Project Management Maturity

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The issue of what makes some project managers and some organizations better at what they do in delivering projects than others has been a question that has been studied for many years. These studies have looked at critical success factors, key result areas and project manager skills and personalities. All have contributed in their own way. Recently, however, the question of maturity of project management has been raised. Driven largely by the work of the Software Engineering Institute (SEI) and its Capability Maturity Model (CMM), a number of more generally applicable models for project management have been developed. This paper addresses the issue of project management maturity and how it may be modeled. Starting with the published models, it develops a framework for a more powerful maturity model that challenges our current body of knowledge.

Introduction

Project Management has traditionally dealt with the work that takes an idea from funding to delivery. There are, however several other parts to this process that impinge on its success, starting with the original idea, its business context and how it was funded. Maturity of project management helps us understand several things. First it tackles the competence of the practitioner and tries to measure it on a generalized scale. Second it helps us understand the working environment of the practitioner, if it also assesses the business for which the project is being done. It also creates an opportunity to study and understand the growth of excellent project managers and could help us understand the mechanism that underlies this growth.

The debate on how to certify project managers continues, with different views on this from different national professional associations. The Project Management Institute (PMI) in North America has a knowledge-based model for its PMP (Project Management Professional) designation. Experience and project management competencies are the basis of other models favored in some European countries. The link between maturity models and certification within the profession of project management is a natural one. In this paper this and other links, with growth of the body of knowledge, moving beyond the traditional bounds of project management and the changing work environment are considered and presented.

The paper also presents a framework for development of a more universally applicable model for assessing and developing project management maturity. This framework is presented as a starting point for discussion rather than a final or even interim product or proposal. The paper concludes with some suggestions for areas of study or debate, which would help us understand the phenomenon of project management maturity. The principal author developed the initial SMART model. Much of the background work on current models was undertaken by the co-author as part of his preparation for studies into project management maturity in the software induustry.

Maturity Concepts

The models for project management that have appeared in the last short while have started the process of building this concept. The published models are briefly described below. Starting with the one that got this idea going: the SEI CMM model (Paulk et al., 1997).

SEI Capability Maturity Model

This model includes five levels. The Initial level is based on no stable environment existing in the organization for development of software. Often commitments are made and not met. It is difficult to achieve a methodical process that results in any consistency in project delivery. The objective is simply to produce software.

At the Repeatable level, the goals have shifted to delivering projects in a controlled fashion. This usually takes the form of schedules that drive the project. At this level, the organization will also control cost and functionality and will have developed policies and procedures around the process it needs to achieve these objectives.

The third level is the Defined level. At this level there is a coherent and consistent approach to project delivery with organization-wide training to ensure that the participants in the process have the skills needed to fill their project roles. The organizations standard practices are now modified on each project to suit the specific needs and demands of the situation. At this level the focus is not on managing the project, but managing the product.

At the fourth, or Managed level, the focus shifts to managing the process to ensure that customer needs are properly met and balanced with cost and other standard measures. Quantitative quality measures are set. There is an organization-wide quality and productivity measurement process. The objective is to achieve improved consistency and predictability of outcomes.

At the fifth level we have achieved the Optimized process. What sets this level apart is that the organization is now continuing to improve on what it has done to grow from level one to four. And it is doing so in a structured way.

Although this model has been widely accepted and adopted, it has been the target of some criticism. The three primary criticisms have been that it increases corporate bureaucracy and rigidity, it causes organizations to focus on CMM issues at the expense of others that are important to its business and finally, organizations will tend to avoid risky projects in order to get better CMM ratings. All of these have been disproven by studies to investigate these phenomena (Herbsleb et al., 1997). Brooks (1987) sought a "silver bullet" for software development. CMM is not that bullet. Nor is any of the other models for project management maturity.

The next models reflect a strong basis in PMI's Project Management Body of Knowledge (PMBOK). As such they may all be open to criticism in that they are limited to more traditional approaches to project management. This means they look specifically at the project execution phase only.

