

PM Illustrated



Learn Project Management - **Visually**

A Visual Learner's Guide to Project Management

By

Mike Griffiths PMP, PMI-ACP

Coverage of the entire PMP® exam through mindmaps,
cartoons and illustrations.



PM Illustrated: A Visual Learner's Guide to Project Management

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Mike Griffiths

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Contents

[Title Page](#)

[Copyright](#)

[Introduction and Visual Learning](#)

[The New PMP Exam](#)

[How this Book is Organized](#)

[How the Book Adds to the PM Illustrated Website Content](#)

[Agile Primer](#)

[Case Studies Profiling Different Life Cycles](#)

[WORK GROUP 1 – BUILDING A TEAM](#)

[1.6 Build a Team](#)

[1.12 Define Team Ground Rules](#)

[1.8 Negotiate Project Agreements](#)

[1.4 Empower Team Members and Stakeholders](#)

[1.5 Ensure Team Members/Stakeholders are Adequately Trained](#)

[1.11 Engage and Support Virtual Teams](#)

[1.10 Build a Shared Understanding about the Project](#)

[WORK GROUP 2 – STARTING THE PROJECT](#)

[2.13 Determine Appropriate Project Methodology / Methods and Practices](#)

[2.8 Plan and Manage Scope](#)

[2.5 Plan and Manage Budget and Resources](#)

[2.6 Plan and Manage Schedule](#)

[2.7 Plan and Manage Quality of Products / Deliverables](#)

[2.9 Integrate Planning Activities](#)

[2.11 Plan and Manage Procurement](#)

[2.14 Establish Project Governance Structure](#)

[2.17 Plan and Manage Project/Phase Closures or Transitions](#)

[WORK GROUP 3 – DOING THE WORK](#)

[2.3 Assess and Manage Risks](#)

[2.1 Execute Project with the Urgency Required to Deliver Business Value](#)

[2.2 Manage Communications](#)

[2.4 Engage Stakeholders](#)

[2.12 Manage Project Artifacts](#)

[2.10 Manage Project Changes](#)

[2.15 Manage Project Issues](#)

[2.16 Ensure Knowledge Transfer for Project Continuity](#)

[WORK GROUP 4 – KEEPING ON TRACK](#)

[1.2 Lead a Team](#)

[1.3 Support Team Performance](#)

[1.7 Remove Impediments for the Team](#)

[1.1 Manage Conflict](#)

[1.9 Collaborate with Stakeholders](#)

[1.13 Mentor Relevant Stakeholders](#)

[1.14 Support Team Performance Through the Application of Emotional Intelligence](#)

WORK GROUP 5 – FOCUS ON THE BUSINESS

[3.1 Plan and Manage Project Compliance](#)

[3.2 Evaluate and Deliver Project Benefits and Value](#)

[3.3 Evaluate & Address External Business Environment Changes for Impact on Scope](#)

[3.4 Support Organizational Change](#)

[PMP Exam Taking Tips](#)

[Additional Resources and Other Products](#)

[About the Author](#)

PM Illustrated



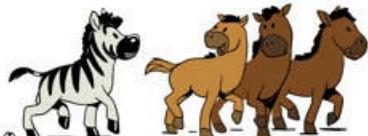
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Coverage of the entire PMP® exam through mindmaps,
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(Support diversity and inclusion)



(Be the bridge to success for others)



(Understand requirements)

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The Legal Stuff

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Dedication

In memory and celebration of Barry Fellows, friend and mentor, who taught me not to take things too seriously. Life is short, have some fun, and live life to the fullest.

Acknowledgements

I would like to thank Samantha Griffiths for her initial review of the content and pointing out things that just made no sense, had missing words, or my rambling rants, etc. Sam also created many of the images and animations featured on the PM Illustrated website.

The cartoons were created by the talented Fabián Fucci, who I have been fortunate to collaborate with for the last 10+ years. The process involved hundreds of back-and-forth emails, sketches, and revisions. It often felt surreal to spend my days during COVID lockdown discussing beavers, bears and dung beetles. However, I think it was worth it. Fabián, I appreciate your patience, persistence, and flair for depicting emotion.

Finally, I would like to thank Jeff Furman for his review of the website and the first draft of this book. The PM Illustrated website and book are all the better for your many suggestions, thank you.

Introduction and Visual Learning

Welcome to **PM Illustrated: A Visual Learner's Guide to Project Management**. This book shows you the scope and topics in the new PMP® exam. It will help you learn the required subjects more quickly by making use of images, spatial memory, and visual learning.

Visual Learning

Visual learning is a learning style that favors images.

- If you like graphics, images, colors and maps to communicate thoughts, you are a visual learner
- If you need to see information to understand it or create your own vision to clarify ideas, you are a visual learner
- If you looked at the image below before reading this text, you are a visual learner

Text book

1.2.2 Support diversity and inclusion

- Foster an environment that is inclusive of differing age, race, experiences, cultures, outlooks, ethnicities, genders and socioeconomic status.

1.2.3 Value servant leadership

- Servant leaders share power, puts the needs of the employees first and helps people develop and perform as highly as possible.

1.2.5 Inspire, motivate and influence team members/stakeholders

- Construct team norms, social contracts and reward systems to inspire and motivate the desired behaviors.

