MAIN STAGES (OR PHASES) OF A TYPICAL PROJECT

PROPOSAL

1. CONCEPTION
2. DEVELOPMENT AND DEFINITION
3. EVALUATION

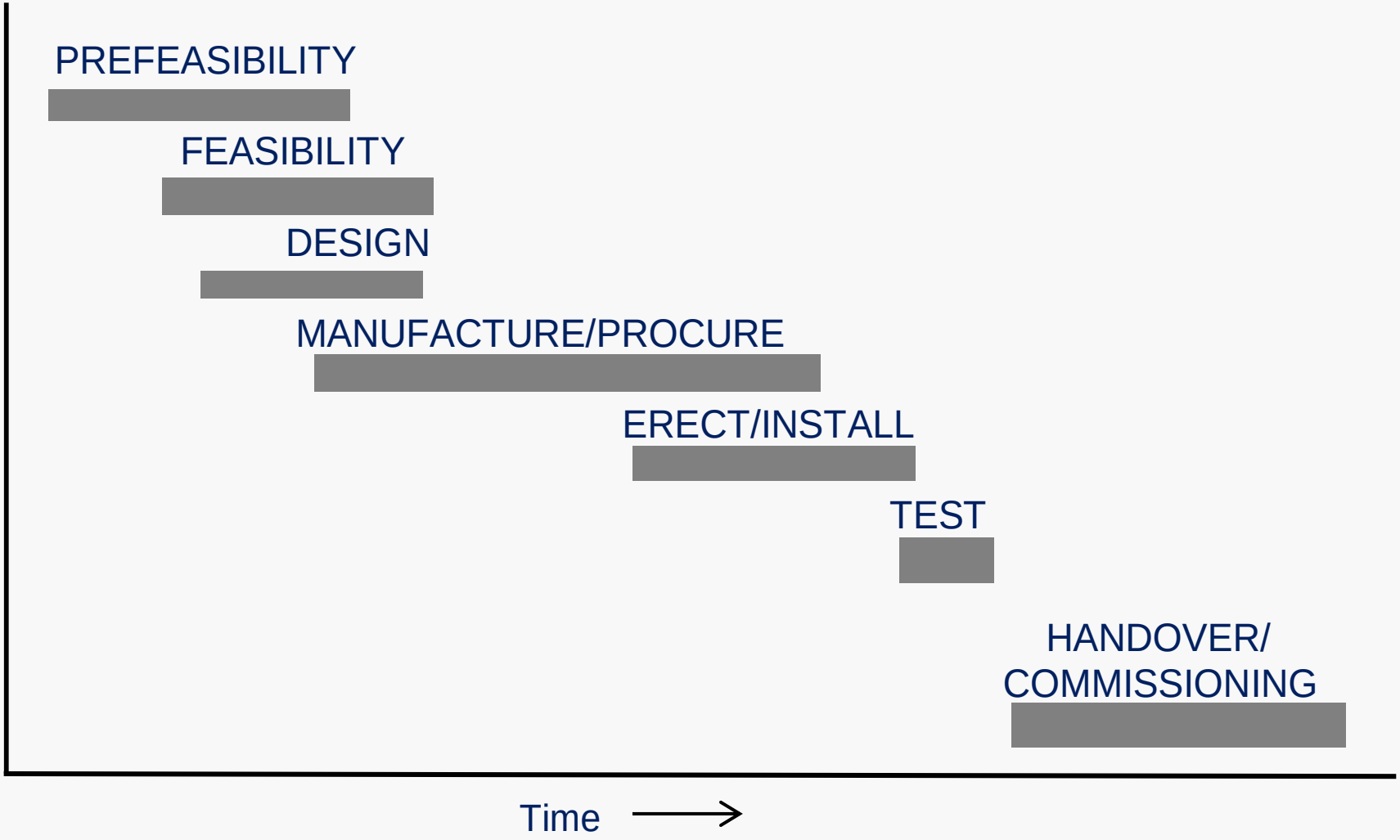
AUTHORISATION

IMPLEMENTATION.

