ZENQ

Software Development Life Cycle (SDLC) Models
&
Testing Methodologies

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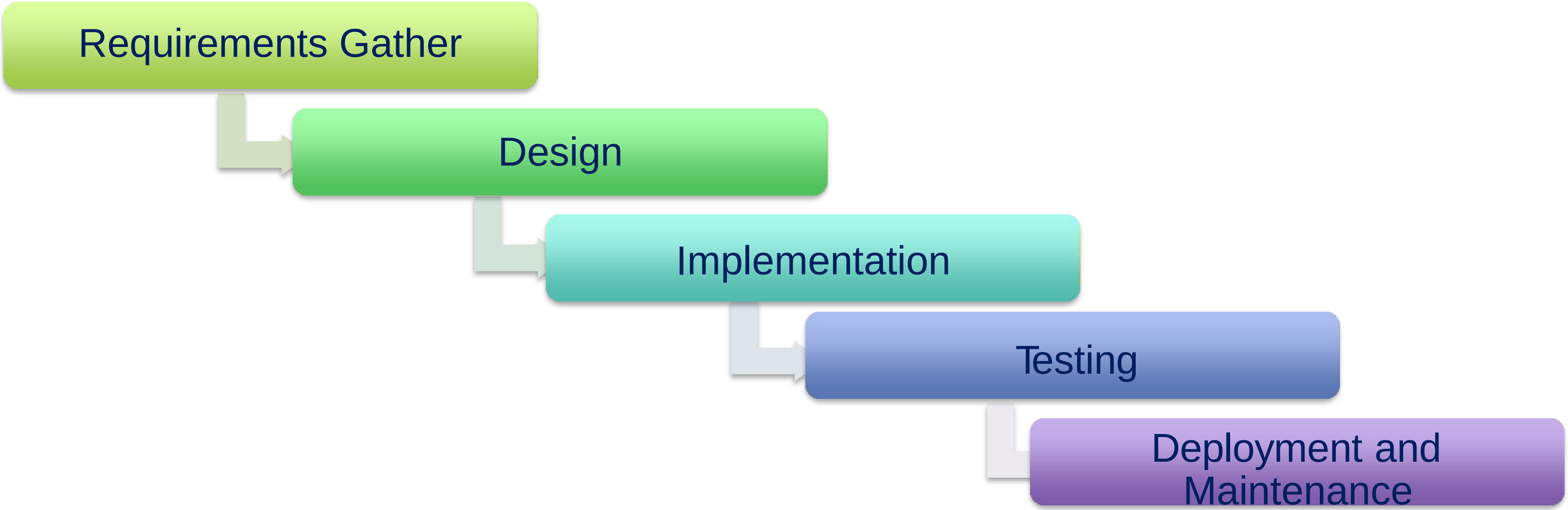
SDLC

A framework that describes the activities performed at each stage of a software development project.

Classification

- ➢ **Sequential Models**
  - Waterfall Model
  - V-Model
- ➢ **Incremental/Iterative Models**
  - Prototype Model
  - Iterative Waterfall model
  - Spiral Model
  - Agile Model

Waterfall Model (Traditional Approach)



Requirements Gather

Design

Implementation

Testing

Deployment and Maintenance

Waterfall Model - Benefits and Disadvantages

Benefits

➢ Simplicity

➢ Each phase has specific deliverable

➢ Completion of one phase at a time

➢ Beneficial for small projects

➢Works well when quality is more important than cost or schedule

Disadvantages

➢ High Risk and Uncertainty

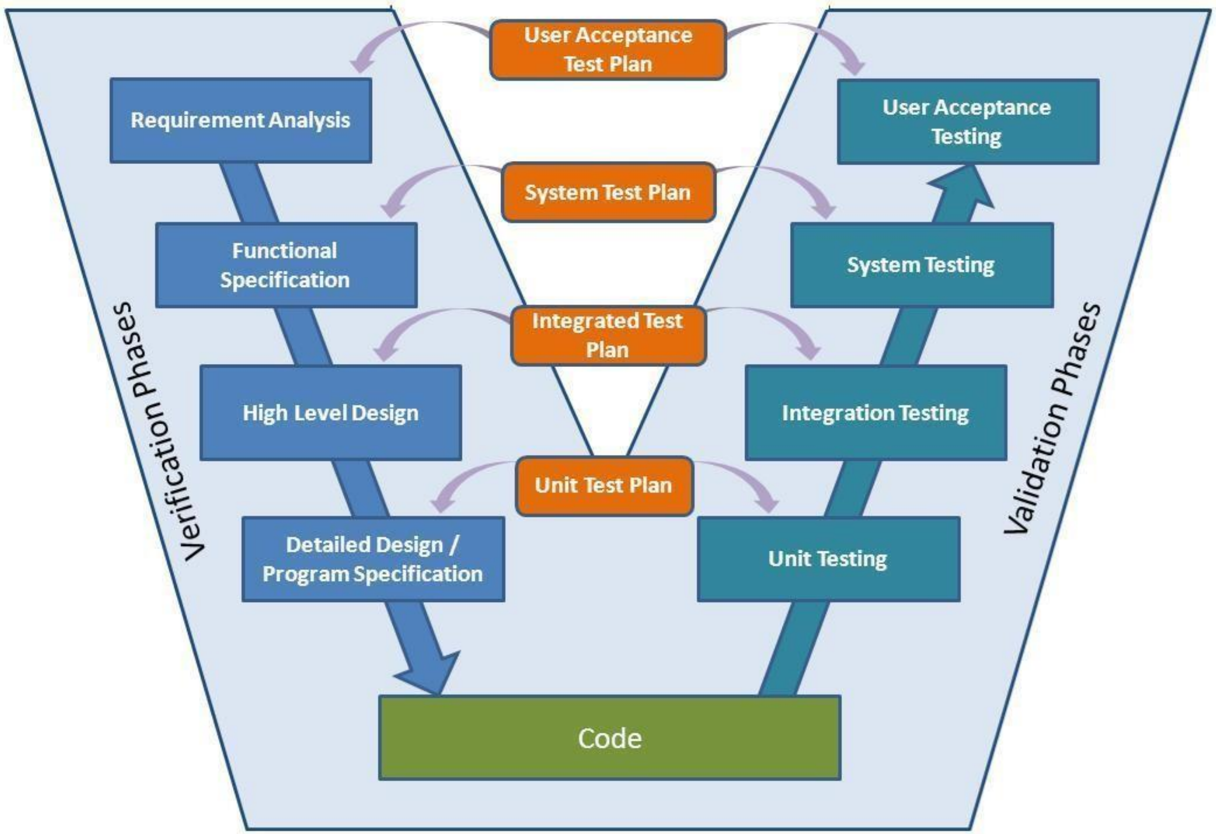
➢Once the project is in testing stage, its difficult to change the requirements(All requirements must be known upfront)

