

# PMG 622

## Agile Project Management

### LECTURE 02: Lifecycle Selection



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# CHARACTERISTICS OF PROJECT LIFE CYCLES

# Types of PM Lifecycles

- **Predictive life cycle.** A more traditional approach, with the bulk of planning occurring upfront, then executing in a single pass; a sequential process.
- **Iterative life cycle.** An approach that allows feedback for unfinished work to improve and modify that work.
- **Incremental life cycle.** An approach that provides finished deliverables that the customer may be able to use immediately.
- **Agile life cycle.** An approach that is both iterative and incremental to refine work items and deliver frequently.



# NON-AGILE (NON-ADAPTIVE) APPROACHES

- **Predictive**
- Linear
- Waterfall
- Plan-driven
- Serial



# Characteristics of Four Categories of Life Cycles

| Characteristics |              |                                       |                             |                                                     |
|-----------------|--------------|---------------------------------------|-----------------------------|-----------------------------------------------------|
| Approach        | Requirements | Activities                            | Delivery                    | Goal                                                |
| Predictive      | Fixed        | Performed once for the entire project | Single delivery             | Manage cost                                         |
| Iterative       | Dynamic      | Repeated until correct                | Single delivery             | Correctness of solution                             |
| Incremental     | Dynamic      | Performed once for a given increment  | Frequent smaller deliveries | Speed                                               |
| Agile           | Dynamic      | Repeated until correct                | Frequent small deliveries   | Customer value via frequent deliveries and feedback |

