Project Management

Lecture 3 – Project Methodologies

Dr. Andre Samuel

Activity- Why use a Project Methodology?

- **Ready-**
  - ✓ *"If you **DO NOT** use a methodology, **what would be the results?***

  - ✓ *Think of **ONE WORD***

Why Project Methodology?

"There's method to his madness"
Shakespeare-Hamlet

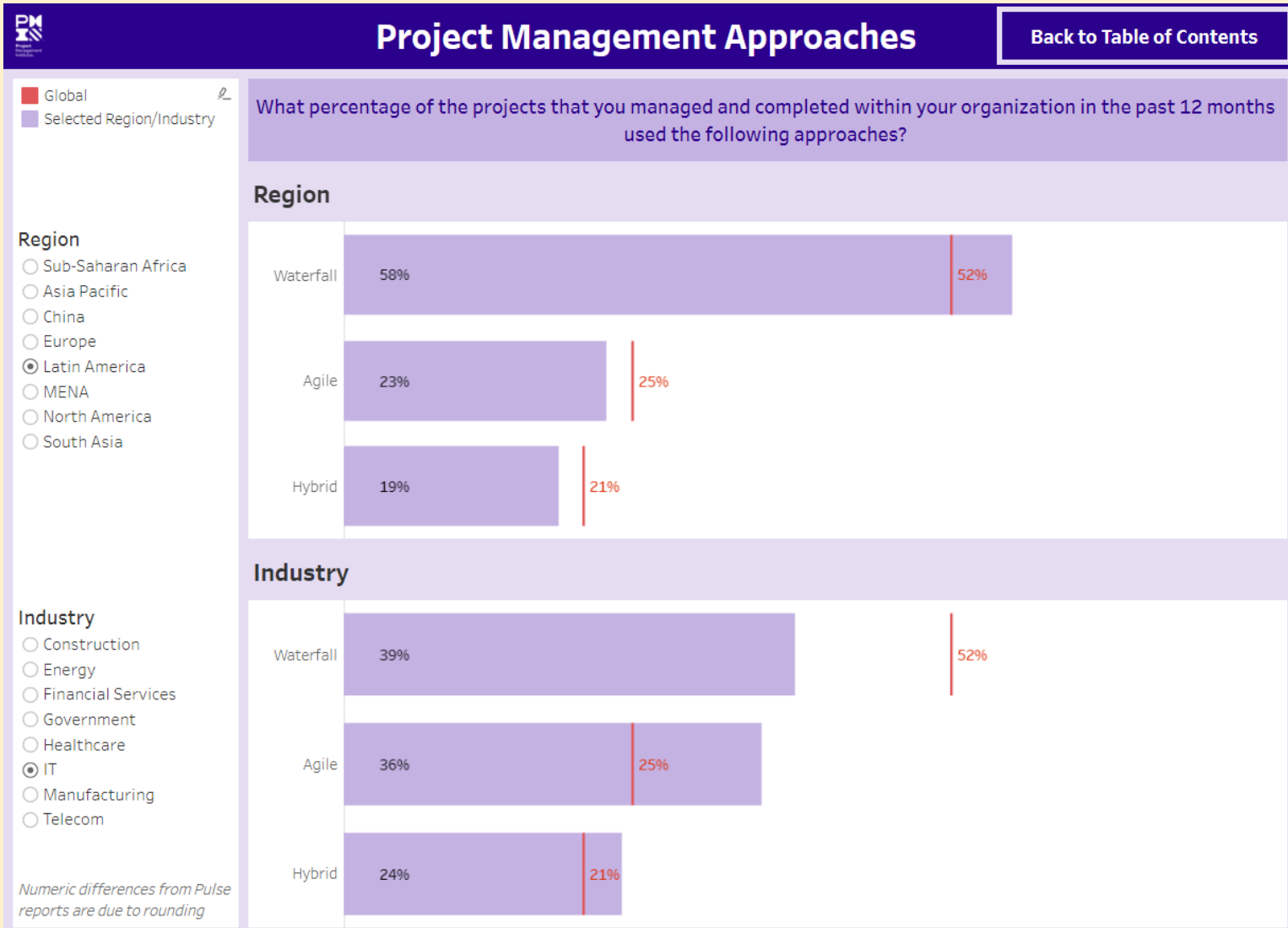Concepts and Structure

Common methods and rules

Standardize Delivery

Provide a Framework for management

Greater the chances of the projects to end on time and within budget

Procedure and steps

Pulse of the Profession by PMI

Project Management Approaches

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Global
Selected Region/Industry

What percentage of the projects that you managed and completed within your organization in the past 12 months used the following approaches?

Region

Waterfall	58%	52%
Agile	23%	25%
Hybrid	19%	21%

Region

- ○ Sub-Saharan Africa
- ○ Asia Pacific
- ○ China
- ○ Europe
- ◉ Latin America
- ○ MENA
- ○ North America
- ○ South Asia

Industry

Waterfall	39%	52%
Agile	36%	25%
Hybrid	24%	21%

Industry

- ○ Construction
- ○ Energy
- ○ Financial Services
- ○ Government
- ○ Healthcare
- ◉ IT
- ○ Manufacturing
- ○ Telecom

Numeric differences from Pulse reports are due to rounding

Need for Project Management Maturity

- Kerzner (2017) considers that managing projects goes beyond adopting the knowledge, skills, tools and techniques usually applied.

- The **greater the standardized practices, the greater the chances of the projects to end on time and within budget** (PMI, 2013)

- Kerzner (2017) states that, **despite the importance of defining a project management methodology, it does not guarantee its success** in terms of performance during its execution

- Therefore, **organizations need to mature in the science and art of project management** in order to coordinate efforts to deliver projects directed to the organization's strategy

Benefits of a Methodology

- No surprises! We know what's coming next
- A structured approach to project management will improve project success:
  - Scope is controlled
  - Cost is controlled
  - Logical plans can be developed to meet deadlines
  - Roles and responsibilities are well defined
  - Quality assurance is built in, are we doing it right?

Consequences of no Methodology?

- The different roles in the project are not clearly defined

- Different teams in the organization manage projects in their own way, with little sharing of lessons learned or consistency of approach.

- Project performance is not consistent across all projects.

- Project teams re-invent the wheel every time, using different tools, templates and processes

Naybour (2016)
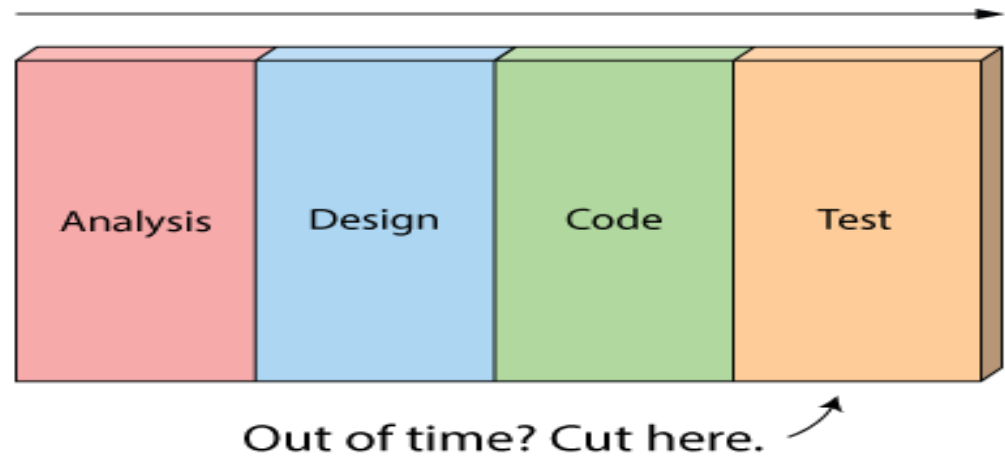
Project Management Methodologies