1. DETAIL DESIGN
2. PROCUREMENT AND CONSTRUCTION
3. COMMISSIONING
4. OPERATE AND MAINTAIN

PROJECT/PROGRAMME LIFE CYCLES

ONE-TIME PROJECTS or One -off projects



METHODS OF GENERATING PROJECTS

SMALL PROJECTS

There is a need for a formal system for examining problems, and reporting so that suggested solutions can be considered as new projects.

PROJECT	POSSIBLE ORIGIN
New product to service to meet a customer need.	Customer/manufacturer
Invention of a new product.	Designer/manufacturer
Reduction of manufacturing cost.	Operative/Planner/Quality Control
Improvements in serviceability reliability, life of an article.	Service Engineer
Improved distribution.	Customer/Driver/ Manufacturer...
Change in design specification.	Customer

PRODUCT DEVELOPMENT PROGRAMMES

MAJOR PROJECTS

Examples are;

1. Replacing old or obsolete equipment.
2. Extension of product range.
3. Response to a threat by a competitor.
4. The output of a research programme.
5. A project needed as a result of an advance in Technology.
6. A deficiency in an existing product.
7. Collaboration with another company.
8. A successor to an existing project.

STAGES IN PROJECT IDENTIFICATION AND DEVELOPMENT

1. Proposal or project identification.

2. Development and definition of the project.

   - Preliminary estimates of costs and benefits.

   - Downey (1969) suggests that the Feasibility Study for a major project can incur about ½% of the total development cost and last no more than 6 months - but depends on the size and complexity of the project.

- Input into Feasibility Study will be a staff target, draft, staff requirements. etc.

- Output of a Feasibility Study will be a technical appraisal of the feasibility of developing and producing the scheme -
  - identification of areas of uncertainty
  - a statement describing the project so that a balance between the requirements, cost and duration is achieved.
  - a description of the means of achieving these.

- An assessment of the programme for the project, divided into:-

    project definition - (stage 1)

    project definition - (stage 2)

  full development. - An estimate of the cost of the project divided into the same three sections.

  - A statement of the main resources - e.g. Labour and plant required for:-

    Project Definition

    Development

    Production or construction.

A **Project Initiation Document** (PID) (as used in PRINCE) is a statement of;

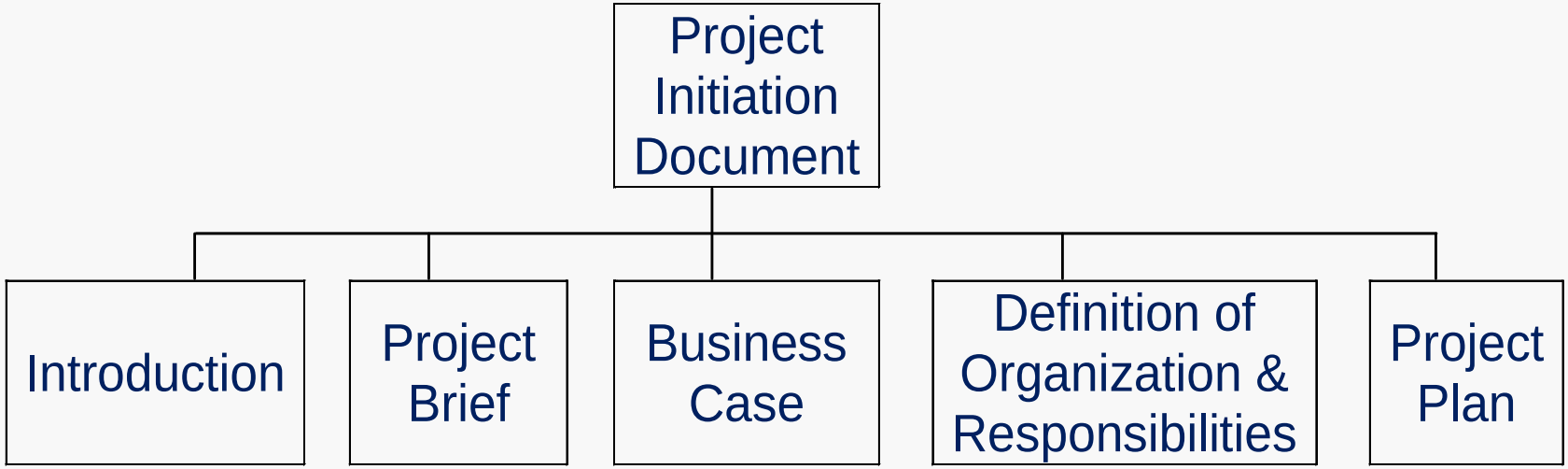
WHAT? - A defintion of the nature and scope of the product to be produced by the project.

