No	**Penerimaan Klien**	sts	ts	ats	n	a s	s	ss
1	Ada dokumentasi proyek yang lengkap agar memudahkan penggunaan oleh para klien.							
2	Para klien telah dihubungi mengenai manfaat proyek tersebut.							
3	Persentasi yang memadai mengenai proyek telah dilakukan untuk para klien.							
4	Para klien mengetahui kepada siapa mereka menghubungi jika ada masalah.							
5	Persiapan yang cukup baik telah dilakukan untuk menawarkan proyek kepada klien.							

Kuesioner Untuk Manajer Proyek

Saudara diminta memberi tanda silang sesuai dengan pandangan saudara mengenai faktor-faktor penting penentu kesuksesan proyek yang sudah anda tangani.

Kategori jawaban adalah sebagai berikut:

Sangat tidak setuju = sts
Tidak setuju = ts
Agak tidak setuju = ats
Netral = n
Agak setuju = as
Setuju = s
Sangat setuju = ss

No	**Sukses Proyek**	Sts	ts	ats	n	as	s	ss
	EFISIENSI							
1	Proyek ini telah terlaksana tepat waktu.							
2	Proyek ini sesuai dengan anggaran.							

No	**Dukungan Manajemen Atas (top management)**	sts	ts	ats	n	a s	s	ss
1	Manajemen atas merespon dengan baik terhadap permintaan kami untuk penambahan sumber daya jika kebutuhan meningkat.							
2	Manajemen atas ikut bertanggung jawab bersama tim proyek untuk meyakinkan kesuksesan proyek.							
3	Saya sependapat dengan manajemen atas tentang tingkat kewenangan dan tanggung jawab saya atas proyek tersebut.							
4	Manajemen atas akan membantu saya jika menghadapi krisis							
5	Manajemen atas menghormati kewenangan kami dan akan mendukung keputusan kami berkaitan dengan proyek.							

No	**Jadual Proyek**	sts	ts	ats	n	a s	s
1	Kami mengetahui aktivitas mana yang mengandung waktu dan sumber daya berlebihan yang dapat dimanfaatkan untuk aktivitas lainnya selama dalam keadaan darurat.						
2	Ada rencana terperinci (meliputi jadual, waktu, material, kebutuhan tenaga kerja) untuk penyelesaian proyek.						
3	Ada anggaran rinci untuk proyek tersebut.						
4	Ada kebutuhan akan personil (siapa, kapan) dikhususkan untuk rencana proyek.						
5	Terdapat rencana cadangan jika proyek keluar dari rencana atau anggaran.						

No	**Tugas teknis**	sts	ts	ats	n	a s	s	ss
1	Tugas-tugas teknis yang khusus diatur dengan baik.							
2	Tenaga ahli proyek dan tenaga teknis memiliki kemampuan di bidangnya.							
3	Teknologi yang digunakan untuk mendukung proyek ini bekerja dengan baik.							
4	Teknologi yang tepat (perlengkapan, program, pelatihan) telah diseleksi untuk mendukung keberhasilan proyek.							
5	Orang-orang yang melaksanakan proyek memahami penggunaan teknologi.							

No	**Monitor dan Umpan Balik**	sts	ts	ats	n	a s	s	ss
1	Semua aspek penting proyek tersebut diawasi termasuk meliputi ukuran-ukuran yang akan memberikan gambaran lengkap kemajuan proyek (sesuai anggaran, jadual, tenaga kerja).							
2	Pertemuan rutin untuk memonitor kemajuan proyek dan memberikan umpan balik kepada tim proyek.							

3	Kemajuan nyata secara reguler dibandingkan dengan jadual proyek.							
4	Hasil review proyek secara reguler disebarkan kepada semua personil tim proyek yang akan berpengaruh pada anggaran dan jadual.							
5	Jika anggaran atau jadual membutuhkan perbaikan, masukan dikumpulkan dari tim proyek.							

No	**Komunikasi**	sts	ts	ats	n	a s	s	ss
1	Semua hasil pertemuan perencanaan berupa keputusan dan informasi lain disebarluaskan dan dipublikasikan ke anggota tim proyek.							
2	Individu/kelompok yang memberikan input telah menerima informasi tentang diterima/ditolak input tersebut.							
3	Ketika anggaran atau jadual diperbaiki, perubahan dan alasan untuk perubahan dikomunikasikan kepada seluruh anggota tim proyek.							
4	Alasan perubahan pada kebijakan/prosedur yang ada telah dijelaskan kepada anggota tim proyek, pihak lain yang menerima akibat perubahan dan manajemen tertinggi.							
5	Semua kelompok yang dipengaruhi oleh proyek mengetahui masalah dalam tim proyek.							

No	**Penyelesaian Masalah**	sts	ts	ats	n	a s	s	ss
1	Pimpinan tim proyek tidak ragu-ragu untuk meminta bantuan para personil yang bukan anggota proyek.							
2	Penyebaran ide dilakukan untuk menentukan masalah yang paling sangat mungkin terjadi.							
3	Jika proyek mengalami masalah, anggota tim proyek mengetahui secara tepat ke mana mencari bantuan.							
4	Saya percaya bahwa masalah yang timbul dapat sepenuhnya diatasi.							
5	Tindakan yang tepat dilakukan jika masalah timbul.							