# Figure X3-1. The Continuum of Project Life Cycles (from PMBOK 6<sup>th</sup> ed.)

## Predictive

## Iterative

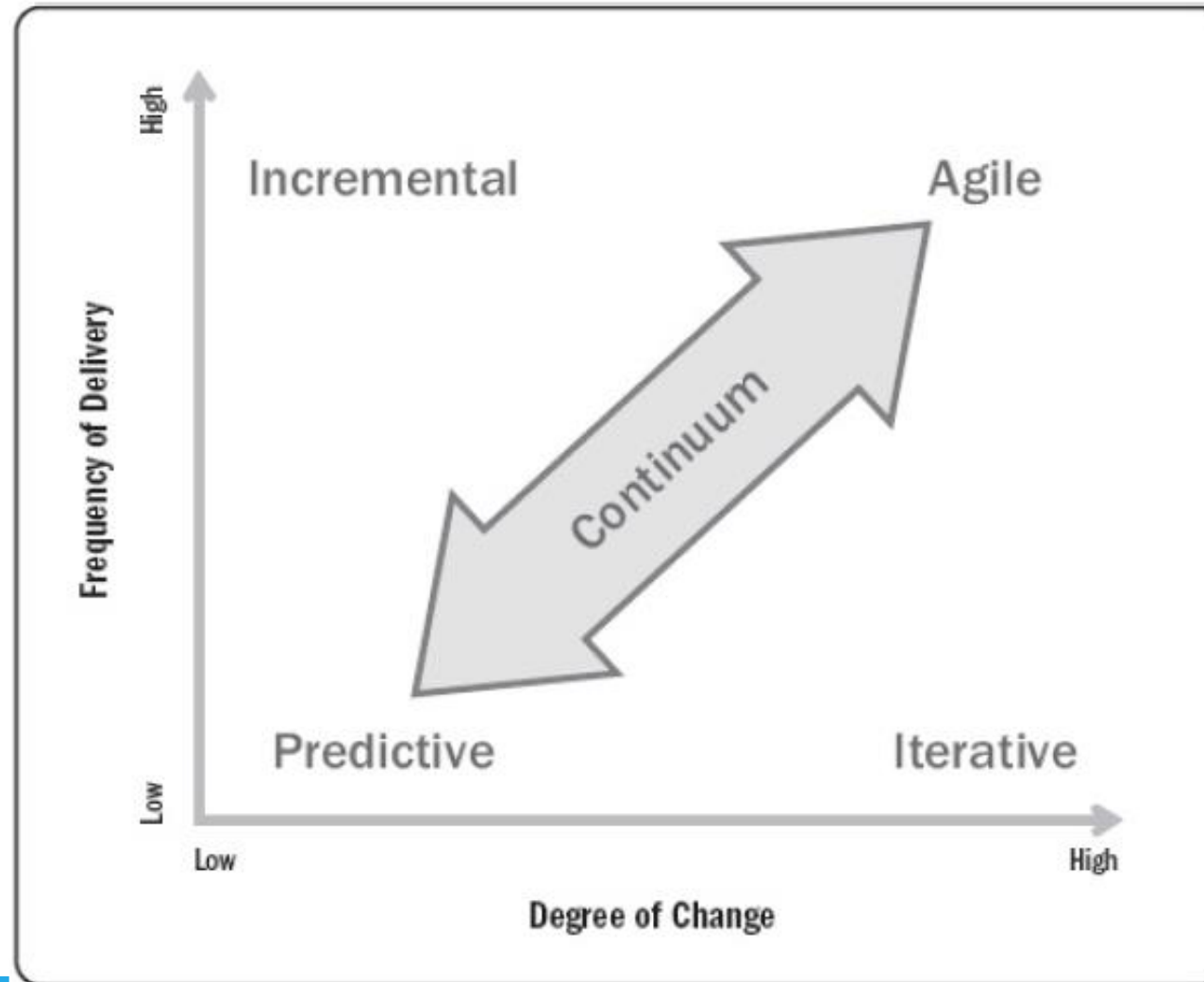
## Incremental

## Agile

|                                                                                                                 |                                                                                          |                                                                                |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Requirements are defined up-front before development begins                                                     | Requirements can be elaborated at periodic intervals during delivery                     | Requirements are elaborated frequently during delivery                         |
| Deliver plans for the eventual deliverable. Then deliver only a single final product at end of project timeline | Delivery can be divided into subsets of the overall product                              | Delivery occurs frequently with customer-valued subsets of the overall product |
| Change is constrained as much as possible                                                                       | Change is incorporated at periodic intervals                                             | Change is incorporated in real-time during delivery                            |
| Key stakeholders are involved at specific milestones                                                            | Key stakeholders are regularly involved                                                  | Key stakeholders are continuously involved                                     |
| Risk and cost are controlled by detailed planning of mostly knowable considerations                             | Risk and cost are controlled by progressively elaborating the plans with new information | Risk and cost are controlled as requirements and constraints emerge            |

*If agile is at one end, we call the other end predictive.*

# The Continuum of Life Cycles



# Predictive life cycles

- Take advantage of things that are known and proven.
- This reduced uncertainty and complexity allows teams to segment work into a sequence of predictable groupings.



# Iterative life cycles

- Allow feedback on partially completed or unfinished work to improve and modify that work