Visual Learning

1.2.2 Support Diversity and Inclusion



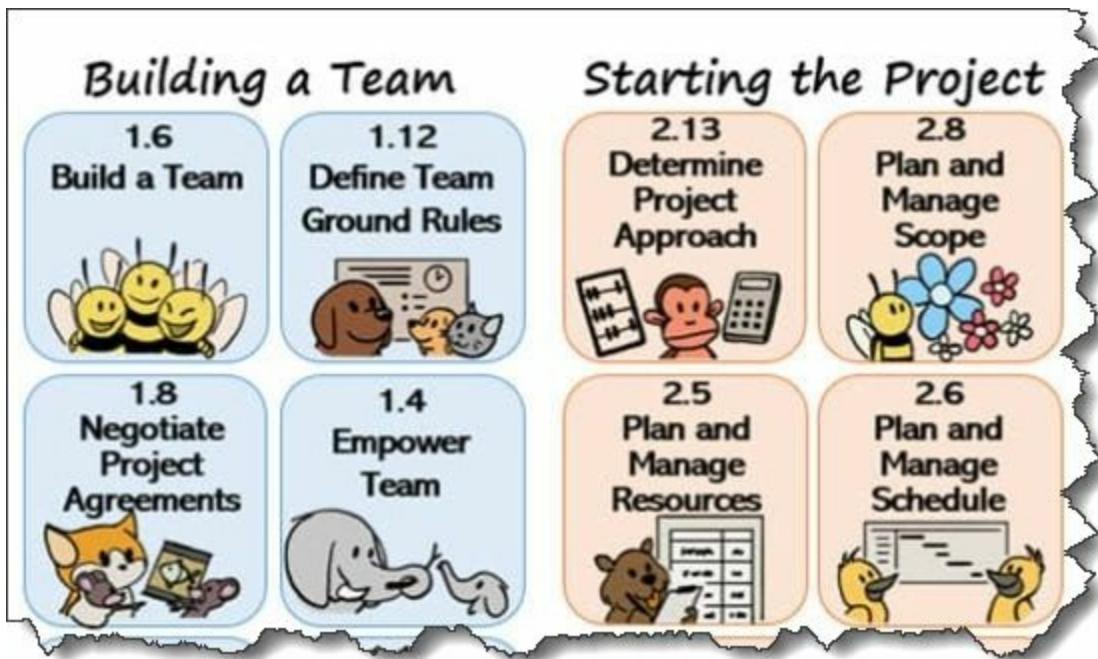
1.2.3 Value Servant Leadership



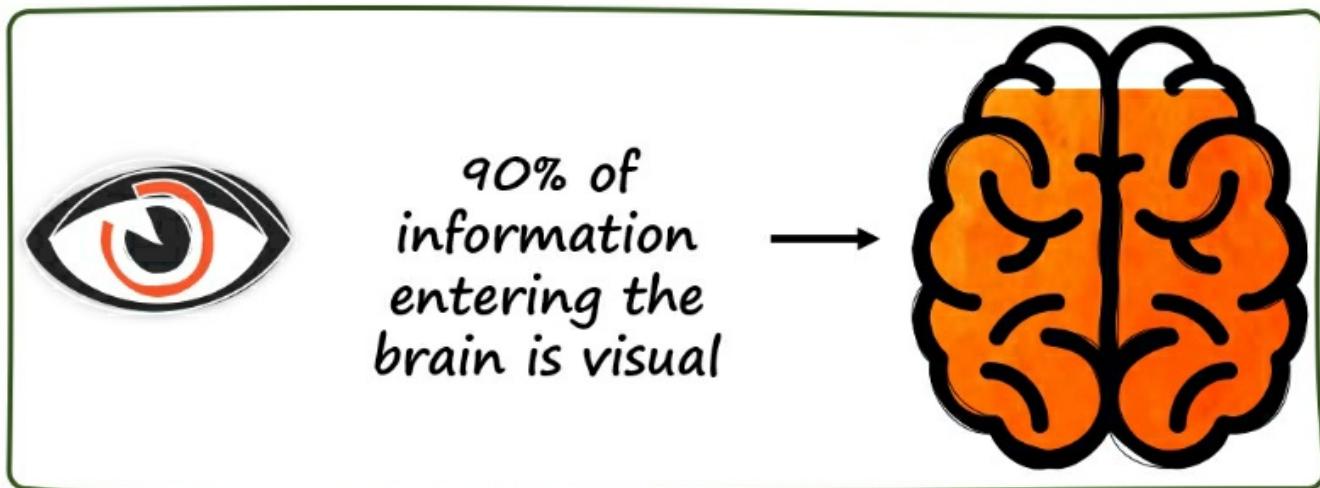
1.2.5 Inspire and Motivate Team Members



This book illustrates project management concepts through cartoons, roadmaps and other graphics. It will help you prepare for the PMP® exam by showing the scope of the exam and different views of how to slice-and-dice the content to understand it better.



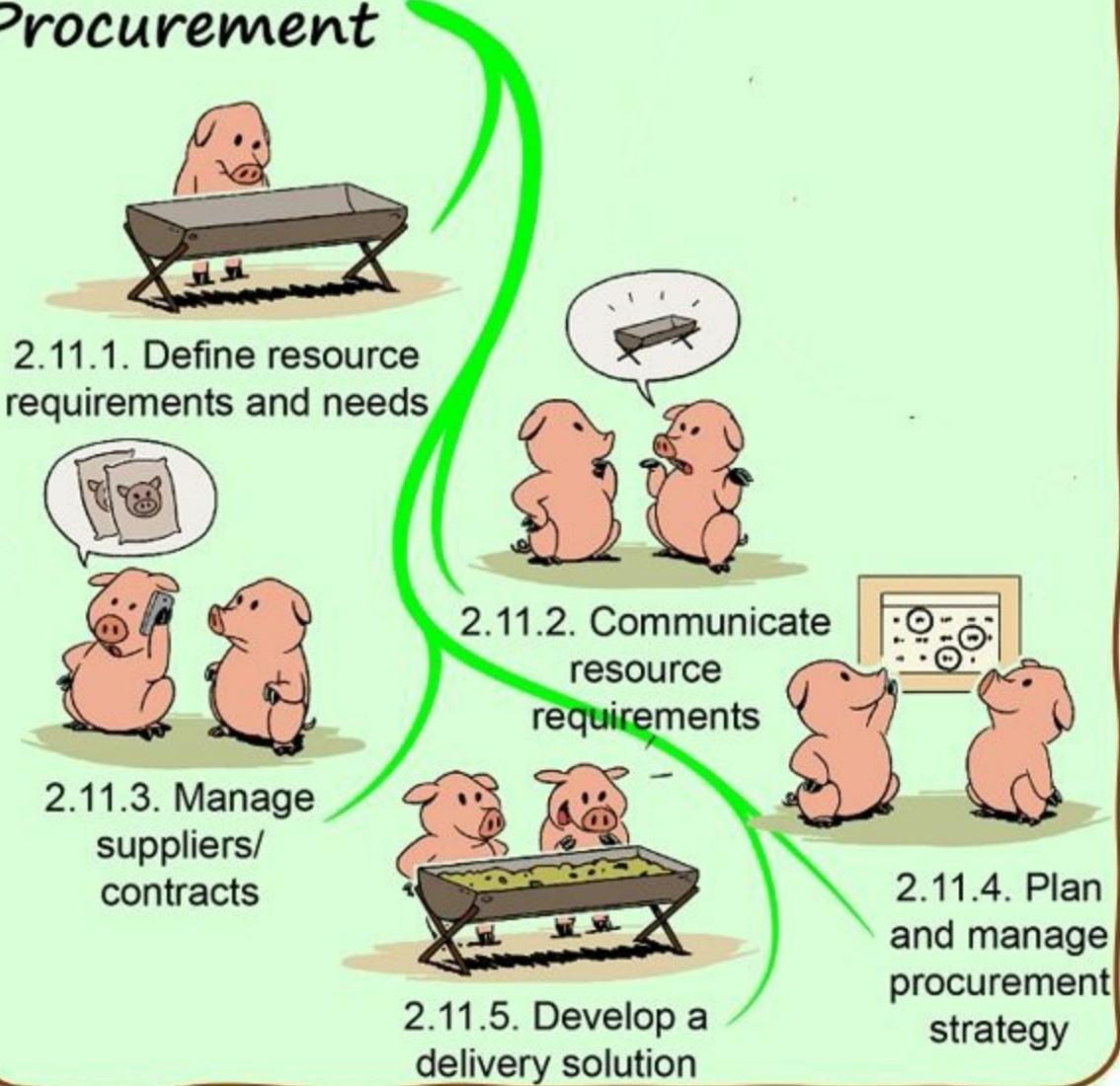
This book is for fellow visual thinkers who like to see the big picture before getting into details. Sometimes called “right-brained,” after the portion of the brain responsible for processing images, we would rather see how something works than being told the information in detail.



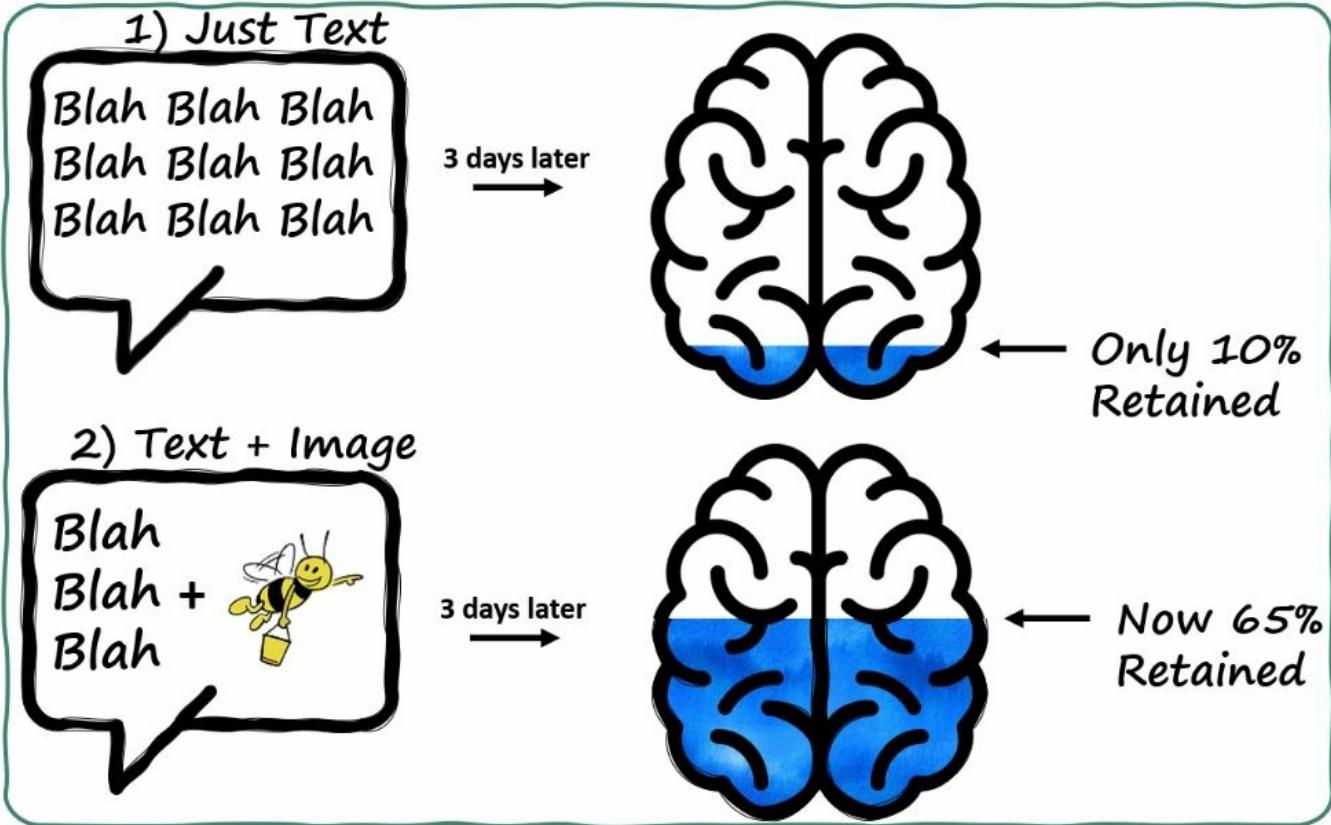
Research into visual thinking by David Hyerle, creator of Thinking Maps methodology, reports that 90% of the information entering the brain is visual. 40% of all nerve fibers connected to the brain are connected to the retina, and a full 20% of the entire cerebral cortex is dedicated to vision, so let's use it.

