MEASURING THE STRATEGIC VALUE OF PROJECT MANAGEMENT

Prof. C. William Ibbs* and Justin Reginato
Deparment of Civil and Environmental Engineering
University of California
Berkeley, CA 94720
USA

* E-mail: **DRCWIBBS@aol.com**

Abstract

This paper describes research that managers can use to measure their Return on Investment for Project Management (PM/RoI[sm]). A PM Benchmarking procedure is explained that can be used to assess the PM Process Maturity of companies. It has two key components: 1) the Berkeley Project Management Process Maturity Model[sm] and 2) our proprietary PM Maturity Assessment Tool.

The PM Maturity model is a 5-step process model. The Assessment Tool measures 1) a company's level of PM Process sophistication and capability; 2) the company's expenditures on PM; 3) staffing ratios; and 4) Cost, Schedule and Quality performance metrics on projects. These performance metrics and maturity levels can be then used to estimate the company's PM/RoI[sm].

This research is partially sponsored by the Project Management Institute (PMI®), the University of California at Berkeley, and The Ibbs Consulting Group, USA.

Keywords
Project management; Return on investment; Value; Benchmarking

INTRODUCTION

The objective of this paper is to describe new research leading to a procedure that can help managers measure their Return on Investment for Project Management (PM/RoI[sm]). We do this by analyzing the PM processes and practices of different companies in a quantitative fashion. Over the past five years we have benchmarked 52 companies or non-profit organizations using our Maturity Model and PM Assessment Tool. This Assessment Tool is based upon six project life cycle phases and nine Project Management Body of Knowledge (PMBOK®) functional areas.

PM Maturity and project performance data are captured from company experience and used to develop curves that show predicted cost, schedule, quality, and customer satisfaction performance levels for a specific PM Maturity level. These curves can then be used by the individual organization to estimate what project performance gains might reasonably be expected if the organization takes steps to improve its PM Maturity. That information, in turn, can be used to estimate its specific PM/RoI[sm].

PREVIOUS RESEARCH

Previous work in this arena includes the work of Ibbs and Kwak (Ibbs, 1997). This study developed and presented the 5-step Berkeley PM Process Maturity Model to better understand and locate an organization's current PM process level. The Berkeley Model is adapted from work by Crosby (Crosby, 1979), the Software Engineering Institute (SEI, 1993) and McCauley (McCauley, 1993). The novel feature is that it incorporates a learning component, which many companies purport to support but in reality do not.

The 5-step Berkeley PM Process Maturity Model was used to establish an organization's current PM maturity level. This model demonstrates sequential steps that map an organization's incremental improvement of its PM processes.

