Quick Review & Case Study
Project Schedule Management

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In This Session

- A quick look back!

- <u>Project Schedule Management</u> knowledge area

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Since Our First Meeting

- General Intro to project management and key terms & roles
- Triple constraint, 10 knowledge areas, 5 process groups
- Waterfall (Classical PM) vs. Agile (Adaptive PM)
- Project Integration Management
- Project Scope Management
- Creating a WBS
- **Assignment #1** – You created a project Charter
- **Practical Lab #1** – Introduction to MS Project

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Project Schedule Management

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"Don't spend major time on minor things"

- Jim Rohn

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PMI Process Chart (6th Ed.)

This Session →

PMBOK 6 Knowledge Areas
Integration Management
Scope Management
Schedule Management
Cost Management
Quality Management
Resource Management
Communications Management
Risk Management
Procurement Management
Stakeholder Management

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Project Schedule Management

1. Plan Schedule Management

2. Define Activities

3. Sequence Activities

4. Estimate Activity Resources

5. Estimate Activity Durations

6. Develop Schedule

7. Control Schedule

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Project Schedule Management

"Project Time Management includes the processes required to manage the timely completion of the project."

1. Plan Schedule Management

The process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.

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The Project Schedule

o A **Plan for Action** showing what work is to be done in what sequence, by whom, taking what time, costing how much, and when it starts and finishes.

o **Gantt Chart** – A diagram showing the *relative placement and duration* of activities on a timeline using long bars.

o A **dynamic** plan to allow tracking.

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2. Define Activities

The process of identifying and documenting the specific actions to produce the project deliverables.

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Defining Activities

An **activity** or **task** is an element of work normally found on the work breakdown structure (WBS) that has an expected duration, a cost, and resource requirements.

Activity definition involves developing a more detailed WBS and supporting explanations to understand all the work to be done so you can develop realistic cost and duration estimates.

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Milestones

o **Milestone** – A marker in a project schedule.

o Used to show completed phases, deliverables, approvals or other goals.

o No duration, resources or costs – only a reference point in the schedule.

Examples:

- o Project Design Complete
- o Stakeholder Approval
- o Phase 2 Complete
- o Server Configuration Completed
- o Kill Point Evaluation

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3. Sequencing Activities

The process of identifying and documenting the relationships among project activities.*

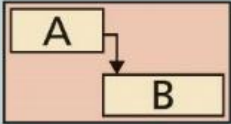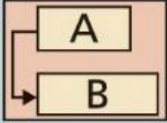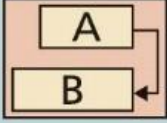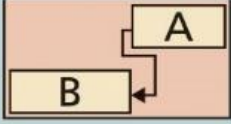- Project Management Institute

*generally at the work package level

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Task Dependency

o A condition when one task of a project is dependent upon another task occurring first.

o The task that comes before is the "Predecessor" task.

o Scheduling involves sequencing tasks by specifying one or more Predecessor Tasks for each work package in the WBS.

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Task Dependency Options

Task dependencies

The nature of the relationship between two linked tasks. You link tasks by defining a dependency between their finish and start dates. For example, the "Contact caterers" task must finish before the start of the "Determine menus" task. There are four kinds of task dependencies in Microsoft Project.

Task dependency	Example	Description
Finish-to-start (FS)	A → B	Task (B) cannot start until task (A) finishes.
Start-to-start (SS)	A / B	Task (B) cannot start until task (A) starts.
Finish-to-finish (FF)	A / B	Task (B) cannot finish until task (A) finishes.
Start-to-finish (SF)	A / B	Task (B) cannot finish until task (A) starts.

MS Project Default

FIGURE 6-3   Task dependency types

Three Types of Dependencies

o **Mandatory** dependencies: inherent in the nature of the work being performed on a project, sometimes referred to as hard logic.

o **Discretionary** dependencies: defined by the project team. Sometimes referred to as soft logic and should be used with care since they may limit later scheduling options.

o **External** dependencies: involve relationships between project and non-project activities.

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MS Project Software:
Task Dependency

o All tasks are scheduled to start at the beginning of the project unless predecessors are entered.

o You can indicate more than one predecessor for a single task if it is logical.

o Do not assign predecessors to levels above work packages. This will complicate your schedule by artificially constraining the software.

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4. Estimate Activity Resources

The process of estimating the type and quantities of material, human resources, equipment, and supplies required to perform each activity*

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*generally at the work package level

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5. Estimate Activity Durations

The process of estimating the number of work periods needed to complete individual activities* with the estimated resources

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Duration vs. Effort

o Effort (Work) Time – Theoretical amount of time to finish Work with no interruptions.

o Duration – Length of time to actually finish Work, including interruptions.

o Schwalbe says that Duration is estimated to produce schedules.

o Experts agree that it is <u>more accurate</u> to estimate <u>Effort</u> of each work package as well as the quantity of people assigned to do it, and let the scheduling software do the rest.

