



FIT 3161 – FIT 3163

CS – DS, Software Project 1

Project Management

**Week 3: Managing your Project, Project Schedule,
Triple Constraints**

Semester 2, 2023

Project Management

Recap:

Project Management (from previous week)

Project Management : Triple Constraints

Recap: Factors affecting Project execution

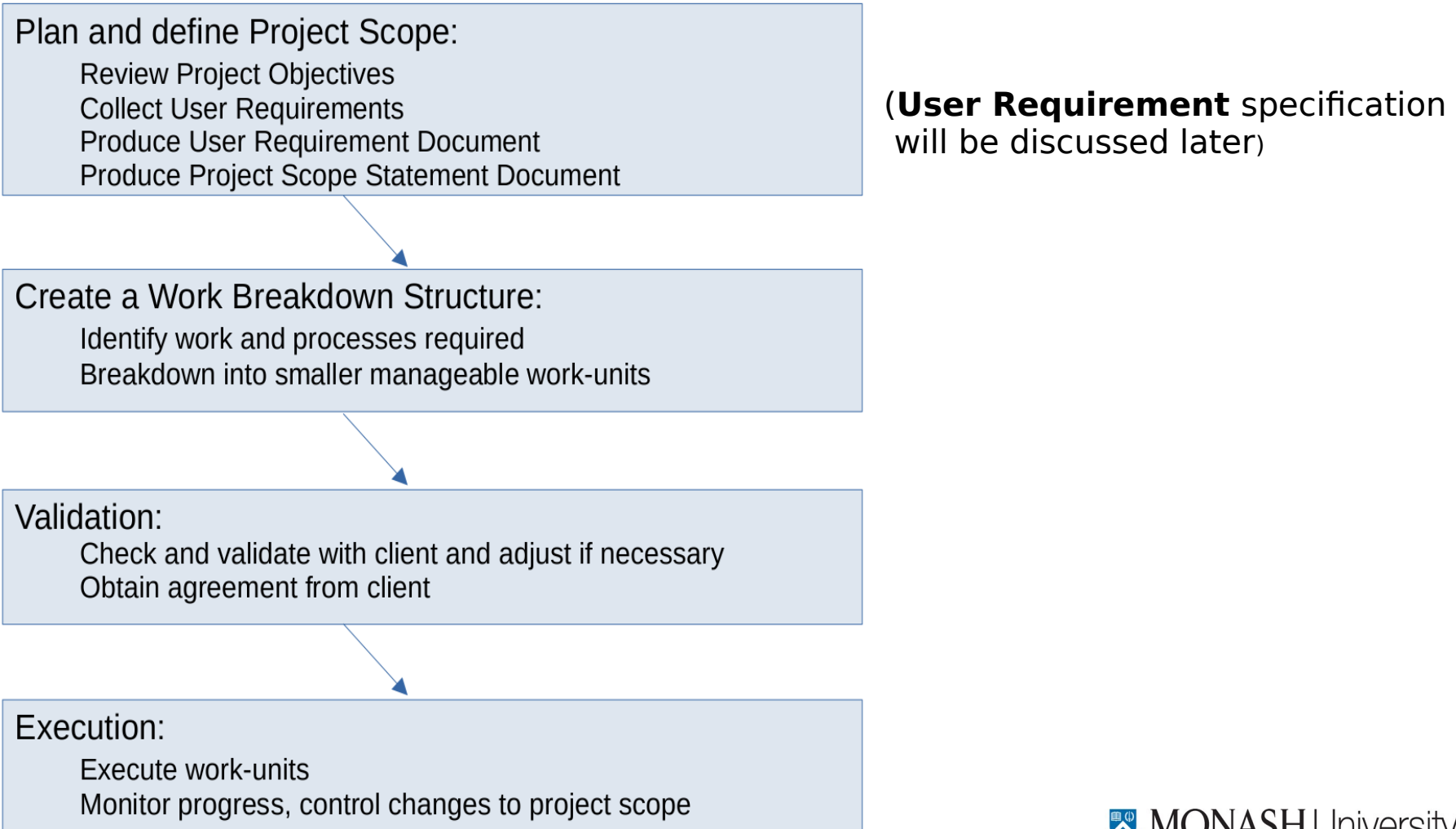
- 1) **Scope**
- 2) **Time**
- 3) Resources
- 4) Communication: internal and external
- 5) Risks
- 6) Quality
- 7) Financial Factors: **Cost**, Budget, Procurement
- 8) Integration Management

Project Management: Scope

What is Scope?

