THADOMAL SHAHANI TSEC ENGINEERING COLLEGE

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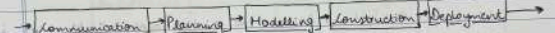
SEPM

Assignment -1

1) Waterfall Model: the waterfall method, sometimes called the classic life cycle, suggests a systematic, sequential approach to software development that begins with customer specifications of requirement and progress through planning, modelling, connection and deployment, eliminating an ongoing support of the completed software. A variation in representation of the waterfall model is called a model.



The Waterfall Method

Advantages:
- simple and easy to understand
- easy to manage
- best for smaller projects
- individual processing

Disadvantages:
- not flexible
- late testing
- not suitable for evolving projects
- lengthy development cycle

For example: in a library management system, phases include requirement analysis, maintaining computer system and software in a thorough,

consistent state

Configuration management: Infrastructure as code is the practice of describing all software runtime environment and networking settings and parameters in simple textual format, that can be stored in your version control system (VCS) and versioned or required. These text files are called manifests and are used by DevOps tools to automatically provision and configure build servers, testing and production environment

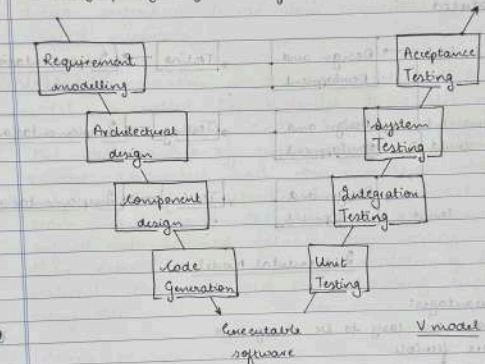
Micro services Architecture: Docker is a tool designed to make it easier to create, deploy, and run applications by using containers. Containers allows a developer to package up an application with all of the parts it needs, such as libraries and other dependencies and deploy it as one package. By doing so, thanks to the container the developer can rest assured that the application will run on any other linux machine regardless of any customized settings that machine might have.
example: Nagios, splunk, etc

Cloud Based DevOps: DevOps automation is becoming cloud centric. Most public and private cloud computing providers support DevOps systematically on their platform, including continuous integration and continuous development tools
example: amazon web services, amazon lambda, google cloud, etc

Advantages:
- Avoids downward flow

Disadvantages:

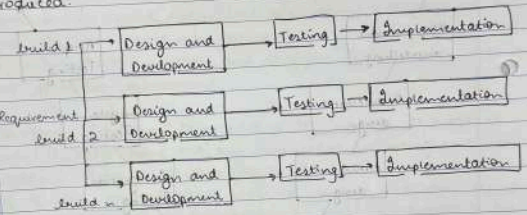
- rigid and least flexible
- not good for complex projects
- no early prototype of the software is produced



V model

2) Incremental Process Model: the incremental model combines elements of linear and parallel process flow. It applies linear sequence in a staggered fashion as time progresses. When a incremental model is used, the first increment and often a core product i.e basic requirement are addressed but many supplementary features remain undelivered. The core product is used by the customer (or undergo detailed evaluation). As a result, a place

addresses the modification of the core product to better meet the needs of the customer and the delivery of additional features and functionality. This process is repeated following the delivery of the increment until the complete product is produced.



Incremental Model

Advantages:
- errors are easy to be recognised
- more flexible
- easier to test and debug

Disadvantages:
- cost is high
- need for good planning
- well defined module interfaces are needed

Where to use waterfall model?
- well understood requirements
- very little changes needed
- small to medium size projects
- clients prefers a linear and sequential approach
- limited resources

2) **V-Model**: variation in the representation of the waterfall model is called the V model. It is also referred to as the verification and validation model. It depicts the relationship of quality assurance actions to the actions associated with communication, modelling and early construction activities. In the V-model as the team moves down the left side, requirements are refined into detailed solution, once coding is done they move up the right side performing testing to validate each developed phase, assuring quality at every step.