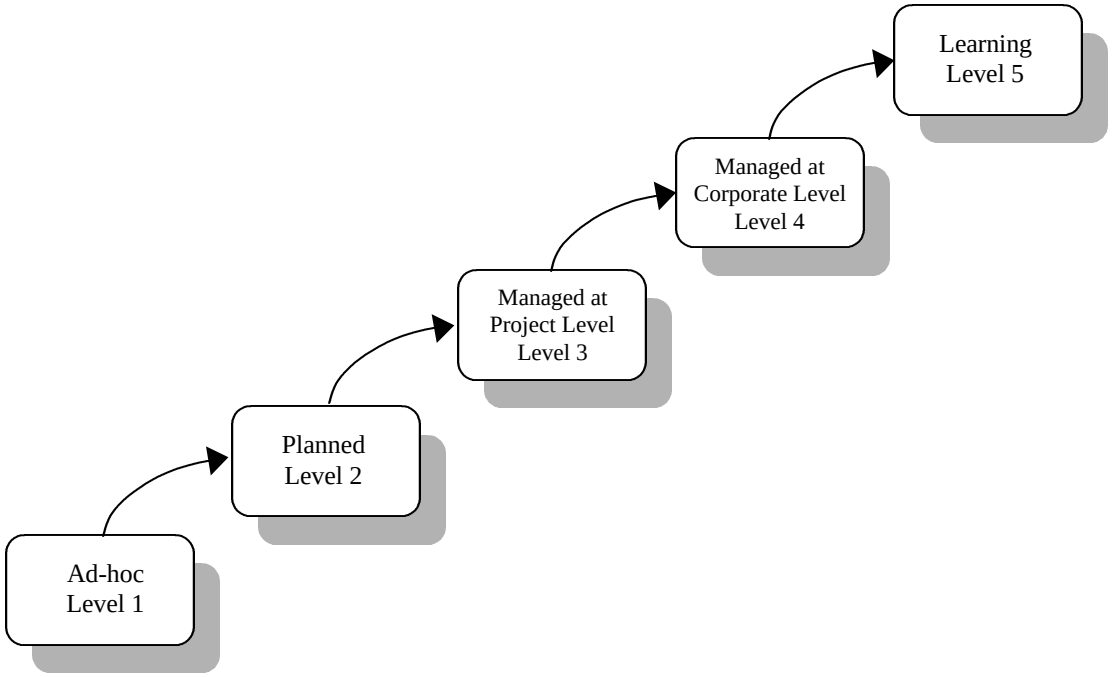

Exhibit 1 Berkeley PM process maturity model

The model progresses from functionally-driven organizational practices to project-driven organizations that incorporate continued PM learning. An organization's position within the model signals their position relative to the other organizations in their industry class or otherwise that have been assessed.

The next step was to use this model to benchmark thirty-eight companies in four different industries. The express purpose was to test the research hypothesis:

H_o: Project Management has value to companies that can be quantitatively demonstrated.

To do this, we developed an Assessment Tool. The Tool consisted of three major sections:

1) a demographic section, where PM Cost and Organizational information;
2) a second section consisting of 162 multiple choice questions. Company respondents would select the option that was most descriptive of their company's typical PM process; and
3) cost and schedule performance results from recently completed projects.

The Maturity questions of Section 2 follow the PMBOK® (1996) and can be visualized as seen in Exhibit 2.

		Project Life Cycle Phases					
		Initiate	Define & Organize	Plan	Track & Manage	Close Out	Project Defined Organization
PMBOK Knowledge Areas	Scope						
	Time						
	Cost						
	Risk						
	Quality						
	Communication						
	Human Resources						
	Procurement						
	Integration						

Exhibit 2 Benchmarked PM phases & knowledge areas (Ibbs, 2000)

The Cost Performance Index and Schedule Performance Index metrics captured in Section 3 are calculated from the equations below. A project finishing under budget or ahead of schedule would have a CPI or SPI < 1.00.

$$\text{Cost Performance Index} = \text{CPI} = \frac{\text{Total Final Project Costs}}{\text{Total Original Authorized Budget}}$$

$$\text{Schedule Performance Index} = \text{SPI} = \frac{\text{Total Final Project Duration}}{\text{Total Original Authorized Duration}}$$

Exhibit 3 Performance metric definitions

Though the research broke new ground, it did not prove this hypothesis to a statistically significant standard. Namely, the Berkeley team found that:

- There was an association, but not a statistically significant relationship, between an organization's PM Maturity and its ability to execute projects more effectively.
- There was an association, but not significant, between a company's PM expenditures and its project effectiveness.
- There was no meaningful relationship between the number of professionally-trained project managers (including PMPs) and the company's ability to execute projects.
- Companies were seen to be relatively weak in the Risk Management knowledge area and in the Project Execution and Project Support phase areas, which confirmed the suspicions of many industry professionals.

PHASE 1

This Phase 1 study had weaknesses though:

- The survey population was self-selecting and, the PM Maturity assessment was conducted principally by the companies themselves. Limited research funding precluded more comprehensive quality control.
- PM Maturity was contrasted with Project Cost and Schedule Performance Indices. One complication is question of budget and baseline consistencies between companies;(e.g. authorized budget at concept vs. authorized budget at contract signing. How are change orders handled, for instance? Which baseline budget should be used for reference purposes?
- Perhaps more importantly, the Cost Performance Index is probably of less importance than the Schedule Performance Index for those enterprises whose revenues are derived from selling the project's deliverable. For instance, the costs of developing software are not tightly coupled to their sales price. What is of more concern to a software vendor is time-to-market and first-market-mover status. Measuring the relationship between those downstream profits and Project Management effort is difficult.
- Project Management cost accounting structures differ radically among companies. Companies amortize expenditures on PM training, for instance, quite differently. Moreover, the line between operations and PM is rarely clearly delineated so salaries, for one, are quite difficult to apportion. On a more global level, many corporate accounting systems are designed to track function (marketing, engineering) but not the portion of engineering or accounting that directly, let alone indirectly, supports a project.

