Chapter Four     Project Management

• Define the terms project and project management, and differentiate between project and process management.
• Describe the causes of failed information systems and technology projects.
• Describe the basic competencies required of project managers.
• Describe the basic functions of project management.
• Differentiate between PERT and Gantt charts as project management tools.
• Describe the role of project management software as it relates to project management tools.
• Describe eight activities in project management.
• Define project planning and its role in project management.
• Define scope and write a statement of work to document scope.
• Use a work breakdown structure to decompose a project into tasks.
• Estimate tasks’ durations, and specify intertask dependencies on a PERT chart.
• Assign resources to a project and produce a project schedule with a Gantt chart.
• Assign people to tasks and direct the team effort.
• Use critical path analysis to adjust schedule and resource allocations in response to schedule and budget deviations.
• Manage user expectations of a project and adjust project scope.

Chapter Map

Project, Project Management, and Process Management

Project – a [temporary] sequence of unique, complex, and connected activities having one goal or purpose and that must be completed by specific time, within budget, and according to specification.

Project management – the process of scoping, planning, staffing, organizing, directing, and controlling the development of an acceptable system at a minimum cost within a specified time frame.

Process management – the activity of documenting, managing, and continually improving the process of systems development.

Measures of Project Success

– The resulting information system is acceptable to the customer.
– The system was delivered “on time.”
– The system was delivered “within budget.”
– The system development process had a minimal impact on ongoing business operations.

Causes of Project Failure

• Failure to establish upper-management commitment to the project
• Lack of organization’s commitment to the system development methodology
• Taking shortcuts through or around the system development methodology
• Poor expectations management
• Premature commitment to a fixed budget and schedule
• Poor estimating techniques
• Overoptimism
• The mythical man-month (Brooks, 1975)
• Inadequate people management skills
• Failure to adapt to business change
• Insufficient resources
• Failure to “manage to the plan”
Poor Expectations Management

Scope creep – the unexpected and gradual growth of requirements during an information systems project.

Feature creep – the uncontrolled addition of technical features to a system.

Project Manager Competencies

- Business awareness
- Business partner orientation
- Commitment to quality
- Initiative
- Information gathering
- Analytical thinking
- Conceptual thinking
- Interpersonal awareness
- Organizational awareness
- Anticipation of impact
- Resourceful use of influence
- Motivating others
- Communication skills
- Developing others
- Monitoring and controlling
- Self-confidence
- Stress management
- Concern for credibility
- Flexibility

(Adapted from Wysocki, Beck, and Crane, Effective Project Management: How to Plan, Manage, and Deliver Projects on Time and within Budget.)

Project Management Functions

- Scoping – setting the boundaries of the project
- Planning – identifying the tasks required to complete the project
- Estimating – identifying the resources required to complete the project
- Scheduling – developing the plan to complete the project
- Organizing – making sure members understand their roles and responsibilities
- Directing – coordinating the project
- Controlling – monitoring progress
- Closing – assessing success and failure

Project Management Tools & Techniques

- PERT chart – a graphical network model used to depict the interdependencies between a project’s tasks.
- Gantt chart – a bar chart used to depict project tasks against a calendar.
Joint project planning (JPP) – a strategy in which all stakeholders attend an intensive workshop aimed at reaching consensus on project decisions.

Scope – the boundaries of a project – the areas of a business that a project may (or may not) address. Includes answers to five basic questions:
- Product
- Quality
- Time
- Cost
- Resources

Statement of work – a narrative description of the work to be performed as part of a project. Common synonyms include scope statement, project definition, project overview, and document of understanding.
V. Managerial Approach (continued)
D. Meeting schedules
E. Reporting methods and frequency
F. Conflict management
G. Scope management

VI. Constraints
A. Start date
B. Deadlines
C. Budget
D. Technology

VII. Ballpark Estimates
A. Schedule
B. Budget

VIII. Conditions of Satisfaction
A. Success criteria
B. Assumptions
C. Risks

IX. Appendices

Statement of Work (concluded)

D. Meeting schedules
E. Reporting methods and frequency
F. Conflict management
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IX. Appendices

Activity 2 – Identify Tasks

Work breakdown structure (WBS) – a graphical tool used to depict the hierarchical decomposition of the project into phases, activities, and tasks.

Milestone – an event signifying the completion of a major project deliverable.

Activity 3 – Estimate Task Durations

1. Estimate the minimum amount of time it would take to perform the task – the optimistic duration (OD).
2. Estimate the maximum amount of time it would take to perform the task – the pessimistic duration (PD).
3. Estimate the expected duration (ED) that will be needed to perform the task.
4. Calculate a weighted average of the most likely duration (D) as follows:

\[ D = \frac{1 \times OD + 4 \times ED + 1 \times PD}{6} \]

Example:

\[ 3.33 \text{ days} = \frac{(1 \times 2 \text{ days}) + (4 \times 3 \text{ days}) + (1 \times 6 \text{ days})}{6} \]

Activity 4 – Specify Inter-task Dependencies

- Finish-to-start (FS) — The finish of one task triggers the start of another task.
- Start-to-start (SS) — The start of one task triggers the start of another task.
- Finish-to-finish (FF) — Two tasks must finish at the same time.
- Start-to-finish (SF) — The start of one task signifies the finish of another task.
**Forward scheduling** – a project scheduling approach that establishes a project start date and then schedules forward from that date.

