Service Learning in Project Management Education

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Abstract

The value of employees entering the workforce with an established knowledge of Project Management continues to increase in response to the expansive international growth of corporations, the amplification of complex, technology demands from consumers and the recent needs recognition for highly skilled workers who can understand product lifecycles from multiple aspects. Professors often find it a challenge to teach these skills in a traditional scholastic setting of lectures, homework assignments and exams. Because of this complexity, the education community has recognized the need for differential teaching styles resulting in the increased popularity of Service Learning. This review provides a broad understanding of current, successful Project Management Methodologies in non-scholastic settings. It ends with a suggested description as to how Graduate Level Project Management Classes with a Service Learning component can be tailored to accommodate the most popular trends in Project Management throughout a cross section of industries and company sizes.

Keywords

Agile Project Planning; Education; Phase; Project Management; Service Learning;
Popular Project Management Methodologies

The changes in Project Management over the past 40 years have resulted in striking modifications to the applicable formality of and general approach to handling these complex, unique, time and budget constrained endeavors most commonly known as “projects.” Project Management has been most recently marked with the creation of specific associations geared towards providing relevant structure and education. The importance of Project Management continues to rise in response to continued pressures for companies, not-for-profits and even groups to increase their efficiency while maintaining high levels of quality and timely completion of assigned tasks.

PMI/PMBOK ®

Accepted as an accredited standards developer by the American National Standards Institute (ANSI), the Project Management Institute (PMI) continues to refine and develop their five phase management tool through the release of their publication entitled “The Project Management Body of Knowledge” (later revised and entitled “A Guide to the Project Management Body of Knowledge”). Still considered as the American standard for project management, companies who have adopted the PMI suggestions find themselves working through a three phase, five process grouped structure representative of the framework that needs to be completed during certain phases of the project lifecycle.

![Figure 1](image_url)

Figure 1: Phase and Process Group Depiction for PMBOK

Figure 1 illustrates the three phases: Initiation, Intermediate and Final. Process group termed Initiation Processes is completed during the Initiation Phase. Process groups Planning Processes, Executing Processes and Monitoring and Controlling Processes are contained within the Intermediate Phase. Closing Processes fall into the Final Phase. More recently, PMI has recognized the need to define deliverables that need to be completed prior to exiting one of their phases; this is intended for the next release.
Stage-Gate®

As PMBOK brought a breadth of knowledge to the surface of Project Management, Stage-Gate® International took the approach to the next level. As seen in Figure 2, the Stage-Gate® Innovation Process is traditionally comprised of 5 Stages + an Idea Discovery Stage. All stages are marked with gates that represent the opportunity for the project team to assess the project from all points of view and then apply a Go/Kill decision making tactic to determine if the project success so far is enough to still make it a worthwhile endeavor for the project team to move forward. Each stage is characterized by combining “stage activities” and “stage analysis” to result in a package of “deliverables.” At the gates, these “deliverables” combined with success “criteria” result in a decision being made, in Stage-Gate® terms the “output.” In general, this method has a very high focus on research and fact checking.

Figure 2: Five stage idea-to-Launch Stage-Gate® System. The loops are spirals – a series of build-test-feedback-and-revise iterations with the customer

PRINCE

Similar to how PMI is the project management standard making body in the United States, PRINCE provides methodology standards for the United Kingdom. PRINCE provides detailed strategies for specific tasks that need to be accomplished in a project and requires users to define by who, when and how for each task. According to Drob and Zichil, the most recent version released in 2009 has reduced the number of processes to comprise the following: Starting up a Project, Initiating a Project, Directing a Project, Controlling a Stage, Managing Product Delivery, Managing Stage Boundaries, Closing a Project.

P2M (A Guide for Project and Program Management for Enterprise Innovation)

Originally, P2M was offered to Japanese business owners as the “next step” to the American PMBOK. In an effort to provide users with practical application, P2M is geared towards total
project management, not just the standards and areas of knowledge. The intention of its concept development (scheme), implementation (system model) and operation (service models) would focus on company, society and customer goals. A revised edition termed KPM (Kaikaku Project Management) brought P2M to the next level by driving 3K into their model. 3K in English would be innovation, development and improvement. It is a lifecycle method that addresses issues throughout the project lifecycle in an attempt to produce products and systems that will be applicable in the future.

