COMPUTER SCIENCE AND INFORMATION TECHNOLOGY RMIT University

# Software Engineering Project Management

## Chapter 11: People and Culture, Project Termination

Up | Site Map

Learning objectives text.

## Course Materials

### Online Course Material

Please select a subtopic to view its contents.


People and Culture in organisations

SWEBOK and ITIL

Project Termination


## Additional Materials

There are no additional materials available at this time.

Up | Site Map

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# Software Engineering Project Management

## Chapter 11: People and Culture, Project Termination

Up | Site Map

## People and Culture in organisations

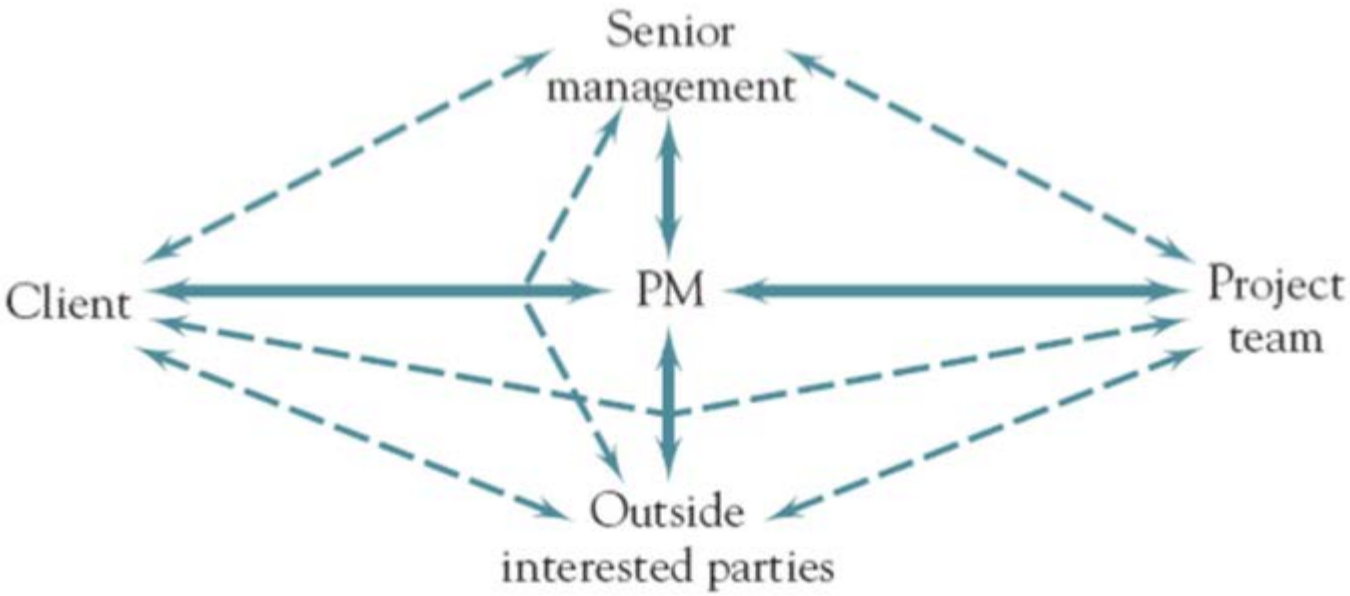
### Learning outcomes

- Upon completion of this lecture you should be able to:
  - understand the overall role of a project manager
  - basic understanding of SWEBOK and ITIL and
  - understand Project Termination phase

### The Project Manager's Roles

- Facilitator
  - Facilitator versus supervisor
    - Must ensure that those working on project have the appropriate knowledge, resources, and time to accomplish their responsibilities
  - Systems approach
    - Must understand how everything impacts the overall project
- Communicator
  - Must communicate effectively with the various stakeholders of the project

### Communication Paths for a Project Manager




### Virtual Project Manager

- More and more often, project teams are geographically dispersed
  - "Often referred to as “virtual projects
  - "Much of the communication is conducted via email, through websites, by telephone, or video conferencing

To succeed, communication between project manager and project team must be frequent, open, and two-way

## Responsibility to Senior Management

- Must keep senior management up to date on the state of the project
- Particularly important to keep management informed of any problems
  - Or any likely to affect the project in the future
- Never let the boss be surprised

## Responsibility to the Client

- The project manager is also responsible to the client
- Clients often want changes to the project
  - Cost, schedule, scope change
  - Cost of changes often exceed client's expectations
- Project manager must be certain the client understands the impact of the changes on the project's goals of delivery time, cost, and scope

## Responsibility to Project Team

- Facilitate the work of the team
- Help the team succeed
- Serve as advisor, counselor, confessor, and interested friend

## The Project Manager's Responsibilities to the Project

- Acquiring resources
  - It is the project manager's responsibility to ensure the project has the appropriate level of resources
  - This is especially difficult with human resources
- Fighting fires and obstacles
  - Early obstacles linked to need for resources
  - Later fires associated with technical problems, supplier problems, and client problems

## Skills of Persuasion

- Effective persuaders must be credible to those they are trying to persuade
- Effective persuaders must find goals held in common with those being persuaded
- Effective persuaders must use "vivid" language and compelling evidence
- Effective persuaders must connect with the emotions of those they are trying to persuade

