Research Practice & Ethics
COMP9011

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Delivered To
MSc Software Architecture and Design
MSc Artificial Intelligence
MSc Information Design and Development

Week 9

- **Assignment 2**
- **Project Planning and Management**

Assessment

Course Work				
Assessment Type	**Assessment Description**	**Outcome addressed**	**% of total**	**Assessment Date**
Essay	The student will propose an initial research topic and will define some initial context behind the idea. In addition, the student will define some preliminary research aims and objectives. The student will then be expected to present their idea with the aim of effectively communicating the broad research topic and context.	1,2	40	Week 9
Other	The student will develop the research proposal detailing fully the idea and relevant state of the art, aims, objective, methodologies, work plan schedule and ethical issues that need to be considered. The student may also be required to present their proposal.	1,2,3,4,5	60	Sem End

Learning Outcomes

On successful completion of this module, the learner will be able to:	
LO1	Develop a research proposal defining the project aims, objectives and research methodology that will be applied to the research project.
LO2	Review the current state of the art in the topic related to the proposed research outlining the contribution the research will make to the general field.
LO3	Evaluate the main research integrity and ethical considerations that need to be considered in the proposed project.
LO4	Develop a project schedule and plan that considers the identified research integrity and ethical considerations.
LO5	Communicate effectively the idea and contribution of the proposed research project.

Description

- **Stage 2**
- Worth 60%
- Due date 08th Dec 2020 23:59pm (end of semester) – **Firm Deadline**
- Student should have a complete research proposal.
- Students should use the latex template provided.
- A minimum of 7 references (strong) need to be included.

Presentation Session

- The purpose of the presentation session is to access your communication skills and your ability to communicate a complex idea in 2 minutes or less.

- 2 slides are allowed.

- Presentation has to be 2 minutes or less.

- Presentation session will be held. Schedule is available on Canvas.

- Presentation session is worth 20 marks out of 60.

- Order of student has been uploaded over Canvas.

Research Proposal Contents

- A proposal typically has a number of prescribed sections:
  - Abstract
  - Research context and contribution to the research field
  - Research Aim
  - Research Objectives
  - Research Methodology
  - Work Plan
  - Ethical Issues

What is a project?

A *TEMPORARY* ENDEAVOUR UNDERTAKEN TO CREATE A *UNIQUE* PRODUCT OR SERVICE

A Guide to the Project Management Book of Knowledge, Fifth Edition,
Project Management Institute 2013

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Characteristics of projects

- Goal: something not done before
- A defined beginning and a defined end
- Produces a unique outcome
- Follows a planned organised approach
- Involves a team of people   **YOUR MSc**
- Has a unique set of stakeholders
- Makes use of resources allocated to the project

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- All projects must be *planned* out in advance if they are to be successfully executed.

- The execution of the project must be *controlled* to ensure that the desired results are achieved.

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Student X

- I am writing this email in order to discuss about my final thesis. I selected topic in which I wanted to present some practical work, but unfortunately, I am not in a position to complete my thesis within time-line. One of the reason is that since start of implementation phase, I was stuck in issues which were beyond my control and then due to lack to experience in this typical area, much more time was spent than I was expecting (hardware issues / deployment etc). Moreover, due to extensive workload in office specially in last two months, I was not able to manage required time on implementation.

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Student Y

I am snowed under at work at the moment and have very little done and feel I may not get it complete by May. I do understand it would mean I wouldn't graduate until 2021 but that would not be a issue for me.

What comprises a successful **research** project?

