CSE 4016 Software Project Management

Selection of an Appropriate project approach

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Choosing Technology

the training requirements for development staff;

the types of staff to be recruited;

the development environment – both hardware and software;

system maintenance arrangements.

We are now going to describe some of the steps of project analysis.

- **Analyse other project characteristic**

Is a data orientated or a control orientated system to be implemented?

Will the software that is to be produced be a general package or application specific? An example of a general package would be a spreadsheet

Is the system to be implemented of a particular type for which specific tools have been developed? For example:

Is the system to be created safety-critical?

What is the nature of the hardware/software environment in which the system will operate? It might be that the environment in which the final

How would you categorize each of the following systems according to the classification above?

(a) a payroll system
(b) a system to control a bottling plant
(c) a system that holds details of the plans of plant used by a water company to supply water to consumers
(d) a software application to support project managers
(e) a system used by lawyers to get hold of case law relating to company taxation.

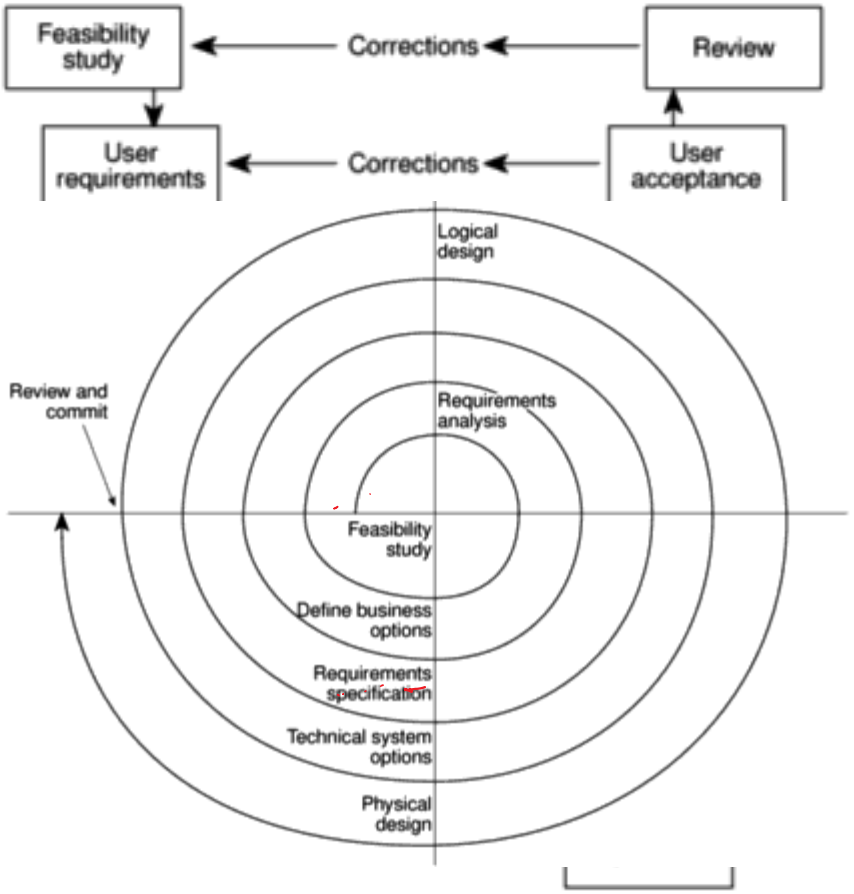
- **Identify high level project risk**

- Product Uncertainty
- Process Uncertainty
- Resource Uncertainty

- **Select General Life Cycle Approach**

- Control System
- Information System
- General Application
- Specialized Techniques
- Hardware Environment
- Safety Critical System

- Choice of Process Model
- Structure Method
- RAD
- Waterfall Model
- V- Process Model
- Spiral Model



Software Prototyping

- Throw away prototypes
- Evolutionary prototypes
- Incremental Prototypes

Evolutionary

- Advantages: Learning by Doing, Improved Communication, Improved user involvement, Demonstration of the consistency and completeness of a specification, Reduce need for documentation and maintenance cost.