PHASE 2

Building on this initial work, we strengthened our model, assessment tool and research methodology. For instance, we developed a more rigorous cost accounting scheme to capture PM cost components, rather than just aggregate numbers. And, when benchmarking the fourteen companies of Phase 2, we instituted more stringent quality control procedures to insure that the PM Maturity responses were reliable.

Because there are other perspectives as to what measures define value, we have also included in the Assessment Tool a section to collect Key Performance Indicator (KPI) metrics. Typical KPIs involve quality standards (defect rates, percentage of product returned / rejected by the customer, etc.), customer satisfaction measures (percentage of original customer performance requirements met), and project delivery success measures (ability to process owner-requested changes, time to process change orders, etc.). Those metrics are not addressed in this paper.

Using the Assessment Tool and these definitions, we benchmarked an additional fourteen companies (bringing the total to fifty-two) over the past five years. Nineteen in the Engineering-Construction Industry, the balance in information systems, financial services and high-tech manufacturing. Exhibits 4 and 5 display Cost Performance Index, CPI, and Schedule Performance Index, SPI, results versus PM Maturity.

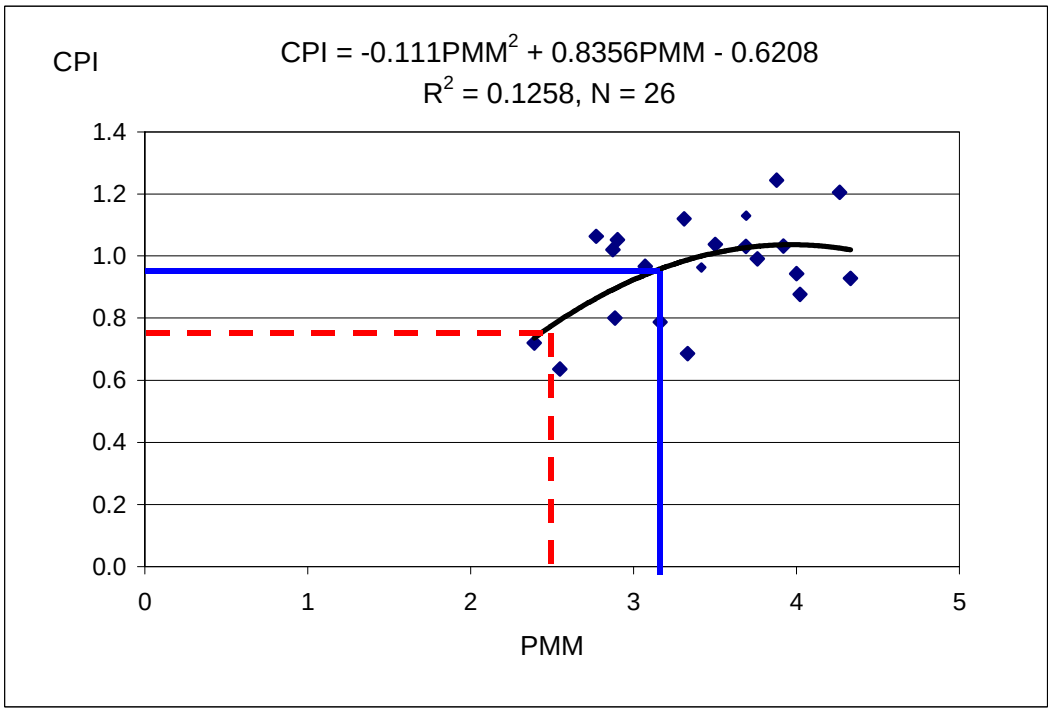

Exhibit 4 CPI vs. Project management maturity

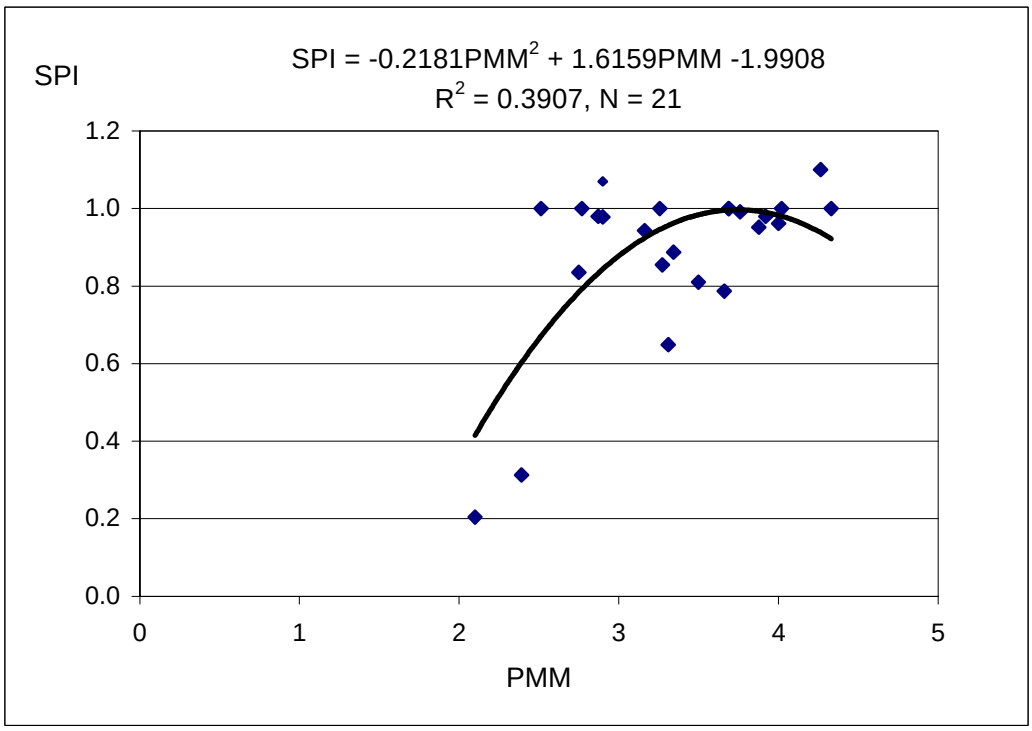

Exhibit 5 SPI vs. Project management maturity

A Case Study for PM/ROI^{sm} Calculations.

This section provides a step-by-step scenario for calculating an order-of-magnitude PM/ROI^{sm} estimate. An actual case study is cited, in which a company wanted to improve its PM maturity from $PM_{current}$ = 2.1 to $PM_{desired}$ = 3.3. These correspond to the red, dashed line and the blue, solid line in Exhibit 4. Currently the company is achieving a profit margin of $P\%_{current}$ = 5%.

