Project Management

Learning Objectives

- List the elements of a good project.
- Understand why so many IT projects fail to meet their targeted goals.
- Explain the relationship between time, scope, and cost of a project.
- Explain why Gantt charts are so popular for planning schedules.
- Define RAD and explain how it compares to the SDLC.

Real World Example

- Rural Payments Agency (RPA), UK, blamed poor planning and lack of system testing for delays in paying out 1.5billion pounds of EU subsidies.
 - Only 15% were paid out by the end of 2006.
- The RPA had to make substantial changes to the system post implementation.
- The system had not been properly managed.
 - Costs were at 122 million pounds, and were originally estimated at 46.5 million.

WHAT DEFINES A PROJECT

Project Definition

"[A] project is a temporary endeavor undertaken to create a unique product or service. Temporary means that every project has a definite beginning and a definite end. Unique means that the product or service is different in some distinguishing way from all similar products or services."

-Project Management Institute (1996)

Projects

- Companies use projects and operations to generate revenue.
- Projects are temporary endeavors that have a fixed start and stop date and time.
- Operations are ongoing, repetitive tasks that are performed until they are changed or replaced.
- Project managers may break projects into subprojects depending upon the work.
- Figure 11.1 show the differences between operational and project based work.

Characteristics	Operations	Projects
Labor skills	Low	High
Training time	Low	High
Worker autonomy	Low	High
Compensation system	Hourly or weekly wage	Lump sum for project
Material input requirements	High certainty	Uncertain
Suppler ties	Longer duration	Shorter duration
	More formal	Less formal
Raw Materials inventory	Large	Small
Scheduling complexity	Lower	Higher
Quality control	Formal	Informal
Information flows	Less important	Very important
Worker-mgmt communication	Less important	Very important
Duration	On-going	Temporary
Product or service	Repetitive	Unique
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Fig. 11.1 Characteristics of operational and project work

WHAT IS PROJECT MANAGEMENT

Project Management

- Project management is the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectation from a project.
- Involves continual trade-offs
- Manager's job manage these trade-offs.

Typical Project Management trade-offs

- Scope
 - Product and project
- Time the time required to complete the project
- Cost all the resources required to carry out the project.
- Cost vs. Quality
 - The quality of a system will normally impact its cost.
- Figure 11.2 shows the three sides of the project triangle.

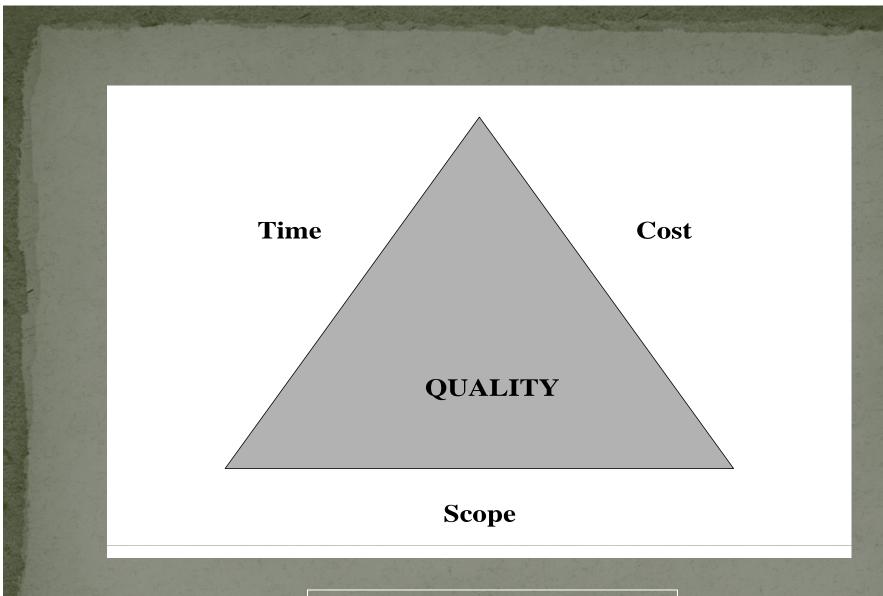


Figure 11.2 Project Triangle

Project Manager's Role

- The project manager will typically be involved in:
 - Ensuring progress of the project according to defined metrics..
 - Identifying risks.
 - Ensuring progress toward deliverables within time and resource constraints.
 - Running coordination meetings.
 - Negotiating for resources on behalf of the project.
- Business projects are often initiated because of a successful business case.
 - A successful project begins with a well-written business case (spells out components of the project).

PROJECT ELEMENTS

Essential Components

• There are four components essential for any project. Necessary to assure a high probability of project success.

<u>Common Project Vocabulary</u>: so all team members can communicate effectively (very important as many are

new).

Teamwork: to ensure all parts of the project come together effectively and correctly (make sure to clearly define the teams objectives).

 Project cycle plan: method and schedule to execute the project (Gantt charts, CPM, and PERT diagrams).