- Project SCOPE refers to all work and processes that will be undertaken in order to deliver on the project's objectives.
- SCOPE is determined by the Project Team in consultation with the client/end users.
- SCOPE Management is determining and controlling the work and processes (determined above).

Where does Project Scope fit in Project Management?



Project Management: Project Scope

Project Scope Statement may include:

In and Out of Scope items
Assumptions and boundaries
Supporting document where relevant

Eg: Project: Create a website for a client

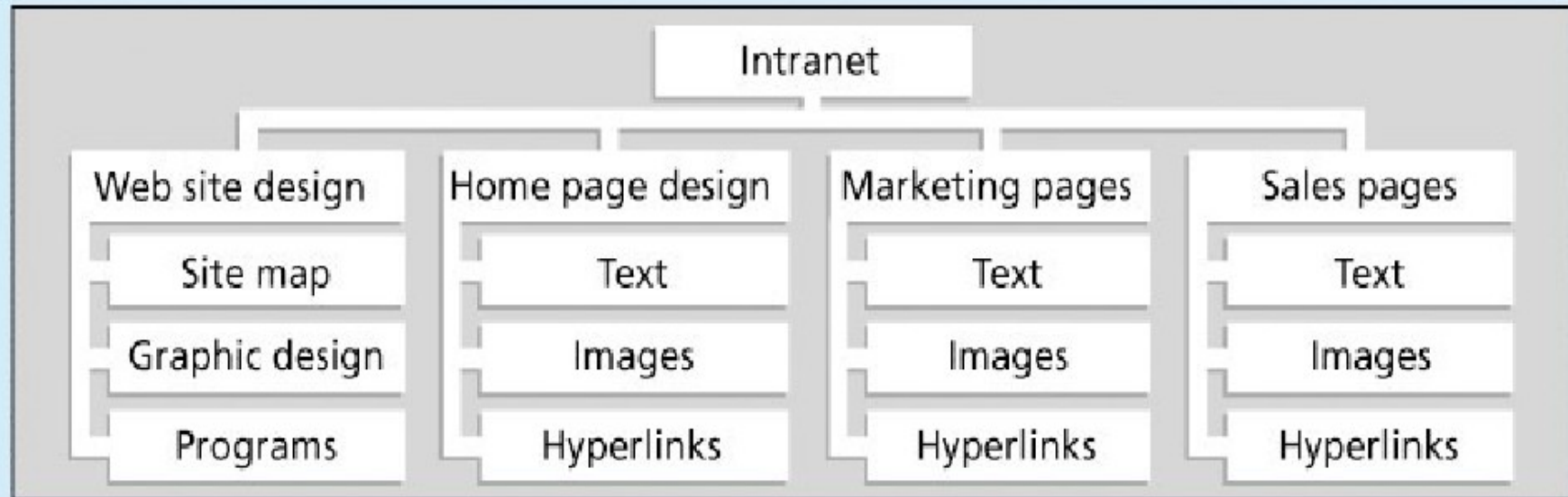
Scope: create webpages
 create database to hold webpage content

Out of Scope: Provide webserver
Assumption: Webserver will be made available to developer
Boundary: Website to fit inside 5Gb disk space

Project Scope: Work Breakdown Structure (WBS)

