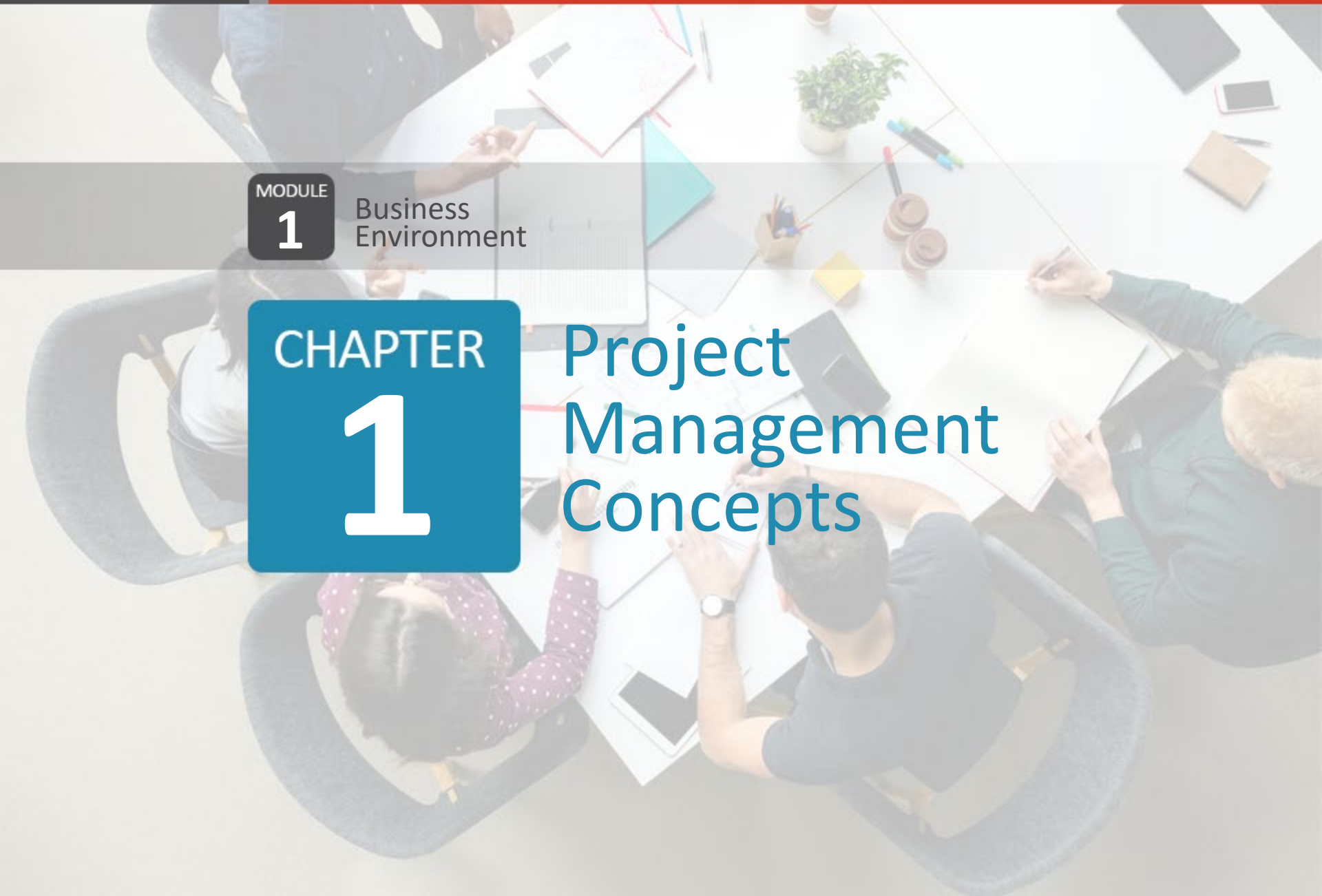
MODULE 1

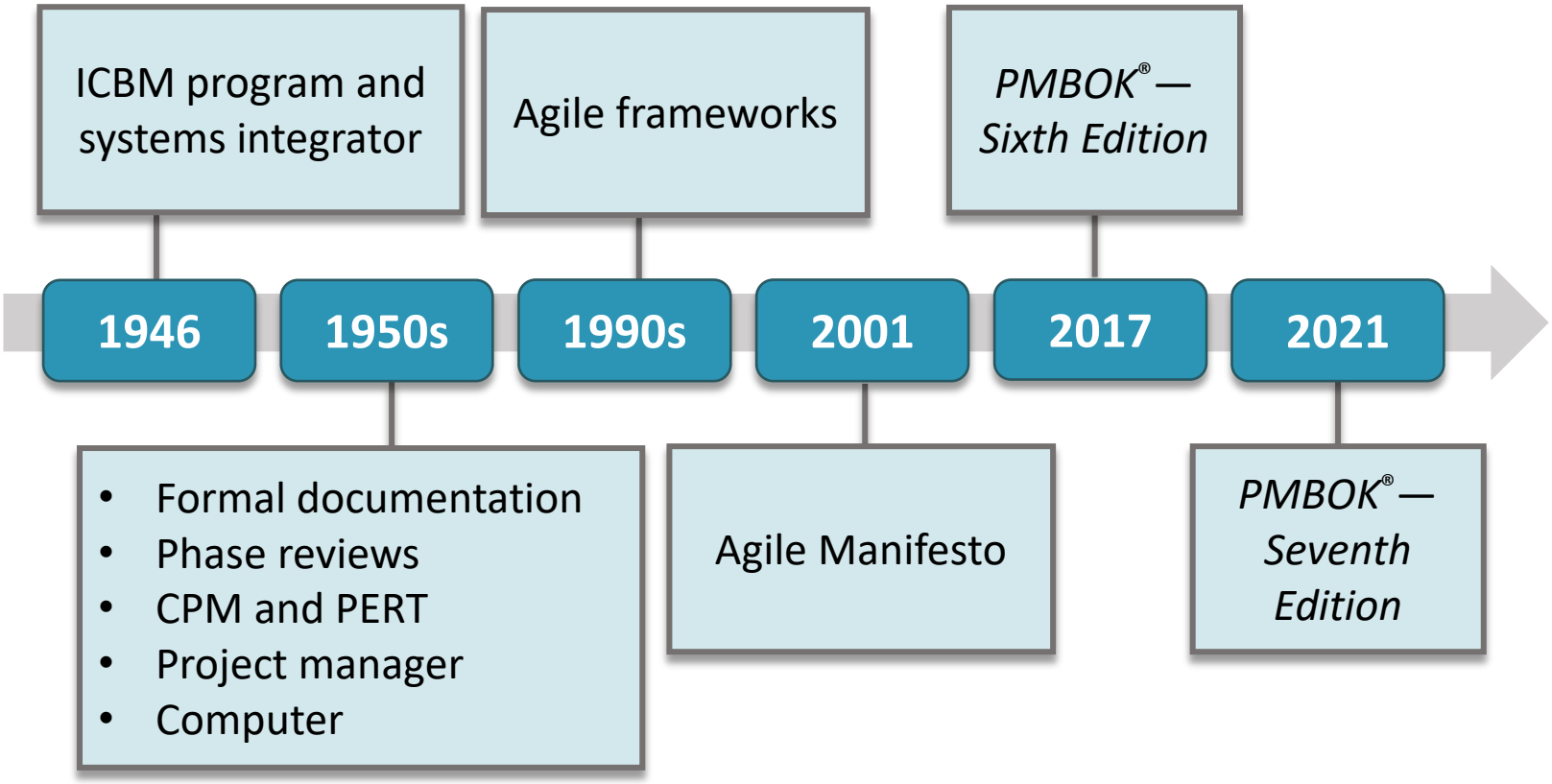
Business Environment



MODULE 1 Business Environment

CHAPTER 1 Project Management Concepts

Timeline of Modern Project Management



Characteristics of a Profession

- Body of specialized and essential knowledge
  - ✓ *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*
  - ✓ *Agile Practice Guide,* other Practice Guides
- Common standards and vocabulary
  - ✓ *PMI Lexicon of Project Management Terms*
  - ✓ *PMBOK® Guide, Agile Practice Guide*
- Means of certifying members' competence
  - ✓ PMP® certification

PMBOK® Guide—Sixth Edition

Subset of BOK practices that:

- Are widely recognized as good practices.
- Add value to all types of projects.
- Apply to most projects most of the time.
- Lead to the right projects being done.
- Enhance the likelihood of success.

B O K *Body of Knowledge*

PMBOK® Guide—Seventh Edition

- Uses principle statements instead of process-based approach.
- Not an invalidation of process-based approach from previous editions.
- Focuses on:
  - Value delivery.
  - Program adaptation through tailoring.
- Section added on models, methods, and artifacts for use during various project management activities.

PMI Practice Guides

Agile Practice Guide

- Learn about agile techniques and tools.
- For software and non-software projects.
- Agile mindset.
- Tailoring a framework or tool.

Managing Change in Organizations

- PMI: All strategic change delivered in programs and projects.
- Change management methodologies.
- Increase chances that projects will have enduring value to organization.

Benefits of Certification

Personal

- Enhance professional reputation.
- Expand marketability globally and across industries.
- Increase salary potential.
- Keep skills and knowledge up to date.

Organizational

- Create efficiencies.
- Reduce risks of ineffective project. management
- Attract a quality talent pool.

PMP® Certification Application

Educational Background	Project Management Experience
Secondary degree (high school diploma, associate's degree or global equivalent)	Minimum five years/60 months unique non-overlapping professional project management experience
OR	
Four-year degree (bachelor's degree or global equivalent)	Minimum three years/36 months unique non-overlapping professional project management experience
OR	
Bachelor's or post-graduate degree from a GAC accredited program (bachelor's degree or master's or global equivalent)	Minimum two years/24 months unique non-overlapping professional project management experience

Check the Project Management Professional PMP® Handbook at www.PMI.org.

What Is a Project?

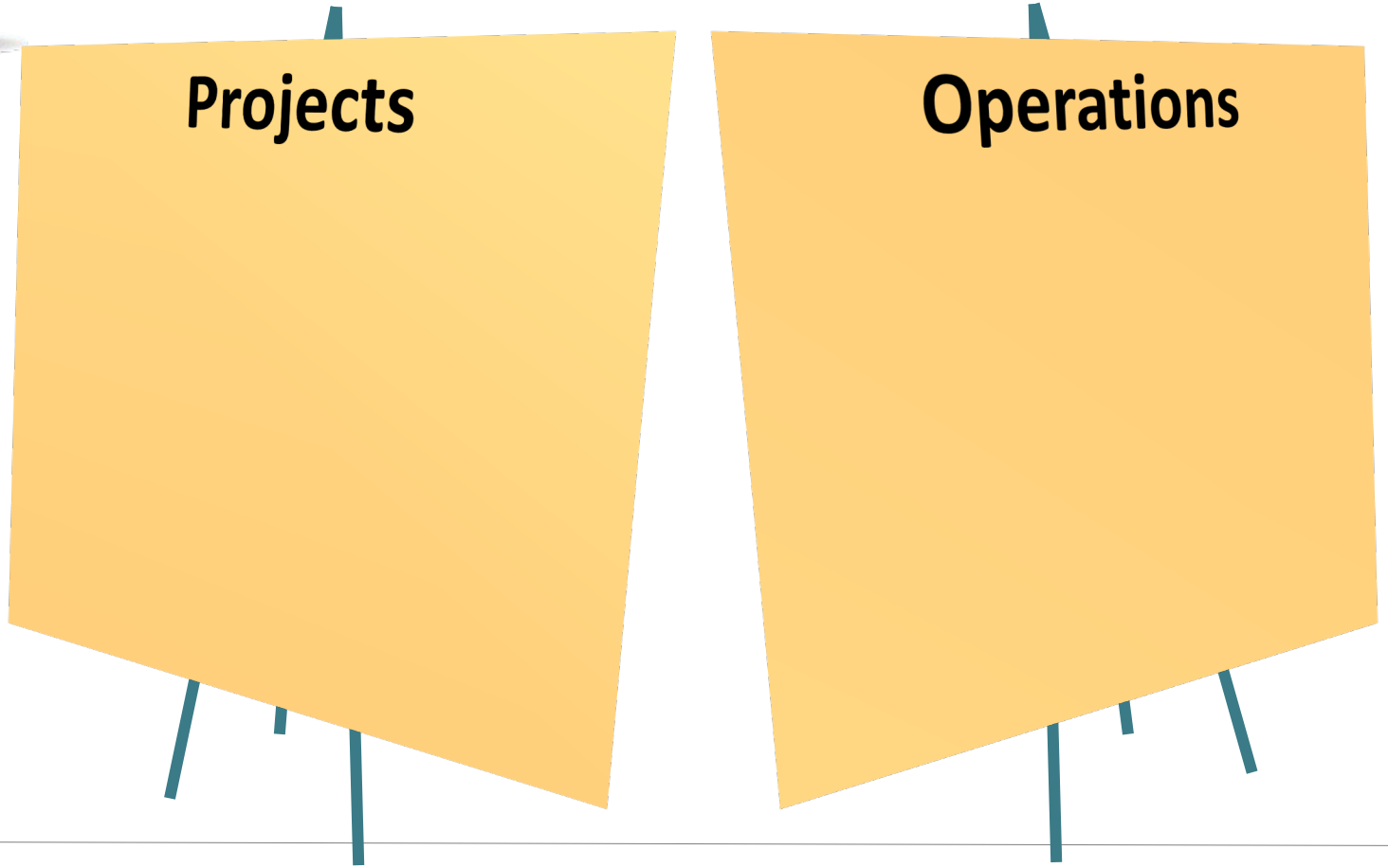
- Temporary endeavor
  - Definite start and end
  - Not ongoing
- Creates a unique product, service, or result
  - Different in some way from what has been done before

Projects vs. Operations

Distinguisher	Projects	Operations
Duration	Varies, but always temporary	Ongoing, indefinite, repetitive
Deliverables	Unique • New or improved product, service, or result • Complete deliverables	Standardized • Non-unique products • Ongoing services • Formalized, repeated process results (e.g., monthly reports)
Human resources	Temporary teams • Possibly cross-functional • Outside functional structure	Permanent positions • Aligned to individual functions within organizational structure
Manager	Project manager	Functional manager

Discussion Question

Name some examples of projects and operations.