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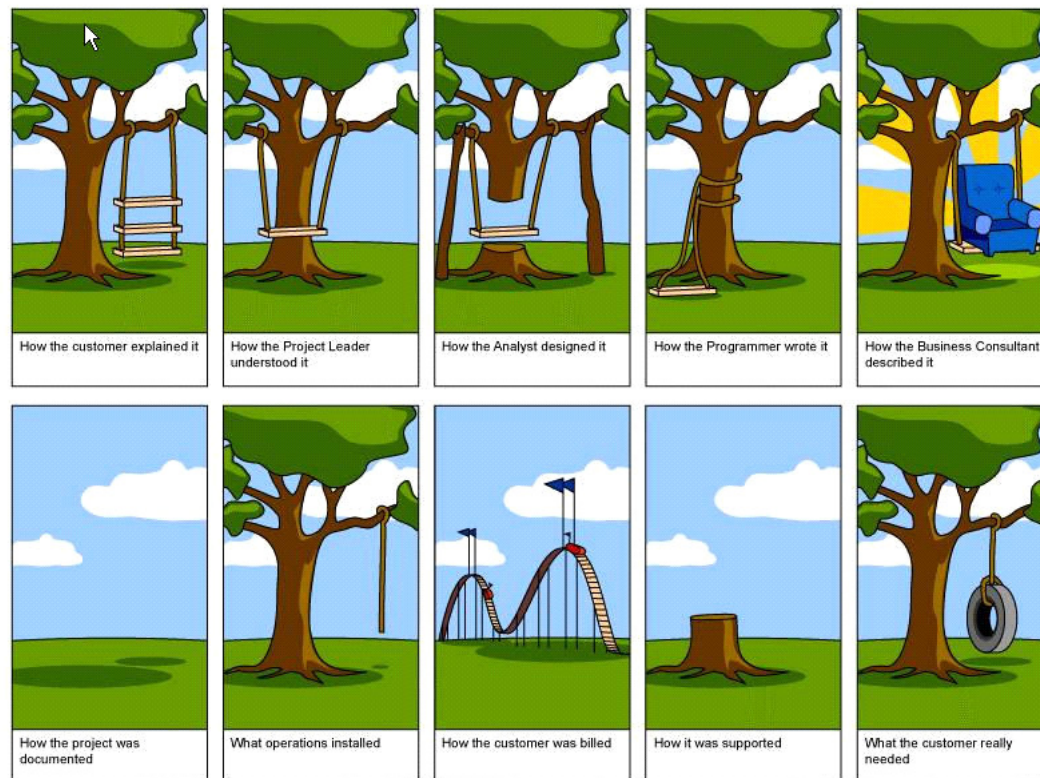**What comprises a successful research project?**

- On time
- On budget
- Meeting quality targets

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What comprises a successful research project?

- Project Communication

Why do Projects Fail?

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Why do project fails?

- Insufficient time

- Insufficient resources

- Unclear expectations

- Changes in scope are not understood or agreed on

- Expectations not realised — dissatisfaction with end results

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We need to ask these important questions:

- What kind of failure was it?

- Who was responsible?

- What happened?

- What did not happen?

- What process broke down?

- What feature failed?