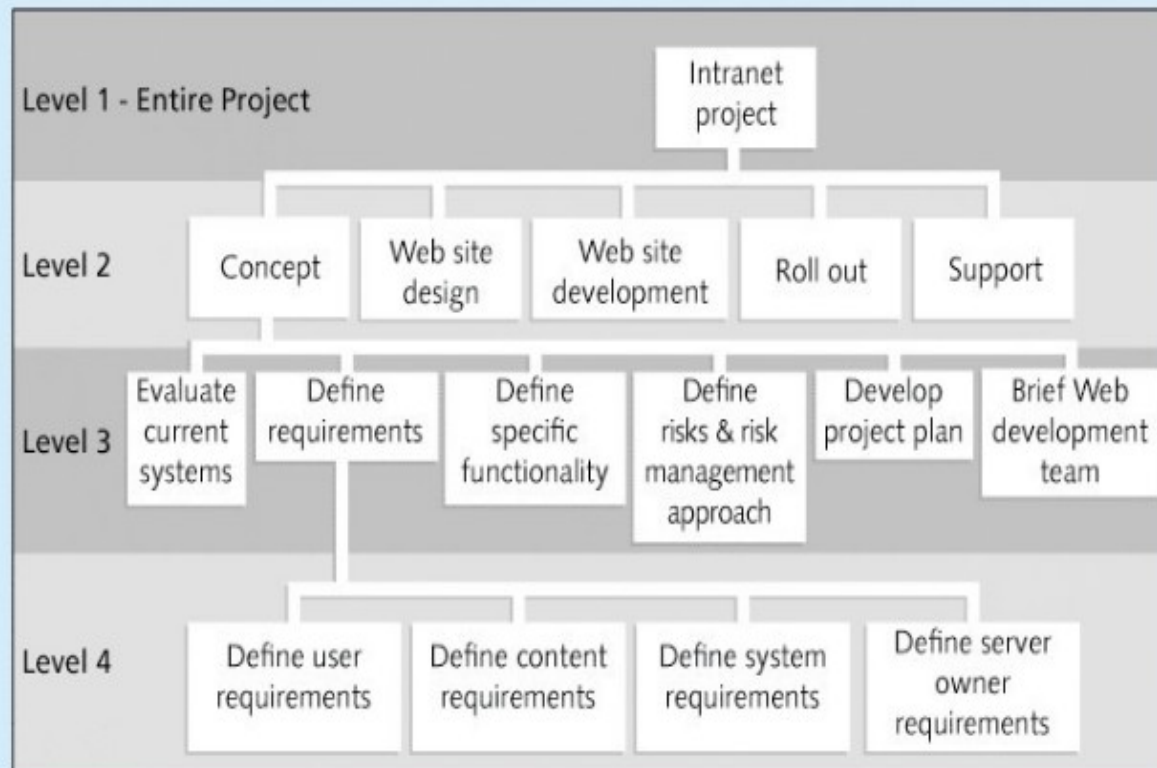
Breakdown scope into smaller manageable units

Sample Intranet WBS Organised by Product



Project Scope: Work Breakdown Structure (WBS)

OR also possible breakdown scope into smaller manageable phases:



Tabular form with PMI numbering

- 1.1 Concept
 - 1.1.1 Evaluate current systems
 - 1.1.2 Define requirements
 - 1.1.2.1 Define user requirements
 - 1.1.2.2 Define content requirements
 - 1.1.2.3 Define system requirements
 - 1.1.2.4 Define server owner requirements
 - 1.1.3 Define specific functionality
 - 1.1.4 Define risks and risk management approach
 - 1.1.5 Develop project plan
 - 1.1.6 Brief Web development team
- 1.2 Web site design
- 1.3 Web site development
- 1.4 Roll out
- 1.5 Support

Project Scope: Work Breakdown Structure (WBS)

Developing your WBS:

- **Top-Down:** break down top level **tasks** into smaller ones
- **Bottom-up:** start with small easy low level **tasks** and group into larger more complex **tasks**
- **Mind-mapping:** start with core **ideas/concepts** and expand into radial branches
- **Analogy:** adapt other WBS from similar projects
- **Progressive process:** WBS will evolve as you progress through project



Likely process by student teams

Project Scope: Work Breakdown Structure (WBS)