Functions Performed on Projects

- Provide oversight and coordination.
- Present objectives and feedback.
- Facilitate and support.
- Perform work and contribute insights.
- Apply expertise.
- Provide business direction and insight.
- Provide resources and direction.
- Maintain governance.

Differences between Projects

Project size and complexity

Definable vs. high-uncertainty work

Unique constraints and priorities

Differences in staffing models

Why Are Projects Undertaken?

- Market demands
- Strategic opportunities/business needs
- Social needs
- Environmental considerations
- Customer requests
- Technological advances
- Legal requirements

Project Management Principles

- Principles reflect morals.
- May be basis of code of ethics.
- Values from *PMI Code of Ethics and Professional Conduct*:
  - Responsibility
  - Respect
  - Fairness
  - Honesty

Principles of Project Management

Stewardship	Collaboration	Engaging stakeholders	Focus on value
Systems thinking	Leadership	Tailoring	Quality
Navigating complexity	Optimizing risk responses	Adaptability and resiliency	Enabling change

Stewardship

- Requires recognition of responsibilities both inside and outside organization.
- Call for:
  - Integrity.
  - Care.
  - Trustworthiness.
  - Compliance.

Internal responsibilities

- Aligning with organization
- Engagement with team members
- Oversight regarding resource use
- Appropriately using authority

External responsibilities

- Environmental sustainability
- Relationships with external stakeholders
- Impacts on market and community
- Advancing practices

Team

- Team agreements ensure that the members of the team are following shared norms and behaviors.
- Team structures help coordinate necessary efforts.
- Team processes enable work to be assigned and completed.
- Diversity can lead to an improved environment and increase productivity.

Stakeholders

Scope and requirements	Schedule	Cost	Project team
Plans	Outcomes	Culture	Benefits realization
Risk	Quality	Success	

Value

- Value may be expressed through financial metrics, measures of public goods, or contributions to organizational or program outcomes.
- Projects should have clearly defined target outcomes, assessed and updated throughout the project.
- Value is subjective, meaning that various stakeholders may value outcomes differently.
- Value can be better ensured by focusing on intended outcome instead of specific deliverables.

Systems Thinking

Requires looking at both entire project and overarching system that project exists in.

Individual team members may be considered to optimize work and communication preferences through project subgroups.

System of systems includes multiple layers of projects, programs, and portfolios.

Timing of execution crucial to successful interactions.

Leadership

- Refers to skills and traits shown by individuals, not authority.
- Does not refer to specific role; leadership may be required by multiple positions at once.
- Multiple leadership styles exist, but all require skills, character, and the ability to motivate and communicate.

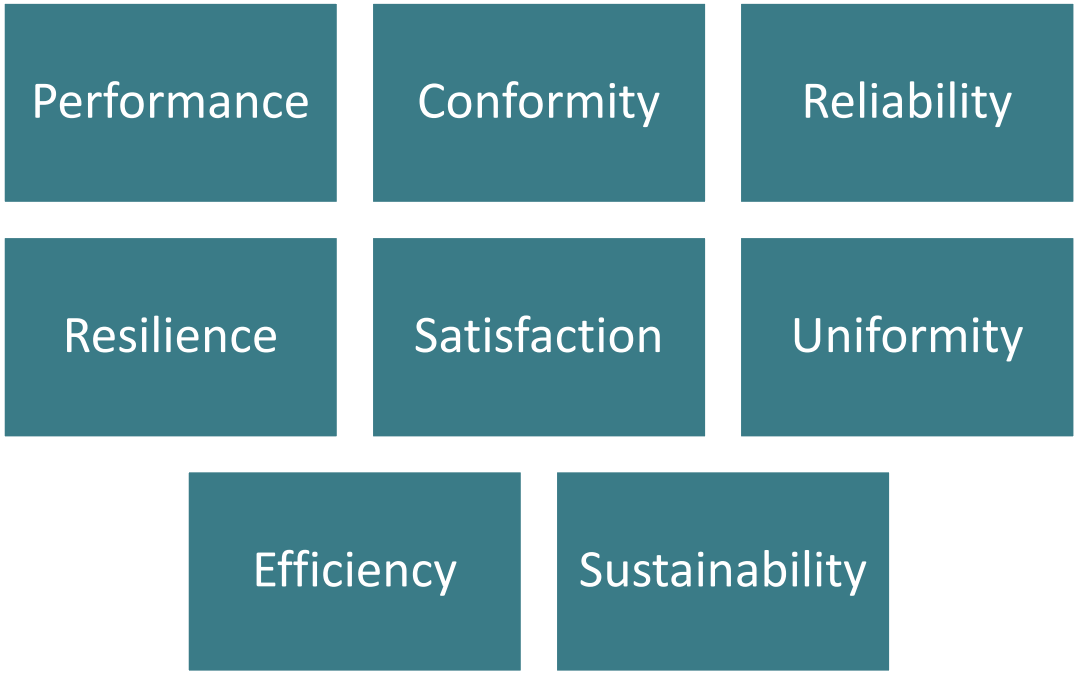
Tailoring

- Means that project teams must be structured to:
  - Promote flexibility.
  - Maximize value.
  - Improve performance.
- Requires determining proper development and delivery approaches, processes, methods, and artifacts needed.
- Occurs in all projects at some level and is an ongoing process.

Quality

- Measure of how well a product, service, or result of a project meets desired outcomes.
- Outcomes may be stated or implied.

Quality may include:



Complexity

Sources and Complicating Factors

- Human behavior
- System behavior
- Ambiguity
- Difficulty in forecasting
- Difficulty isolating causes

Risk

- Risk:
  - May have positive or negative effects on project and outcomes.
  - May arise from individual or larger sources.
  - May not represent events that end up occurring.
- Requires ongoing management during project.
- Must understand risk appetite/threshold of stakeholders.
  - Risk appetite describes willingness to tolerate uncertainty.
  - Risk threshold measures acceptable level of variation.

Adaptability and Resiliency

Adaptability

- Describes how well team or individual adjusts based on changing conditions.

Resiliency

- Describes how team or individual withstands impacts and recovers from setbacks and failures.

- Obstacles may arise due to failure of team to achieve goals or due to other internal and external stimuli.
- Adapt with systems view.
- Can be enhanced by working toward outcomes instead of outputs or deliverables.

Change

- Project teams play key role in driving change.
- Change may arise from internal and external sources.
- Change may be created by and/or have consequences for stakeholders.
- Change may be made difficult by:
  - Risk-averse or change-resistant individuals and organizations.
  - Fatigue.
  - Difficulties with change absorption.
- Change should be driven by motivation, engagement, communication.

Project Performance Domains

- Stakeholder
- Team
- Development Approach and Life Cycle
- Planning
- Project Work
- Delivery
- Measurement
- Uncertainty

Stakeholder Performance Domain

Identify	• High level; may include customers, sponsors, end users, project team
Understand	• Motivations, feelings, beliefs, values • Subject to change during project
Analyze	• Various positions and perspectives • Includes how stakeholders interact with each other
Prioritize	• Based on level of influence over or interest in project • Subject to change during project
Engage	• Calls for collaborative work • Requires communication with stakeholders
Monitor	• How stakeholders and their priorities, attitudes, and importance change

Team Performance Domain

- Leadership may be centralized or distributed.
- Useful leadership skills:
  - Establishing and maintaining vision
  - Applying critical thinking
  - Motivating project team members
  - Using interpersonal skills, e.g., emotional intelligence, decision making, conflict resolution
- Common concepts to be addressed during team development:
  - Vision and objectives
  - Roles and responsibilities
  - Project team operations
  - Guidance
  - Growth

Development Approach and Life Cycle Performance Domain

- Delivery cadence:
  - Single
  - Multiple
  - Periodic
  - Continuous
- Development approach:
  - Predictive
  - Adaptive
  - Hybrid

Planning Performance Domain

Parameters

- Business case
- Requirements
- Applicable project and product scopes

Resource needs

- Time
- Personnel
- Equipment
- Financial needs

Other areas

- Team composition and structure
- Planned communication methods
- Physical resources

- Planning may take place in detail early on in project or occur at a high level early and become more detailed.
- Estimates produced early in the project will change and require updating.
- Estimates produced later in project will be more accurate in terms of range, accuracy, precision, and confidence.

Project Work Performance Domain

Managing workflow	Establishing efficient systems and processes	Communicating with stakeholders
Managing material, equipment, supplies, logistics	Working with contracting professionals and vendors	Monitoring changes that can affect project
	Enabling project learning and knowledge transfer	

Delivery Performance Domain

- Requires providing value, which:
  - May be delivered during course of project.
  - May be delivered with release of deliverables.
  - May be delivered at end of project.
  - May continue long after project officially ends.
- To provide value, deliverables must:
  - Reflect requirements, scope, and quality.
  - Address long-term impacts to people, profits, and planet.

Measurement Performance Domain

Common Categories

- Deliverables
- Delivery
- Baseline performance
- Resources
- Business value
- Stakeholders
- Forecasts

Possible Negative Effects

- Hawthorne effect
- Vanity metrics
- Demoralization
- Misused metrics
- Confirmation bias
- Correlation vs. causation

Uncertainty Performance Domain

- Responses to uncertainty:
  - Gathering information
  - Preparing for multiple outcomes
  - Investigating multiple designs or alternatives
  - Focusing on resilience in project team and organizational processes
- Ambiguity can be conceptual or situational.
- Complexity arises from ambiguity or human/system behavior.

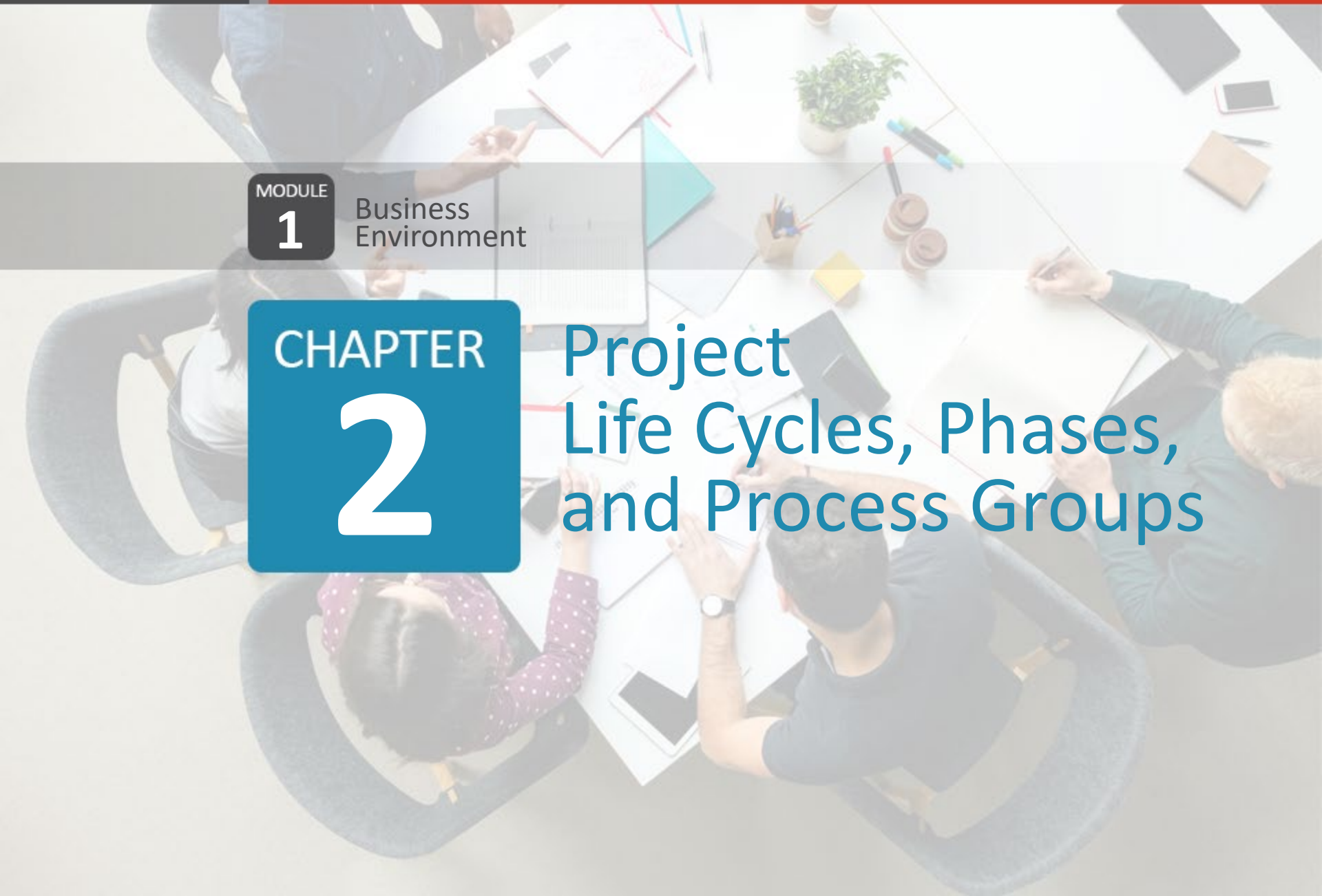
Tailoring to Fit Organization

Organizational governance regarding project methodologies, management, or development approaches creates boundaries for tailoring.

