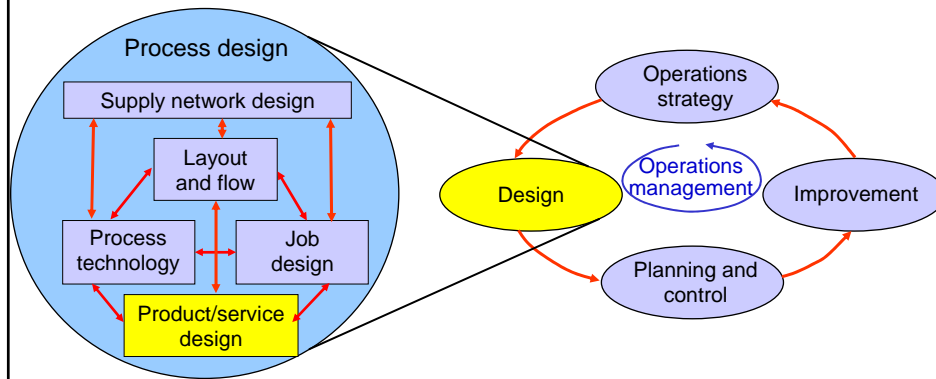


Product and service design



Source: Toyota (GB) plc

Product and service design






Why is design so important?

UK Design Council Survey ...

- Design helps businesses connect strongly with their customers.
- 90% of businesses growing rapidly say design is significant to them; only 26% of static companies say the same.
- Design reduces costs by making processes more efficient. It can also reduce the time to market for new products and services.
- Almost 70% of companies seeing design as integral have developed new products and services in the last three years, compared to only a third of businesses overall.
- Companies that were 'effective users of design' had financial performances 200% better than average.

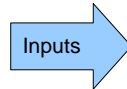
What is designed in a product or service?

- A concept  The understanding of the nature, use and value of the service or product
- A package  The group of 'component' products and services that provide those benefits defined in the concept
- A process  The way in which the component products and services will be created and delivered

The product and service design activity is a process in itself

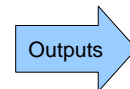
Transformed resources,
e.g.

- Technical information
- Market information
- Time information



The product / service design
process whose performance
is measured by its

- Quality
- Speed
- Dependability
- Flexibility
- Cost

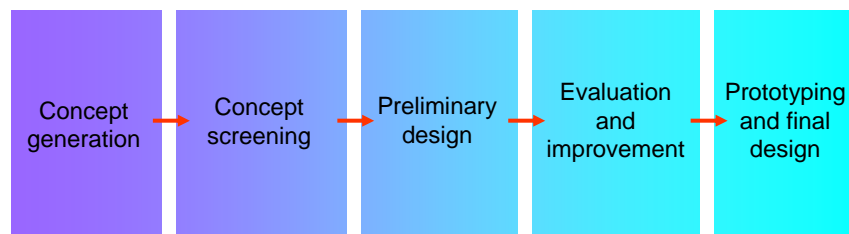


Fully specified
products and
services

Transforming resources,
e.g.

- Test and design equipment
- Design and technical staff

The stages of product / service design

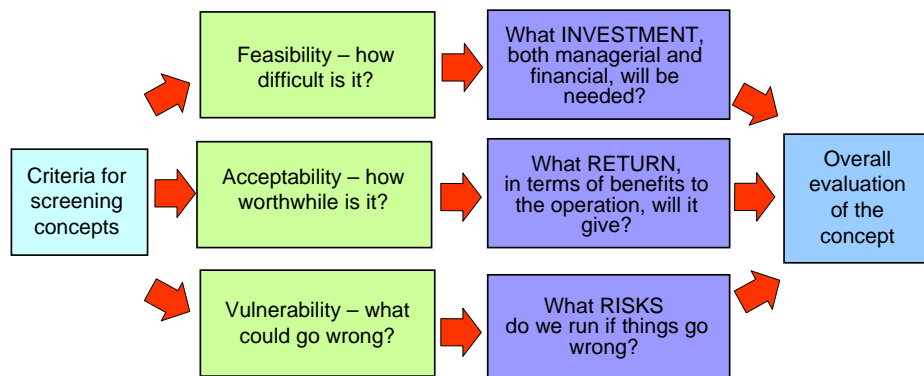


Concept generation ...