Project Management Maturity Model (PMMM)

Fincher and Levin (1997) proposed their PMMM on the basis of goals that an organization may use to to assess their maturity level. By focussing on the weak areas identified in a comparison to the suggested goals, it is possible to identify where improvements may be made to improve project management performance. All nine of the PMBOK areas of knowledge are included at each level in this model. It is a fairly close adaptation of the SEI CMM, so it too has five levels and their definitions reflect the same types of goals as the CMM. An analysis of these levels by Skulmoski (1997) suggests that there are inconsistencies between the different levels in the model. There is no evidence that it has been empirically tested. Mastery of the PMBOK effectively constitutes level 4, so it does not challenge the status quo in any significant way.

CMM/Project Management Maturity Model

This PMBOK-based model was developed by Goldsmith (1997). This model is specific to software projects. Goldsmith's focus was on accelerating development time. The process includes steps such as learning about project management and then becoming certified by PMI as a PMP. This model simply brings together SEI's CMM and PMBOK. It adds nothing new beyond this.

Project Management Process Maturity Model (PM^2)

This is the last of the PMBOK-based models. It was developed by Ibbs and Kwak (1997) and is reported in a PMI publication. This is the most comprehensive of the PMBOK-based models. It is based on a study that was intended to identify the organizational and financial benefits of Project Management. The authors looked at 38 organizations and assessed their maturity, using a simple and prescriptive model. This model was developed to help project managers assess maturity and return on investment that might accrue from this process. The model is loosely based on SEI's CMM. It starts with an ad hoc approach to project management at level one and grows to continuous improvement at level five. At level 2 some informal procedures and plans are in place. At level 3 organizations have partially developed procedures and practices, and trend data is collected and shared between teams. Systematic and structured project management occurs at this level. At level 4 integration across the entire organization occurs. At this level, too, project management is documented and well understood.

The authors of this model point out that previous studies and models trying to identify the benefits to project management have been unsubstantiated and anecdotal.

The next two models (one published, the other under development) are not based directly on PMBOK.

The Project Management Maturity Model (PM^3)

This model was developed and trade marked by Remy (1997). This model, like the others is loosely based on the one by SEI. It has five levels. The creator of this model does not advocate trying to get all of the organization to the top level. Instead, he suggests that the organization achieve a balance that best suits its business objectives. This model differs significantly in that it is based on the domain of Modern Project Management as defined by Kerzner (1996). It is similar to Ibbs and Kwak's model in that an organization can have several different levels of maturity, and still be effective.

One of the prime differences in this model is that it recognizes that "Effective project management is the evolving interaction of process, systems and culture. Addressing one aspect without considering the others produces little more than expensive frustration". This model is, however, not backed by any empirical research. It is anecdotal and from a consulting company that makes a living in this business.

SMART Project Management

This early concept of a maturity model is also loosely based on the SEI model. It is the result of three years of empirical study in the application of derived best performance studies, described below. It challenges many of the standard practices in project management by pushing the envelope of accepted expertise and processes.

The SMART model is based on the following elements:

- Projects are Strategically Managed and integrated with the corporate objectives.
- Teams and objectives are properly Aligned and this alignment is tested and validated.
- The project is performed in a Regenerative culture that encourages and supports high performance teams

- The project id defined, planned and managed in the context of a continuously changing (Transitional) environment with corresponding shifts in demands on the project and its assigned resources.

These models, when applied to projects in organizations, consistently yielded significantly better project performance in terms of customer satisfaction, cost and time required. However, it had proven to be unsustainable when implemented in an environment that was at level 1, 2 or even 3 on most of the maturity models previously defined. In order to understand what the cause of this might be, further study was undertaken, based generally on the principles of identifying best practices.