Tailoring may also be subject to safety concerns and regulations or contractual agreements.

Tailoring to Fit Project

Product/Deliverable	Project Team	Culture
• Compliance/criticality • Type of product/ deliverable • Industry market • Technology • Time frame • Stability of requirements • Security • Incremental delivery	• Team size • Team geography • Organizational distribution • Team experience • Access to customer	• Buy-in • Trust • Empowerment • Organizational culture



MODULE 1 Business Environment

CHAPTER 2

Project Life Cycles, Phases, and Process Groups

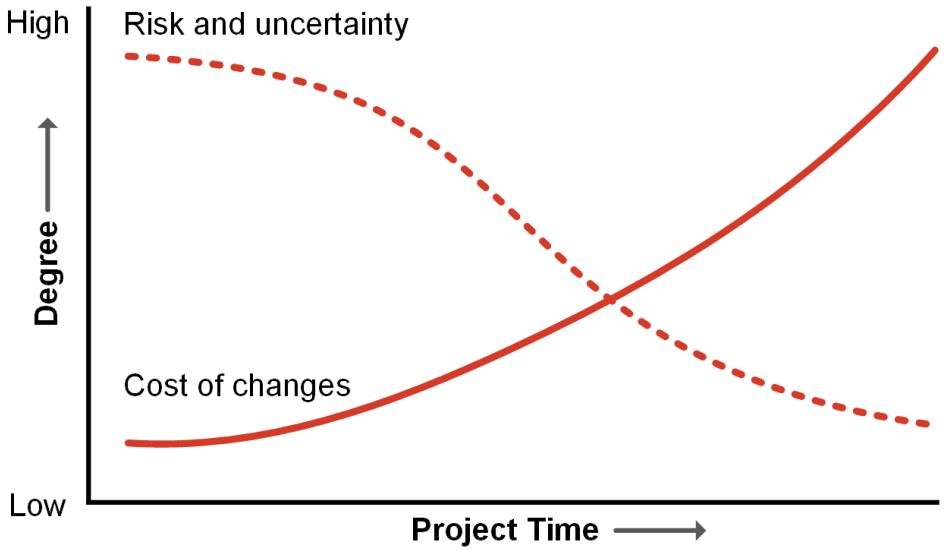
Progressive Elaboration

- Iterative (repeating) process within a project
- Increasing levels of detail and accuracy
- Critical tool in developing planning documents, especially project management plan

Characteristics of Life Cycles

Common characteristics:

- Costs and staffing are **highest** during Executing and Monitoring and Controlling.
- Risk to project objectives **decreases** as project proceeds.
- Cost of making changes **increases** as project proceeds (less so for agile projects).



Source: Adapted from Project Management Institute, *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Sixth Edition*, Project Management Institute, Inc., 2017, Figure 1-3, Page 549. Material from this publication has been reproduced with the permission of PMI.

Cadence Choices

Single delivery

- Single delivery of any and all intended deliverables at the end of the project

Multiple delivery

- Multiple deliveries over project life
- May not use a fixed schedule

Periodic delivery

- Multiple deliveries over project life
- Uses fixed schedule, such as biweekly or monthly

Continuous delivery

- Features delivered continuously upon creation

Project Life Cycle Types

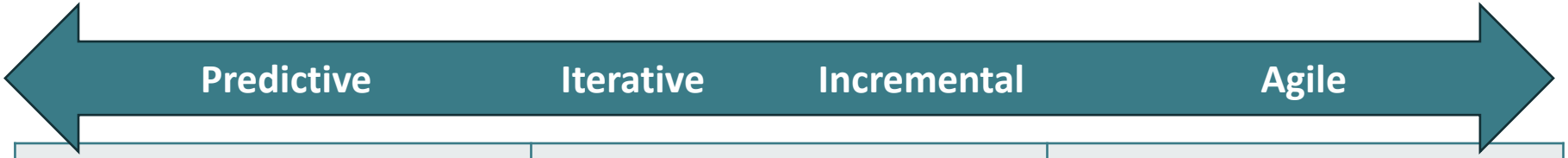
Four life cycle types identified in *PMBOK® Guide—Sixth Edition*:

1. **Predictive**
2. **Iterative**
3. **Incremental**
4. **Agile**

Rolling wave planning

All types can manage uncertainty by planning near term in detail while future work is planned in more general manner.

Continuum of Project Life Cycles

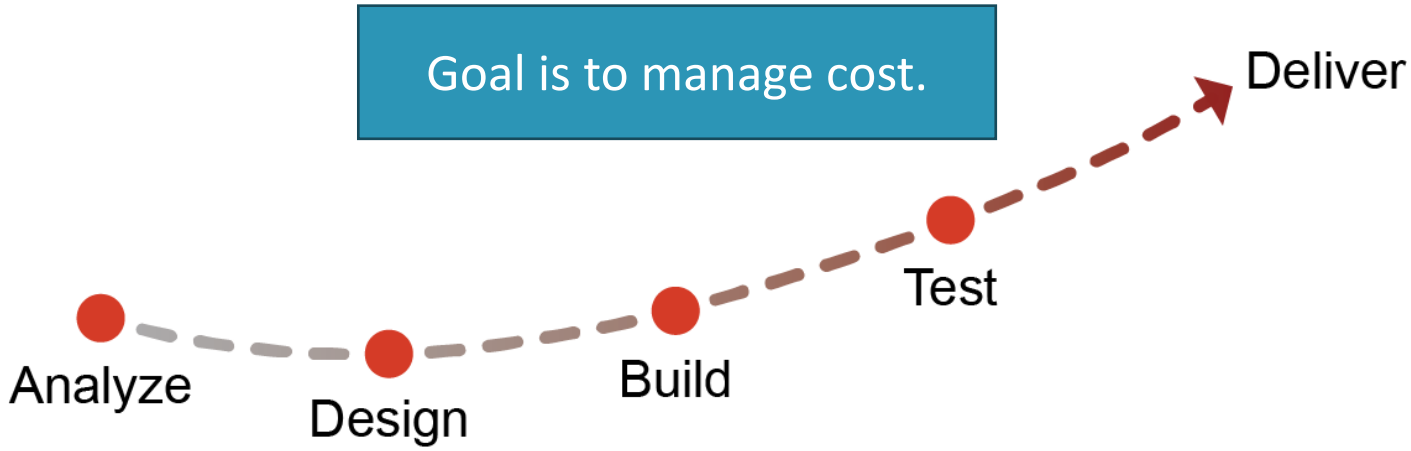


Requirements are defined up-front before development begins	Requirements can be elaborated at periodic intervals during delivery	Requirements are elaborated frequently during delivery
Deliver plans for the eventual deliverable. Then deliver only a single final product at the end of the project timeline	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

Source: Project Management Institute, *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Sixth Edition*, Project Management Institute, Inc., 2017, Figure X3-1, Page 666. Material from this publication has been reproduced with the permission of PMI.

Predictive Life Cycle

- Detailed planning—scope, time, cost, fixed requirements—early in life cycle followed by execution.
- Activities done once.
- Single delivery.
- Milestones for stakeholder involvement set early in project.
- Best suited to projects that have easily defined, well-understood deliverables.



Source: Project Management Institute, *Agile Practice Guide*, Project Management Institute, Inc., 2017, Figure 3-2, Page 21. Material from this publication has been reproduced with the permission of PMI.

Iterative vs. Incremental

Iterative

- Dynamic requirements.
- Activities repeated until correct.
- Single delivery.

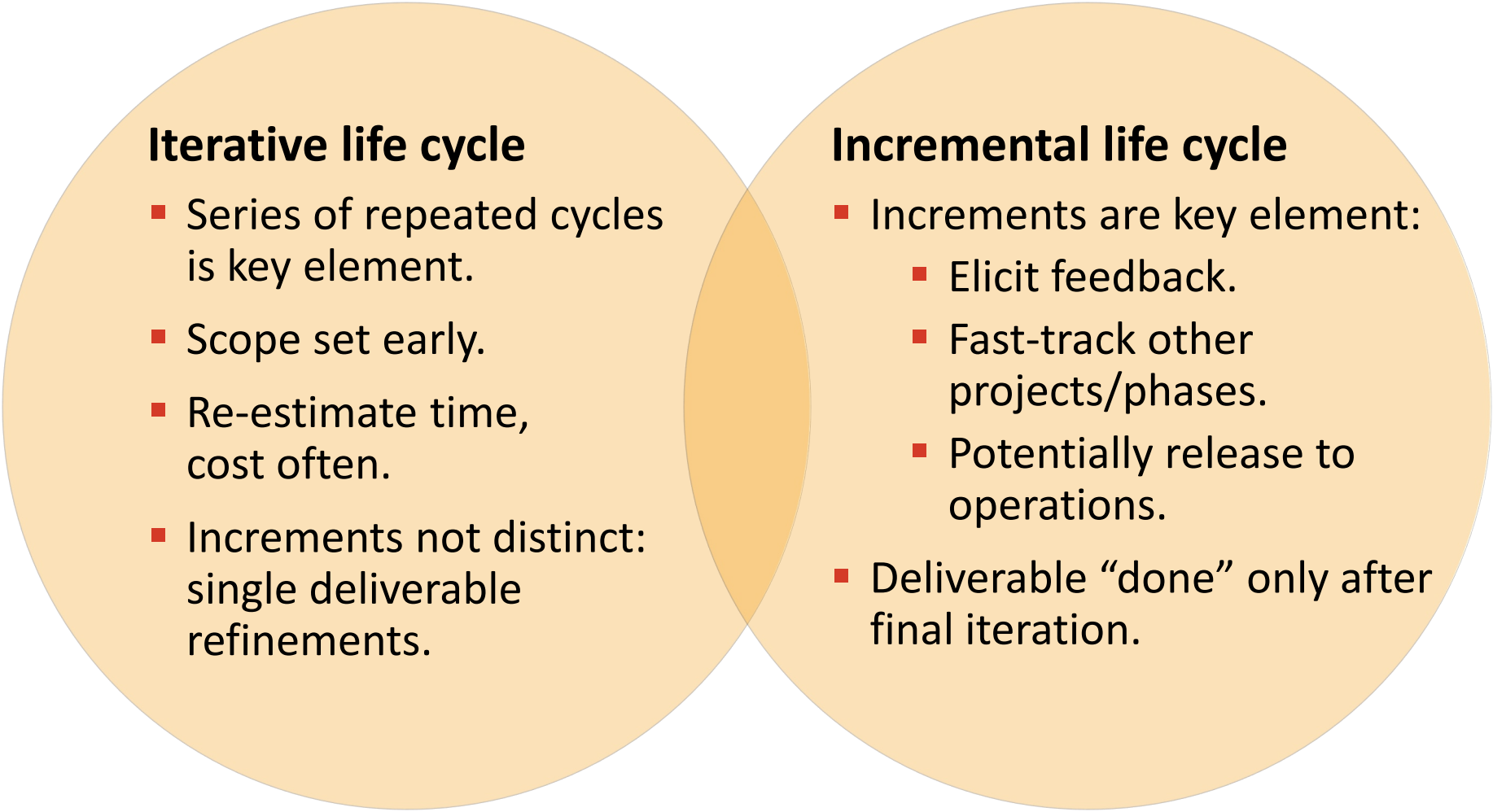
Goal is correctness of solution.

Incremental

- Dynamic requirements.
- Activities performed once for a given increment.
- Frequent smaller deliveries.

Goal is speed.