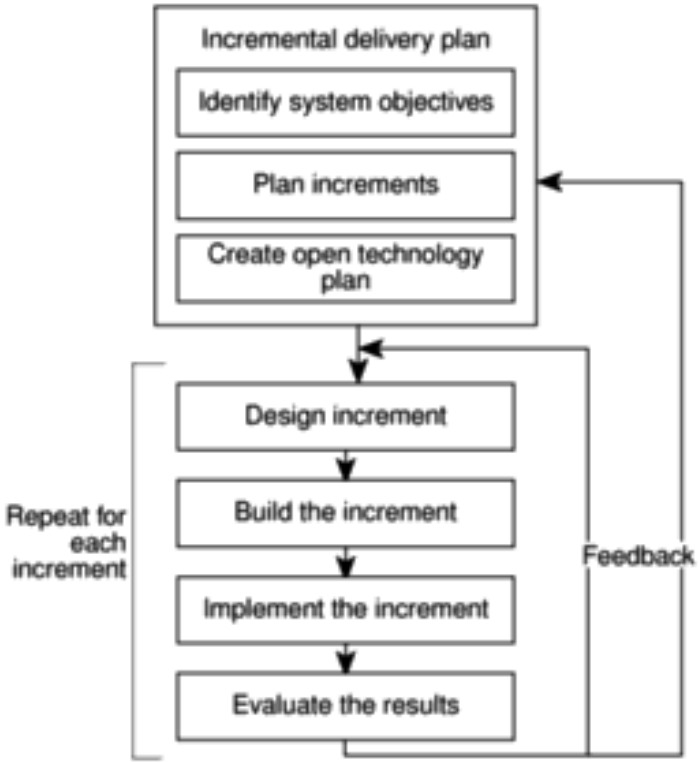
- Disadvantages: User Can misunderstand the role of prototype, lack of control, lack of project standard, additional expense, machine efficiency.

Major problems in prototyping

- Cosmetic : Simple changes to the layout / GUI
  - Implement, record
- Local: Changes some part but will not affect other parts of the system.
  - Implement, record, backed up, inspect
- Global: Affect other parts which are related.
  - All changes have to be the subject of design review

Incremental Delivery

- Breaks the application down into small components which are than implemented and delivered in sequence.
- Each delivered must give some benefits to the user.
- Deadline should be made even at the expense of dropping some planned functionality.



Advantages of this approach

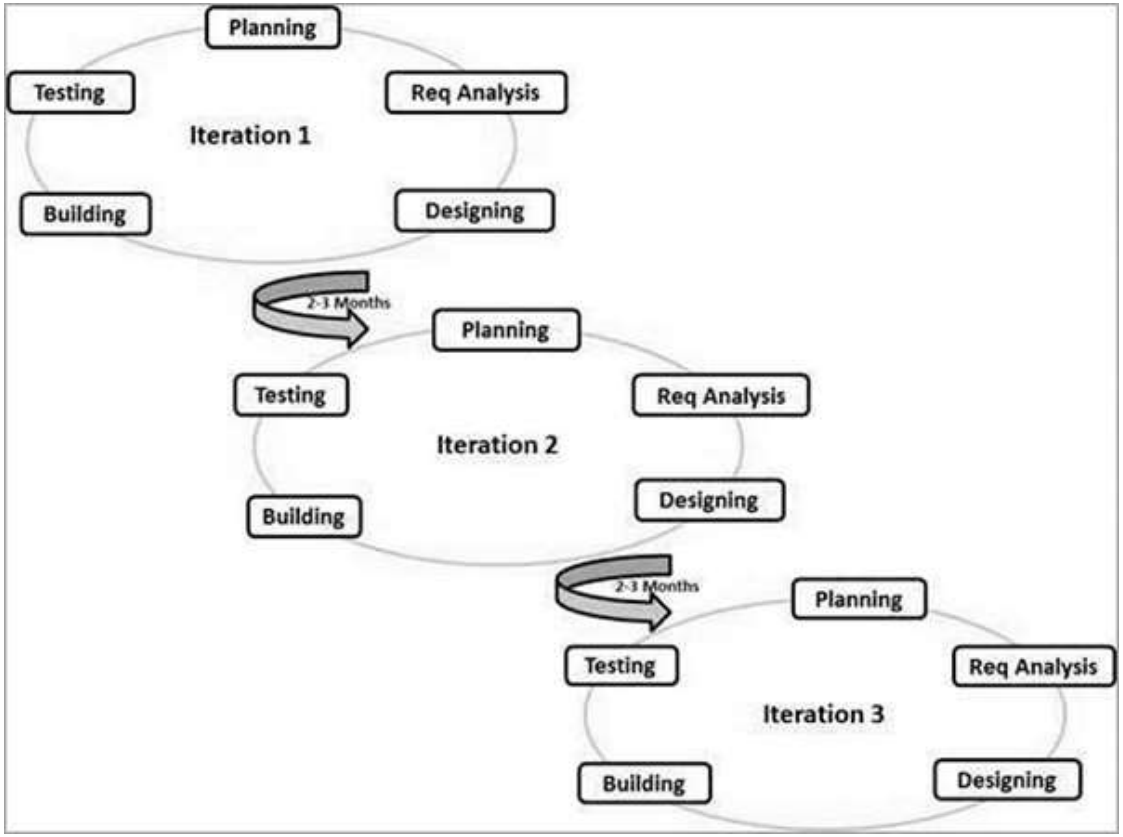
- The feedback from early increments can influence the later stages;
- The possibility of changes in requirements is not so great as with large monolithic projects because of the shorter timespan between the design of a component and its delivery;
- Users get benefits earlier than with a conventional approach;
- Early delivery of some useful components improves cash flow, because you get some return on investment early on;
- Smaller sub-projects are easier to control and manage;
- The project can be temporarily abandoned if more urgent work crops up;
- Job satisfaction is increased for developers who see their labours bearing fruit at regular, short, intervals.

