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University

Summer 2022

PMG 622

AGILE PROJECT MANAGEMENT

LECTURE 02: LIFE CYCLE SELECTION

دكتور مهندس استشاري ادارة المشروعات

Eng. Dr. Akram Mustafa Suliman Ali,

PhD. AU, BEng. & MSc. AAST, CEng CMarEng MIMarEST, PE, PMP®,

ASQ CSSBB, ISO Lead Auditor, NDT Level II,

Eng. Dr. Akram Ali



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QUICK REVIEW



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AGILE MANIFESTO AND MINDSET

• ميثاق

- بيان الاسلوب الرشيق
- عقلية الاسلوب الرشيق

AGILE MANIFESTO / “4 VALUES”

- We are uncovering better ways of developing software by doing it and helping others do it.
- Through this work we have come to value:

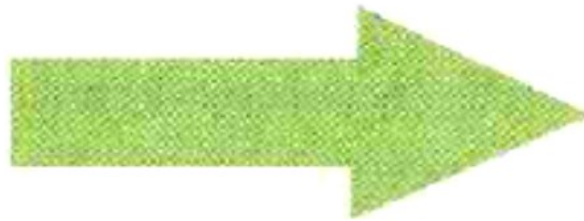


- That is, while there is value in the items on the right, we value the items on the left more.

BEING AGILE VS DOING AGILE

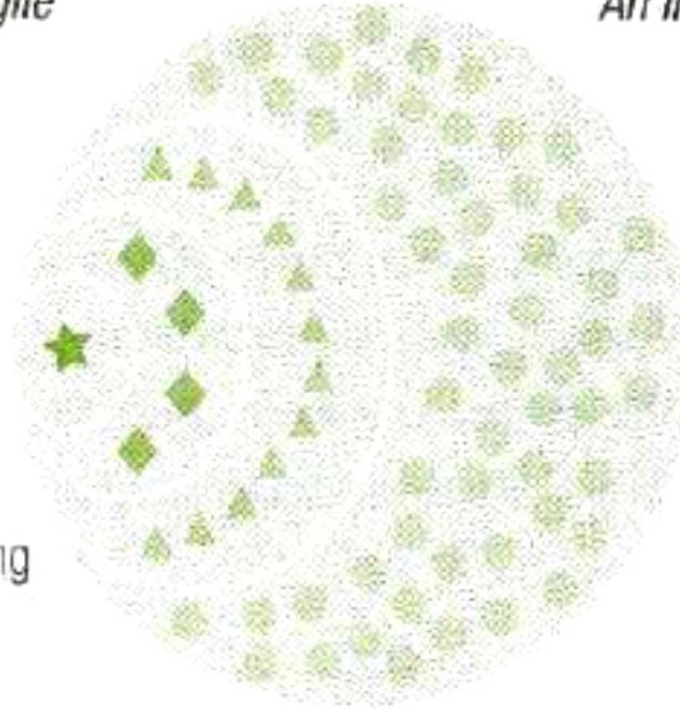
“Being” Agile

The correct way to implement agile



Being agile starts with internalizing the agile mindset, then using that understanding to select and implement the correct practices, tailoring them to different situations as needed.

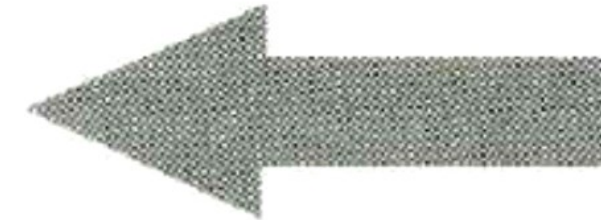
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Eng. Dr. Akram Ali

“Doing” Agile

An ineffective way to implement agile



Doing agile involves using agile practices without embracing the agile mindset that allows us to understand how to select the right balance of practices and tailor them appropriately.

PMIAA

- Program Management Improvement and Accountability Act

A large, multi-pointed starburst graphic with a gradient from red at the top to yellow at the bottom, set against a black background.

