Lectures and Seminars by Week

1: Subject Outline +
   Processes for Project Management – Planning
2: Project Management Tool
   Personal Software Process
3: Project Scheduling and Quality Assurance + quiz
5: Integrated and Collaborative projects + quiz
6: No lecture and no formal tutorials
7: Seminar – An invited speaker from industry
8: Subject Review
9: Exam

Tutorial Exercise: Schedule by week

1: No tutorials – look at documents at ~cs3710
2: Initial Planning of your mini-project
3: Work on design for Planning Module of the PM Tool
4: Deliver design for Planning Module of the PM Tool
5: Work on design for Monitoring Module of PM Tool
6: No formal tutorial – revise plan for your mini-project
7: Deliver design for Monitoring Module of PM Tool
8: Deliver Project Review, Design change exercise
9: No tutorials

Tutorial Exercise – Resource Changes

- If you were working alone on the Planning Module, you will work in pairs on the Tracking Module
- If you were working in pairs on the Planning Module, you will work alone on the Tracking Module
- Everybody needs to update their project plan to reflect this change in resources
- Everybody needs to record the impact of this change for the Project Review Report
Tutorial Exercise – Requirements Change

- The client has requested that **Change Management** functionality is added to the Project Management tool. This functionality will:
  - Provide the ability to analyse the impact of a change to a project
  - Automatically notify all project participants who are affected by the change.
- Add the necessary tasks to your project plan to implement the Design Changes
  - Eg Change the high-level DFD and the Data Storage Design
- **DO NOT CARRY OUT THE DESIGN CHANGES**
- Everybody needs to record the impact of this change for the Project Review Report

Feedback

- Some students are not providing any commentary and/or explanation on the data that they have entered into their MS Project plan
- Actions Required section of the Project Status Report
  - Is not an additional risk analysis section
  - Is a risk management section
  - Should relate to any Variation on Plan section
  - May contain “Actions Required” by your manager

Outline of this Lecture

1. INTEGRATED PROJECT MANAGEMENT FOR IPPD (Integrated Product and Process Development)
2. COLLABORATIVE PROJECT MANAGEMENT

Integrated Project Management

The CMMI Reference Model
Capability Maturity Model Integration
Reference

Capability Maturity Model® Integration (CMMI), Version 1.1, for Systems Engineering and Software Engineering (CMMI-SE/SW, V1.1) Continuous Representation. CMU/SEI-2002-TR-001, ESC-TR-2002-001
http://www.sei.cmu.edu/cmmi/

A CMMI Process Area Definition

- Purpose
- Introductory Notes
- Related Process Areas
- Specific Goals
- Generic Goals – what you need to achieve to be assessed at a particular capability maturity level
- Practice-to-Goal Relationship Table
- Specific Practices by Goal
- Generic Practices by Goal – what you need to do for a particular capability maturity level

CMMI Project Management Process Areas

<table>
<thead>
<tr>
<th>Project Planning</th>
<th>Configuration Management</th>
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<tbody>
<tr>
<td>Project Monitoring and Control</td>
<td>Product and Process Quality Assurance</td>
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<tr>
<td>Measurement and Analysis</td>
<td>Decision Analysis and Resolution</td>
</tr>
<tr>
<td>Risk Management</td>
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<tr>
<td>Integrated Project Management</td>
<td>Organizational Process Focus</td>
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<tr>
<td>Supplier Agreement Management</td>
<td>Organizational Process Definition</td>
</tr>
<tr>
<td>Data Management</td>
<td>Organizational Process Performance</td>
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<tr>
<td>Quantitative Mgmt of Quality and Process</td>
<td>Causal Analysis and Resolution</td>
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<tr>
<td>Organizational Training</td>
<td>Org Process Technology Innovation</td>
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<tr>
<td></td>
<td>Process Innovation Deployment</td>
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</tbody>
</table>

Why “CMM Integrated?”

- CMMI more explicitly links management and engineering activities to business objectives
- Expands the scope of and visibility into the product life cycle and engineering activities
  - To ensure that the product or service meets customer expectations
- Incorporates lessons learned from additional areas of best practice
  - Eg measurement, risk management, and supplier management
- Implements more robust high-maturity practices
- Addresses additional organizational functions critical to its products and services
- More fully complies with relevant ISO standards
There used to be many CMMs

- Capability Maturity Model for Software (SW-CMM)
- Systems Engineering Capability Maturity Model (SE-CMM)
- Integrated Product Development Capability Maturity Model (IPD-CMM)
- People CMM

Recognition of the Business Context for CMM users

Large-scale projects requiring integration of multiple skills e.g. defence, aerospace, telecommunications
Principles scale-down to smaller projects

Sydney Water – Customer Information and Billing System (CIBS)

- An example of an Integrated Project
  - CIBS was Sydney largest IT project
    - Initial budget $38.2 million, delivery Feb 2002
    - Final budget of $60 million, delivery Mar 2003
  - Project terminated in October 2002
  - Sydney Water had spent approximately $61.0 million up to project termination and another $18.6 million on related CIBS hardware and software.
  - Little was implemented

Auditor-General Review of CIBS

- The review covers Sydney Water’s performance in relation to:
  - project governance
  - project specification, interface with users, project management
  - selection of suitable contractor
  - cost estimation
  - risk management.
Sydney Water’s customer information and billing system (CIBS) project was intended to:
- Improve service to customers,
- Fill gaps in existing information systems and
- Provide business efficiencies.

