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Identifying the State of the Project Management Profession

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Abstract

Project management has struggled with delivering low performing construction and information technology (IT or ICT) projects. Approximately 60% of construction projects are over budget, over schedule and have low customer satisfaction. The IT industry reports even worse performance for their projects. IT projects seem to be far less defined, leading to increased complexity. Documentation shows that companies do not have a successful methodology to track their performance and thus there is a lack of documented performance information to identify if their project management methodologies are delivering high quality and efficient projects. A literature research was performed on the most used Project Management (PM) methodologies worldwide. These PM methodologies were then compared based upon their characteristics and performance information to identify the most successful methodologies. The analysis of the results revealed that only one methodology had proven performance metrics on over 90% of its projects.

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1. Introduction

Traditionally, project management has been the mechanism to delivering professional services. Project managers have been responsible for managing, directing, and controlling projects. They are responsible for planning, coordinating between stakeholders, cost-estimating time and materials, and creating schedules [2, 9, 21]. The main objectives of a project manager is to deliver a project on time, on budget, with high customer satisfaction. It is to understand the client expectations, and ensure there is clear communication between stakeholders. Also, in order to ensure productivity is optimal, a project manager must align all resources, and ensure quality control on their own work.

Even with the increase in the amount of project management education and certifications over the past 25 years, the delivery of services has continued to struggle with low performance for many decades. Project managers have been having difficulties delivering services on time, on budget, with high customer satisfaction. In fact, according to the latest Construction Industry Institute study done in 2015, identified that only 2.5% of projects were defined as successful in terms of scope, cost, schedule and business, 30% of projects completed within 10% of planned cost and schedule, 25 to 50% waste in coordinating labor on a project, management inefficiency costs owners between $15.6 and $36 billion per year, rework by contractors is estimated to add 2-20% of expenses to a contractor's bottom line, and an estimated $4 billion to $12 billion per year is spent to resolve disputes and claims [15, 20, 25].

Many of the issues project managers are facing today have been due to services being too complex, due to the increase in supply chain participants as projects become larger. Many of the stakeholder roles are unclear and are confusing due to the amount of details required to understand what it going on. Due to the confusion, many of the client's intentions are misunderstood and result in poor performance and changes in scope. The amount of details have created a non-transparent environment, making it difficult to accurately measure performance, creating a reactive environment and only solving problems when they are faced [1, 10].

The major role of the project manager is to efficiently and effectively deliver services. The increasing size of projects and number of projects run simultaneously by project managers has made it difficult to align resources and maintain order between multiple supply chain participants [15, 20, 25]. Due to the increase in project size, PMs are expected to know more and have more experience in order to survive, making an already difficult job more difficult. With the continued poor performance seen in the industry, it is difficult to see how project management will improve its performance to deliver services efficiently and effectively with high customer satisfaction. Over the century, there have been many solutions developed to resolve the low performance, but with so many solutions, it is difficult for project managers to know which approach is the best and most efficient for improving their performance of delivering services.

2. Problem

Project managers are having difficulty efficiently and effectively delivering services. This may be due to the numerous theories and innovations proposed to project managers to deliver professional services. PMs are having difficulty choosing which methodology would be best to implement because they may not be clear on which methodology works and which ones do not. This results in many project managers using limited exposure and experience as an aid to resolving issues.

3. Proposal

It is proposed to identify all research and documentation on the performance of projects within each major project methodology, and identify potential solutions to increase project performance.

4. Methodology

The authors propose to conduct the following methodology for this paper:

1. Literature research on performance of delivering professional services.

2. Identify potential solutions.
3. Analyze the proposed solutions.
4. Identify performance of the solutions.
5. Compare characteristics of the solutions.

5. Performance in Delivery Professional Services

A literature search was conducted to identify the performance in delivering professional services in the industry. The literature search identified the two industries with significant documentation of poor performance has been mostly the technical industries like construction and information technology. Interestingly, both industries have not seen significant changes in the delivery of services in the last 3-6 decades, despite the many efforts and funds spent to improve the non-performance. The fact remains that the industry as a whole does not understand the source of its own problem and has not done anything effective to fix it. This is not just an issue in the construction and information technology industries [8, 17], but many industries are suffering from poor delivery of services and do not understand the source of its own problem or has found any effective methods to resolve the issue. The problem is not just proliferated by one party in each industry, rather multiple parties in the entire supply chain to include manufacturers of systems and materials, owners / owner project managers, procurement personnel, general contractors and subcontractors, general and sub-contractor project managers.