By using mind maps, this book shows the workings of project management and illustrates how all the parts link together. Many memorization techniques are based on spatial memory - by associating ideas with places, we can recall them more easily.

2.11. Plan and Manage Procurement



Using a combination of images, mind maps, and explanations, we engage the right and left hemispheres of our brains to build stronger comprehension and better recall. Tests show most people only remember 10% of what they heard three days ago. Add an image to the message, and this figure jumps to 65%.



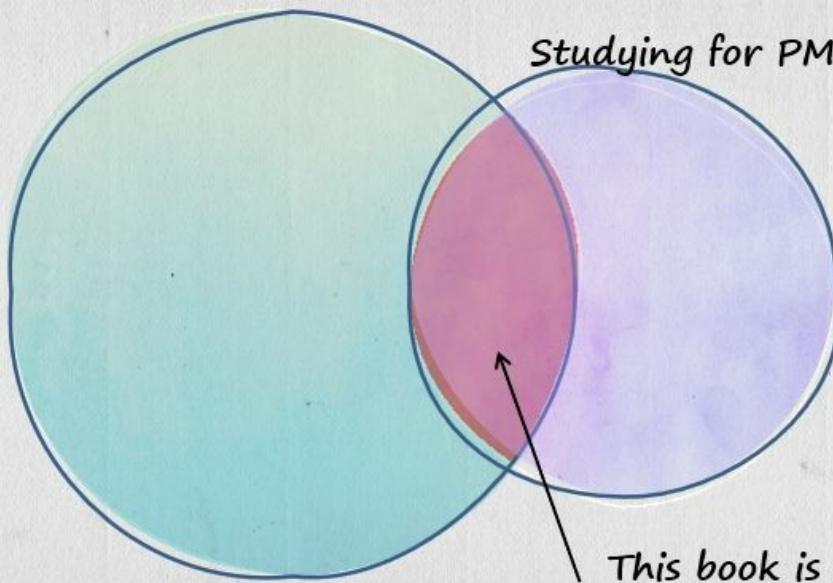
So, if you are going through all the effort of studying for your PMP exam, make it worth your time. Use visual tools instead of reading and rereading content up to 6 times to achieve similar retention.

So, if you are a visual learner and studying for your PMP® credential, you are in the right place.

Everyone

Visual Learners

Studying for PMP



This book is for you!

The New PMP Exam

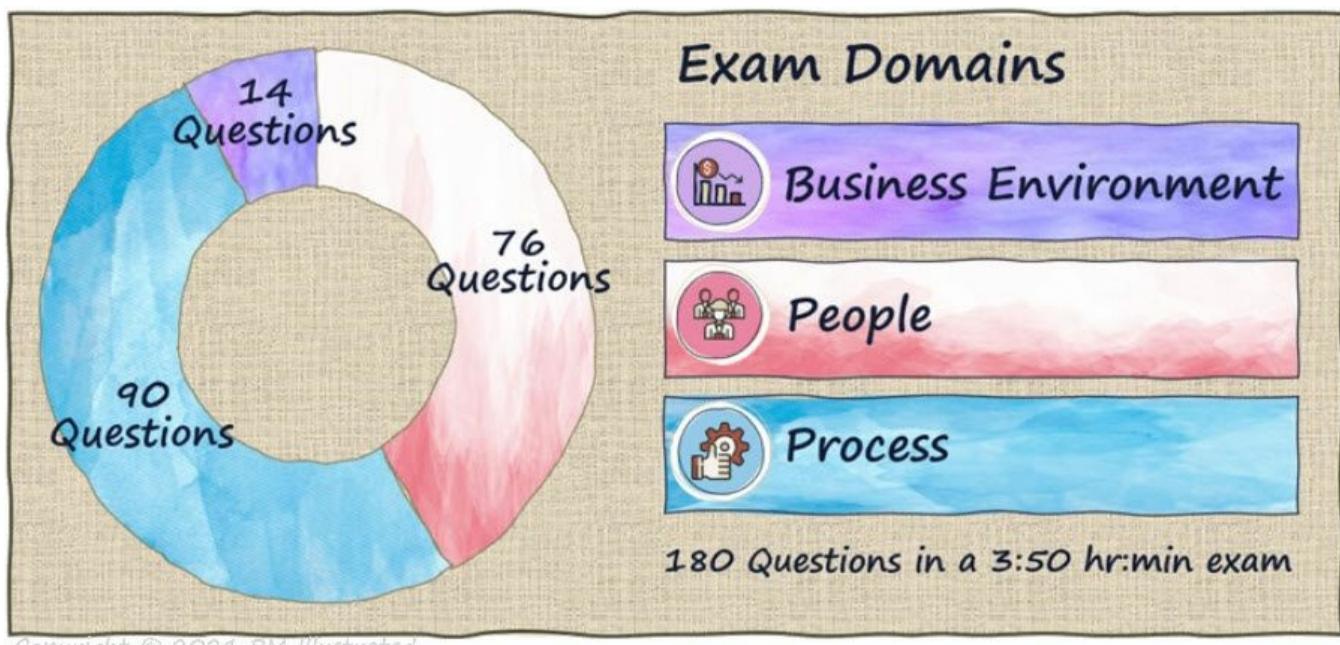
On January 2, 2021, the PMP® exam radically changed its structure and content. The changes were based on research undertaken by PMI into which tasks and approaches project managers frequently use.



New Focus

Based on this research, the new exam dropped the old domains based on process groups (Initiating, Planning, Executing, Monitoring and Controlling, Closing) and is now based on three new domains:

- Business Environment (8% of questions)
- People (42% of questions)
- Process (50% of questions)



New Content

PMI's research revealed that many project managers use agile approaches or agile concepts in

hybrid life cycles. So, the new exam now covers predictive, hybrid and agile approaches.

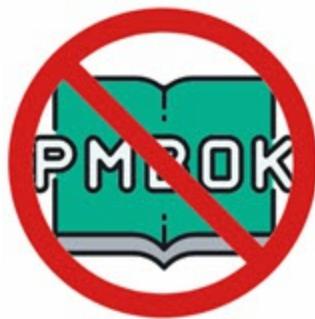
These agile concepts and increased weight on the people aspects of projects are a significant shift. Topics such as conflict resolution, servant leadership, and retrospectives were previously only in the PMI-ACP® exam but will now also be featured in the PMP® exam (although not in so much depth or frequency).