➢Sequential nature causes delay in resolving problems

➢ Not suitable for long duration projects

➢Not suitable for projects with changing requirements

V-Model



User Acceptance Test Plan

Requirement Analysis

User Acceptance Testing

System Test Plan

Functional Specification

System Testing

Integrated Test Plan

High Level Design

Integration Testing

Unit Test Plan

Detailed Design / Program Specification

Unit Testing

Code

Verification Phases

Validation Phases

Benefits and Disadvantages- V-Model

Benefits

➢Saves time as test plan is done before coding.

➢ Pro-active defect tracking.

➢ Avoids downward flow of defects.

➢Suitable for small projects with changing requirements.

Disadvantages

➢ Very rigid and least flexible.

➢ Expensive model- needs lot of resources.

➢If requirements change, test documents along with requirements document has to be changed.

➢ Incorporating changes in requirements midway is difficult.

When to use

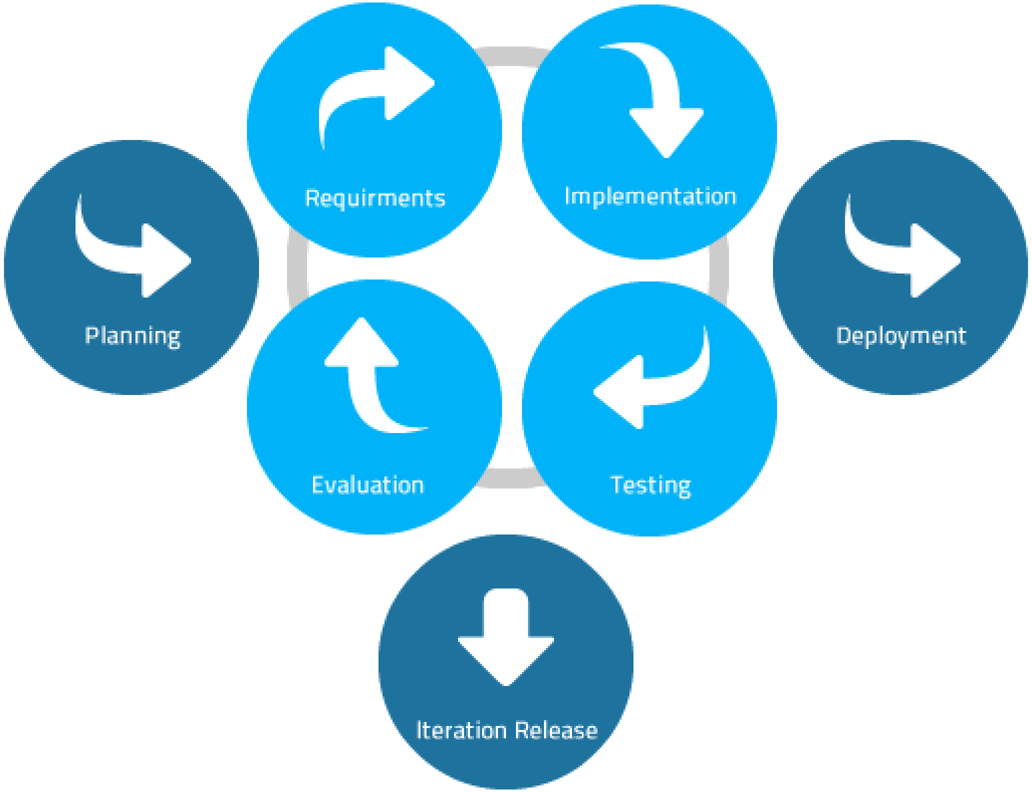
Waterfall Model

- ➢ Requirements are very well known.
- ➢ Product definition is stable.
- ➢ Technology is understood.
- ➢ Short duration projects
- ➢ Porting an existing product to a new platform.

V-Model

- ➢ Excellent choice for systems requiring high reliability.
- ➢ Suitable for small to medium sized projects.
- ➢ All requirements are known up-front.
- ➢ Ample resources are available with required technical expertise.
- ➢ Solution and technology are well known.

