AH Computing Science

DEVELOPMENT METHODOLOGIES
Development Methodologies

Problem Decomposition

- Breaking a problem down into sub problems
- Sub problems are easier to solve than the whole problem
- Help identify data structures needed
- Top-down design methodology
- Used in both Traditional and Contemporary methodologies

Iterative Prototyping

- A series of prototypes of a program are created as the development process goes on
- At each iteration of the program, a new function is added
- As the program is developed, functionality is added
- Client can modify functionality as process goes wrong
Development Methodologies

Traditional
- Waterfall
  - Analysis
  - Design
  - Implementation
  - Testing
  - Documentation
  - Evaluation
  - Maintenance

Contemporary
- RAD (cfe H)
- Agile (cfe H)
- RERO
- SCRUM
- Extreme Programming
- MDSD
- Others
  - Cowboy Coding
  - Kanban
  - Bottom Up
  - Test Driven

Wikipedia notes
## Development Methodologies (cfe H)

### RAD
- **Rapid Application Development**
- Uses prototyping
- Involves client at more stages than Waterfall
  - 4 stages
    1. Requirements Planning Phase
    2. User Design Phase
    3. Construction Phase
    4. Cutover Phase

### AGILE
Developed from the RAD idea
- Best for *small scale development*
- Disadvantages:
  - Allows client to be lazy in specification
  - Not as rigorous as waterfall
- Benefits:
  - Reduced development time
  - Responsive to changing circumstances
  - Reduced costs due to using small groups of developers
Development Methodologies

RERO

- Release Early Release Often
- Early and frequent Releases of versions of the software
- Frequent feedback from users
- Developers kept up to date with User needs
- Problems with many versions of the software in the market at the one time- difficult to support.

SCRUM

- is an iterative and incremental agile software development framework.
- It defines "a flexible, holistic product development strategy where a development team works as a unit to reach a common goal."
- enables teams to self-organize by encouraging physical co-location or close online collaboration of all team members
- A key principle of scrum is its recognition that during production processes, the Clients can change their minds about what they want and need
- Clients changing their requirements is often called requirements volatility and that unpredicted challenges cannot be easily addressed in a traditional predictive or planned manner.
- SCRUM accepts that the problem cannot be fully understood or defined, focusing instead on maximizing the team’s ability to deliver quickly producing ‘Releases’ and meeting often with clients to respond to emerging requirements and to adapt to evolving technologies and changes in market conditions.
Development Methodologies

Extreme Programming
- Similar to SCRUM with shorter cycles of prototyping and client feedback
- Uses small teams of developers who both Design & Code
- more details

MDSD
- Model-Driven Software Development
- Developers build models of the proposed system using diagrammatic design notations such as UML
- The diagrams are used to specify the system and can be used to generate the code in a conventional programming language
Contemporary Development Methodologies

- May use prototyping
- Involve more client contact than traditional waterfall method
- Are more responsive and flexible to changes in client needs or in the deployment environment