- Waterfall
- Agile

Waterfall- Linear methods have been criticised

- Too slow,
- Not dynamic
- Not all requirements known at the beginning
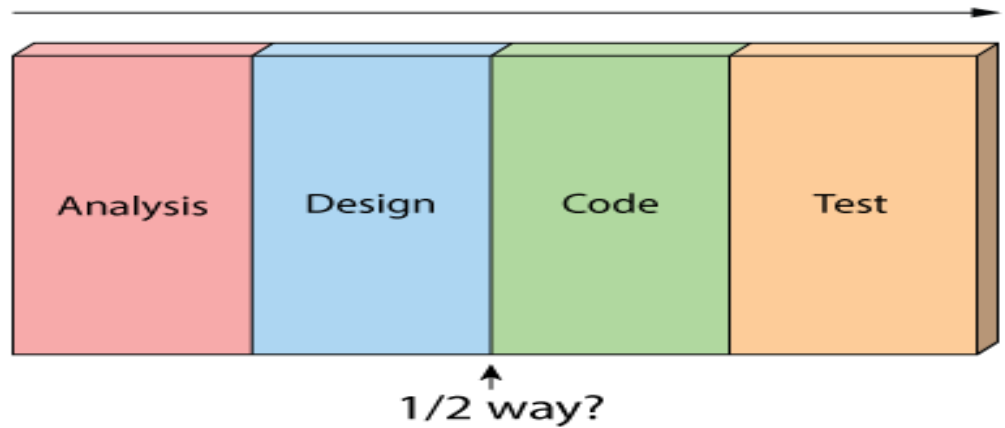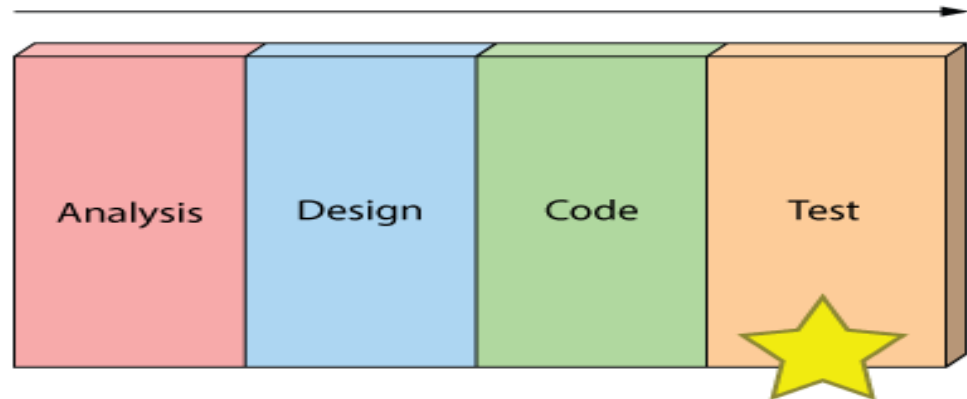- Too rigid
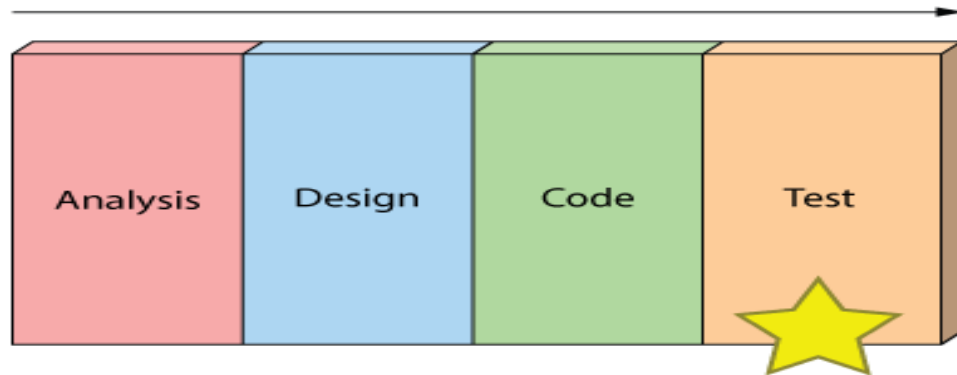- Need to adapt to change
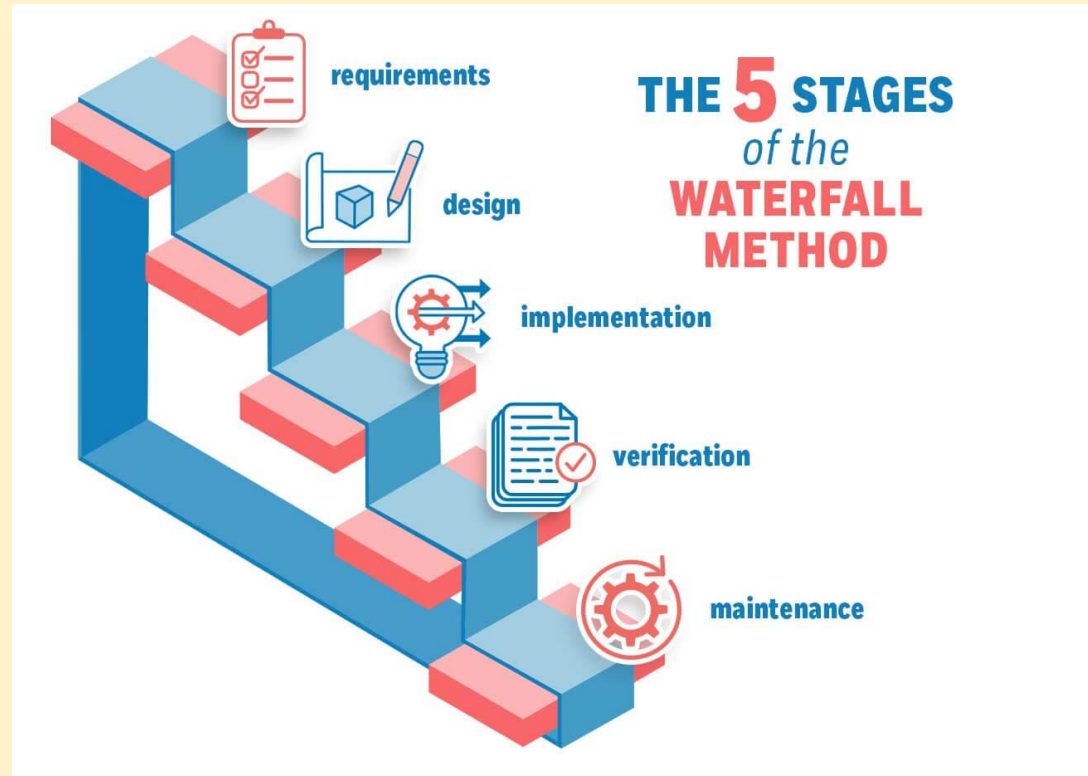
Waterfall challenges

Poor quality

Analysis | Design | Code | Test

Out of time? Cut here.

Poor visibility

Analysis | Design | Code | Test

1/2 way?

Too risky

Houston we have a problem

Can't handle change

And finally, most importantly, it's just not a great way for handling change.

'I know what I really want!'

Why Agile?
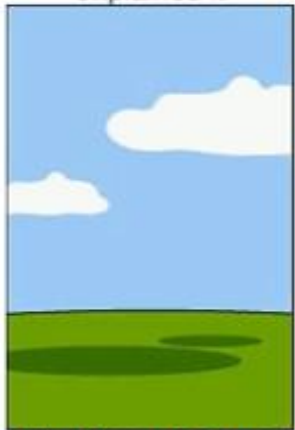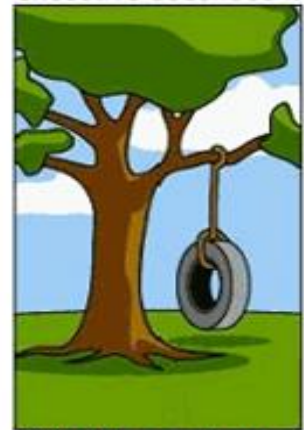
What is Agile Project Management?

- Agile project management is an approach based on:
  - delivering requirements **iteratively** and
  - **incrementally** throughout the project life cycle.

- At the core of agile is the requirement to exhibit central values and behaviours of
  - trust
  - Flexibility
 - empowerment and collaboration.

Characteristics of Agile

- Delivers work in **short bursts (or sprints)** of anything up to a few weeks.

- These are **repeated to refine the working deliverable** until it meets the client's requirements.

- Agile starts **work with a rough idea** and as the project progresses **clarifies the requirements**

- **Collaborative relationships** are established between stakeholders and the team members delivering the work
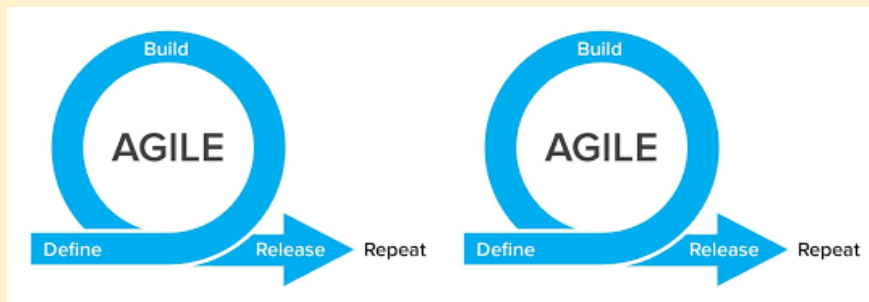
Sprint 1   Sprint 2
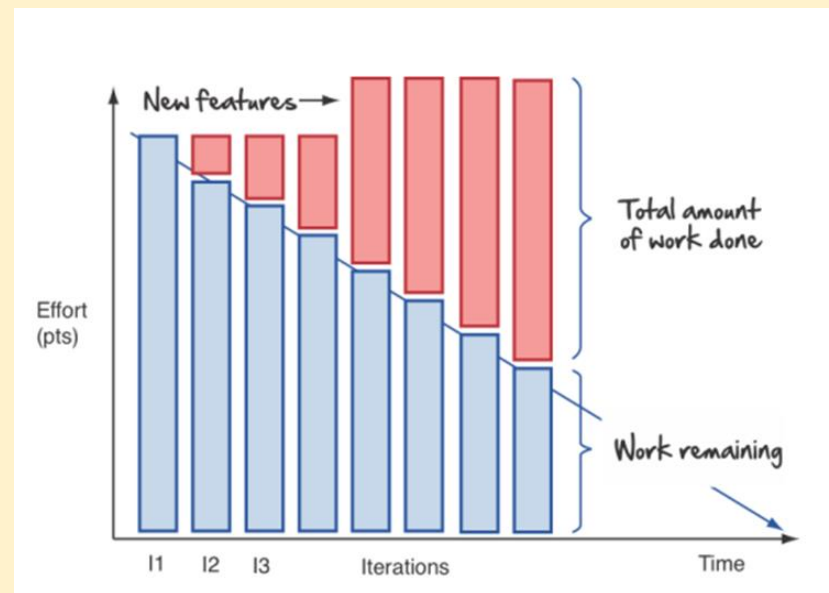
Iterative nature of Agile