Forum Topic: Tell us
anything about PMIAA



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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 6TH ED.)

Predictive

Iterative

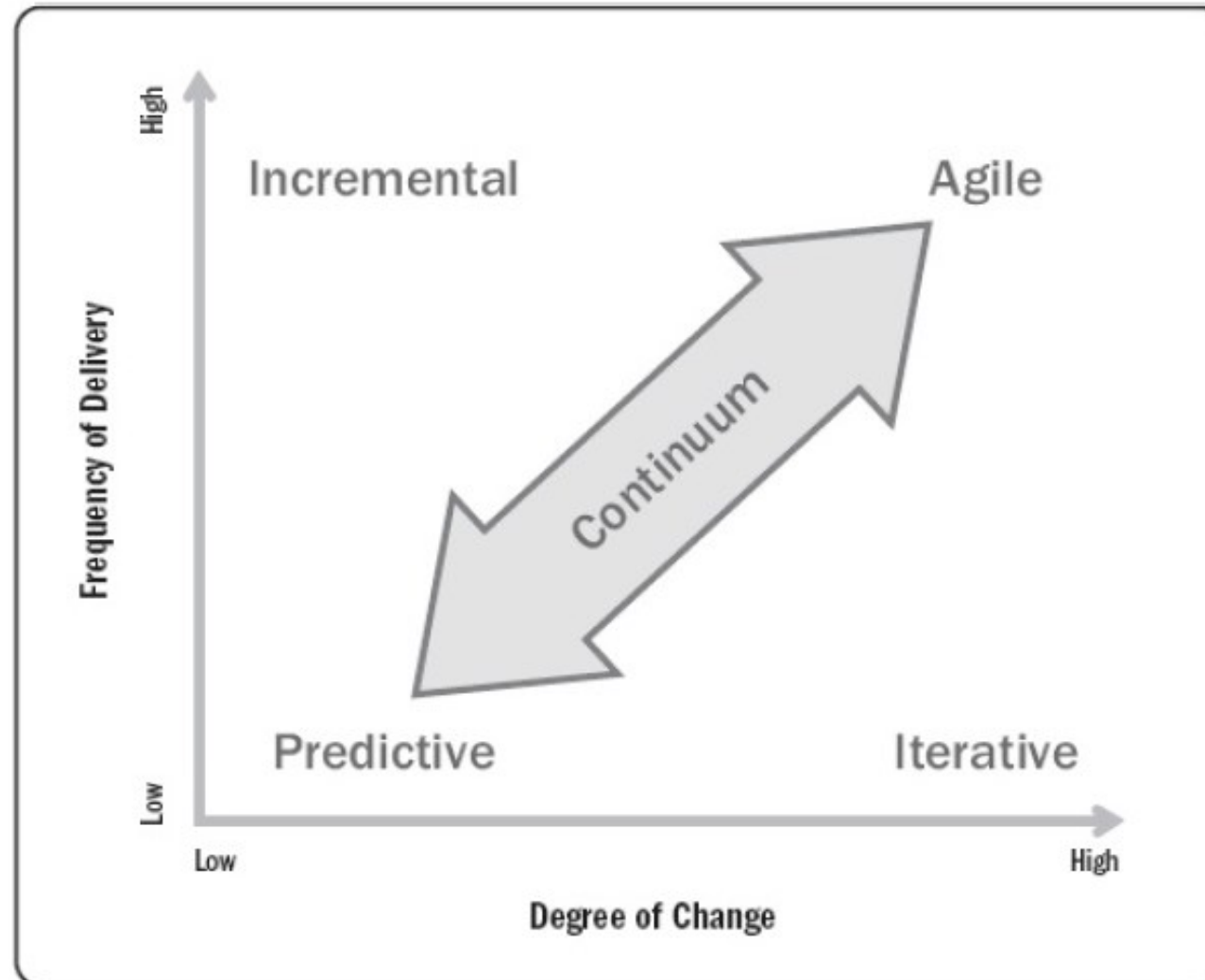
Incremental

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

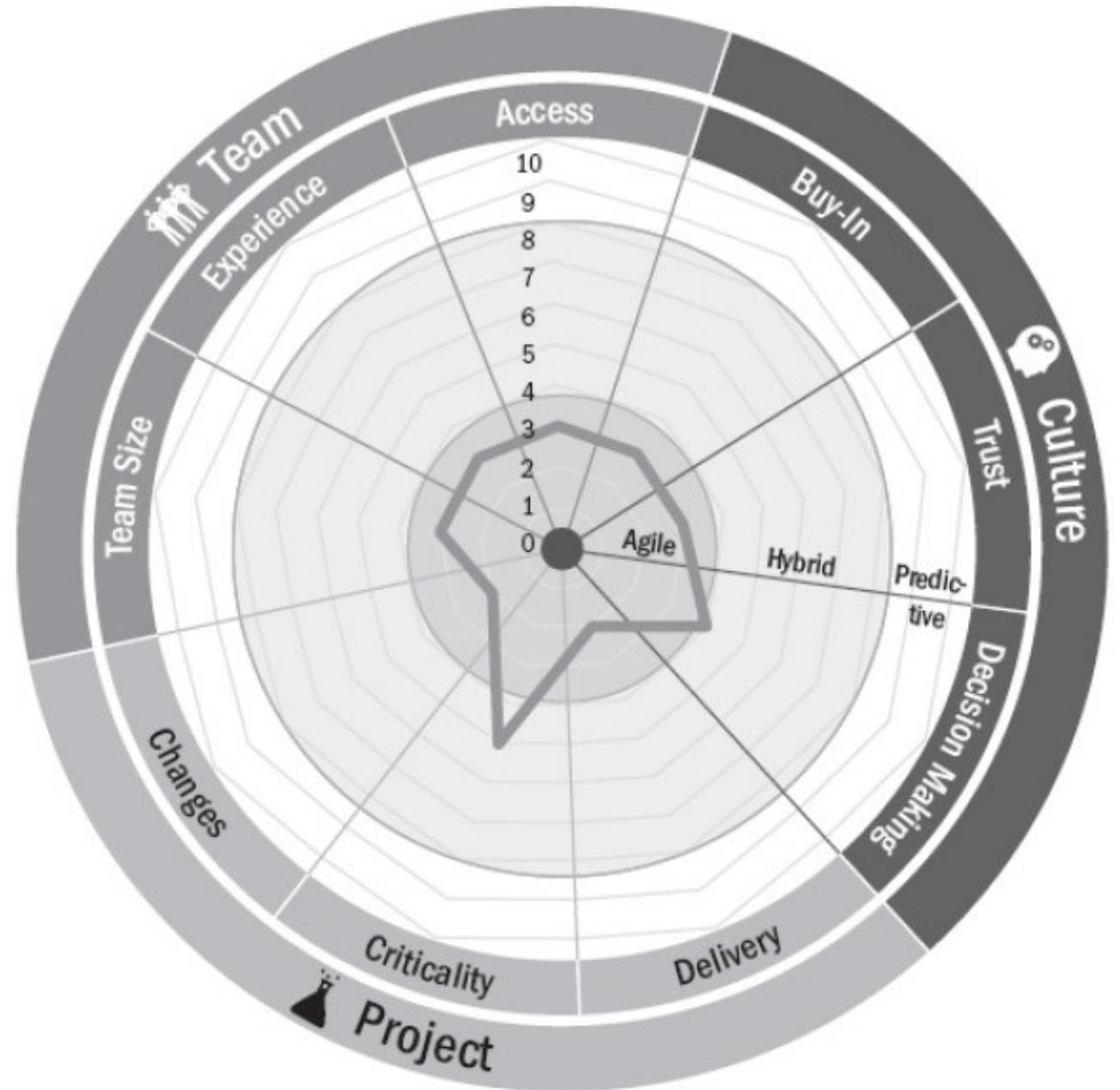
INCREMENTAL LIFE CYCLES

- 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