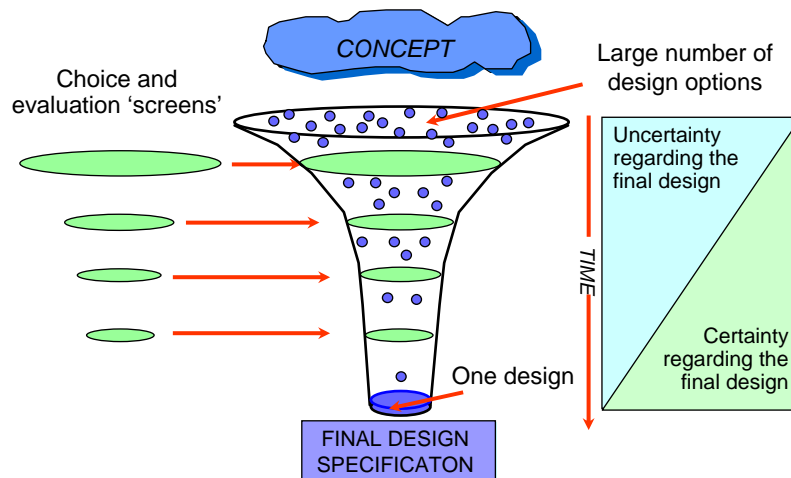
- Ideas from customers formally through marketing activities
- Listening to customers – on a day-to-day basis
- Ideas from competitor activity – for example reverse engineering
- Ideas from staff – especially those who meet customers every day
- Ideas from research and development

Concept screening ...

Broad categories of evaluation criteria for assessing concepts

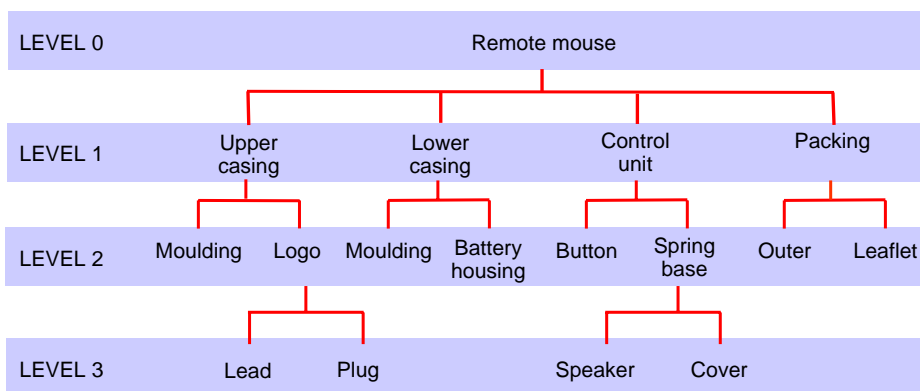


Design involves progressively reducing the number of possibilities until the final design is reached



Preliminary design ...

Component structure for remote mouse



Design evaluation and improvement ...

- There are various ways of evaluating preliminary designs
- These include:
 - quality function deployment
 - value engineering
 - Taguchi methods