Next, the regression line from the PM maturity versus CPI graph in Exhibit 4 is used as a basis. If $PM_{current}$ = 2.1 for this organization, then its estimated $CPI_{current}$ = 1.6. (If the organization has reliable project records, it may be able to calculate its own typical CPI value and substitute that in place of $CPI_{current}$.)

The next step is to compute a $CPI_{forecast}$. In this case, given a desired shift to $PM_{desired}$ = 3.3, the $CPI_{forecast}$ = 1.3. The new $P\%_{predicted}$ would be predicted to be 6.2% using the historical experience of Exhibit 4.

In this particular case, the organization had $10 million in annual project revenues, and the costs for upgrading from $PM_{current}$ = 2.1 to $PM_{desired}$ = 3.3 were $400,000 annually. Then the PM/ROI^{sm} realized by upgrading from $PM_{current}$ to $PM_{desired}$ can be computed. For this particular case study, the company had annual revenues of $10 million. The cost of increasing the firm's PM Maturity from 2.1 to 3.3 was estimated to be $400,000. Then the PM/ROI^{sm} realized by upgrading from $PMM_{current}$ to PMM_{target} is:

$$PM/ROI^{sm} = \frac{(6.2\% - 5.0\%) \times \$10{,}000{,}000}{\$400{,}000}$$

$$PM/ROI^{sm} = 29\%$$

The result is an estimated of PM/ROI^{sm} 29%. A 90% confidence interval analysis indicates that the return will be in the 15% to 41% range.

OTHER FINDINGS

Our research has explored other areas, too. One key area is the issue of reliability of cost and schedule performance. It is not enough to deliver projects that, on average, have favorable cost and schedule performance. It is also crucial that those results be predictable.

Our research has shown that predictability in fact improve with increasing levels of PM Maturity; see Exhibit 6.

Finally, there is the question of how much does Project Management cost. Our research indicates that the average cost for all types of companies is approximately 10%. (It will be higher for companies that must establish temporary headquarters, such as construction firms.) But what is even more interesting is how the rate of those expenditures changes as PM Maturity improves; see Exhibit 7.