**Reverse scheduling** – a project scheduling strategy that establishes a project deadline and then schedules backward from that date.

- **People** – includes all the system owners, users, analysts, designers, builders, external agents, and clerical help that will be involved in the project in any way.
- **Services** – includes services such as a quality review that may be charged on a per use basis.
- **Facilities and equipment** – includes all rooms and technology that will be needed to complete the project.
- **Supplies and materials** – includes everything from pencils, paper, notebooks to toner cartridges, and so on.
- **Money** – includes a translation of all of the above into budgeted dollars!

**Resource leveling** – a strategy for correcting resource overallocations.

There are two techniques for resource leveling:

- **task delaying**
- **task splitting**
Task Splitting and Delaying

- **Critical path** — the sequence of dependent tasks that determines the earliest possible completion date of the project.
  - Tasks that are on the critical path cannot be delayed without delaying the entire project schedule. To achieve resource leveling, critical tasks can only be split.

- **Slack time** — the amount of delay that can be tolerated between the starting time and completion time of a task without causing a delay in the completion date of the entire project.
  - Tasks that have slack time can be delayed to achieve resource leveling.

Activity 6 – Direct the Team Effort

- Supervision resources
  - The Deadline: A Novel about Project Management
  - The People Side of Systems
  - The One Minute Manager
  - The One Minute Manager Meets the Monkey

- Stages of Team Maturity (see figure to the right)

10 Hints for Project Leadership

- Be Consistent.
- Provide Support.
- Don’t Make Promises You Can’t Keep.
- Praise in Public; Criticize in Private.
- Be Aware of Morale Danger Points.
- Set Realistic Deadlines.
- Set Perceivable Targets.
- Explain and Show, Rather Than Do.
- Don’t Rely Just on [Status Reports].
- Encourage a Good Team Spirit.

Activity 7 – Monitor and Control Progress

- Progress reporting
- Change management
- Expectations management
- Schedule adjustments—critical path analysis (CPA)

Sample Outline for a Progress Report

I. Cover Page
   A. Project name or identification
   B. Project manager
   C. Date or report

II. Summary of progress
   A. Schedule analysis
   B. Budget analysis
   C. Scope analysis
     (describe any changes that may have an impact on future progress)
   D. Process analysis
     (describe any problems encountered with strategy or methodology)
   E. Gantt progress chart(s)

III. Activity analysis
   A. Tasks completed since last report
   B. Current tasks and deliverables
   C. Short term future tasks and deliverables

(continued)

IV. Previous problems and issues
   A. Action item and status
   B. New or revised action items
     1. Recommendation
     2. Assignment of responsibility
     3. Deadline

V. New problems and issues
   A. Problems
     (actual or anticipated)
   B. Issues
     (actual or anticipated)
   C. Possible solutions
     1. Recommendation
     2. Assignment of responsibility
     3. Deadline

VI. Attachments
   (include relevant printouts from project management software)
Change management – a formal strategy in which a process is established to facilitate changes that occur during a project.

Changes can be the result of various events and factors including:
- An omission in defining initial scope
- A misunderstanding of the initial scope
- An external event such as government regulations that create new requirements
- Organizational changes
- Availability of better technology
- Shifts in planned technology that force unexpected and significant changes to the business organization, culture, and/or processes
- Management’s desire to have the system do more than was originally requested or agreed to
- Reduced funding for the project or imposition of an earlier deadline.

Expectations management matrix – a tool used to understand the dynamics and impact of changing the parameters of a project.

The most important

The second most important

The least important

Can have only one X in each row and each column

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<th>Max or Min</th>
<th>Constrain</th>
<th>Accept</th>
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<tr>
<td>Schedule</td>
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<tr>
<td>Scope and/or Quality</td>
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</tr>
</tbody>
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Typical, Initial Expectations for a Project

Adjusting Expectations

Cost
- $20 billion (estimated)

Schedule
- Dec 31, 1969 (deadline)

Scope and/or Quality
- Land a man on the moon
- Get him back safely

Accept expanded requirements
- Increase budget
- Extend deadline

Accept expanded requirements
1. Using intertask dependencies, determine every possible path through the project.
2. For each path, sum the durations of all tasks in the path.
3. The path with the longest total duration is the critical path.
   - The critical path for a project is that sequence of dependent tasks that have the largest sum of most likely durations. The critical path determines the earliest completion date of the project.
   - The slack time available for any non-critical task is the amount of delay that can be tolerated between the starting time and completion time of a task without causing a delay in the completion date of the entire project.

Activity 8 – Assess Project Results and Experiences
• Did the final product meet or exceed user expectations?
  – Why or why not?
• Did the project come in on schedule?
  – Why or why not?
• Did the project come in under budget?
  – Why or why not?