System development life cycle

Initiation

Not part of the project

Justify the project

Short phase

Checks that a problem or opportunity really exists

Decides whether the proposed change appears to be desirable,

Identification of the business case

Assesses whether the proposed development is practical in terms of the balance of costs and benefits the technical requirements and the organisation's information system objectives

Output is a feasibility report

Project set-up

Decide to go ahead

Steering committee set up

PM appointed

Project steam initially set up to start

Detailed planning undertaken

Important decisions are made

Requirements elicitation and analysis

Defines the requirements of the new system in detail

May involve:

- interviewing users
- examining documentation describing the current operations
- analysing operational records created by the current system
- observation of work practices

System development life cycle (cont)

- joint application development (JAD) sessions – stakeholders and business analysts in intensive sessions identify and agree detailed requirements;
- questionnaire surveys
- Mock ups and prototypes

Output is a requirements statement

Design

Translates the business specification for the automated parts of the system into a design specification of the computer processes and data stores that will be needed

Elements to be designed include: inputs, outputs, processing, data and information structures

Logical design: identification of the inputs, outputs, business rules and information that the system will process

Physical design: Concerned with the actual appearance of the input and output screens and the printed reports

Construction

Objective of designing, coding and testing software and ensuring effective integration between different software components

Produce procedure manuals

New hardware acquired

Requirements statement will be re-examined to ensure that it is being followed to the letter

Acceptance testing

User testing

Implementation/installation

System development life cycle (cont)

Hardware that has been purchased is delivered and installed.

Software is installed

Users trained

Initial content of databases set up

Project closure

Sign-off of acceptance documents

Handing over responsibility for maintenance and support to a permanent team

Closing down accounts relating to the project

Project manager writing a lessons learnt report

Releasing and re-allocating project resources

Arranging publicity to tell the outside world about the project's success

Review and maintenance

Post-implementation review should be carried out by a business analyst who was not involved in the original project

The project plan

Part of set up phase

Consists of several different types of documents, including activity networks and Gantt charts

Not cast in stone

Defines the project's scope, schedule and cost, as well as the supporting processes related to risk, procurement, human resources, communication and quality.

Control document

Includes

- Project initiation document
- Schedule planning
- Cost planning
- Resource planning



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The project plan (cont)

- Communication planning
- Quality planning

Resource planning

Project plan needs to account for various types of resources, including people, equipment and facilities

Responsibility assignment matrix (RAM): simple matrix showing individuals associated with the project on one axis and the activities for which they are responsible on the other.

Quality planning

To develop a system which meets all users' functional and system performance requirements documented during analysis, a carefully considered quality plan is needed

Quality criteria can be applied both to project deliverables and to the processes by which the deliverables are created

Don't let quality get overruled by deadlines and budget cuts. Emphasise throughout entire project

Projects

A group of related activities carried out to achieve a specific objective

Start from an idea about a desirable product or change

Business case (aka feasibility study)

- Showing value of benefits greater than costs
- Consider business concerns
- Consider technical difficulties of the project

Project attributes

Projects (cont)

Defined start point, which is when:

- Becomes an undertaking instead of just idea
- Obtains business backing and a project sponsor – financial backer within the organisation
- A commitment is made to provide the necessary resources
- Responsibilities are defined
- Initial plans are produced

Objectives

- Drive team actions towards common goal
- Stated and understood at project start
- Clear and unambiguous

Set of outputs or deliverables

Set end date

Set max budget

A unique purpose

Benefits which are measureable and greater than costs

Successful projects

Enable the stated objectives to be achieved

Delivered on time and within budget

Deliver a system that performs to agreed specifications

Satisfy the project sponsor and other interested parties (stakeholders)

Final judges

Project sponsor and the users

Being sensitive to their needs as important as sticking to the letter of a contract