New Question Types

In addition to the traditional four-option multiple-choice questions used in the past, PMI is now using some new question types. There are **multiple-select** questions, where you would select all the appropriate options from a more extensive list. For example, select the three correct answers from a list of six.

There are also **drag-and-drop** options to match scenarios/options in one column to their corresponding options in another column. Finally, **click-on-the-image** questions where you have to select the appropriate area of a chart or graph.



Not a Test of the PMBOK® Guide

The PMP® exam is not a test of the PMBOK® Guide. When question writers create questions, they reference two source documents for each question. This is to ensure questions are based on approved sources and not just their belief or suggestion. Previously, the PMBOK Guide was frequently used as one of the two sources, but it was always backed up by at least one non-PMBOK reference.

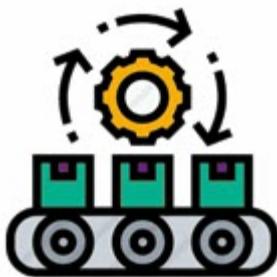
Now there is more people-based and agile-approach coverage, more questions will come from outside the PMBOK Guide. Exam takers need to understand and apply the concepts described in the new Exam Content Outline (ECO). That's where this website and the book come in.



The Scope of the Exam

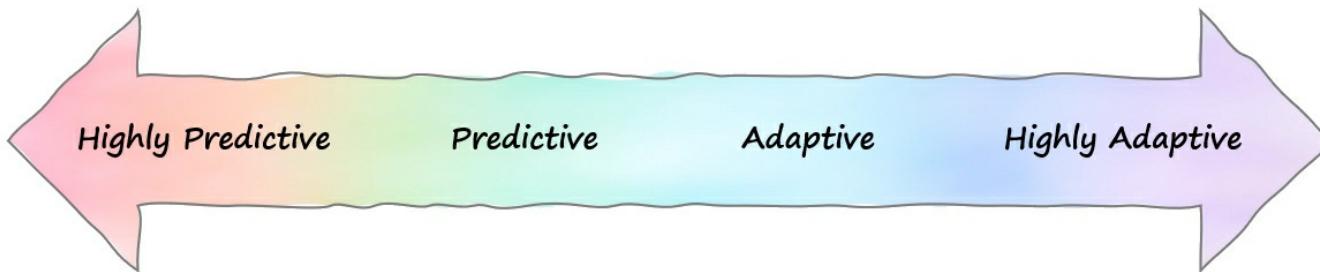
This website and associated book are based on the new ECO topics. These domains, tasks and enablers align with the new questions in the PMP® exam. Think of the ECO as the scope of the exam. If something is listed in the ECO, there can be exam questions on it. Things outside the ECO will not be tested in the exam.

The tasks you see on the content maps (such as “1.1 Manage Conflict” and “1.2 Lead a Team”) are the tasks from the new ECO. This is why this website, and the book are structured the way they are. It is to match the sets of questions used in the exam.



Multiple Life Cycles

The new exam tests knowledge of predictive (plan-driven/waterfall) life cycles as well as agile and hybrid life cycles. If we lay these approaches out on a spectrum, projects can exist anywhere from Highly Predictive through to Highly Adaptive.



Summary

The new PMP® exam is very different. No longer is the PMBOK® Guide a primary study reference. The new ECO draws upon people, process and business environment questions. It also embraces agile and hybrid lifecycles.

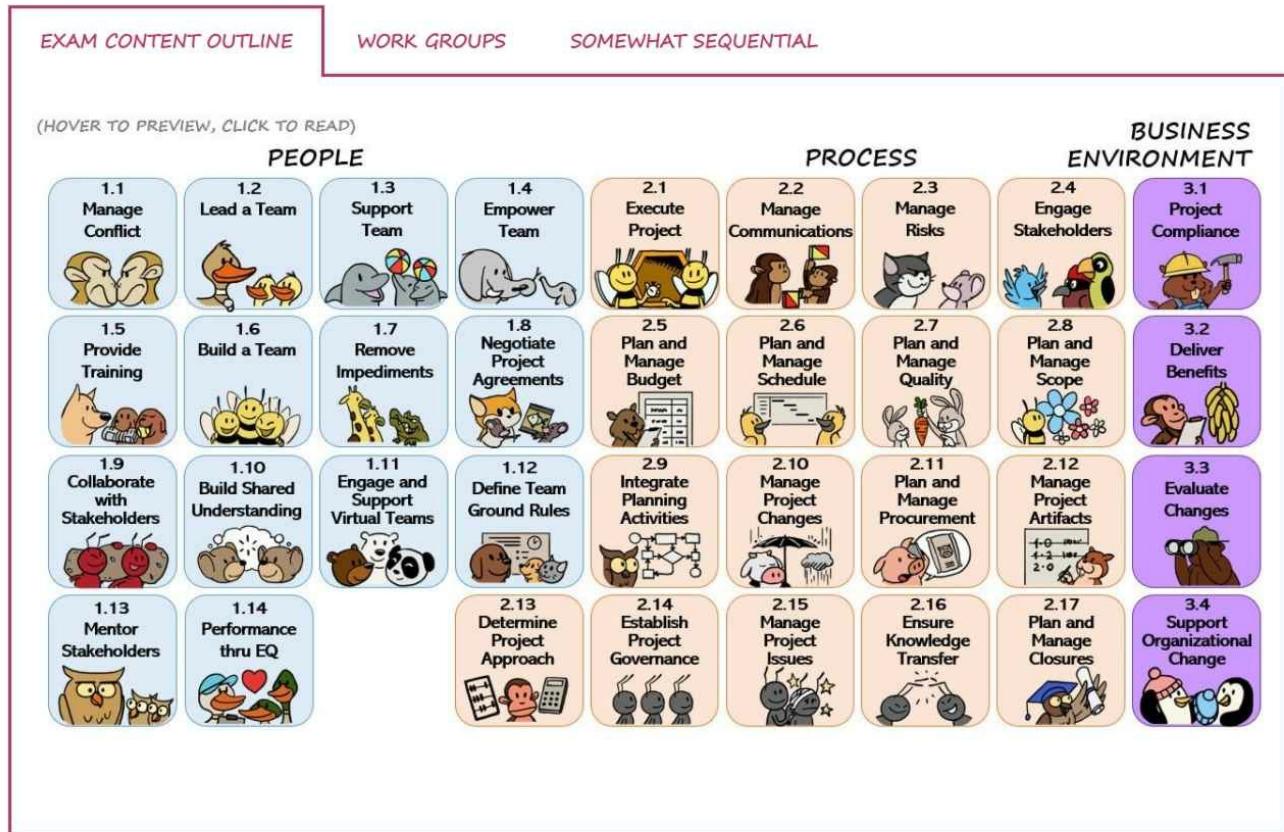
The good news is these changes reflect how today’s projects operate. To understand and answer the questions, there is less converting to PMI process and recalling what comes next in the sequence. Instead, it comes down to knowing and applying the tasks outlined in the ECO, and that’s why you are here. We make the exam scope visual and memorable so you can understand and recall it more easily.

How this Book is Organized

The new PMP® exam is based on the published Exam Content Outline (ECO). This PMI publication lists the domains, tasks and enablers tested in the exam. Much like a requirements document or product backlog describes the entire scope of a project, the ECO describes the entire scope of the PMP® exam.

The new PMP® Exam Content Outline has three domains (People, Process, and Business Environment) and 35 tasks - as you probably recall from the PM Illustrated website.