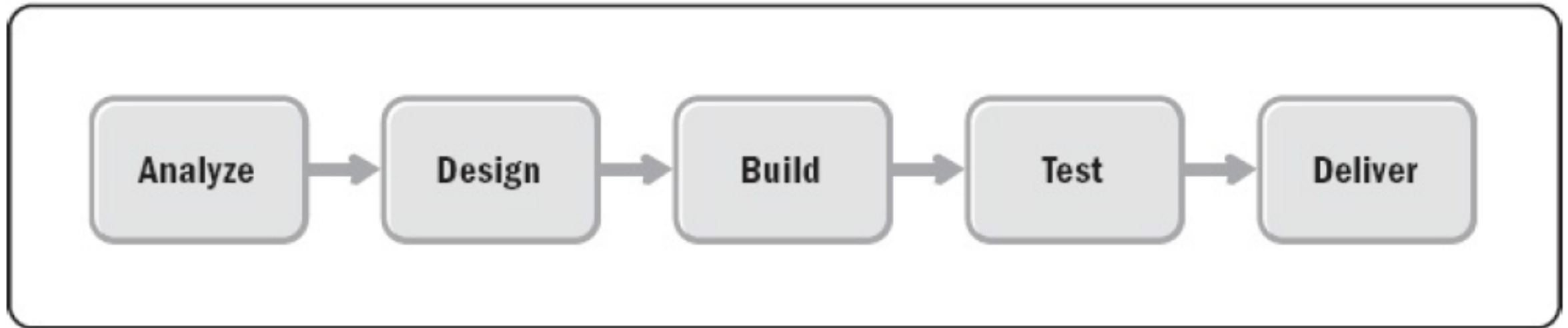
- The team works in iterations (time-boxes of equal duration) to deliver completed features
- The team works on the most important feature, collaborating as a team to finish it
- Then the team works on the next most important feature and finishes it
- The team may decide to work on a few features at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

CHARACTERISTICS OF FLOW-BASED AGILE LIFE CYCLES