WBS is related to **Project Schedule**

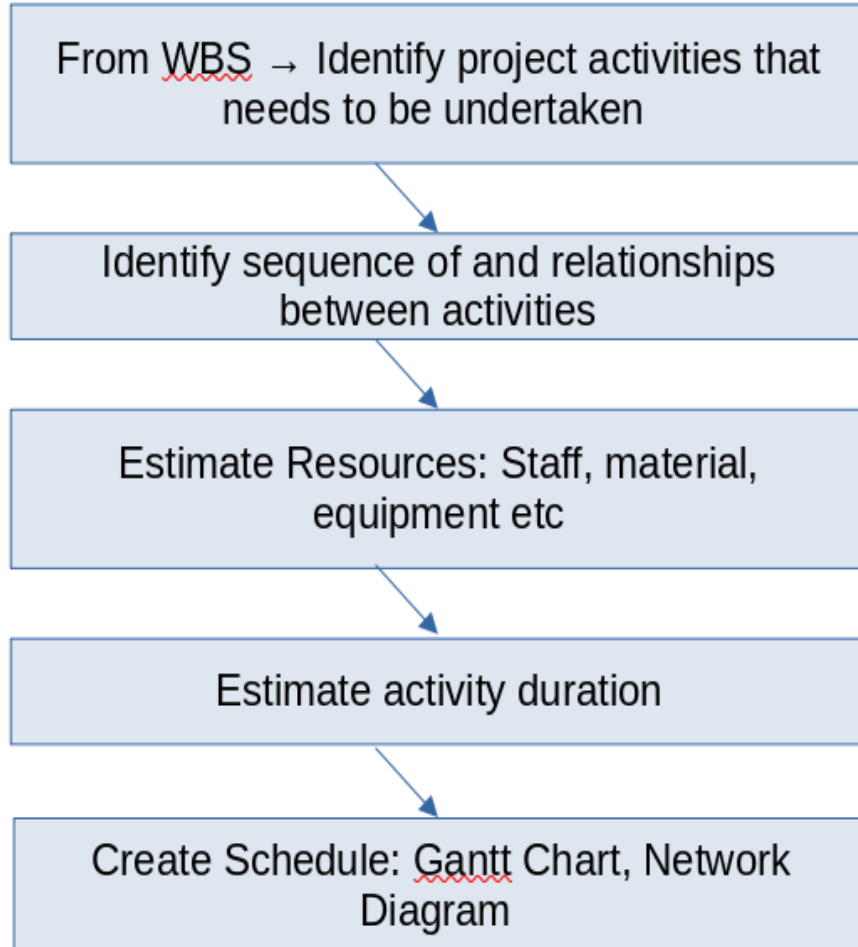
The importance of Project Schedule.

Time is a resource that is consumed no matter what happens, ie:

You can't stop time, no matter what you do!
There is only 24 hrs in a day!! Its all you have...
You need to manage within time constraints
You can only delay a project by asking for more time!

(But you can stop spending \$\$ or stop using other resources.)

Project Schedule



