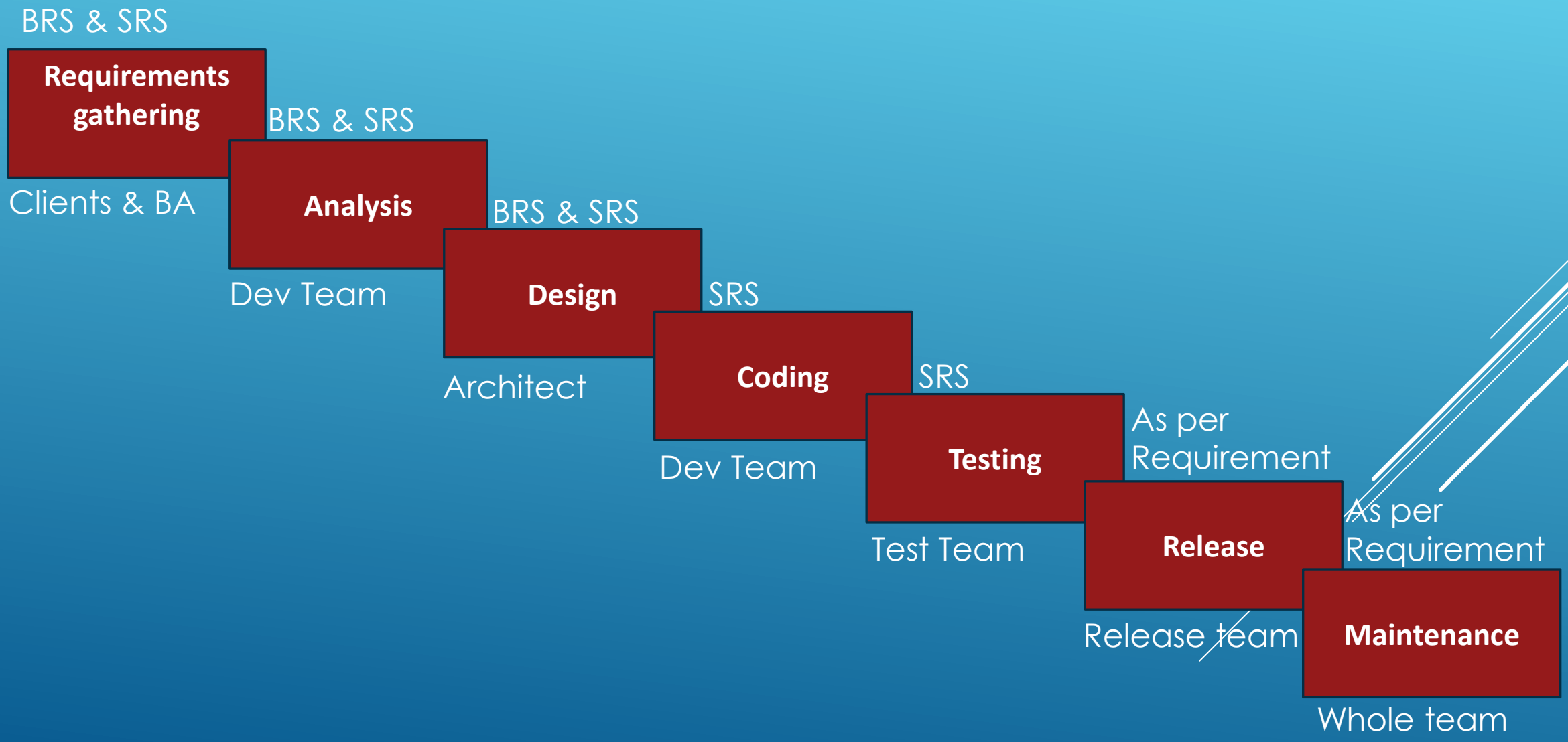
TODAY'S AGENDA

- Testing Levels continued…
  - White Box Testing
  - Blackbox Testing
- Static vs Dynamic Testing
- Software Development Models
  - Waterfall
  - Iterative
  - V-Model
  - Verification and Validation

Static and Dynamic Testing

- **Static testing** is an approach to test project documents in the form of the Reviews, Walkthroughs and inspections.
- **Dynamic testing** is an approach to test the actual software by giving inputs and observing results.

