Waterfall Model

- The classical waterfall model is the basic software development life cycle model
- It is very simple but idealistic. Earlier this model was very popular but nowadays it is not used
- It is very important because all the other software development life cycle models are based on the classical waterfall model.

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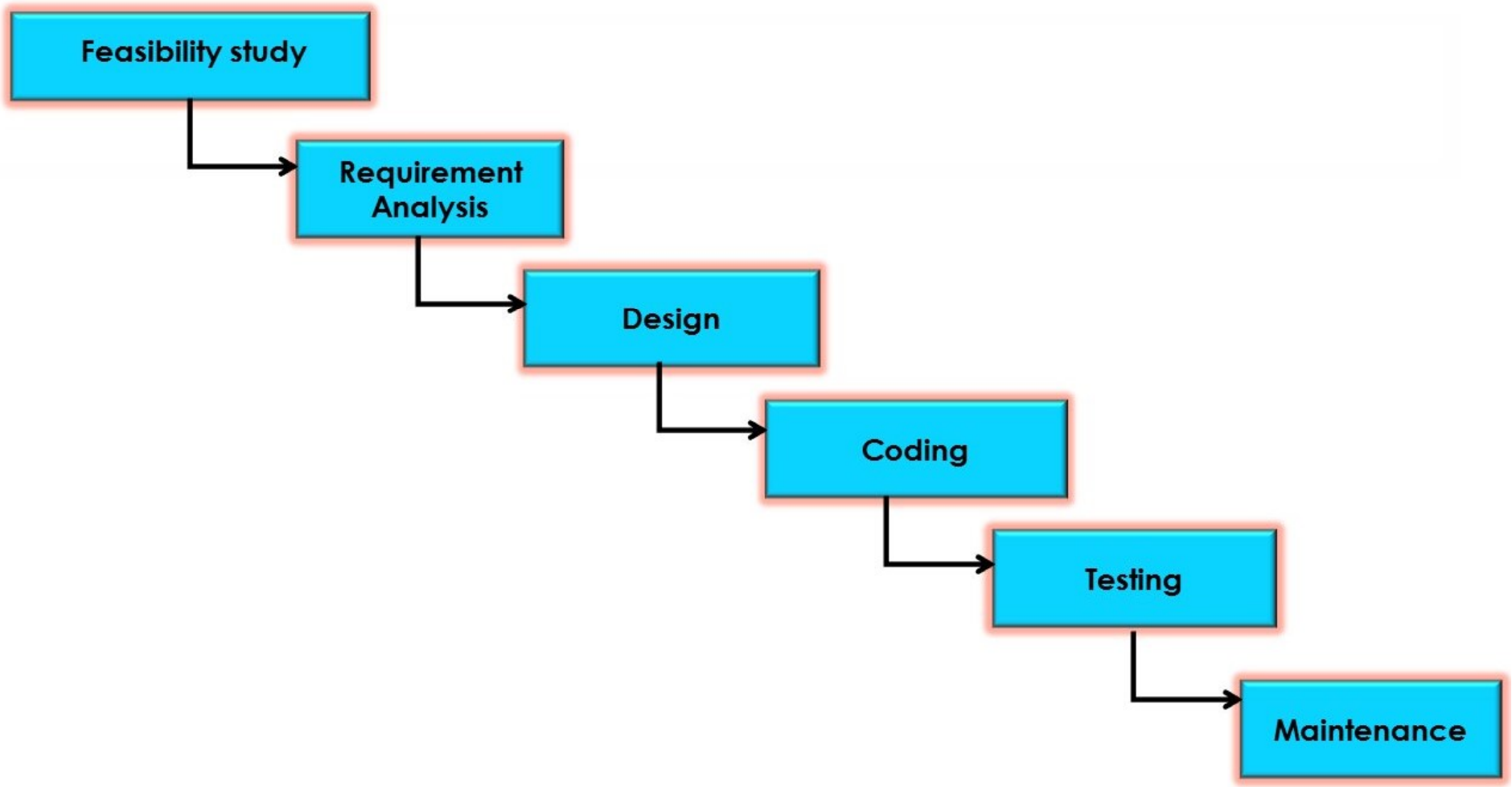

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Iterative Waterfall Model

- The Iterative Waterfall Model is a software development approach that combines the sequential steps of the traditional Waterfall Model with the flexibility of iterative design.
- It allows for improvements and changes to be made at each stage of the development process, instead of waiting until the end of the project
- The iterative waterfall model provides feedback paths from every phase to its preceding phases, which is the main difference from the classical waterfall model.