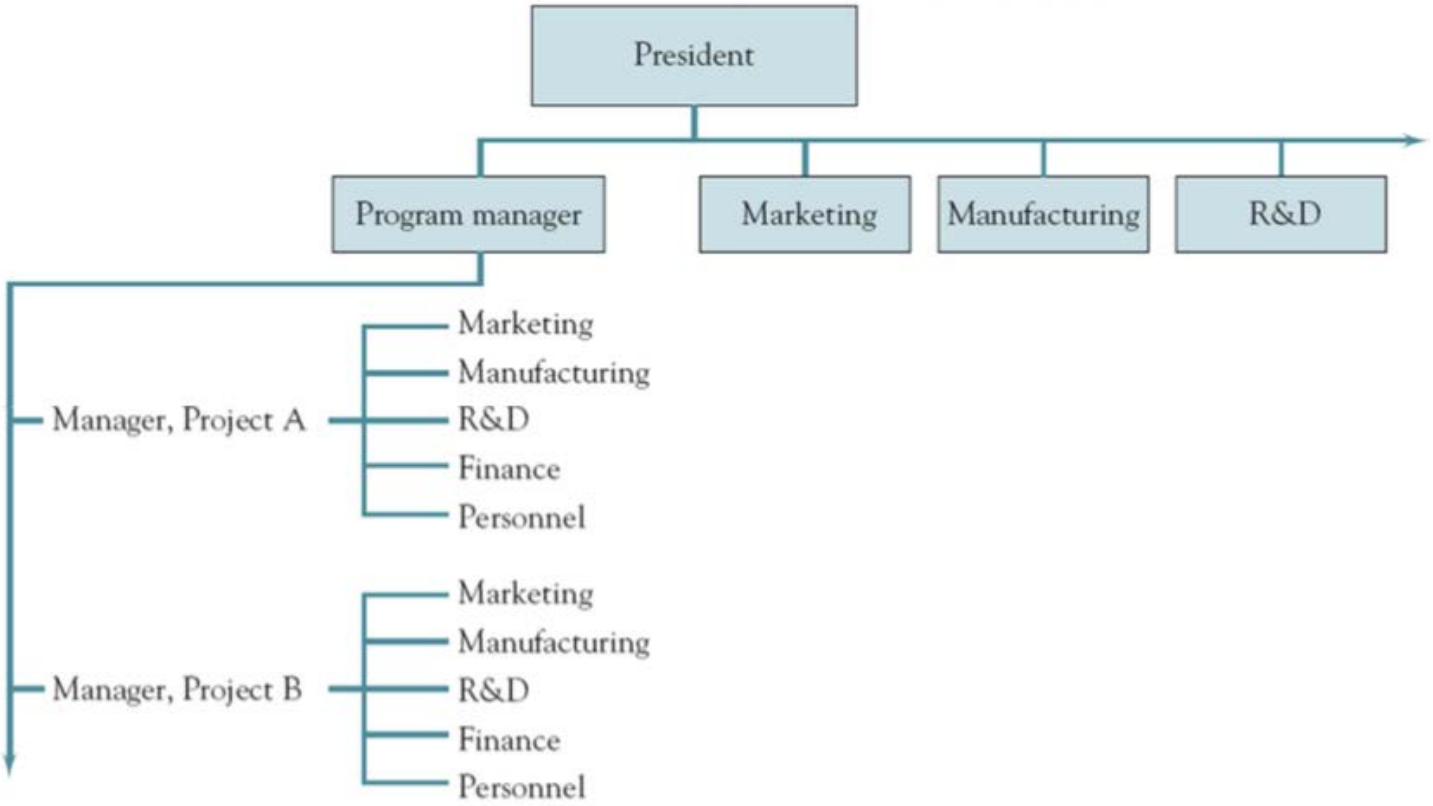
## Growing Importance of Multicultural Projects

- Project managers have to be aware of cultural differences between countries
- Common practice in one country may be illegal in another
- Discovering another culture's ethical standards is difficult
- Project managers have to be trained to the highest ethical standards

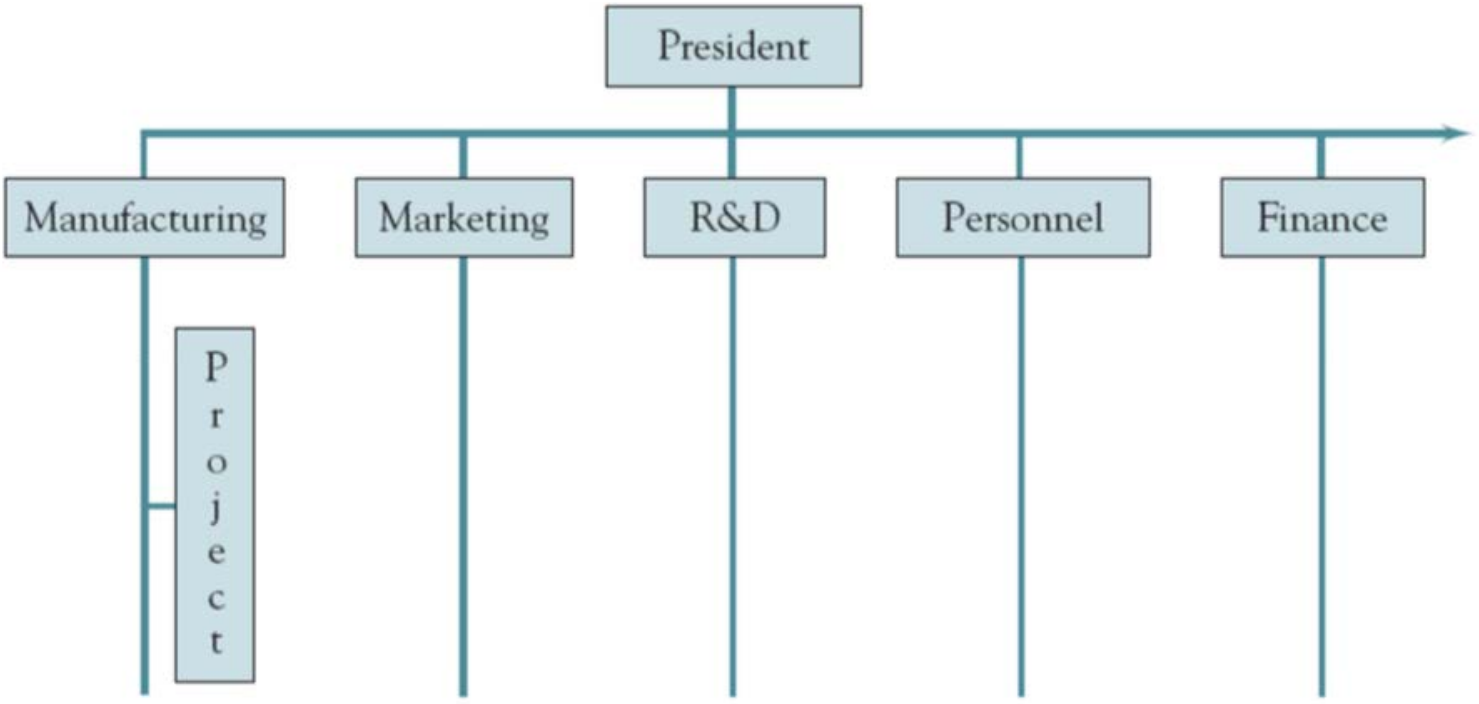
## Career Path for the Project Manager

- Starts with work (not as manager) on a small project
- Moves on to larger projects
- Moves on to a project engineer or deputy project manager
- Project manager for a small project
- Moves on to larger projects
- May manage a "megaproject"