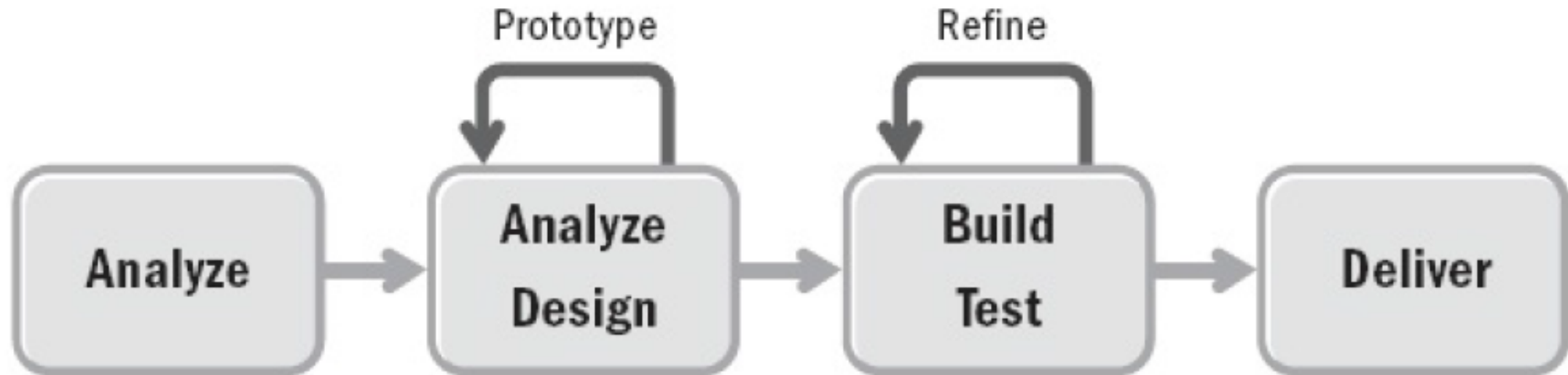
- In flow-based agile, the team pulls features from the backlog based on its capacity to start work rather than on an iteration-based schedule
- The team defines its workflow with columns on a task board and manages the work in progress for each column
- Each feature may take a different amount of time 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