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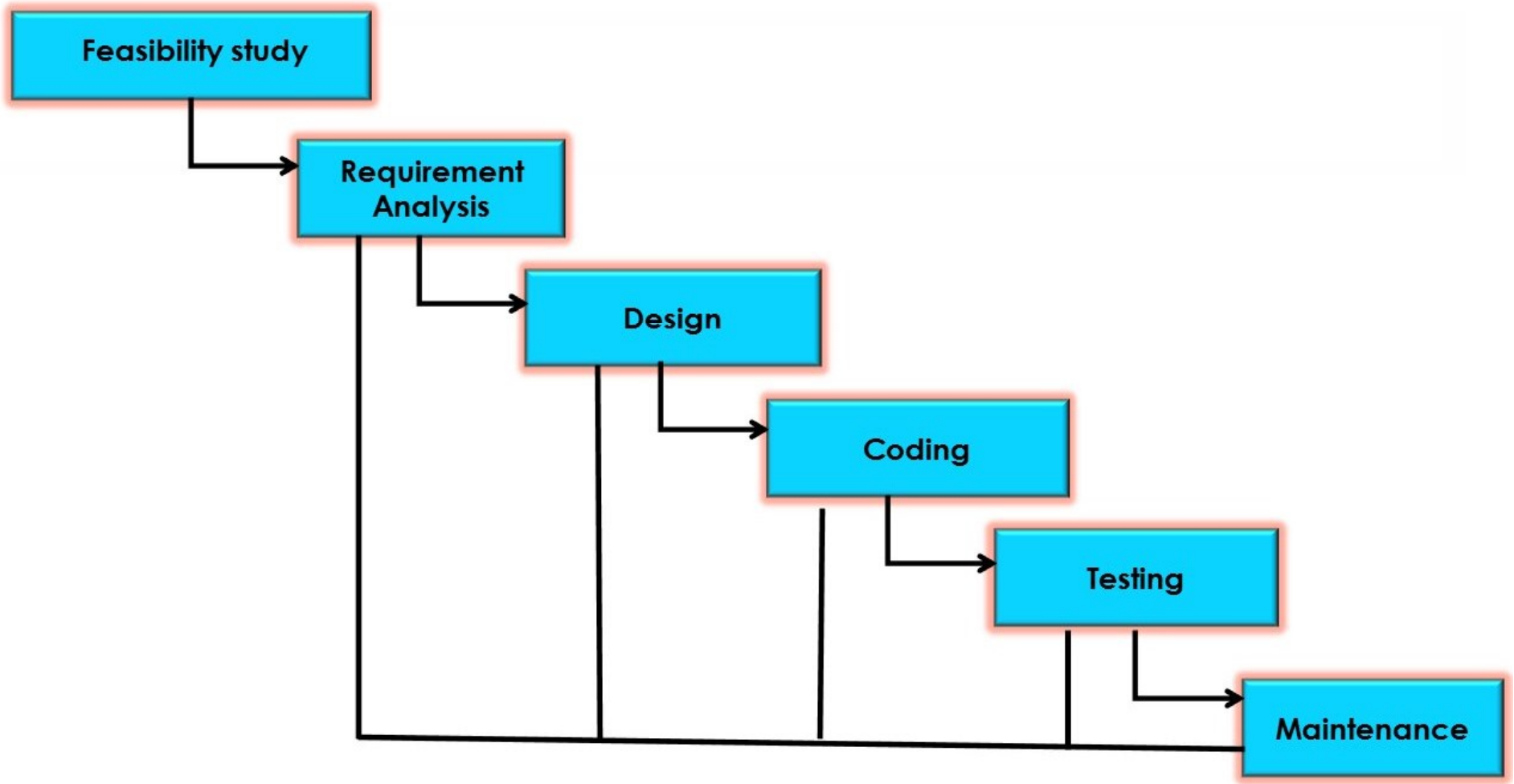

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V-Model

❖ V-Model is an SDLC model, it is also called Verification and Validation Model

❖ V-Model is widely used in the software development process, and it is considered a disciplined model. In V-Model, the execution of each process is sequential, that is, the new phase starts only after the previous phase ends.

❖It is based on the association of testing phase with each development phase that is in V-Model with each development phase, its testing phase is also associated in a V-shape in other words both software development and testing activities take place at the same time.

