A Short Course in Project Management: 3rd Capstone Orientation

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Sponsor: SIE, Mayaguez Student Chapter
Project Management Tools and Techniques

An Introductory Course in Project Management Foundations
What Is 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 expectations.”

Source: Project Management Institute
What Is a Project?

“A project is a temporary endeavor undertaken to create a unique product or service.”

Source: PMI
Project Manager

“The person who is responsible for the project and will be held accountable for its success or failure.”
The Triple Constraint

Project Scope

Within Available Resources

Schedule

Cost

Quality
Balancing the “Project Success Triangle”

- A clear understanding of customer priorities
- “People” skills
- Thorough planning
- An organized, structured process
To help guide you through the process you need a roadmap of some type …
Project Stakeholders

What is a project stakeholder?

* If you can gain or lose from the success or failure of a project, you have a “stake” in the project.
Key Project Stakeholders

- Customer/client
- Project sponsor
- Project manager
- Project team
Project Manager

- Define and manage customer expectations.
- Coordinate development of the project plan.
- Monitor and control project work according to the approved plan.
- Communicate project status by preparing status reports and conducting progress review meetings.
- Establish and follow a change management process.
- Lead the project team and resolve conflicts between team members.
- Maintain the project notebook.
- Conducting project close-out activities.
Project Team Members

- Identify work tasks
- Estimate the duration of work tasks
- Help prepare the project network diagram
- Honestly report work status
- Keep the project manager informed on project issues
- Attend scheduled progress review meetings
- Raise issues important to the project’s success
- Keep their functional managers updated
- Participate in the project close-out
Roadmap to Project Management Success

Statement of Work

Purpose
Project Background
Project Deliverables

Form Project Team

Conduct Close-Out Meeting

Share Lessons Learned

Evaluate Success

LEADERSHIP

COMMUNICATION

LEARNING

CLOSE-OUT

IMPLEMENT

PLAN

BOOK

MEETINGS

REPORTS

P R O J E C T  N O T E S

- Leadership
- Communication

- Lessons Learned
- Close-Out

- Implement
- Plan

- Reports
- Meetings

- Book

- Plan
- Meet
- Implement
- Close-Out

- Lessons Learned
- Manage Change

- Resolve Issues
- Evaluate Success

- Share Lessons Learned
- Conduct Close-Out Meeting

- Form Project Team

- Purpose
- Project Background
- Project Deliverables

- Gantt
- Resource Plan
- Budget

- Time
- Budget

- Break Timer

- Learn Lessons
- Prepare
- Evaluate

- Update Plan
- Resolve Issues
- Manage Change

- Conduct
- Close-Out
- Share
- Evaluate

- Purpose
- Project Background
- Project Deliverables

- Responsibility Matrix
- Work Breakdown Structure
- Statement of Work

- Network
- Resource Plan
- Budget

- Time
- Budget

- Break Timer

- Learn Lessons
- Prepare
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- Manage Change

- Conduct
- Close-Out
- Share
- Evaluate
Project Plan Contents

- Statement of work (SOW)
- Work breakdown structures (WBS)
- Responsibility assignment matrices
- Project schedule
- Resource plans/histograms
- Budget
- Risk management plan
- Communications plan
- Quality plan
- Verification and validation plan
Project Plan Benefits

- Provides an effective communication tool to ensure understanding of project goals and the means to achieve them
- Defines outcomes and commitments
- Establishes guidelines and standards
- Establishes the baseline for evaluating and reporting progress
- Forms the basis for scope control and change management
Project Notebook

- Project Pre-plan
  - Background information
  - Customer data
  - Third-party data (vendors, suppliers, etc.)

- Project Plan
  - Statement of Work (SOW)
  - Work Breakdown Structure (WBS)
  - Organization/responsibility charts
  - Schedule data
  - Budget/capital plan
  - Risk management

- Project Implementation
  - Meetings (agenda/minutes)
  - Team/management/customer/third party progress reports
  - Customer change requests/decision matrix issue resolution forms/reports

- Project Close-out
  - Final evaluation of measurable success indicators
  - Close-out meeting (agenda/minutes)
  - Final project report
  - Reference letters
  - Lessons learned

- Project Administration
  - Contractual documents
  - Invoices
  - Expenses
  - Correspondence
  - Contact log
Statement of Work — Purpose

- Define the scope of the project
- Establish customer expectations
- Serve as a “contract” if necessary
A Good SOW will answer ...