The project required the solution to be integrated with 12 existing major internal business systems and over 60 external party interfaces.

Sydney Water contracted PwC in June 2000 to build and implement CIBS.

Project planning and specifications were inadequate:
- Contributing to many change requests and significant additional costs and delays.
- The business case supporting CIBS was not updated for substantial changes in costs and benefits
- The project team lacked certain skills to do the job
- Sydney Water recognised that it needed a business improvement process, but during the project it reverted to only implementing a computer system.
- There was poor communication between the project team and the Customer Services Division.
  - This greatly weakened the project.

More Findings
- The project was approved without a corporate information technology strategy.
  - Once Sydney Water developed this strategy, it was found that the CIBS computer architecture was not compatible.
- An integrated project plan was not maintained during the project.
- Testing was neither timely nor comprehensive.
- There was a belief in SW that IT projects of this nature and complexity would inevitably go over budget and be delayed.
- The involvement and accountability of some internal service providers was lacking.
- The review of CIBS was restricted in some areas because Sydney Water was unable to provide relevant documentation.
  - A poor records management system exists in relation to CIBS.

PwC led the Successful Consortium
- The core package came from the UK-based vendor, Severn Trent Systems (STS)
- PwC was responsible for integrating the package
  - $29.4 million paid to PwC, $8.6 million to other parties
- Sydney Water staff were seconded to the project
- Other organisations were contracted to provide specific services
  - Eg Training for User Acceptance Testing
- SW Internal Divisions also participated eg Customer Services Division.
Integrated Project Management

The process that was appropriate to the CIBS project

Purpose

- The purpose of Integrated Project Management is to establish and manage the project and the involvement of the relevant stakeholders
  - According to an integrated and defined process that is tailored from the organization’s set of standard processes.
- For Integrated Product and Process Development, Integrated Project Management also covers
  - The establishment of a shared vision for the project
  - A team structure for integrated teams that will carry out the objectives of the project.

Introductory Notes

- Establishing the project’s defined process by tailoring the organization’s set of standard processes
- Managing the project using the project’s defined process
- Using and contributing to the organizational process assets
- Enabling relevant stakeholders’ concerns to be identified, considered, and, when appropriate, addressed during the development of the product
- Ensuring that the relevant stakeholders perform their tasks in a coordinated and timely manner
  - To address product and product-component requirements, plans, objectives, issues, and risks;
  - To fulfill their commitments; and
  - To identify, track, and resolve issues

The Defined Process

- The organization’s set of standard processes is tailored for the project and called the project’s defined process
- Managing the project’s effort, cost, schedule, staffing, risks, and other factors is tied to the tasks of the project’s defined process
- The defined process addresses the coordination of all activities associated with the project including:
  - Technical activities such as requirements development, design, and verification
  - Support activities such as configuration management, documentation, marketing, and training
The Concept of Stakeholders

- The working interfaces and interactions among relevant stakeholders internal and external to the project are planned and managed to ensure the quality and integrity of the entire product
- Relevant stakeholders participate, as appropriate, in defining the project’s defined process and the project plan
- Reviews and exchanges are regularly conducted with the relevant stakeholders and coordination issues receive appropriate attention
- Reviews and exchanges are regularly conducted with the relevant stakeholders to ensure that coordination issues receive appropriate attention and everyone involved with the project is appropriately aware of the status, plans, and activities
- In defining the project’s defined process, formal interfaces are created as necessary to ensure that appropriate coordination and collaboration occurs.

Specific Goals

SG 1 Use the Project’s Defined Process
   The project is conducted using a defined process that is tailored from the organization’s set of standard processes.

SG 2 Coordinate and Collaborate with Relevant Stakeholders
   Coordination and collaboration of the project with relevant stakeholders is conducted.

SG 3 Use the Project’s Shared Vision for IPPD
   The project is conducted using the project’s shared vision.

SG 4 Organize Integrated Teams for IPPD
   The integrated teams needed to execute the project are identified, defined, structured, and tasked.