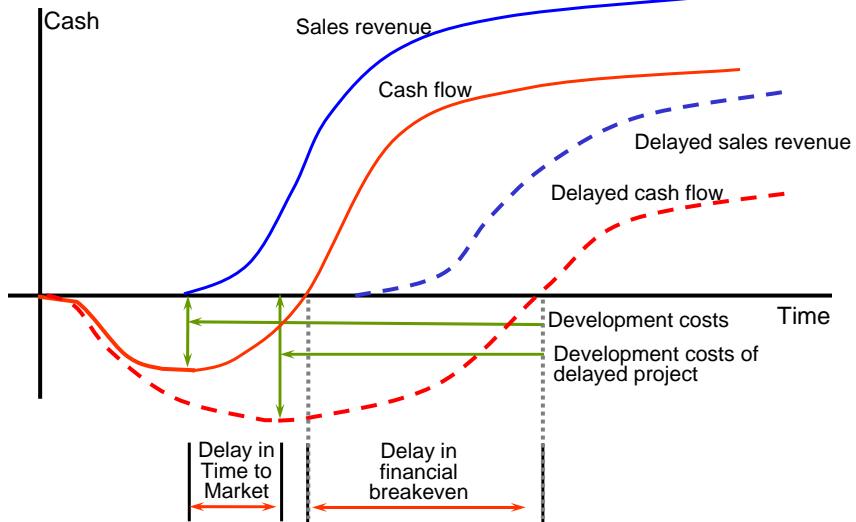
Prototyping and final design ...

- Prototypes are needed so products and services can be tested
- Prototypes come in various forms:
 - card models
 - clay models
 - computer simulations
- CAD has considerably simplified the production of prototypes