Iterative and Incremental Life Cycles



Agile

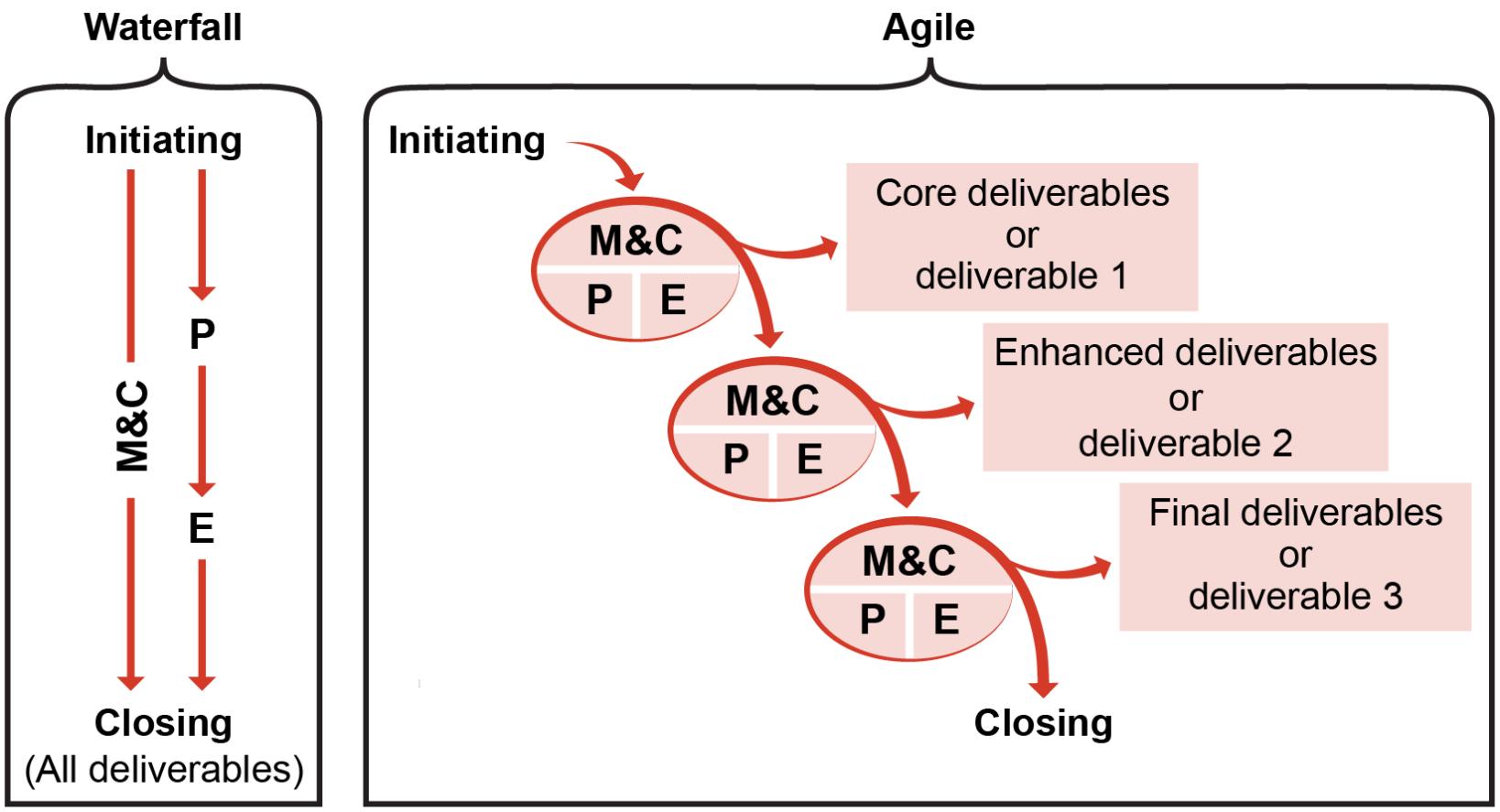
- Dynamic requirements.
- Low detail early on, high detail per iteration.
- Activities repeated until correct.
- Frequent small deliveries.
- Stakeholders continuously involved to give feedback.

Goal is customer value via frequent deliveries and feedback.

Should be used if:

- Nature of project or deliverables will evolve as more information is gathered.
- Project needs to be flexible, adaptive, and responsive to high degree of change and uncertainty.
- Project has a wide variation of stakeholder interpretations and expectations.
- Partial or incremental deliverables are valuable to stakeholders.

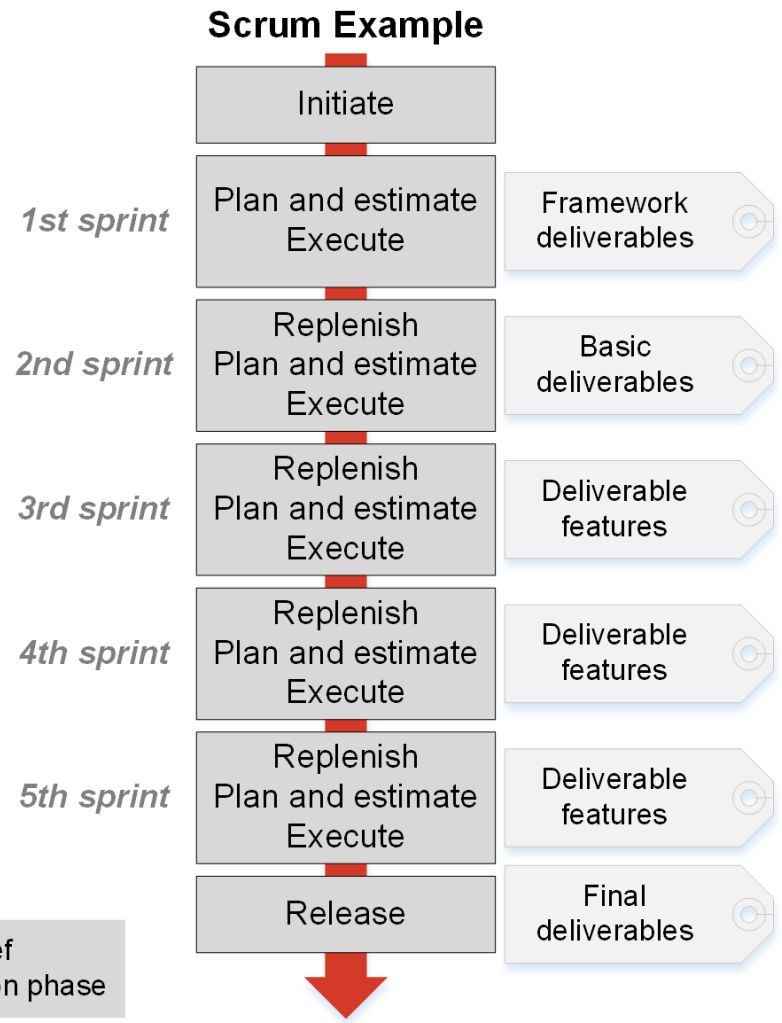
Waterfall (Predictive) vs. Agile Life Cycles



P = Planning E = Executing M&C = Monitoring and Controlling

Agile Life Cycle

- **Iteration-based agile (e.g., Scrum):** Brief, timeboxed iterations/sprints (2–4 weeks).
  - Regular meetings each iteration.
- **Flow-based agile (e.g., Kanban Method):** WIP strict limits; add new features in continuous flow as prior features done.
  - Determine appropriate meeting schedule.
- At end of iteration or selected points in flow-based: deliverable ready for review (stable, complete, finished).
- Product owner (sponsor) reviews to provide feedback or accept/reject.
- Retrospective (replenish) reviews work, sets improvement action plan.



Project Phases

"A collection of logically related project activities that culminates in the completion of one or more deliverables"

Approach	Divisions	Purposes
Predictive	Major subdivision	To control work as a phase gate
Agile	Iterations/sprints	To integrate a project's incremental product, service, or result into a release for feedback or use in operations

What Are the Phases of the Project Life Cycle?

It depends.

- No ideal structure that will apply to all projects.
- Phase-to-phase relationships:
  - **Sequential**

    Next phase begins only after prior phase is complete—deliverables are accepted and phase is closed, e.g., a single small agile team works on one sprint at a time.
  - **Overlapping or parallel**

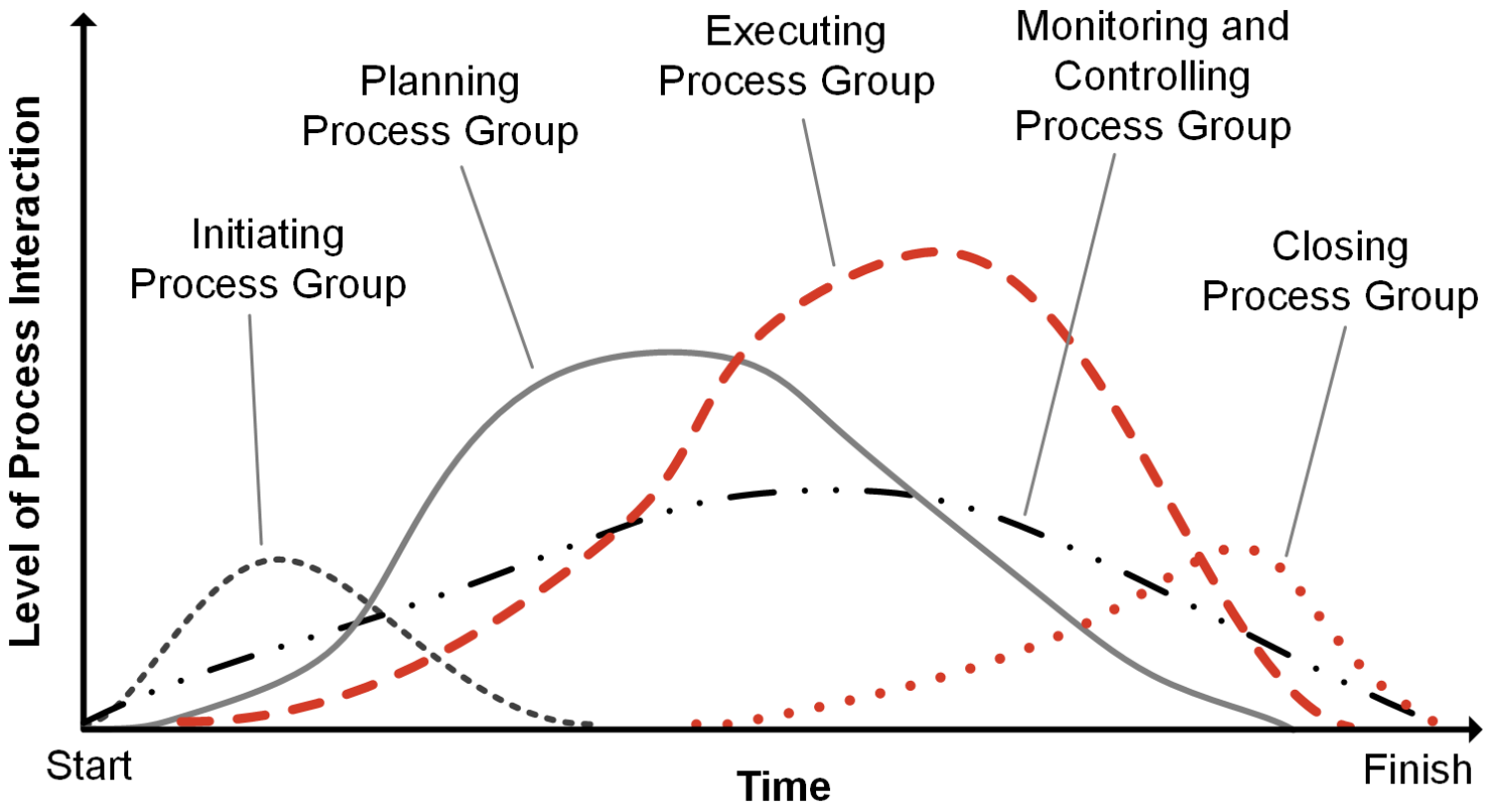
    Work in one phase overlaps another phase or is done simultaneously. Possible given independent teams, resources, and deliverables (or only partly dependent teams).

Discussion Question

What life cycle type would be best to use if the deliverable is well-understood?

A. Predictive
B. Iterative
C. Agile
D. Incremental

Overlap of Process Groups

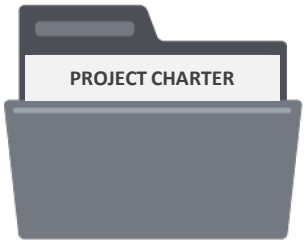


Source: Project Management Institute, *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Sixth Edition*, Project Management Institute, Inc., 2017, Figure 1-5, Page 555. Material from this publication has been reproduced with the permission of PMI.

Initiating Process Group

Define a new project or new phase of an existing project by obtaining authorization to start.

- **Initiating has 2 processes:**



Develop Project Charter

Identify Stakeholders

Planning Process Group

Determine detailed requirements and scope, refine the objectives, and define the course of action.

- **Planning has 24 processes**:
  - Greatest number of processes.
  - Output is ***project management plan*** that includes all aspects of project work.

Executing Process Group

Complete the work defined in the project management plan to satisfy the project specifications.

- **Executing has 10 processes**:
  - The largest portion of project time and resources are spent in this Process Group.
  - Project manager coordinates team activities to ensure that project work is proceeding smoothly.

Monitoring and Controlling Process Group

Track, review, and regulate the progress and performance of the project; identify where changes are required and initiate the changes.

- **Monitoring and Controlling has 12 processes**:
  - This Process Group runs concurrently with the others.
  - Project manager confirms that deliverables conform to scope and requirements and are acceptable to the customer.

Closing Process Group

Finalize all activities across all Process Groups to formally close the project or phase.