- What is the purpose or goal of the project?
- Why is the project being done?
- Who is the initial customer?
- Who is the end user or final customer?
- What are the customer deliverables?
- What technical support is required for the deliverables?
And continue to answer ... 

- What is the budget?
- What is the final date for the deliverables?
- What are the measurable success indicators (metrics)?
- What kind of support is required from the customer?
- What contingency plans are in place?
SOW — Generic Contents

- Customer
- Project
- Title
- Purpose
- Background
- Deliverables
- Measurable success indicators
- Customer support
- Risk plans
Work Breakdown Structure—Purpose

- Identify all of the work that needs to be done to complete the project.
- Structure the work into logical components and subcomponents.
- Define the work to a level of detail so individual responsibilities can be assigned.
- Summarize and report project data.
Representative Work Breakdown Structure

- **Level I**: (Noun)
- **Level II**: (Noun)
- **Level III**: (Action Verbs)
- **Level IV**: (Action Verbs)

**Diagram**:
- TITLE
  - DELIVERABLE
  - PHASE
  - FUNCTION
  - "CHUNK" OF WORK
  - PROJECT MANAGEMENT
    - ACTIVITY
      - TASK (WORK PACKAGE)
    - ACTIVITY
      - TASK (WORK PACKAGE)
WBS — Outlining Approach

I. Main Project Deliverable  
   A. Major Element  
      1. Activity  
      2. Activity  
         a. task  
         b. task  
         c. task  
      3. Activity

B. Major Element  
   1. Activity  
   2. Activity

The outline approach is used by Microsoft® Project®
Roadmap to Project Management Success

- Statement of Work
- Work Breakdown Structure
- Responsibility Matrix
- Network
- Gantt
- Resource Plan
- Budget
- Form Project Team
- Conduct Close-Out Meeting
- Share Lessons Learned
- Evaluate Success
- Perform Tasks
- Track Progress
- Manage Change
- Update Plan
- Resolve Issues
- Leadership
- Communication
- Lessons Learned
- Implement
- Meetings
- Reports
- Close-Out
- Responsibility Matrix

Plan
Book
Meeting
Responsibility Assignment Matrix (RAM) — Purpose

- Ensure that all tasks are assigned to people
- Show levels of involvement of people to work
Responsibility Assignment Matrix

**RASIC Method**

<table>
<thead>
<tr>
<th>MARKETING STUDY</th>
<th>PROJECT MANAGER</th>
<th>CUSTOMER</th>
<th>TEAM MEMBER</th>
<th>SENIOR MANAGEMENT</th>
<th>SUPPORT STAFF</th>
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<td>IDENTIFY POTENTIAL MARKET</td>
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<td>R</td>
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<td>IDENTIFY SURVEY POPULATION</td>
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<td>S</td>
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<td>S</td>
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<td>R</td>
<td>I</td>
<td>S</td>
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<td>FINALIZE SURVEY</td>
<td>R</td>
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<td>S</td>
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<td>ANALYZE DATA</td>
<td>R</td>
<td>I</td>
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<td>R/S</td>
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<td>REPORT RESULTS AND SUGGESTION</td>
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<td>A</td>
<td>S</td>
<td>A</td>
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**LEGEND**

R - RESPONSIBLE
A - APPROVE
S - SUPPORT (DOES THE WORK)
I - INFORM
C - CONSULT

**Break Timer**
RASIC Coding System

- **R** = Responsible
  - Ensures that the assigned work is completed
- **A** = Approve
  - Approves that the work meets all requirements
- **S** = Support
  - Does the work
- **I** = Inform
  - Is kept informed of work status
- **C** = Consult
  - Is consulted on the work
Project Schedule — Purpose

- Determine if requested completion date is possible.
- Identify start and completion dates of all work.
- Determine the controlling sequence of activities.
- Provide data for resource allocation.
- Track progress by providing a baseline.
Scheduling

**Step 1:** Estimate Activity Durations

**Step 2:** Determine Activity Sequence By Creating a Network Diagram

**Step 3:** Calculate the Schedule Using Critical Path Method (CPM) Procedures

**Step 4:** Show the Schedule by Drawing Gantt and/or Milestone Charts
Network Diagram Methods

Arrow Diagram Method

A → B → C → D → E → F → G

Precedence Diagram Method

A → B → D → E → F → G

C → J

H → I
Precedence Diagram Method

Logic Connection

Activity
What’s is the Critical Path?