Straçusser, G. (2015)
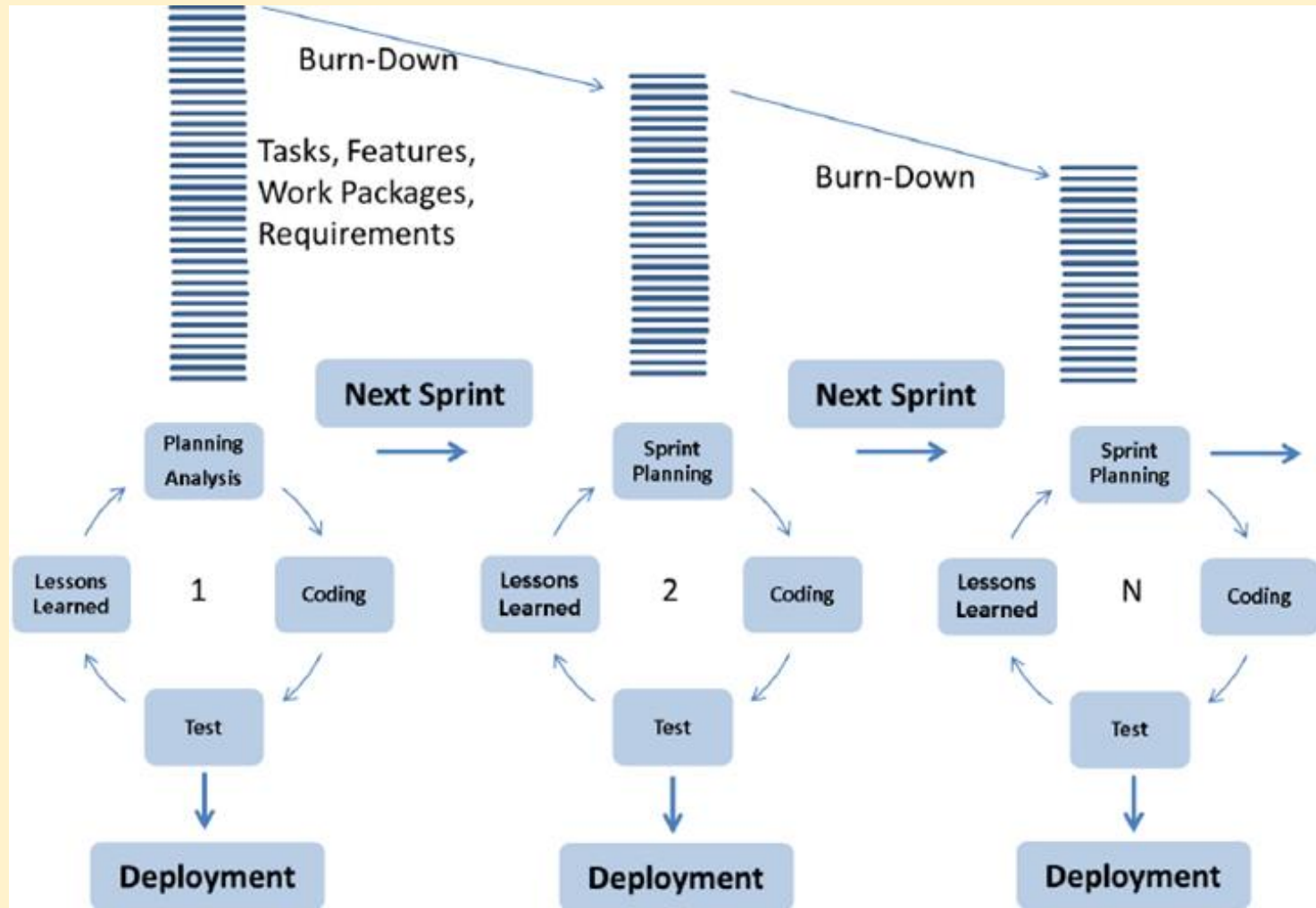
- Agile **does not expect to fully understand the requirements** before work can begin.

- Instead it **emphasises the importance of delivering a working product as something tangible** for the client that can then be refined until it fulfils the client's needs.

- The key **measure of project progress is this series of working deliverables**.

Pareto Principle

- **20% of the User Stories (functional work) probably contain 80% of the customer value**. So find them and do those first

- Find the 20 percent that delights customers, deliver them, and repeat.

80% EFFECT

20% CAUSE

Focus on the 20% that matters for an 80% effect.

Prioritisation- MoSoCoW

- **Must-** Cannot deliver/go live without this.
- **Should-** Important but not vital
- **Could**- Wanted or desirable but less important. "nice to haves"
- **Won't-** team has agreed it will not deliver

Principles behind the Agile Manifesto

Key outcomes of Agile

- **Customer collaboration** over contract negotiation
- **Individuals** and **interaction over processes** and **tools**
- **Responding to change** over following a structured plan
- **Prototyping**/working solutions over comprehensive documentation

Agile Benefits

Focus on Customer Needs

Reduce Waste

Agile Benefits To Project Management

Faster detection of Issues

Increased Flexibility

Faster Turnaround

Increased Adaptability
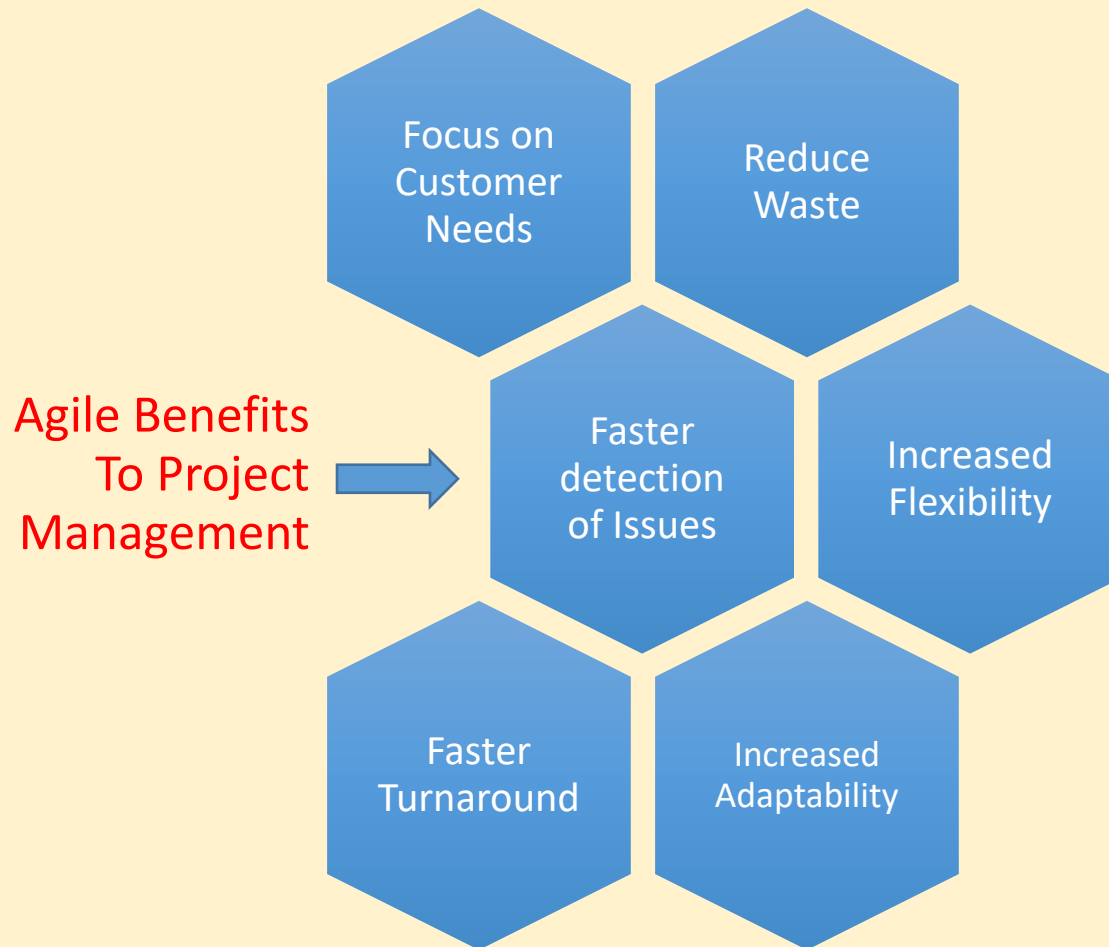
Activity- Agile Word Cloud

- When you hear the term "Agile Methodology", what words come to mind?

- Give 3 words that come to mind

- Go to: https://www.menti.com/d7r32t81pe

Implication of Agile to Project Management

Project Management Function	Implication
Planning	Less formal, **based on sprints**
Scope	Collaborative and interactive approach to requirements as they are not fully known. **Change is welcomed**, scope creep is expected
Cost	**Based on number of sprints and effort**, iterative, bottom up
Quality	**Early testing**, continuous improvement
Project Team	**Greater communication** and collaboration