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Unclear Expectations

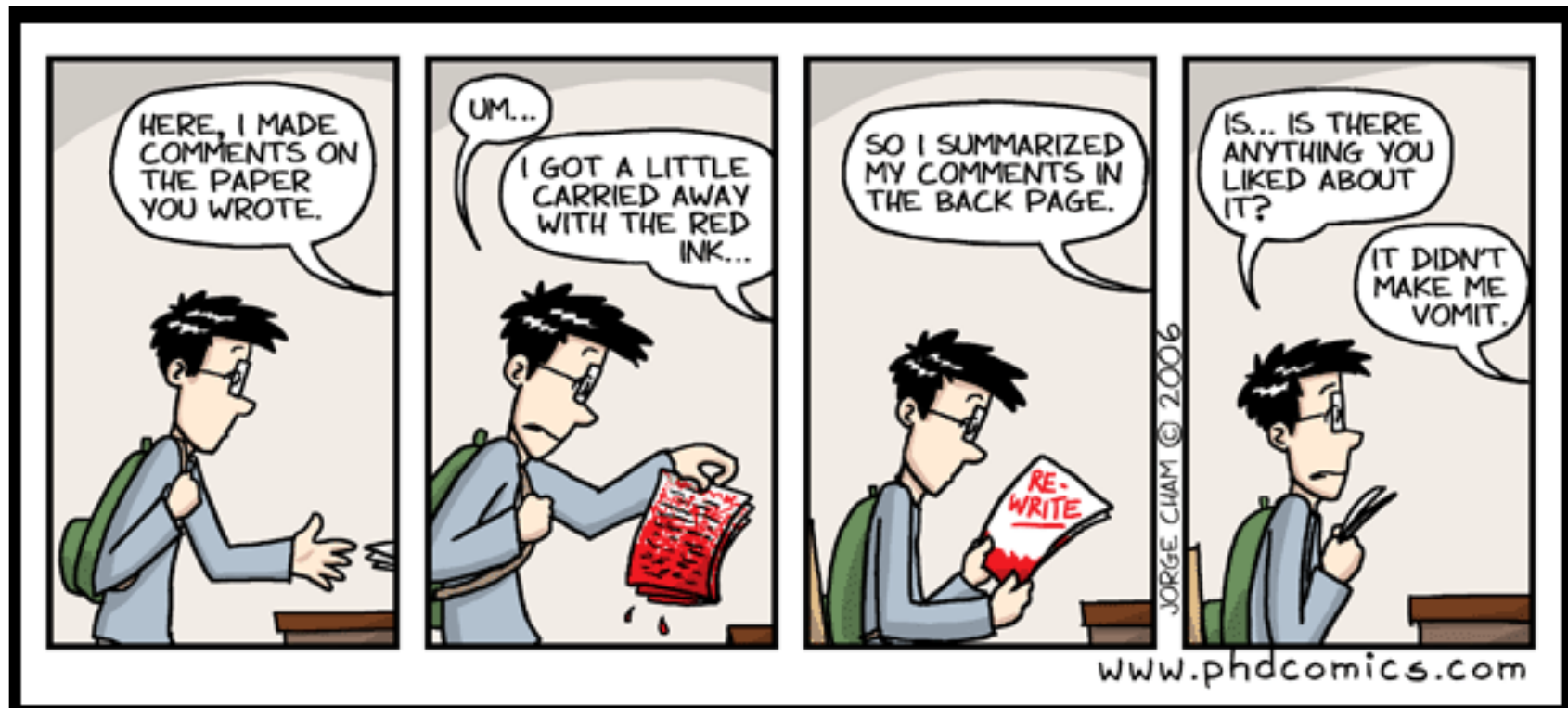# Project Planning & Management

Write, write, write!

Never too early to start writing your thesis

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Insufficient unfamiliarity with the knowledge area – read, read, read!!!

Read papers (every week); read books; read excellent theses; make notes, summaries; jargon; grammar; read a text about writing.

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**Lack of clarity of role of supervisor and communication method.**

- Distinguish between what you want to do and what your supervisor wants you to do

- Agree with your supervisor the best way to keep in contact

- Find out how often they will meet with you – weekly, every second week, monthly? What is expected – verbal report, written report, updates. What if there is a "crisis"?

- Style of Supervision

Distractions

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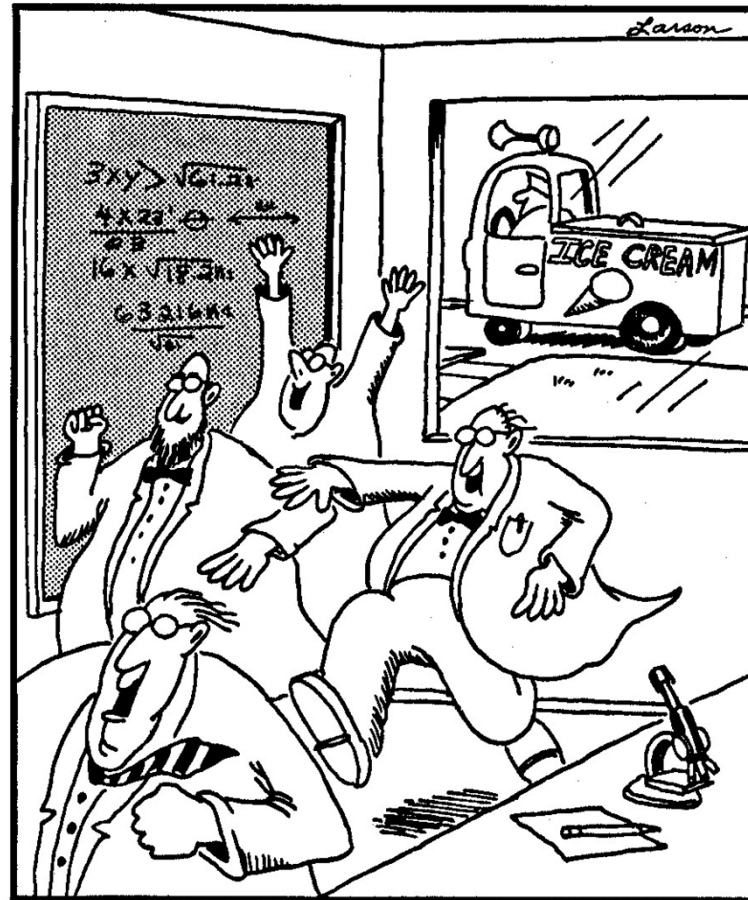
Problem with project goals