Project Management Methodology in Service Learning

In May of 2009, “Project Management in Real Time: A Service learning Project” was published in the Journal of Management Education. The 23 page work depicts “a service-learning assignment for a project management course.” The article touches on the importance of educators understanding the fluidity of the Global marketplace and the importance of providing students with applicable tools and experiences that will immediately translate to a business setting upon graduation. This is a difficult task that should not be taken lightly by educational institutions. Students who have taken this class are walking into industries focused on the bottom line. The shortening of product lifecycles due to increased competition and technological advances on all levels, the aging of the “instant gratification” generation and general economic constraints on a global scale have transformed almost all industries. The focus is now higher efficiency, greater success, and increased quality in a shorter span of time, with a smaller amount of resources. For this reason, student preparation utilizing hands on activities and the top trending methods is critical for an individual’s success in the workplace.

Service learning projects can provide these opportunities for blossoming project managers by giving students an opportunity to utilize specific tools in a non-scholastic setting. But what tools should students be using? How can professors integrate these tools into classes that have a Service Learning component? How can professors measure the student’s success and proper application and understanding of the material?

Drexler and Larson’s journal article form a good basis for this integration and provide a benchmarking opportunity but its suggested project management structure is not the best-fitting project management method. Their primary structure focuses on a four phase traditional project management methodology. Their course is offered “as a senior elective for management and management information student systems.” Their dedication to implementing Service Learning Projects to benefit both the students and community is groundbreaking. However, with a bit of tweaking and consideration of upcoming and current trends in Project Management, the benefits students receive could be enhanced tremendously.

According to the Project Management Institute project managers who have experience with integrating agile approaches into project management strategies are in high demand and are often much better suited for the current business environment. Business Insider (2014) and PM-Partners Group (2014) both state in some form that in depth understanding of agile methodology is not only trending now in 2014, it is trending into 2015. It is apparent that these iterative planning skills and consideration of continuously improving a project's plan and a project's team should be integrated into project management classes due to its increasing importance-- but structure, especially in a scholastic environment, also needs to be integrated.
The current phases defined by Larson and Drexler\textsuperscript{13} include the defining stage, planning stage, executing stage and termination stage. From a learning perspective that highlights the importance of deadlines and unremitting review and learning cycles, it is suggested that a tailored version of the Stage-Gate\textsuperscript{®} method be applied. Robert G. Cooper\textsuperscript{5}, co-founder of the Stage-Gate\textsuperscript{®} method, states in his 2014 article that "Agile is a useful micro-planning or project management method that can be used within Stage-Gate to accelerate certain stages." In a project management service learning environment, students will have the opportunity to review and evaluate their progress at each gate allowing opportunities for behavioral changes and modifications to their approaches as they gain a better understanding of course content. In theory, outputs from the preceding phase combined with customer and class constraints become the inputs for the next phase.

As students utilize the trending tools in an application in which they are held accountable solely outside the classroom environment, they should better retain their learning as they will have an example to tie it back to. Providing an environment of flexibility with underlying structure will be consistent with many newer business models. This blend should ultimately supply students with concrete evidence to how certain methodologies can be applied successfully.

**Direct Use of Agile Stage Gate\textsuperscript{®} Methods in Service Learning**

In an attempt to integrate these current project management trends, five stages are suggested each with appropriate agile components and gate and team reviews. Figure 3 depicts the suggested structure for a Systems and Project Management Class. Dependent upon the university's quarter or semester schedule, dates should be assigned accordingly.

Each stage has inputs and outputs. Outputs from the previous stage become inputs for next. Gate reviews require: (1) outputs reviewed and accepted by PSMO (2) project plan for next section (3) team gate review and optionally (4) team review with PSMO where the team is offered specific feedback to make them a more productive and efficient team in an attempt to help them get the most out of their learning experience. The team gate review is part of agile planning: continuously reviewing as a team in an effort to getting better and more efficient each cycle. The right hand column shows the different responsibilities of the PSMO team. They would be responsible for reviewing the outputs and ensuring the team is doing the correct work to make their project a success. The Stage/Gate structure provides an opportunity for the PSMO to help a team if they observe a project veering incredibly far off the objectives of the course. Within this structure is the added benefit of very natural opportunities for the PSMO to dissolve a project; in theory it is as if the PSMO decides the team does not have the combination to unlock the gate to the next phase.