- **Closing has 1 process**:
  - Turning the product/service over to the customer and supporting the transition into operation as needed.
  - Completing administrative work, including closing out budget accounts.
- Must be done for projects that are completed, terminated, or indefinitely postponed.

Discussion Question

Which Process Group is where the majority of project time is spent?

A. Initiating
B. Planning
C. Executing
D. Monitoring and Controlling
E. Closing

Agile Projects: Agile Manifesto

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

- **Individuals and interactions** over processes and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

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

Agile Projects: Clarifying Principles

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference for the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

Agile Projects: Clarifying Principles

7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. 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.

Agile Mindset

- If embrace manifesto and principles, can tell if a framework fits in “agile mindset.”
- Pick best framework (e.g., Scrum) for project, motivated team, culture, and team’s reflections.
- Mindset built around customer:
  - Prioritize outputs to fulfill needs.
  - Learn customer needs by working together daily.
  - Customer must have deep level of commitment.
  - High-uncertainty work contracts need flexibility.

Agile Project Roles

Product owner

- Customer representative committed to daily interactions with team
- Provides feedback and task priority
- Develops plans such as high-level roadmap

Scrum master/ servant leader

- Project manager with agile mindset (trusts motivated, self-organizing team)
- Servant leader: facilitate, problem-solve, enforce use of agile framework as tailored

Cross-functional team member

- Generalizing specialist: technical specialist with broad skill base to help others
- Plan own work, coordinate, communicate

Agile Ceremonies

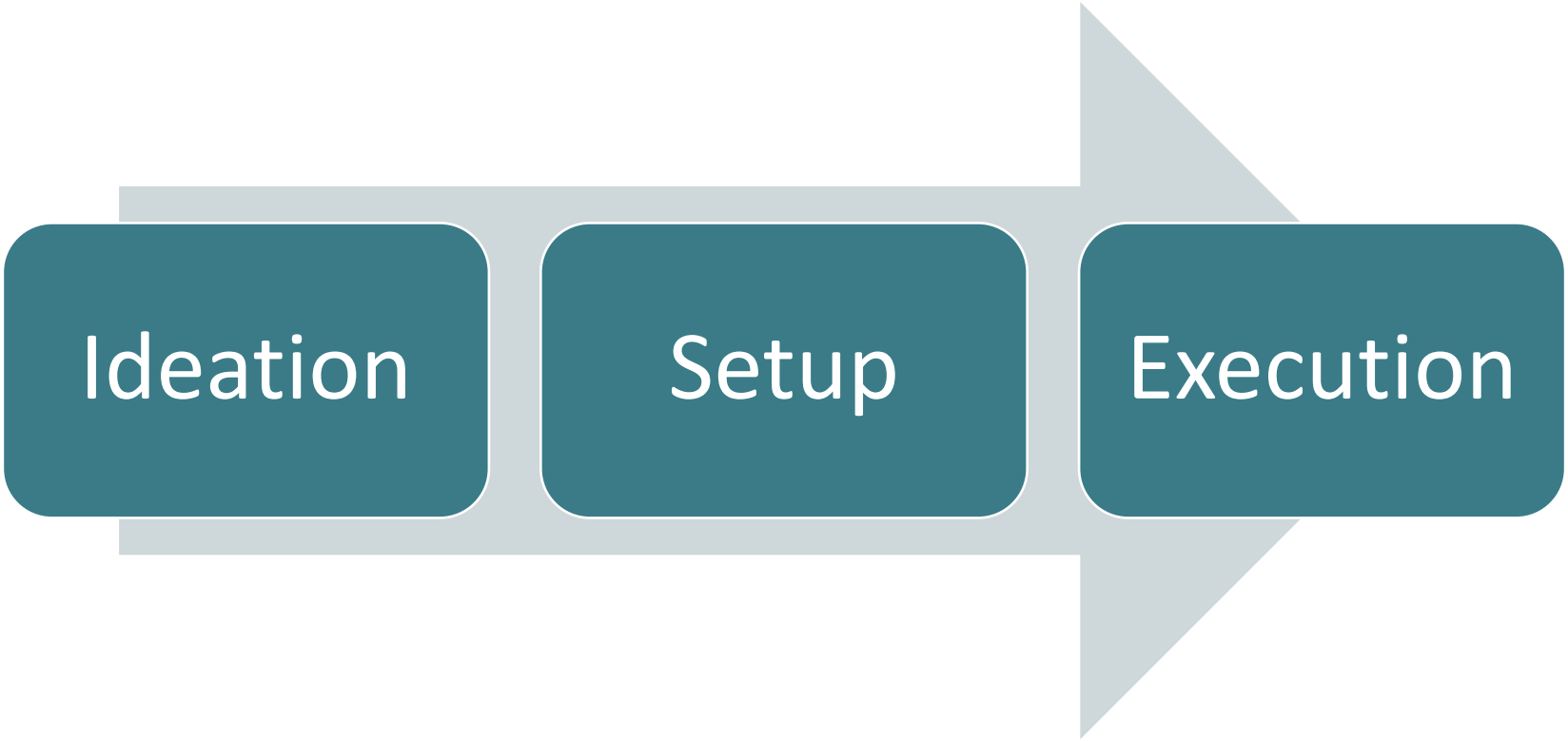
- Iteration/sprint planning or backlog grooming
- Daily standups
- Demonstrations
- Retrospectives

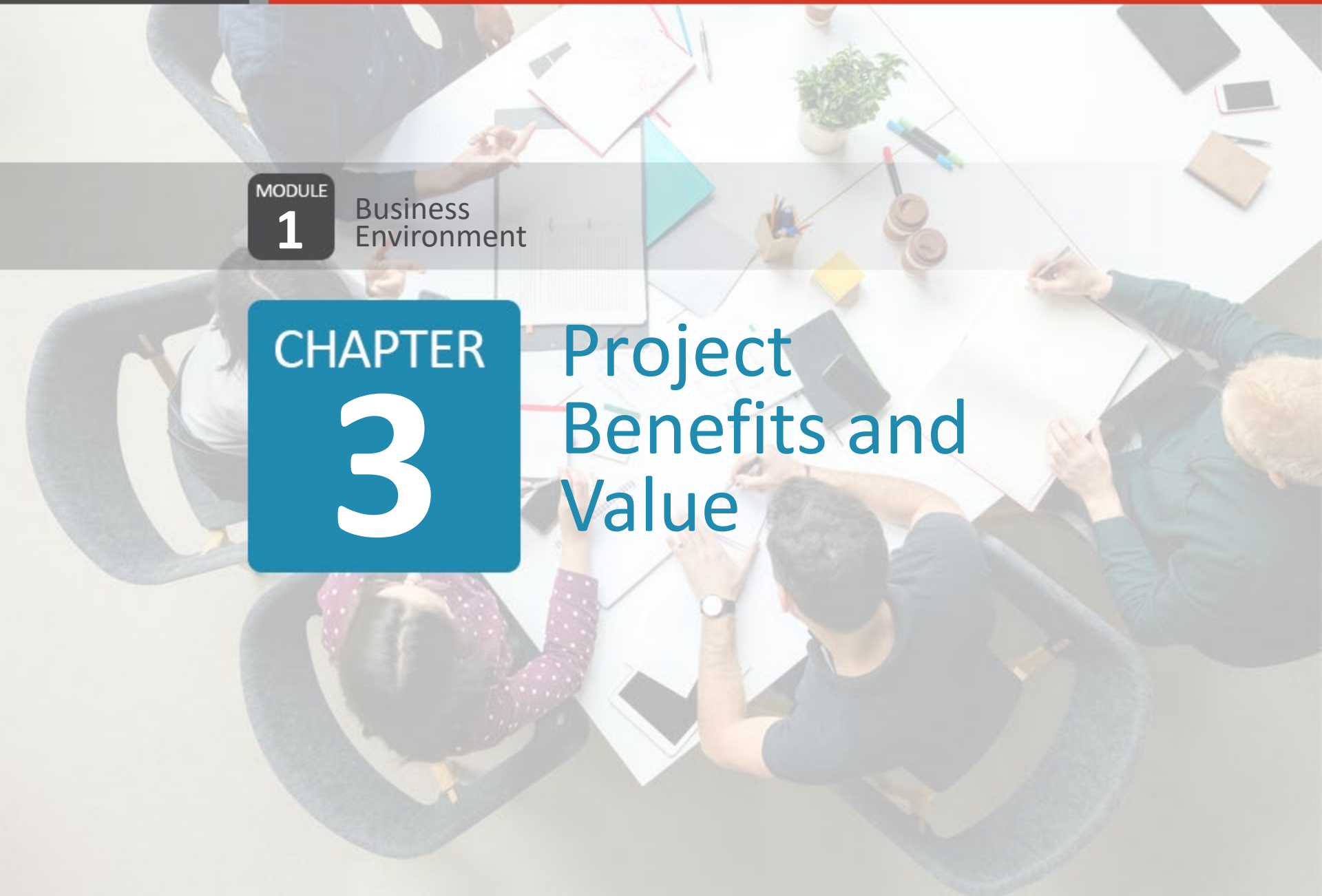
Kanban Boards

Empowers team, may limit size of backlog and/or work-in-process (WIP)

Backlog column	WIP columns • Develop and unit test • Completed • System test	Done (ready for delivery) column