SDLC Software Development Life Cycle



MAINTENANCE

What is a Change Request?

- It is a documented request to modify the current software system, usually by the user/customer.

- E.g: requirement changes or design changes.

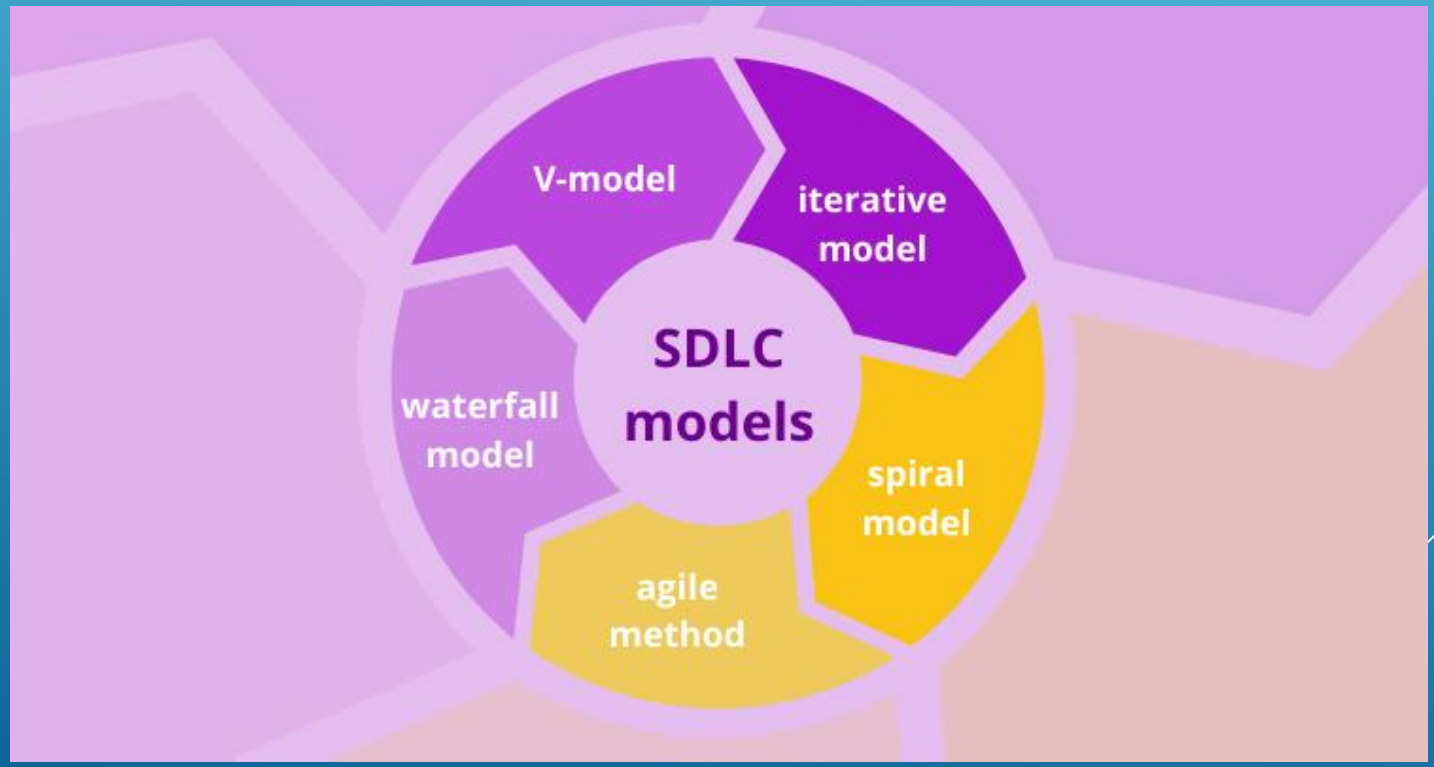
What is a Hotfix?