Agile Methodologies

- Scrum
- Lean
- Kanban
- DSDM

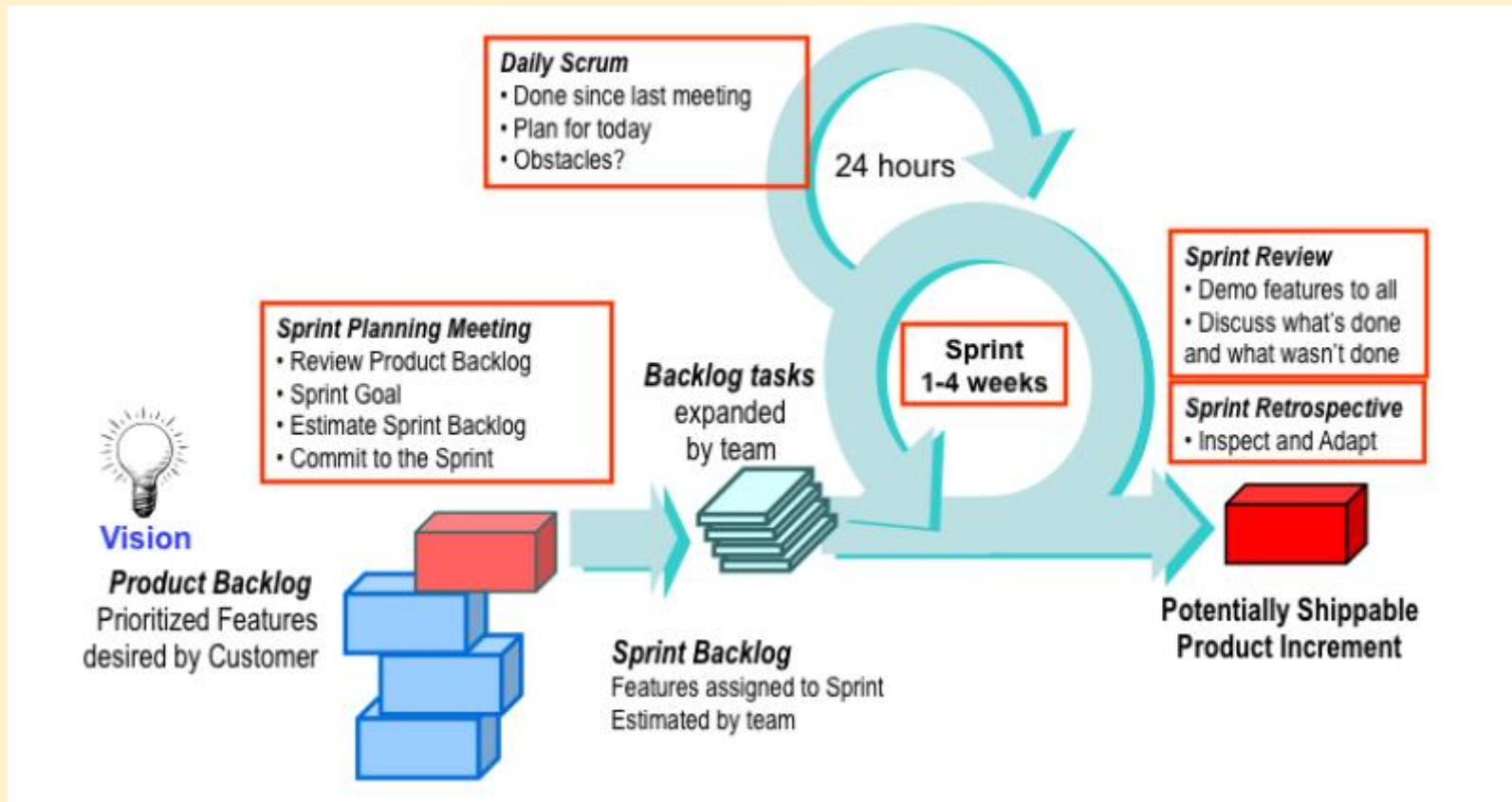| Knowledge Areas	Activities	Scrum Tools & Techniques
Project Integration Management	Direct & Manage Project Execution	Execute Tasks
	Monitor & Control Project Work	Taskboard, Burnup & Burndown charts, and related tools
	Perform Integrated Change Control	Manage Product Backlog
Project Scope Management	Collect Requirements	Write Epics & Stories
	Define Scope	Sprint Planning Meeting
	Create WBS	Create Task Breakdowns
	Verify Scope	Sprint Review Meeting
	Control Scope	Manage Product Backlog
Project Time Management	Define Activities	Develop Task Breakdown
	Sequence Activities	Rank Product Backlog
	Estimate Activity Duration	Planning Poker, Analogous Estimation
	Develop Schedule	Sprint Planning Meeting
	Control Schedule	Daily Scrum Meeting
Project Quality Management	Plan Quality	Create Definition of Done
	Perform Quality Control	Validate to Definition of Done
Project Cost Management	Estimate Costs	Planning Poker, Analogous Estimation
Project Human Resource Management	Develop Project Team	Swarming
	Manage Project Team	Daily Scrum Meeting
Project Communication Management	Plan Communications	Taskboard and related tools
	Distribute Information	Taskboard and related tools
	Report Performance	Taskboard and related tools
Project Risk Management	Monitor & Control Risks	Daily Scrum Meeting

SCRUM Framework

Scrum Framework © Scrum.org

Detailed Framework

Daily Scrum
- Done since last meeting
- Plan for today
- Obstacles?

24 hours

Sprint Planning Meeting
- Review Product Backlog
- Sprint Goal
- Estimate Sprint Backlog
- Commit to the Sprint

Backlog tasks
expanded
by team

Sprint
1-4 weeks

Sprint Review
- Demo features to all
- Discuss what's done and what wasn't done

Sprint Retrospective
- Inspect and Adapt

Vision

Product Backlog
Prioritized Features
desired by Customer

Sprint Backlog
Features assigned to Sprint
Estimated by team

Potentially Shippable Product Increment

Adopting PRINCE2 Agile™ to deliver projects: The AXELOS Website

https://youtu.be/P4dO4pbJHSU

Agile Project Management with SCRUM

- Jeff Sutherland created the scrum process in 1993, he borrowed the term "scrum" from an analogy put forth in a 1986 study by Takeuchi and Nonaka, published in the Harvard Business Review.

- In that study, Takeuchi and Nonaka compare high-performing, cross-functional teams to the scrum formation used by Rugby teams.

- Scrum is the leading agile development methodology, used by Fortune 500 companies around the world
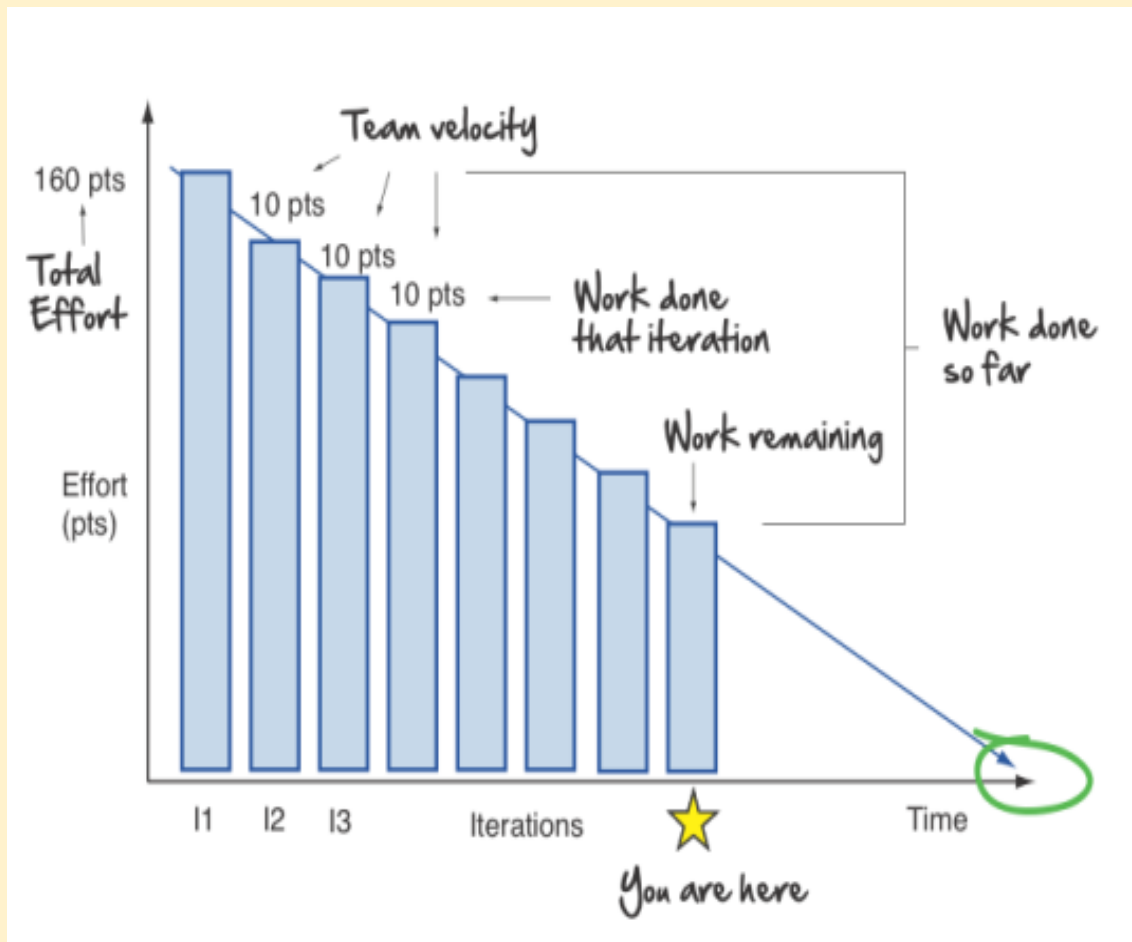
SCRUM Values

SCRUM Events

- Sprint
- Sprint Planning
- Daily Scrum
- Sprint Review
- Sprint Retrospective

Tracking Progress- Burndown Chart

SCRUM Roles

- **SCRUM Development Team-** consists of seven plus or minus two people who are jointly responsible for the delivery of the product

- **Product Owner-** represents the voice of the customer and has the authority to make decisions about the product.

