Project Management Part I

Introduction

- A project is a set of related tasks that are coordinated to achieve a specific objective, usually in a given time limit

- The effective management of any project is essential to ensure that the project is completed:-

    a) within the specified time-scale;
    b) with the assigned resources;
    c) to the required standards or quality.

- The material presented in this lecture aims to present one possible approach to effectively managing the second year group project.

Overview of Project Stages

- All projects should include several fundamental management elements. The following list presents an overview of the recommended activities to be carried out during the group project.

    1) **Determine Project Objectives and Aims.**
    2) **Establish Project Team Membership.**
    3) **Consider all Project Stakeholders.**
    4) **Establish Project Activities.**
    5) **Estimate Project Duration, Resource Requirements and Dependencies.**
    6) **Project Quality Control**
    7) **Project Evaluation**

Let us examine each of these stages in more detail: -

1) **Determine Project Objectives and Aims.**

- It is essential to clearly define the expected outcomes for the project.
- Where possible quantify project aims.
- Identification of project quality criteria should also be considered.

Example: -

1. *The design and development of a new commercially viable long term antiseptic product.*

2. *The design and development of a suitable product packaging system*

3. *The design, implementation and construction of suitable product production/package facilities.*

4. *To achieve a product market entry by January 2004.*

5. *To produce a production yield of 10 million litres per year.*

2) **Establish Project Team Membership.**

- Once all project aims and objectives have been defined it is important to assign project responsibilities to all project members

- Project responsibilities should be assigned based on:-

  - The skills of the individual members within the group;
  - Required project activities;
  - Any constraints placed on the group by the module tutor.
    (E.g. Each member of the team must contribute the development of application code)

- Typical project responsibilities include:-

  Project Manager

  - Overall control of the project team.
  - Assigning tasks to team members.
  - Schedule and plan activities within the group.
  - Monitor the progress of tasks.
  - Reschedule tasks if required.
  - Motivate and support team members.

Programmer(s)

- Code application code.
- Document development of code.
- Test and debug the code produced.

System Analysis/Designer(s)

- Interview users and parties involved with the system.
- Interpret specifications/user requirements.
- Design a correct, robust solution to users requirements.

GUI Designer(s)

- Formulate well design GUI designs.
- Test the GUI designs with the user group/stakeholders.
- Incorporate required changes on an iterative basis

Secretary

- Record the proceedings at all group meetings.
- Maintain a diary of key group events.

Quality Assurance and Testing

- Determine the Quality assurance criteria for all products developed.
- Test and evaluate all products.
- Document the testing and quality control checking throughout the project.

Documentation Team

- Document all designs, coding, testing, project management tasks and quality assurance activities.

3) **Consider all Project Stakeholders.**

- Project stakeholders are the parties that have an active interest in the completion of the project.

- These may include:-

  - Potential application users.
  - The project commissioner.
  - Product marketing teams.
  - Subject experts.
  - Existing user groups/organisations.

- All interested parties should be interviewed and relevant findings should be incorporated into the project plan. (This may include the creation or modification of project aims and objectives)