Iterative Model



- Can be used to quickly develop a working product and get early feedback
- Cost of change can be minimized, with incremental product delivery
- Need more resources and Tight product management control
- System architecture/design changes can not be implemented
- Best suited for Projects when High level requirements are documented, and low level details need to be worked
- Also, best suited for new technology implementation

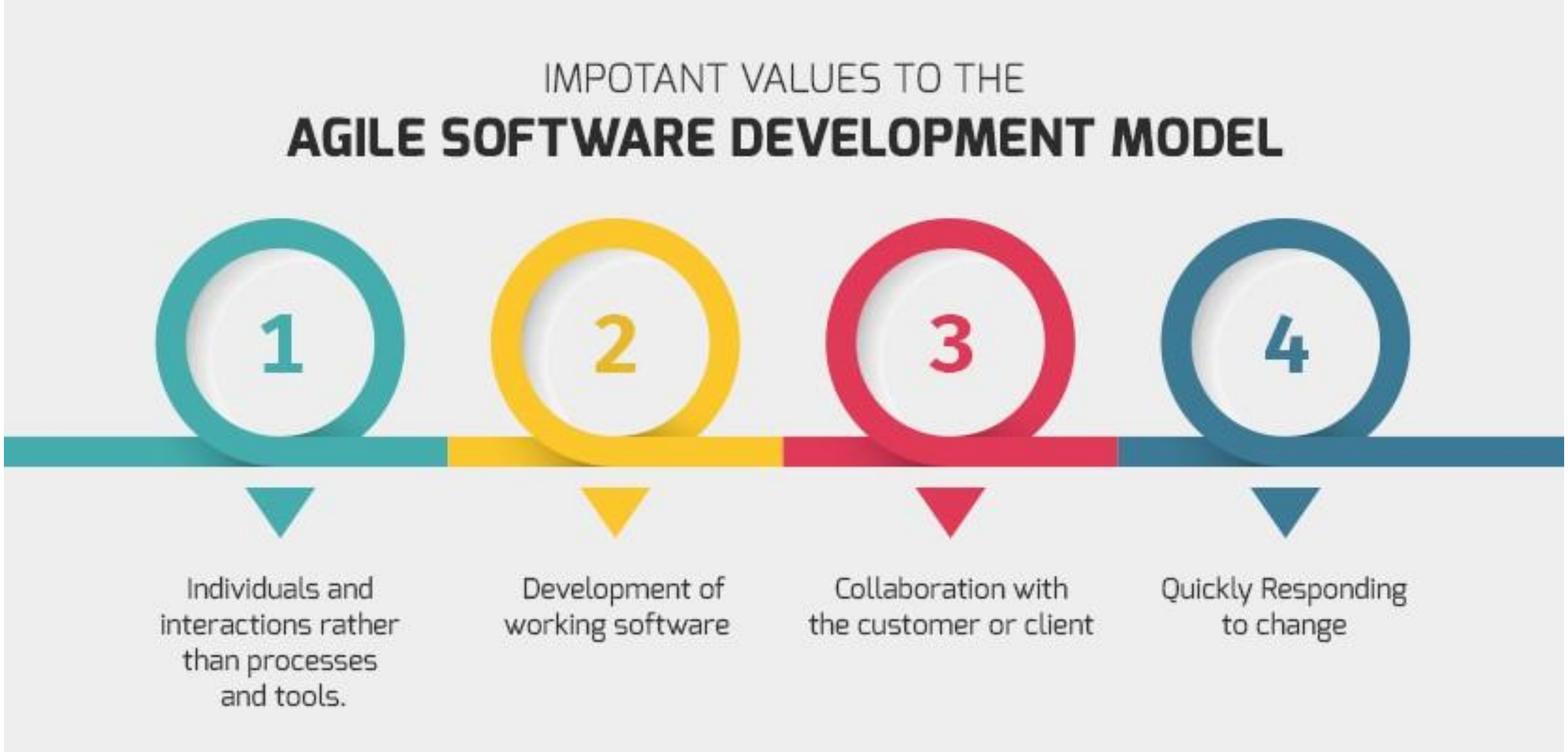
Iterative Model - AGILE

➢Agile software development is based on

- Iterative and incremental development
- requirements and solutions evolve through collaboration between self-organizing, cross-functional teams.

➢It is a conceptual framework that promotes foreseen interactions throughout the development cycle.

Iterative Model – AGILE (Cont.)

