

FINANCIAL AND ORGANIZATIONAL IMPACTS OF PROJECT MANAGEMENT

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Abstract

Many organizations are projectizing their operations these days, particularly non-construction enterprises. There is, of course, a range of levels of Project Management (PM) sophistication and tools that can be adapted by such enterprises.

This study, sponsored by the Project Management Institute (PMI), examines current PM levels and practices in various companies and industries, and proposes a five level model of PM sophistication. This paper summarizes proposed PM process maturity analysis methodology which can be used to evaluate financial and organizational impacts of PM to organizations. Also, a benchmarking system is developed and presented to quantitatively measure an organization's level of PM sophistication.

This research is currently in progress. This benchmarking methodology and the resulting quantitative data will aid managers in making wiser PM investment decisions. Future research will continue to report quantitative results and findings by applying this research methodology.

Keywords: Benchmarking, Project Management, Project Management Body of Knowledge, Project Life Cycle, Project Management Process Maturity Model

Résumé

Actuellement, de nombreuses organisations planifient leurs projets, particulièrement les entreprises hors du génie civil. Il existe différents niveaux de sophistication et une grande gamme d'outils pour la gestion de projets, ceux-ci peuvent facilement être adaptés à ces entreprises.

Cette étude, sponsorisée par le "Project Management Institute (PMI)", examine les pratiques courantes et les niveaux de raffinement de différentes compagnies et

industries en matière de gestion de projets. Elle propose ensuite un modèle à cinq niveaux pour leur classification, selon leur degré de sophistication. Dans ce travail, nous proposons une méthode pour analyser le degré de maturité de la gestion de projets. Elle nous permet de quantifier l'impact financier et organisationnel de la gestion de projets sur la compagnie. Un "Benchmarking System" est développé et proposé afin de quantitativement mesurer le niveau d'une organisation du point de vue de sa gestion de projets.

Cette méthodologie de "Benchmarking" est actuellement en cours d'élaboration, elle permettra avec ses résultats quantitatifs les managers de mieux déterminer les investissements en matière de gestion de projets. Nous poursuivons actuellement nos recherches afin d'étoffer nos résultats quantitatifs et découvrir les paramètres affectant la gestion de projets.

1. Introduction

Corporate organizations are facing enormous competitive pressures these days. New markets are hard to penetrate, technology is rapidly evolving, organizations are segmented and experts are decentralized. Many companies are forming strategic alliances to share their knowledge and resources to produce and provide high quality product or services. In today's time-based business environment, the project-driven organizational form appears to be attractive.

Project Management (PM) techniques and skills have been growing and widely being accepted throughout the industries for the last forty years [1]. PM is the application of knowledge, skills, tools, and techniques in order to meet or exceed stakeholder requirement from a project [2]. From the construction and aerospace industries to software development and pharmaceutical projects, PM has been adapted to improve organizational effectiveness. PM techniques allow organizations to perform work faster with fewer resources and to effectively implement any changes during project life cycle [2].

Each industry and even companies within same industry have different levels of PM sophistication. Some of the reasons are: the adaptation timing of PM, market situation, and top management's commitment. It is not clear though "how much" PM should be injected into a company. However, project managers agree on the benefits of applying PM tools and techniques. Some of the benefits include fulfilling customer satisfaction, meeting quality standards and improving organizational effectiveness.

Generally, implementation of PM practices and processes in organizations is hard to justify economically. Rationalizing the benefits of PM processes and the cost of executing PM is hard to do in precise terms. PM expenditures in terms of direct cost, training, and equipment are hard to determine. Previous research in PM identified some of the qualitative benefits of PM. However, that research is very general and not helpful to managers trying to answer the hard and challenging questions that senior managers raise regarding PM expenditures and investments.

This paper briefly describes a PM process maturity analysis methodology that would be used to determine the financial and organizational impacts to organizations that result from the implementation of PM practices, processes and tools. By determining quantitative benefits and relationships, this study will enable managers to promote PM applications. Also, this study will provide organizations an opportunity to use PM in a more cost effective manner.

2. Background

“We just need to get the work done. We don’t have time for implementing processes and systems to manage projects. We have been managing our work successfully for years.”

- Anonymous Business Executive

Often times corporate executives request what benefits PM will provide them. They demand a better understanding of the relationships between PM maturity and the value of the company in the business environment. Managers who try to promote PM have to convince executives that implementing PM is a worthwhile investment. However, management usually has trouble providing benefits and paybacks from PM investment with our current knowledge.