4) **Establish Project Activities.**

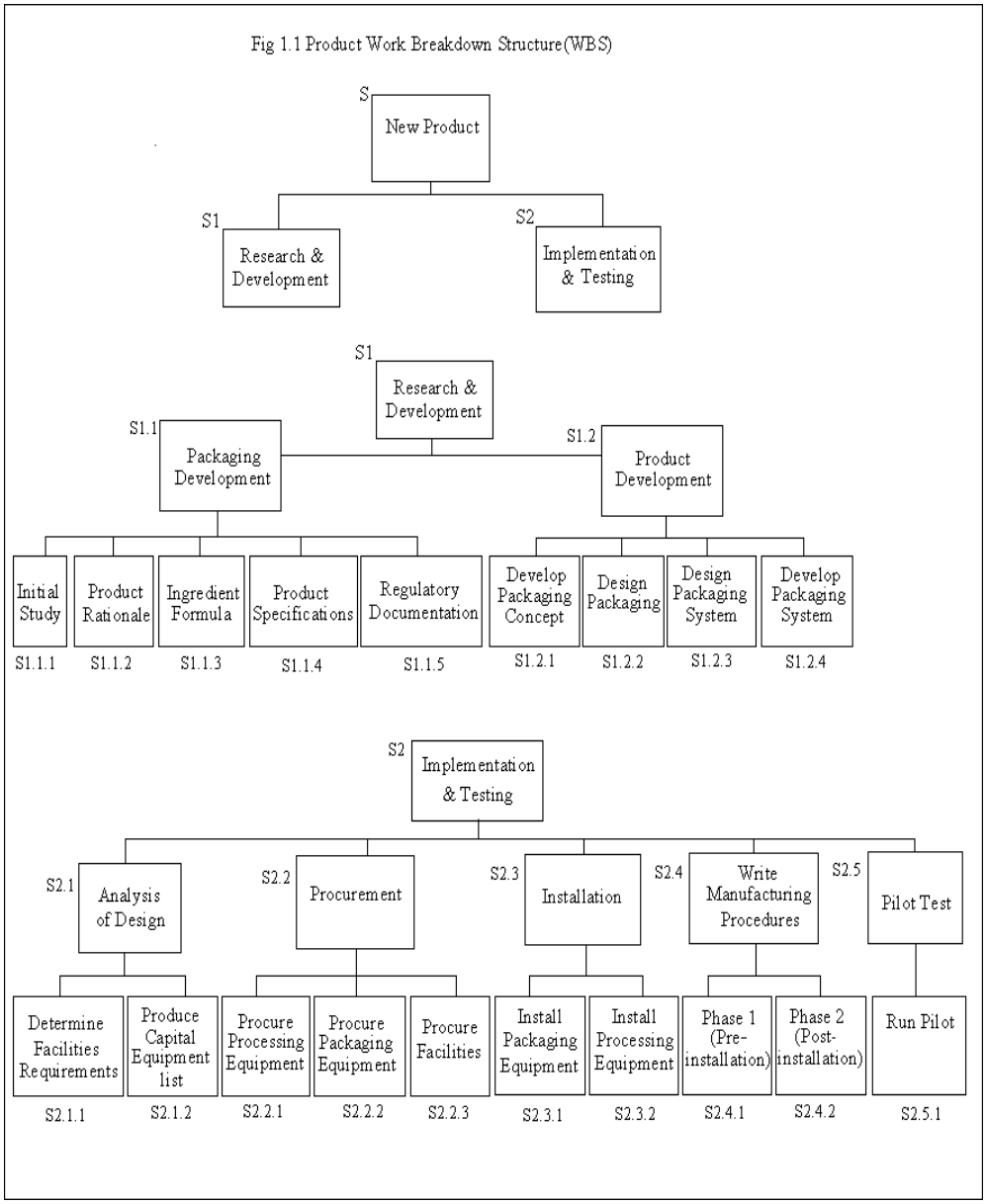
- Once all project aims and objectives have been finalised, it should be possible to identify all essential project activities.

Example: -

A list of activities essential for the successful completion of the antiseptic product project is as follows: -

1 - Product rationale
2 – Ingredient formula
3 - Product Specifications
4 – Regulatory documentation
5 – Develop packaging concept
6 - Design packaging
7 – Develop processing system
8 – Develop packaging system
9 - Study facilities requirements
10 - Capital equipment list.
11 – Procure processing equip.
12 – Procure packaging equip.
13 – Procure packaging facility
14 - Install processing equip.
15 - Install packaging equip.
16 - Install facilities
17 - phase 1 (Facilities)
18 - phase 2 (Facilities)
19 - Pilot test

- A Work Breakdown Structure Diagram (WBSD) can be used to effectively illustrate task dependencies and activity sequence. (See Fig 1.1)



5) **Estimate Project Duration, Resource Requirements and Dependencies.**

- Once the project has been decomposed into the required project activities, detailed consideration of each project activity should be made.

- For each activity consider:-

  - Estimated Duration.
    (The estimated duration of the activity in days or weeks)
  - Resource Requirements.
    (What equipment, materials, manpower, will the activity require?)

- Activity Dependencies.
  (What activities, if any, must be completed before this activity can be started?)
- Task allocation to group members
  (Allocation of group members to appropriate tasks)

- This information should be represented initially in table format before subsequent analysis is carried out.