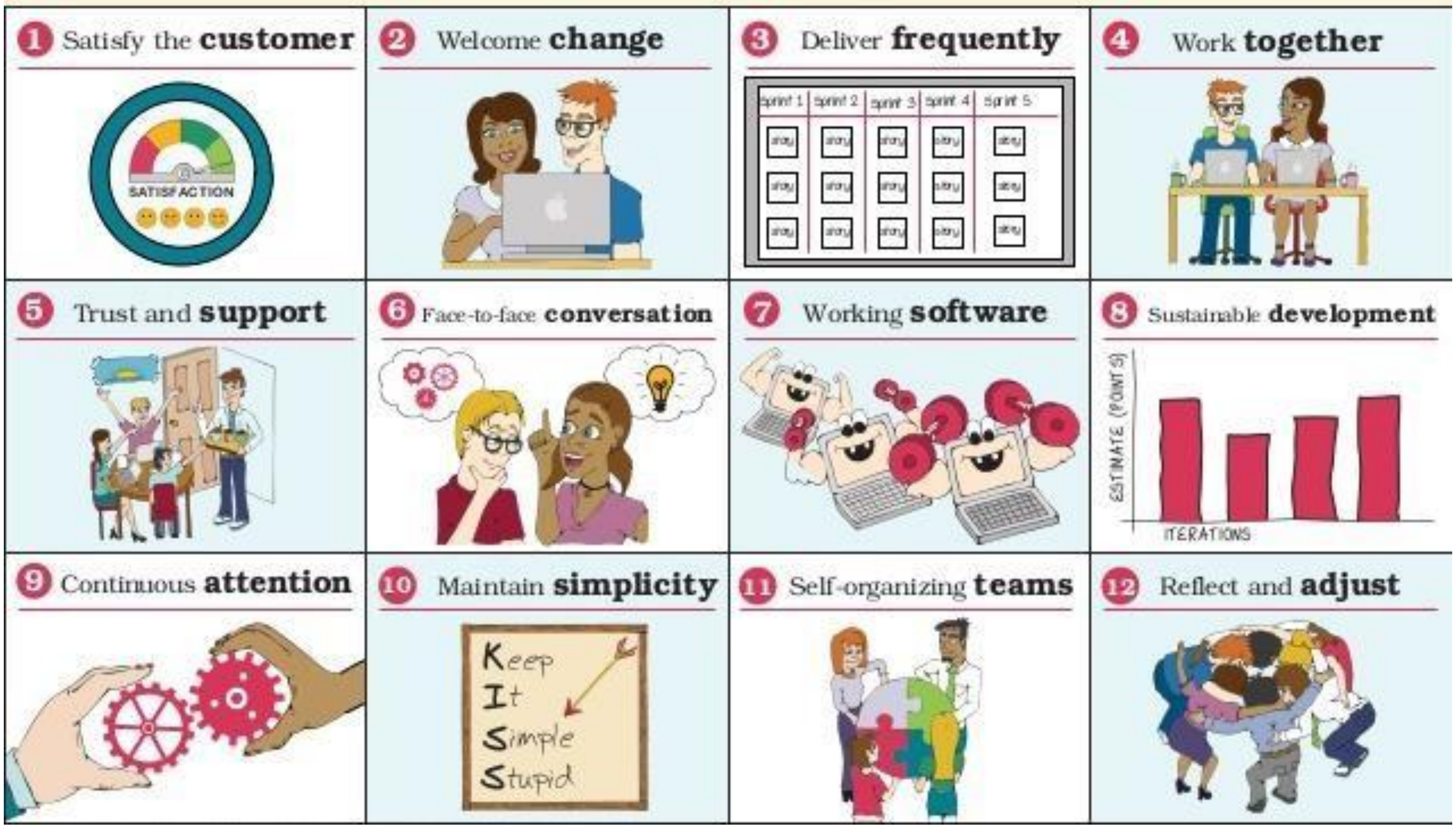


IMPOTANT VALUES TO THE

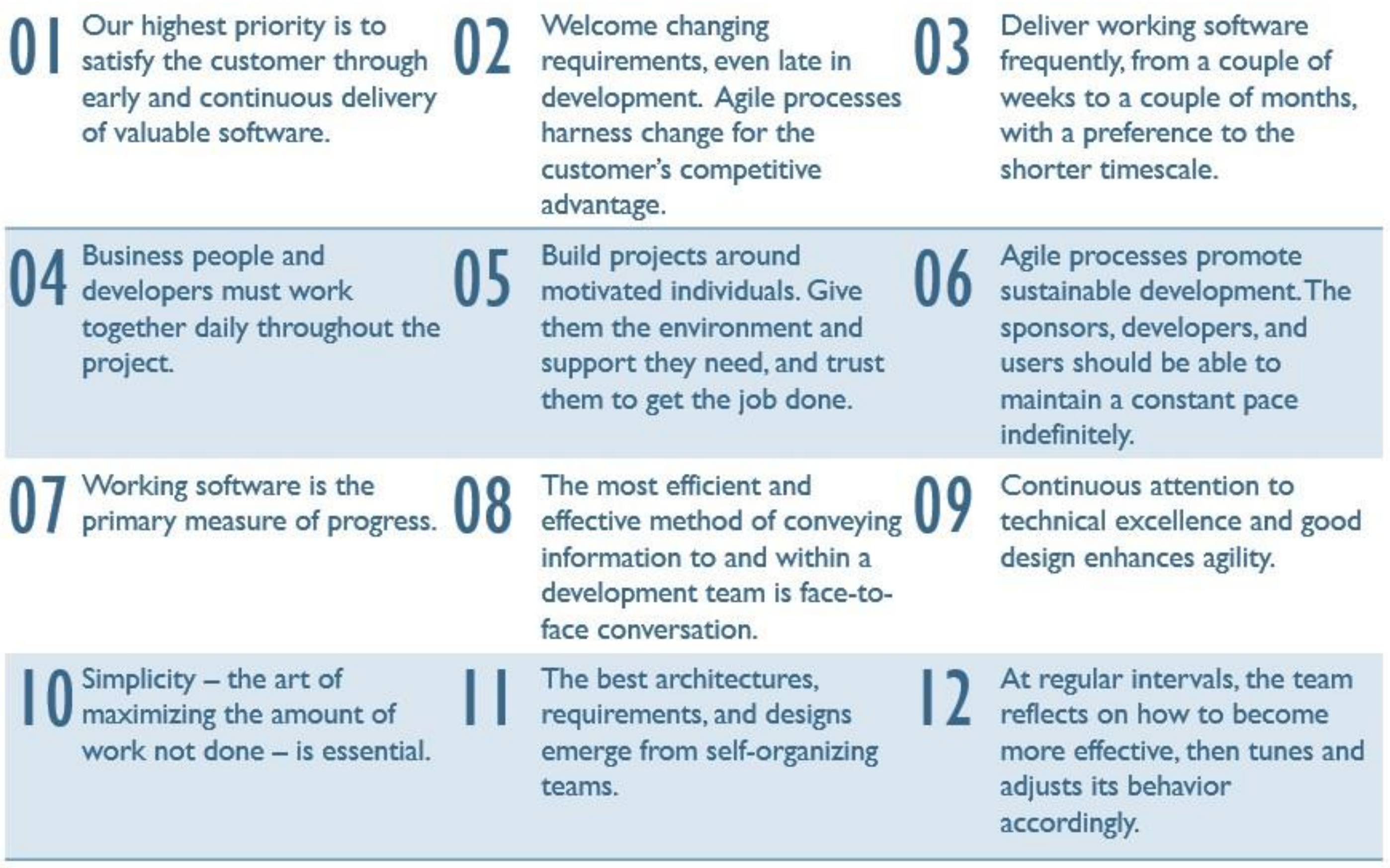
AGILE SOFTWARE DEVELOPMENT MODEL

1. Individuals and interactions rather than processes and tools.
2. Development of working software
3. Collaboration with the customer or client
4. Quickly Responding to change

AGILE PRINCIPLES



AGILE PRINCIPLES



01 Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

02 Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

03 Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.