- It's a software update designed to fix a bug or security hole in the program.

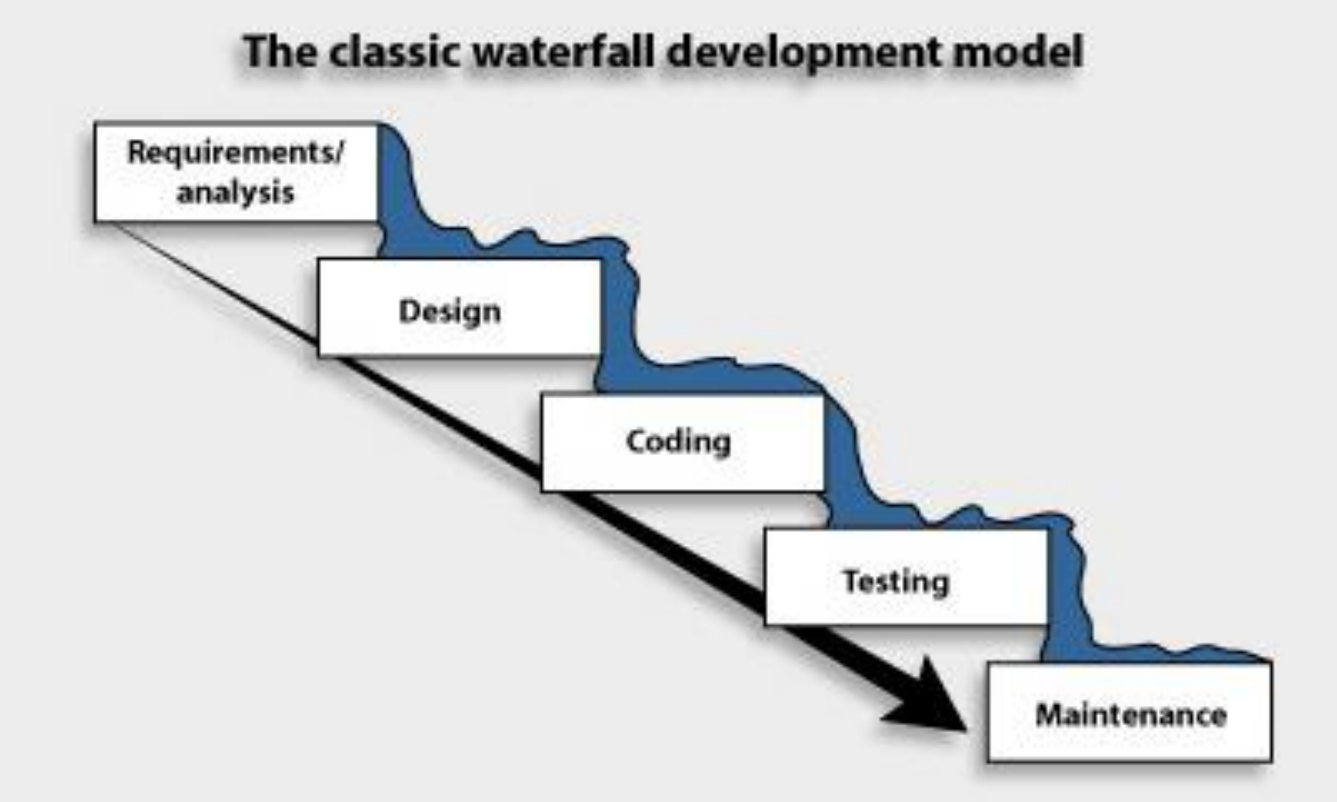
- Urgently developed and released as soon as possible to limit the effects of the software issue.

SOFTWARE DEVELOPMENT MODELS

Processes or methodologies that are being selected for the development of the project depending on the project's aims and goals.