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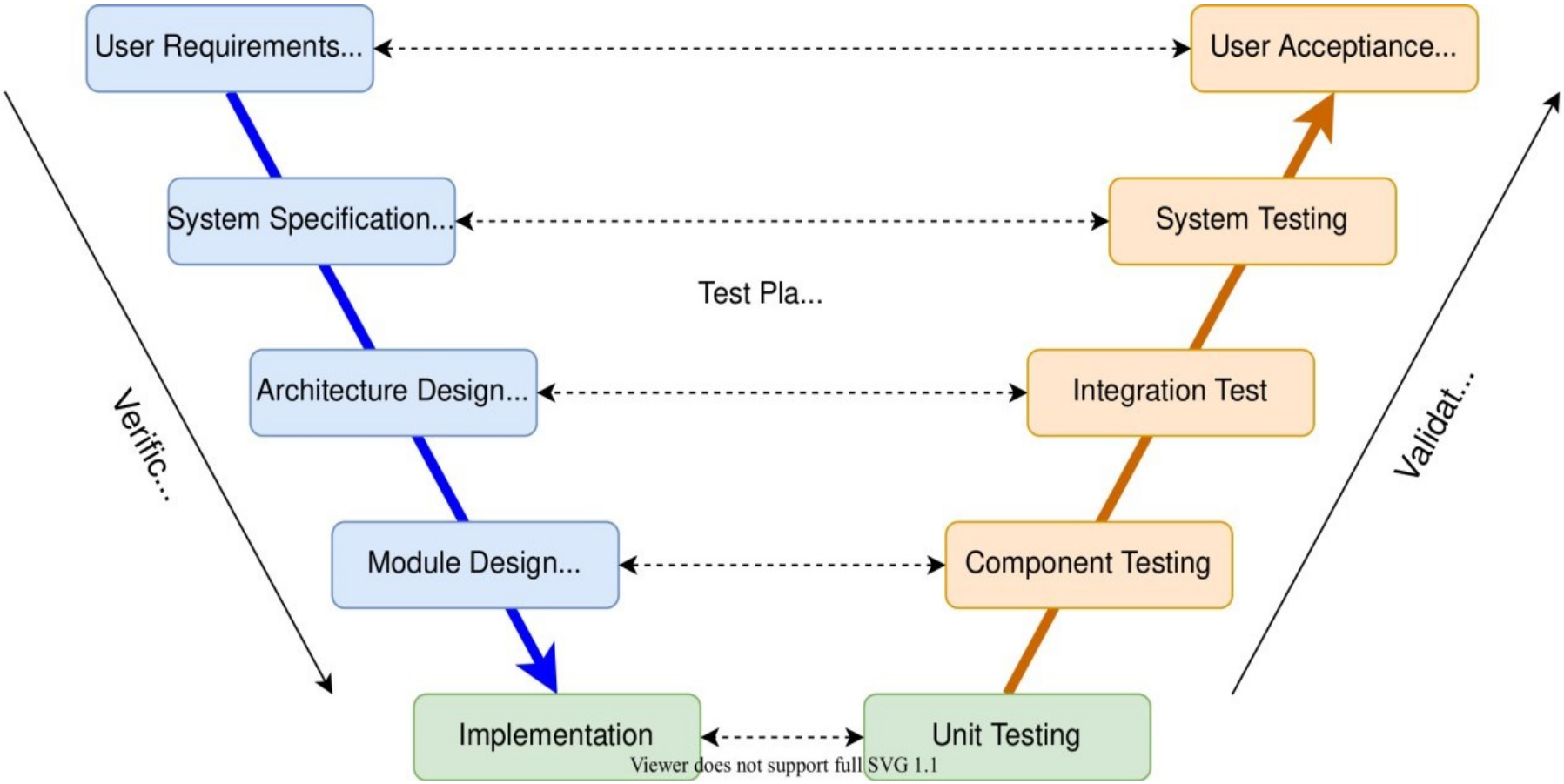

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Incremental Model

- In Incremental Model, the software development process is divided into several increments and the same phases are followed in each increment
- In simple language, under this model a complex project is developed in many modules or builds.
- we collect the customer's requirements, now instead of making the entire software at once, we first take some requirements and based on them create a module or function of the software and deliver it to the customer.

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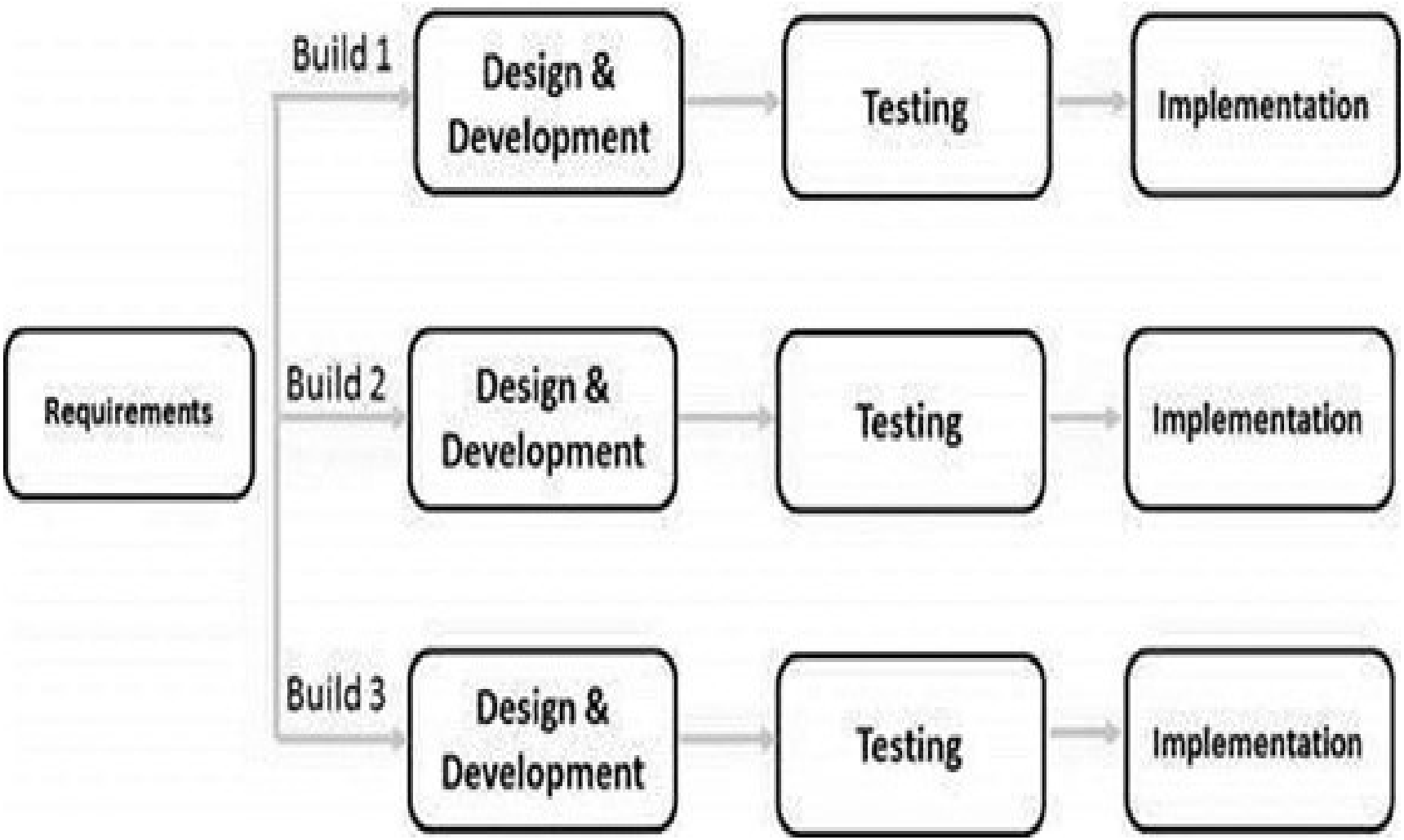