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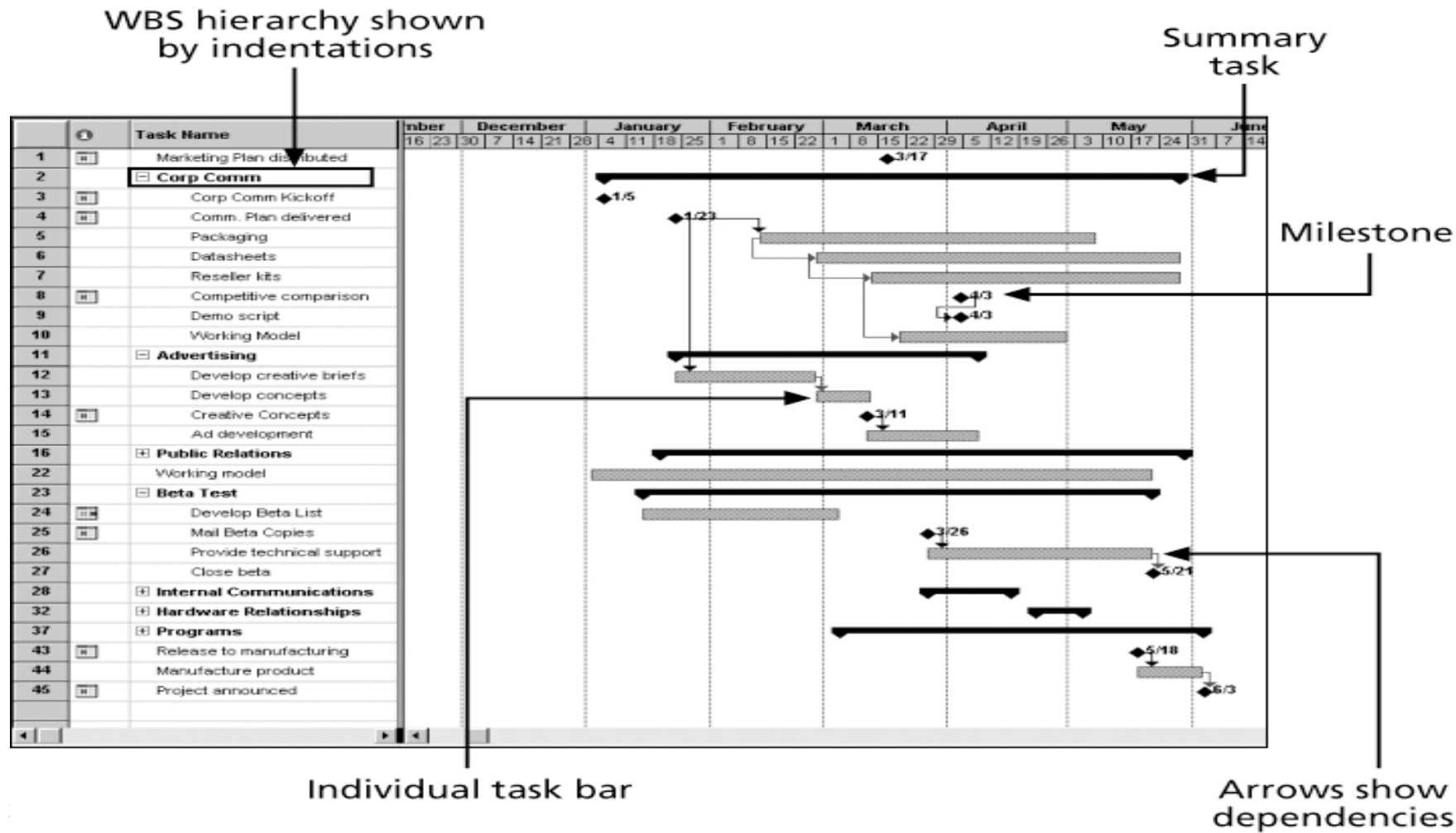Syracuse University

6. Develop Schedule

The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model.

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*generally at the work package level

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Figure 6-7, SCHWALBE
Gantt Chart FOR SOFTWARE LAUNCH

USING EXPERIENCE:
Three Point Estimating

Most Optimistic Time – the length of time to do a task that is the shortest ever taken or imagined possible.

Most Pessimistic Time – the length of time to do a task that is the longest ever taken or imagined possible.

Most Likely Time – average between the above, or the most frequent actual results.