Choose your view of the content:



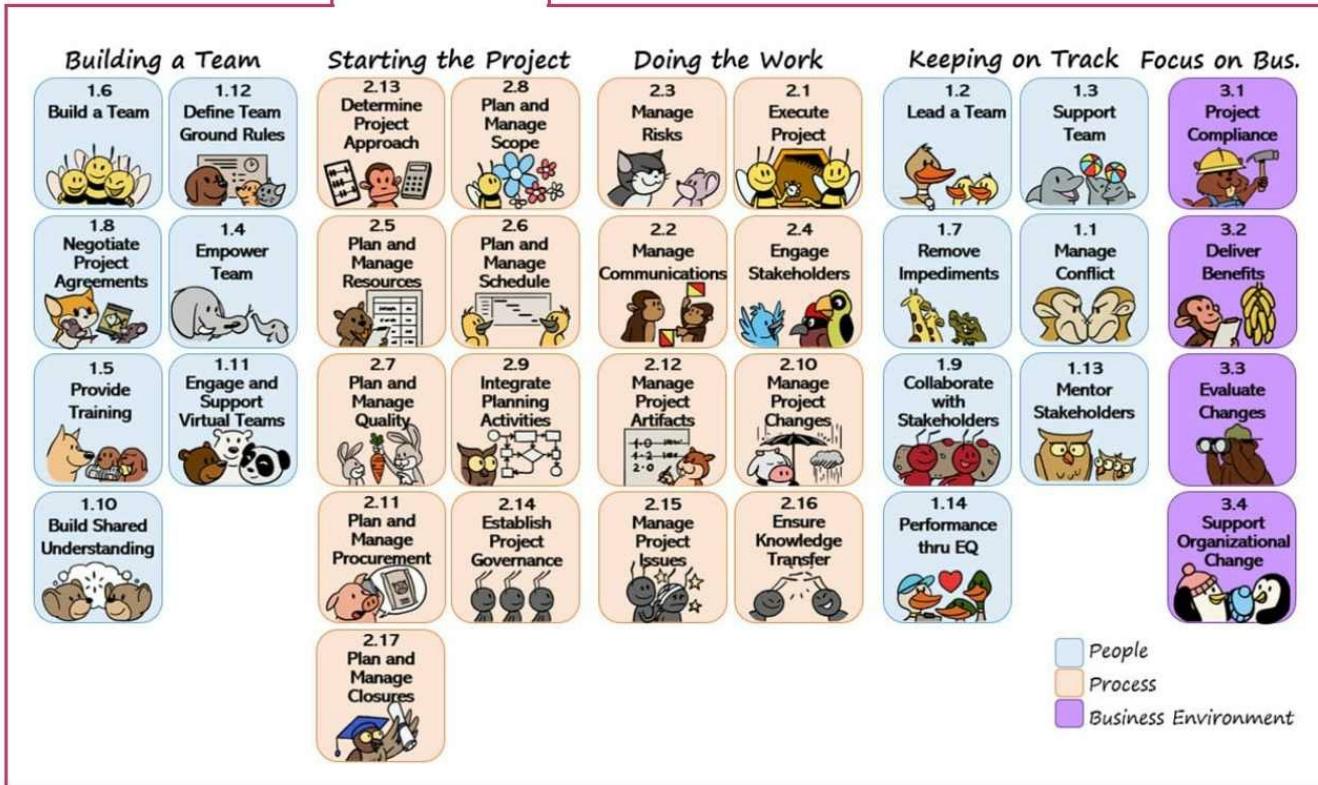
Unlike the website that provides three different ways of navigating the content, I had to choose one for the book. PMI Authorized Training Partners (ATPs) use a syllabus and training materials arranged around Work Groups which is the second tab on the PM Illustrated website.

So, rather than going through the ECO numerically (starting with “1.1 Manage Conflict”) I decided to use the ATP Work Group sequence. That way, if someone has taken ATP training and is looking for additional study materials the book will follow the training course sequence.

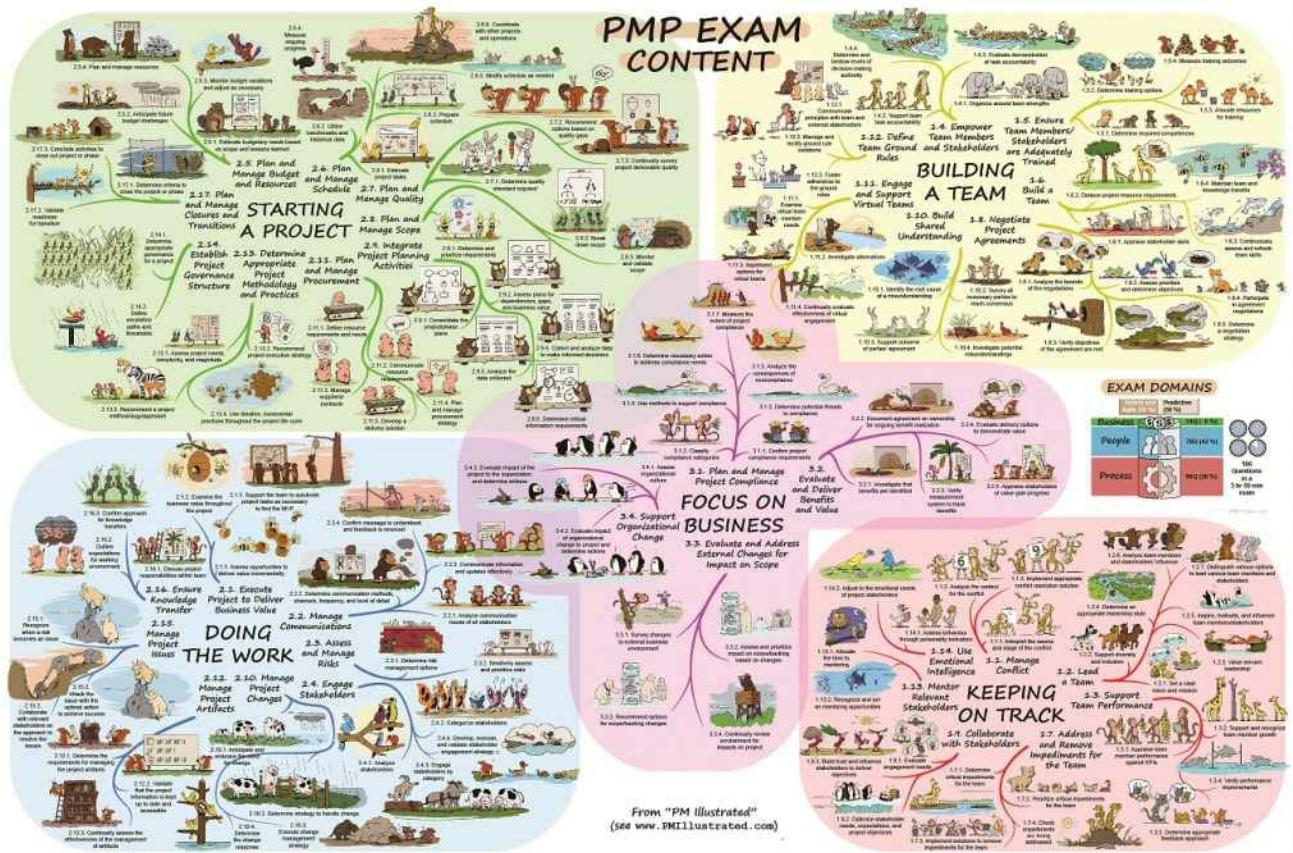
EXAM CONTENT OUTLINE

WORK GROUPS

SOMEWHAT SEQUENTIAL



This structure also aligns with the PM Illustrated Big Picture Mindmap Poster, portions of which are used in the book to summarize and preview content.



Icons Used in This Book



Throughout this book, you'll find the following icons.

Traditional – Mr. Carthorse is large and strong and tells us about traditional, plan-driven life cycle concepts. These approaches are sometimes also called waterfall, serial or predictive.



Agile – Ms. Gazelle is our agile ambassador, here to explain all things small, fast, lean, and agile. These life cycles and approaches are sometimes called iterative and incremental.



Hybrid – Mx. Zebra is somewhere between Mr Carthorse and Ms Gazelle in terms of strength and speed. Mx Zebra explains hybrid approaches.



Remote Teams – These distant-cousin bears explain virtual and remote team concepts to us.