Estimating resource and time is based on experience.

Activity Duration:

Effort + Elapsed time

Effort = Time working on activity

Eg: Duration = 5 days

Effort = 3 working days

Day 1, 2: start activity

Day 3,4: wait for another activity to finish

Day 5: continue and finish activity

Project Schedule : Gantt Chart

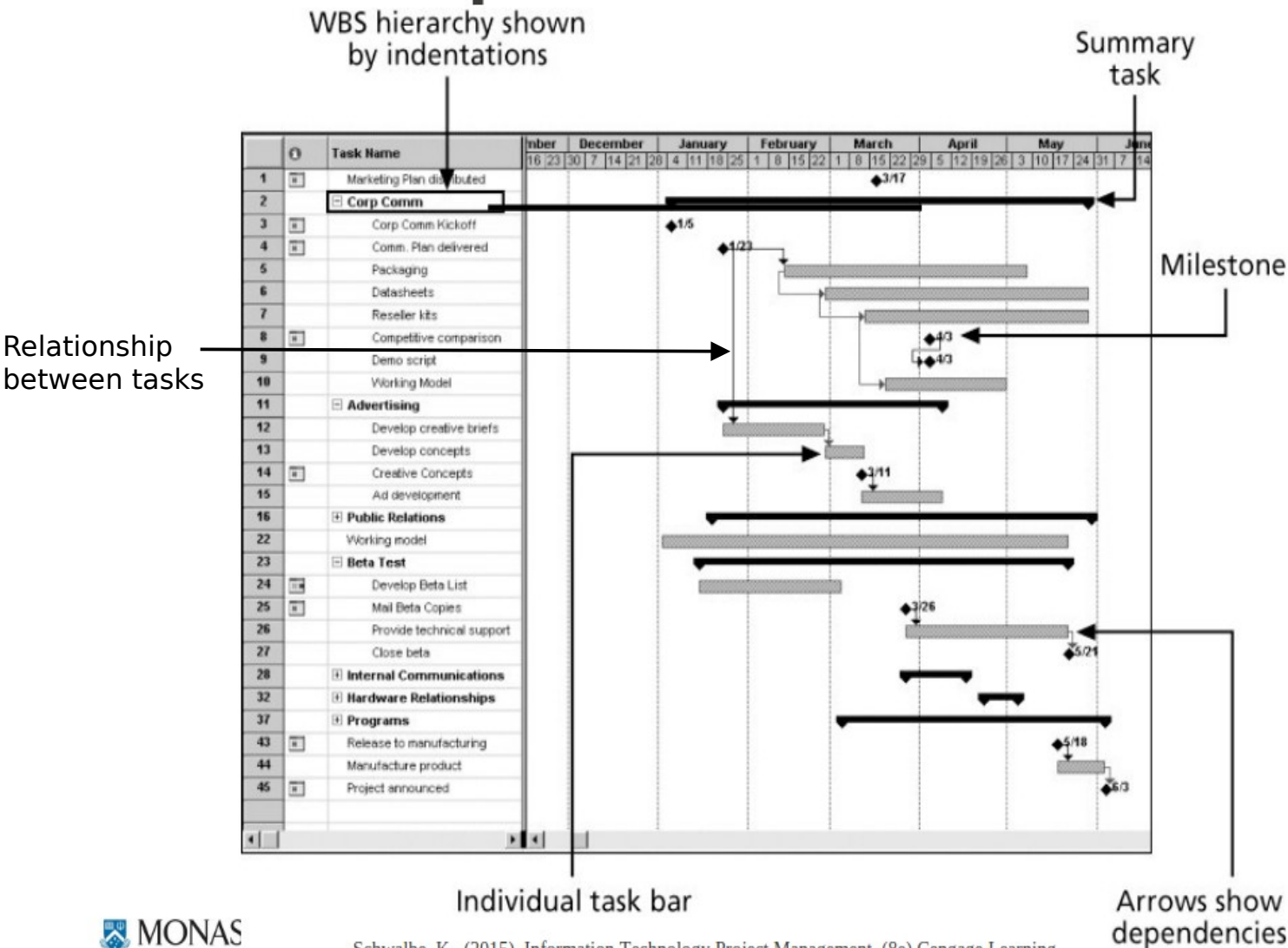
Gantt Chart : shows how project tasks from WBS can be mapped onto a specific schedule: start and finish times/dates and duration