Hybrid Projects



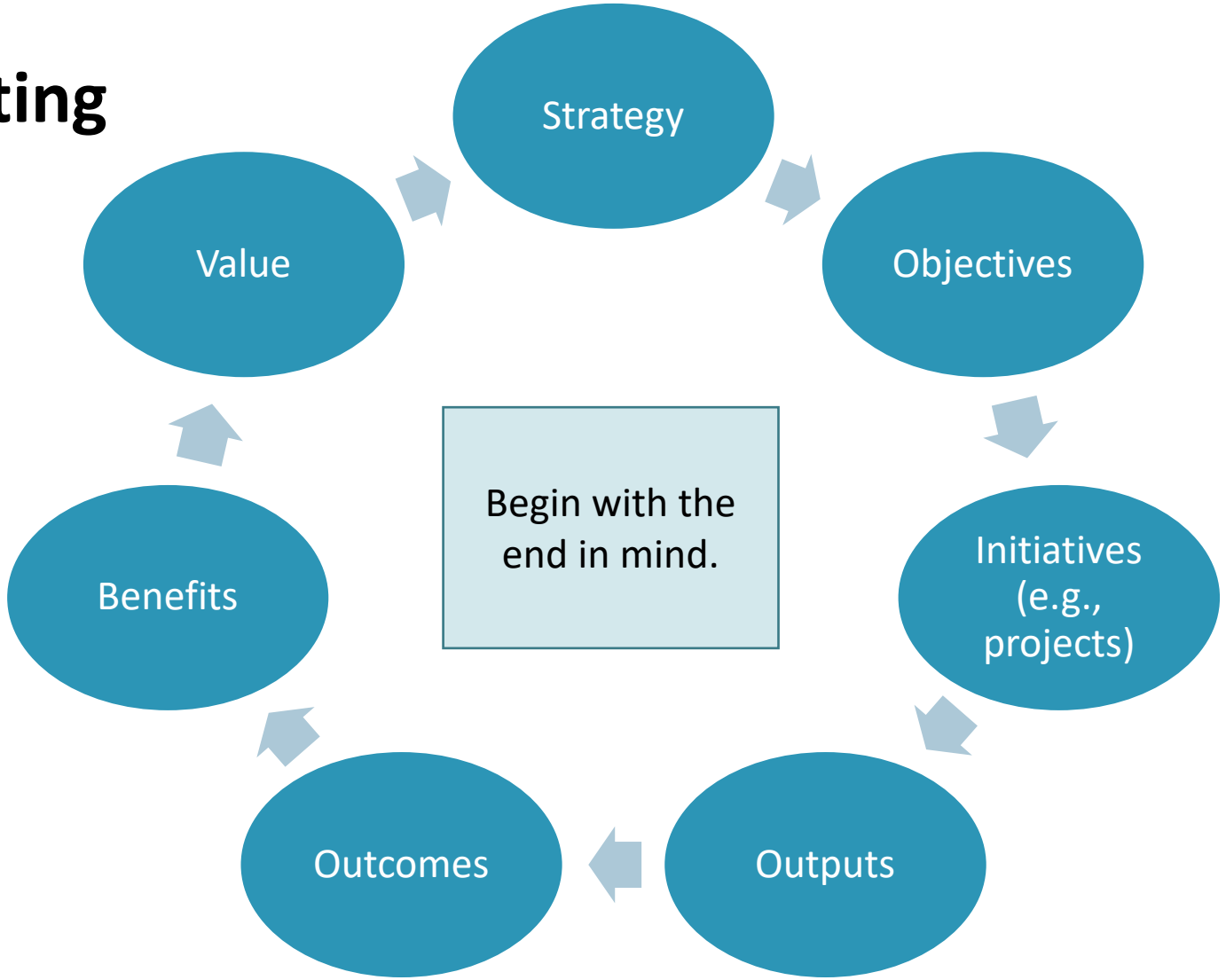


MODULE 1 Business Environment

CHAPTER 3

Project Benefits and Value

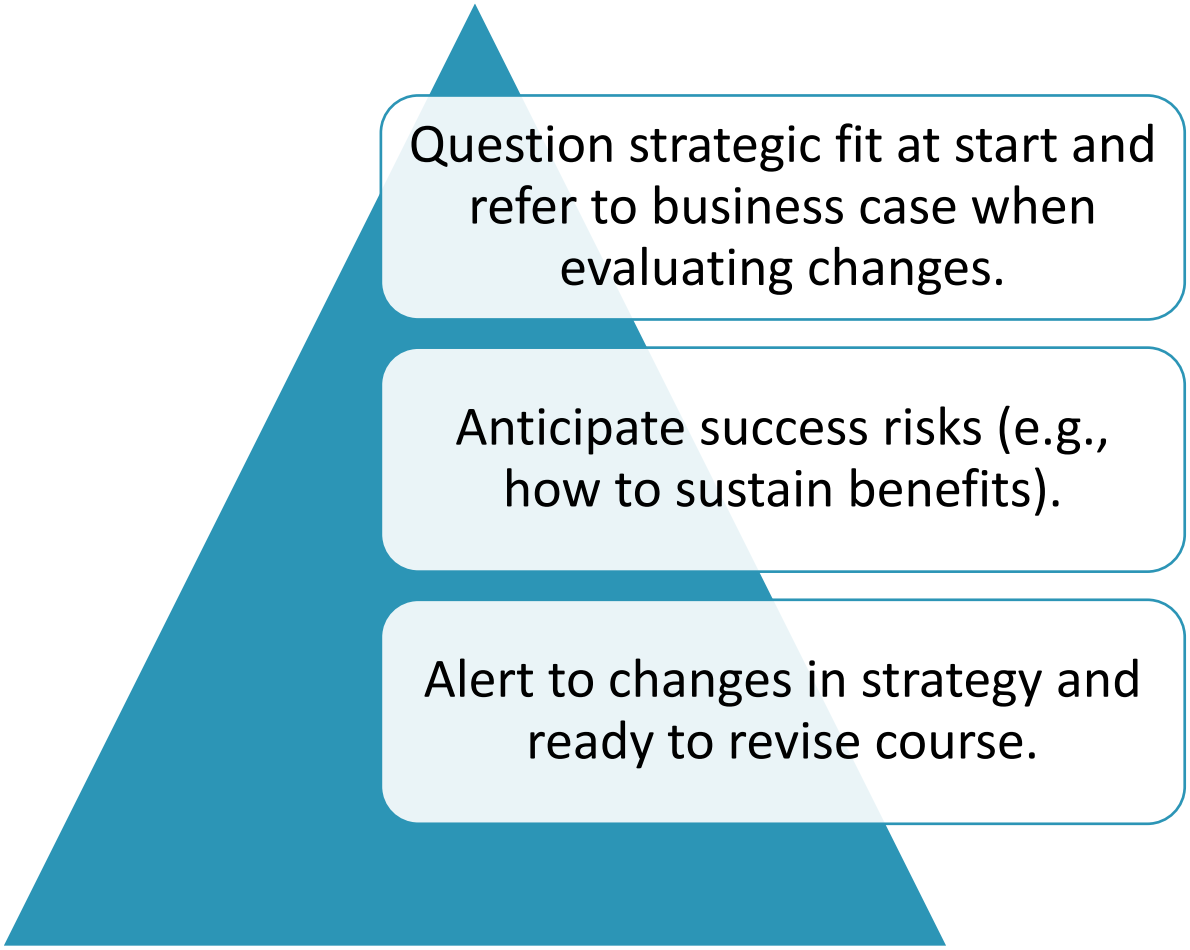
Implementing Strategy



Implementing Strategy via Project Selection

Low Cost Leader	Customer Intimacy
Operational efficiency	Improve marketing and delivery teams
Innovation	**Market Growth**
Faster time to market and aid in creativity	Customer retention, reputation, infrastructure, market awareness

Implementing Strategy on a Project

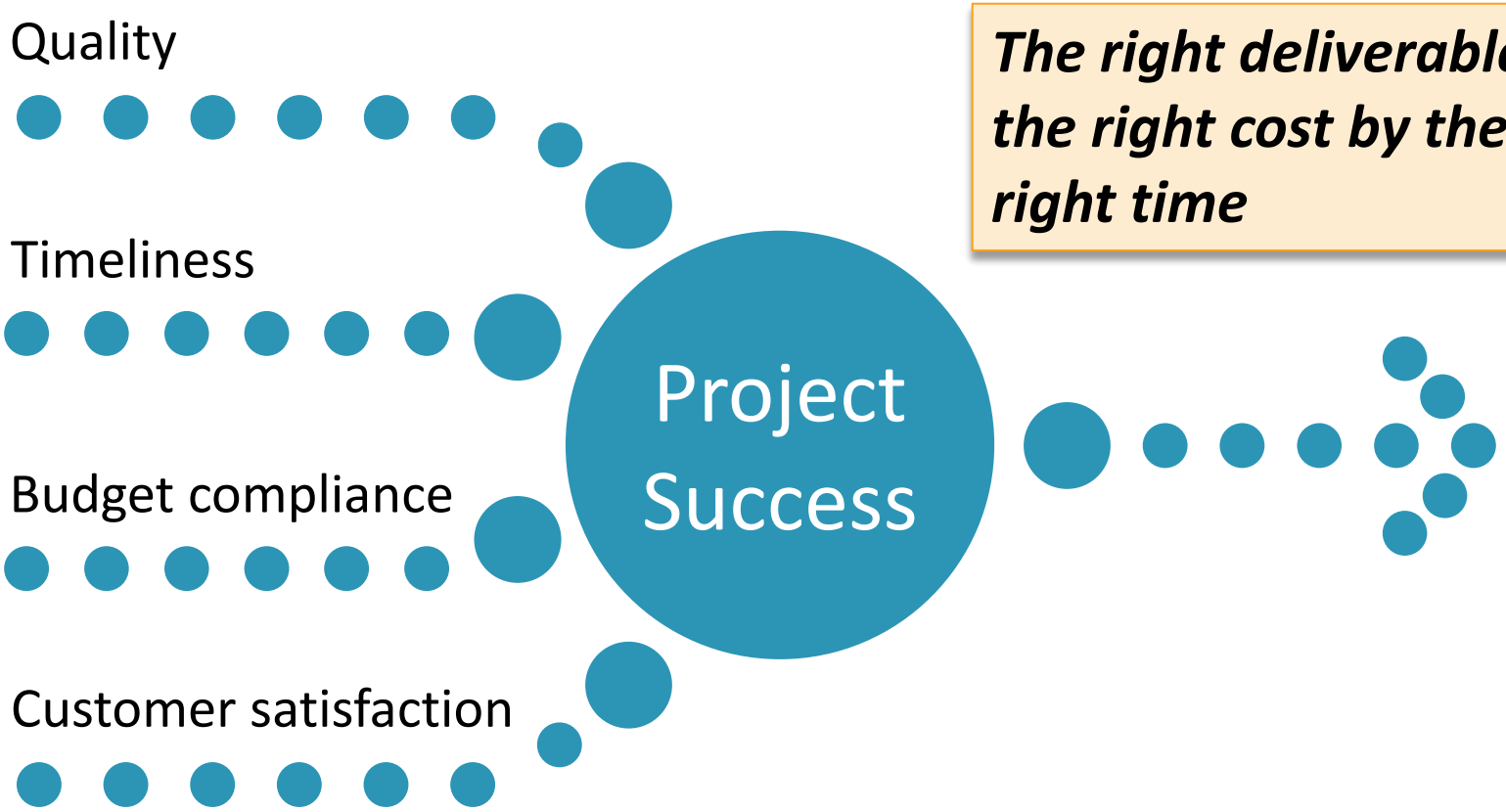


Projects Must Add Business Value

- Value: net quantifiable benefit (tangible or intangible).
- Tangible and intangible benefits are part of a value delivery system.
- Benefits greater than costs.
- How will value be measured?
- Benefits assessment after project is done:
  - Data on benefits over short, medium, or long term
  - Report on benefits realization
  - Accountability for initial benefits projections
- Add value only if project successful.

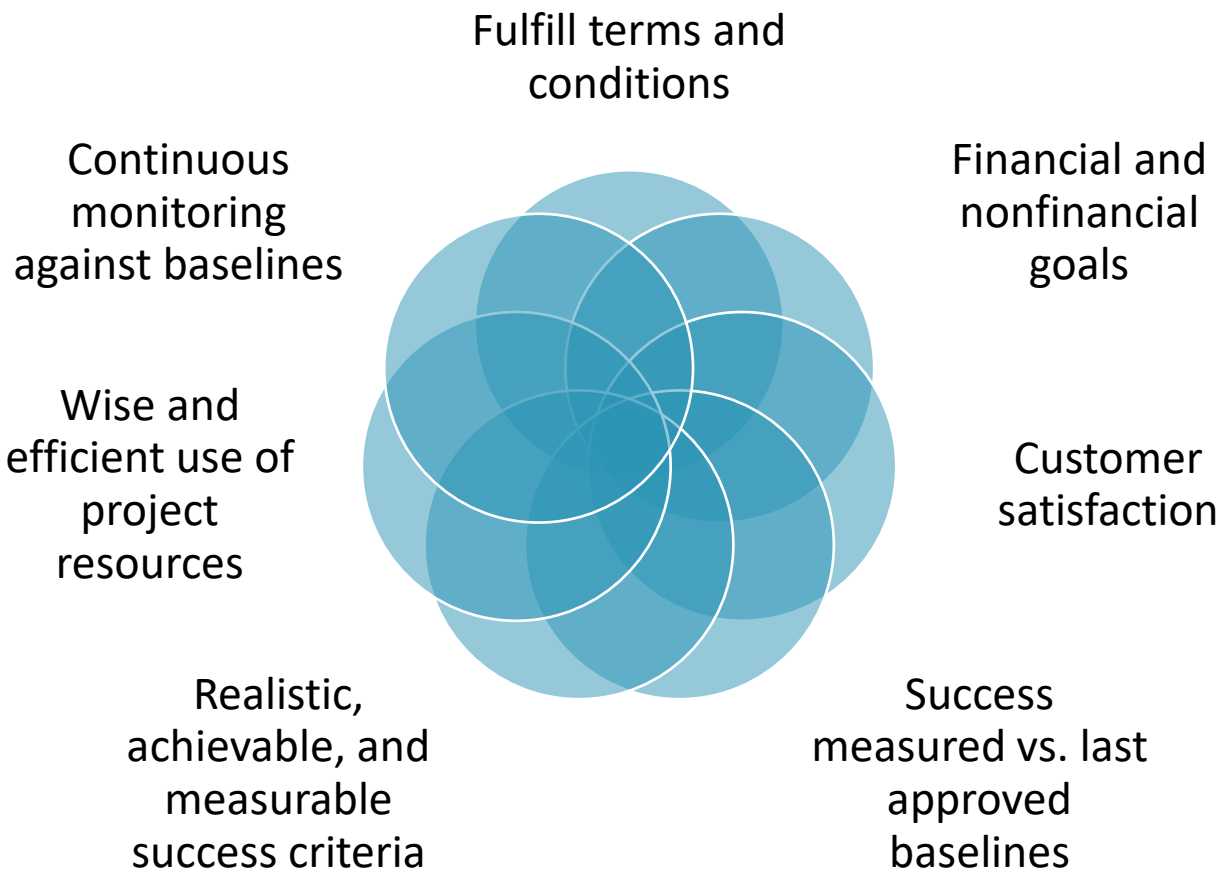
Measuring Project Success

Product and Project



The right deliverable at the right cost by the right time

Predictive Project Success



Agile and Hybrid Project Successes

- Customer satisfaction: top critical success factor
- Defining "done"
  - Story
    - Feature and quality acceptance
    - Individual and system tests
    - Demonstration
  - Iteration: Work-in-process cleared
- Project release criteria
  - Final iteration meets roadmap or cost constraint, etc.
  - Criteria revised in future iterations to reflect new end state.
  - Team, product owner collaborate:
    - Customer satisfaction
    - Feasibility

MODULE 1 Business Environment

CHAPTER 4 Compliance

Project Compliance Requirements and Classifications

Verifiable adherence to regulation or standard

Mandatory external: Government agency enacts laws, e.g., U.S. SOX or HIPAA, EU's GDPR, or health, safety, accessibility, data privacy, equal employment, environment	**Mandatory internal:** Policy, procedure, control for process or result: ethics, quality, financial/metrics (e.g., same on all projects but can limit innovation)	**Optional external:** e.g., social norms, reputation enhancers, customer technology **Optional internal:** e.g., best practices, culture