PULL/ PUSH / JIT

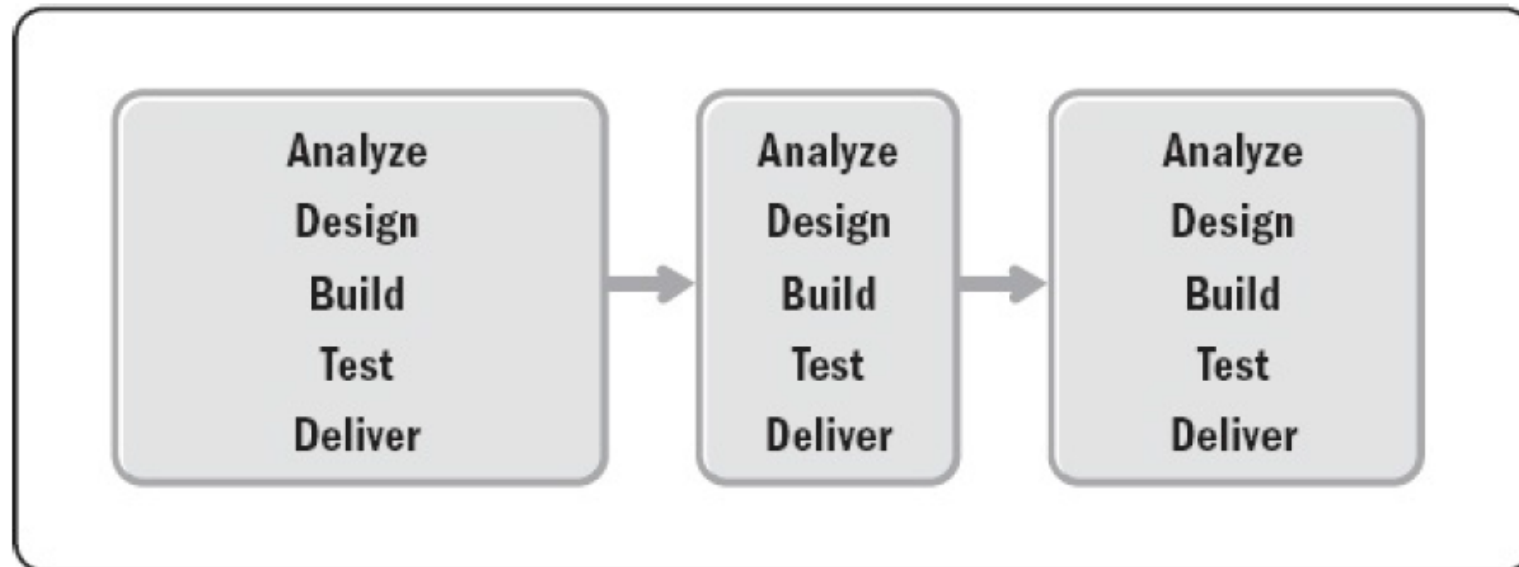
PREDICTIVE LIFE CYCLES



ITERATIVE LIFE CYCLE



A LIFE CYCLE OF VARYING-SIZED INCREMENTS

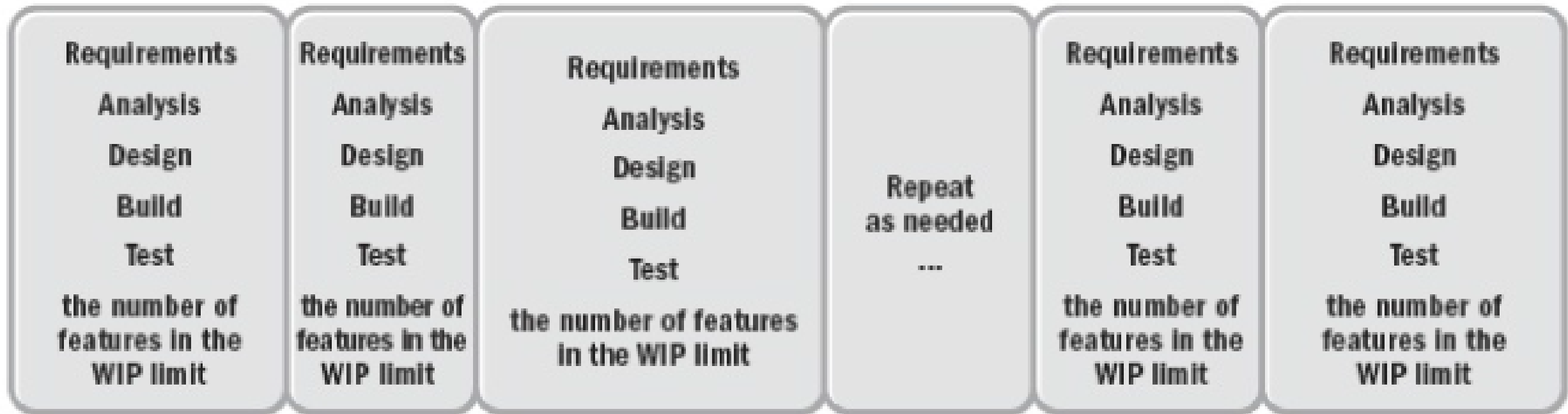