Smart Fox – Mrs. Fox is smart and explains great ideas learned from life experience. Not always topics in the exam, but valuable advice for putting these skills to use in the real world.



Undercover Mole – Undercover Mole provides insights into the PMP® exam and general exam taking tips.

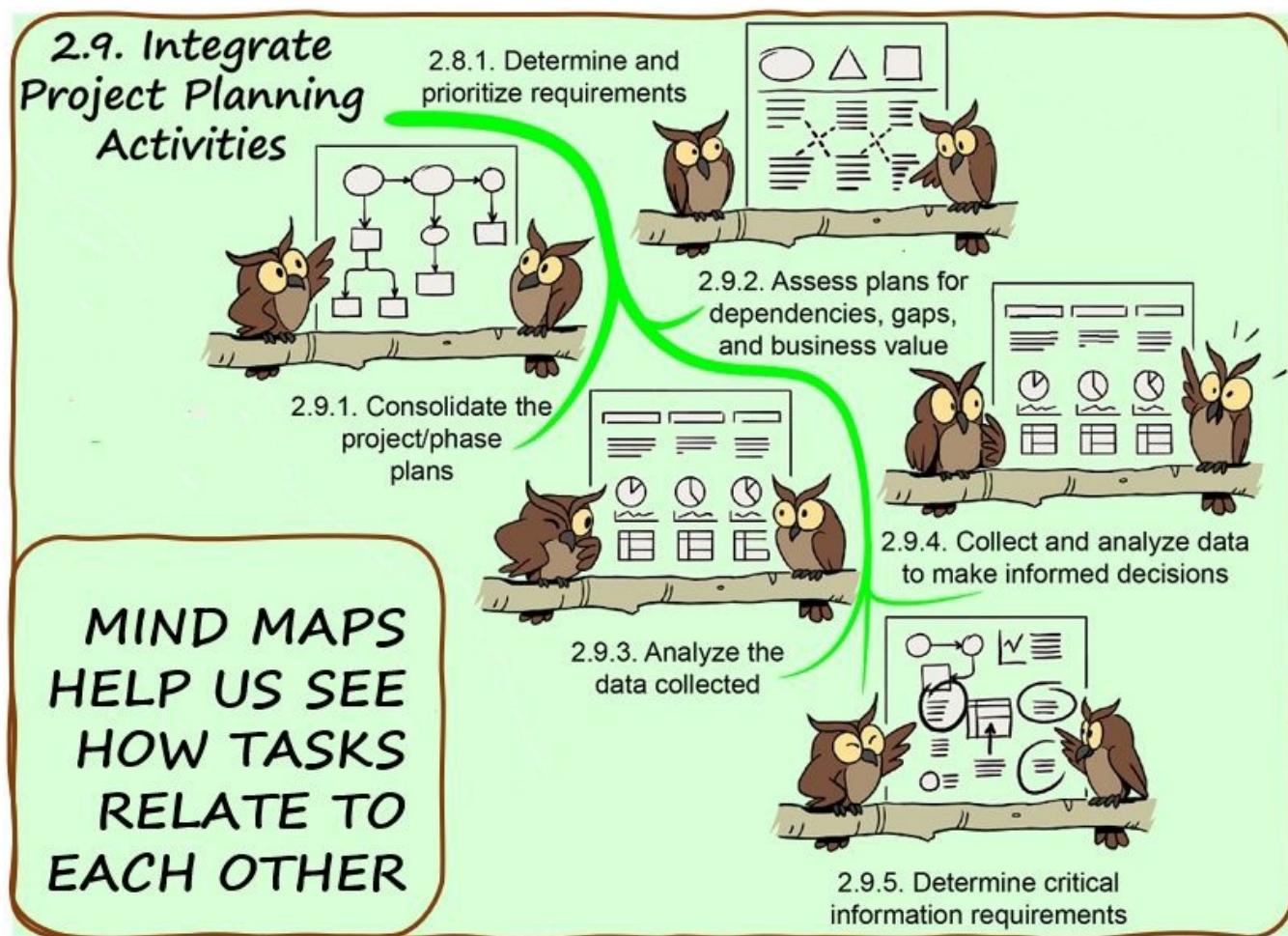
How the Book Adds to the PM Illustrated Website Content

This book provides all the website content, plus Mind Maps, an Agile Primer, Life Cycle Case Studies, Study Tips, and more. Here are some of the many valuable extras in the book (that are NOT in the free website).



More Visual Content

This book features mindmaps to provide further context and act as navigation and review tools.



Agile Primer

Not on the website, this book features an Agile Primer. This provides a comprehensive

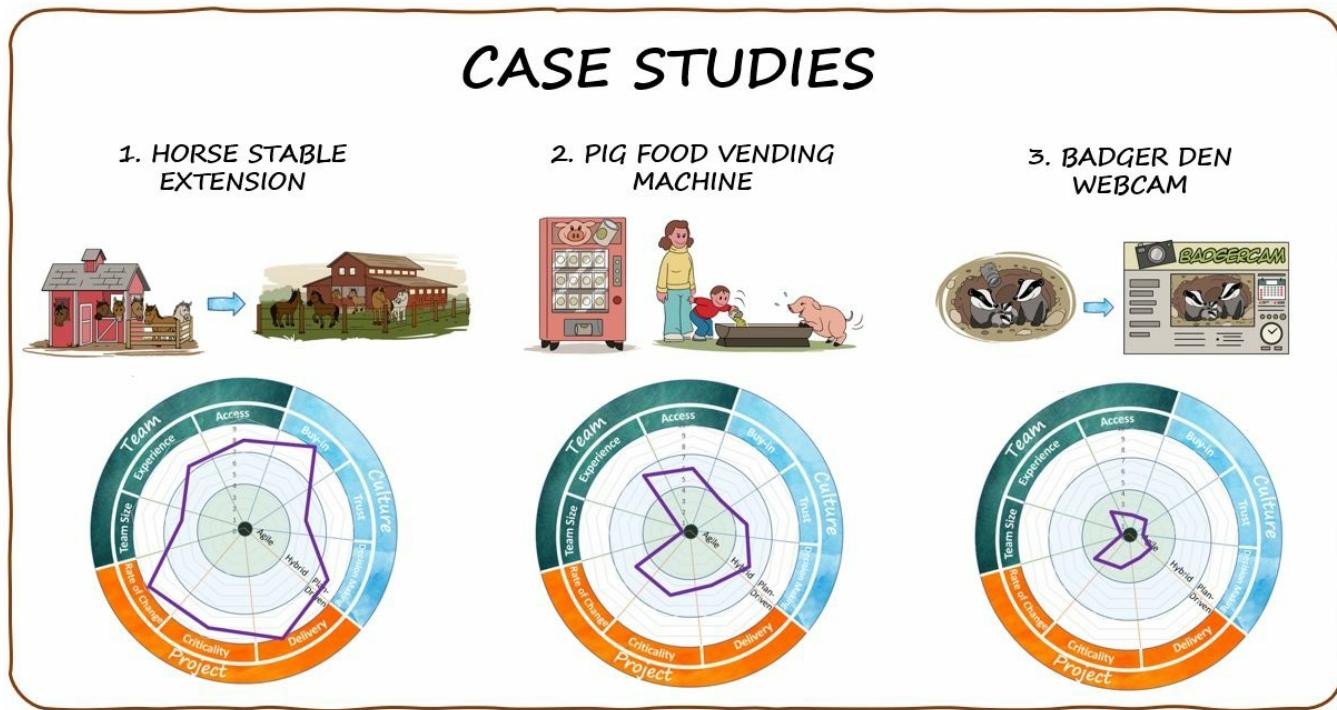
overview of agile from the mindset and values to the principles and practices. Even if you have been using agile for many years it is good to understand how the components fit together and connect.



Case Studies

The new PMP® exam tests our knowledge of multiple development life cycles. We are expected to understand not only how to use each approach, but also when to choose one over another.

The case studies chapter presents and analyzes three projects in detail. One is a typical waterfall/ predictive project, one a good candidate for an agile approach, and the third likely benefiting from a hybrid approach.