WATERFALL MODEL



- Introduced by Winston Royce in 1970. Also referred to as a linear-sequential life cycle mode
- It is a sequential model that divides software development in pre-defined phases.
- Each phase must be completed before next phase can begin.
- Each phase is designed for performing specific activity during SDLC.

WHEN?

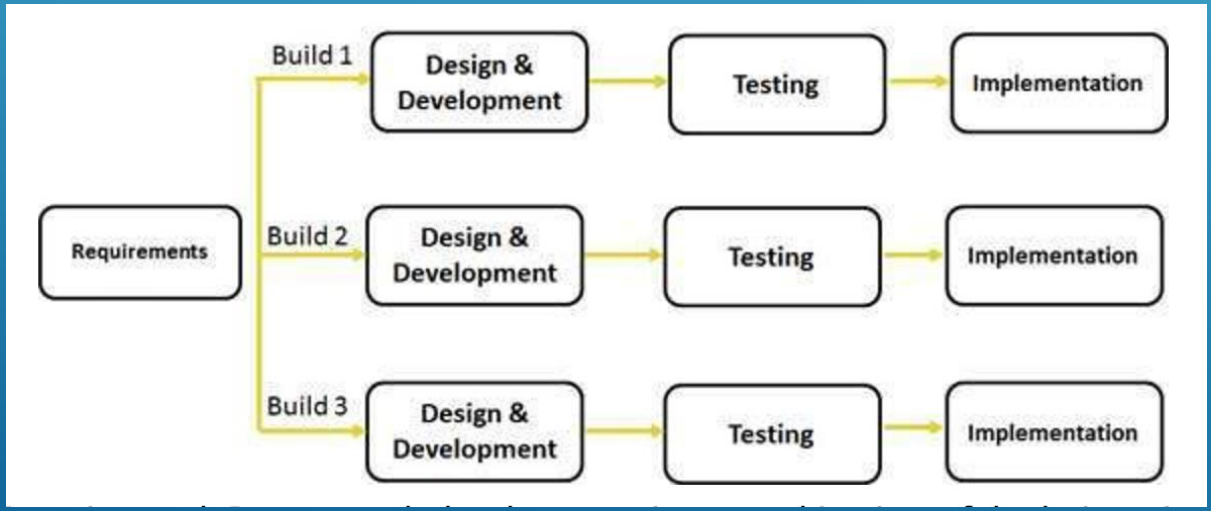
- Waterfall model can be used when Requirements are not changing frequently.
- Application is not complicated and big.
- Project is short.
- Requirement is clear.
- Environment is stable.
- Technology and tools used are not dynamic and is stable.
- Resources are available and trained.