- The client has an unclear / inadequate idea of what the project is about.

- Failure of communication between the client and project manager.

- Constant change of project specifications.

- The project goals may be unachievable or unrealistic.

- Complex project

- Project objectives may contradict each other.

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Project Success Criteria

Quantitative

- Performance Specifications
- Quality Standards
- Deadlines
- Budget Constraints
- Resource Constraints

Qualitative

- Demonstrate Co-operation
- Ethical Standards
- Reputation
- Total Project Commitment
- Quality Approach

What is Project Management?

Project Management & Planning

What is project management?

- *Project Management*
  - is the adept use of techniques and skills in planning and controlling tasks and resources needed for the project. Project management aims to ensure the effective delivery of the project objectives on time and within cost constraints.

- *Project managers*
  - are people responsible for managing project processes, and applying the tools used to carry out the project activities

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History of Project Management

- Industrial Revolution large scale projects e.g. trans continental railway in the United States, London Sewers

- Needed way to manage large quantities of labour

- Fredrick Taylor's study of work

- Henry Gantt – Gantt charts outline the sequence and duration of all tasks in a process

- Modern form only a few decades old

- Second World War leads to a scarcity of labour and increases the complexity of projects; reduction in duration of projects

- Early 1960s organisations began to see the benefit of organising work around projects

- 1969 Project Management Institute

- 1970's: military & navy, defence, construction industry were using PM software

- Need to communicate and integrate work across multiple departments and professions.

- 1990's: large shift to PM-based models

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Application of specific

- KNOWLEDGE
- SKILLS
- TOOLS
- PROCESSES

- PLAN
- ORGANISE
- INITIATE
- CONTROL

} TO ACHIEVE { *SPECIFIC OBJECTIVES*

- Time
- Cost
- Quality

Project Planning

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Project Planning

- Scope Management

- Developing the Work Breakdown Structure (WBS)

- Planning the project schedule

    - Gantt Charts

- Resources

    - Labs

    - Supervisor

    - Postdocs / research colleagues

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Essence of a good project schedule

- Logical
- Simple and easy to work with
- Easy to monitor
- Flexible i.e. easy to revise
- Specific and timely
- Help you to anticipate problems
- Promote effective communication

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Scope

- Scope is the sum of the products and services to be provided as a project

- A concise and accurate description of the end products or deliverables of the project

- That meet specified requirements

- As agreed between the project stakeholders – supervisor(s) and you

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Work Breakdown Structure (WBS)

A deliverable oriented grouping of project elements which organises and defines the total scope of the project: work not in the WBS is outside the scope of the project. Each descending level represents an increasingly detailed description of the project elements.

PMBOK 2013

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Why develop WBS?

- A WBS provides the basis for:
  - Defining the project scope
  - Identifying all the components of work within the project
  - Identifying the skills and resource requirements for the project
  - Planning the project; WBS leads to scheduling the project, assigning resources and cost estimates

- When the WBS is complete:
  - The dependencies between tasks can be identified
  - The duration of the tasks can be estimated

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Work Breakdown Structure (WBS)

- Need to break down the project into manageable pieces.

- Projects have *phases*, *activities* and *milestones.*

- The WBS is a hierarchical list of project's work activities

- Can be generated by : *Graphical Tree* or *Outline (Indented Format)* or *Mind- map*

- Both methods use a decimal numbering system:

    1 top level – project title

    1.1 phase e.g. research

    1.1.1 task – library based

    1.1.1.1 subtask …

Work Breakdown Structure (WBS)

- A *phase* marks the beginning and works as the container of a group of tasks. In a software project you could have four phases, analysis, programming, testing and implementation.