04 Business people and developers must work together daily throughout the project.

05 Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.

06 Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

07 Working software is the primary measure of progress.

08 The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

09 Continuous attention to technical excellence and good design enhances agility.

10 Simplicity – the art of maximizing the amount of work not done – is essential.

11 The best architectures, requirements, and designs emerge from self-organizing teams.

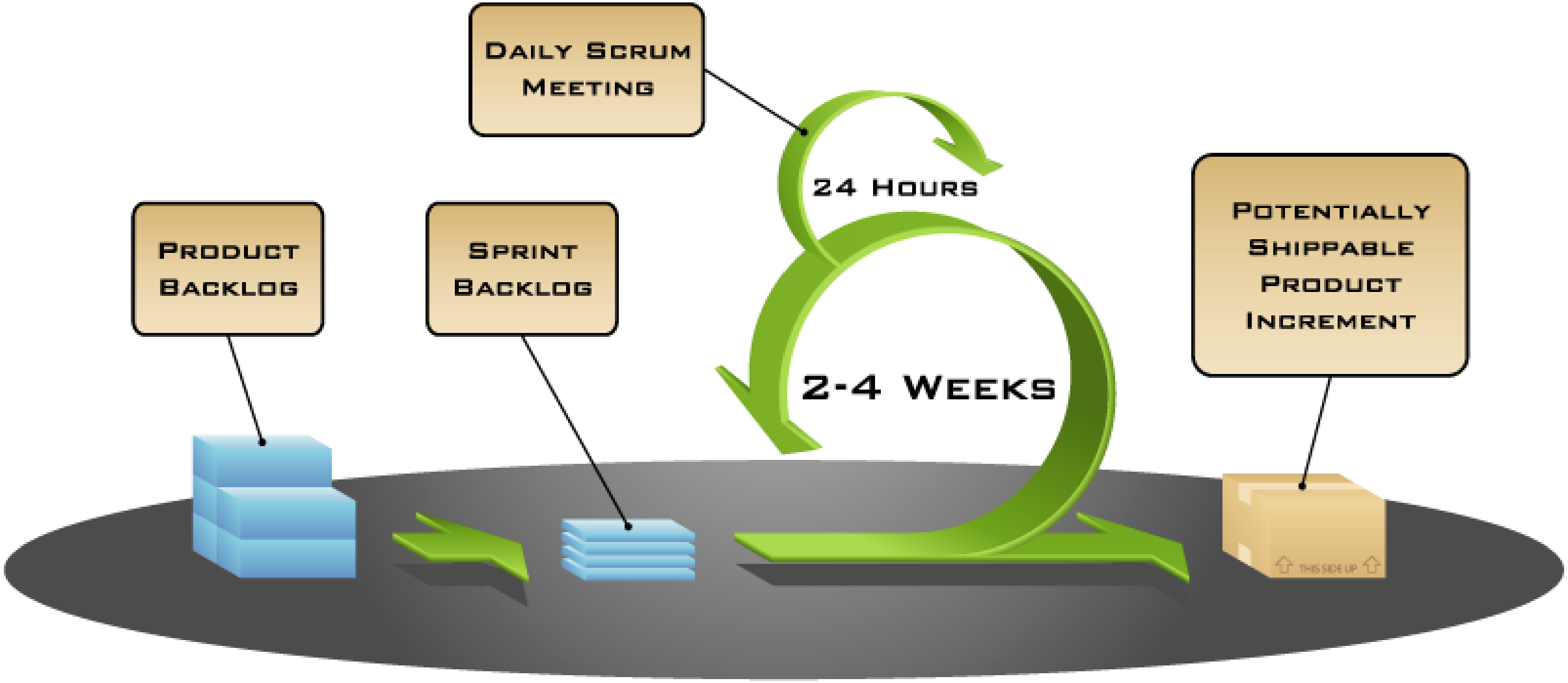
12 At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