Best Performance Issues

We were not interested in the quality of practices in industry, but rather in the results obtained. We therefore looked at projects that were perceived to be successful and then we looked at the project manager and tried to understand the skills, knowledge and other attributes that these highly successful project managers had. As the source of information was diverse, the results of this study are questionable. As sources, published cases, documentaries and docu-dramas (such as the story of the Avro Arrow by the Canadian Broadcasting Corporation) were considered. Also looked at were cases that were not in the public domain, but were known to the author through personal contacts and through consulting work. As a consequence, these latter sources cannot be published, further weakening the case for the model for maturity that is about to be presented in this paper. Finally, a number of studies and monographs were considered in formulating the model. These studies, papers and monographs are extensive and cover a multitude of industries and a broad spectrum of companies, cultures and socio-economic situations.

A significant amount of information synthesis has led to the development of a model for project management maturity that is based on setting level four at "world class" performance. The other readily definable levels are level one - the entry level and level five - the level at which structured and logical continuous improvement on performance at level four occurs. However, to put some meat on the bones of this skeletal definition of a maturity model, we need to consider the elements that constitute performance at entry level and at "world class" level, and we need to define these terms more clearly. That done, the next step in developing a rational maturity model is to determine the building blocks required to go from level 1 to level 4. The final step is to find the right sequence for assembly of these blocks to allow individuals and organizations to develop their project management skills in a sustainable way.

Elements of Maturity

As a starting point, we defined levels one and four in the proposed model as follows.

Level One:

At this level we see the typical first-time project manager with little or no formal training but a mandate to deliver a project. From an organizational point of view, this level would be defined as one where there is no formal career path for project managers, the title "project manager" may be assigned without any recognition in terms of promotion, training, pay increase or added authority to do the work.

Level Two:

This level is the one at which three elements need to be in place. The first is a formal training program with an appropriate certification, diploma or other qualification associated with successful completion. This is needed to allow the individual project manager to obtain two important requirements: basic knowledge in accepted project management practices and credibility in the organization and with the team. The credibility of the project manager will also depend on a number of other - and often more important - elements. Some of these elements include technical competence in the content of the project, experience and reputation for success in some form. The second element needed is acceptance at the organizational level of formal project management. Specifically, this means that the organization expects projects to be managed, rather than just happen. Symptoms of this include formal recognition of the title "Project Manager" perhaps with differing levels from Assistant to Senior or Executive. The underlying organizational commitment is important, not lip service to a process and to job titles. The third element at this level is that the organization permits its project managers to do what they need to in order to manage their projects properly.

For the organization, this level requires a formal and effective training programme in project management to be in place. It typically needs project management standards to be in place and a career part for project managers is in place within the organization.

Level Three:

The third level of project management maturity is the one at which the definition of project management in the organization has been broadened to include all of the steps in the project life cycle. This goes from when the idea is first thought of through to final closeout of the project or its product at the end of its useful life. This is a much larger mandate. It does NOT mean that the same person is managing every step of the process. At this level, we expect project managers to consider the technical elements (classical project management) as well as the business context in which the project takes place (modern project management). Finally we would expect the project manager to consider social and societal issues (SMART project management).

The organization needs to reflect these additional factors as well. This means that a number of additional issues need to be addressed. First, the project selection process should consider how well aligned each project is with corporate strategy. It also needs to consider where the project fits in a risked portfolio of projects that the company must chose from in order to achieve its objectives. Currently, most organizations that do this risked selection will include in the evaluation a risk factor for technical and commercial success of the project. They will not consider the risk in project delivery. This latter risk can have a profound impact on the outcome of the project, and helps to explain the significant difference between the expected return on investment when the project is approved and the actual return on completion that is commonly reported.

At level three, the project is developed as part of the corporate strategy. It is also routinely and predictably delivered at or below a stretch budget

and schedule, with little or no rework and with a satisfied customer.