# Incremental life cycles

- Provide finished deliverables that the customer may be able to use immediately

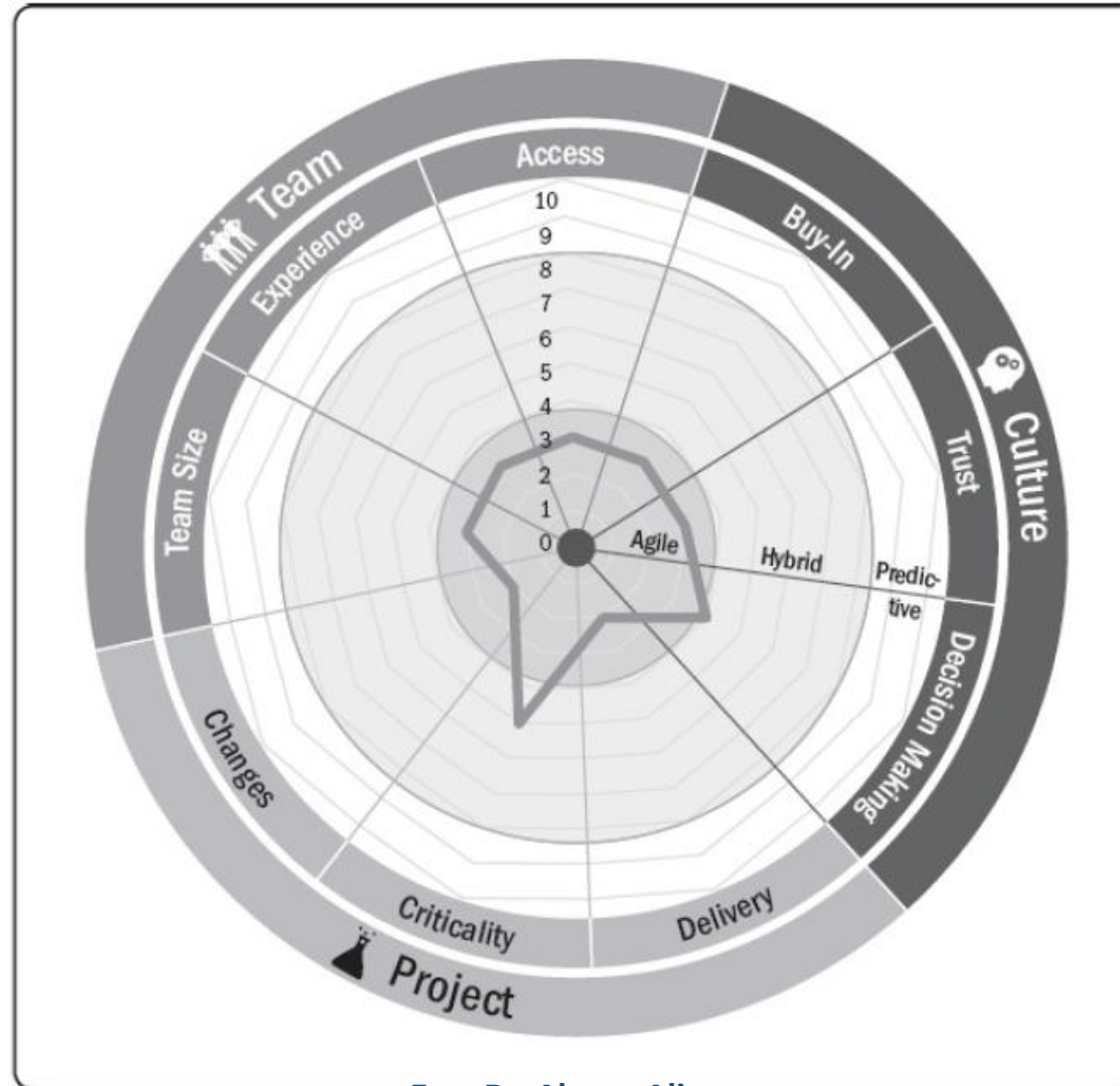


# Agile life cycles

- Leverage both the aspects of iterative and incremental characteristics.
- When teams use agile approaches, they iterate over the product to create finished deliverables.
- The team gains early feedback and provides customer visibility, confidence, and control of the product.
- Because the team can release earlier, the project may provide an earlier return on investment because the team delivers the highest value work first.



# Model for Suitability of Agile Approaches



# Characteristics of Predictive Life Cycles

- Predictive life cycles expect to take advantage of high certainty around firm requirements, a stable team, and low risk
- Project activities often execute in a serial manner
- These projects succeed when potential changes are restricted (plans, team members, requirements)
- Articulate the constraints
- Serialized sequence of work
- Do not typically deliver business value until the end of the project



# Characteristics of Iterative Life Cycles

- Iterative life cycles improve the product or result through successive prototypes or proofs of concept
- Iterations help identify and reduce uncertainty in the project
- Projects benefit from iterative life cycles when:
  1. complexity is high
  2. when the project incurs frequent changes
  3. when the scope is subject to differing stakeholders' views of the desired final product



# Characteristics of Incremental Life Cycles

- Optimize work for delivering value to sponsors or customers more often than a single, final product
- Delivery of smaller deliverables
- Speed of delivery
- Customers receive a subset of the overall solution frequently
- The degree of change and variation is less important than ensuring customers get value sooner than at the end of the project.