We then go beyond stereotypes to view two more projects that defy conventional classification. This is the messy world of real project management where there is no obvious life cycle choice. Instead, we need to apply our best judgement, canvas others for their ideas, and maybe use some common implementation patterns as the inspiration for our approach.

After reading the case studies chapter you will understand diagnostic tools for assessing life cycle suitability. You will also be able to identify the pros and cons for different approaches and help stakeholders make intelligent life cycle selection decisions.



More Animals

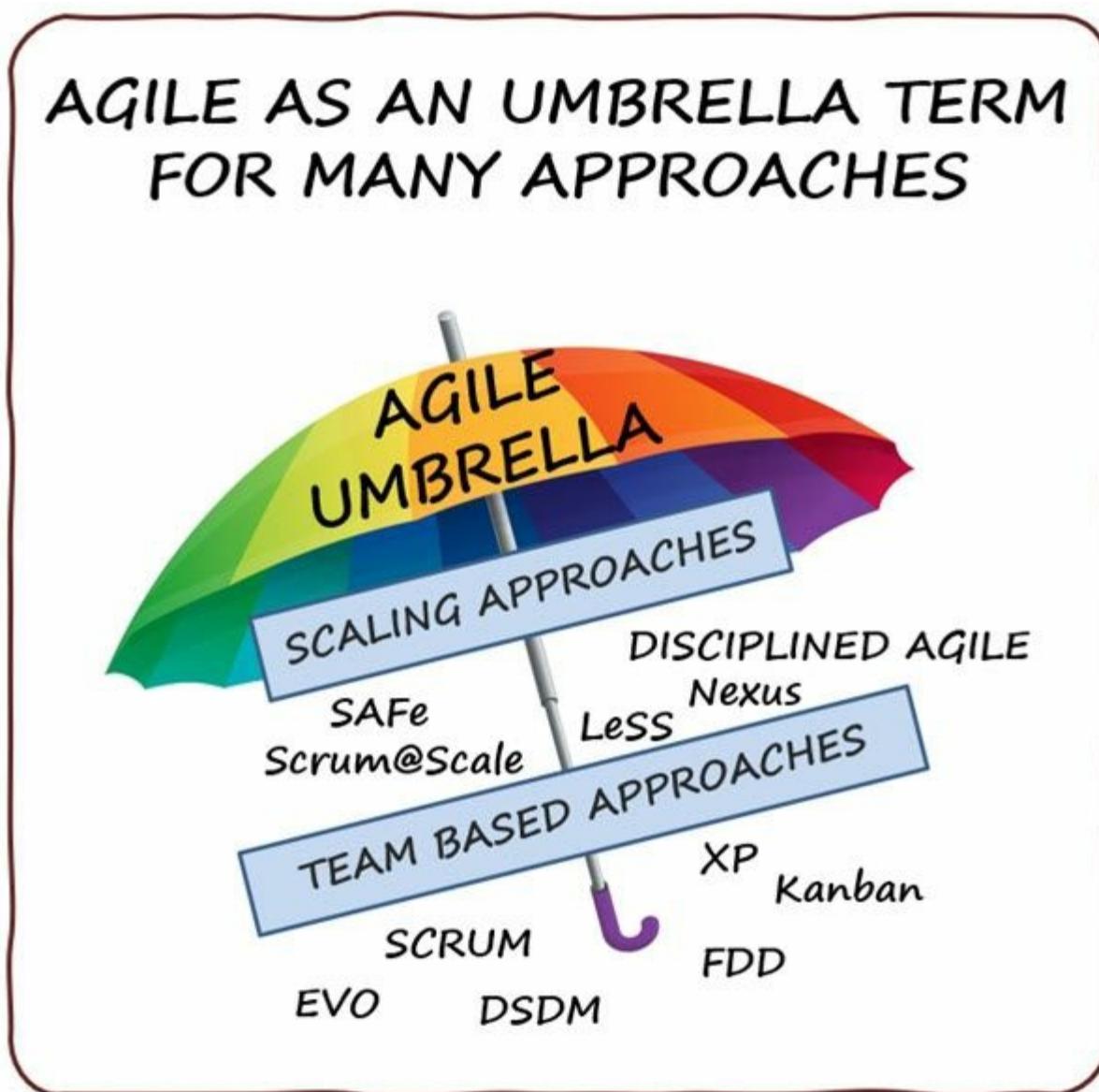
In addition to all the animals from the website, this book also features **Undercover Mole** to provide insights and PMP® exam study tips.

Agile Primer

This chapter introduces agile for people who may not be very familiar with it. Or, more likely, know bits and pieces but want to see it laid out as a complete system.

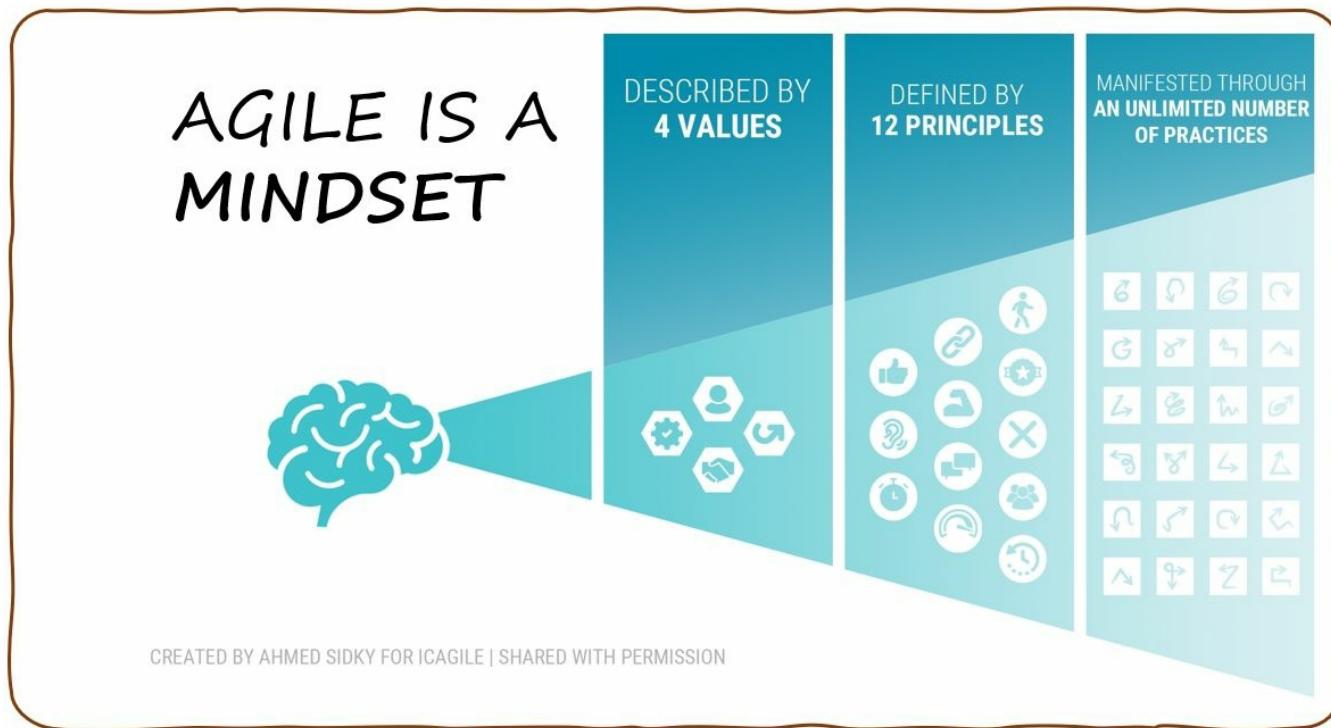
The term "Agile" as a way to develop software systems was christened in 2001. However, the approaches employed are much older. Luckily, we don't need to understand where they came from to embrace their guidance.

Many people report agile approaches align with how they intuitively run projects. So, what is Agile? From a definition perspective, "Agile" is an umbrella term used to describe a variety of methods, approaches and frameworks.