- An *activity* or task is the smallest unit of work effort within the project and consumes both time and resources which are under control of the project manager.

- *A milestone* marks the end of a phase and all the tasks within.

Work Breakdown Structure (WBS)

- Milestones
  - Have a duration of zero
  - Identify critical points or events in your schedule
  - Often used at "review" or "delivery" times
    - or at end or beginning of phases
    - Ex: Literature Review Complete
    - Ex: Supervisor Sign-off

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Sample Graphical Tree
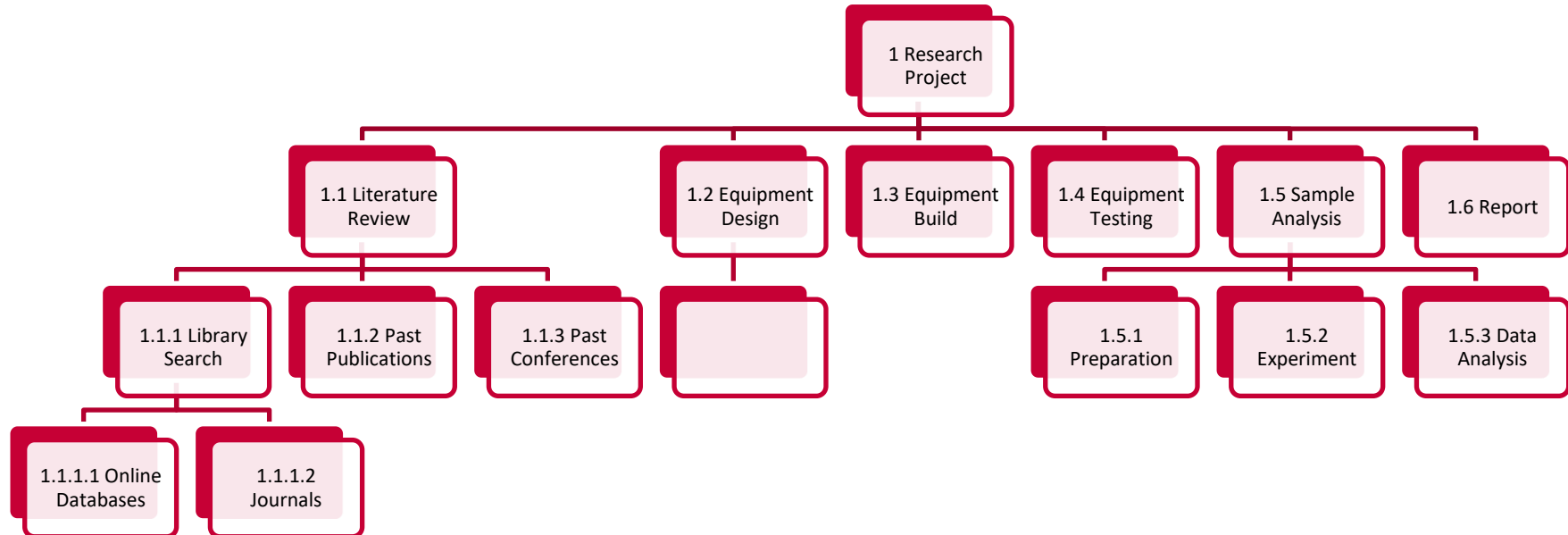
WBS Outline Example

1 Research Project

    1.1 Literature Review

        1.1.1 Library Search

            1.1.1.1 Online Databases

            1.1.1.2 Journals

        1.1.2 Past Publications

        1.1.3 Past Conferences

    1.2 Equipment Design

    1.3 Equipment Build

    1.4 Equipment Testing

    1.5 Sample Analysis

        1.5.1 Preparation

        1.5.2 Experiment

        1.5.3 Data Analysis

    1.6 Report

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Project Scheduling
Gantt Charts