- **SCRUM Master-** is the keeper of the process, the advocate for the team, and the protector of the team
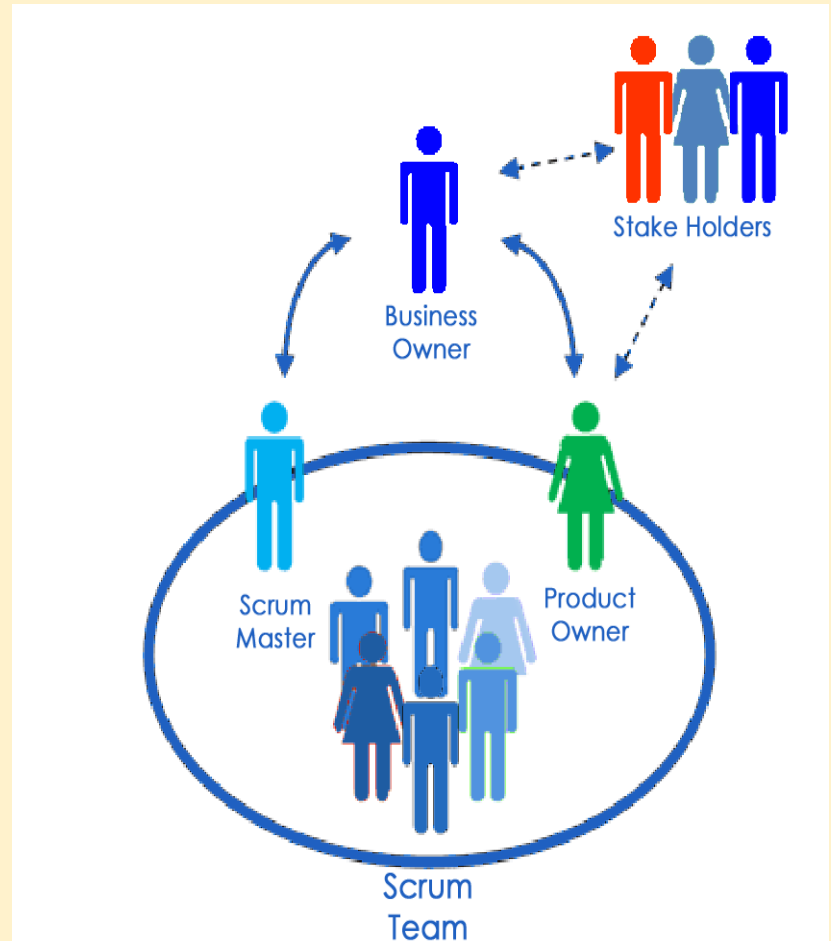
SCRUM Development Team

- Cross-functional (e.g., includes members with testing skills, and others not traditionally called developers: business analysts, designers, domain experts, etc.)
- Self-organizing / self-managing, without externally assigned roles
- Plans one Sprint at a time with the Product Owner
- Has autonomy regarding how to develop the increment
- Intensely collaborative
- Most successful when located in one team room, particularly for the first few Sprints
- Most successful with long-term, full-time membership. Scrum moves work to a flexible learning team and avoids moving people or splitting them between teams.
- 6 ± 3 members
- Has a leadership role

Product Owner

- Single person responsible for maximizing the return on investment (ROI) of the development effort
- Responsible for product vision
- Constantly re-prioritizes the Product Backlog, adjusting any long term expectations such as release plans
- Final arbiter of requirements questions
- Decides whether to release
- Decides whether to continue development
- Considers stakeholder interests
- May contribute as a team member
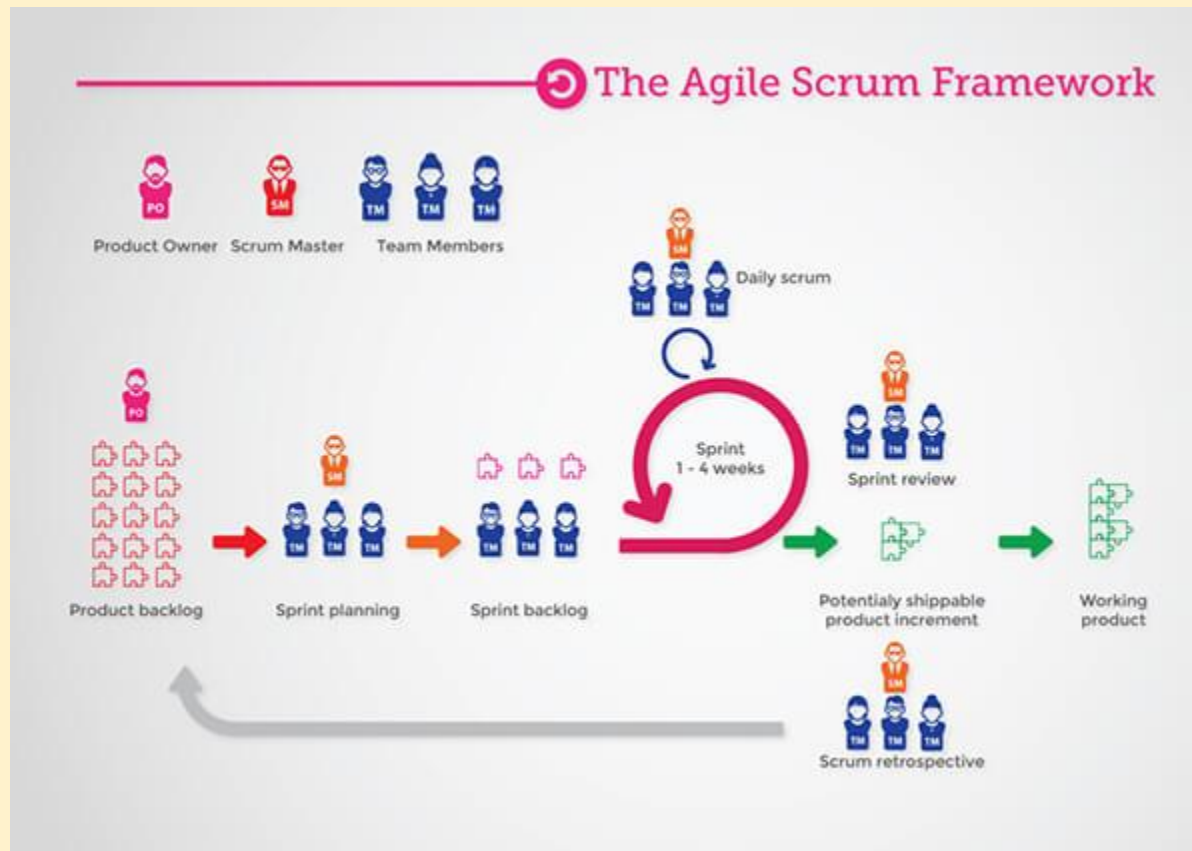- Has a leadership role

SCRUM Master

- Works with the organization to make Scrum possible
- Ensures Scrum is understood and enacted
- Creates an environment conducive to team self-organization
- Shields the team from external interference and distractions to keep it in group flow (a.k.a. the zone)
- Promotes improved engineering practices
- Has no management authority over the team
- Helps resolve impediments
- Has a leadership role

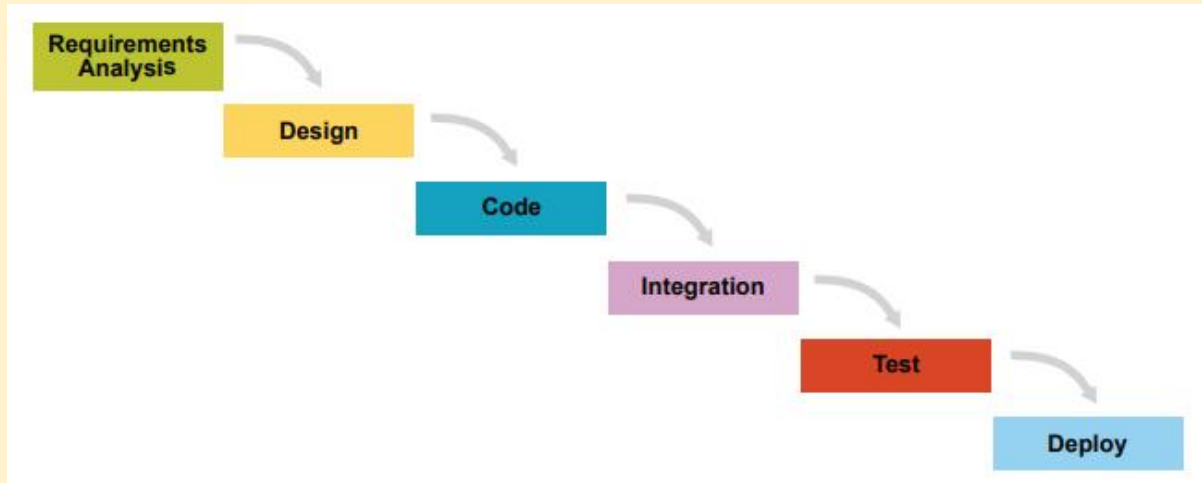# SCRUM Roles integrated with SCRUM Framework
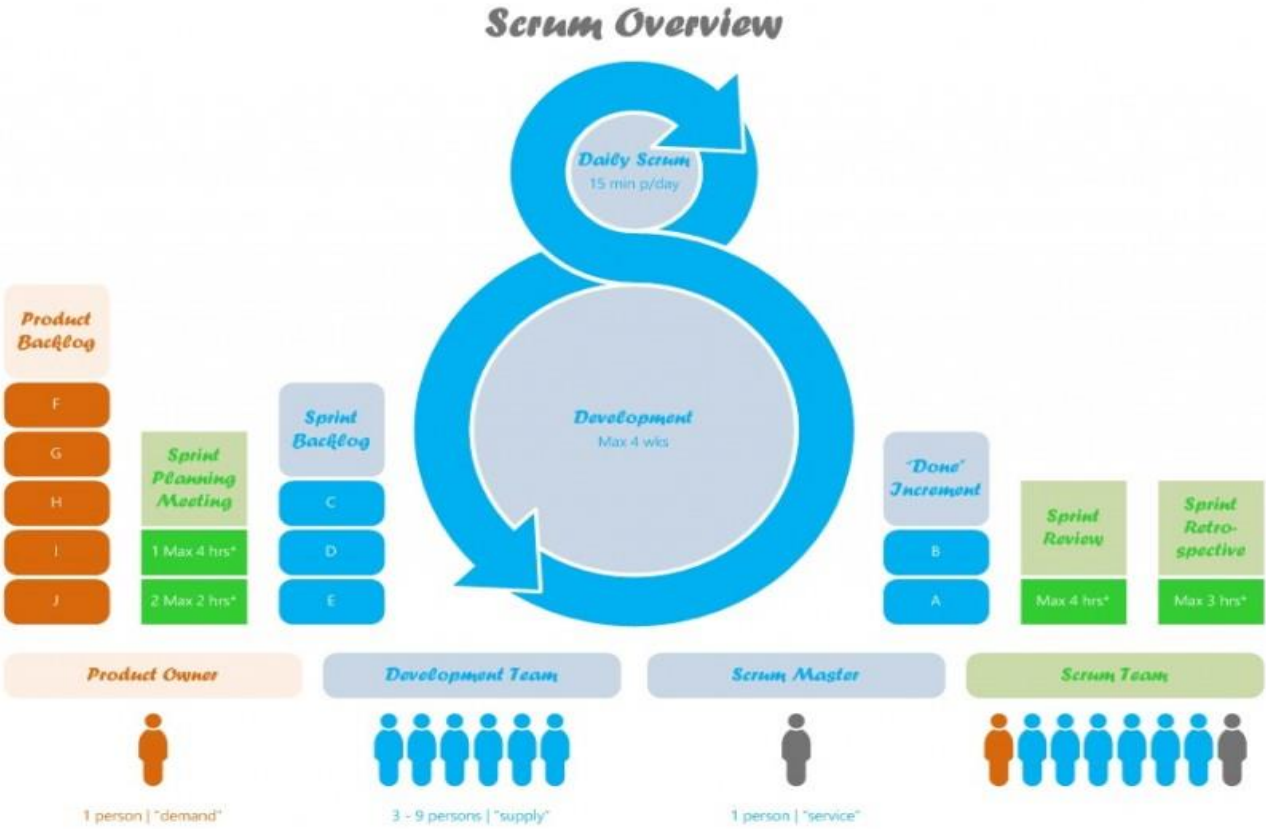
SCRUM Roles integrated with SCRUM Framework