WHY? - The justification for the project based upon the underlying business problem or opportunity which the business product is to address and the reasons for its selection in preference to other alternative solutions.

WHO? - The definition of the organisation structure and roles and responsibilities of the project.

HOW? - The approach to be taken to the management of the production of project products.

WHEN? - A mapping of "HOW?" over time.


Project Initiation Document
Introduction
Project Brief
Business Case
Definition of Organization & Responsibilities
Project Plan

PROJECT DEFINITION

Objectives

1. To verify the scientific and technical approaches identified in the feasibility study.

2. To analyse trade-offs between performance, time and cost.

3. To finalise the characteristics of the project.

4. Develop the specification.

5. Draw up plans for construction/production.

6. To provide an assessment of the costs and duration of the project.

7. To develop proposals for procurement strategy and contract action.

PROJECT DEFINITION - STAGE 1 (PD1)

Inputs to PD1 come from the results of the feasibility study.

These include:-

Staff Requirement

Technical Appraisal

Estimates of the duration, effort and expenditure for the project definition stages and for development to completion.

A PD1 may last up to 9 months and incur up to 5% of total development cost.

It is at this stage that preliminary **specifications** are prepared.

These describe the requirements of a product, its form, the purpose of trials etc.

The specification should be as specific as possible as one of its main purposes is to produce detailed estimates and programmes and to evaluate the effects of subsequent changes. The specifications should be comprehensive, and in areas of uncertainty, describe the assumptions made.

BY THE END OF PD1 THERE SHOULD BE

1. A development programme, giving a detailed breakdown of the tasks for project definition (stage 2) and a broader appraisal of the project.

2. Cost estimates for PD2 and cost estimates for missing out PD2 and proceeding directly to the following stage.

3. An estimate of the costs of the scheme itself.

4. A description of the arrangements for project management.

DECISIONS WHICH CAN BE MADE AFTER PDI.

1. To terminate the project.

or

2. To continue and to defer a decision until the results of PD2, and authorise additional work.

or

3. To proceed with PD2 and authorise additional work e.g. to order equipment which has a long delivery time.

or

4. To place a contract for development or design, at once.

PROJECT DEFINITION - STAGE 2 (PD2)

Follows without interruption from PD1 - unless it was decided to cancel the project. It involves more detailed design and experimental work.

Duration of PD2 varies with the size of the project, but for a large project will last 12-15 months and cost about 10% of the total development costs.

Detailed Design can start at PD2 stage.

- The "Fleshing out" of ideas proposed in the PD1 stage.
- Rarely a single optimum design solution to a problem.
- Changes in design for its own sake need to be avoided.
- There can be prejudice against other people's designs
    - "Not invented here" syndrome.
    - Valuable time and money can be lost in a project by producing equally acceptable alternative designs.

Project Appraisal – also called Project Evaluation

Appraisal is the process of defining objectives, examining options and weighing up the costs benefits, risks and uncertainties of those options before a decision is made.

Appraisals should provide an assessment of whether a proposal is worthwhile, and clearly communicate conclusions and recommendations.

Appraisals are often iterated a number of times before their proposals are implemented in full.

As the stages of an assessment progress, data must be refined to become more specific and accurate.

Some organisations appraise projects before possibly implementing them, and then (retrospectively) evaluates them (e.g. the World Bank).

Evaluation is the retrospective analysis of a project, programme, or policy to assess how successful or otherwise it has been, and what lessons can be learnt for the future.