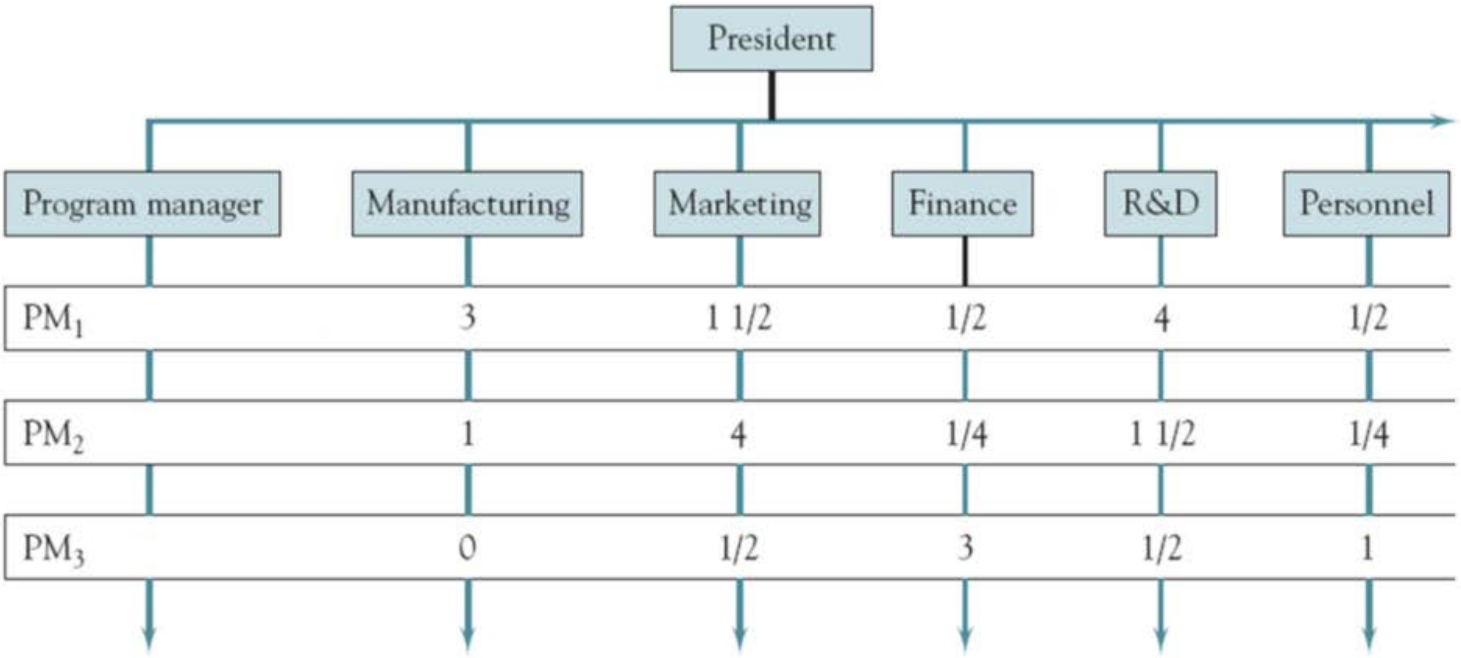
## Pure Project Organization



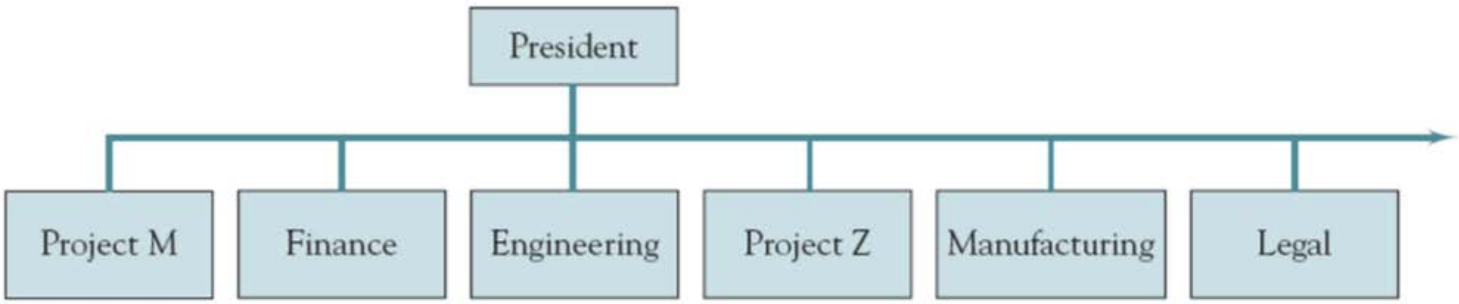

## Functional Project Organization




## Matrix Project Organization




## Mixed Organizational Systems




## The Project Management Office and Project Maturity

- Another way of solving some of the problems of choosing an organizational form for projects
- Parent organization can set up a project management office (PMO) like a functional group
  - It can handle the budgeting, scheduling, reporting, scope, compliance with corporate governance, and risk management activities
  - The functional units supply the technical work
- The PMO often serves as a repository for project documents and histories

## The Project Team

1. They must be technically competent
2. Senior members of the project team must be politically sensitive
3. Members of the project team need a strong problem orientation
4. Team members need a strong goal orientation
5. Project workers need high self-esteem

## Matrix Team Problems

- The smaller the project, the more likely it is to be organized as a weak (functional) matrix
- As a result:
- Project manager may have no direct reports
  - Ability to communicate directly with team members will be critical

    - Important to maintain good morale ... since team loyalty may be limited
- A project "war room" may be helpful 5

## Matrix Project Teams and Unusually Difficult to Manage

- Such teams are seen by their members to be temporary
    - So, the tendency to develop team loyalty is limited
- The technical specialists working on the teams are often perfectionists
    - Have a strong desire to keep tinkering with a project deliverable that already meets requirements
- Project teams can cause scope creep
- High levels of conflict

## Intrateam Conflicts

- Matrixprojectshavelotsofconflict
- Sourcesofconflictdifferswhentheprojectis
- in different stages of its life cycle
- Fourcommonthreadsforreducingor preventing these conflicts
    1. Careful project planning
    2. Participative management
    3. Interaction and negotiation between the project manager and the functional manager
    4. Communication between the project manager and all project stakeholders

## Multidisciplinary Teams-Balancing Pleasure and Pain

- Using multidisciplinary teams on projects raises serious problems for the project manager
    - A.k.a. transdisciplinary teams
- Managing the way these groups work together is called interface coordination "Arduous and complicated
- Coordinating the work of these groups is called integration management
    - Arduous and complicated

## Five Dysfunctions of a Team

1. Absence of trust
2. Fear of conflict
3. Lack of commitment
4. Avoidance of accountability
5. Inattention to results

## Comments on Empowerment and Work Teams

1. Teams generate high-quality solutions to appropriate problems
2. Micromanagement is avoided
3. The team is given accountability for some part of the project deliverable
4. Synergistic solutions are frequent
5. The PM has a tool for timely team evaluation and feedback