- Path with least slack
- Path with longest duration
- **Critical Path Method** is a project management technique that analyzes what activities have the least amount of scheduling flexibility (i.e., are the most mission-critical) and then predicts project duration schedule based on the activities that fall along the “critical path.”
  - Activities that lie along the critical path cannot be delayed without delaying the finish time for the entire project.
Project X — Critical Path
Solution

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Break Timer
1 2 3 7 8 5 6 8 9

A
0 2
2 0 2

C
0 3
2 5 2 5

D
5 1
2 3 7 8

H
3 1
5 6 8 9
Project X — Gantt Chart Solution

<table>
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<th>Activity</th>
<th>Duration</th>
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<td>I</td>
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<td>J</td>
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- Critical
- Non-Critical
- Slack/Float
Enhanced Gantt Chart

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<th>Task</th>
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<td>Task D</td>
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<td>Task F</td>
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</tbody>
</table>

- Critical
- Non-Critical
- Slack/Float
Assigning Resources

A schedule is not complete until all the resources necessary to complete the project have been committed or assigned.
Non-Labor Resources

- Lab time
- Facilities
- Prototype parts/systems
- Equipment
- Materials
Cost Budgeting

- Cost Budgeting involves allocating overall cost estimates to individual work items in order to establish a cost baseline for measuring project performance. Using cost estimates, the WBS, the project schedule, and cost estimating tools, the project team develops a time-phased budget. This budget will be used to measure and monitor cost performance on the project.”

Source: PMI
Roadmap to Project Management Success

1. Form Project Team
2. Statement of Work
3. Work Breakdown Structure
4. Responsibility Matrix
5. Network
6. Gantt
7. Resource Plan
8. Budget

Form Project Team

- Purpose
- Project Background
- Project Deliverables

Statement of Work

- Work Breakdown Structure

Responsibility Matrix

- Network

Gantt

- Resource Plan

Budget

- Time

Conduct Close-Out Meeting

- LEADERSHIP
- COMMUNICATION

CLOSE-OUT

- LESSONS LEARNED
- IMPLEMENT

- PROJECT MANAGEMENT SUCCESS

Share Lessons Learned

- Evaluate Success

- Update Plan

- Resolve Issues

- Manage Change

- Track Progress

- Share Lessons Learned

- Evaluate Success

- Update Plan

- Resolve Issues

- Manage Change

- Track Progress
What Is Risk?

Risk can be defined as:

“Any threat to project success.”
Project Scope

Cost
Within Available Resources
Quality
Schedule
Project Risk
Project Implementation
Roadmap to Project Management Success

- Form Project Team
- Conduct Close-Out Meeting
- Share Lessons Learned
- Evaluate Success
- LEADERSHIP
- COMMUNICATION
- PLAN
- IMPLEMENT
- CLOSE-OUT
- LESSONS LEARNED
- PROJECT NOTEBOOK
- MEETINGS
- Resource Plan
- Budget
- Gantt
- Network
- Resource Matrix
- Work Breakdown Structure
- Purpose
- Project Background
- Project Deliverables
- Perform Tasks
- Track Progress
- Manage Change
- Update Plan
- Resolve Issues
Implementation Model

Step 1: Perform Tasks

Step 2: Track Progress

Step 3: Manage Change

Step 4: Update the Plan

Resolve Issues
Roadmap to Project Management Success

- Form Project Team
- Statement of Work
- Work Breakdown Structure
- Responsibility Matrix
- Network
- Gantt
- Resource
- Budget
- Conduct Close-Out Meeting
- Share Lessons Learned
- Evaluate Success
- LEADERSHIP
- COMMUNICATION
- LEARNING
- IMPROVE
- PLAN
- MEETINGS
- IMPLEMENT
- CLOSE-OUT
- Project Background
- Project Deliverables
- Perform Tasks
Reporting Project Progress

