A Structure for an Interactive
Project Management Course

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Abstract

Interactive, two components combined to make one word. Inter, meaning between, among, or involving individual elements. Active, meaning to cause motion or change, implying action. A project is composed of the proposal, the plan, the schedule, the budget, the performance measures, the status updates, the termination, and the audit. These are all key concepts covered in a project management course. Often, when taught, these elements of a project come across as being stagnant, stand-alone entities. In the real world, these topics are anything but static. For this reason a Project Management course should be interactive. The outcome of each element affects the outcome of the others. Proposals are updated and resubmitted. Plans are changed. Schedules are altered. Budgets are cut. Changes are made based on the status reports given, and so on. Teaching project management should be more than teaching the individual components of a project, it should also impress upon students the importance of the interactions among these components. A well-taught course should ensure that the students have an understanding of how to react to the changes so prevalent in the working world.

How is it possible to take a stagnant list of assignments and turn them into a dynamic, interactive experience? What changes need to be made to enhance the teaching of each stage of a project? How can the instructor show the interrelationships between the components? How can the instructor mimic the actions and changes prevalent in industrial projects? What activities does the instructor need to plan in order to show the relationship between the various elements of a project? This paper intends to provide readers with a structure for teaching an interactive Project Management course.

Introduction

In the business world today, with increased global competition and the continuing requirement for more complicated products and systems, the focus is increasingly on agility, quality, customer satisfaction, employee empowerment and teamwork. Many organizations are seeking ways to streamline their internal functions and implement productivity improvements. One of the techniques gaining more emphasis is project management. Project management provides the organization with the tools to meet the challenges of a complex project while ensuring that accountability and responsibility are clearly defined.

Each term, The University of Dayton offers a Project Management course, which the Engineering Technology Department requires of all its majors. The primary goal of this course is to familiarize Sophomore and Junior level students with the tools and techniques necessary to manage a project. The course also seeks to expose students to the real life complexities of managing a large-scale project. Students will use their project management skills in managing projects in other courses, notably the Senior Design capstone course. Project management concepts can be taught to students in a traditional lecture format, but unless the students have previously been involved in a project as a leader or member of a team, they tend to have trouble relating these concepts to the real world experiences soon they will be facing. These students tend to focus on completing the assignment rather than gaining insight into the complexities of managing a project. Demonstrating to students how good project management skills are required for a complex project pointed to the need to create an interactive environment in class.

When covering project proposals, selection, plans, control, auditing, and project termination, creating an interactive learning environment requires a course structure different from the traditional course. Instead of presenting the information to the students as stand-alone components, a structure was developed for an interactive experience that would simulate a project in the real world from start to finish. The simulated project developed involved creating a park for a local community. The requirements required included writing and presenting a project proposal, a detailed project plan, a mid-term project review, and a project audit at the completion of the term.

The structure of the course followed the same format with lectures and assignments in the following sequence:

- Lectures - characteristics and responsibilities of a Project Manager, the different organizational forms for managing project, conflict and negotiation, project initiation procedures and proposal documentation.
- Project teams were formed. The students chose their team members and Project Managers with some guidance from the instructor. Teams started preparation of their proposals.
- Lectures – requirements of a project plan, budgeting and cost estimating.
- Team oral and written presentation of their proposals.
- Lectures - scheduling and resource allocation.
- Team presentation of project plans.
- Lectures – monitoring and information systems and project control.
- Teams present project update reports.
- Lectures – project auditing and termination.
- Team oral and written final project presentations.

For each segment, students were expected to answer the following questions:

Project Proposals and Selection

What are the components of an effective project proposal?

When a variety of projects are competing for the same resources, how are projects selected?

How can we improve our project's chances of being selected?

Project Plan

What are the components of an effective project plan?

How is a project schedule prepared and where does it fit within the project plan?

Why is a project plan so important?

How is a project plan used to manage a project?

How are project budgets prepared?

Project Control

What is meant by project control?

How are projects controlled effectively?

How are project budgets used to control projects?

Project Auditing and Termination

How do we know that we did what we said we would do when we said that we would do it?

How do we know that we spent what we meant to spend and got what we meant to get with the money?

How is a project brought to a close?

Project Solicitation, Proposal, and Selection

To simulate the real world as much as possible, the project started with a solicitation for proposals from the fictional City of Clipton for the design and construction of a new recreational park encompassing 5 square acres. As with many real world requests for quotation, the solicitation document was intentionally left fairly open-ended in terms of specific expectations regarding costs, equipment, overall layout, etc. This was done to ensure creativity and diversity among the proposals submitted by the various student teams. The solicitation indicated that the successful proposer would be responsible for managing the project, including developing a detailed design and following through with construction. Requests for reports, status meetings, and audits, could be expected.