Waterfall vs Agile

Comparison of Agile and Waterfall

WATERFALL

Requirements Analysis → Design → Code → Integration → Test → Deploy

AGILE

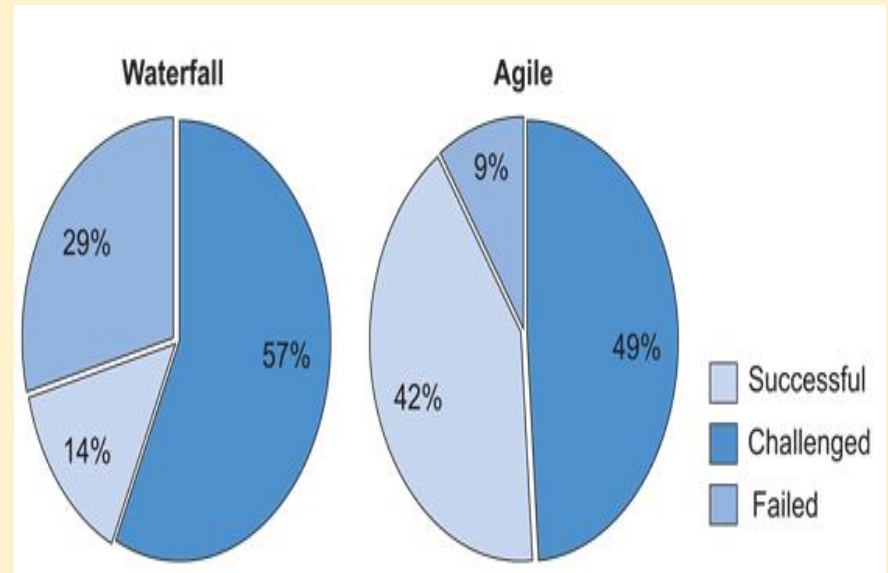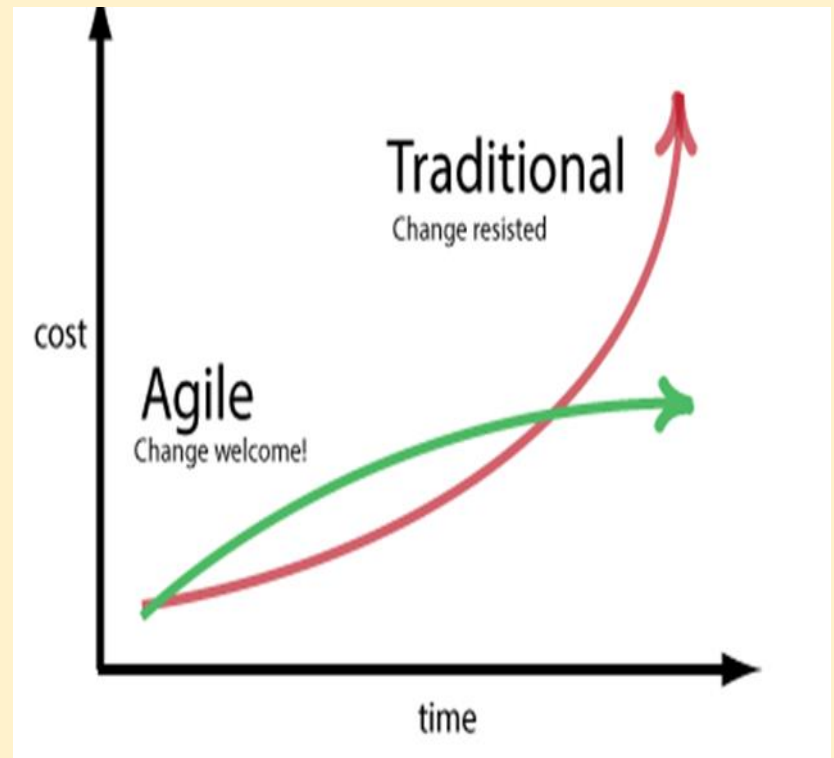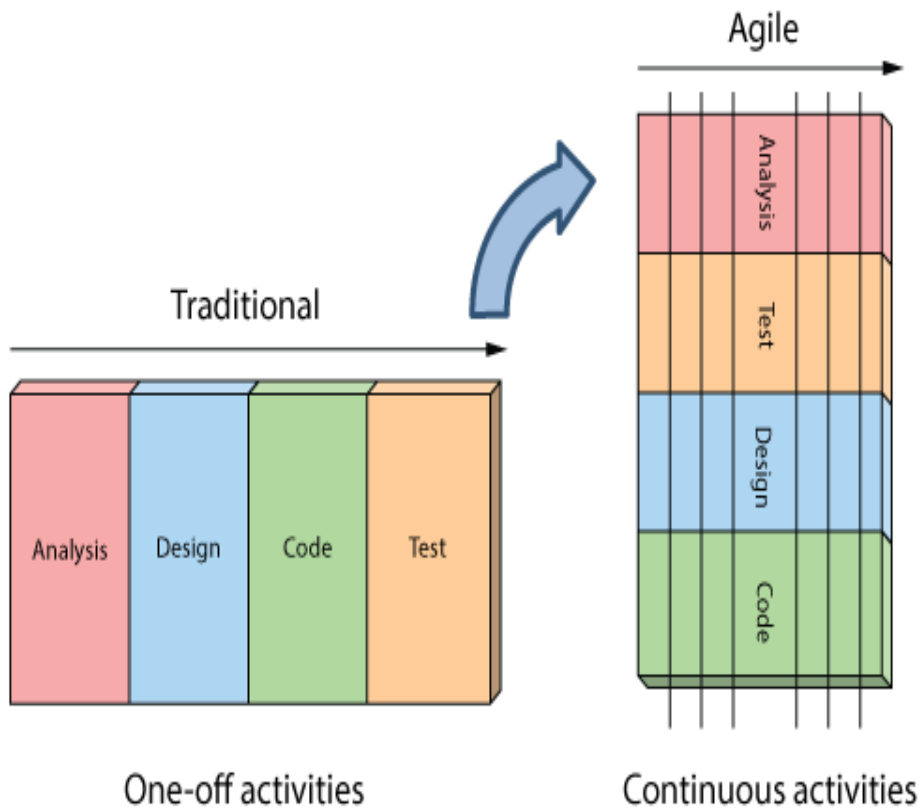Vision → Iteration 1 → Iteration 2 → Iteration 3 → Iteration 4 → Continue

Differences between Agile and Waterfall

- Traditional 'waterfall' approaches will tend to treat scope as the driver and calculate the consequential time and cost;

- Whereas 'agile' commits set resources over limited periods to deliver products that are developed over successive cycles.