## Six Signs of Excessive Stress in the Workplace

1. Inability to switch-off work issues
2. Disturbed sleep
3. Lack of pleasure in non-work-related leisure activities
4. Difficulty concentrating or making decisions
5. Tendency to anger quickly
6. Lack of energy

## Ways to Keep Stress Under Control

1. Keep a journal
2. Prioritize all tasks
3. Give yourself time to unwind
4. Engage in after-work physical activities
5. Improve your physical surroundings
6. Become aware of the control you have

## Case Study discussion

1. Case 1: Samuel's approach to PM- Textbook- Page 70 (chapter 2)
2. Case 2: HeartTech, Inc. Textbook- Page 70 (chapter 2)

Up | Site Map

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# Software Engineering Project Management

## Chapter 11: SWEBOK and ITIL

Up | Site Map

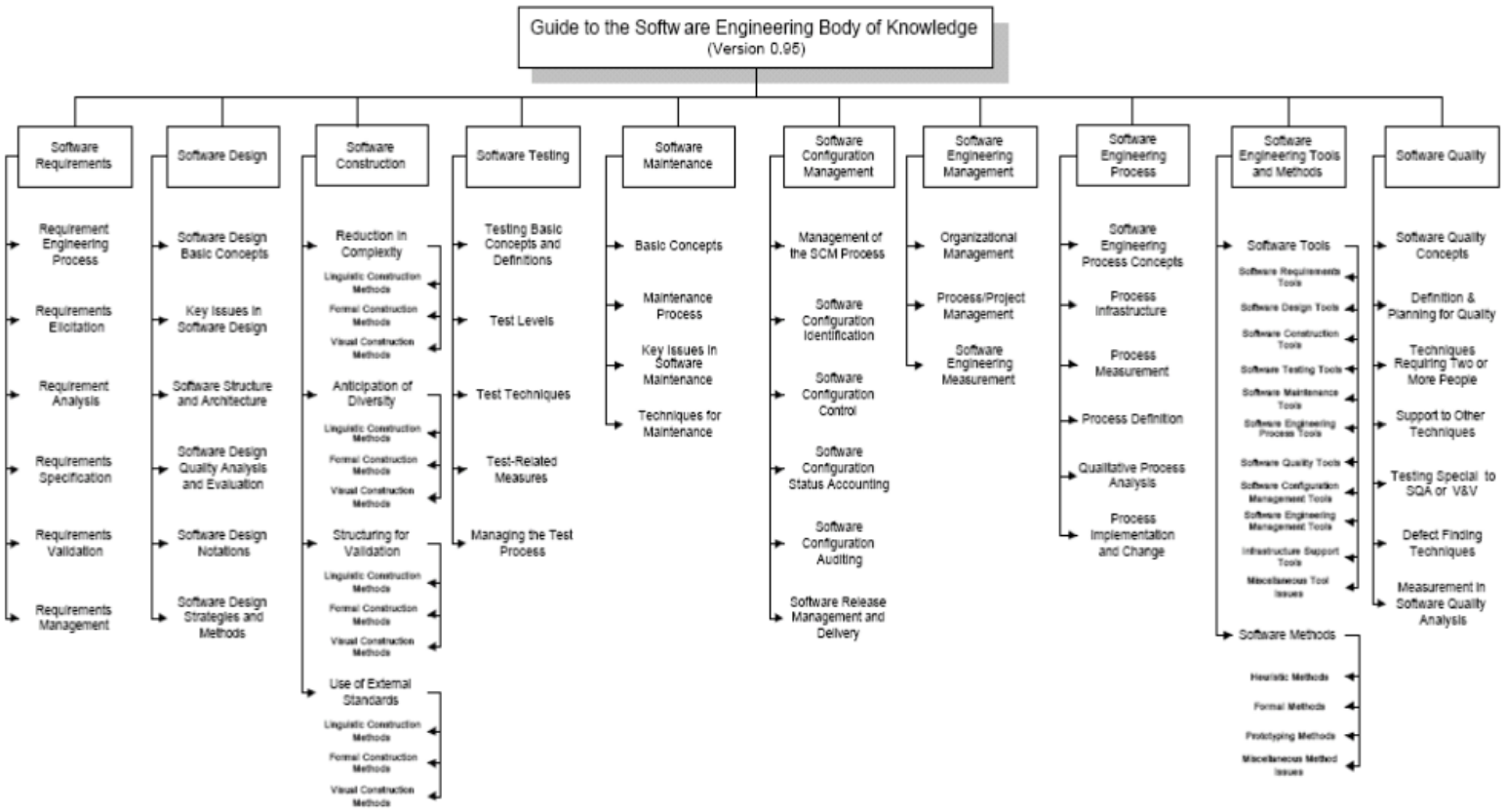
## SWEBOK and ITIL

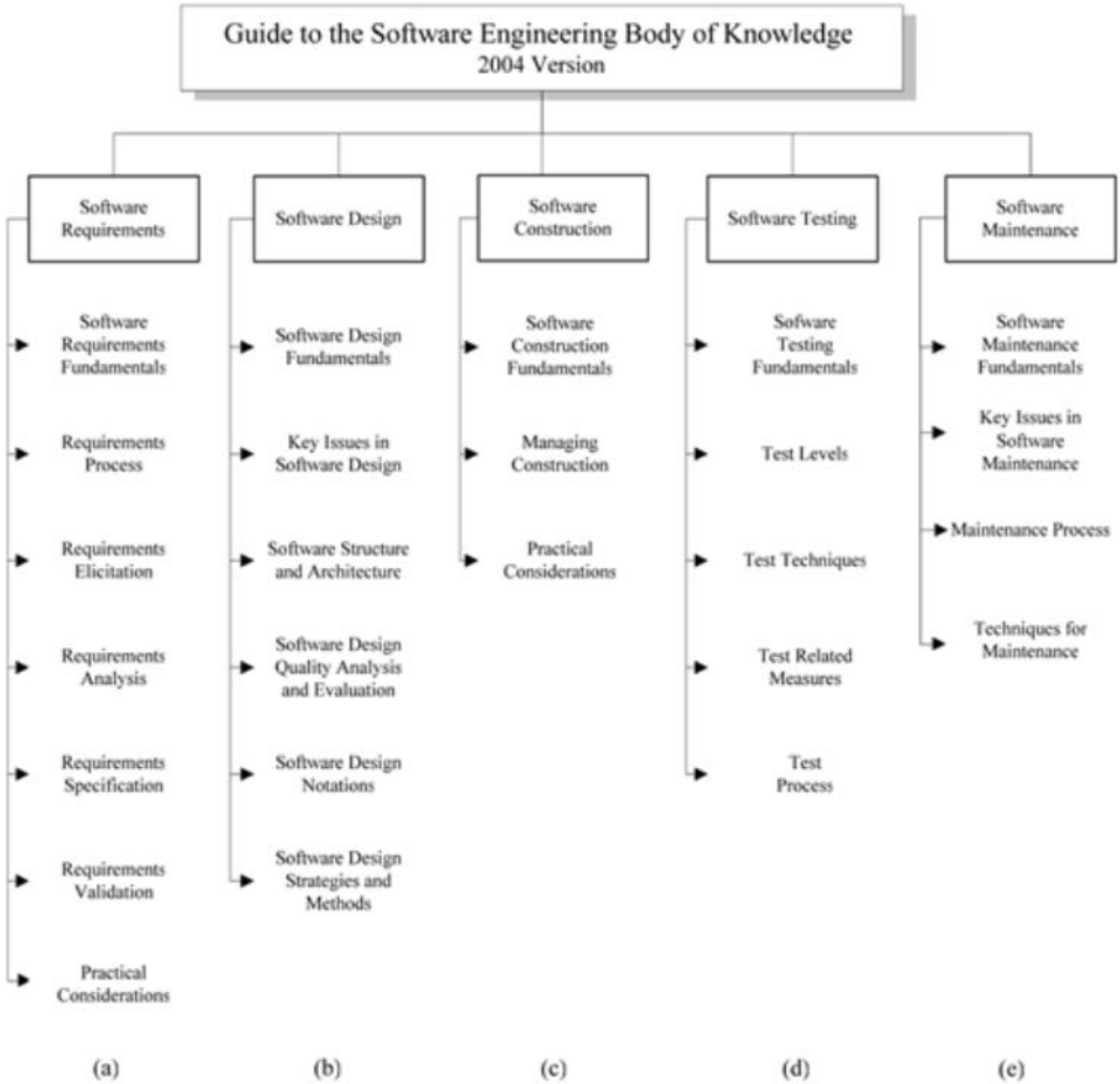
### SWEBOK®

- The Software Engineering Body of Knowledge is subdivided into ten software engineering Knowledge Areas (KA) plus an additional chapter providing an overview of the Knowledge Areas of strongly related disciplines.
- Scientists extend our knowledge of the laws of nature while engineers apply those laws of nature to build useful artefacts, under a number of constraints.
- The emphasis of the Guide to the SWEBOK is placed upon the construction of useful software artefacts.

### SWEBOK

- Software requirements
- Software design
- Software construction
- Software testing
- Software maintenance
- Software configuration management
- Software engineering management
- Software engineering process
- Software engineering tools and methods
- Software quality






## Software Maintenance

- The modification of a software product after delivery to correct faults, to improve performance or other attributes, or to adapt the product to a modified environment.
- Software life cycle processes essentially depicts maintenance as one of the primary life cycle processes, and describes maintenance as the process of a software product undergoing modification to code and associated documentation due to a problem or the need for improvement.
- The objective is to modify the existing software product while preserving its integrity.
- Modification requests are logged and tracked, the impact of proposed changes is determined, code and other software artefacts are modified, testing is conducted, and a new version of the software product is released. Also, training and daily support are provided to users.
- Maintenance has a broader scope, with more to track and control than development, preserving its integrity.