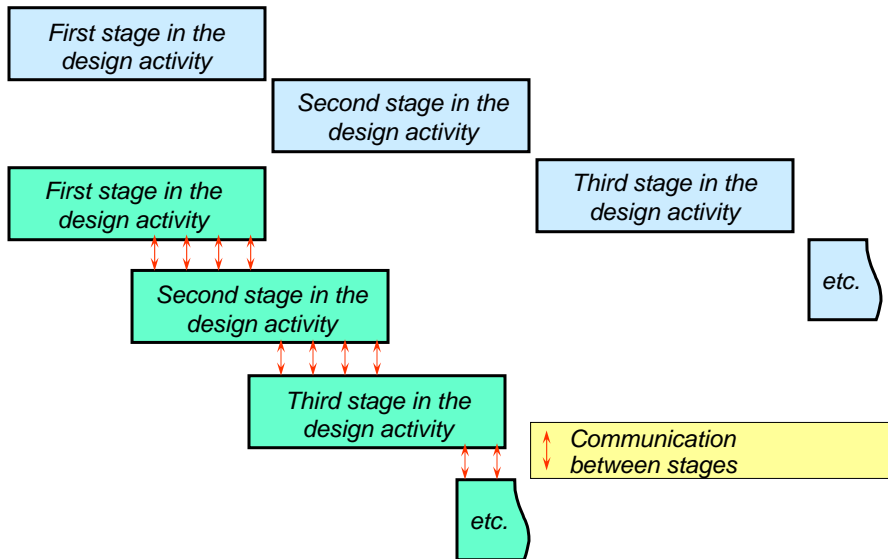


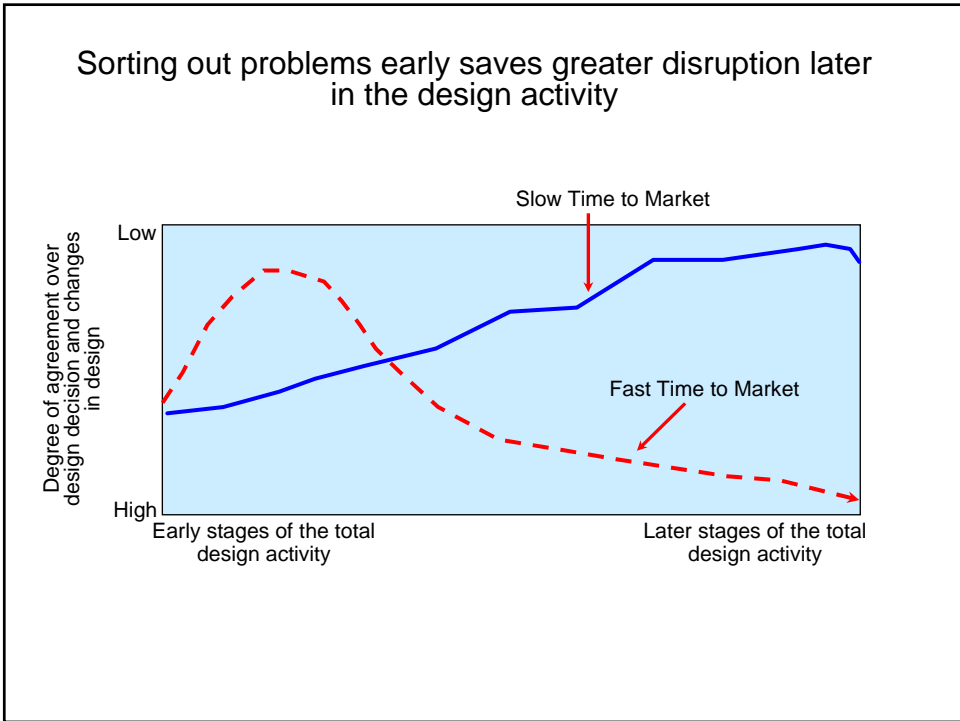
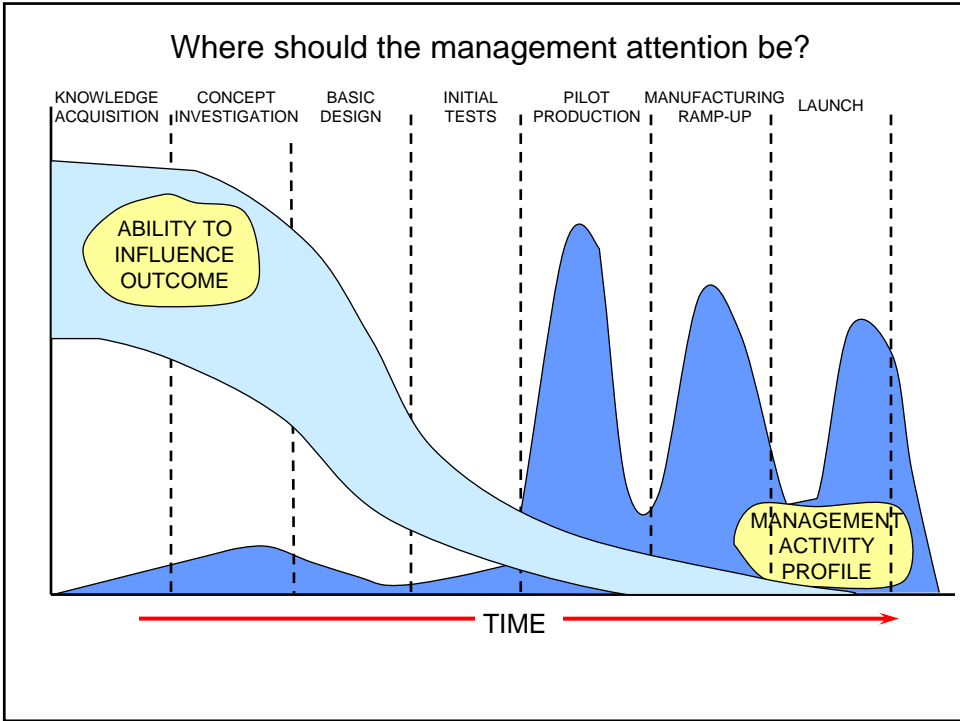
Source: Dyson