Project management is needed so that it is coordinated and executed appropriately

Project Cycle Plan

- The project cycle plan organizes discrete project activities, sequencing them into steps along a time line.
- Identifies critical beginning and ending dates and breaks the work spanning these dates into phases
- The three most common approaches are:
 - Project Evaluation and Review Technique (PERT) (Figure 11.3)
 - Critical Path Method
 - Gantt chart (Figure 11.4)
- Figure 11.5 provides detail on the project cycle template.

Requirements **Production Period** Deployment/ **Dissemination Period Definition** period **Investigation Task Force** Information Collection Draft **Publication** Distribution User Research Collection requirement concept planning and phase phase use report definition definition specification phase analysis phase phase Typical High Tech Commercial Business **Product Product** Product Product Engineer Internal Production Manufacturproposal developmodel test phase ing, sales & requirement definition phase support phase phase phase ment phase phase phase Generic Project Cycle Template User require-Concept System Acquisition Source Develo Verification Deployment or specificatio production phase ment definition planning selection pment phase definition n phase phase phase phase phase phase. Deactivate phase

Figure 11.5 Project cycle template

Elements of Project Management

- The following elements can be considered as managerial skills that influence a project's chance for success.
 - Identification of requirements
 - 2. Organizational integration
 - Team management
 - 4. Risk and Opportunity management
 - 5. Project control
 - 6. Project visibility
 - Project status
 - 8. Corrective action
 - Project leadership
- See figure 11.6 in the text for a description of each element
- Figure 11.7 reflects the inverse relationship between the players of a project.

More leadership Needed Less leadership Needed

Project Leadership

Project Management Process

No PM process
Team is new to PM process
Team does not value process

PM process exists
Team is fully trained in process
Team values process

Figure 11.7 Project leadership vs. project management process



- IT projects are a specific type of business project.
- IT projects are difficult to estimate.
- Many projects are measured in "man-months".
 - How many people will be required to complete the project in a specified time period.
 - Additional people may speed up the process (but may not).

IT PROJECT DEVELOPMENT METHODOLOGIES

Project Development Methodologies

- The choice of development methodologies and managerial influences distinguish IT projects from other projects.
- There are four main methodologies IT professionals use to manage the technology projects:
 - Systems Development Life Cycle (SDLC)
 - Prototyping
 - Rapid applications development (RAD)
 - Joint applications development (JAD)

Systems Development Life Cycle

SDLC typically consists of seven phases

- Initiation of the project
- 2. The requirements definition phase
- 3. The functional design phase
- 4. The system is actually built
- 5. Verification phase
- 6. The "cut over" where the new system is put in operation and all links are established
- 7. The maintenance and review phase

Limitations of SDLC

- Traditional SDLC methodology for current IT projects are not always appropriate:
 - Many systems projects fail to meet objectives because of the difficulty in estimating costs and each project is often so unique that previous experience may not provide the necessary skills
 - Objectives may reflect a scope that is too broad or two narrow so that the problem the system was designed to solve may still exist, or the opportunity that it was to capitalize upon may not be appropriately leveraged.
 - If the business environment is very dynamic, there may not be enough time to adequately do each step of the SDLC for each IT project

Prototyping

- SDLC may not work for all situations, requires a lot of planning and is difficult to implement quickly.
- Prototyping is a type of evolutionary development.
- Builds a fast, high-level version of the system at the beginning of the project.
- Advantages include:
 - User involvement and comment early on and throughout the development process.
- Disadvantages include:
 - Documentation may be difficult to write.
 - Users may not understand the realistic scope of the system.

System 3 Concept Version "1" Version "2" Version Software «N" Development **Process**

Figure 11.9 Iterative approach to systems development

RAD and JAD

- RAD (Rapid Application Development) is similar to the SDLC but it substantially reduces the time through reduction in steps (4 instead of 7).
- RAD, like prototyping, uses iterative development tools to speed up development:
 - GUI, reusable code, code generation, and programming, language testing and debugging
- Goal is to build the system in a much short time frame than normal.
- JAD (Joint Application Development) is a technique developed by IBM where users are more integrally involved throughout the development process.

Other Development Methodologies

- Agile development methodologies are being developed for those situations where a predictable development process cannot be followed.
- Examples include:
 - XP (Extreme Programming), Crystal, Scrum, Feature-Driven Development and Dynamic System Development (DSDM).
- Tend to be people rather than process oriented.
- DSDM is an extension of RAD used in the UK.
- Object Oriented (OO) development is becoming increasingly popular.