- Maintainers can learn from the developer's knowledge of the software. Contact with the developers and early involvement by the maintainer helps reduce the maintenance effort.
- In some instances, the software engineer cannot be reached or has moved on to other tasks, which creates an additional challenge for the maintainers.
- Maintenance must take the products of the development, code, or documentation, for example, and support them immediately and evolve/maintain them progressively over the software life cycle.
- Correct faults
- Improve the design
- Implement enhancements
- Interface with other systems
- Adapt programs so that different hardware, software, system features, and telecommunications facilities can be used
- Migrate legacy software
- Retire software
- Maintaining control over the software's day-to-day functions
- Maintaining control over software modification
- Perfecting existing functions
- Preventing software performance from degrading to unacceptable levels

## Software Maintenance Issues

- Trying to find a fault in software containing 500K lines of code that the software engineer did not develop is a good example.
- Similarly, competing with software developers for resources is a constant battle. (CAPEX and OPEX)
- Competing business priorities
- Planning for a future release, while coding the next release and sending out emergency patches for the current release, also creates a challenge.
- Understanding the organizational strategy
- Utilizing an effective maintenance framework

## ITIL

- Developed in the late 1980's, the IT Infrastructure Library (ITIL) has become the worldwide de facto standard in service management. Starting as a guide for UK Government, the framework has proved to be useful to organisations in all sectors through its adoption by many service management companies as the basis for consulting, education and software tools support.
- Being a framework, ITIL describes the contours of organising Service Management. The models show the goals, general activities, inputs and outputs of the various processes, which can be incorporated within IT organisations. ITIL focuses on best practice that can be utilised in different ways according to the need.
- IT Infrastructure Library can be used within organisations with existing methods and activities in Service Management. By emphasising the relationships between the processes, any lack of communication and co-operation between various IT functions can be eliminated or minimised.
- ITIL provides a proven method for planning common processes, roles and activities with appropriate reference to each other and how the communication lines should exist between them.