PM practices are unique or nearly unique compare to other management disciplines. It provides the tools to plan, control, monitor, track and manage resources, schedules, costs, and quality. PM enables project to be on the right track within limited time and budget. PM is probably the most suitable management techniques that integrates planning and controlling for schedule intensive and one-of-a kind endeavors. In today’s high-risk, rapidly changing business environment, effective use of PM practices is thought to help improve an organization’s competitiveness.

Contemporary strategic planning tools help corporate organizations to be in a better position in today’s uncertain circumstances. Total Quality Management (TQM), Business Process Reengineering (BPR), and Continuous Process Improvement (CPI) are some of the few strategic planning applications [3]. PM tools and skills assist the implementation of these strategic planning tools in corporate organization. Eventually, PM will embrace greater acceptance and interest at the senior organizational level with corporate awareness and understanding [4][5]. This will help PM move from a technical activity to a strategic management practice. Figure 1 illustrates the relationships of PM with other management practices.

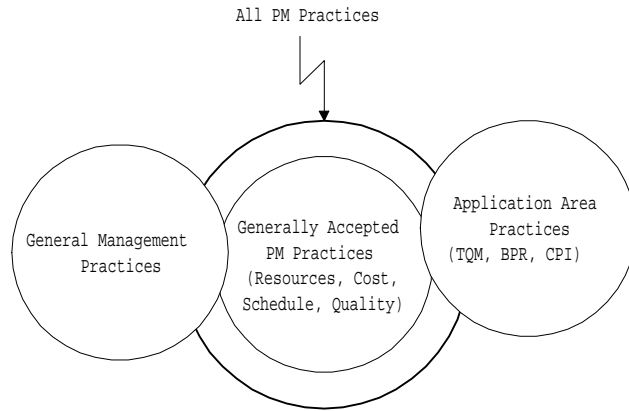


Figure 1. Relationships of PM with Other Management Practices [Adapted from PMBOK [2]]

The PM process is an integrative series of activities. It consists of and integrates five basic management processes within a project life cycle: initiating, planning, executing, controlling, and closing [2]. The project life cycle concept is important because it underscores the influence that early project planning has impact on overall project success. Project success is determined by how well the project is defined and planned. In turn the sufficiency and effectiveness of project planning is strongly affected by an organization's PM preparedness.

The Software Engineering Institute (SEI) is advocating PM practices for software development companies. SEI has developed the Capability Maturity Model (CMM) for software development that describes the key elements of an effective software process [6]. The CMM can be used for software process improvement, process assessments, and software capability evaluations. It is composed of five maturity levels [Figure 2]. It is being used to evaluate an organization's capability to perform successfully on software engineering contracts.

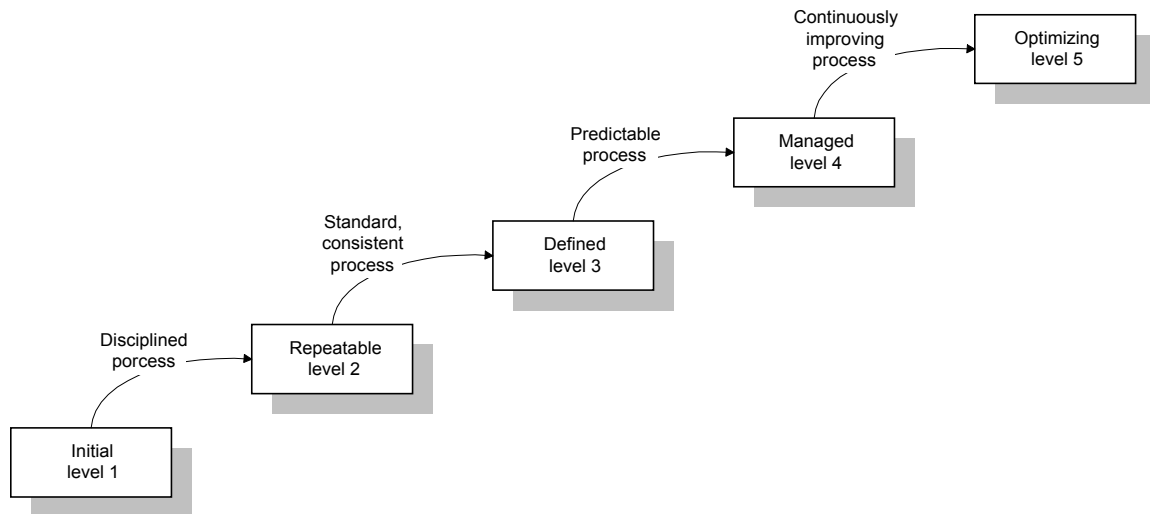


Figure 2. Five Levels of Software Capability Maturity Model [Adopted from [6]]

We believe the PM process and the software development process are closely related. This study modifies the CMM to systematically evaluate corporate organization's PM sophistication.. Our model blends the concept of PM life cycle and software development processes as shown in Figure 3. This research will provide an improved yardstick for determining and assessing an organization's current level of PM processes and systems throughout any project life cycle.