The literature research has shown that both the construction and information technology industries having significant documentation on the performance of the delivery of services. In fact, both industries have had similar results. The following studies were identified to show low performance in the information technology industry [14]:

- 1,471 IT projects reported an average cost overrun of 27%, of which 17% had a failure high enough to threaten the company's existence, with an average cost overrun of 200% and schedule overrun of 70%.
- US Accountability office identified 413 IT projects--totaling at least $25.2 billion in expenditures for the fiscal year of 2008--as being poorly planned, poorly performing, or both. With just under half being re-baselined at least once.
- European Services Strategy Unit reported 105 outsourced public sector ICT projects with 57% of contracts, which experienced cost overruns with an average cost overrun of 30.5% and 30% of contracts which were terminated.
- Genenca Survey included 600 U.S. businesses IT executives and practitioners and reported that 75% of respondents admit that their projects are either always or usually doomed right from the start, of which 27% always felt this way.
- McKinsey & Company analyzed over 5400 projects and reported 50% of IT projects on average are 45% over budget, 7% over time, 56% less value than predicted and 17% of projects end so badly they can threaten the life of the company.

Studies have also been conducted in the United States showing similar results of construction non-performance [13]:

- Productivity has decreased by .8% annually.
- Construction companies have the second highest failure and bankruptcy rate of 95%.
- Over 90% of transportation construction jobs are over budget.
- Almost 50% of time is wasted on job site.

As a result of the industry misunderstanding the source of its problem, few academic researchers and practitioners have been able to create a successful hypothesis, and have run cycles of tests which has resulted in the changing of industry practices and poor performance [12]. The most impactful research identified has led to conclusions that pre-planning is critical, hiring contractors who have expertise will result in better performance, and risk is mitigated when the supply chain partners work together, and expertise is utilized at the beginning of projects. The fact remains

that project managers delivering professional services need a solution that is proven in the industry to overcome the seemingly inevitable poor performance.

6. Project Management Methodologies

With the identification of poor performance in the industry, many project management methodologies have been developed over the last 50 years as potential solutions. A project management methodology is defined as any new management model that attempts to improve the delivery of services. The authors were only interested in the major project management methodologies (methods commonly known and used in industry), of which twelve were identified. In order to better understand what each methodology proposed as a solution to improve the delivery of services, the authors conducted an in depth literature search and reviewed 249 publications. The purpose of the research was to identify any methodology with significant documented performance information that showed impact in industry, and then compare them to one another. Out of the twelve methodologies, only three showed significant performance information (see Table 1).

Table 1 lists each of the twelve PM methodologies, the number of publications researched for each methodology, and the number of publications each methodology had documented performance information identifying impact in the industry. The top three methods identified were Lean Management, Agile Methods, and the Best Value PIPS. Out of 249 publications, 57 publications had documented performance information, of which Agile and Lean made up 32% combined, Best Value PIPS made up 44%, and the remaining PM methodologies made up the last 25%.

Table 1 – PM Methodology Publications with Performance Information

PM Methodologies	# of Publications	# of publications with metrics	% of publications with metrics
Waterfall Methodology	22	1	5%
Rapid Application Development	20	5	25%
Agile Methods	25	10	40%
Scrum	20	3	15%
Prince2	20	0	0%
Lean Management	17	8	47%
Deming PDCA	20	3	15%
Business Process Modeling	20	1	5%
Spiral	20	0	0%
Stage Gate	20	0	0%
Best Value PIPS	25	25	100%
PMBOK	20	1	5%

Next, the authors evaluated each of the top three methodologies using the following criteria:

1. What was the unique/innovative solution the methodology developed to improve the delivery of services?
2. What were the dominant performance measurements that showed the impact in industry?