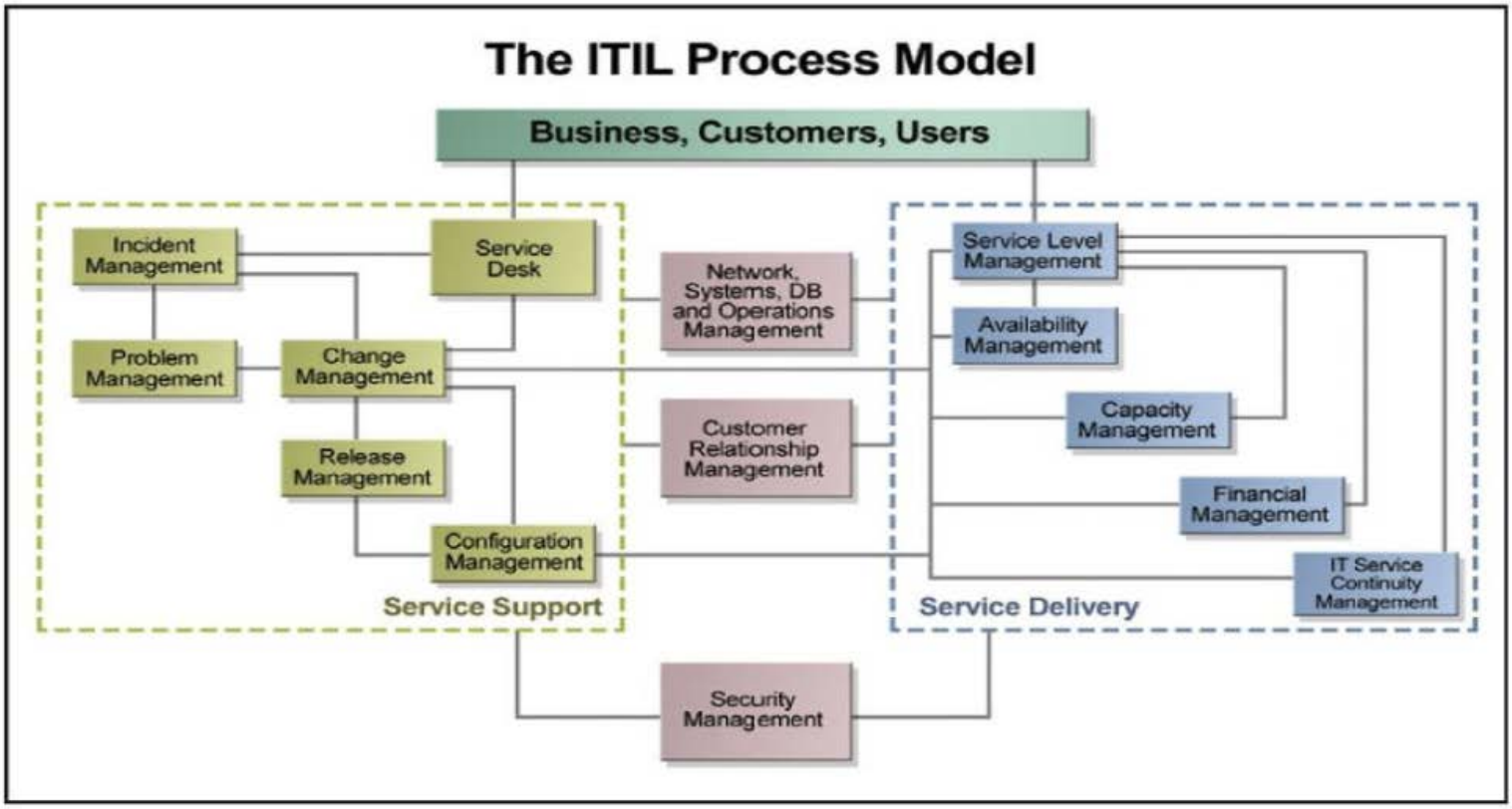
## Core ITIL Processes

- The planning, delivery and support of IT Services are divided into ten core processes within ITIL. These ten processes are distributed into two groups, one that focuses on Service Support and the other which focuses on Service Delivery.
- Service Delivery deals with the planning, realization, continuation of services, and optimising the cost performance of IT services
- Management of the IT services themselves, and involves a number of management practices to ensure that IT services are provided as agreed between the Service Provider and the Customer
- Service Support encompasses the operational processes that enable an IT organisation to implement a stable IT infrastructure
- The practice of those disciplines that enable IT Services to be provided effectively

## ITIL Core Processes

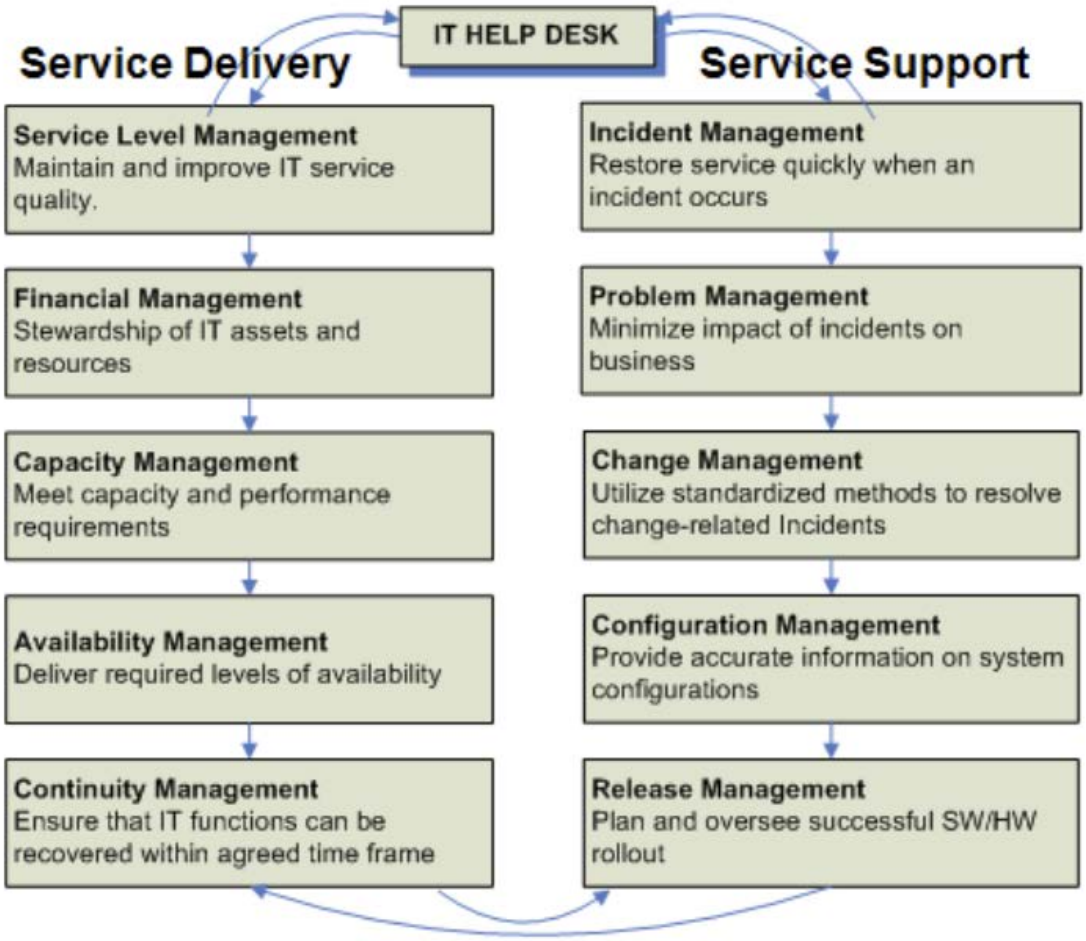
- Service Delivery
  - Service Level Management
  - Capacity Management
  - Financial Management for IT Services
  - Availability Management
  - IT Service Continuity Management
- Service Support
  - Configuration Management
  - Change Management
  - Release Management
  - Incident Management
  - Problem Management
  - Service Desk

## The ITIL Process Model




Additional Reference: ITIL Version 2, Office of Government Commerce (reproduced by Her Majesty's Stationary Office) © Crown Copyright.

