Life Cycle Models

Prototype

Learning objectives:

- understand that there are several lifecycle models that can be used (eg cyclical, waterfall, spiral);
- discuss the advantages and disadvantages of these lifecycle models;
- discuss the advantages and disadvantages of using prototyping when developing solutions.

Waterfall Model

- Steps completed one at a time
- Each step should have an output
- Can go back but then the steps will need redoing
- User has little impact after analysis until the evaluate stage.

Waterfall Model

Advantages

- Self-contained steps are easy to manage
- Defined processes and output per step
- Good model for managing large groups of developers working in parallel

Disadvantages

- Requirement changes mean going back to an earlier stage that had already been completed
- Changes can be costly in money and time
- Lack of customer involvement after Analysis means issues are not highlighted until the Evaluation

Cyclical Model

- Similar to waterfall model
- Knows that once a version of software has come out, then ideas for a new version are already being made taking it back to the feasibility study.

Cyclical Model

Advantages

- Self-contained steps are easy to manage
- Defined processes and output per step
- Good model for managing large groups of developers working in parallel
- Maintenance, logically starts the next cycle of the process so it maps better on to the real lifecycle of a complex piece of software.

Disadvantages

- Requirement changes mean going back to an earlier stage that had already been completed
- Changes can be costly in money and time
- Lack of customer involvement after Analysis means issues are not highlighted until the Evaluation

Spiral Model

- Developing the software in iterative (repeating) stages
- After each run through a prototype is made
- Keeps refining the software
- Used for larger projects

Spiral Model

Advantages

- Well defined steps in the process make it easy to manage
- Interim prototypes highlight issues quickly so that the end product is more likely to be what the customer wants
- Iterative nature of the process means changes can be easily incorporated as feedback is received

Disadvantages

- It takes time to build prototypes and get feedback, so it takes longer to get the product to the customer
- Longer timescale means it costs more to develop

Agile Model

- Similar to spiral in making prototypes
- Customer then evaluates each prototype and gives feedback
- Best suited to small groups of developers who work together rather than large projects where developers work on separate parts in parallel
- Good if the requirements of the products are likely to change

Agile Model

Advantages

- Essentially the same as the Spiral Model with the following addition:
- Small multitasking groups make the team flexible to changing requirements so this is more effective in a rapidly changing environment

Disadvantages

- Essentially the same as the Spiral Model with the following addition:
- This way of working is only suitable for smaller development teams.

Review

- Can you simplify each model to 10 words?
- Now 5?

Agile

Prototype – опытный образец

- In the spiral life-cycle model at the stage of analysis and design verification of the results of verification of prototyping.

?????? Give examples of prototypes.

advantages of prototyping:

disadvantages of prototyping:

Prototype – опытный образец

- advantages of prototyping:

 Enable the system to be reviewed by the client/user during development.

 May provide a final system that is better suited to the client/user's needs.

 Will detect incorrect features earlier than other models.

 Enable the developers to gain an early insight into how the system could be developed.

Prototype – опытный образец

disadvantages of prototyping:

- Prototypes can be converted to final code that is hard to maintain.
- Prototypes can be converted to final code of lower quality than a properly analysed. solution.