Types of requirements

Functional

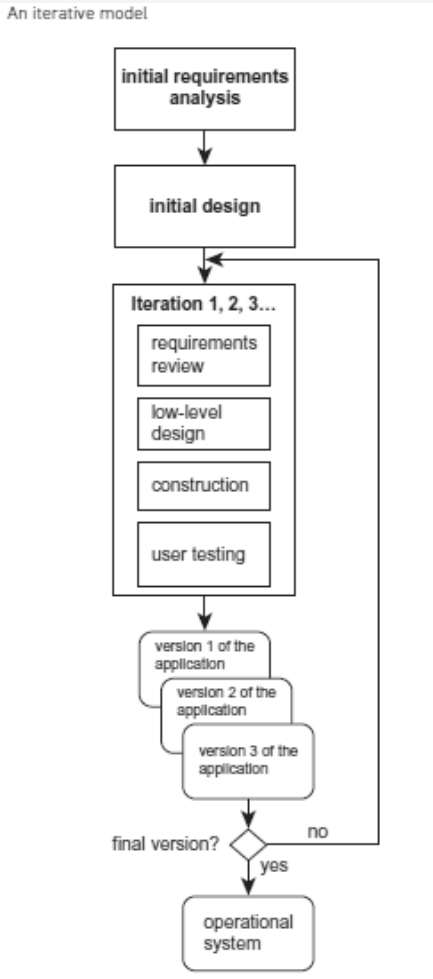
Cost

Quality

Deadline

Legal

Iterative model





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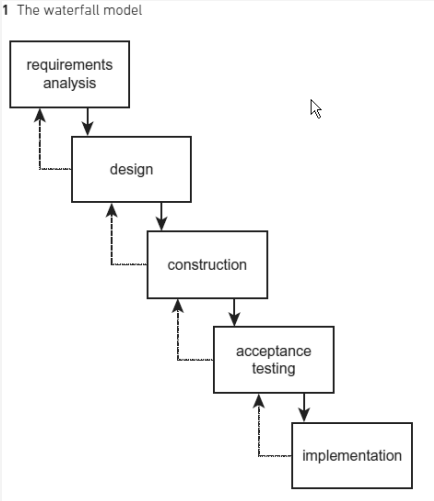
Waterfall model

1 The waterfall model



Project initiation document

Starts with an intro with project background, document's purpose, business justification for the project

Goals, objectives and deliverables

Project org chart

Project structure section

List of project milestones

Success and completion criteria

Management control section

- Reports timing and who gets them
- How plan to be produced and maintained
- How the information will be recorded
- How packages of work will be signed off and reviews conducted
- The people responsible for recording and assessing the impact of any changes

Project initiation document (cont)

- The people responsible for authorising different levels of change to goals, objectives, deliverables, cost or completion date

Risks and assumptions section

Communication plan

Post implementation review

Usually scheduled 6 to 12 months after sign-off

Review the implemented system in terms of its contribution to business objectives

Considers

- Whether the business and system requirements have been met
- Cost and benefit performance
- Operational performance
- Controls, auditability, security and contingency
- Ease of use

Output: post-implementation review report

SMART mnemonic for good objectives

Specific, **M**easurable, **A**chievable, **R**esource-constrained and **T**ime-constrained

Three specifications aka 'iron triangle'

Specified cost

Specified time

Meet a specified business requirement.

These three specifications are closely linked and any change to one will affect the others.

These form the scope

Projects should have

Clearly defined responsibilities

Clear objectives and scope. If you don't have these you'll have lots of problems in the future

Control

Change procedures

Reporting and communication

Elements of project management

Planning and estimating

Monitoring and control

Issue management

Change control

Risk management

Project assurance

Project organisation

Business change management

Development process models

IT development need a well-defined, repeatable and predictable system development life cycle

Waterfall method

Basic phased model of a development cycle

One-shot or once-through approach

Each phase cascades into the next

Assumes takes done in a strict sequence

Can loop back but expensive and lots of replanning required

Best used on projects where requirements have been clearly defined and agreed, most projects don't at beginning

Works best where there are few changes

Requires tons of documentation

Agile



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Development process models (cont)

Reduce bureaucratic obstacles by encouraging intense, informal, communication between project participants

Scrum

- Breaks project into increments called sprints
- Activities small steps which are listed in a backlog

Incremental and iterative

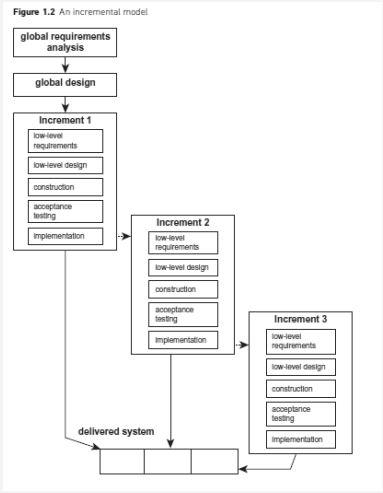
Incremental

- Develop in fragments
- Global requirements are defined and an overall architecture designed
- Product is developed in increments. After each increment is designed, developed and tested, it is system tested and then becomes operational, so that users get their new system in instalments
- Works best when reqs are well known

Iterative model

- Suited to situations in which the requirements are not clearly understood and where there is a need to begin development quickly
- Prototypes
- Customer can make suggestions for the next iteration
- Risk associated with this model is not knowing when to stop iterating

Incremental model



Schedule planning

Definition of requirements that is agreed and unambiguous

Careful breakdown of work

Schedule when activities will start and end and the resources

Cost planning

If the costs of the project exceed the value of its benefits, the project becomes uneconomic. It is also possible for an organisation to simply run out of money for a project.

Estimate quantities and costs, set budgets

Communication planning

Flows of communication during the project

How communication tools will be used

What meetings will be held with what attendees, and at what times

Implementation strategies

Get user input and make a recommendation on the best type to the steering committee

Direct changeover

The old system is discarded and immediately replaced by the new one

Risky

Relatively inexpensive

Need great testing

More risky for higher complexity systems

Parallel running

Running the old and new systems together for a period of time using the same inputs and comparing the related outputs

Continuation of testing

Safe

Low risk

Expensive

Phased take-on

Breaks the system into components that will be introduced in sequence

Low risk

Slow

Allow users to learn one system component at a time

Pilot changeover

Entire new system is introduced to just one business unit or location

Problems can be addressed and fixed before the system is introduced company-wide, but company-wide deployment of the entire system is consequently delayed.



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