- Tasks from WBS are shown as bars with length equal to duration of tasks
- Relationships or dependencies between tasks are shown as connecting arrows
- Project **Milestones** can be shown
- Planned and Actual execution times can be shown and compared: Tracking Gantt Chart
 - This can reveal delays or slack/spare time
 - (Example next slide)
- Use **ProjectLibre** to construct Gantt chart for Project ← student task

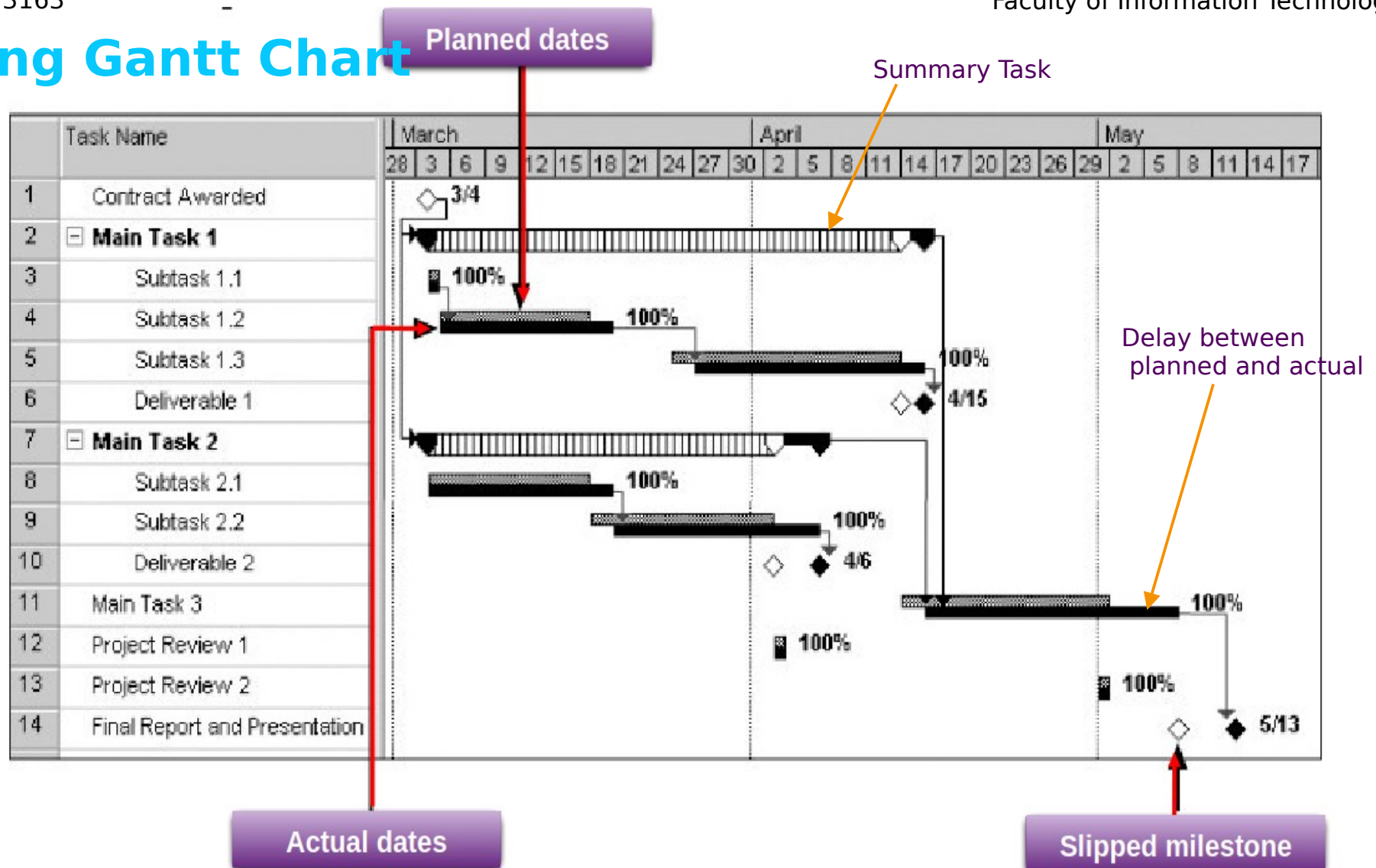
Project Schedule: Project Milestone

- Important events or completion of specific stages in project execution
- Milestones are significant events and have no duration
- Setting of milestones → allows monitoring of progress
- Milestones should be
 - ***Specific***
 - ***Measurable and/or observable***
 - ***Realistic***
 - ***Time-fixed***
- Examples:
 - Completion of a major component of software product
 - Signing-off on key documents

An example of a Gantt Chart



Tracking Gantt Chart

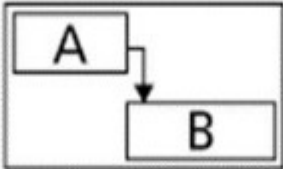
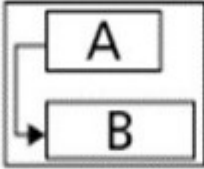
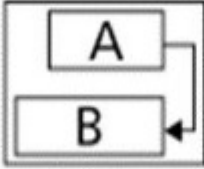
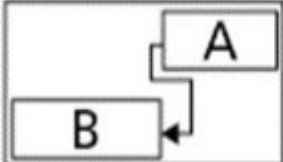


Project Schedule: Sequencing Activities

- Review activities and determine dependencies
- How start and finish times for 2 activities are related ?:
 - Finish to Start (FS)
 - Start to Start (SS)
 - Finish to Finish (FF)
 - Start to Finish (SF)

Project Schedule Sequencing Activities

Show on Gantt Chart as:

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

Project Schedule: Task Dependencies

- **Mandatory:** cannot be avoided as they are inherent in project
 - Eg: need to complete code before testing
- **Discretionary:** determined by project team and can be avoided
 - Eg: dependency relating to staff availability
- **External:** dependencies with activities outside of project
 - Eg: dependency on update of software by software vendor

Project Schedule

- **Gantt Chart**

- Student to create a Gantt Chart for their project
- Do Gantt Activity (Workshop)

- **Activity Depedency diagram**

- Used to determine **Critical Path** → **Critical Path analysis**
 - A **critical path** for a project is the series of activities that determines the **earliest time** by which the project can be completed
 - Workshop → Do Network Diagram activity (Moodle Video)
 - Watch video and attempt a **critical path** analysis (worksheet)

Project Triple Constraints

Triple constraints express relationship between Scope, Time and Cost

We considered **on time project completion** as a project success criteria (among others, eg user satisfaction)

Many projects however go overtime (most projects do!!)