## ITIL 2



## Management

- An incident is any event that is not part of standard procedure which causes an interruption to normal operations – objective is to restore operations with the least possible impact
- A problem is a condition as a result of a set of incidents – objective is to find the root cause
- A change is an event that results in a new set of operations or configuration items (Sware and Hware) – objective is for the change to be implemented with minimal disruption and high acceptance
- A release consists of new or changed Sware or Hware required to implement approved changes – objective is to plan, design, communicate and manage for ease of acceptance
- Configuration Management covers all the individual Configuration Items in a system (Sware and Hware – objective is to plan, control, monitor and manage

## Management

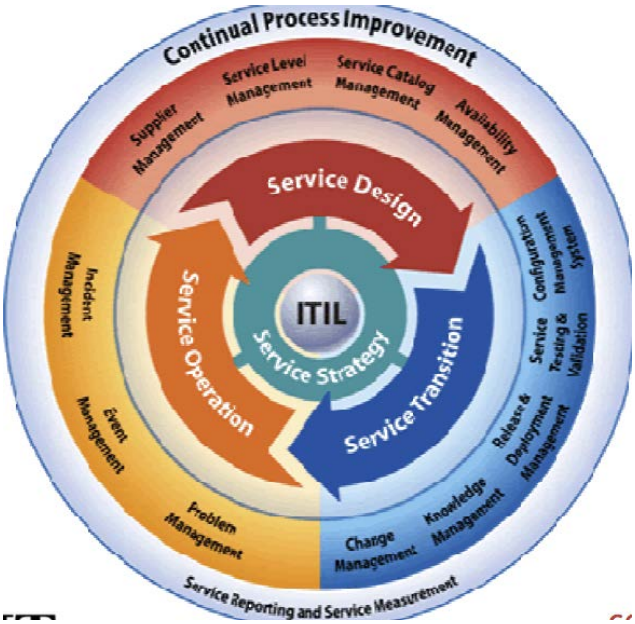
- Service Level Management includes Service Level Agreements (SLA) and Operational Level Agreements (OLA) – internal or external
- Capacity Management includes App sizing, workload mgt., demand mgt., capacity planning and resource management. – supports the optimum and cost effective provision of IT services
- Service Continuity Management includes plans and management of processes to recover should a serious incident occur – Disaster Recover Plans and Business Continuity Plans
- Availability Management includes reliability, maintainability, serviceability, resilience and security
- Financial Management includes infrastructure, ICT assets, procurement processes and management

## ITIL 3

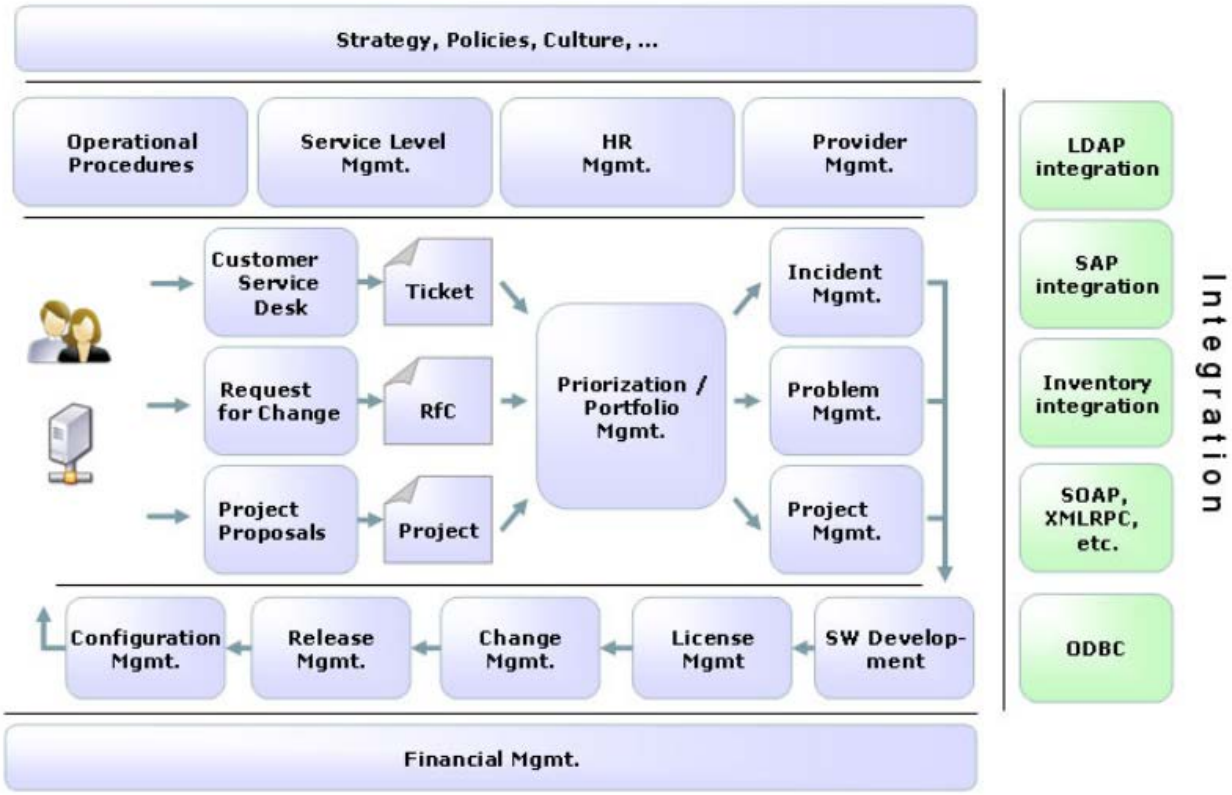
- The release of the new version of ITIL brought with it an important change of emphasis, from an operationally focused set of processes to a mature service management set of practice guidance.
- It also brought a rationalization in the number of volumes included in the set, which now comprises the following:
  - Service Strategy
  - Service Design
  - Service Transition
  - Service Operation
  - Continual Service Improvement

## Continual Service Improvement


## Continual Process Improvement




## IT Org / Process Structure




## Other Bodies of Knowledge

- Every profession is based on a body of knowledge and recommended practices, although they are not always defined in a precise manner.
- In many cases, these are formally documented, usually in a form that permits them to be used for such purposes as accreditation of academic programs, development of education and training programs, certification of specialists, or professional licensing.