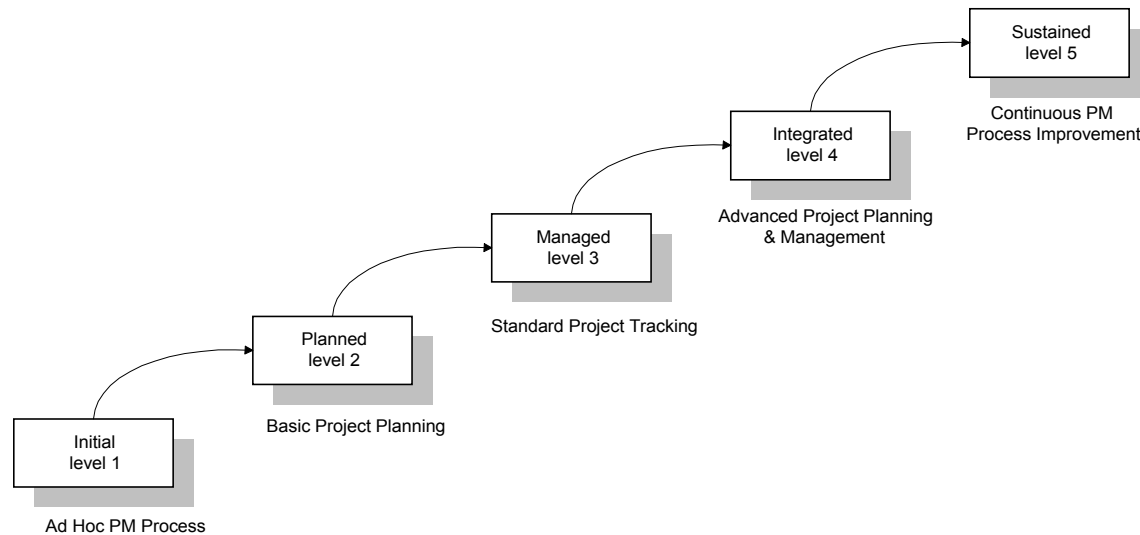


Figure 3. Project Management Process Maturity Model

3. Previous Related Research

“Managers in the U.S. smiled knowingly in the 1950’s when Japanese engineers made the rounds at trade shows, endlessly snapping photos. In the early 70’s, the smile faded as those photos led to world-class products. Now, the U.S. is embracing an effective response: Benchmarking.”

- Business Week, Nov. 30, 1992

3.1 Benchmarking

Benchmarking is a continuing discovery process that opens the organization to new and sometimes radical ideas that can play a pivotal role in improving effectiveness. It is a method to increase the competitiveness of a firm through getting information about the best practices and comparing top performing companies. It has have been widely applied to evaluate current practices and performance of industries such as construction, manufacturing, automobile, and hi-tech manufacturing.

MIT’s five-year, five-million-dollar study that compared and analyzed world-class automobile manufacturers introduced benchmarking to the public [7]. An on-going study of the semiconductor industry also uses benchmarking to find where other companies are standing and give incentives to companies who participate [8]. Both studies tested various performance factors in terms of regions and companies and correlate their research by gathering actual project performance data.

A study of Lotus Notes determined the impact on organizational productivity and financial impact of using a category of software called groupware. Groupware is designed to enhance productivity by allowing users to share information, and customize the view of information to suit individuals needs. This study calculated and quantified the return on investment (ROI) that resulted from implementing groupware in different organizations [9][10].

3.2 Project Management

Previous research on PM benefits and costs is limited to identifying the “soft” benefits of applying PM practices and tools. Most studies were based on surveys of corporate managers and failed to exploit quantitative project performance data or a methodology for developing such data [11][12][13][14][15][16][17]. Other studies deal with determining the relationships between organizational productivity and organizational structures by comparing functional and matrix organizational structures [18][19][20][21][22][23].

3.3 Software Development

PM and the software development process share a common domain. Humphrey [24] described SEI’s capability maturity model and its impact on Hughes Corporation’s software engineering division. He analyzed actual project data to show performance improvement in the division and correlated that with levels of CMM maturity.