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Sample Gantt Charts

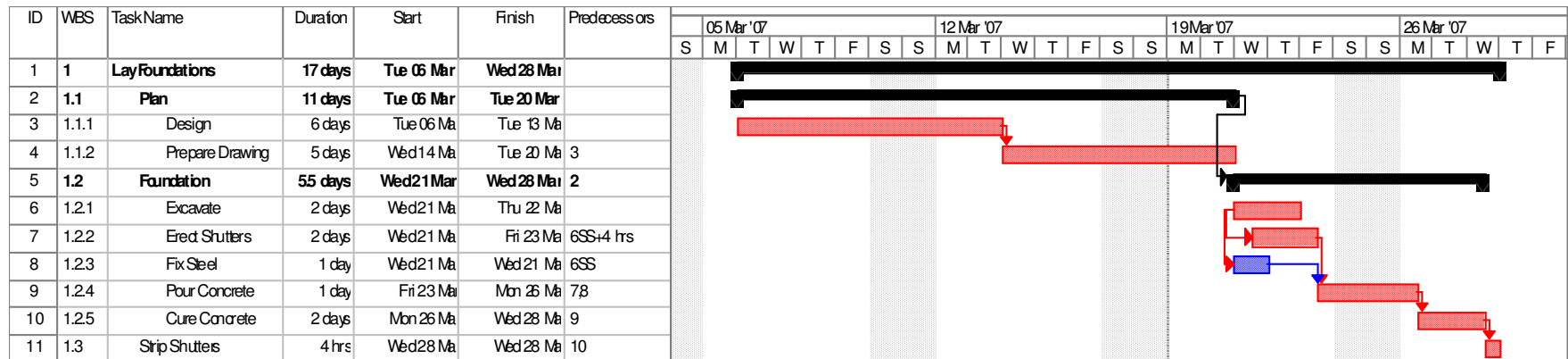| ID	WBS	Task Name	Duration	Start	Finish	Predecessors
1	1	**Lay Foundations**	**17 days**	**Tue 06 Mar**	**Wed 28 Mar**	
2	1.1	**Plan**	**11 days**	**Tue 06 Mar**	**Tue 20 Mar**	
3	1.1.1	Design	6 days	Tue 06 Ma	Tue 13 Ma	
4	1.1.2	Prepare Drawing	5 days	Wed 14 Ma	Tue 20 Ma	3
5	1.2	**Foundation**	**5.5 days**	**Wed 21 Mar**	**Wed 28 Mar**	**2**
6	1.2.1	Excavate	2 days	Wed 21 Ma	Thu 22 Ma	
7	1.2.2	Erect Shutters	2 days	Wed 21 Ma	Fri 23 Ma	6SS+4 hrs
8	1.2.3	Fix Steel	1 day	Wed 21 Ma	Wed 21 Ma	6SS
9	1.2.4	Pour Concrete	1 day	Fri 23 Mar	Mon 26 Ma	7,8
10	1.2.5	Cure Concrete	2 days	Mon 26 Ma	Wed 28 Ma	9
11	1.3	Strip Shutters	4 hrs	Wed 28 Ma	Wed 28 Ma	10

Gantt chart generated using Microsoft Project; note dependencies shown

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Gantt charts ensure that ….

1. All activities are planned for.
2. Sequence of activities is accounted for.
3. Activity time estimates are recorded.
4. the overall project time is known.

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To produce a Gantt chart…

1. Need to know the duration of each task
2. The inter-dependence between tasks
3. Start date or finish date of the project

Critical Path

Task	Days															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A	■	■	■	■	■	■	■	■	■							
B	■	■	■													
C				■	■	■	■	■	■	■	■	■				
D										■	■	■	■	■		
E													■	■	■	■

The set of tasks which together determine the project duration are referred to as the *critical path* through the chart.

The critical path can be highlighted to help the project manager to give priority to them.

Project Tracking

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Controlling processes. Keeping the project on track.

- Measure performance
- Refine control limits
- Take corrective action and evaluate effectiveness
- Ensure project plan compliance
- Reassess control plans
- Respond to risk event triggers
- Monitor project activity
- Status and progress reports are important outputs of controlling

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Tracking

- Cost, effort, schedule

- Planned vs. Actual

- How to handle when things go off plan?

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