# Characteristics of Agile Life Cycles

- Agile life cycles are those that fulfill the principles of the Agile Manifesto
- Customer satisfaction increases with early and continuous delivery of valuable products
- An incremental deliverable that is functional and provides value is the primary measure of progress
- Adapt to high degrees of change and deliver project value more often
- Incremental delivery uncovers hidden or misunderstood requirements
- Iteration-Based Agile
- Flow-Based Agile
- The iterative and incremental approaches provide feedback to better plan the next part of the project



# Characteristics of Iteration-based Agile Life Cycles

- The team works in iterations (time-boxes of equal duration) to deliver completed features
- The team works on the most important feature, collaborating as a team to finish it
- Then the team works on the next most important feature and finishes it
- The team may decide to work on a few features at a time, but the team does not address all of the work for the iteration at once

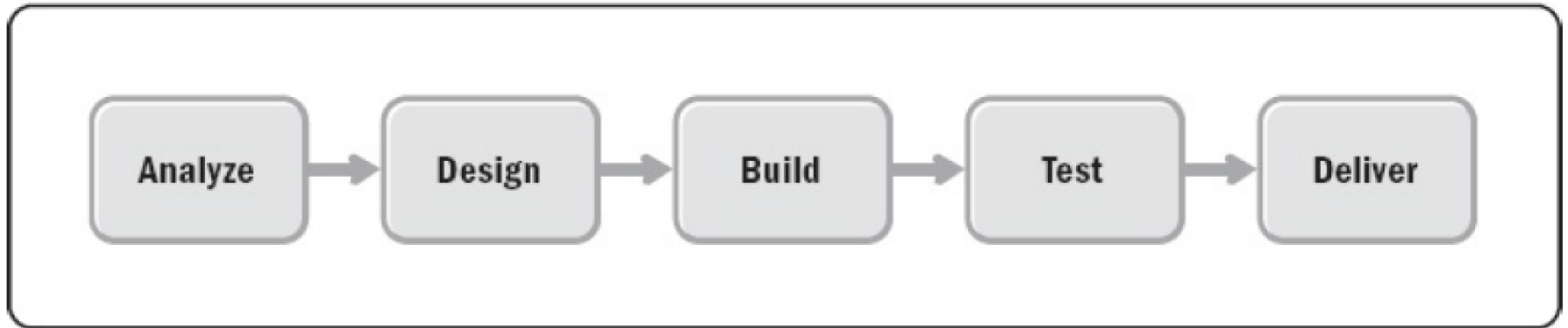


# Characteristics of Flow-based Agile Life Cycles

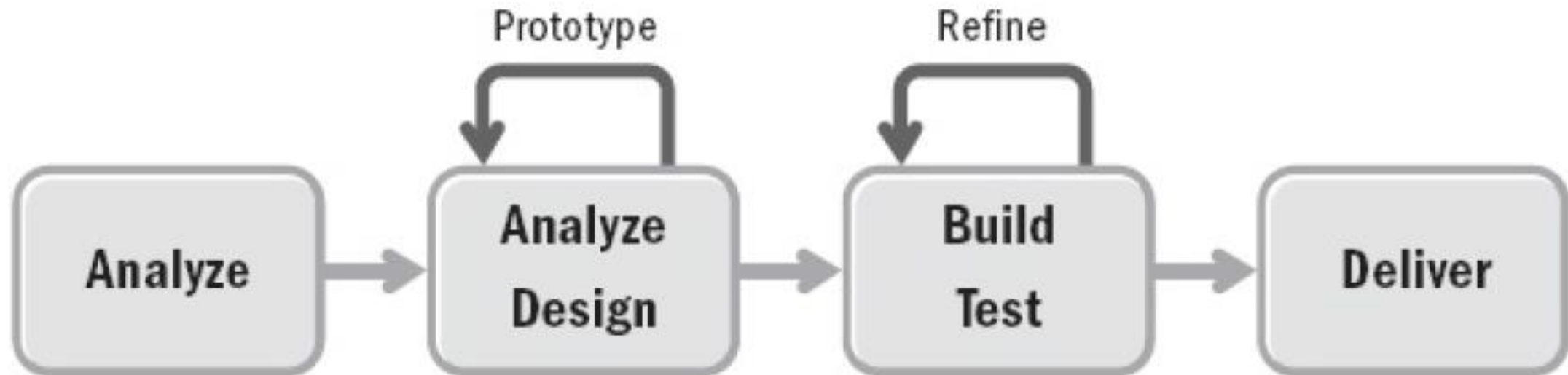
- In flow-based agile, the team pulls features from the backlog based on its capacity to start work rather than on an iteration-based schedule
- The team defines its workflow with columns on a task board and manages the work in progress for each column
- Each feature may take a different amount of time to finish
- Teams keep work-in-progress sizes small to better identify issues early and reduce rework should changes be required
- Without iterations to define planning and review points, the team and business stakeholders determine the most appropriate schedule for planning, product reviews, and retrospectives