MANAGERIAL INFLUENCES

Technical Influences

- General managers face a broad range of influences during the development of projects.
- Four software tools are available to aid in managing the technical issues:
 - Computer-Aided Software Engineering (CASE) suite of tools
 - Software development library
 - Automated audit trail
 - Software metrics

Key Terms

- Below is a list of key terms that a general manager is likely to encounter:
 - Source lines of code (SLOC) is the number of lines of code in the source file of the software product.
 - **Source statement** is the number of statements in the source file
 - Function points describe the functional requirements of the software product and can be estimated earlier than total lines of code
 - Inheritance depth is the number of levels through which values must be remembered in a software object
 - Schedule slip is the current scheduled time divided by the original scheduled time
 - Percentage complete measures the progress of a software product in terms of days or effort

Managing Organizational and Socioeconomic Influences

- Balance goals of stakeholders
 - project manager
 - customer
 - end-user (there's a difference)
 - sponsor
- Sustain commitment
 - project
 - psychological (personal responsibility, biases)
 - social (rivalry, norms for consistency)
 - organizational (political support, culture)

MANAGING PROJECT RISK

Complexity

Factors influencing a project's complexity include:

- 1. How many products will this website sell?
- 2. Will this site support global, national, regional, or local sales?
- 3. How will this sales process interface with the existing customer fulfillment process?
- 4. Does the company possess the technical expertise inhouse to build the site?
- 5. What other corporate systems and processes does this project impact?
- **6.** How and when will these other systems be coordinated?

Clarity

- Clarity is concerned with the ability to define the requirements of the system.
- A project has low clarity if the users cannot easily state their needs or define what they want from the system.
- A project with high clarity is one in which the systems requirements can be easily documented and which do not change

Size

- Plays a big role in project risk
- A project can be considered big if it has:
 - Large budget relative to other budgets in the organization
 - Large number of team members (= number of man months)
 - Large number of organizational units involved in the project
 - Large number of programs/components
 - Large number of function points or lines of code

Managing Project Risk Level

- Large, highly complex projects that are usually low in clarity are very risky
- Small projects that are low in complexity and high in clarity are usually low risk
- Everything else is somewhere in between
- The level of risk determines how formal the project management system and detailed the planning should be
- When it is hard to estimate how long or how much a project will cost because it is so complex/clarity is so low, formal management practices or planning may be inappropriate

Managing the Complexity Aspects of Project Risk

Strategies that may be adopted in dealing with complexity are:

- Leveraging the Technical Skills of the Team such as having a leader or team members who have had significant work experience
- Relying on Consultants and Vendors as their work is primarily project based, they usually possess the crucial IT knowledge and skills
- Integrating Within the Organization such as having frequent team meetings, documenting, critical project decisions and holding regular technical status reviews

Managing Clarity Aspects of Project Risk

- When a project has low clarity, project managers need to rely more heavily upon the users to define system requirements
 - Managing stakeholders managers must balance the goals of the various stakeholders, such as customers, performing organizations and sponsors, to achieve desired project outcomes
 - Sustaining Project Commitment there are four primary types of determinants of commitment to projects

Pulling the Plug

- Often projects in trouble persist long after they should have been abandoned
- The amount of money already spent on a project biases managers towards continuing to fund the project even if its prospects for success are questionable
- When the penalties for failure within an organization are also high, project teams are often willing to go to great lengths to insure that their project persists
- Or if there is an emotional attachment to the project by powerful individuals within the organization

Gauging Success

- At the start of the project, the general manager should consider several aspects based on achieving the business goals.
- Care is needed to prevent a too narrow or too broad set of goals.
- It is important that the goals be measurable so that they can be used throughout the project to provide the project manager with feedback.

Four dimensions of success

- Four dimensions of project success:
 - Resource constraints: does the project meet the time and budget criteria?
 - **Impact on customers**: how much benefit does the customer receive from the project?
 - Business success: how high and long are the profits produced by the project?
 - Prepare the future: has the project altered the infrastructure of the org. so future business success and customer impact are more likely?
 - See Figure 11.12 in the text for more information.

The PMO

- Project Management Office (PMO) some companies create to boost efficiency, gather expertise, etc.
- Sarbanes-Oxley is a driver to create a PMO
- May lead to cost savings in the long run.
- PMOs can be expected to function in seven areas:
 - Project support; Project management process and methodology; Training; Project Manager home base; Internal consulting and mentoring; Project management software tools and support; Portfolio management.
- Responsibilities range widely.
 - Clearinghouse to full managing projects.
- Usually it mirrors the organization, culture and bureaucracy of the CIO's organization.

FOOD FOR THOUGHT: OPEN SOURCING

Food For Thought: Open Sourcing

- Linux, a version of Unix created by Linus Torvalds, is a world-class OS.
- Linux was built using the open-source model.
- Open-source software is really free software that can be modified by anyone since the source code is free.
- It is premised upon open and unfettered access to the code to modify, update, etc.

Open sourcing = Free Software

Offers four kinds of freedom for the software users:

- 1. The freedom to run the program, for any purpose
- 2. The freedom to study how the program works, and adapt it to your needs. Access to the source code is a precondition for this
- The freedom to distribute copies so that you can help your neighbor
- 4. The freedom to improve and release your improvements to the public, so that the whole community benefits. Access to source code is a precondition for this

Managerial Issues associated with Open Sourcing

- **Preservation of intellectual property** As its use cannot be restricted how are the contributions of individuals recognized?
- Updating and maintaining open source code –
 Because it is "open", difficult to achieve these
- Competitive advantage Since the code is available to all, hard to achieve competitive this
- Tech support The code may be free, but technical support usually isn't
- Standards As standards are open, open sourcing may be unable to charter a viable strategy for selecting and using standards

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