  Example activity table format: -

Code.	Activity	Estimated Duration	Resources Requirements	Activity Dependencies	Staff Allocation
A	Product rationale	8 Weeks	Laboratory 3 + 5	None	12 Product Design Staff
B	Ingredient formula	12 Weeks	Laboratory 2	A	5 Food Technicians

- This information can then be used to calculate key project information such as:-

  - The total project duration.
  - Project critical activities (The critical path)
  - Total estimated resource requirements.

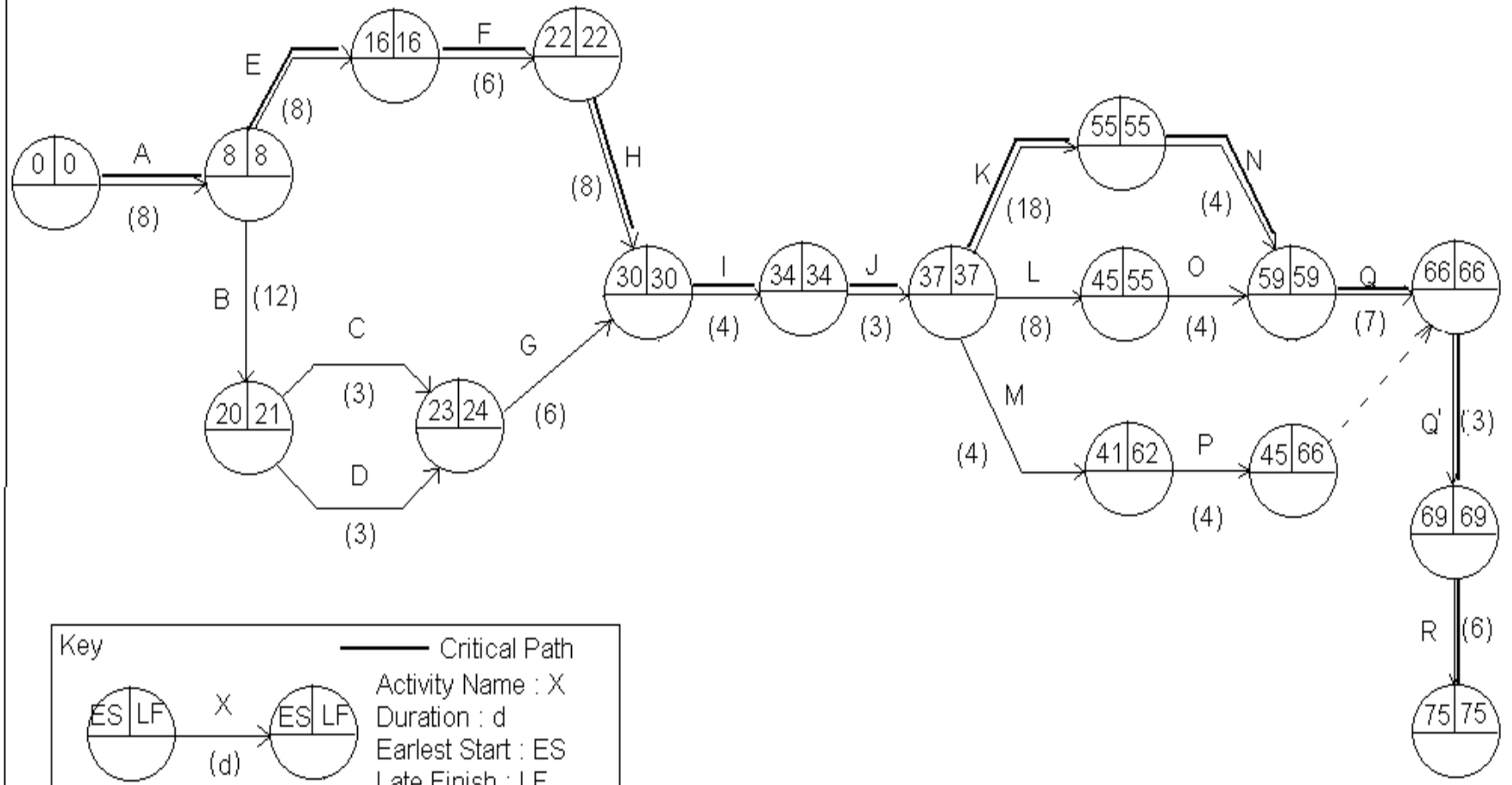
- Graphical representation of this information can be generated using a suitable project-management application such as ***Microsoft Project.***

- If suitable software is not available use one or more of the following techniques manually:-

  - **Activity on Arrow Diagrams. (See Fig 1.2)**
  - **Gantt Chart Diagrams.**
  - **Precedence Diagram Method.**

  NB: See your tutor for additional support, if you are unfamiliar with these techniques.