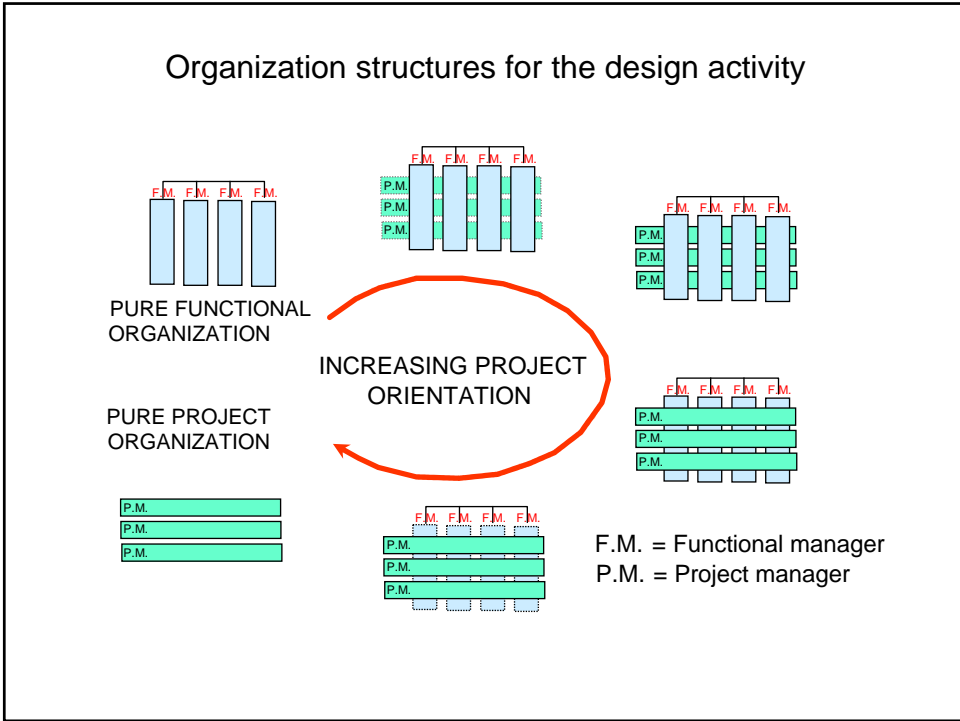
Delays in 'Time to Market' usually cause far longer delays to the financial breakeven point



Simultaneous arrangement of the stages in the design activity







Key Terms Test

Concept generation
A stage in the product and service design process that formalizes the underlying idea behind a product or service.

Reverse engineering
The taking apart or deconstruction of a product or service in order to understand how it has been produced (often by a competing organization).

Research and development (R&D)
The function in the organization that develops new knowledge and ideas and operationalizes the ideas to form the underlying knowledge on which product, service and process design are based.

Key Terms Test

Feasibility

The ability of an operation to produce a process, product or service.

Acceptability

The attractiveness to the operation of a process, product or service.

Vulnerability

The risks taken by the operation in adopting a process, product or service.

Key Terms Test

Design funnel

A model that depicts the design process as the progressive reduction of design options from many alternatives down to the final design.

Component (or product) structure

A diagram that shows the constituent component parts of a product or service package and the order in which the component parts are brought together (often called a components structure).

Standardization

The degree to which processes, products or services are prevented from varying over time.

Key Terms Test

Commonality

The degree to which a range of products or services incorporate identical components (also called parts commonality).

Modularization

The use of standardized sub-components of a product or service that can be put together in different ways to create a high degree of variety.

Quality function deployment (QFD)

A technique used to ensure that the eventual design of a product or service actually meets the needs of its customers (sometimes called house of quality).

Key Terms Test

Value engineering

An approach to cost reduction in product design that examines the purpose of a product or service, its basic functions and its secondary functions.

Taguchi methods

A design technique that uses design combinations to test the robustness of a design.

Virtual prototype

A computer-based model of a product, process or service that can be tested for its characteristics before the actual process, product or service is produced.

Key Terms Test

Computer-aided design (CAD)

A system that enables designers to create and modify product, service or process drawings on a computer.

Interactive design

The idea that the design of products and services on one hand, and the processes that create them on the other, should be integrated.

Simultaneous (or concurrent) engineering

Overlapping the stages in the design process so that one stage in the design activity can start before the preceding stage is finished, the intention being to shorten time to market and save design cost.