4. Research Methodology

4.1 Literature Review of Related Research

Table 1 compares some of the previous related research and each study’s research methodology. The purpose of this table is to determine and choose the research methodology that is most suitable for our research. It is also useful for determining the areas lacking solid understanding.

4.2 Scope of work/Industry

As part of our research we are investigating a number of companies in various industries including High-Tech Manufacturing; Information Movement and Management; Engineering and Construction; and Utilities. We are seeking companies with any level of PM maturity and sophistication.

4.3 Variables

This research intends to identify and benchmark the key variables needed to understand where participating companies stand in the use of PM practices. This will be accomplished by asking detailed questions that incorporates PMBOK criteria and project life cycle phases [Figure 4]. This breakdown structure will assess an organization’s PM sophistication level in moderate detail.

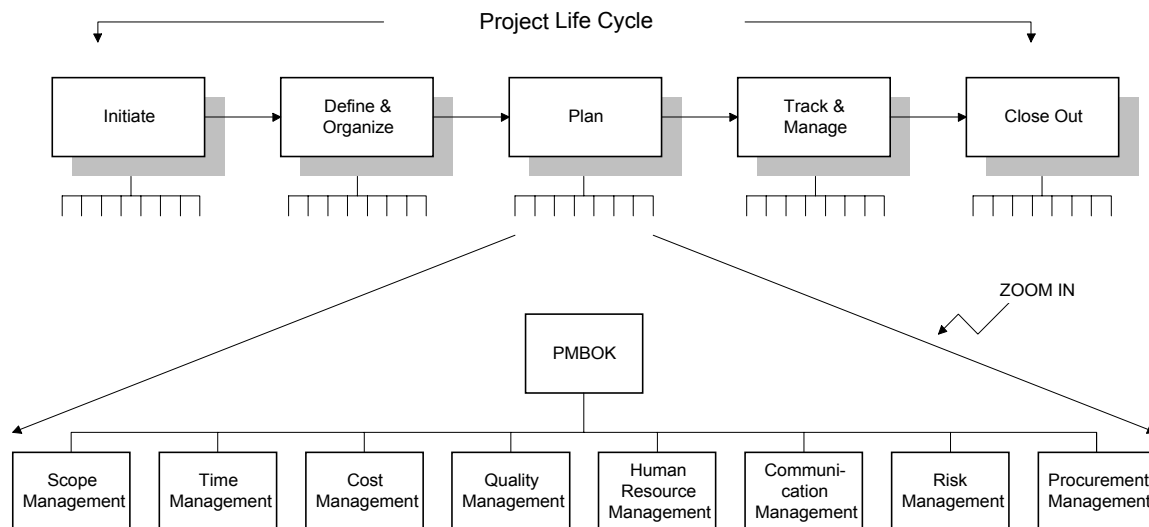


Figure 4. Blending PMBOK with Project Life Cycle Process

It also examines traditional project performances such as cost, schedule, quality, and customer satisfaction. These data are collected from representative, recently completed projects. One of the more challenging data that we would like to collect is determining annual rate of return on PM investment in the organizations. This will be hard to determine precisely, however this research attempts to estimate these numbers on an order of magnitude basis.

4.4 Research Steps

This research is a 2-step study.

- **Step 1. Evaluate organization's PM maturity using 2 part questionnaire**
The objective of the 2 part questionnaire is to effectively collect information about the organization's current PM maturity level and statistically correlate it with actual performance data. This questionnaire is developed and modified to capture the essence of PM practices in the organization [6][32].

⇒ Part 1: Organizational maturity assessment

It is used to precisely evaluate an organization's level of PM sophistication. PM levels are defined on a 1 to 5 **Likert Scale**.

1. Organizational information:
Organization's size, product focus, project management practices return on investment and quality management.
2. Initiate the Project:
Developing potential project proposal, analyzing feasibility.
3. Define and Organize the Project:

Defining the project, organizing project team.

4. Plan the Project:

Defining the scope, establishing schedule, estimating resources and costs, and risk management.

5. Track and Manage the Project:

Collecting and analyzing status, planning and taking adaptive actions and reporting status to organization.

6. Close Out The Project:

Effectively bringing a project to a close.

7. Project-driven Organization Environment:

Budgeting for project management and process support, compensation, and career advancement.

⇒ *Part 2: Project Performance Assessment*

The purpose of part 2 is to collect actual quantitative project performance information such as cost, schedule, change, quality, and customer satisfaction. Data that organization provides for this research should be chosen from at least one specific, recently completed project. Also, the chosen project should represent organization's current PM practices.