Image source

Spiral Model

- This model has characteristics of both iterative and waterfall models.
- This model is used in projects which are large and complex.
- This model was named spiral because if we look at its figure, it looks like a spiral, in which a long curved line starts from the center point and makes many loops around it.
- The number of loops in the spiral is not decided in advance but it depends on the size of the project and the changing requirements of the user.

Image source

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- A software project goes through these loops again and again in iterations.
- After each iteration a more and more complete version of the software is developed.
- The most special thing about this model is that risks are identified in each phase and they are resolved through prototyping.
- The number of loops in the spiral is not decided in advance but it depends on the size of the project and the changing requirements of the user. This feature is also called Risk Handling

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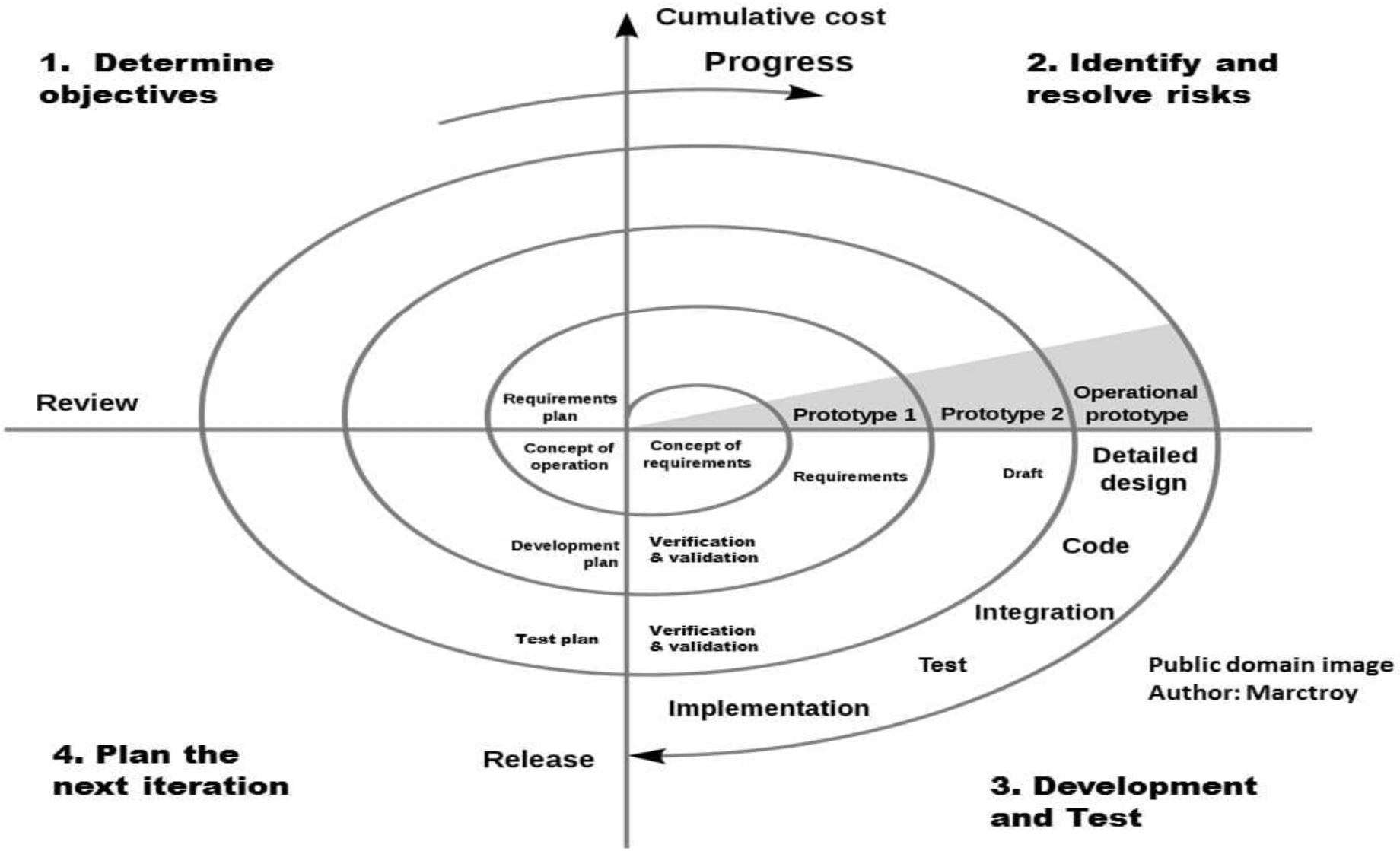
Cumulative cost
Progress
1. Determine objectives
2. Identify and resolve risks
Review
Requirements plan
Concept of operation
Concept of requirements
Prototype 1
Prototype 2
Operational prototype
Requirements
Draft
Detailed design
Development plan
Verification & validation
Code
Integration
Test plan
Verification & validation
Test
Implementation
Release
4. Plan the next iteration
3. Development and Test
Public domain image
Author: Marctroy

Prototype model

Prototype model is an activity in which prototypes of software applications are created. First a prototype is created and then the final product is manufactured based on that prototype.