ITERATION-BASED AGILE



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.



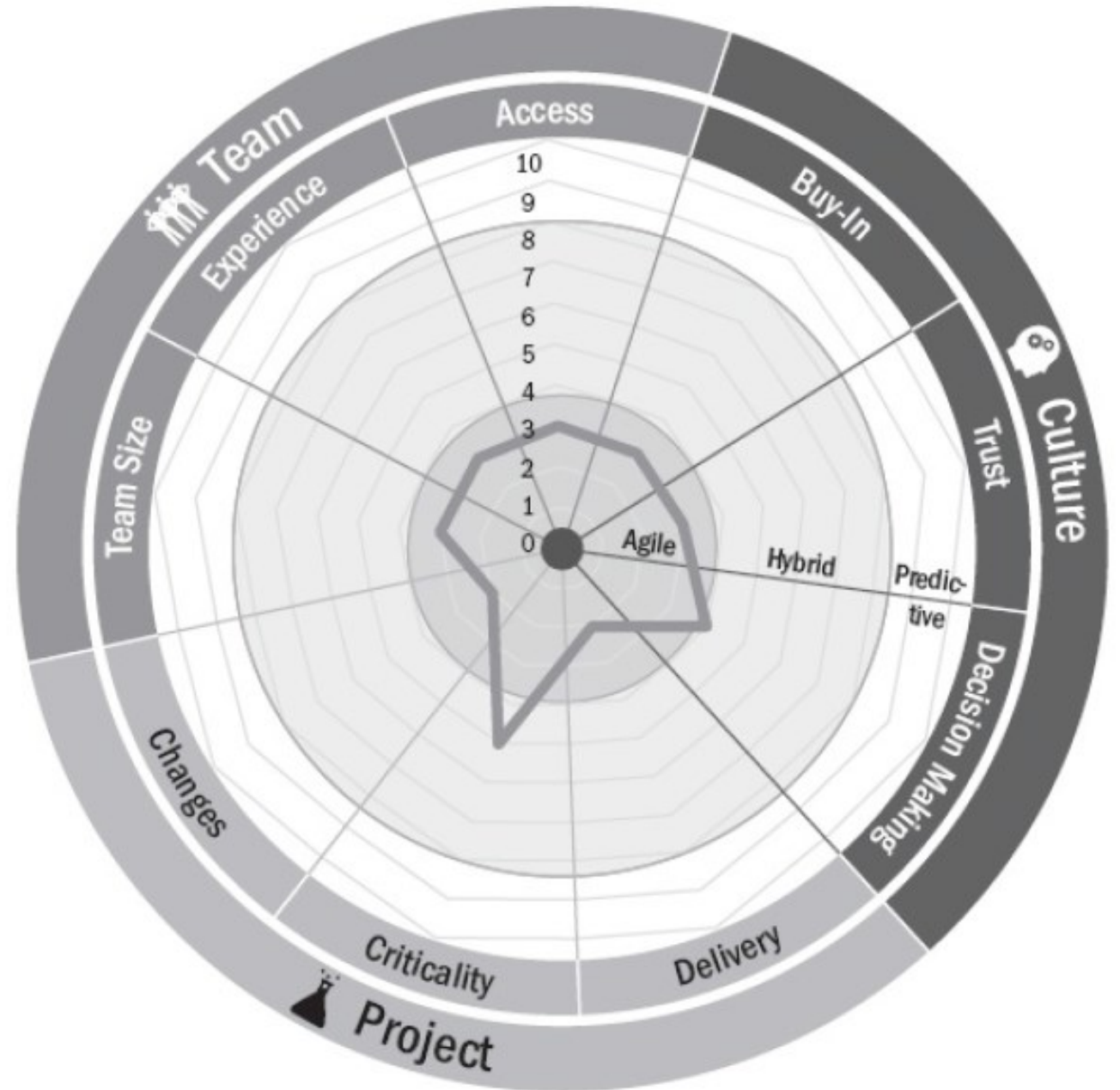
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AGILE SUITABILITY FILTERS