Traditional

Analysis | Design | Code | Test

One-off activities

Agile

Analysis
Test
Design
Code

Continuous activities

Traditional
Change resisted

Agile
Change welcome!

cost

time

WATERFALL

Analyze   Design   Build   Test   Deploy

Requirements Document

Requirement #1
Requirement #2
Requirement #3
Requirement #4
Requirement #5

AGILE

High-Priority Requirement   Next High Priority Requirement   Next High Priority Requirement   Next High Priority Requirement   Next High Priority Requirement

Agile Process

Analyze
Design
Build
Test
Deploy

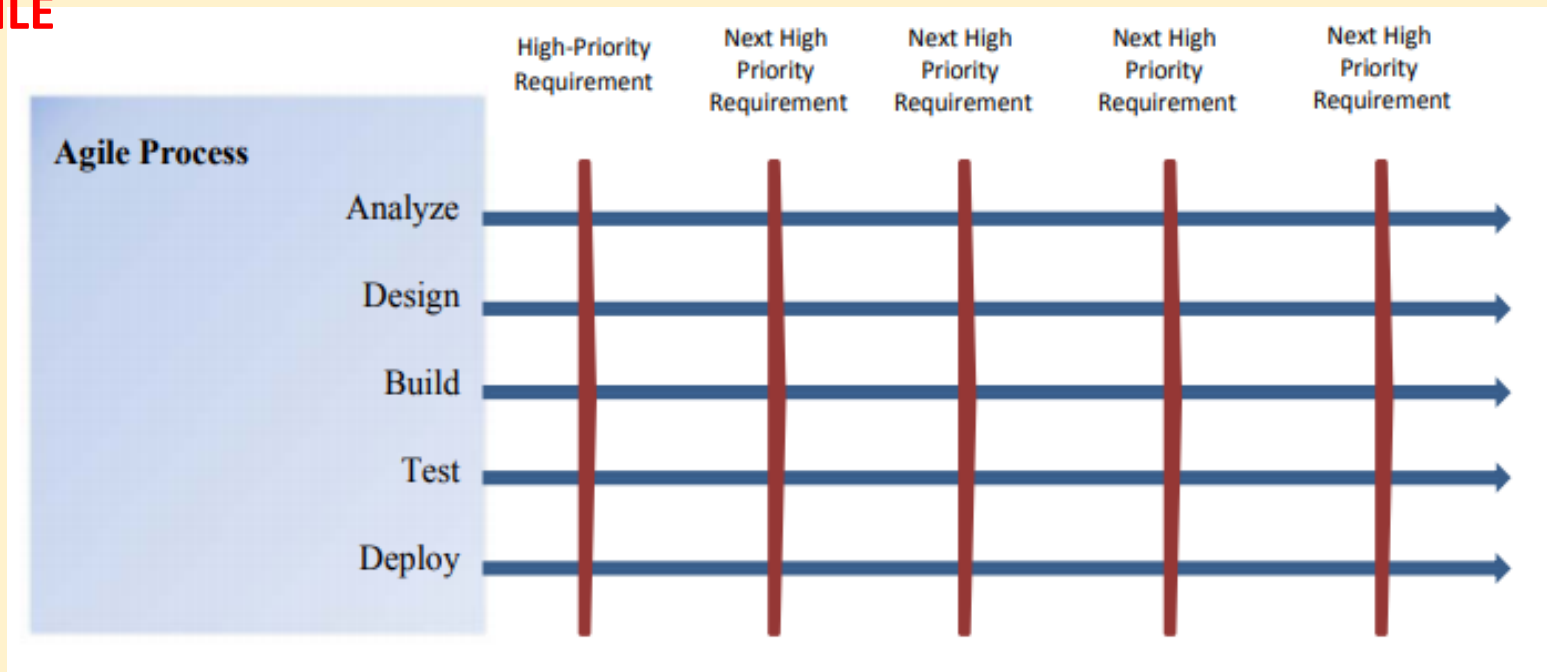## WATERFALL

- Detailed, long-term project plans with single timeline
- Definitive and rigid project management and team roles
- Changes in deliverables are discouraged and costly
- Fully completed product delivered at the end of the timeline
- Contract-based approach to scope and requirements
- Customer is involved only at the beginning and end of a project
- Linear-phased approach creates dependencies

AGILE

- Shorter planning based on iterations and multiple deliveries
- Flexible, cross-functional team composition
- Changes in deliverables are expected and less impactful
- Product delivered in functional stages
- Collaborative and interactive approach to requirements
- Customer is involved throughout the sprint
- Concurrent approach seeks to reduce dependencies

Similarities of Agile and Waterfall

- They both have the same goal i.e. deliver a quality product in an effective and responsive manner
- Same Principles:
  - plan the work out completely before beginning
  - lock down requirements early
  - institute multiple reviews24
  - move forward in a step-by-step, sequential manner
  - move forward only when all parts of the previous steps were complete
  - capture all details with extensive documentation

Similarities

- They both work on the same Project Management functions:
  - **Cost**
  - **Scope**
  - **Time/Schedule**
  - **Quality**
- They are both based on the same development stages:
  - **Analyze-** the requirement
  - **Design-** a capability to satisfy the requirement
  - **Build-** the capability
  - **Test-** the capability to ensure the requirement is met
  - **Deploy-** the capability

Agile PM application in the context of Construction

- Potential for gains to be made from the adoption of Agile in the pre-design and design phases of construction

- Compressing the project schedule by running design and construction phases simultaneously with intensive investor, designers and general contractor collaboration during the process

Adapting Agile in Design stage of Construction

- Design phase requires an iterative approach based on short cycles and rapid feedback loops in order to continuously arrive at the perfect solution

- Adaptation of the Scrum approach into the design phase of construction projects

- The goal of Agile here would be to increase coordination, interface management, collaboration and transparency throughout all design phases.

Implications of Agility in Construction Projects

continuous resource monitoring & improvement

flexible workflow

facilitated communication

client's participation

receiving requirements during the project

accelerate responding to the changes

Agile PM in construction- Benefits

Improved team and project effectiveness

Improved communication and cooperation between project stakeholders

Improved understanding and implementation of project requirements

Quickly switch between teams on one or more of construction sites

Reducing project time and costs

Reducing omissions and reworks
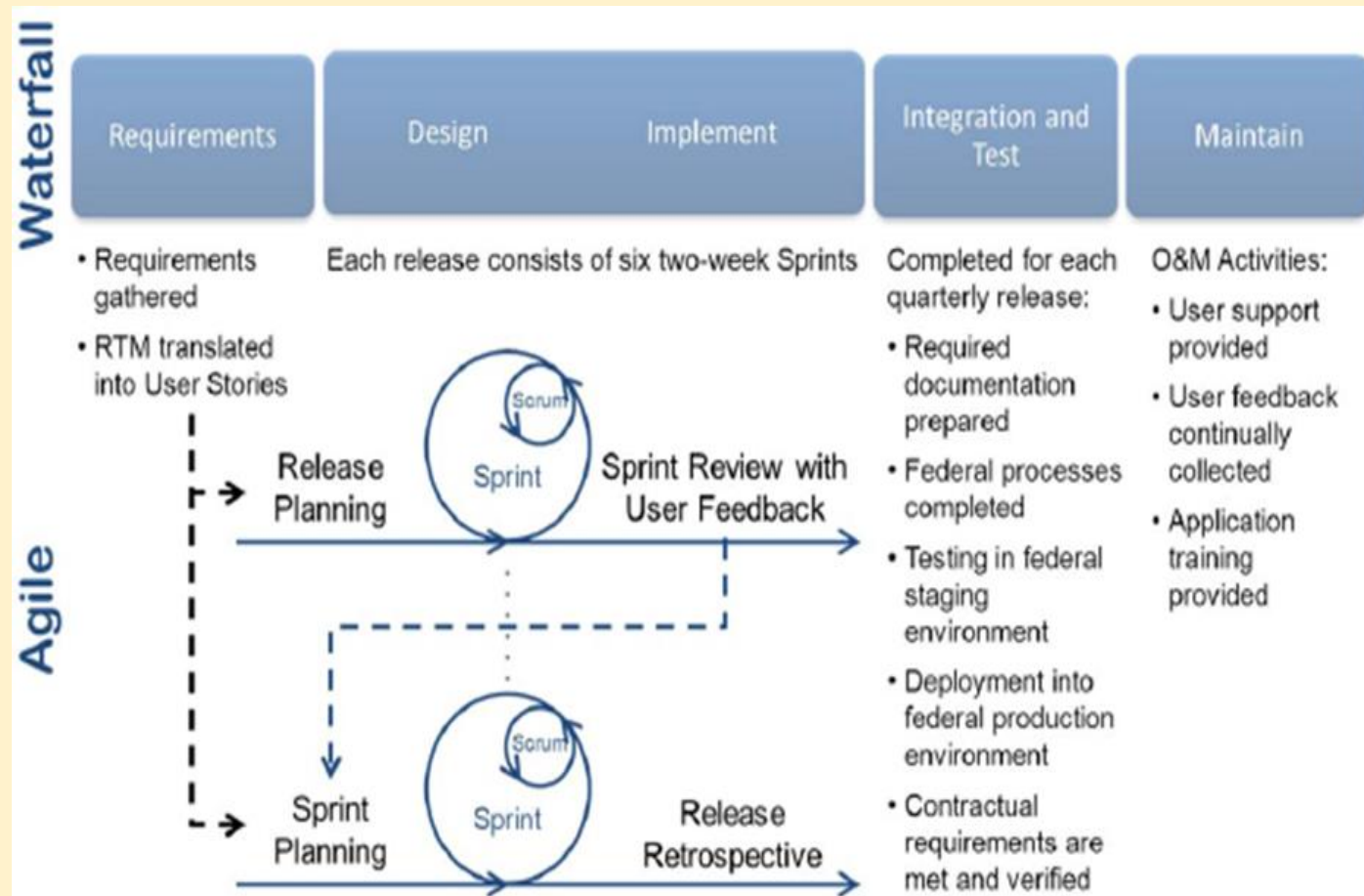
Hybrid Methodologies

Hybrid PM Methodologies

- Opportunity exists to combine agile with other methodologies such as waterfall to create a hybrid solution.