- The prototype model was developed to overcome the shortcomings of the waterfall model.
- This model is created when we do not know the requirements well.
- The specialty of this model is that this model can be used with other models as well as alone.

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One problem in this model is that if the end users are not satisfied with the prototype model, then a new prototype model is created again, due to which this model consumes a lot of money and time.

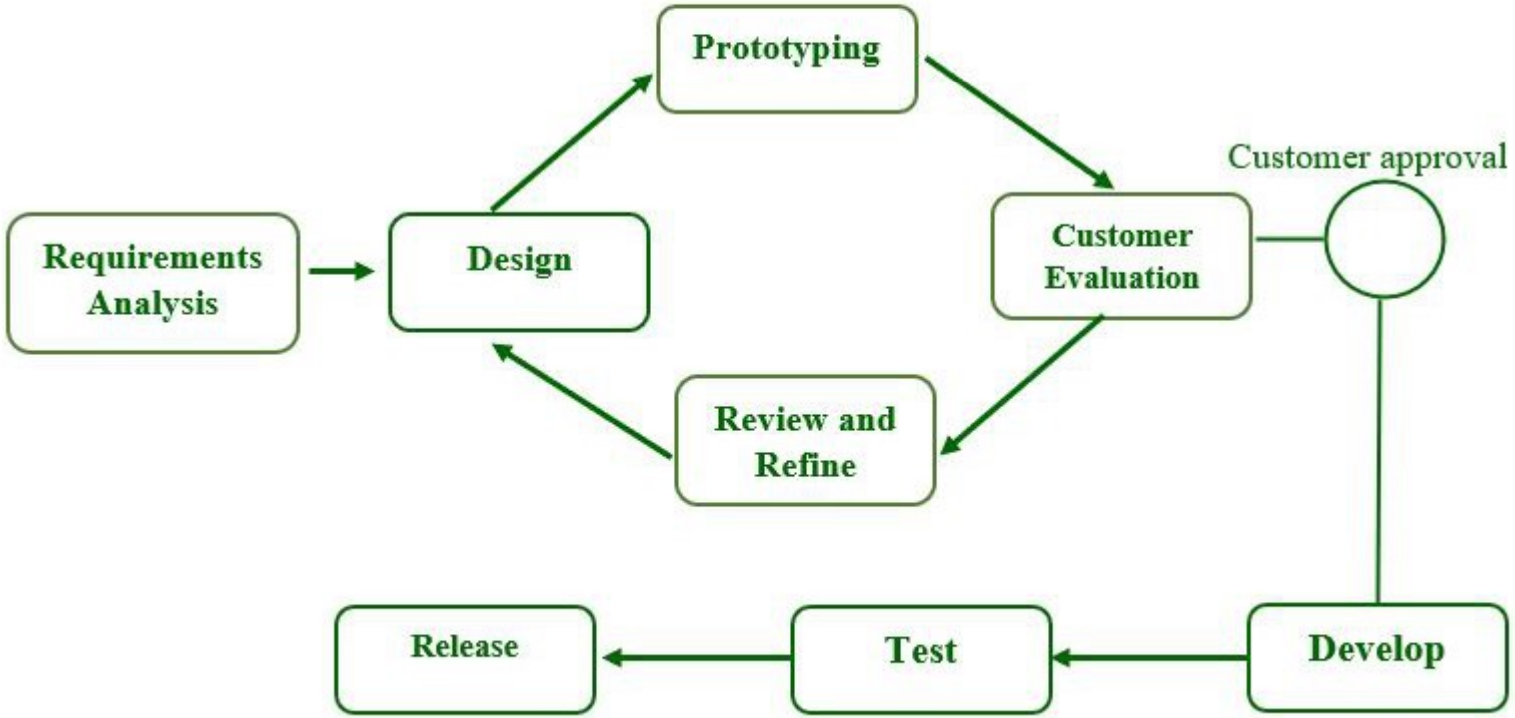

Image source

Concurrent model

- It is a type of evolutionary model.
- Concurrent development model is also known as concurrent engineering.
- The term concurrent means done at same time.
- It used in all software development process model.
- Transition from state to state for each of the software engineering.
- It is a type of evolutionary model.

Image source

Cont..

- SDLC Activities: Requirement, Design, Code, Test, Deploy
- Inactive: No any activity start.
- Under Development: Any activity performed.
- Awaiting Changes: If customer want any changes
- Under Review: Testing Activity Start
- Under Revision: Do all required changes.
- Base lined: Do all required changes.
- Done: Project completed an deployed.