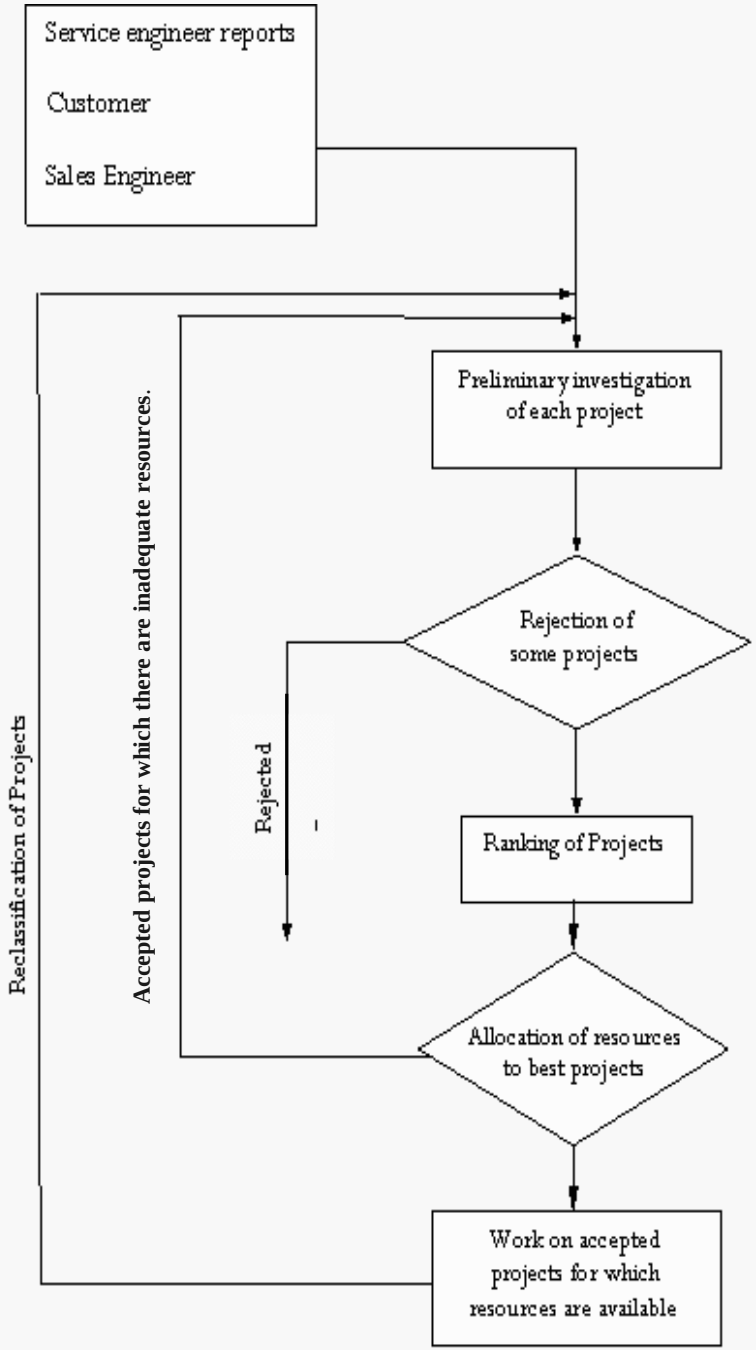
The terms ‘policy evaluation’ and ‘post-project evaluation’ are often used to describe evaluation in those two areas.

Appraisal, done properly, is crucially important and needs to be carried out carefully.

Decisions taken at the appraisal stage affect the whole lifecycle of new policies, programmes and projects.

Similarly, the proper evaluation of previous initiatives is essential in avoiding past mistakes and to enables learning from experience.

Economic Appraisals	Financial Appraisals
Focus: • VFM – net present value (NPV)	Focus: • Funding and affordability – cash flow and stock
Coverage: • wide coverage – Government and Society ('UK Ltd')	Coverage: • relevant organisation(s)
Relevant standards: • HM Treasury Green Book and supplementary guidance • discount rate (3.5%) applied	Relevant standards: • organisational accounting rules and standing orders • no discount rate applied
Analysis: • constant (base year) prices • includes opportunity cost • includes all quantifiable costs, benefits and risks to both organisation and wider society • includes environmental costs • excludes all Exchequer 'transfer' payments – for example, VAT • excludes general inflation • excludes sunk costs • excludes depreciation and capital charges.	Analysis: • current (nominal) prices • benefits – cash releasing only • includes capital and revenue costs • includes transfer payments (for example, VAT) • includes inflation • includes depreciation and capital charges.