6.1 Agile Methods

Agile methods, also known as adaptive management approaches, are systems used with software development and service deliveries to increase the flexibility, relevance, and business value of software solutions [6]. Seventeen software developers created the idea of agile methods in 2001, and released the Manifesto for Agile Software Development. Agile methods have been used primarily in the software development industry, but has also expanded to nearly every other industry. What makes agile methods unique are the integration of multiple lightweight, low-risk and easy-to-implement strategies to improve performance on projects. Some of the existing agile methods referenced in the original publication include: Agile Unified Process (AUP), Dynamic Systems Development Method (DSDM), Scrum, Crystal Clear Methods, Extreme Programming (XP), Adaptive Software Development (ASD) and Feature-Driven Development (FDD). According to Cooke, the major advantages of the agile methodology are simple [6]. First, replace upfront planning with incremental planning. Second, address technical risks early in the process. Third, minimize the impact of changing requirements. Fourth, prioritize capabilities that will be fully functional first. Then, fifth, increase communication with stakeholders.

These objectives are achieved through iterative processes, cross-functional teams, face-to-face communication with stakeholders, constant reports on team member productivity, and quality focus by utilizing measurement tools and techniques. The team is able to select which of the agile methods will work best and can tailor to the specific needs of their project. This method has had the following results:

- The Standish group claims that the agile approach increases performance by 33%" [24].
- According to Business Wire, 92% of those surveyed said agile management tools improve their ability to manage changing priorities, 85% said agile management tools improve project visibility, and 77% said using agile tools enhanced software quality" [5].
- Agile shows productivity gains between 66 percent and 302 percent based on hard metrics [16].

6.2 Lean Management

According to the article "Lean production, six sigma quality" (also known as the Toyota Production System or Just In Time), Lean management was developed in the early 1950's by Taiichi Ohno, in cooperation with Eiji Toyoda [7]. These two visionaries developed their production system based on the manufacturing methods of Ford's plant in Detroit, USA [the world's largest and most efficient manufacturing plant at that time]. Lean management has been widely applied across many industries, including economic sectors, as a production approach that focuses on the elimination of waste, but its use has been primarily centered on the manufacturing industry. The core principles of Lean are to eliminate waste, reduce inventories, increase customer satisfaction, eliminate bottlenecks, and improve communications.

What is unique about Lean management is the principle of waste reduction, its process-centered focus, and high level of personnel participation. Lean asks the employees to adopt a culture of continuous improvement, which allows them to solve small issues before they become large problems and enables the employees to actively suggest how to improve the process of the company. By centralizing the focus on eliminating waste, employees are now motivated to reduce time, cost, and materials to increase overall productivity. This method has had the following results:

- Before Lean Project Planning and Lean Management, non-lean processes typically had a 35%-65% planned complete ratio. Many companies that began using Lean management saw success increase from 40% to a 75%-90% average planned complete ratio [4, 11, 19].
- Between 63% and 82% of the "lean" organizations in each country, are profitable and around 35% are highly profitable [4, 11, 19].
- One aerospace company saw 30-50% timesaving's, 50% improvement in labor productivity, and 50% reduction in errors [3].

6.3 Best Value Performance Information Procurement System Methodology

The Best Value Performance Information Procurement System (BV PIPS) is a non-traditional procurement/project/risk management model that was first proposed in 1991 by Dr. Dean Kashiwagi in his dissertation at Arizona State University. It has been found to increase the efficiency of delivering services up to 40% while simultaneously reducing project management by up to 79%. The BV PIPS is an innovative response to the traditional price-based purchasing of professional services and project management methodologies. What is unique about this approach is the replacement of management, direction, and control with the utilization of expertise. The BV PIPS stresses utilizing expert vendors [ensuring that an expert vendor is selected], minimizing owner/client MDC, and forcing the expert to use transparency, metrics, and non-technical language to increase the accountability of the expert vendor and motivating the owners to minimize interference in the project. The advantages of the BV PIPS are its minimization of the need to MDC expert vendors, and the increase in the accountability of the expert vendors. It increases the accountability of the client/owners to know their business, and how the services rendered will add to their business goals, while increasing the value of the experts and their expertise, which creates

transparency. This allows everyone to understand the project with minimized information and communications, and increases the strength and performance of the industry to deliver high performance. This method has had the following results [18]:

- 1800+ projects and services, totaling $6.3B worth of services procured.
- 98% customer satisfaction / 9.0 (out of 10) client rating of BV PIPS model.
- Decreased the cost of services on average by 31%.
- Contractors/vendors were able to offer the client/owner 38% more value.