This information will be statistically analyzed and correlated to the responses of the two part questionnaire. This two part questionnaire has been pilot tested by participating organizations and the PM process maturity analysis methodology is proven to be working.

• *Step 2. In-depth interview with selected organization for developing mini-case studies*

We will develop mini-case studies that contain some particularly unique practices and business aspects of project management from a follow-up in-depth interview.

4.5 Research Assumptions

- * All of the participating organizations are treated equally.
- * All questions have the same weight for assessing organizational maturity.
- * Quantitative data from at least one specific, recently completed project represent company's current PM practices.

	INDUSTRY	VARIABLES/FACTORS	METHODOLOGY	CONTRIBUTION	SAMPLE SIZE
Jaselskis [25]	construction	- project success - project schedule - project cost - project input characteristics	- quantitative model - statistically correlate performance and project input characteristics	- project managers can predict their chances of achieving successful project outcomes based on predicted resource allocation strategies	75 projects
Russell [26]	construction	- project failure, non-failure - project characteristics	- statistical analysis: numerical: student t-test qualitative: chi-square test	- contract administrators can better understand the impact of contractor failure	107 projects
CII [27]	construction	- trust indicator - cost impact	- regression analysis - benchmark cost impact	- statistically support the notion that the increased level of trust between parties leads to project cost benefits	262 projects
Herbsleb [28]	software	- process improvement cost - productivity - duration - quality - business value	- statistical analysis - empirical methods - mini case studies	- identify substantial gains in productivity, early defect detection, time to market and quality by implementing CMM-based software process improvement	13 organizations
Pearce [29] [30]	hi-tech manufacturing	- time -cost - quality	- 1 to 7 Likert scale - chi-square test - correlation analysis	- demonstrate that PM practices provide at least one way of maintaining the necessary focus while broadening the firm's basis	317 firms
ibbs [31]	construction	- percent complete - change cost - budget - productivity	- linear regression model - student's t-test - correlation analysis - regression analysis	- understand how change occurs and affects project	104 projects

[Berkeley's Research]	<i>multi-industry</i>	<i>- 8 PMBOK criteria - 5 project life cycle phases - schedule, cost and quality - customer satisfaction - ROI in PM practices</i>	<i>- develop quantitative model - 1 to 5 Likert scale - benchmark PM level - correlation analysis - regression analysis</i>	<i>- better understand the financial and organizational benefits of using PM practices in corporate organizations</i>	<i>3 to 4 industries 50 to 60 projects</i>
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Table 1. Comparison of Related Research Methodologies

5. Expected Results/Contributions

5.1 Academic point of view

This research will provide solid, comparative studies on PM practices among industry and across industries. Comparing the organizational aspects of PM practices and correlating such to the project performance data is a principal research methodology and product of this investigation. Statistical analysis will assure the reliability of the qualitative and quantitative data analysis.

Benchmarking will provide a framework for identifying different PM levels by blending the project life cycle concept and PM body of knowledge with quantitative project information. This system can be easily used and further modified to assess different aspects of PM practices in more detail.

5.2 Practical point of view

This research will provide an independent reference point on best PM practices and skills. The level of PM in the organization and actual project performance data will be statistically analyzed to plot possible correlation. This study may help managers to better promote PM practices for less PM-sophisticated industries. Understanding what level of sophistication is appropriate for a specific project or environment will provide greater insight into appropriate levels of PM use.

Executives will even be able to determine the necessary practices for achieving a fully project-driven organization [33]. By presenting relationships between PM practices and project performance, it may convince top management that PM is an appropriate management discipline area in today's time-based, resource-limited, and highly competitive environment. The benefits to companies will be promotion of better project management practice and a better project management future.

This study will benefit strategic planning people to plan and implement PM practices in the entire organization to achieve and maintain competitive edge. By comparing PM practices to similar or different industries, managers can assess the current PM level of their own organization and of the competition, and set more realistic goals for achieving a more appropriate level of PM sophistication.

An attempt to calculate the PM ROI will assist managers to determine required future investments to achieve any specific level of PM maturity. This will convince top managers to be aware and invest more on PM practices and tools.

6. Conclusions

This paper summarizes PM process maturity analysis methodology that will be used by the authors to find financial and organizational impacts of PM to corporate organizations. A benchmarking system is developed and presented to quantitatively measure an organization's level of PM sophistication. It is expected to have benefits that such quantitative data and methodology will aid managers in making better PM

investment decisions. Future research will continue to report quantitative results and findings by applying this research methodology.

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