Namely, companies with low PM Maturity, generally do not spend much on Project Management; similarly companies that have high PM Maturity spend low rates, too. It is the companies in the middle that spend the most proportionally. Consequently, companies that want to improve their PM Maturity, have to surmount a "PM Cost Hump".

Exhibit 8 schematically represents what we call the "Virtuous Cycle of PM".

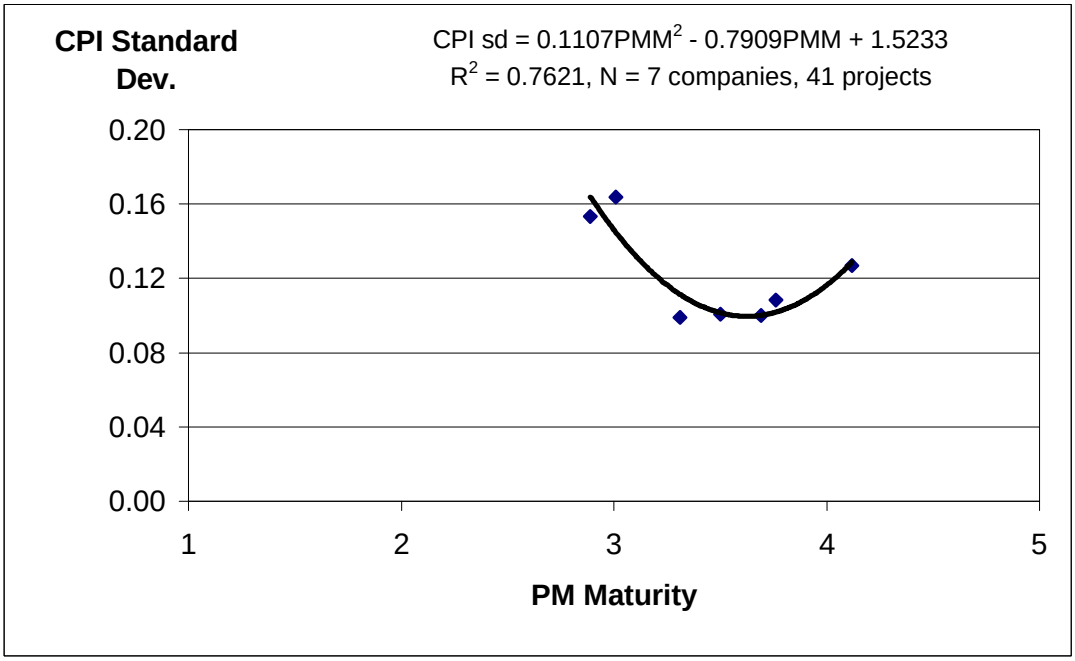

Exhibit 6 PM maturity vs. CPI standard deviation

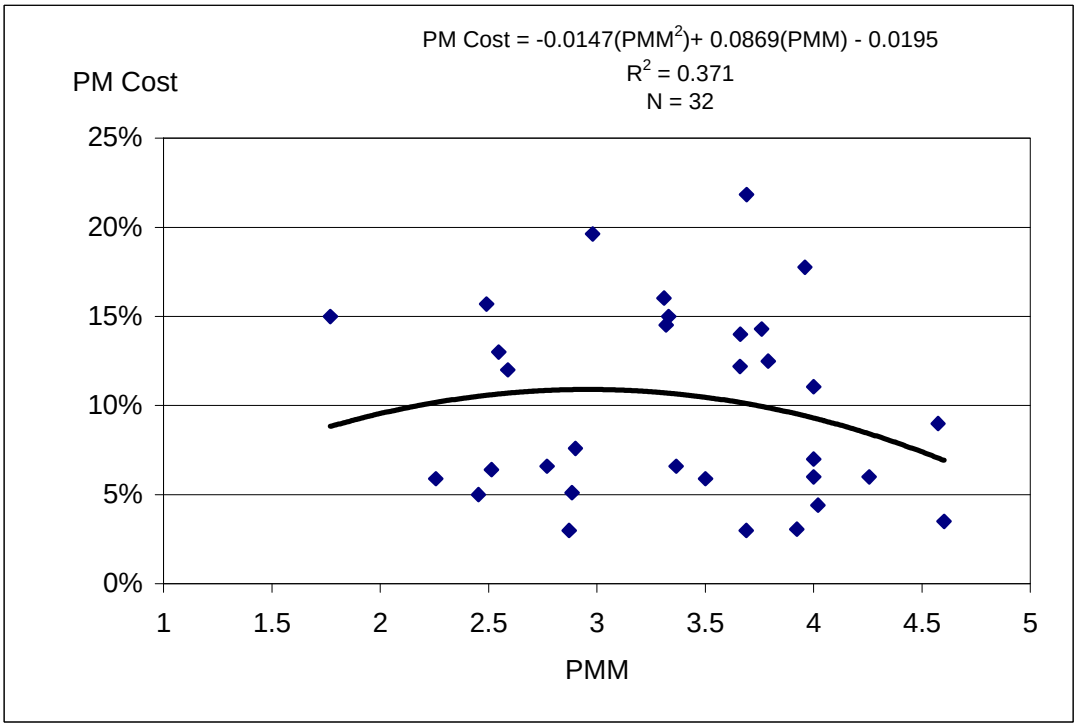

Exhibit 7 PM cost vs. PM maturity

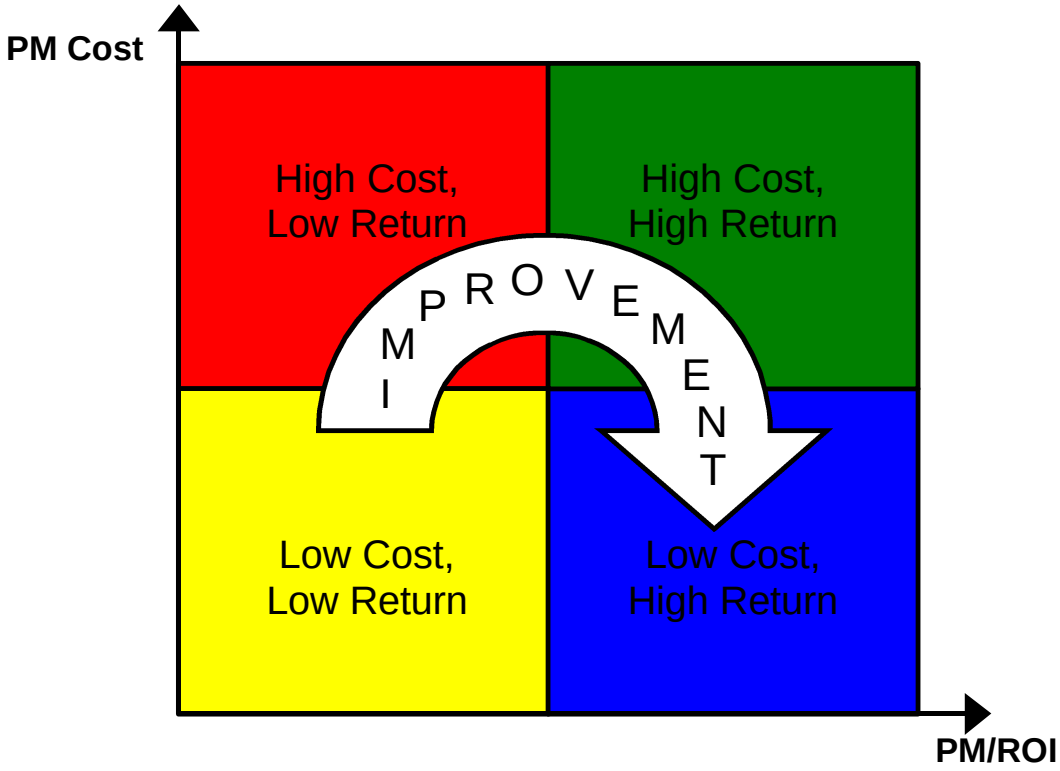

Exhibit 8 The virtuous cycle of project management

SUMMARY

This paper reports the progress of a PMI® sponsored research study for measuring Project Management's value by the Berkeley PM / RoI[sm] team.

This phase of the research confirms our earlier work: Higher levels of PM Maturity are found to be associated with better cost and schedule results, on average. Critically important, they are also associated with ***more predictable*** results.

The cost of managing projects is shown to decline over time, too. However, there is a "PM Cost Hump" that companies must move through before they get to highly economical levels of PM Maturity. This hump means that companies may actually see their PM expenditures increase – on a proportional basis – for some time before they reap the economies of scale.

The wait (and increased cost ratio) is worth it. For not only do companies get more mature with the proper PM investments, they achieve better project cost and schedule results. The data presented in this paper make a compelling case for that assertion.

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