Up | Site Map

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# Software Engineering Project Management

## Chapter 11: Project Termination

Up | Site Map

## Evaluating and Terminating the Project

### Evaluation

- Appraises the progress and performance of the project relative to...
    1. The initial or revised plan
    2. The goals and objectives set for it during the
- selection process
- Projects should be evaluated at key points in the project life cycle
- Purpose is to improve process of carrying out future projects

### Evaluation Criteria

- Criteria set by senior management
- Original criteria for selecting and funding project
- Success to-date
- Business/direct success
    - Such as the level of commercial success for external projects and reduced throughput time for internal projects
- Contribution to organization's goals
- Contribution to team member objectives

### Four Important Dimensions of Project Success

1. Efficiency in meeting the budget and schedule
2. Customer impact/satisfaction
3. Business/direct success
4. Future Potential

### Items to Consider for Project Evaluation Report Recommendations

- Communication with the client and senior management
- Locating opportunities for technological advances
- Reduction of indirect costs and direct costs
- Improving the project-management process
- Identification of risks in the organization’s use of projects
- Utilization of the skills resulting from project members’ work on projects
- Employment of general management experience gained by project managers
- Improving the organization’s use of projects
- Increasing the speed of obtaining results in projects

### Measurement

- Measuring performance against planned budgets and schedules
    - Relatively straightforward
- Measurement of actual expenditure and earned values
    - More complicated

### Project Auditing

- A special type of evaluation is the formal audit
  - Not a financial audit
  - Broader in scope and may deal with the whole or any part of the project
- A thorough examination of the management of a project, its methodology and procedures, its records, properties, inventories, budgets, expenditures, progress, and so on
- Broader than the traditional management audit

## The Audit Process

- The timing of the audit depends on the purpose
- An audit can be conducted at three levels:
  1. General: usually constrained by time and cost and limited to project essentials
  2. Detailed: initiated if the general audit finds something that needs further investigation
  3. Technical: usually performed by a team with technical skills

## Timing and Value of Project Audits

- Initiation
  - Very useful
  - Takes place early
- Feasibility study
  - Very useful, especially technical audit
  - Preliminary plan/schedule budget
- Very useful for setting measurement standards
- Master schedule
  - Less useful
  - Flexibility of team limited
- Evaluation of data by project team
  - Marginally useful
  - Team defensive
- Implementation
  - More or less useful
  - Depends on importance of project methodology to successful implement
- Post-project
  - More or less useful
  - Depends on applicability to future projects

## Typical Steps in a Project Audit

1. Familiarise the audit team with the requirements of the project
   - Including its basis for selection and any special charges by upper management
2. Audit the project on-site
3. Write up the audit report
4. Distribute the report

## To Ensuring an Effective Audit The Audit Team Must...

- Have free access to anyone with knowledge of the project
- Make sure the project team is aware of the audit
- Avoid judgmental comments
- Understand the politics of project team
- Confirm all information (wherever possible)
- Understand that project team members rarely trust auditors

## Form to Audit a Software Installation Project

DATA COLLECTION FORM

Date: _____ Auditor: _____

MANAGERIAL DATA:

Project: _____
Project manager: _____
Start date: _____
Due date: _____
•
•
•

FINANCIAL DATA:
Allocated budget, $: _____
Spent to date, $: _____
•
•
•

SCHEDULE DATA:
Scheduled time for work performed: _____
Actual time for the work performed: _____
•
•
•

TECHNICAL DATA:
% User involvement in design: _____
*User training, hours:*
-Planned: _____
-Completed to date: _____
*Software complexity*
-Lines of code: _____
-# Modules: _____
*Organizational complexity*
-# Department involved: _____
•
•
•

## The Audit Report

- Introduction
  - Description of project and its goals
- Current status
  - Comparison of work completed and planned
- Future project status
  - Conclusions regarding project progress
  - Recommendations for changes for subsequent projects
- Critical management issues
  - Issues senior management should monitor
- Risk analysis and risk management
  - Potential for project failure and monetary loss
- Final comments
  - Caveats, assumptions, limitations

## Project Termination

- Every project is terminated
  - Quickly or slowly
  - Referred to as project closure
- Way it is handled may have an impact on the success of the project
  - Will have a major impact on residual attitudes toward the project
- In some industries the teams remain relatively intact
- In other industries, project termination is similar to the breakup of a family

## When to Terminate a Project

- Is the organization willing to invest the time and cost required to complete the project
  - Given its current status and expected outcome
  - Assumes sunk costs are irrelevant
- The criteria commonly applied for deciding whether to terminate a project fall into two general categories
  1. The degree to which the project has met its goals
  2. The degree to which the project qualifies against a set of success factors

## Four Generic Factors Associated with Project Failure

1. A project was not required for this task in the first place
2. Insufficient support from senior management
   - Especially for unanticipated resources
3. Naming the wrong project manager
   - Often a person with excellent technical skills but weak managerial skills
4. Poor up-front planning

## Five Questions to Decide Which Projects to Continue

1. Which projects have a legal or strategic imperative?
2. Which projects are luxuries?
3. Which projects are likely to drive future revenue and growth?
4. Which projects best match our skill sets and strengths?
5. What are the risks to the business if we do not service the project's deliverables?

## Types of Project Termination

- Project Extinction
  - Project activity suddenly stops because it has been successfully completed or has a high expectation of failure
- Termination-by-addition
  - When an in-house project is successfully and is institutionalized as a new formal part of the organization
- Termination-by-integration
  - The output of the project becomes a standard part of the operating system of the sponsoring firm or the client
- Termination-by-starvation
  - Occurs when it is impolitic to terminate a project but its budget can be squeezed until it is a project in name only

## The Termination Process

- Decision should be made by a broad based committee of senior managers
  - Projects do not take kindly to being shut down
  - Shutting down an ongoing project is not a mechanistic process
- Termination process should be specified in project plan
- A termination manager should be appointed

## Project Personnel

- One of the more difficult jobs is the reassignment of project personnel
- In a functional organization, it usually entails a transfer back the parent department
  - When a large project is shut down, team members may be laid off
- In a pure project organization there may be more projects to which project personnel can be transferred
  - There is no "holding" area for personnel
  - As a result, layoffs are common

## Main Duties of the Termination Manager

- Ensure completion of the work
- Notify the client of project completion
- Ensure that documentation is complete
- Clear all accounts and invoicing
- Redistribute personnel, material, equipment ! Clear project with legal counsel
- Save records that need to be saved
- Project any support material
- Close project books

## The Project Final Report

- Project performance
  - What was achieved and reasons for resulting performance
- Administrative performance
  - Review of how well administrative practices worked
- Organizational structure
  - Identify modifications to help future projects
- Project teamwork
  - Team members who worked particularly well and very poorly
  - Confidential part of report
- Project management techniques
  - Recommendations for improvements in future projects

## References


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- ITIL and PRINCE2 - http://www.itil-itsm-world.com
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Up | Site Map