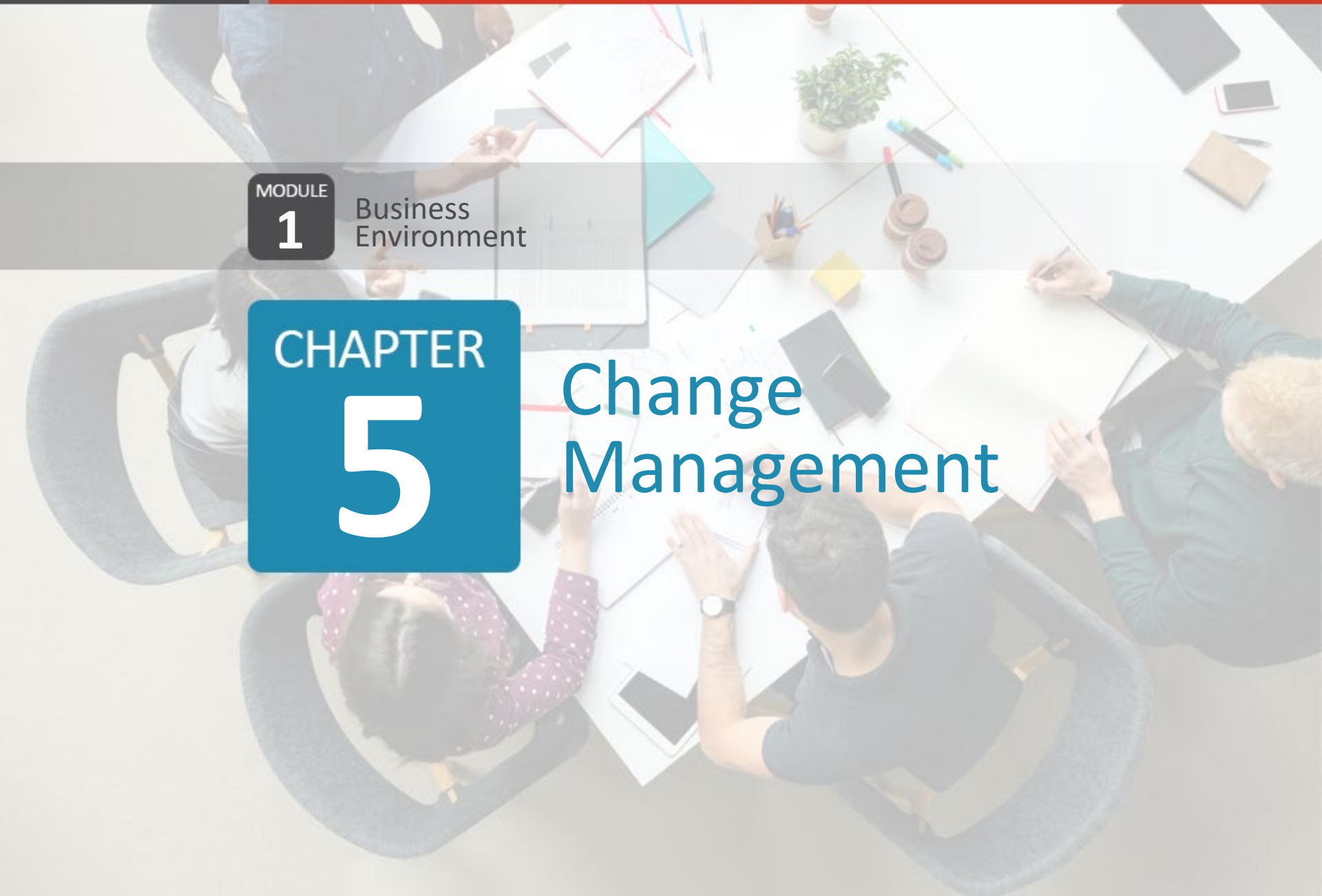
Threats and Noncompliance Consequences

- Rework
- Legal jeopardy
- Project failure
- Communicate consequences
  - To team: reduce risks
  - To sponsor/product owner: get approvals

- Examples:
  - Fines and jail time under U.S. SOX
  - Construction rework
  - HR discrimination lawsuits
  - Safety noncompliance fines
  - Contractor or union role rules violations
  - Procurement contract breaches or disputes
  - Intellectual property loss
  - Data privacy breaches

Managing Project Compliance

- Requirements documentation, risk register, or change request.
- Measure compliance.
- Build into tasks/stories.
- RACI chart: who can/cannot do what, who reviews and approves.
- Training, especially after team rollover.
- Waivers or new policies to enable agile.
- Tailoring methodology to use compliance tools.
- Failures: occurrence, root cause, and nature, speed, and effectiveness of fix.

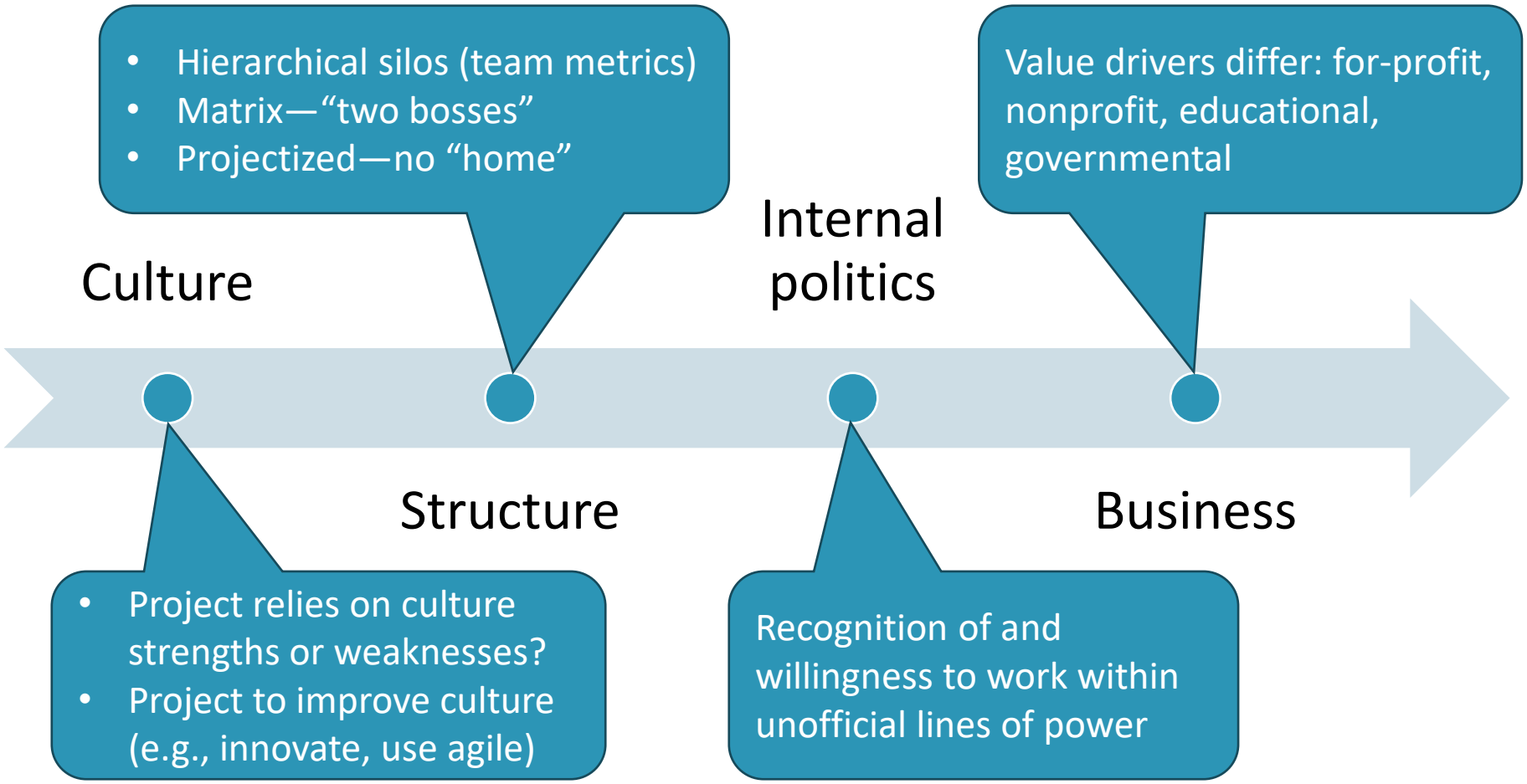


MODULE 1 Business Environment

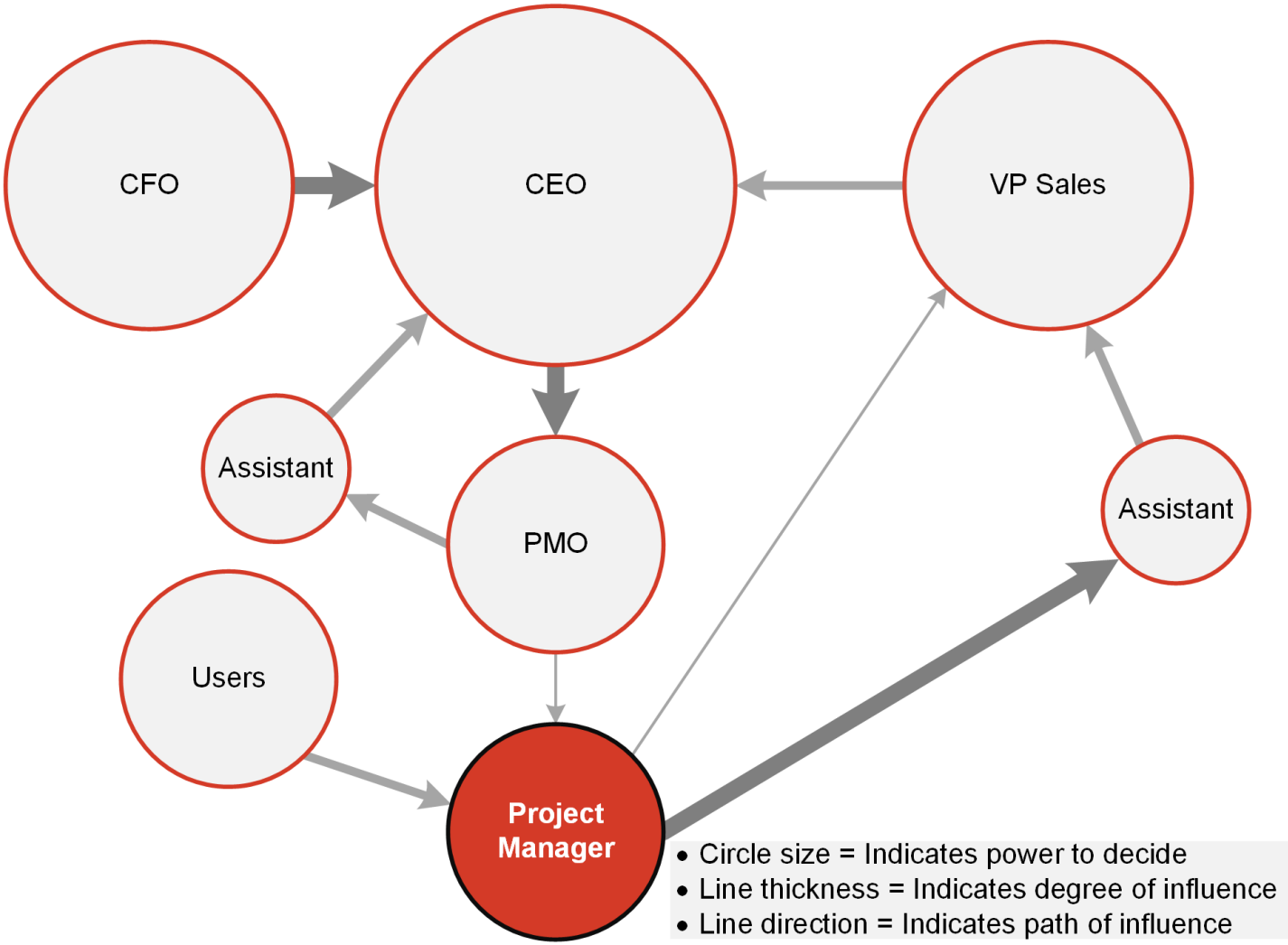
CHAPTER 5

Change Management

Change Management: Organizational Awareness



Power Mapping

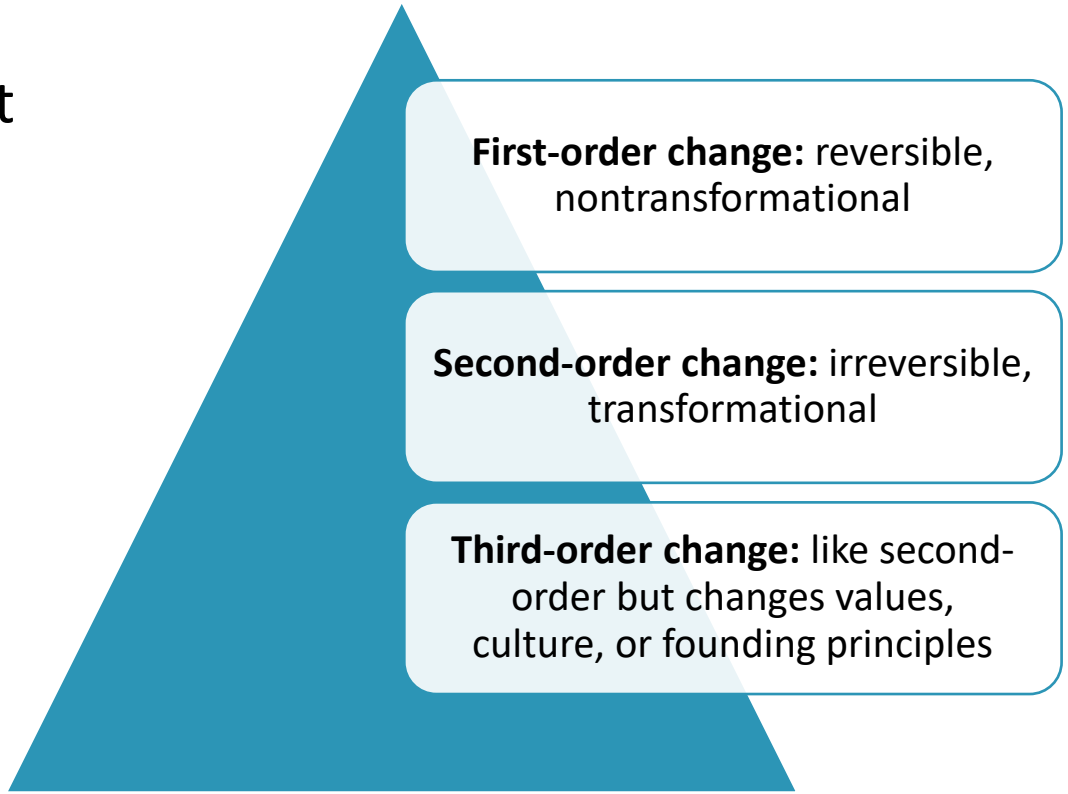


Change Impact on Project/Organization

Environmental change impacts project.