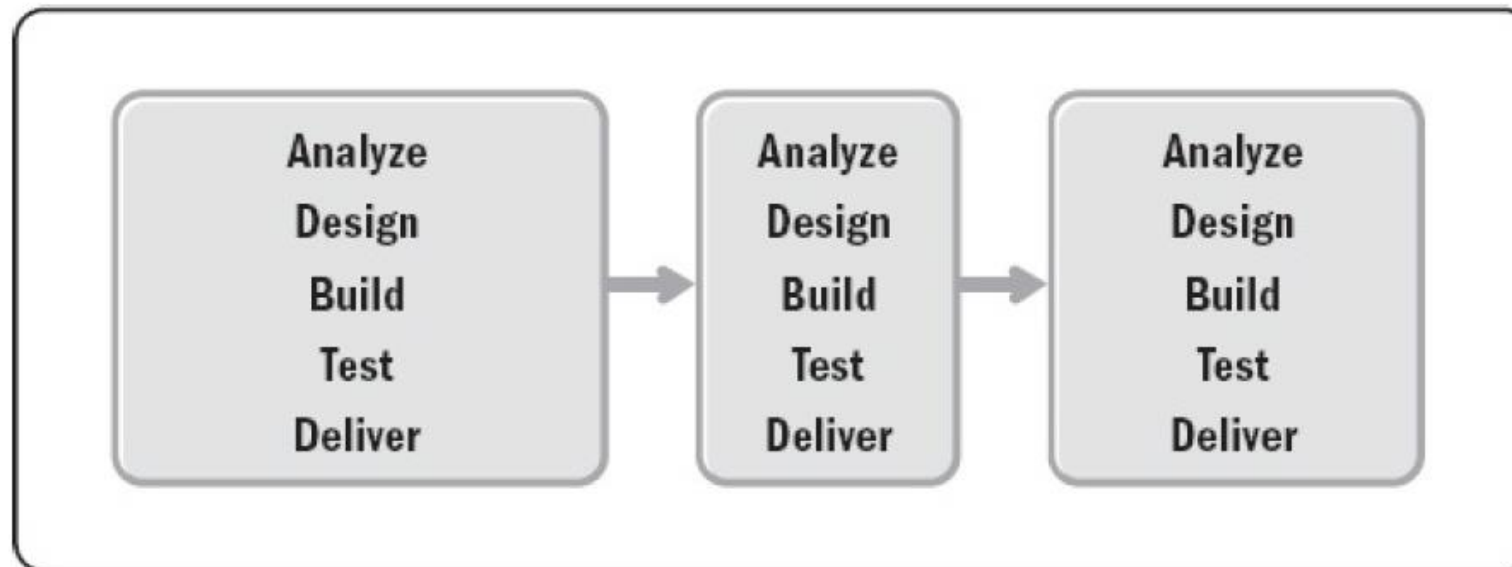
# PREDICTIVE LIFE CYCLES



# ITERATIVE LIFE CYCLE



# A Life Cycle of Varying-Sized Increments



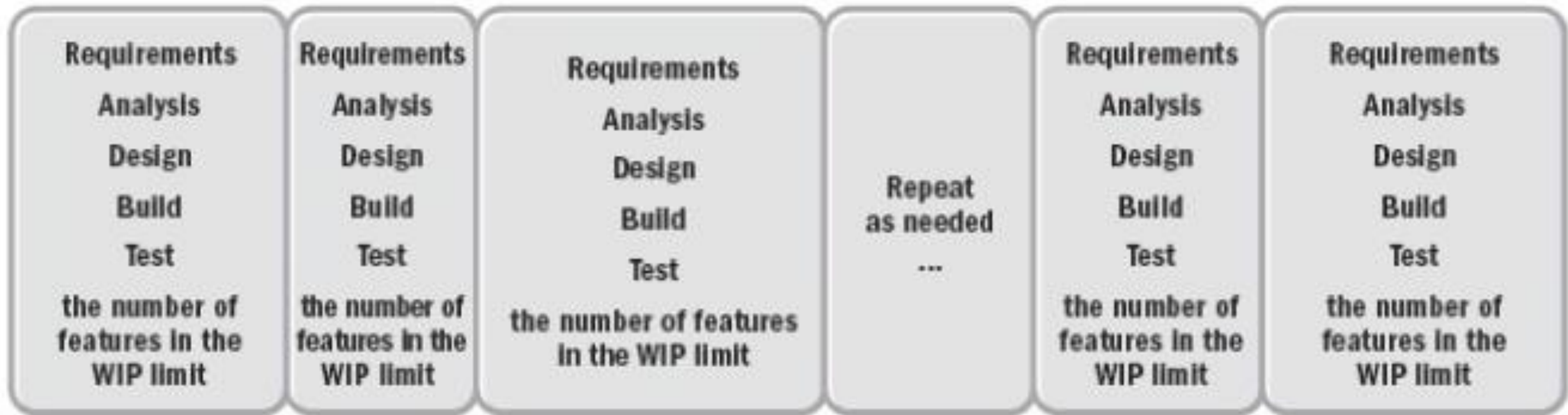
# Iteration-Based Agile



**NOTE:** Each timebox is the same size. Each timebox results in working tested features.



# Flow-Based Agile



**NOTE:** In flow, the time it takes to complete a feature is not the same for each feature.