Consider a Project with fixed schedule:

Scope is defined with 5 main tasks
Expected time to completion 5 weeks
Cost \$50K

Project Management : Triple Constraints

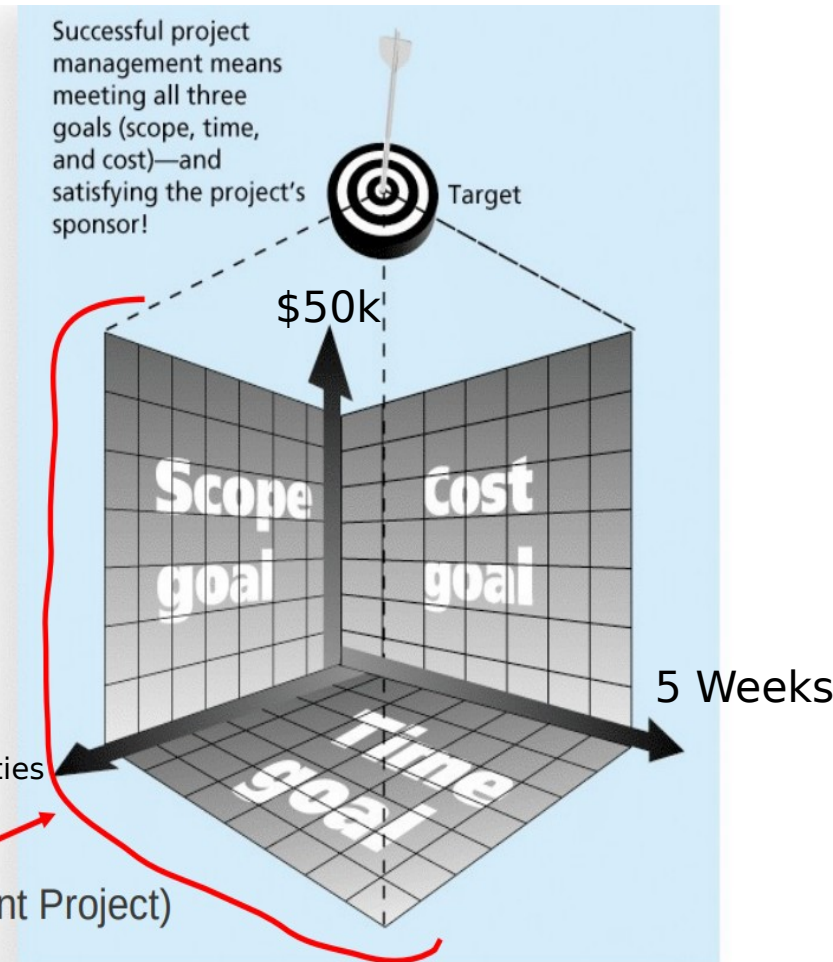
We briefly saw
earlier

....

The Triple
Constraint of
Project
Management

5 Functionalities

(Main interest for Uni/Student Project)



Project Triple Constraints

For Project with fixed schedule:

If project has unexpected difficulties → additional tasks are required to handle difficulties → **increased scope**

Increased scope → **increased time** → **increased cost**
or → **increased resources(staff)** → **increased cost**

You need to **negotiate** with client to give more time (eg 5.5 weeks) and/or increase budget for additional staff. (eg: \$55k)

OR reduce the overall scope to stay within schedule and within budget (cost)
– possibly drop some functionalities in a software project.

Project Triple Constraints

For Project that is ongoing, eg Linux development
OR software undergoing ongoing updates

Triple Constraints applies as follows:

Scope is always increasing: eg bug fixes and new features

- Time to completion always increases
- Cost increases

For student project, Cost is ignored and only consider Scope and Time. Cannot also increase “staff”

Project Management: Triple Constraints

Note that the concept of Triple Constraints is often mentioned in Project Management and is in fact “stating the obvious”!

Further readings:

<https://www.projectmanager.com/blog/triple-constraint-project-management-time-scope-cost>

<https://thedigitalprojectmanager.com/projects/scope-management/triple-constraint/>

<https://www.teamwork.com/blog/triple-constraint-triangle/>

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Week 3: Q & A

Project Management: Project Schedule

In Seminar Activity (Week 3): Individual task - but can discuss with others

Student to consider their FIT studies in 2023 as a project. (can do 1 semester first)

Decompose into units (start with FIT316x)

For each unit → identify assessment tasks and submission dates

→ identify lecture/seminar content that relate to assessment tasks

(This is your WBS for the year!)

For each assessment task → identify smaller task required to complete them

Draw or sketch a Gantt chart for the year.

Try to include dependencies and slack time

What type of dependencies are these?

Best to use ProjectLibre, but can use other software or spreadsheet.

How is ProjectLibre a more useful tool for this task?