- Project success may not equal business success.
- Still aligned to strategic direction?

Project changes organization.



Resistance to Change

Individual resistance (fears)

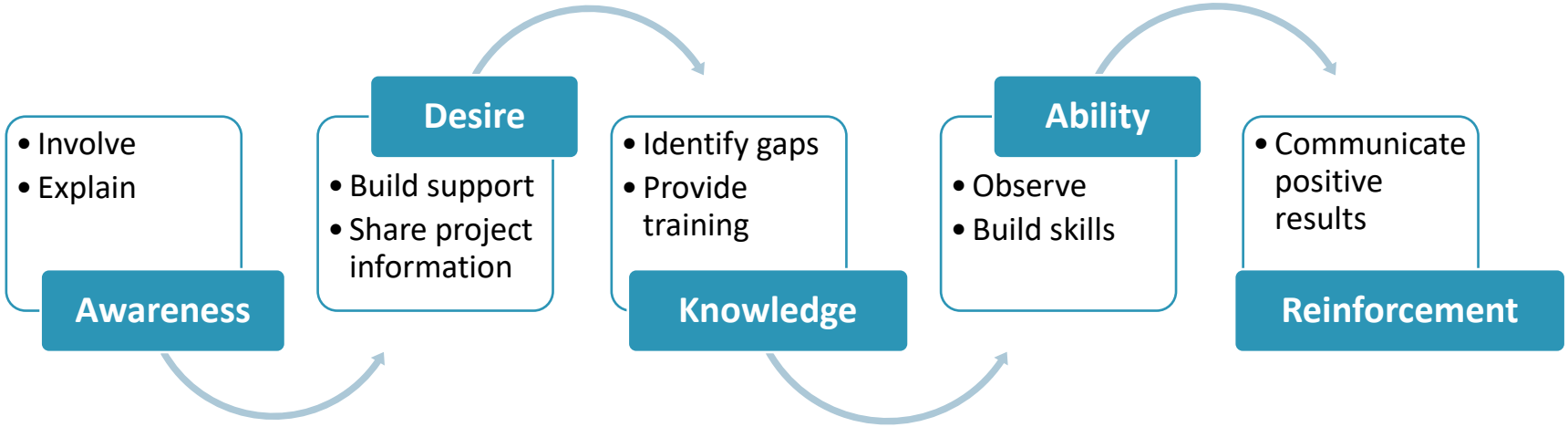
- New reporting lines, “two bosses”
- May need to share power (self-esteem)
- Resource competition (ability to do good job)
- Overwork/loss of work
- Don’t see need/benefit

Organizational resistance

- Leaders who insulate selves from daily work
- History of past failures
- Need competencies, exposure
- Bureaucracy
- Tailoring not allowed

Change Management Methodologies

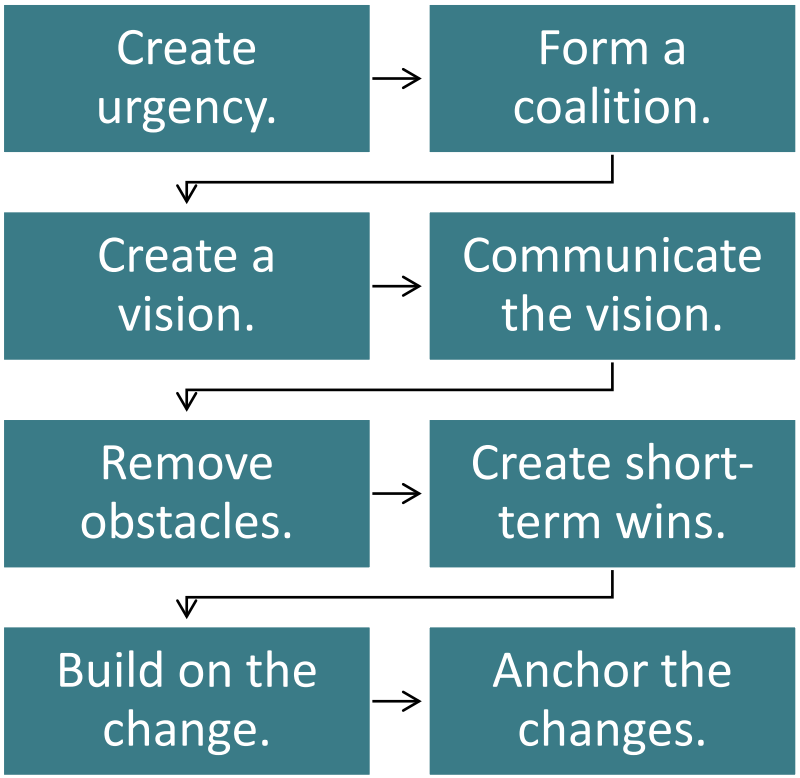
- Proactive sponsor vocalizes vision, mitigates resistance.
- Be aware of drivers and signs of resistance to change and get people's commitment to support change.



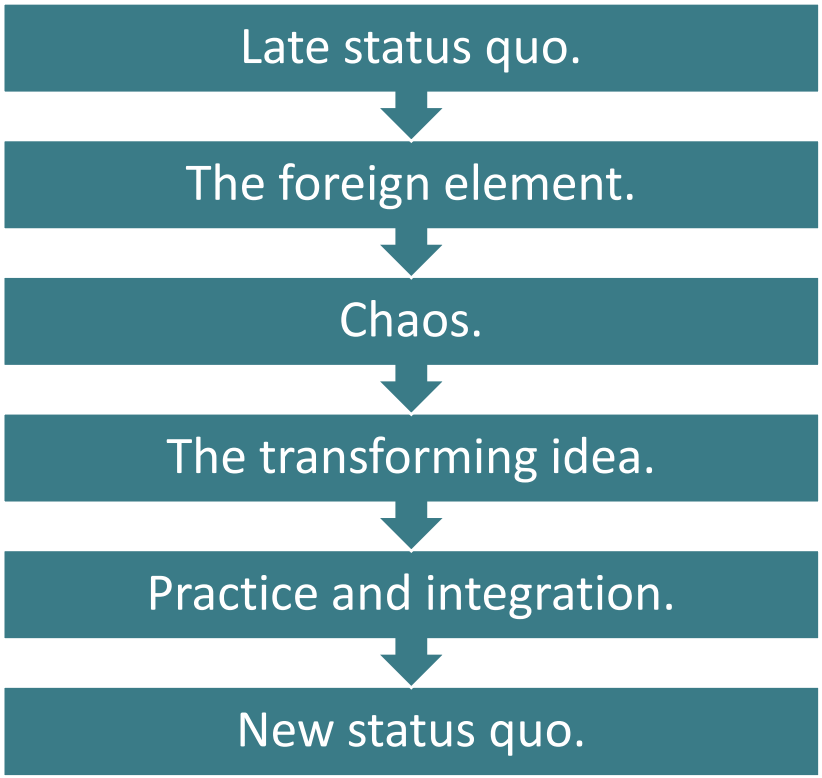
– ADKAR approach from Prosci Group

Kotter's and Satir's Change Models

Kotter's Network-Based Change Model



Virginia Satir Change Model



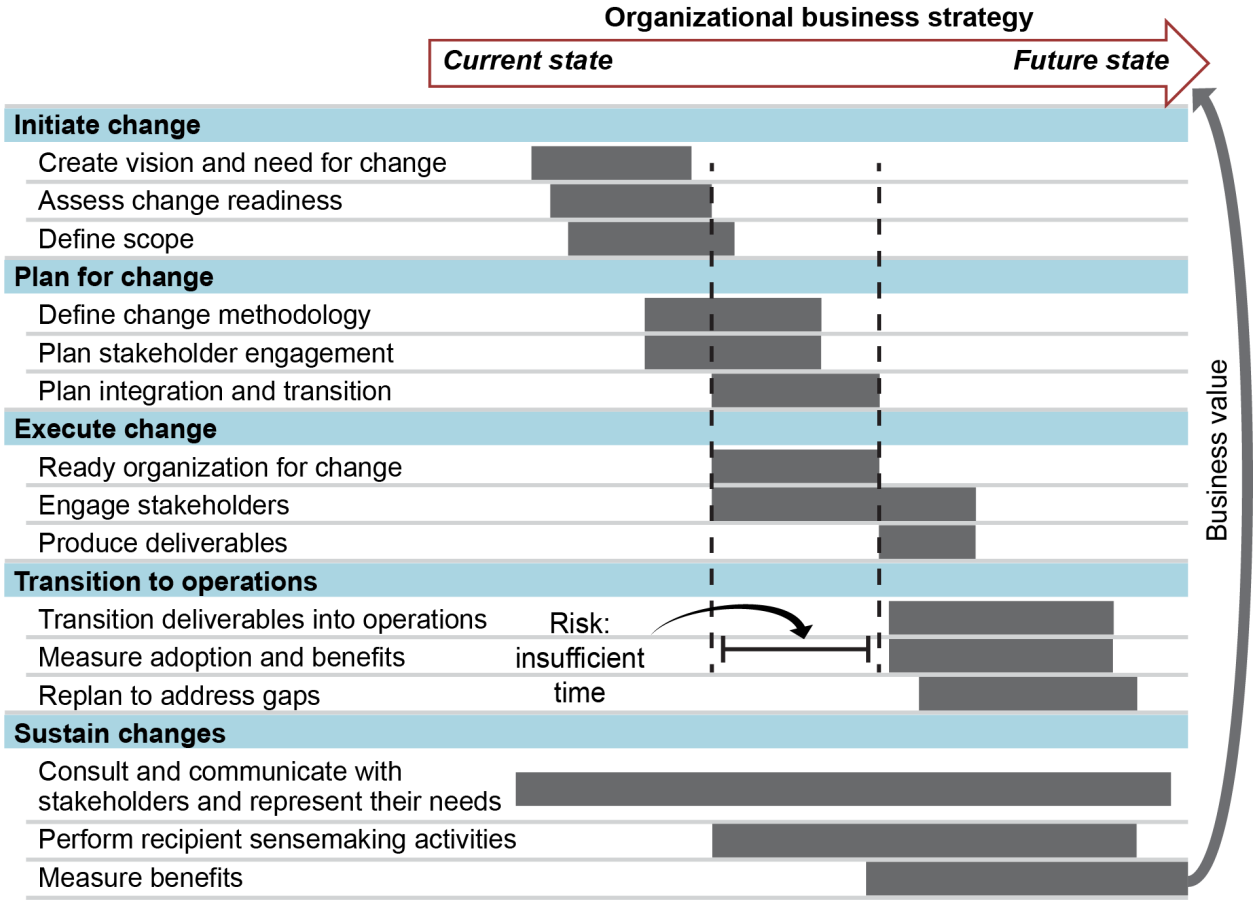
Bridges & Agile

Bridges' Transition Model

Agile for Change Management

- Useful due to built-in feedback and replanning processes.
- Changes that need to be made are added to backlog.
- Changes can be treated as experiments.

Change Life Cycle Framework



Source: Adapted from PMI's *Managing Change in Organizations: A Practice Guide*

Surveying External Business Environment Changes

Macro-economic

- **Technology:** knowledge management, computational power, technological capability, global communications
- **Culture:** education levels, social networking, social pressures, cultural shifts
- **Socioeconomics:** economy, population growth, demographics, taxes, new markets, regulatory

Micro-economic

- Competitor actions
- Financing issues
- Supply issues
- Legal issues
- Customer issues

When Project Manager Detects/Is Informed of Change

- Raise concerns with sponsor/product owner.
- Change request with recommendation.
- Discussion and analysis.
- Sponsor decides on change in scope, time, or budget.
- Risk register, planned response, and monitoring.
- Mitigate threats, capitalize on opportunities.

Adapting Projects to External Changes

Agile or predictive projects

- External dependencies (e.g., inspections, supply delays).
- Work on tasks not delayed, crash tasks after delay resolved.
- Measure lead times needed, responsiveness.

Predictive projects

- Integrated change request after data analysis.
- Adjust contingency reserves for new known risks.

Agile projects

- Replan next iteration.
- Add/modify/reprioritize backlog.