Level Four:

This is the level at which high performance is achieved. In looking for the differentiation between good and world class project managers, one characteristic stood out in particular. That was the ability to make and maintain all the connectivity between disparate elements of the project and its successful management. For example, What impact will approval of this project have on others in the organization and vice versa. What does selection of one contracting strategy over another have on schedule, team effectiveness, the effort required to maintain effective communications, cost, administrative processes and so on. No decision is made in isolation. The project manager finds solutions to the disease, not the symptom.

At the organizational level, steams cooperate between projects. Priorities are set to suit corporate goals, rather than those of the project with the strongest manager or sponsor. It is not just acceptable practice, but good practice to cancel your own project if that is the right thing to do. Currently it is a career limiting move to do so in many organizations.

Essentially, at this level, the project manager, with the conscious support of the organization, is working beyond corporate guidelines, procedures and processes, adapting or changing them to suit the needs of the situation. The result of this final set of skills and competencies is that projects at this level are scheduled and budgeted aggressively to perform at up to 30% faster and more cost effectively than projects at level two. Projects at this level consistently come in on time and within expected cost, scope , safety and quality expectations.

Level Five:

This level, like that in the SEI CMM is one at which controlled and organized process improvement is achieved.

It is not enough to define these elements. Several other things need to be done. First we need to develop ways to perform at level four. By the definition in the model above, this has been done with SMART project management, but has not been done yet in a sustainable way. Three pilot projects in organizations are currently under way to test the concept to this maturity model. Results will take several years to develop. Faster approaches need to be found.

Next, we need to detail what knowledge, experience, competencies and other skills or attributes are needed at each level for both the individual and the organization. The different levels can co-exist within an organization. Career paths for project managers, company standards and other infrastructure elements need to be defined for each organization so that the framework for growth in this increasingly important area of management is in place.

A Framework for Development of a Universal Model for PM Maturity

The model outlined in this paper is presented as a framework for discussion. The authors welcome input, advice and suggestions from researchers and practitioners on how this framework might be developed. Ideally, with international cooperation, we will be able to develop a truly useful model for project management maturity that will help us all understand the real drivers for project management effectiveness, together with the myriad of peripheral factors that contribute to such success.

The intent behind this framework is to develop a platform for future study of project management. If of use, this platform will help us understand the elements that are required to develop truly competitive project delivery. Such elements will include technical, business and social issues. Some of these may be as follows.

- Technical Issues:
  - More effective resource-based scheduling techniques
  - Better tools for scope and change management
  - Ways of measuring team alignment
  - Simplified tools for earned value, risk analysis and more, to make them more accessible and user-friendly
  - Tools to plan for and manage communication
- Business Issues:
  - Multi project management to include inter-project communication and priority setting
  - Planning that helps align projects with, and support, corporate strategy
  - Risk plans for projects that are consistent with the risk-taking and investment policy of the sponsor organization
- Social and Societal Issues:
  - Ensuring legal and regulatory compliance
  - Understanding the impact of the project long term on the community and on the team
  - Developing good working environments for the WHOLE project team and stakeholders
  - Ensuring a sustainable social infrastructure to support the project during implementation and in the operating phase
  - Understanding and mitigating social, environmental and economic damage to third parties.

There is still much to be learned about effective project management. The wider we cast the net, the sooner we will find the most critical factors that will positively influence the outcomes of future projects.

Conclusions

This paper reports the general structure of an evolving model for understanding and improving project management. A model based on the concept of maturity in capabilities offers a new opportunity to revisit what we know of project management. Perhaps just as important, if set correctly it will challenge how we think of the profession and the skills needed for success.

No maturity model will ever be correct or complete. This is because project management will continue to evolve and will affect the model as a result. The Organization for Project Advancement and Leadership (OPAL) will host and support this particular maturity model and will cooperate with anyone who wishes to participate in collaborative or independent work in developing it as a basis for future study, certification, training development and other action that will support fast growth in the profession. OPAL is housed at the University of Calgary and is supported by a growing number of member corporations from around the world, including Computing Devices Canada, Imperial Oil, KPMG, Nortel, PanCanadian Petroleum and Shell.

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