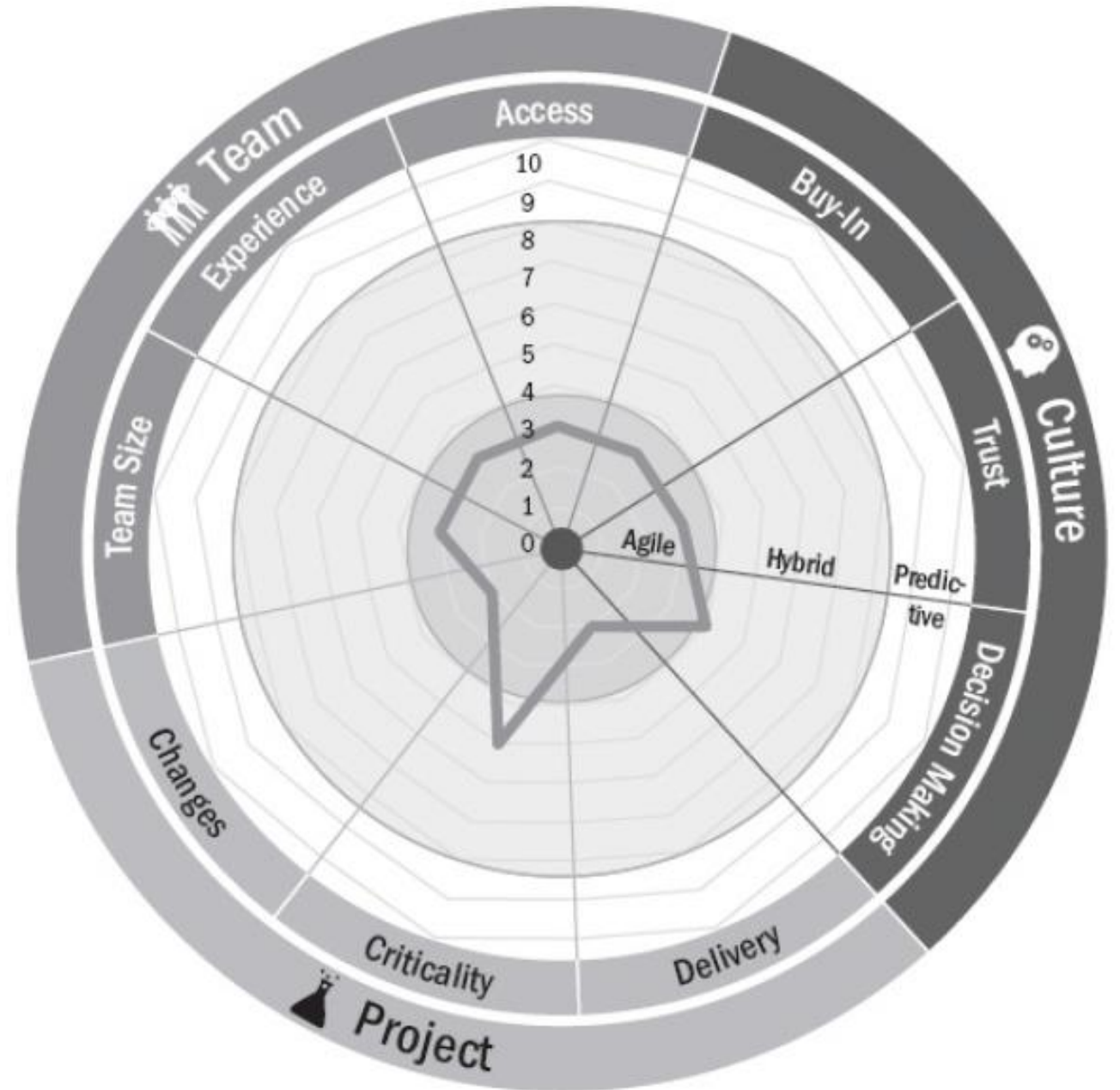
# Agile suitability filters

# Introduction

- Various assessment models exist to help determine the likely fit or gaps for using agile approaches.
- These models assess project and organizational factors associated with adoption and suitability and then provide scores indicating alignment or potential risk areas.