Service engineer reports
Customer
Sales Engineer
Preliminary investigation of each project
Rejection of some projects
Rejected
Ranking of Projects
Allocation of resources to best projects
Work on accepted projects for which resources are available
Accepted projects for which there are inadequate resources.
Reclassification of Projects

In General projects are aimed at producing some financial return but this is not always the case.

For example AMENITY PROJECTS such as new sewers or new roads, cannot show a rate of return.

Amenity projects can be compared by cost or duration.

- Small pressure groups can exert influence beyond the true importance of their cause.
- There could be a need for an amenity but the demand is not concerted or well organised.

Other considerations in project evaluation include:-

1. Environmental problems.
2. Social or Trade Union Issues.
3. Marketing Constraints.
4. The cost of ownership or maintenance.

It may be difficult to appraise the project as it could be ill defined, and hence there being a lack of information about the costs and benefits, but also because the sources of information may be biased or have some ulterior motive in proposing or objecting to a project.

The future is to a great extent unknown and there will be great **risks** and uncertainties in anticipating the outcomes of projects.

It is often necessary to make assumptions about the future (eg interest rates, exchange rates, revenues and expenditures) and these assumptions need to be made clear and explicit.

It is worthwhile making a number of assumptions about key aspects of a proposal, some optimistic, others pessimistic, to test how robust a project proposal is in the challenge of such assumptions.

FULL DEVELOPMENT PHASE includes

- All Engineering processes. trials and tests to establish the detailed final design.

May include the manufacture of models, prototypes, pre-production versions, preparation of all necessary information, specifications, drawings, test equipment, tools, user training aids etc.

ACCEPTANCE PROCEDURES

- establish whether a product meets the specification and is suitable for use. Acceptance criteria are set out in the specification and provide the basis of evaluation and user trials.

PRODUCTION PLANNING

- is essential to ensure a smooth transition from development to production/construction.

PROJECT EXECUTION

Can include detail design, procurement, operation and maintenance, planning, monitoring and control.

Some activities do not have be sequential: e.g. construction of a scheme can start before the detailed design work is complete.

But if this approach is adopted project costs will be higher as more errors are likely to occur.

If contracts are let for manufacture or construction before design is completed, then the contract will be let on less favourable terms. But savings in time can often be critical in a project's success.

AT THE <u>PROJECT EXECUTION</u>

STAGE THE

***<u>RATE OF EXPENDITURE IS HIGH</u>*,**

SO THAT MONITORING AND CONTROL

ARE ESSENTIAL. INADEQUACIES IN

PLANNING BECOME APPARENT AND

MAY JEOPARDISE A PROJECT.

Note that;

When a single main contractor has been employed for the PD phases, the work and planning in those phases may assume the placing of a full development contract with that firm - possibly as a main contractor.

This should not be accepted without question.

Possibilities for competition should be appraised if possible more than one contractor should be retained during project definition, so that there may be competition for the full development/project execution phase.

e.g. Lufthansa's crew management system.
The Royal Navy's new aircraft carriers.

COMMISSIONING AND START-UP

- The first attempt at making the project hardware work.

Problems at this stage may arise because of:-

- errors in detailed design.
- organisational aspects.
- errors in construction/manufacturer.

PROJECT AUDITING

cf. WORLD BANK'S PROJECT EVALUATION PHASE.

Useful lessons can be learnt from examining completed projects.

Was the project completed on time, within budget and to specification, showing the required or expected financial return?

Why? Why not ?

Even when a project has been completed there can be a need for;

- Further Developments.
- Post Design Services.
- In Service Support.

<u>FURTHER DEVELOPMENT</u> -

Improvements in performance during the life of the project.

POST DESIGN SERVICES

Ensures that modifications and minor design alterations are properly appraised, approved and implemented.

Concerned with re-design, re-development etc. for preserving the product's reliability and maintainability includes the appraisal of defects.

IN SERVICE SUPPORT

Subject to the provision of guarantees of warranties, once a product has entered service, the main responsibility for maintenance lies with the user/operator.

May involve for example;

Trained operators, Trained repair personnel, Support Equipment, Spares, Repair facilities, Documentation, Training Aids.

Sometimes there is a

<u>DISPOSAL</u> phase

- the final phase of the project cycle.

- it is the responsibility of the user.
- can be very expensive

  e.g. decommissioning of a nuclear power station or a North Sea oil platform.
- can initiate a new project.