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.

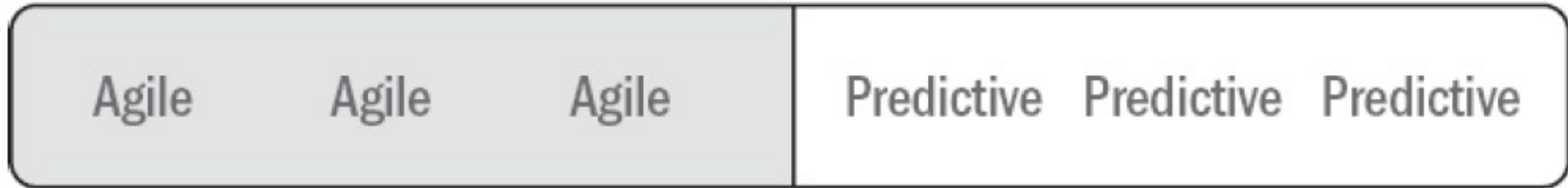
MODEL FOR SUITABILITY OF AGILE APPROACHES



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



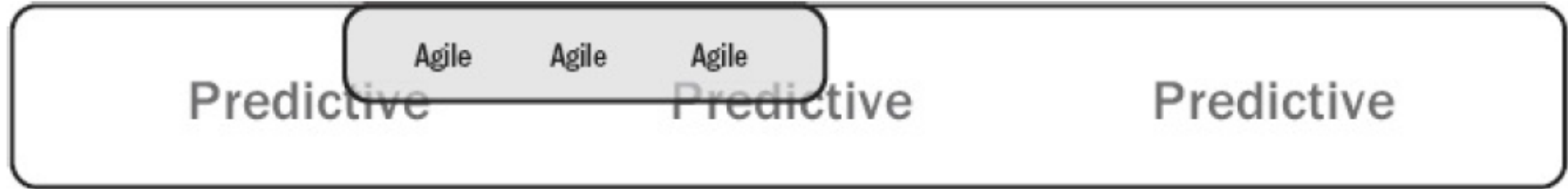
- This approach can be used when there is uncertainty, complexity, and risk in the development portion of the project that would benefit from an agile approach, followed by a defined, repeatable rollout phase that is appropriate to undertake in a predictive way, perhaps by a different team.
- An example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



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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