Disadvantages

- 'software breakage', that is, later increments might require the earlier increments to be modified;
- Developers might be more productive working on one large system than on a series of smaller ones.

Agile Methods

- Designed to overcome the disadvantage on heavy weight implementation methodologies. - Because of frequent change request.
- It is an umbrella – refers to a group of development process.



- Crystal Technologies
- Atern (DSDM)

→ Dynamic System Deve Meth

There are three concepts of this method-

Chartering: Multi activities are involved in this phase such as making a development team, performing feasibility analysis, developing plans, etc.

Cyclic delivery: under this, two more cycles consist, these are:

Team updates the release plan.

Integrated product delivers to the users.

Wrap up: According to the user environment, this phase performs deployment, post-deployment.

The eight Principles of DSDM:

Focus on the business need

Deliver on time

Collaborate

Never compromise quality

Build incrementally from firm foundations

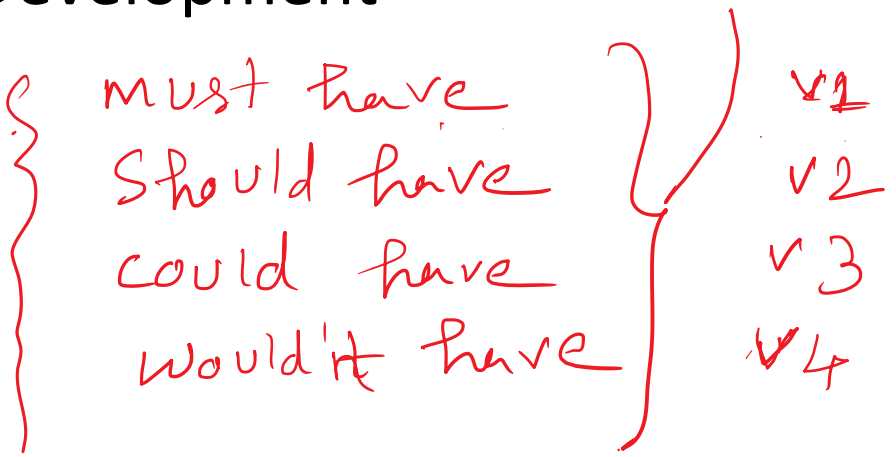
Develop iteratively

Communicate continuously and clearly

Demonstrate control

DSDM advocates the use of several proven practices, including:

- Facilitated Workshops
- Modelling and Iterative Development
- MoSCoW Prioritisation
- Time boxing



Feature Driven Development(FDD):

- This method focuses on "Designing and Building" features. In contrast to other smart methods, FDD describes the small steps of the work that should be obtained separately per function.

Scrum:

- SCRUM is an agile development process focused primarily on ways to manage tasks in team-based development conditions.
- There are three roles in it, and their responsibilities are:
- **Scrum Master:** The scrum can set up the master team, arrange the meeting and remove obstacles for the process
- **Product owner:** The product owner makes the product backlog, prioritizes the delay and is responsible for the distribution of functionality on each repetition.
- **Scrum Team:** The team manages its work and organizes the work to complete the sprint or cycle.

Extreme Programing:

- Extreme Programming (XP) is an agile software development framework that aims to produce higher quality software, and higher quality of life for the development team. XP is the most specific of the agile frameworks regarding appropriate engineering practices for software development.

  - Communication and feedback
  - Simplicity
  - Responsibility
  - Courage

Selecting Most Appropriate Process Model

The basic characteristics required to **select** the **process model** are project type and associated risks, requirements of the project, and the users. One of the key features of **selecting** a **process model** is to understand the project in terms of size, complexity, funds available, and so on

Project Type and Associated Risks	Waterfall	Prototype	Spiral	RAD	Formal Methods
Reliability requirements	No	No	Yes	No	Yes
Stable funds	Yes	Yes	No	Yes	Yes
Reuse components	No	Yes	Yes	Yes	Yes
Tight project schedule	No	Yes	Yes	Yes	No
Scarcity of resources	No	Yes	Yes	No	No

Requirements of the Project	Waterfall	Prototype	Spiral	RAD	Formal Methods
Requirements are defined early in SDLC	Yes	No	No	Yes	No
Requirements are easily defined and understandable	Yes	No	No	Yes	Yes
Requirements are changed frequently	No	Yes	Yes	No	Yes
Requirements indicate a complex System	No	Yes	Yes	No	No

User Involvement	Waterfall	Prototype	Spiral	RAD	Formal Methods
Requires Limited User Involvement	Yes	No	Yes	No	Yes
User participation in all phases	No	Yes	No	Yes	No
No experience of participating in similar projects	No	Yes	Yes	No	Yes