7. Analysis of Documented Performance Information

The authors conducted an analysis on each top PM methodology as follows:

1. Identify the dominant characteristics of each method and compare.
2. Based on the characteristics and dominant performance information identified in the literature search, recommend a potential solution for the improvement of delivery of services.

The research effort and analysis was affected by one major constraint: the number of projects that use one of the methods and have not documented the performance information. Taking this into consideration, the value of the analysis is not to invalidate any method, rather, use the existing literature to find similarities amongst the most documented methods and recommend potential solutions to overcome the poor delivery of services.

Table 2 lists the major characteristics of each methodology.

Table 2 –PM Methodology Characteristics (see references for Agile, Lean, and BV PIPS)

Agile	Lean Management	BV PIPS
MDC	MDC	No MDC/Utilize Expertise
Technical	Technical	Non-technical
Non-transparent	Non-transparent	Transparent
Continuous Improvement	Continuous Improvement	Continuous Improvement
Performance Measurements	Performance Measurements	Performance Measurements
Focused on Quality	Focused on Quality	Focused on Quality
Focused on Minimizing Waste	Focused on Minimizing Waste	Focused on Minimizing Waste
Standardization	Standardization	Standardization
Complex	Complex	Simple
Requires Experience	Requires Experience	No Experience
Alignment of Resources	Alignment of Resources	Alignment of Resources
Collaboration/Meetings	Collaboration/Meetings	No collaboration/meetings
Collaboration/Meetings	Collaboration/Meetings	No collaboration/meetings
Increased Communication	Increased Communication	Decreased Communication
Decision-making	Decision-making	No Decision-making
Employee Empowerment	Employee Empowerment	Employee Empowerment
Documented Performance Metrics	Documented Performance Metrics	Documented Performance Metrics

The only significant difference between the first two methodologies and the third is the use of management, direction, and control (MDC). The BV PIPS is the only PM methodology researched that focuses on the minimization of management, and sole utilization of expertise and alignment of resources. It is also the only method to show an increase in performance while not using MDC [13].

8. Conclusion

Project managers are struggling with delivering services on time, on budget and with high customer satisfaction. The industry is plagued by a history of non-performance, and complexity due to the numerous parties in the supply chain who are all in silos and communicate using technical information. Very little documentation or research results have been identified that optimize project performance. Although new solutions have been suggested and

implemented, the overall performance and customer satisfaction could be improved. Three potential solutions have been identified.

The first solution, the lean management approach, which was developed from the successful manufacturing model, the Toyota Production System. It has evolved to encompass many different industries, and is more commonly known as a set of principles and techniques that assist organizations in eliminating wasted efforts, increasing the likelihood of delivering services that meet customer satisfaction. However, it is still primarily a manufacturing system to improve efficiency. The downside to this approach is it does not minimize the owner's management, direction, and control, which has been identified as of the main causes for failed attempts to implement lean throughout organizations.

The second solution, the agile project management approach, is a logical solution like the first. The approach breaks up a project into smaller components, utilizes partnering between all stakeholders, and lessons learned can be quickly implemented into the project's other components. The downside of this approach is that it does not minimize the owner's management, direction, and control (MDC), which is a source of project cost, and time deviation.

The third solution, the BV PIPS, is the most dominant solution based on the extensive performance documentation and impact in industry. The approach has been tested, modified, and implemented for the past 23 years. What is unique about the BV PIPS is its ability to minimize management, direction, and control, resulting in decreased costs on average of 31% with 98% customer satisfaction. It has shifted the role of the project manager from being the expert to utilizing expertise.

The difference between the first two approaches and the BV PIPS is that the BV PIPS utilizes expertise to resolve project complexity, while the other two approaches attack the complexity by increasing communication, collaboration, and decision-making. Experts in the BV PIPS work backwards from the well-defined deliverable to the initial conditions, while the other two approaches work from the beginning to the end, and do not know what is all required to complete a project until it after it starts.

Recommendation

The authors recommend that the information in this paper be presented at different industry conferences, and published in journals of project management, supply chain, and procurement. Ramifications of the conclusion lead to recommendations of changing the traditional MDC PM model to use the no management, direction, and control principles of the BV PIPS.

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