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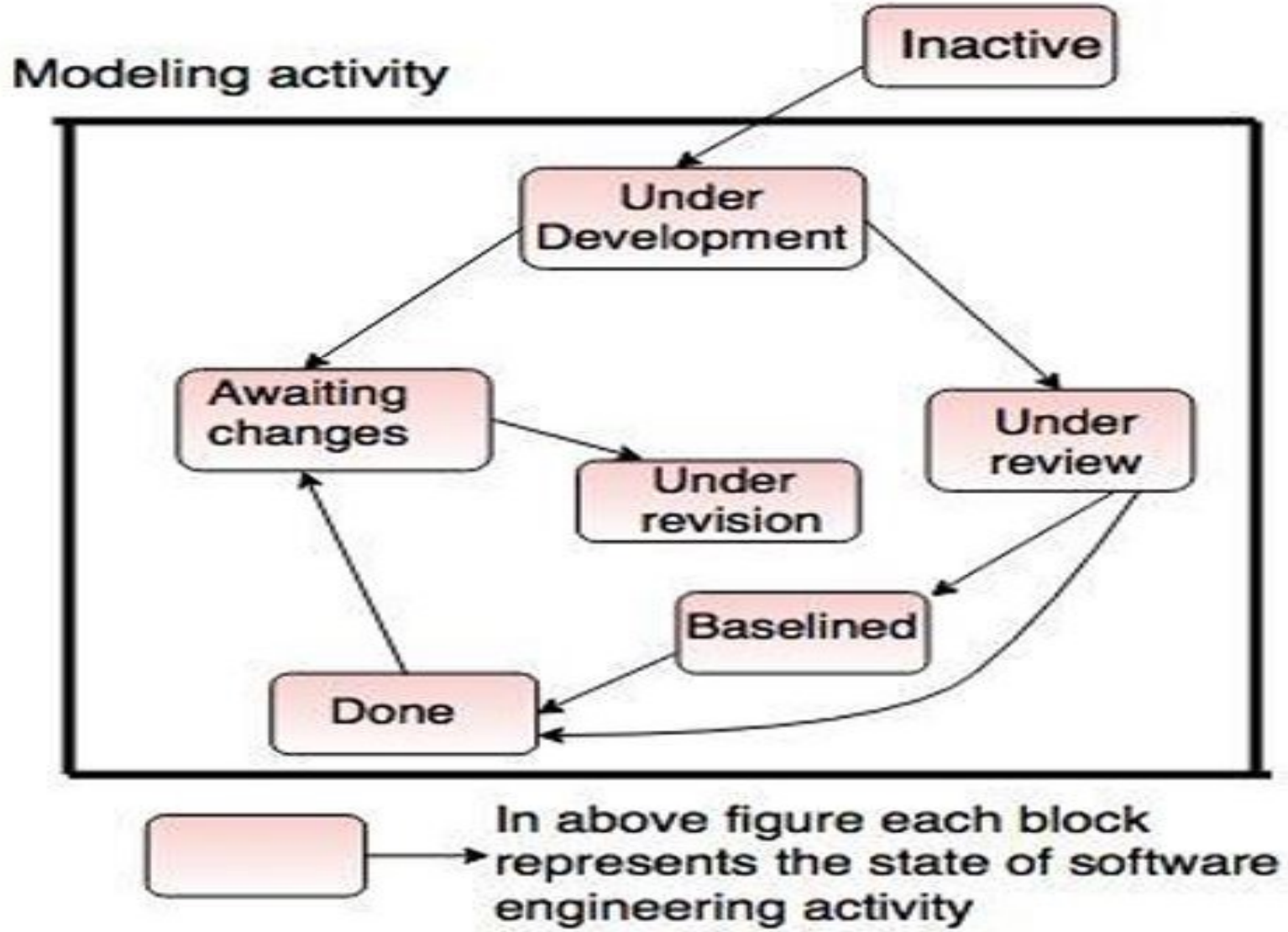
Modeling activity
Inactive
Under Development
Awaiting changes
Under revision
Under review
Baselined
Done
In above figure each block represents the state of software engineering activity

Agile Development

❖ Agile software development is an iterative approach to creating software products based on quickly releasing a minimum viable product and then adjusting it and adding features and functionalities in stages based on user behaviour and feedback.

❖ The methodology is designed to address the fact it can be difficult to accurately predict the most intuitive user journeys, features and functionalities users need, prefer and desire from software.

❖ agile software development stands in contrast to the once dominant Waterfall approach. When building software to the Waterfall methodology, software development teams create highly detailed specifications and functionality requirements upfront

Image source

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❖ The software is then built to that blueprint and released as a ‘completed’ product.

❖ An iterative Agile approach helps sidestep the risk of the project sponsor wasting money developing a digital product based on mistaken assumptions of functionalities and features users need and want

❖ Another pillar of the Agile methodology is the promotion of collaborative cross-functional teams

Image source

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❖ A product is conceptualised, designed and detailed specifications created by one group of specialists.

❖ It is then passed on to front and back end software developers and designers who build their separate sections which are then put together.

❖ then passed over to QA and testing teams and, finally, an operations team that deploy it as a live software product.

❖ An Agile software development team is far more integrated with constant back-and-forth collaboration and often regular cross-over between specialists of different disciplines.