SCRUM

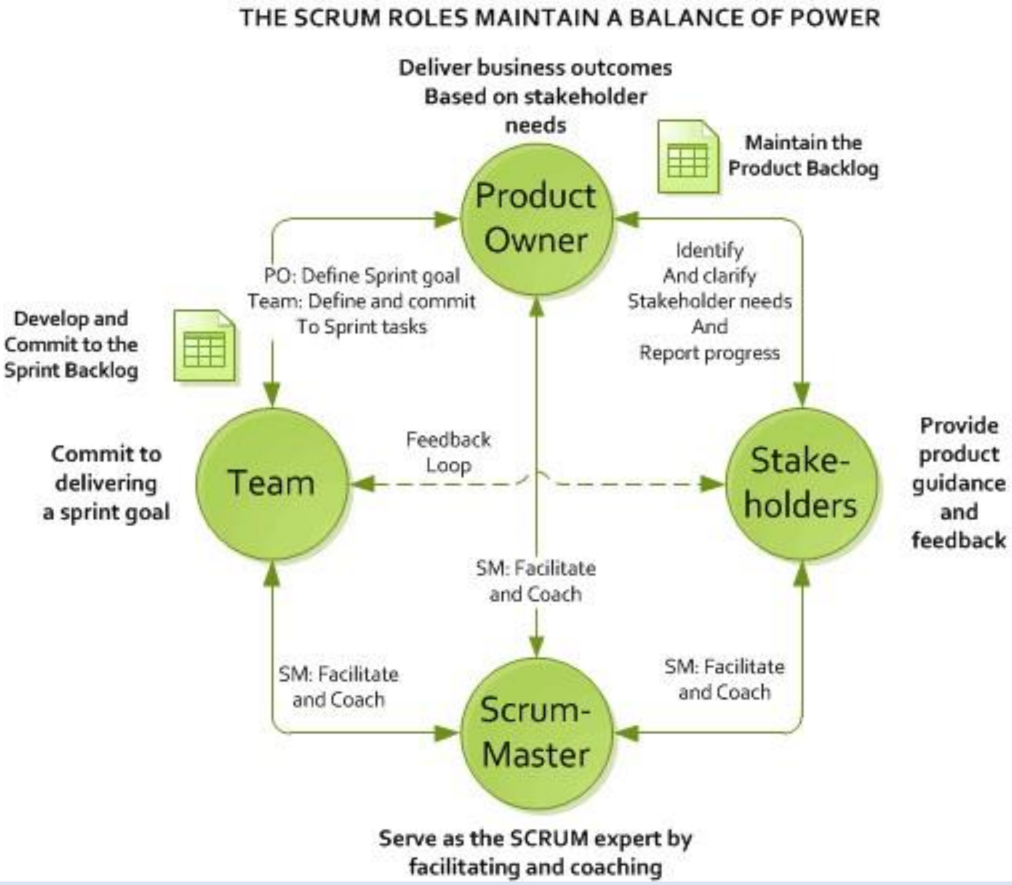
- Scrum is an iterative and incremental agile software framework for managing software development.

- Its focus is on
  "a flexible, holistic product development strategy where a development team works as a unit to reach a common goal"
  as opposed to a
  "traditional, sequential approach".

SCRUM PROCESS



SCRUM ROLES


THE SCRUM ROLES MAINTAIN A BALANCE OF POWER
Deliver business outcomes Based on stakeholder needs
Product Owner
Maintain the Product Backlog
PO: Define Sprint goal
Team: Define and commit
To Sprint tasks
Identify
And clarify
Stakeholder needs
And
Report progress
Develop and Commit to the Sprint Backlog
Commit to delivering a sprint goal
Team
Feedback Loop
Stake-holders
Provide product guidance and feedback
SM: Facilitate and Coach
SM: Facilitate and Coach
SM: Facilitate and Coach
Scrum-Master
Serve as the SCRUM expert by facilitating and coaching

SCRUM Roles

- **Product Owner**- represents the stakeholders and is accountable for ensuring that the team delivers value to the business.

- **Team** - The Team is responsible for delivering potentially shippable product increments at the end of each Sprint.

- **Scrum Master** - Scrum is facilitated by a Scrum Master, who is accountable for removing impediments to the ability of the team to deliver the sprint goal/deliverables.

- **Stakeholders-** customers, end-users, and vendors who interface both with the Project Assurance group and with the Scrum Team.

SCRUM Terms

- ❑ Sprint
- ❑ Daily Scrum / Stand up call
- ❑ Backlog Refinement
- ❑ Product Backlog
- ❑ Sprint Backlog
- ❑ Sprint Planning Meeting
- ❑ Sprint Review
- ❑ Sprint Retrospective

SCRUM Terms (Cont.)

- **Sprint**

  A sprint is the basic unit of development in Scrum. The sprint is a "timeboxed" effort i.e. it is restricted to a specific duration which is usually one week or one month.

SCRUM Terms (Cont.)

➢ **Daily Scrum / Stand up call**

Each day during the sprint, a project team communication meeting occurs. This meeting has specific guidelines:

- Dev team come prepared with the updates for the meeting.
- The meeting starts precisely on time.
- Happens at the same location and same time every day.
- The meeting length is set (time boxed) to 15 minutes.

SCRUM Terms (Cont.)

- **Backlog Refinement**

  Process of creating stories into smaller parts, refining the acceptance criteria for individual stories, prioritizing them.

  - Meetings should not be longer than an hour.
  - Meeting does not include breaking stories into tasks.
  - The team can decide how many meetings are needed per week.

SCRUM Terms (Cont.)

➢ **Product Backlog**

- The product backlog is an ordered list of "requirements" that is maintained for a product.
- It consists of features, bug fixes, non-functional requirements, etc.
- The items are ordered by the Product Owner based on considerations like risk, business value, dependencies, date needed, etc.
- The features added to the backlog are commonly written in story format.

SCRUM Terms (Cont.)

➢ **Sprint Backlog**

- The sprint backlog is the list of work the Development Team must address during the next sprint.
- The list is derived by selecting stories/features from the top of the product backlog until the Development Team feels it has enough work to fill the sprint.
- This is done by the Development Team asking "Can we also do this?" and adding stories/features to the sprint backlog.

SCRUM Terms (Cont.)