Each project team was required to respond to the solicitation with a formal proposal. All proposals included:

-a cover letter introducing the team and its proposal
-an executive summary of the proposal
-a summary of the technical details and requirements
-an overview of the implementation plan
-a summary of logistic support and administrative needs.

Students were required to submit both a written proposal and make a presentation to the

City of Clipton. Since having a project proposal selected is a key measure of success in the business world, each team's proposal was reviewed and either accepted or rejected. As with the real world, a significant potential for rejection or being out-bid existed. If the proposal was rejected as unsuccessful, the students could make the necessary corrections to their proposal and resubmit it. Reasons for rejecting proposals were varied and included: incomplete proposals, inadequate information, unrealistic proposals, etc.

Project Plan

Upon having their proposal accepted, the team received a communication indicating they needed to prepare and submit a master plan. Recognizing that the success or failure of a project often rests in the quality of the project plan, the detailed plan must show how they intend to successfully complete the park project requirements. The plan had to explain what it would take to do what they said they would do in their proposal. The project plan must include the following elements:
- a cover letter
- a table of contents
- an overview including the mission and the ultimate deliverables
- the specific objectives that support the mission
- the general approach including the technicalities of who, what, where, when, why, and how
- the contractual elements including specifics of how to meet contractual requirements
- a schedule including a Gantt chart showing the time needed to support each aspect of the plan
- the resources needed to support each aspect of the plan
- the personnel needed to support each aspect of the plan
- the evaluation measures necessary to monitor performance, cost and time
- the contingency plans for dealing with the unexpected
- an appendix providing related supporting documentation.

Project Update Report

Throughout projects in the real world, project managers provide interested parties with updates concerning the progress of the project toward completion. To simulate this in the classroom, after successfully preparing the project plan, the teams received a communication stating that their project was approximately 50% complete and the City of Clipton would like a formal report and presentation to update them on the status of their park.

Since no project is without its problems, the teams were notified shortly after that, that certain problems had surfaced. Simulating problems with a hypothetical project is not always easy to do. Throughout the term, the teams were provided with details of how their project was progressing. They also received notification of difficulties as they arose. In one instance, the teams were notified that the carpenters were not on-site as scheduled.

Further investigation revealed that the carpenters would not be available until they finished another job in several days time. The absence of the carpenters during this critical phase would delay completion of the entire project. The teams were asked to explore a variety of options including waiting on the carpenters to finish their current job, in which case the team would incur a liquidated damages penalty and lose goodwill with the City of Clipton. The team could also choose to hire additional carpenters from the union hall at an increased cost, or the team could develop their own approach to solving the problem. The teams had to quickly react to these problems, develop a solution and present that solution during the update presentation. This gives the simulation a real-life twist.

Project Completion and the Final Report

To signal that the project has come to an end, toward the end of the course, the teams received a communication that the City of Clipton would like to hold a final meeting closing the project. At this meeting, the team must submit a final report to be reviewed by the city managers. The report was to detail how the project was accomplished, what they had planned to do and what they actually did, what went right and what did not go as they had planned. The teams were also asked to discuss any lessons applicable to this or future projects that they learned from completing this project.

Besides detailing the events, activities, adventures, costs and timing of their project, the teams were required to utilize the evaluation measures they developed with their master plan to review their project. Emphasis was placed on the management issues they encountered and what they would change, along with suggestions for improvement, if they had to do a similar project in the future.

The report included:
      -project technical performance review detailing whether or not the team actually achieved what they had planned or what needed to be done differently
      -administration performance review discussing how administrative issues were handled
      -organizational structure describing the form of project organization the team used and the results of that choice
      -team member effectiveness commenting on the team's performance, synergism and chemistry
      -techniques of project management or how did the team manage the project
      -other issues that needed to be addressed.

The overall final report required the teams to organize all of the project reports and communiqués that were submitted during the term. This enabled the teams to review their overall project. At this time, any previous deficiencies in the project plan or later assignments were to be corrected. To assure accountability, teams submitted peer evaluations at each step of the process to assess their efforts and that of their peers on their project. The evaluations showed that with few exceptions, project responsibilities were fairly equally divided and carried out among the team members.

Future

This type of structured format using a single simulated project for all teams was first tested in the Fall Semester of 2002. In the following Winter 2003 term, five different types of projects were planned and run. Three of these five involved interaction with area industries to resolve issues within their plants. Future plans include further interaction with industry.

Conclusion

Project management is a powerful tool for managing complex projects and ensuring clear definition of authority and responsibility. Teaching the course in an interactive manner helps students relate to the real world complexities of managing a large project. By utilizing an interactive project in class, students developed key project management documents, presented them to the customer and reacted to problems associated with managing a project. Through the use of carefully created problems, the instructor was able to mimic the actions and changes prevalent in real world projects. This dynamic interactive experience took a static list of assignments and demonstrated the interrelationships between the components of a project.

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Biography

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