- [Appendix X3](#) provides a synthesis of popular assessment models for use as an agile suitability filter.



# Model for Suitability of Agile Approaches

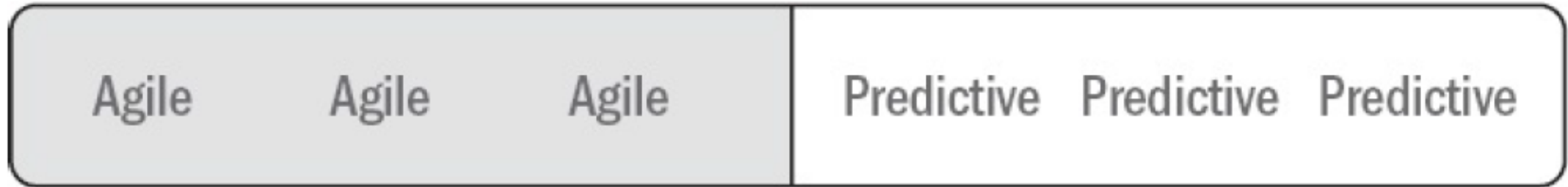


# Characteristics of Hybrid Life Cycles

- It is not necessary to use a single approach for an entire project.
- A combination of predictive, iterative, incremental, and/or agile approaches is a hybrid approach.