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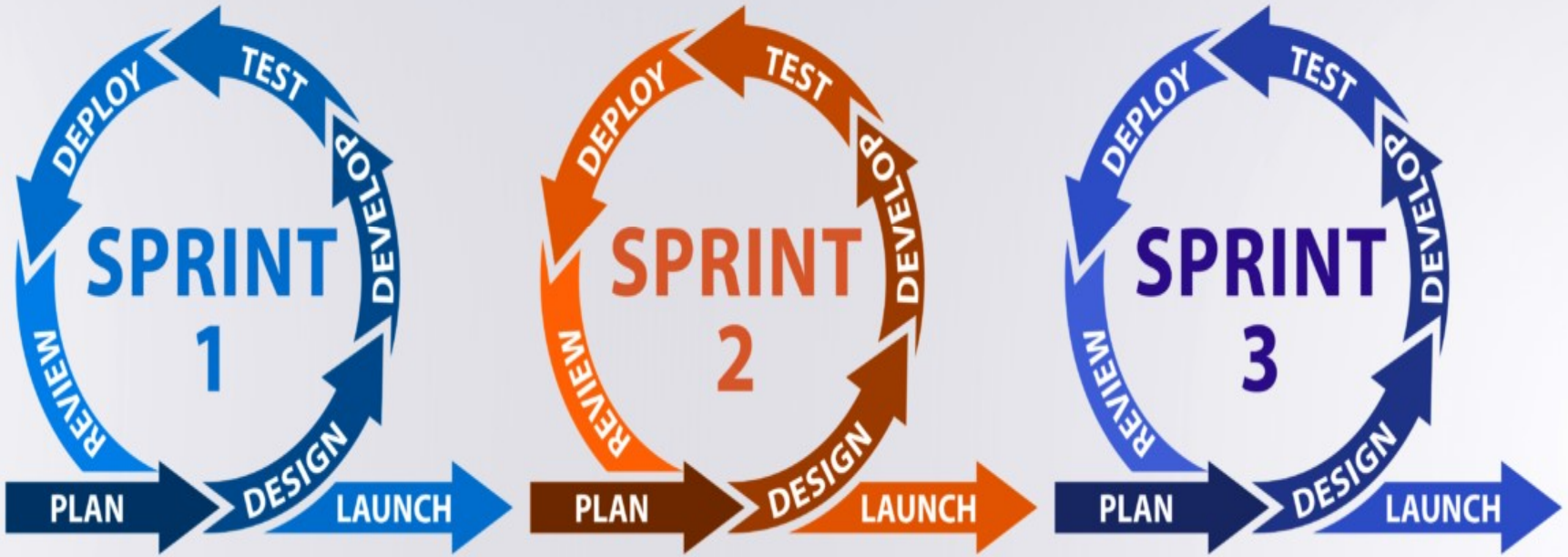
SPRINT 1
PLAN
DESIGN
LAUNCH
REVIEW
DEPLOY
TEST
DEVELOP
SPRINT 2
PLAN
DESIGN
LAUNCH
REVIEW
DEPLOY
TEST
DEVELOP
SPRINT 3
PLAN
DESIGN
LAUNCH
REVIEW
DEPLOY
TEST
DEVELOP

Scrum model

❖ Scrum, named after a rugby scrum for the metaphor of a whole team pushing together in one direction is by far the most commonly used Agile process framework in the context of software development.

❖ Agile software development with Scrum is distinguished from other Agile frameworks and processes by the specific concepts and practices, divided into the three categories of Roles, Artifacts, and Time Boxes

❖ then passed over to QA and testing teams and, finally, an operations team that deploy it as a live software product.

❖ An Agile software development team is far more integrated with constant back-and-forth collaboration and often regular cross-over between specialists of different disciplines.

Image source

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- key quality of Scrum is the introduction of the roles *Scrum Master* and *Product Owner* who organise and manage the rest of the Scrum team including software developers, designers, QA, testing and operations.