- Progress review meeting
- Project reports
Project Progress Review
Meetings

- Review of action items from last meeting
- Update on activities and schedule
- Problem identification and corrective action planned
- Review of issues (closed, open, new)
- Change request status
- Risk status
- Plan for next period
Roadmap to Project Management Success

- Form Project Team
- Statement of Work
- Work Breakdown Structure
- Responsibility Matrix
- Network
- Gantt
- Resource Plan
- Budget

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**Plan**

- Project Notebook
- Meetings
- Reports

**Leadership**

**Communication**

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**Close-Out**

- Conduct Close-Out Meeting
- Share Lessons Learned
- Evaluate Success

---

**Implement**

- Update Plan
- Resolve Issues
- Manage Change

---

**Track Progress**

- Track Progress
Project Tracking and Control

- **Step 1**: Perform Tasks
- **Step 2**: Track Progress
- **Step 3**: Manage Change
- **Step 4**: Update the Plan

Resolve Issues
Managing Project Change

Step 1: Perform Tasks

Step 2: Track Progress

Step 3: Manage Change

Step 4: Update the Plan

Resolve Issues
Addressing Project Changes

- Call a team meeting.
- Explain what the change is.
- Obtain feedback from team members.
- Identify alternative corrective options.
- Prepare a decision matrix.
- Select a recommended option(s).
- Present information to upper management/customer.
- Implement the approved course of action.
Roadmap to Project Management Success

- Form Project Team
- Statement of Work
- Work Breakdown Structure
- Responsibility Matrix
- Network
- Gantt
- Resource Plan
- Budget

- Conduct Close-Out Meeting
- Project Background
- Structure
- Purpose
- Deliverables
- Plan
- Manage Change
- Evaluate Success
- LEADERSHIP
- LESSONS LEARNED

- PLAN
- RESOURCES

- Resolve Issues
- Close-Out

- LEADERSHIP
- COMMUNICATION

- Share Lessons Learned
Issue Resolution

- Disagreements that should be ...
  - Documented
  - Assigned
  - Scheduled
  - Tracked
  - Escalated
  - Resolved
Roadmap to Project Management Success

Form Project Team

Statement of Work
- Purpose
- Project Background
- Project Deliverables

Work Breakdown Structure

Responsibility Matrix

Network

Gantt

Resource Plan

Budget

PLAN

PROJECT NOTEBOOK

MEETINGS

LEADERSHIP

COMMUNICATION

LESSONS LEARNED

REPORTS

IMPLEMENT

CLOSE-OUT

Conduct Close-Out Meeting

Share Lessons Learned

Evaluate Success

Update Plan

Update Plan
Plan Updates

Step 1: Perform Tasks

Step 2: Track Progress

Step 3: Manage Change

Step 4: Update the Plan

Resolve Issues
Closeout
Project Manager’s Role During Project Close-Out

- Ensure that all project deliverables have been completed and formally accepted by the customer.
- Determine if the measurable success indicators were achieved.
- Conduct project close-out meetings, both internal and external.
- Write the final project report.
- Document and share lessons learned.
Evaluating Project Success

- Project purpose
- Deliverables
- Measurable success indicators
  - Quality
  - Schedule
  - Cost
Sharing Lessons Learned

- Lessons Learned Database
  - Categorized electronic project information database

- Continuous Improvement Recommendations
  - Project Management Process
  - Forms
  - Standards
Roadmap to Project Management Success

Plan:
- LEADERSHIP
  - Conduct Close-Out Meeting
- COMMUNICATION
  - Share Lessons Learned
- IMPLEMENT
  - Evaluate Success
- CLOSE-OUT
  - Update Plan
  - Resolve Issues
  - Manage Change
  - Perform Tasks
  - Track Progress

Project Notebook:
- Statement of Work
- Work Breakdown Structure
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Form Project Team
Thank You!!!!