Unit 34: Operations Management

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June 27, 2016

Learning Outcome 2

- LO3 **Understand how to organise a typical production process**
  - Ac 3.1 Assess how linear programming adds value to a given production process
  - AC 3.2 Evaluate critical path analysis and network planning
  - AC 3.3 Justify the need for operational planning and control in a selected production process

In this Session

- LO3 **Understand how to organise a typical production process:**
- AC 3.2 evaluate critical path analysis and network planning
  - What is Project Management?
  - Describe the type of problem that would lend itself to solution using linear programming.
  - Formulate a linear programming model from a description of a problem
  - Solve simple linear programming problems using the graphical method.
- Further readings
- References

What is Project Management

- Project: "A temporary endeavour undertaken to create a unique product, service or result." PMBOK Guide, Fourth Edition.
  - New Product
  - Organisational Changes
  - Information Systems modifications
  - Execution of a new procedure or modification of an existing on
- Project Management: "The application of knowledge, skills, tools, and techniques to project activities to meet project requirements." Project Management Body of Knowledge (PMBOK) Guide

Elements for managing a Project

- The three elements that require simultaneous management in a typical projects are:
  - Identify project requirements
  - Monitor and tend to stakeholders needs and expectations throughout the project
  - Balance typical project constraints that are identified as:
    - Scope
    - Quality
    - Schedule
    - Resources
    - Risk

Sample Project Plan Outline

Outsourcing Project Plan Name

Company Name

Date of Issue

1. Project Overview
    a. Statement of need
    b. Project scope
    c. Project objectives
2. Project Process
    a. Technical specifications
    b. Constraints
    c. Deliverables
    d. Project tasks
3. Selection Criteria
4. Project Time Frame
5. Project Budget
6. Reference Materials

Work Breakdown Structure

- Once the deliverables are confirmed in the Scope Statement, they need to be developed into a **work breakdown structure** (WBS), which is a decomposition of all the deliverables in the project. This deliverable WBS forms the scope baseline and has these elements:
  - Identifies all the deliverables produced on the project, and therefore, identifies all the work to be done.
  - Takes large deliverables and breaks them into a hierarchy of smaller deliverables. That is, each deliverable starts at a high level and is broken into subsequently lower and lower levels of detail.
  - The lowest level is called a "work package" and can be numbered to correspond to activities and tasks.

Work Breakdown Structure

- Based on the Project deliverables, you should create WBS. Create WBS is the process of subdividing project deliverables and project work into smaller, more manageable components. (*PMBOK® Guide, Fifth Edition*, Glossary)

- Each deliverable or achievement must equal the sum of its sub-elements. The WBS can be represented either as a list or graphically (University of Calgary, 2016)

Work Breakdown Structure

WBS for Building a Table: Table form

1. **Table Designed**
   1.1 Dimensions determined
   1.2 Drawings completed
2. **Materials Obtained**
   2.1 Material calculated
   2.2 Materials purchased
3. **Table Constructed**
   3.1 Parts prepared
   3.1.1 Top cut to size
   3.1.2 Legs turned
   3.1.3 Parts assembled
4. **Table Finished**
   4.1 Table sanded
   4.2 Table stained
5. **Table installed**

Estimate Activity Durations

- The process of approximating the number of work periods needed to complete individual activities with estimated resources.
- The duration of an activity is the elapsed time in business working days, not including weekends, holidays, or other non-working days, required to complete the activity. When the duration is calculated, the resources requirements specified in Estimate Activity Resources are applied.
- Two factors need to achieve accurate duration:
  - Work effort
  - Percentage per day assignment