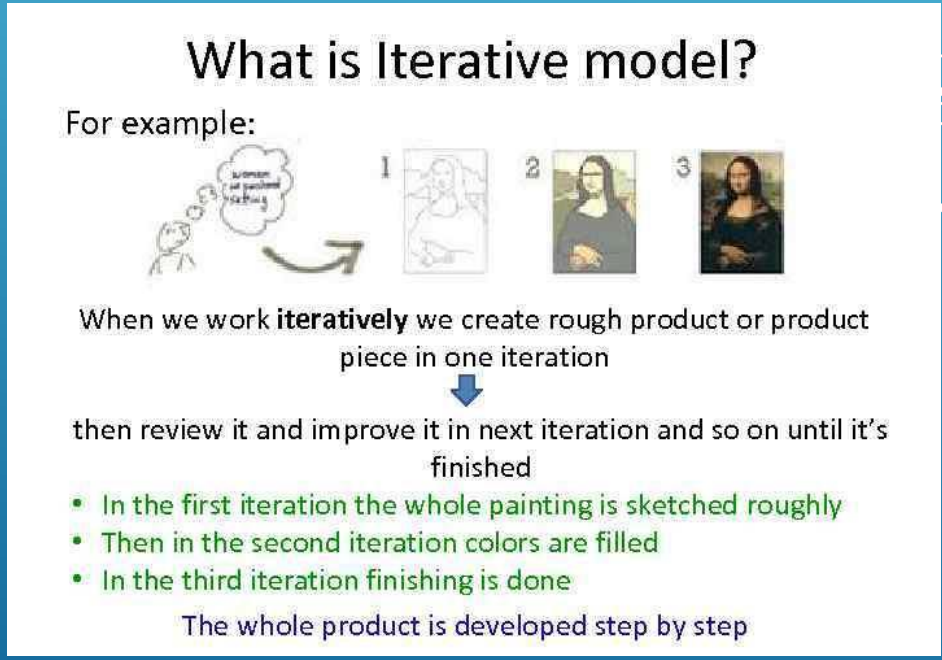
WATERFALL MODEL

Advantages	Dis-Advantages
• Before the next phase of development, each phase must be completed.	• Error can be fixed only during the phase.
• Simple and easy to understand and use.	• Not a good model for complex and object-oriented projects.
• They should perform quality assurance test (Verification and Validation) before completing each stage.	• Testing period comes quite late in the developmental process.
• Documentation is done at every phase of the software's development cycle.	• Documentation occupies a lot of time of developers and testers.
• Project is completely dependent on project team with minimum client intervention.	• Clients valuable feedback cannot be included with ongoing development phase.
• Any changes in software is made during the process of the development.	• Small changes or errors that arise in the completed software may cause a lot of problems.