- **Waterfall-** waterfall can be used for **Planning**, where rapid or repetitive steps are not required

- **Agile-** Once a project enters the **development phase**, rapid and repetitive changes require a different approach and this is where Agile kicks in to deliver the best results in the shortest amount of time.

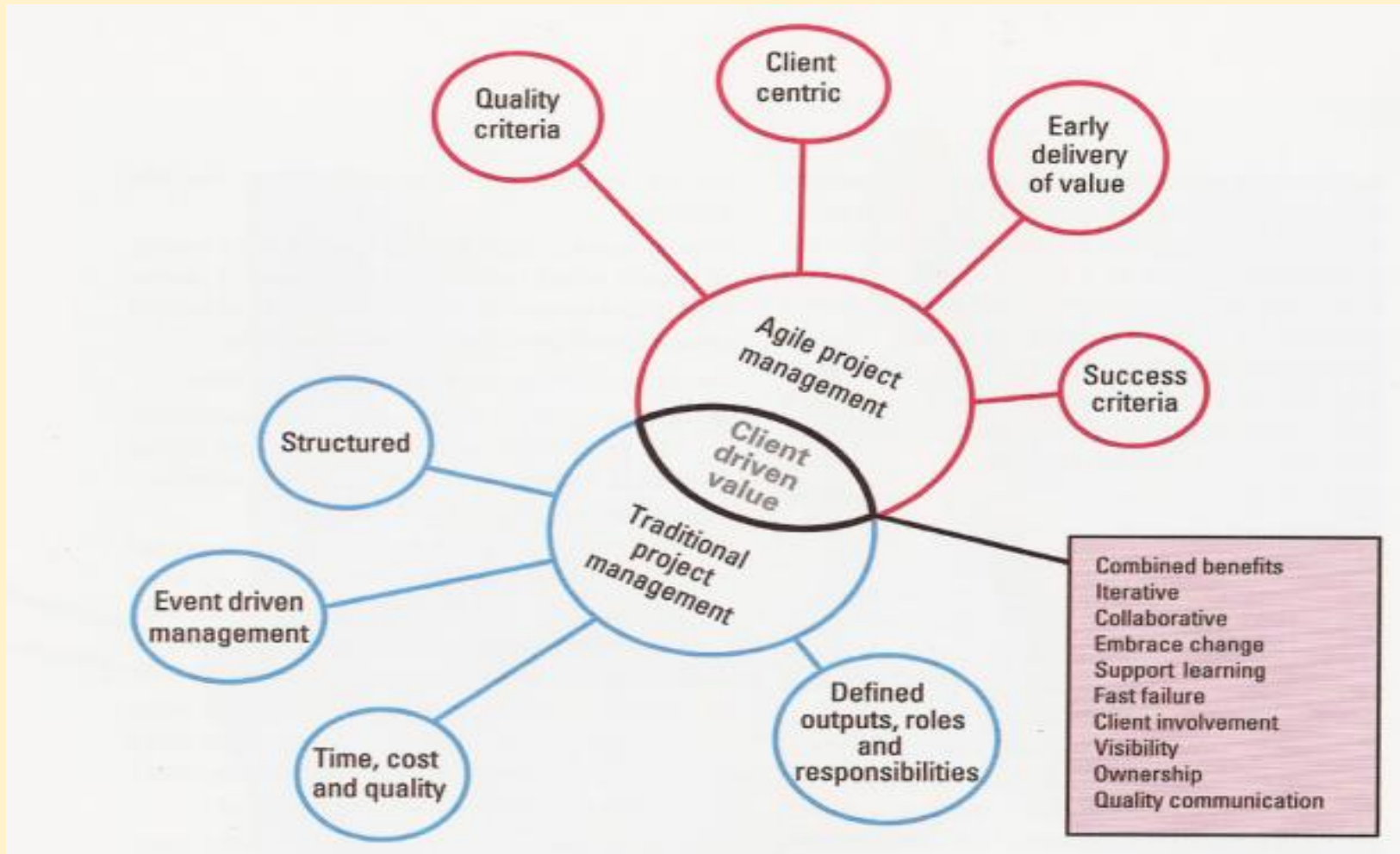# Using Waterfall and Agile- IT Projects
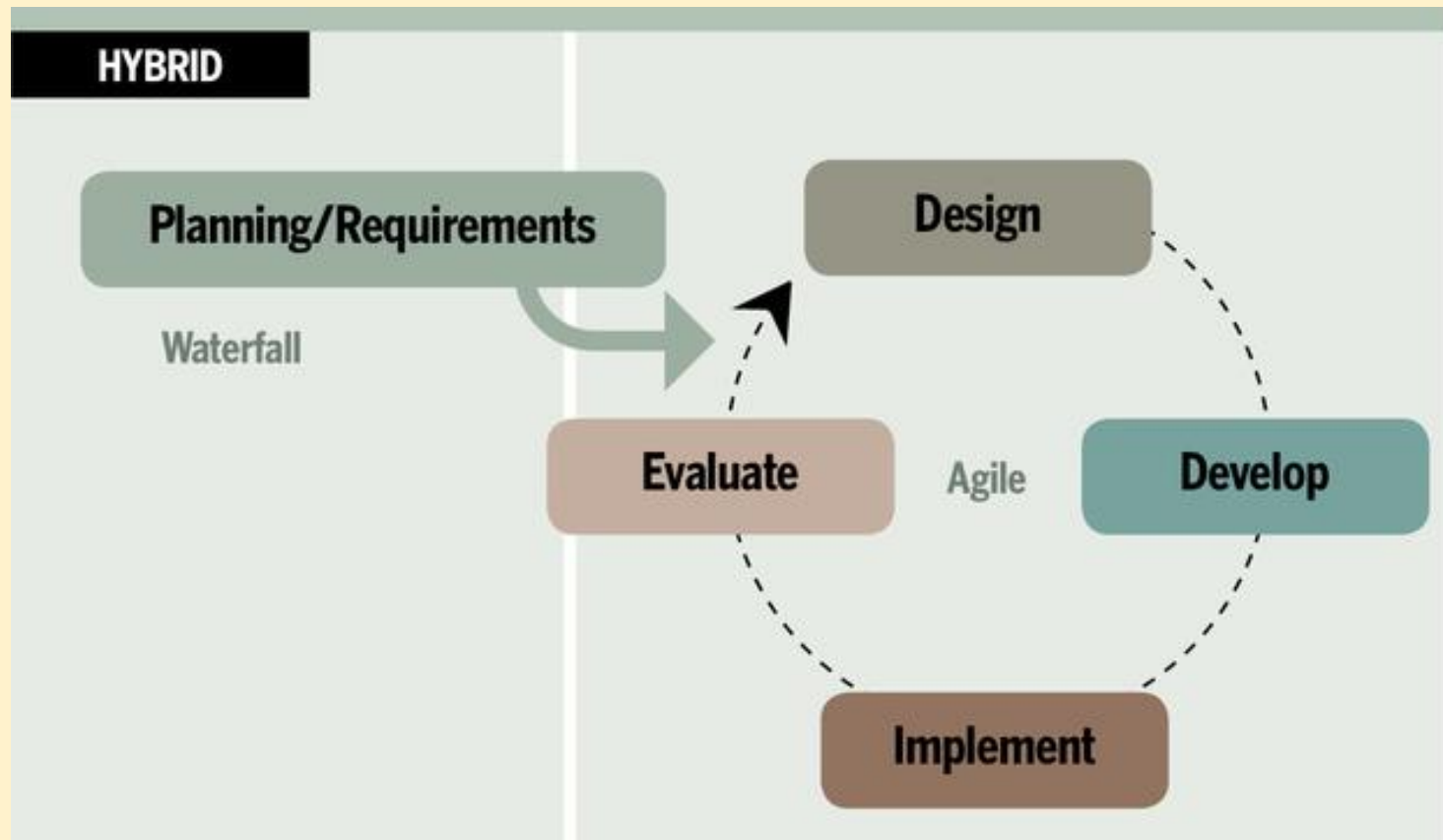
Using Waterfall and Agile- IT Projects

(E. M. & Boyne, L. 2012).

Benefits of Hybrid

Group Activity- Choose Waterfall or Agile or Hybrid

- Using the Library Case Study

- In your groups, Discuss and Decide the best Approach

- Think of reasons why?

Link to Assignment - **Methodology Choice**

- For the GreenReach Case

- What is the possibility of using Agile PM

  - Can it be used?

  - Which of the Agile principles are applicable?

  - What stages of a Construction project can Agile be applied, if any?

References

- Sliger, M. (2011). Agile project management with Scrum. Paper presented at PMI® Global Congress 2011—North America, Dallas, TX. Newtown Square, PA: Project Management Institute. https://www.pmi.org/learning/library/agile-project-management-scrum-6269

- APM (2018) Agile Project Management https://www.apm.org.uk/resources/find-a-resource/agile-project-management/

- Rodov, A. & Teixidó, J. (2016). Blending agile and waterfall: the keys to a successful implementation. Paper presented at PMI® Global Congress 2016—EMEA, Barcelona, Spain. Newtown Square, PA: Project Management Institute. https://www.pmi.org/learning/library/blending-agile-waterfall-successful-integration-10213

- Fair, J. (2012). Agile versus Waterfall: approach is right for my ERP project? Paper presented at PMI® Global Congress 2012—EMEA, Marsailles, France. Newtown Square, PA: Project Management Institute. https://www.pmi.org/learning/library/agile-versus-waterfall-approach-erp-project-6300