Sequence Activities

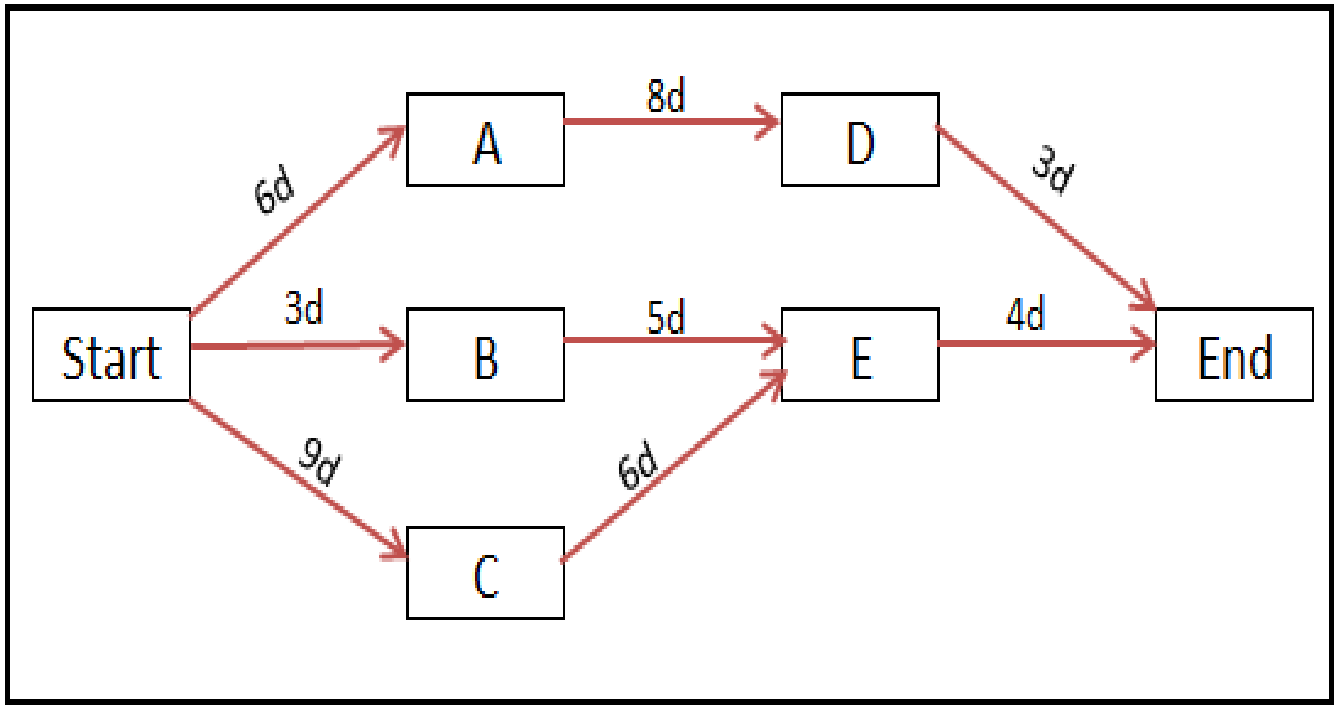
- This is the process of identifying and documenting dependencies among the project activities.
- The purpose of this process is to determine the correct flow of activities so they can be arranged in the order on which they should be performed. This can be done by the aid of a project management software or by using manual techniques. Many practitioners find it better to work out the dependencies between activities by first using a sticky note for each activity arranged on a large flat surface, such as a wall. After the sequence is initially laid out, it is then manually refined until the dependencies appear to be complete and correct.

Project Schedule Network Diagram

- Any schematic display of the logical relationships among the project schedule activities. Always drawn from the left to the right to reflect project work chronology.

- Precedence relationship: the term used in the precedence diagramming method for a logical relationship.

Sample Project Schedule Network Diagram



Inputs and Tools and Techniques

- Inputs:
  - Activity List
  - Activity Attributes
  - Project scope statement
  - Organisational process assets
- Tools and Techniques:
  - Precedence diagramming method
  - Dependency determination
  - Applying leads and lags
  - Schedule network templates

PDM

- **Predecessor** is a driver activity. The start or finish drives the start or finish of the next activity.
- **Successor**: is an activity where the start and finish is driven by the start or finish of another activity.
- Four main precedence relationship:
  1. Finish-to-start
  2. Start-to-start
  3. Finish-to-finish
  4. Start-to-finish

Further Reading

- http://www.projectmanagement.ie/blog/an-implementation-strategy-for-a-project-the-critical-steps
- http://www.justgetpmp.com/2013/04/doubt-in-schedule-network-diagram.html

References

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- Manick (2013) Doubt in Project Network Diagram retreived from http://www.justgetpmp.com/2013/04/doubt-in-schedule-network-diagram.html
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- Woods, Samuel An Implementation Strategy For a Project: A Critical Path (2013) retrieved from http://www.projectmanagement.ie/blog/an-implementation-strategy-for-a-project-the-critical-steps
- University of Calgary (2016) Work Breakdown Structure and Schedules retrieved from http://people.ucalgary.ca/~design/engg251/First%20Year%20Files/wbss.pdf