# Agile development followed by a predictive rollout



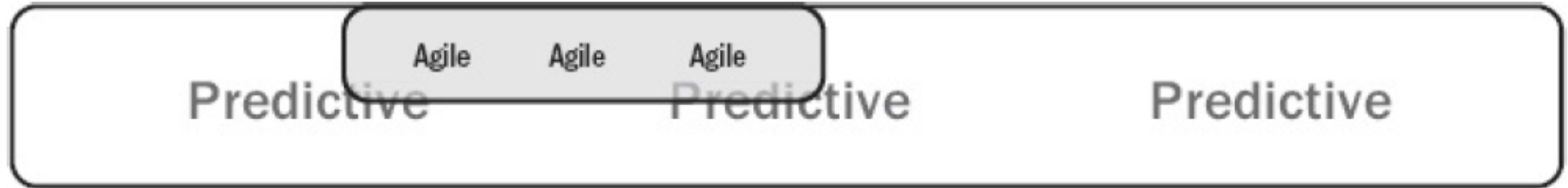
- This approach can be used when there is uncertainty, complexity, and risk in the development portion of the project that would benefit from an agile approach, followed by a defined, repeatable rollout phase that is appropriate to undertake in a predictive way, perhaps by a different team.
- An example of this approach is the development of a new high-tech product followed by rollout and training to thousands of users.

# COMBINED AGILE AND PREDICTIVE APPROACHES

| Agile      | Agile      | Agile      |
|------------|------------|------------|
| Predictive | Predictive | Predictive |

- Another approach is to use a combination of agile and predictive approaches throughout the life cycle
- It would be misleading to call the approach agile since it clearly does not fully embody the agile mindset, values, and principles
- It would also be inaccurate to call it predictive
- It is a hybrid approach

# PREDOMINANTLY PREDICTIVE APPROACH WITH SOME AGILE COMPONENTS



- A small agile element within a chiefly predictive project
- The portion of the project with uncertainty, complexity, or opportunity for scope creep is being tackled in an agile way

# A LARGELY AGILE APPROACH WITH A PREDICTIVE COMPONENT



- A largely agile approach with a predictive component
- Used when a particular element is non-negotiable or not executable using an agile approach

# Hybrid Life Cycles as Fit-for-purpose

- Project teams may design a hybrid life cycle based on project risks
- The goal of project management is to produce business value in the best possible way given the current environment
- The question to ask is: “How can we be most successful?”
- Is feedback needed as the team produces value? If so, increments will help
- Is it necessary to manage risk as ideas are explored? If so, iterations or agile will help
- When the organization cannot deliver intermediate value, agile approaches may not be useful
- Agile is about customer-based delivery on a frequent basis. That delivery creates feedback for the team. The team uses that feedback to plan and replan the next chunk of work.



# Hybrid Life Cycles as Transition Strategy

- A gradual transition involves adding more iterative techniques to improve learning and alignment among teams and stakeholders
- Later, consider adding more incremental techniques to accelerate value and return on investment to sponsors
- Try these new techniques on a less risky project with a medium-to low-degree of uncertainty
- Then, when the organization is successful with a hybrid approach, try more complex projects that require more of those techniques to be added



# MIXING AGILE APPROACHES

# Introduction

- Agile frameworks are not customized for the team.
- The team may need to tailor practices to deliver value on a regular basis.
- Often, teams practice their own special blend of agile, even if they use a particular framework as a starting point



# Project Factors That Influence Tailoring [1/2 ]

| Project Factor                                                         | Tailoring Options                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Demand pattern: steady or sporadic                                     | Many teams find that using a cadence (in the form of a regular timebox) helps them demo, retrospect, and take in new work. In addition, some teams need more flexibility in their acceptance of more work. Teams can use flowbased agile with a cadence to get the best of both Worlds |
| Rate of process improvement required by the level of team experience   | Retrospect more often and select improvements                                                                                                                                                                                                                                          |
| The flow of work is often interrupted by various delays or impediments | Consider making work visible using Kanban boards and experimenting with limits for the various areas of the work process in order to improve flow                                                                                                                                      |



## Project Factors That Influence Tailoring [2/ 2]

| Project Factor                                                            | Tailoring Options                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The quality of the product increments is poor                             | Consider using the various test-driven development practices. This mistake-proofing discipline makes it difficult for defects to remain Undetected                                                                                                          |
| More than one team is needed to build a product                           | To scale from one to several agile teams, with minimal disruption, first learn about agile program management or formal scaling frameworks. Then, craft an approach that fits the project context                                                           |
| The project team members are inexperienced in the use of agile approaches | Consider starting by training team members in the fundamentals of the agile mindset and principles. If the team decides to use a specific approach such as Scrum or Kanban, provide a workshop on that approach so the team members can learn how to use it |