➢ **Sprint Planning Meeting**

At the beginning of the sprint cycle (every 7 or 30 days), a "Sprint planning meeting" is held:

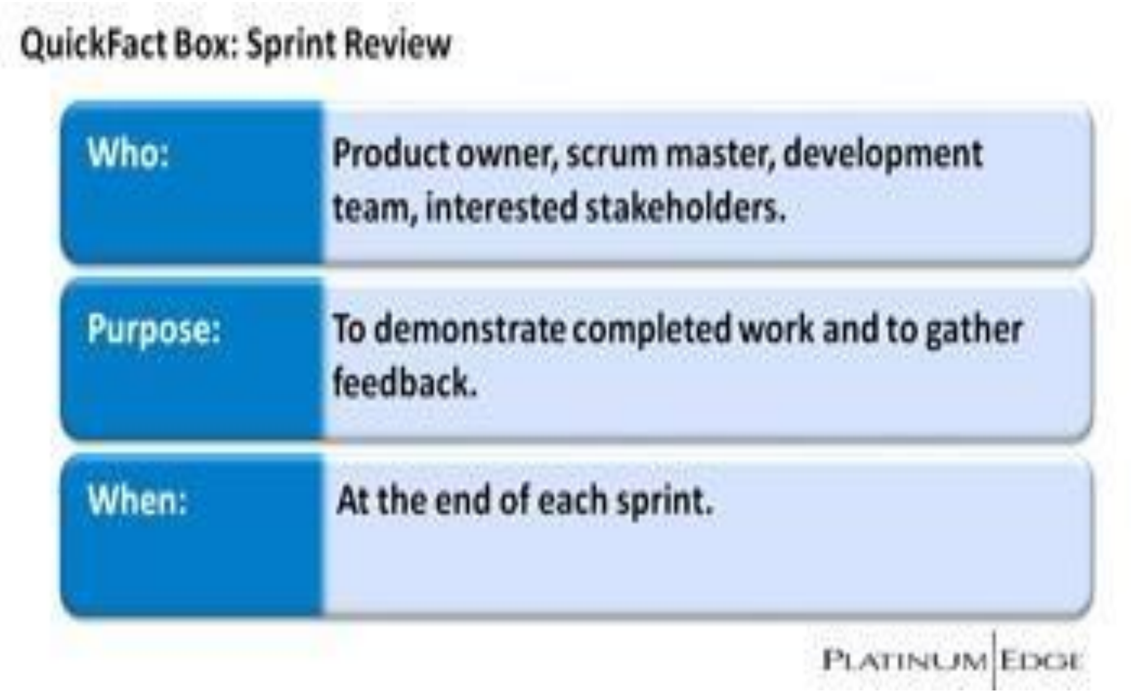
- Select what work is to be done

- Prepare the Sprint Backlog that details the time it will take to do that work, with the entire team

- Identify and communicate how much of the work is likely to be done during the current sprint

SCRUM Terms (Cont.)

- ➢ **Sprint Review**



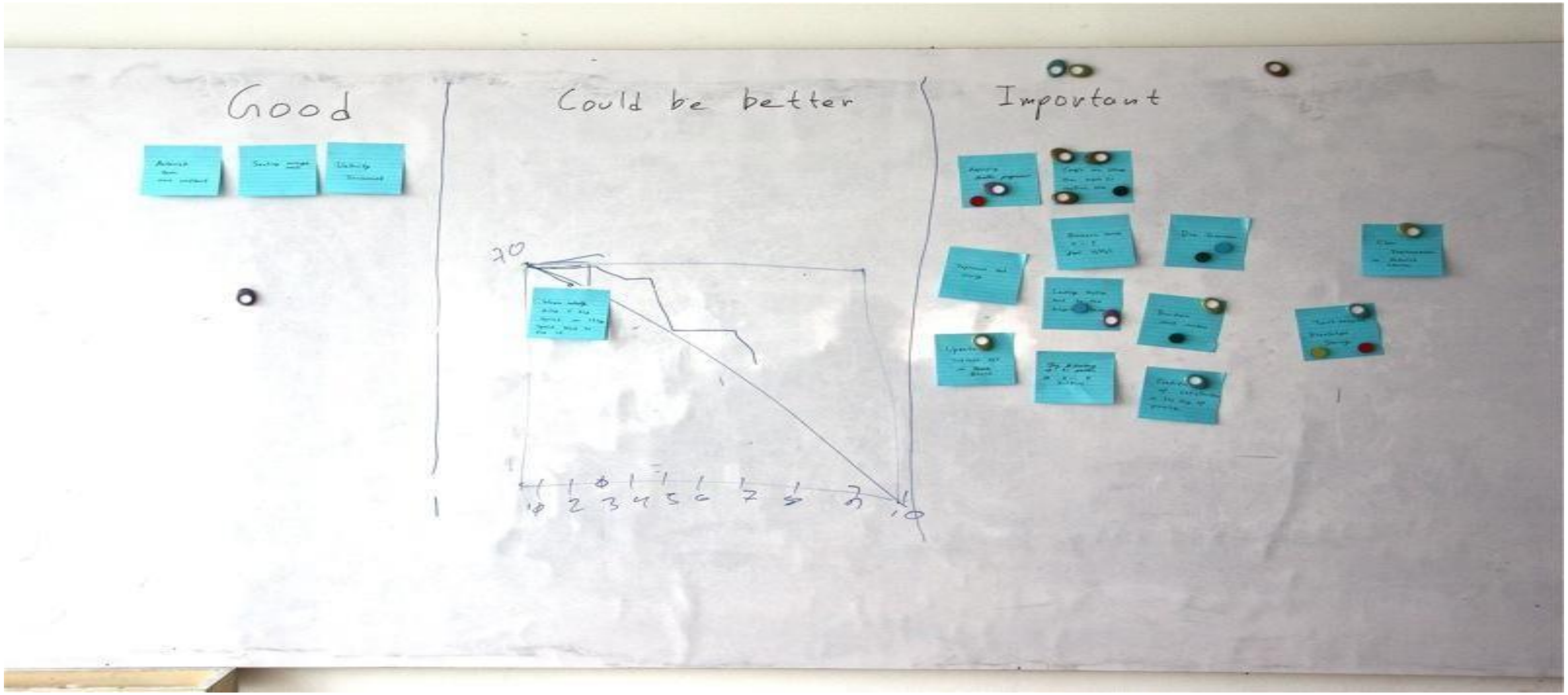
QuickFact Box: Sprint Review

Who:	Product owner, scrum master, development team, interested stakeholders.
Purpose:	To demonstrate completed work and to gather feedback.
When:	At the end of each sprint.