Agile planning can produce natural feedback cycles where teams will naturally address problems they had as they plan the next phase. Team discussion will probably lead towards conversations such as: "well last cycle we just used email as communication and I missed some critical information, can we include texting as well" or "last cycle we were rushing at the end to finish the deliverables, this cycle we should add in more defined milestones to hold ourselves accountable."
<table>
<thead>
<tr>
<th>STAGE</th>
<th>INPUTS</th>
<th>OUTPUTS</th>
<th>GATE REQUIREMENTS</th>
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</thead>
</table>
| CONCEPT GENERATION | Registered Students  
Fundraising Seminar  
School Policy Seminar  
Project Description  
Request for Group Formation by PSMO | • Project Plan for Scoping Stage  
• Team Norms, Values, Roles (Responsibility Matrix)  
• Potential Project Solutions and System to pick best | • PSMO Council acceptance of outputs  
• Team Gate Reviews |
| SCOPING          | • Project Plan for Development Stage  
• Scope Statement  
• Project Proposal  
• Stakeholder Matrix  
• Customer Requirements  
• Project Dependencies | • Project Plan for Execution Stage  
• Work Breakdown Structure | • PSMO Council acceptance of output  
• Team Gate Reviews  
• PSMO Review with Teams |
| DEVELOPMENT      | • Project Completion | • Project Completion Presentation  
• Post Project Audit | • PSMO Council acceptance of output  
• Team Gate Reviews  
• PSMO Council Review with Teams |
| EXECUTION         |                                                                         |                                                                         |                                                      |
| CLOSURE           |                                                                         |                                                                         |                                                      |

Figure 3: Service Learning in Project Management
The PSMO

In companies with highly developed Project Management Structures, the Project and Systems Management Office exists as its own department responsible for not only the record keeping associated with projects and enforcing Project Management Standards set by the specific company, they many times are also the gate keepers. The Project Management Office is a separate department so they can produce factual based decisions regarding a project's continuation. Because they do not have a personal stake in the projects they oversee, they can make decisions without emotional interference.

While it is important that students in a Service Learning Class understand the importance of a Project Management Office, it is often detrimental to the learning experience if peers or members of groups within a Service Learning Class are asked to make up the Project Management Office. They are often unable to make the "tough decisions" like cutting a project or returning a project plan because of their personal ties to their peers or personal ties to projects or chosen charities. It is suggested that Universities who choose to offer a Project Management Class with a Service Learning component also offer the opportunities for students outside the class to make up the Project Management Office.

This can be accomplished in several ways. Depending on the areas of studies the University offers, one suggestion (or a combination of the suggestions) may work better than others. It is important to be cognizant of the relationships that exist between the programs of study, the motivations behind students at certain points in their educational journey and the graduation requirements each student has to consider.

1. Schools working to integrate a Project Management classes with a Service Learning Component can utilize their Masters or Doctorate students in their respective Schools of Engineering, Management and/or Business. This may require a bit of teamwork interdepartmentally, but more often than not students are looking for ways to fill their schedule or resume with hands on, applicable experiences that gives them tangible examples of what they are learning in class. If it is possible, make the PSMO a 5-6 person class that can be registered for and built into a student's schedule. It may not be the workload of a 3 credit class, but the team decision making process, coaching of students as they take the projects from concept generation to completion and explicit application of materials learned in previous courses definitely provides a solid footing to make it a 1-2 credit class. If that is not an option, look into seeing if co-op or intern credit could be applied. Students who have not yet had experience in a professional environment could be enticed to participate just for the opportunity.

2. Reaching out to students who have previously taken the class.

3. Reaching out to community members or graduates who have project management backgrounds. The individuals may find it as an opportunity to give back to their community or Alma matter in a positive way. They are directly helping students learn and the consistent, timely feedback loops they can provide to students will only further their educational experience.
Conclusion

As business continues to grow on a global scale and projects increase in complexity but are allocated decreased resources it is critical that Project Management education in post-secondary education is up to date and relevant. By combining characteristics of agile planning and Stage/Gate® methodology, students are given the opportunity to learn the top trends for Project management and educators are able to maintain a sense of structure and continued opportune learning in the classroom. Applying this theory to Systems and Project Management Classes with a Service Learning Component helps students broaden their Project Management skills and community relationships. With the suggestions provided it is guaranteed that balanced opportunities and learning experiences will be provided for the educator, the students and the recipient of the service!

References

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Margaret Bates will receive her B.S. in Industrial Engineering and M.E. in Industrial and Systems Engineering from the Rochester Institute of Technology in May of 2015. While completing her first two years of higher education at Monroe Community College, Margaret was hired at Zeller Corporation to the electrical drafting team in her hometown of Rochester, NY. Since then, Margaret has held positions related to Lean Manufacturing and Project Management at Kamatics in Bloomfield, CT and RWG Frankenjura in Höchstadt, Germany.