Course Name

Management of Software Development for Technology Executives

Course Objectives

Upon completion of this course the students will be able to

- Describe key processes for software acquisition, development and maintenance
- Select the most appropriate life cycle for a given development
- Estimate the effort, resources and time required to execute a project
- Understand the human and political considerations that ought to be weighted in steering a project

Course Description

The course will explore software development from a managerial perspective putting emphasis on the selection of appropriate development lifecycle for the problem at hand, estimating effort and development times, in understanding the unintended consequences of common project management actions within and across projects and challenges of outsourcing and working with distributed teams.

The course will start by explaining the overall software development process in terms of standard processes and how these processes are implemented in particular lifecycles, e.g., sequential, incremental, iterative. Among the criteria to select the most appropriate lifecycle we will consider goals specificity and technology readiness. The impact of new business models such as Software as a Service and Product Lines in the selection of lifecycle models will be explored.
The second theme of the course is estimation, because in the words of F. Brooks, one of the pioneers of the software engineering discipline, “More projects have gone awry for lack of calendar time than for any other reasons combined” and balancing ambitions with resources is an undeniable management responsibility.

Invariably, projects deviate from their original plans and need to be steered back onto course or redirected to take advantage of unforeseen opportunities. The problem is that projects are difficult to steer as they are characterized by time-lagged and time dependent responses to the project manager actions. So the third theme of the course is to present a framework to evaluate common project management actions such as requiring people to work longer hours, adding new personnel in the middle of a project and reducing scope.

Finally the course will address the challenges presented by global development and enterprise project management and take a look at project management office (PMOs) as a mechanism to coordinate the use of shared resources across the organization.

**Delivery strategy**

The course will consist of a series of lectures, with assigned readings prior to each class.

Student participation will be encouraged through the examination of two case studies, one individual and one group-based. The individual case will consist in the analysis of the MS Office Business Unit (OBU) case from Harvard Business School. The group case will consist on the analysis and presentation of the London Ambulance Case or the Ontario Integrated Justice System. Groups could propose to study a different project of their interest, provided that it is of a complexity similar to those proposed by the instructor.

**Grading**

Class participation: 10%
Questions on readings: 30%

   Five short assignments containing reading questions with only 4 taken in consideration

   If you submit more than 4, only the best 4 will be considered towards your final grade

   If you submit less than 4, the average will still be calculated dividing by 4

   No late submittals. No excuses. You administer your own time

Report on the group case: 30%

Term paper: 30%

Textbook

There is no required text. Readings will be made available through the Blackboard system.
<table>
<thead>
<tr>
<th>Class</th>
<th>Lesson</th>
<th>Topics</th>
<th>Purpose</th>
<th>Readings (before the class)</th>
<th>Notes</th>
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</table>
| 1     | Introduction | Course description, grading, participation, expectations. Group project depiction. | Establish a common vocabulary and an introduction to software development upon which the rest of the classes will build upon. | Notes from 12207 – E. Miranda  
Software Configuration Management for Project Leaders – T. Kasse and P. McQuaid |       |
| 2     | Development Phase Processes | Acquisition & supply processes  
Project processes  
Technical processes  
Organizational project enabling processes | Explain the purpose of the processes and good characteristics | The ROI from Software Quality - An Executive Briefing – Khaled El-Emam |       |
| 3     | Support Phase Processes | Software implementation processes  
Software support processes  
Software reuse processes | Explain the purpose of the processes and good characteristics | The ROI from Software Quality - An Executive Briefing – Khaled El-Emam |       |
| 4 | Process Improvement Frameworks | Project life cycles  
Stage gate development  
Selecting work approaches using the goals – methods matrix  
Software development methods: The V-Model, RUP, SCRUM | To provide and end-to-end view of a system development project. Explain project life cycles and their relation to risk. | Software Project Secrets - Why Software Projects Fail – Chapter 5, G. Stepanek, 2005  
V-Modell® XT, Bundesrepublik, Deutschland 2004  
The Problem Of Projects Of Differing Size And Skill Mix, Turner & Payne, 1997 |
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<td>5</td>
<td>PSP/TSP</td>
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| 6 | MS OBU | Analyze the decisions made at MS in the case of the development of the Office software suite. What went right? What went wrong? | Microsoft Corp.: Office Business Unit, Iansiti & Gii, HBR, 1990 | Guest speaker: Dave Root  
Group composition decided by the students. |
| 7 | Introduction to Project Management | Project governance and stakeholders  
The project team  
Political aspects | To describe the roles of the project manager and his/her team in the larger organizational context. | Understanding The Role Of Politics In Successful Project Management, J. Pinto, 1997  
<table>
<thead>
<tr>
<th></th>
<th>Introduction to project management</th>
<th>Impact of emerging trends in the development life cycle</th>
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<tbody>
<tr>
<td>8</td>
<td>Software as a service</td>
<td>Software as a Service Strategic Backgrounder, SIIA, 2001</td>
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<td></td>
<td>Product lines</td>
<td>Panel discussion</td>
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<td>Component-Based Development</td>
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<td>10</td>
<td>Estimating effort From effort to schedule</td>
<td>Estimation Politics Type of estimates Bottom-up estimation Function points Parametric models Fixed resources Fixed time Fixed scope Release planning</td>
<td>A presentation of techniques to measure the scope of the project and to establish the effort it will require to accomplish it.</td>
<td>Design By Deception: The Politics of Megaprojects Approval, B. Flyvbjerg, Harvard Design, 2005 Causes of Inaccurate Software Development Cost Estimates, Lederer &amp; Prassad, 1995</td>
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<tr>
<td>9</td>
<td></td>
<td>Explains how to deal with the triple constraint: resource, scope, time</td>
<td>Curve Fitting for a Model of Applied Research and Development Scheduling, P. Norden, 1958</td>
<td></td>
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| 10 | Process dynamics | Project Dynamics  
Corrective actions  
The impact of overtime  
Learning curves  
Multitasking – The learning forgetting cycle  
Rework cycle  
Adding a new member to the team  
Communications in small groups  
Project recovery | While is impossible to provides recipes for taking corrective actions there is a great deal of knowledge about the intended and the unintended consequences of commonly employed management actions. | THE $2,000 HOUR How Managers Influence Project Performance Through the Rework Cycle, K. Cooper, 1994  
The Role Of Feedback Dynamics In Disruption And Delay On The Nature Of Disruption And Delay (D&D) In Major Projects, Eden & Williams, 2000 |
|---|---|---|---|
| 11 | Monitoring & reporting | The GQM method  
Levels of measurement  
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Details</th>
<th>Notes</th>
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<tr>
<td>12</td>
<td>Global development Distributed development</td>
<td>Distributed development is possible due to advanced communications and economic conditions. Systems are developed across the globe. This class will explore issues arising from working across time zones.</td>
<td>Guest speaker</td>
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<td>Outsourcing</td>
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<td>13</td>
<td>Enterprise project management</td>
<td>Conflicts across multiple projects are explained, including resource balancing.</td>
<td>Notes On Multi-Project Management – E. Miranda, 2008</td>
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<td>The project office</td>
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<td>- Center of excellence</td>
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<td>- Consolidator</td>
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<td>- Executive</td>
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<td>Balancing organizational capacity with demand</td>
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<td>Project management information systems</td>
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<td>15</td>
<td>Presentation of chosen case</td>
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