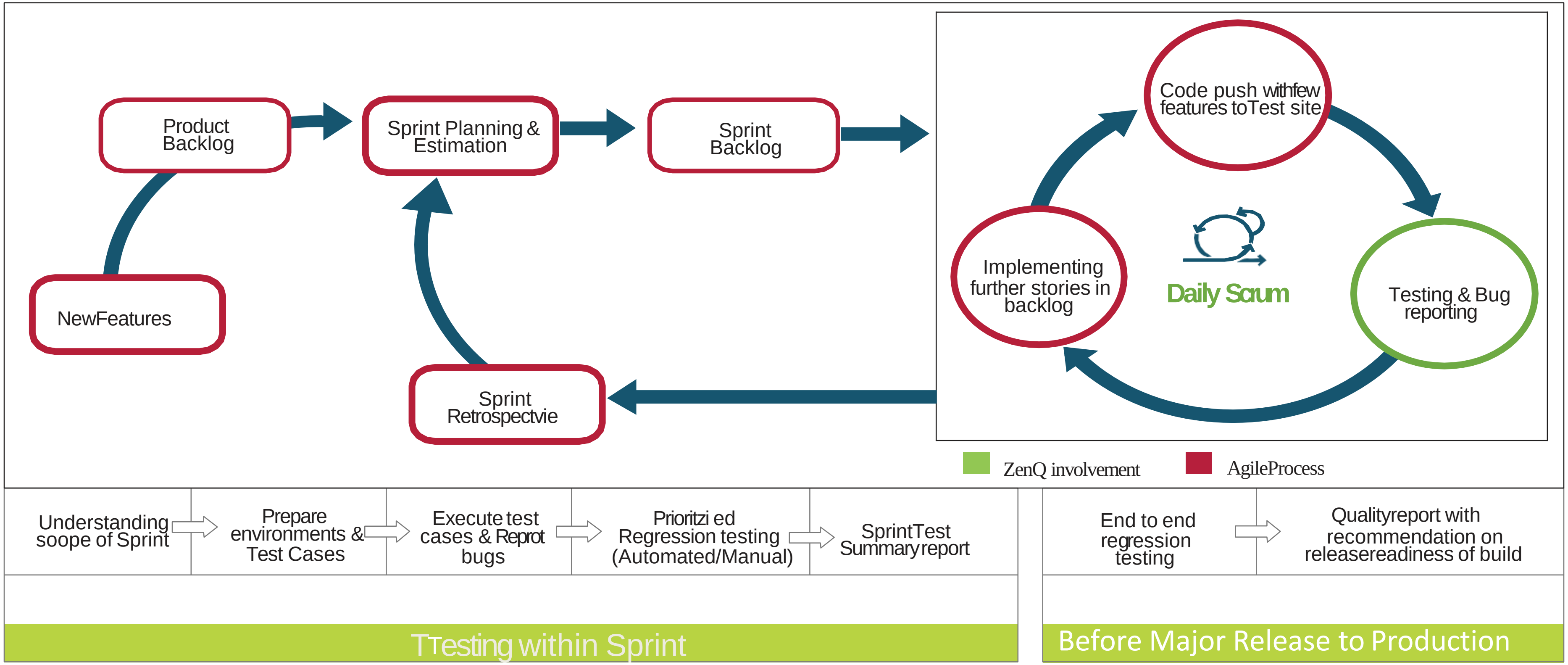
PLATINUM | EDGE

SCRUM Terms (Cont.)

- **Sprint Retrospective**



SCRUM Terms (Cont.)



Product Backlog

Sprint Planning & Estimation

Sprint Backlog

NewFeatures

Sprint Retrospectvie

Code push withfew features toTest site

Testing & Bug reporting

Implementing further stories in backlog

Daily Scrum

🟩 ZenQ involvement 🟥 AgileProcess

Understanding soope of Sprint → Prepare environments & Test Cases → Execute test cases & Reprot bugs → Prioritzi ed Regression testing (Automated/Manual) → SprintTest Summary report

TTesting within Sprint

End to end regression testing → Qualityreport with recommendation on releasereadiness of build

Before Major Release to Production

Software Testing Methodologies

Testing Types

- **Functional Testing**
  - Unit testing
  - Integration testing
  - System testing
  - Acceptance testing

- **Non-Functional Testing**
  - Performance testing
  - Security testing
  - Usability testing
  - Compatibility testing

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Related:

Agile Methodology - https://www.youtube.com/watch?v=WjwEh15M5Rw
Scrum Sprint Planning Meeting - http://www.youtube.com/watch?v=oWptXjhAVbI
Sprint Review - http://www.youtube.com/watch?v=fpBQ5yxrR_c
Scrum Backlog Refinement - http://www.youtube.com/watch?v=azMX6kFw8sA
Daily Scrum - http://www.youtube.com/watch?v=MR88bbHf0wA
Scrum Sprint Retrospective - http://www.youtube.com/watch?v=GjzdG0G5SI8
Testing Methodologies - https://smartbear.com/learn/automated-testing/software-testing-methodologies/

Q & A