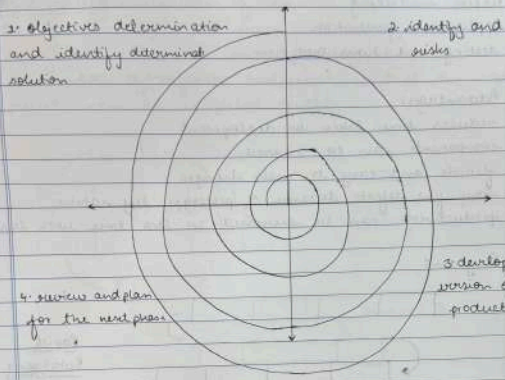
Where to use V-model?
- clear and stable requirements
- defined testing phases
- less risk of changes
- strict quality assurance needs

Advantages:
- easy to understand
- saves a lot of time

4) **Spiral Model**: Originally proposed by Barry Boehm, the spiral model is the evolutionary software process model that couples the interactive nature of prototyping with systematic aspects of the waterfall model.
The special spiral development model is a risk driven model generator that is used to guide multi-stake holder concurrent engineering of software intensive systems
It has two main distinguishing features. One is a cyclic approach for incrementing growing a system's degree of definition and implementation while decreasing the degree of risk
The other is a set of anchor point milestone for ensuring stakeholder commitment to feasible and mutually satisfactory system solutions
A spiral model is divided into a set of framework activities defined by the software engineering team

Advantages:
- risk handling
- good for larger projects
- customer satisfaction
- improved quality

Disadvantages:
- complex
- expensive
- difficulty in time management
- too much dependability on risk analysis



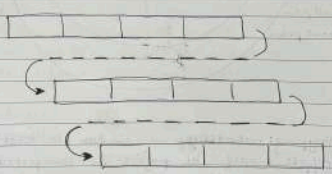
5) Rapid prototyping: methodology is similar to that of incremental or waterfall model. The project is completed within the given time and all requirement all collected before starting project. It is very fast. The main objective of this model is to reuse code, component, tools, processes in the project development process.

Phases:
- Business modelling
- Data modelling

- Process modelling
- Application generation
- testing and turn over.

Advantages:
- reduces time taken in development
- components can be reused
- flexible and easy to make changes
- very few defects because of prototype by nature
- productivity can be increased in less time with less people

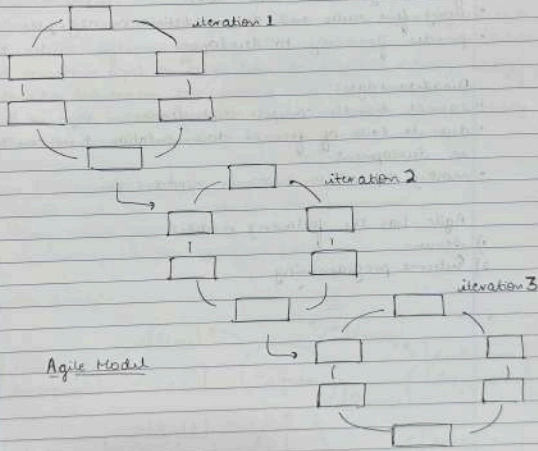
Program:



Rapid Prototyping

Disadvantages:
- need highly skilled developers and designers
- very difficult to manage
- not suitable for project that all are complex and take long time
- automated code generation is expensive.

6) Agile Model: combination of iterative and incremental models. Its focus is given to process adaptivibility and customers satisfaction. It was created mainly to make changes in the middle of software development so that the software project can be completed quickly.



Agile Model

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Advantages:
- project completed in very small time
- customer representative has an idea of each iteration so it can easily change the requirements.
- very realistic approach
- focus is given on team work
- very few rules and documentation is negligible
- provides flexibility to developers

Disadvantages:
- cannot handle complex dependencies
- due to lack of formal documentation, there can be confusion in development
- mostly depends on customer representation

Agile has the following models:
1) Scrum
2) Extreme programming