Fig 1.2 Activity On Arrow Diagram for Project



6) **Project Quality Control**

- Measures should be taken to ensure that ALL project deliverables conform to basic quality criteria.

- Quality criteria should be defined with the project aims and objectives at the start of the project.

- Ideally each quality criteria should be measurable. This will ensure that clear project acceptance targets can be formulated.(See Fig 1.7)

Fig 1.7 Example Simple Quality Criteria

- *A prototype system will be produced within 11 working weeks.*

- *The prototype will include 75% of the users required system functionality, as specified in the user system requirements.*

- *The prototype system will function within the stipulated boundaries with no more than a 1.5% error rate.*

- The following measures can be taken to maintain quality standards within the group:-

    - Create a quality policy and ensure that all group members understand the procedures they must follow. (Including the format of all documentation)

    - Adopt a standard analysis and design methodology

    - Ensure continuous quality reviews of project deliverables against quality targets.

    - No deliverable should be considered complete, or issued to the stakeholders, until it has passed a quality review

    - Ensure that the stakeholders for the project are involved in quality reviews

    - Ideally, quality reviewers should be independent of the producers (e.g. programmers), and not afraid to mention problems and errors

    - Quality reviews should look at three things:
        - Does the product work?
        - Does it conform to technical standards?
        - Does it do what it is meant to do?

7) **Establish Project Monitoring and Control Procedures.**

- All group members should meet on a regular basis to review project progress.

- The time and frequency of group meetings should be determined by the group and be adhered to wherever possible. (Not less than one meeting every two weeks.)

- Each meeting should consider as a minimum:-

  - A review of the last meeting
    - Are the minutes from the previous meeting correct?

  - Activity progress.
    - Are all activities on schedule?
    - If not what action needs to be taken?
    - What is the impact on the total project completion time?
    - Are additional resources required in-order for the activity to be completed on time?
    - Does the project schedule need to be adjusted?

  - Risk Assessment Review
    - Are there any current threats to project completion?
    - If so, has this risk been previously identified?
    - What action must be taken to counteract the threat?

  - Quality Criteria
    - Have all current project deliverables been checked against established quality criteria?
    - Do all current project deliverables conform to project quality criteria?

  - Action Points
    - What are the action-points from the meeting?
    - What is each member of the team expected to do before the next meeting?

- The group secretary should record the minutes from each meeting.

7) Project Evaluation

- As a final project deliverable your project documentation should include a project evaluation report.

- This essential project component should evaluate the projects overall success and include the following key elements:-

- Performance against project aims/quality criteria
  - Were the project aims/quality criteria met successfully?
  - If they were, reference any measurable figures, dates, test results, supporting evidence.
  - If you did not meet the goal successfully, then you should comment on the performance level that was achieved and state the reasons why the aim was not satisfied.

- Application Considerations.
  - An overall view of the product. (Does it do what it is supposed to do? Does it do it effectively and efficiently?)
  - What future enhancements would you make to the application produced?
  - Would you make the same choices regarding the design and development of the system if you were to undertake this project again?

- Group Dynamics and Overall Performance.

  - How did the team members share the project workload?
  - Did all team members work effectively and contribute to the successful completion of the project?
  - How were meetings organised and conducted? Were they regular and productive?
  - If problems arose, how did your group deal with them? (Give examples where possible)
  - Did each team member keep to his or her specified project role(s)? If not, what necessitated the changes?
  - Did you successfully follow your activity schedule, as laid down in your project management documentation? If not, what problems arose and how did you deal with them?
  - What project risk assessment considerations were made and how did the team cope with emergent risks?

- This report should be truthful, candid and represent the views of all the group members. If opinions do differ, note any differences within the document.