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Three Point Estimating

Estimated Time = $\dfrac{\text{Optimistic} + (4 * \text{Most Likely}) + \text{Pessimistic}}{6}$

<u>Example</u>:

If Optimistic = 8; Most Likely = 10; and Pessimistic = 24:

Estimated Time = $\dfrac{8+(4*10)+24}{6}$ = 12

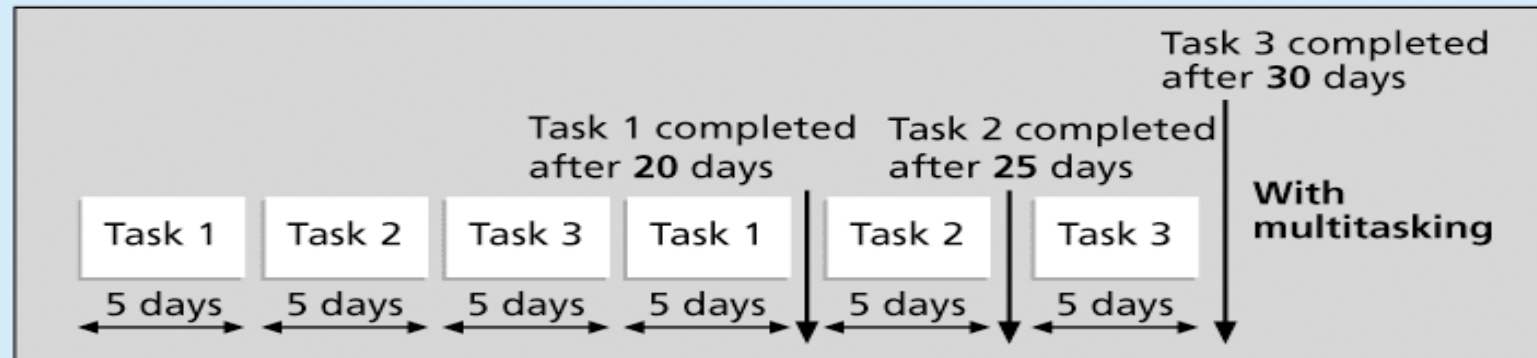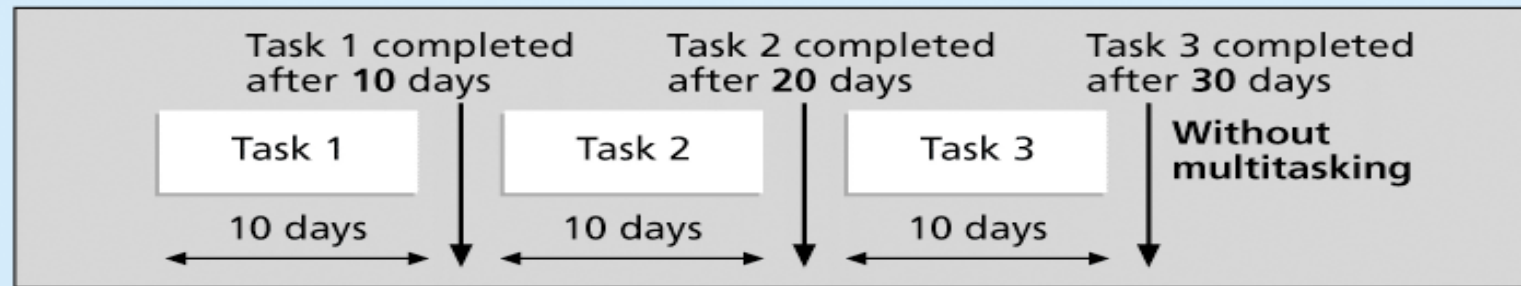School of Information Studies
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Duration-Based Project Estimating

o Given Time Constraints, you must sequence activities <u>within</u> them.

o Involves setting constraint dates on last work package in a sequence.

o All work packages are estimated, sequenced and assigned resources as usual.

o Schedule software will attempt to fit work into resource and time constraints.

o You must then review and adjust resources/duration/effort to be practical.

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A Day's Worth of Work

o Deduct Administrative and Personal Office Worker Interruptions (40%)

o Result (100% - 40%) = 60% Efficiency of Staff

o Therefore each 8-hour day duration = 4.8 hours of <u>Estimated Available Effort Time</u> Per Resource

o Software like MS-Project also assumes 8-hour days, so these must be adjusted before use for resulting schedules to be practical.

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Figures 6-10 (a and b), SCHWALBE
Multitasking Example

Extra Time, or *NOT!*

o **Slack Time** – The extra time left over between tasks when a task takes less time than was scheduled.

o **Float Time** – The range of time a task can shift in the schedule without affecting the target dates of other tasks in the project.

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The Critical Path

o <u>Critical Path</u> –a sequence of tasks in a project where each have a direct impact on the duration of the entire project.

o Project Software will calculate this.

o The project can never be shorter than its Critical Path tasks.

o Critical Path tasks should be managed carefully by the PM.

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Factors in Scheduling Logic

o Level of Effort

o Available Elapsed Time

o Quantity of People Assigned

o Availability of Each Person

o Overall Workday Efficiency

o Specific Time Constraints

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7. Control Schedule

The process of monitoring the status of project activities to update project progress and manage changes to the schedule baseline to achieve the plan.

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Controlling the Schedule

Goals are to know the status of the schedule, influence factors that cause schedule changes, determine that the schedule has changed, and manage changes when they occur.

Tools and techniques include:
- Progress reports
- A schedule change control system
- Project management software, including schedule comparison charts like the tracking Gantt chart
- Variance analysis, such as analyzing float or slack
- Performance management, such as earned value (chapter 7)

End of Presentation

o Please be quiet and courteous in common areas as to not interrupt other classes.

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