SG 1 Use the Project’s Defined Process (contd)

SP 1.1-1 Establish the Project’s Defined Process
   - Consists of defined processes that form an integrated, coherent life cycle for the project

SP 1.2-1 Use Organizational Process Assets for Planning Project Activities
   - Assumes that there are organisational process assets and a measurement repository
   - Estimating and planning are based on the tasks and work products of the project’s defined process and use the organisation’s experience and processes

SP 1.3-1 Integrate Plans
   Extends the specific practices for establishing and maintaining a project plan to address additional planning activities such as
   - incorporating the project’s defined process
   - coordinating with relevant stakeholders
   - using organizational process assets
   - incorporating plans for peer reviews, and
   - establishing objective entry and exit criteria for tasks
SG 1 Use the Project’s Defined Process (contd)

- Integrated Plans
  - Quality assurance plans
  - Configuration management plans
  - Risk management strategy
  - Documentation plans
- Identify and analyze product and project interface risks
  - Incomplete interface descriptions
  - Unavailability of tools or test equipment
  - Availability of COTS components
  - Inadequate or ineffective team interfaces

SG 1 Use the Project’s Defined Process (contd)

- Ensure that the project plan is appropriately compatible with the plans of relevant stakeholders
  - Typically the plan and changes to the plan will be reviewed for compatibility
- For Supplier Sourcing
  - Ensure that the plans for the integrated supplier management process are compatible with related plans
- Identify how conflicts will be resolved that arise among relevant stakeholders

SG 2 Coordinate and Collaborate with Relevant Stakeholders

SP 2.1-1 Manage Stakeholder Involvement
- Coordinate with the relevant stakeholders who should participate in the project’s activities
- Ensure that work products that are produced to satisfy commitments meet the requirements of the recipient projects
- Develop recommendations and coordinate the actions to resolve misunderstandings and problems with
  - The product and product-component requirements,
  - Product and product-component architecture, and
  - Product and product-component design

SG 2 Coordinate and Collaborate with Relevant Stakeholders (contd)

SP 2.2-1 Manage Dependencies
1. Conduct reviews with relevant stakeholders.
2. Identify each critical dependency.
3. Establish need dates and plan dates for each critical dependency based on the project schedule.
4. Review and get agreement on the commitments to address each critical dependency with the people responsible for providing the work product and the people receiving the work product.
5. Document the critical dependencies and commitments typically includes:
   - Describing the commitment
   - Identifying who made the commitment
   - Identifying who is responsible for satisfying the commitment
   - Specifying when the commitment will be satisfied
   - Specifying the criteria for determining if the commitment has been satisfied
6. Track the critical dependencies and commitments and take corrective action as appropriate
SG 2 Coordinate and Collaborate with Relevant Stakeholders (contd)

SP 2.3-1 Resolve Coordination Issues
1. Identify and document issues.
2. Communicate issues to the relevant stakeholders.
3. Resolve issues with the relevant stakeholders.
4. Escalate to the appropriate managers those issues not resolvable with the relevant stakeholders.
5. Track the issues to closure.
6. Communicate with the relevant stakeholders on the status and resolution of the issues

SG 3 Use the Project's Shared Vision for IPPD

- The purpose of creating a shared vision is to achieve a unity of purpose
- Requires that all people in the project have an opportunity to speak and be heard about what really matters to them
- The shared vision captures the guiding principles, mission, objectives, expected behaviour, values
- People understand and can adopt the principles to guide their actions and decisions

SG 4 Organize Integrated Teams for IPPD

- Create an integrated team structure that will efficiently meet the project’s requirements and produce a quality product
- The integrated team structure partitions responsibilities, requirements, and resources to teams so that the right expertise and abilities are available to produce the assigned products.
- The integrated teams are organized to facilitate communications between teams and to reflect interfaces between product components.
- Organizing integrated teams to realize IPPD requires care and deliberation
- As the project evolves, integrated team structures are re-evaluated for continued applicability
- An interface should be specified whenever:
  - two teams share responsibility for a general requirement of the product
  - one team produces a work product that will be used by another

Collaborative Project Management

A new model for getting things done
A number of interests share a common vision of “The System”

- Stakeholders
  - Collaborators contribute work
  - Funding agencies contribute money
  - Users interact with “The System”, voluntarily or otherwise
  - Share the benefits of the system
  - Share the risks
- Systems Integrator has semi-autonomous clients
- Collaborators
- Funding agencies
- Contractors & Suppliers have a contractual relationship
Requirements for Collaborative Projects

- Support the sharing of mutual knowledge amongst participants
- Support consultation between participants
- Ensure a fair distribution of workload and risks
- Actively work to:
  - Reduce project uncertainty
  - Identify and manage project risks
  - Increase mutual trust and commitment to the project
  - Minimise coupling between participants’ project activities
- Exploit the common factor of participants’ IT
- Capture experience and support learning
- Support traceability between project objectives and project activities
- Support maximum autonomy for participants in their assigned area of responsibility

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Lecture 5 – The End

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