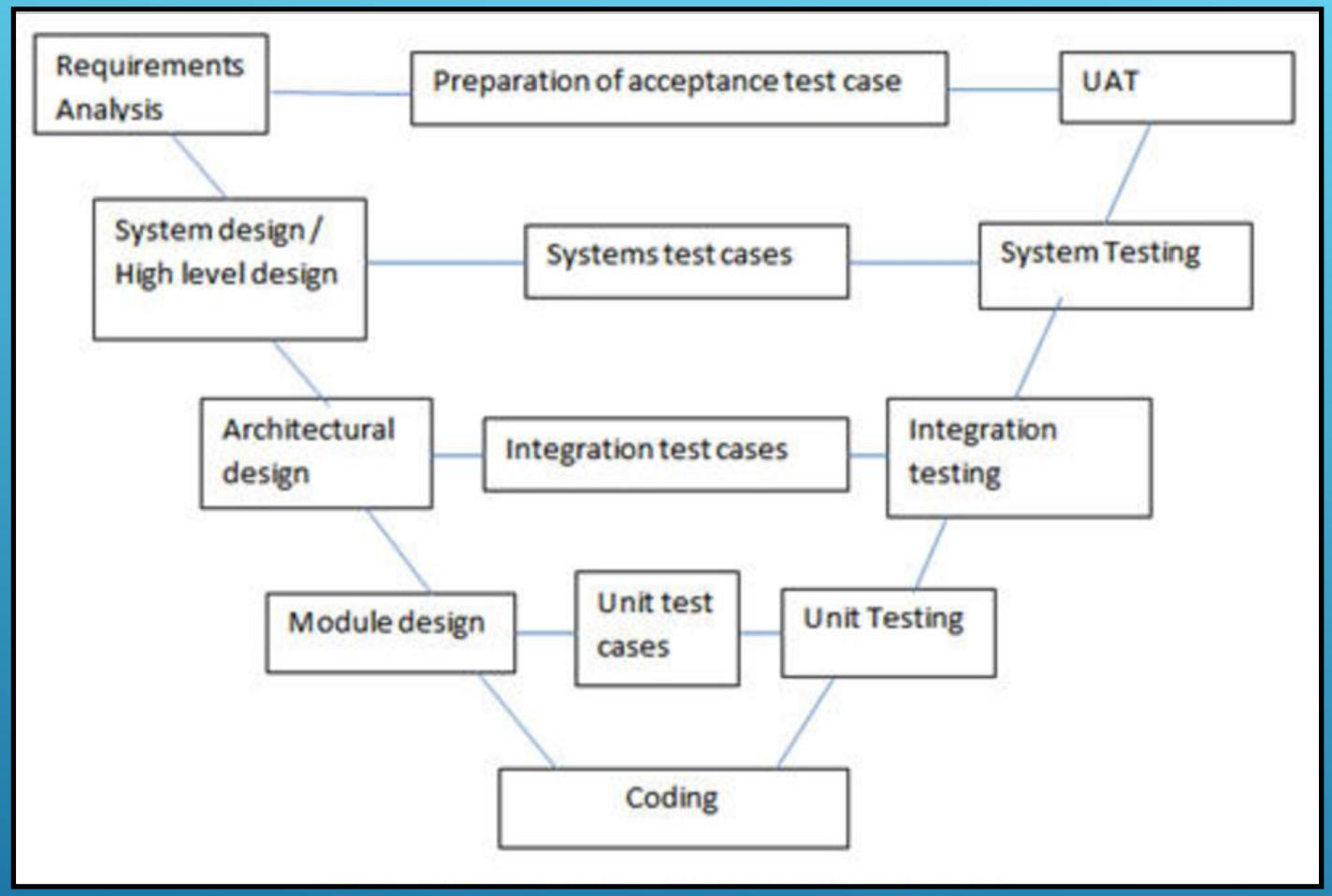
ITERATIVE MODEL

- Iteration : the repetition of a process
- Full specification of requirements not needed. Instead, development begins by specifying and implementing just part of the software.
- Iterative process starts with a simple implementation of a small set of the software requirements and iteratively enhances the evolving versions until the complete system is implemented and ready to be deployed





V-MODEL



- Extension of waterfall model, also known as Verification and Validation model.
- For every phase, in the Development life cycle there is a matching Testing phase.

V-MODEL

Advantages	Dis-Advantages
• Simple and easy to use.	• Poor model for long and ongoing projects
• Testing activities like planning, **test designing** happens well before coding. This saves a lot of time. Hence higher chance of success over the waterfall model.	• If any changes happen in midway, then the test documents along with requirement documents has to be updated.
• Proactive defect tracking – that is defects are found at early stage.	• Not suitable for the projects where requirements are keep changing.
• Avoids the downward flow of the defects.	• No working software is produced until late during the life cycle.
• Works well for small projects where requirements are easily understood.	• Once an application is in the testing stage, it is difficult to go back and change a functionality

VERIFICATION & VALIDATION

Verification:

- It involves static analysis technique (review) done without executing code. It is the process of evaluation of the product development phase to find whether specified requirements meet.

Validation:

- It involves dynamic analysis technique (functional, non-functional), testing done by executing code. Validation is the process to evaluate the software after the completion of the development phase to determine whether software meets the customer expectations and requirements.

VERIFICATION & VALIDATION

Criteria	Verification	Validation
Definition	The process of evaluating work-products (not the actual final product) of a development phase to determine whether they meet the specified requirements for that phase.	The process of evaluating software during or at the end of the development process to determine whether it satisfies specified business requirements.
Objective	To ensure that the product is being built according to the requirements and design specifications. In other words, to ensure that work products meet their specified requirements.	To ensure that the product actually meets the user's needs, and that the specifications were correct in the first place. In other words, to demonstrate that the product fulfills its intended use when placed in its intended environment.
Question	Are we building the product *right*?	Are we building the *right* product?
Evaluation Items	Plans, Requirement Specs, Design Specs, Code, Test Cases	The actual product/software.
Activities	• Reviews • Walkthroughs • Inspections	• Testing

HOMEWORK

- Interview preparation for homework
  - Tell me about yourself?
  - What do you know about the company?
  - Revise all manual testing topics so far.

Jainik	TCS
Khyati	IBM
Krutik	Jaguar/Land Rover
Meghavee	AXA Insurance
Namrta	Bet365
Neepa	Tesco
Pragna	Parexel
Vaishali	MHR Global

Interview week:
21st March to 26th March