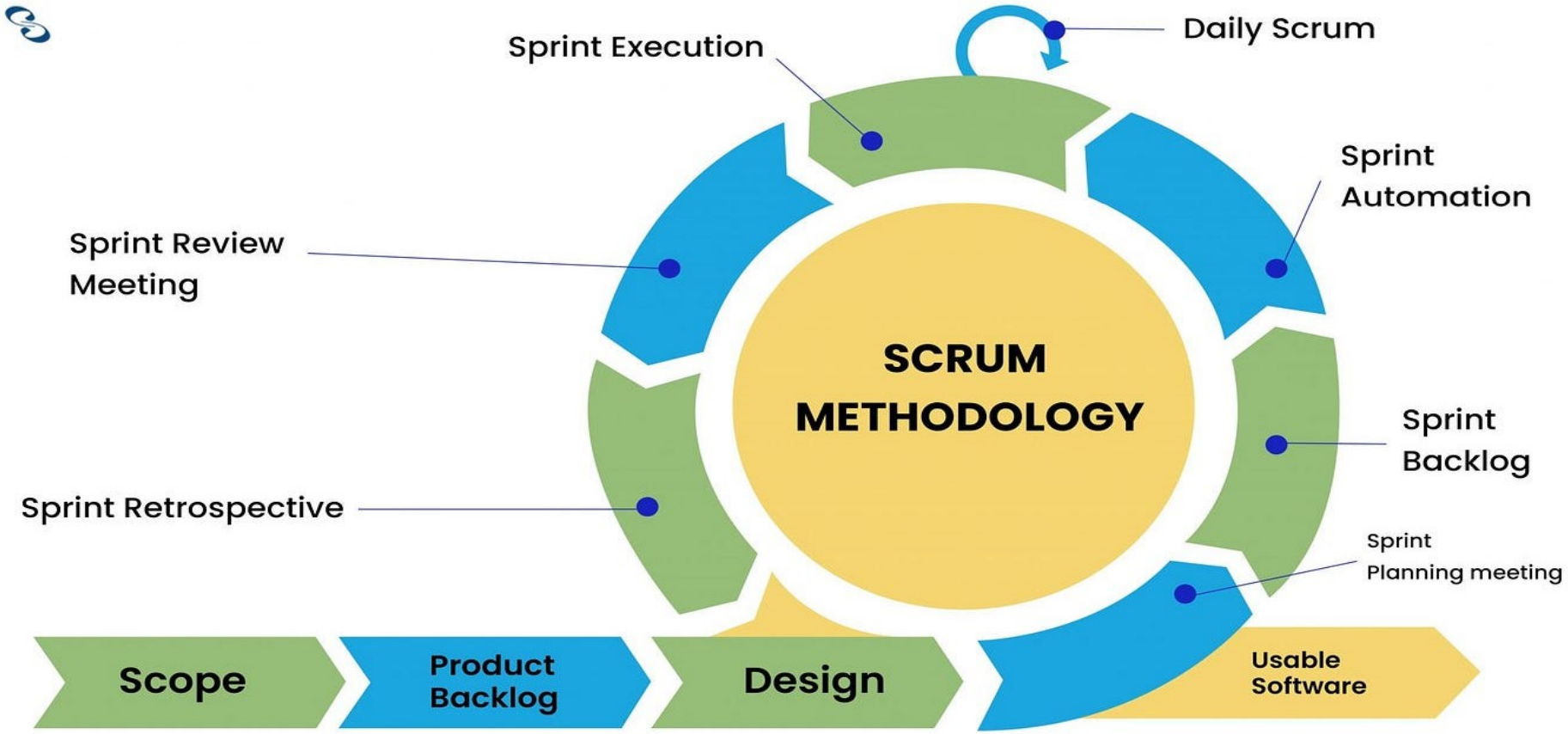
- Agile software development with Scrum is distinguished from other Agile frameworks and processes by the specific concepts and practices, divided into the three categories of Roles, Artifacts, and Time Boxes

- Sprints, which are ‘time-boxed’ periods of often around two weeks during which a pre-determined amount of development work is completed, are integral to the Scrum framework.

Image source

Scrum model

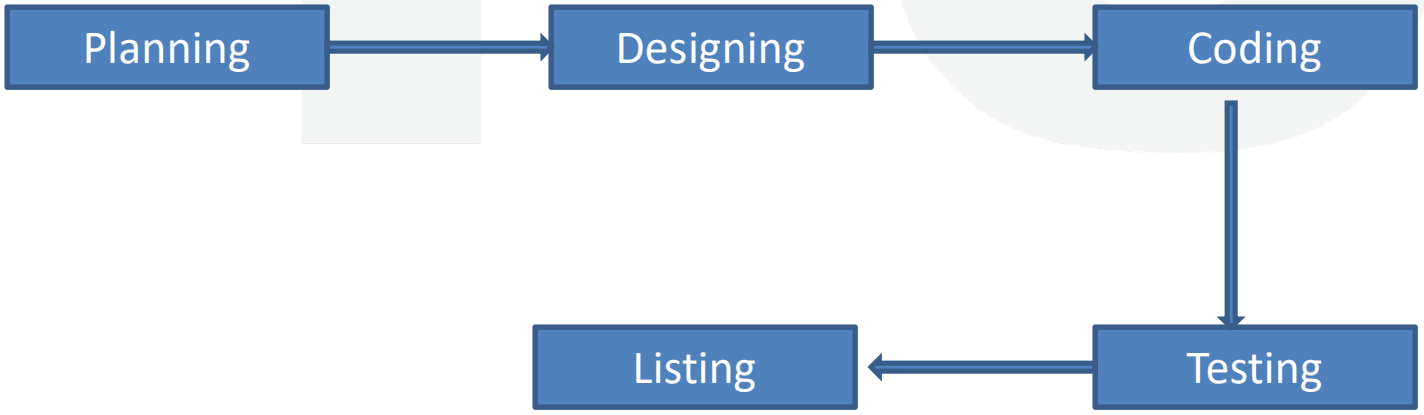
❖ Sprints are Scrum's mechanism to ensure the Agile principles of *"delivering working software frequently.*



Extreme Programming

❖ Extreme Programming (XP) is not a traditional Agile framework because it places more emphasis on the technical aspects of software development and implementation of specific practices than the management and organisational sides.

❖ An XP software development life cycle has 5 stages:



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❖ XP teams also sometimes include the relatively unique role of ‘tracker’, which is often assigned to one of the developers on a part-time basis.

❖The tracker follows metrics like velocity, overtime worked, tests pass rate or anything else the team feels is important to follow progress and identify potential improvements.

❖ Sprints, which are ‘time-boxed’ periods of often around two weeks during which a pre-determined amount of development work is completed, are integral to the Scrum framework.

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