These approaches include Team Based Approaches such as Scrum and XP (eXtreme Programming) as well as Scaling Approaches such as SAFe (Scaled Agile Framework) and Disciplined Agile.

Once we get beyond the labels, a great image for explaining what agile is really about was developed by Ahmed Sidky (AhmedSidky.com). It shows agile as a mindset described by 4 values, defined by 12 principles, and manifested through many practices.



We will step through the components of this image to provide an overview of agile.



1) Agile is a Mindset

Agile is a way of thinking. A view of how to collaborate with others and get work done. It is big on sharing information, using lots of visualizations, and getting the people doing the work involved in the planning and decision-making processes.



4 Agile Values

AGILE IS A MINDSET



The four agile values were outlined in a document called the “Agile Manifesto.” It was created during a meeting in February 2001 that brought together software and methodology experts at the forefront of the emerging agile methods.

Let's look at the values one by one.

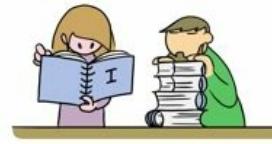
THE AGILE MANIFESTO



**Individuals and interactions
over processes and tools**



**Working software over
comprehensive documentation**



**Customer collaboration
over contract negotiation**



**Responding to change
over following a plan**



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Value 1 – Individuals and Interactions over processes and tools



**Individuals and interactions
over processes and tools**



While processes and tools are necessary, we should focus attention on the individuals and interactions involved. This is because work is undertaken by people, not tools, and problems get solved by people, not processes. Likewise, products are accepted by people, the scope is debated by people, and the definition of a successfully "done" project is negotiated by people.

What will help set up a project for success is an early focus on developing the individuals involved and emphasizing productive and effective interactions. Processes and tools can help, yet projects are ultimately about people. So, to be successful, we need to spend the majority of our time in what may be the less comfortable, messy, and unpredictable world of working with people.

Value 2 – Working software over comprehensive documentation



Working software over comprehensive documentation



This value speaks to the need to deliver. It reminds us to focus on the purpose or business value we're trying to deliver rather than on paperwork.

Many developers are detail-oriented and process-driven. While these characteristics are often highly beneficial, they can also mean the developer's focus is easily distracted from the real reason they are undertaking software projects—to write valuable software. So, this emphasis on valuing working software over comprehensive documentation acts as a helpful reminder of why these projects are commissioned in the first place—to build something useful. Documentation by itself, or at the expense of working software, is not helpful.

Value 3 – Customer collaboration over contract negotiation



Customer collaboration over contract negotiation



We need to be flexible and accommodating rather than fixed and uncooperative. This involves tradeoffs between the development team and business rather than reverting back to contracts and statements of work. We could build the product precisely as initially specified, but if the customer's preferences or priorities change, it would be better to be flexible and work toward the new goal.

We should recognize at the start that things are going to change, and we'll need to work with the customer throughout the project to reach a shared definition of "done." This requires a more trusting relationship and more flexible contract models than we often see on projects.

Value 4 – Responding to change over following a plan



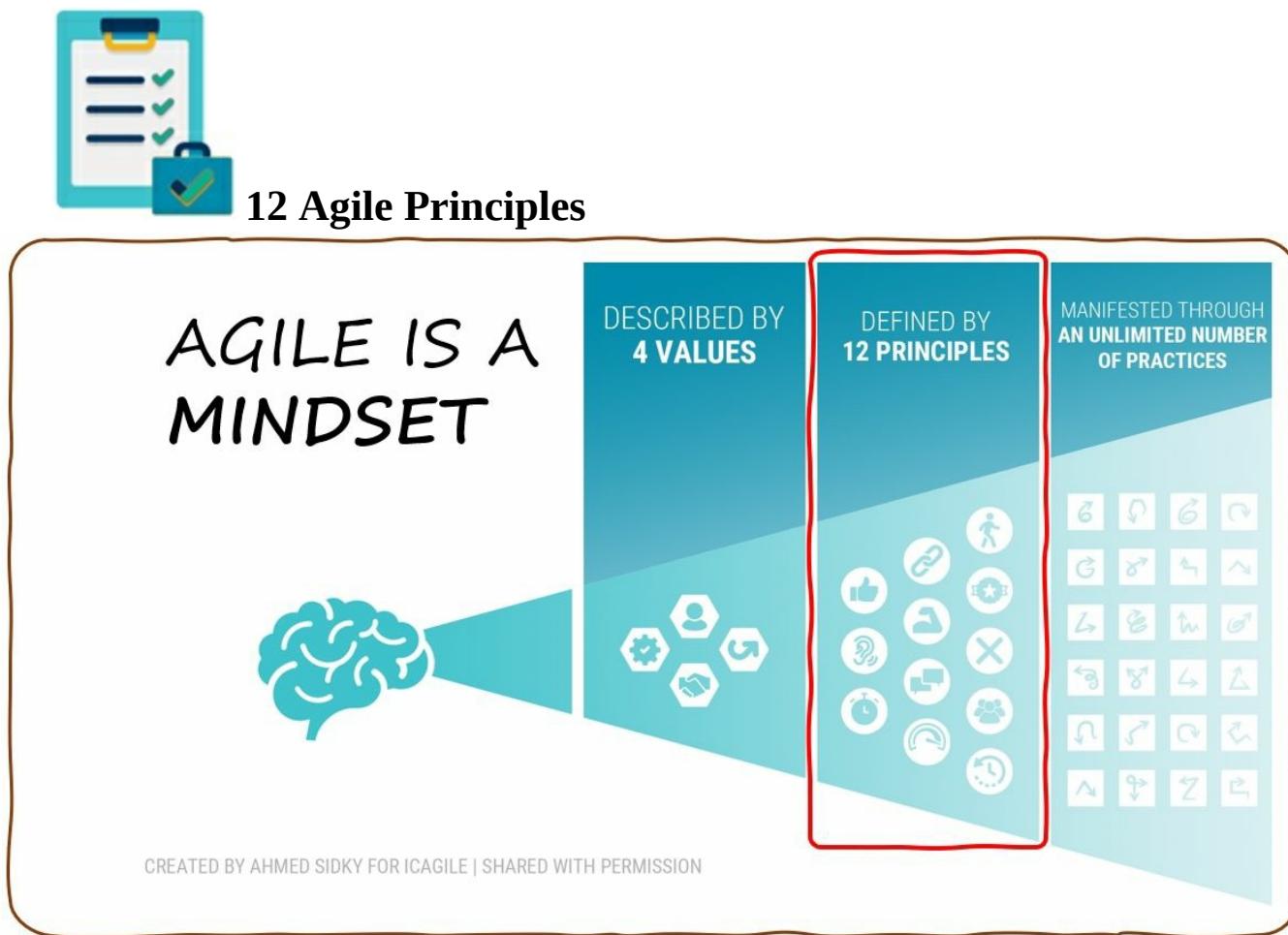
Responding to change over following a plan



The quote from scholar Alfred Korzybski, "*The map is not the territory*," warns us not to

follow maps if they do not match the surroundings. Instead, trust what you see and act accordingly. In modern, complex projects, we know our initial plans will likely be inadequate. They are based on insufficient information about what it will take to complete the project.

Agile projects have highly visible queues of work and plans in the form of backlogs and task boards. The intent of this value is to broaden the number of people engaged in the planning process.



The authors of the Manifesto expanded the four values with twelve guiding principles for agile approaches:

AGILE MANIFESTO PRINCIPLES



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



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



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



Business people and developers must work together daily throughout the project



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



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



Working software is the primary measure of progress



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



Continuous attention to technical excellence and good design enhances agility



Simplicity—the art of maximizing the amount of work not done—is essential



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



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

Let's examine the 12 agile principles in more detail:

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



This principle reminds us to satisfy the customer via early and continuous delivery of value. We must structure the project and the development team to deliver value early and frequently.

We must also remember that what we are delivering is valuable software, not completed work products such as a WBS, documentation, or plans. We need to stay focused on the end goal. For software projects, this is the software; for other types of projects, the end goal will be the product or service we have been asked to deliver or enhance.

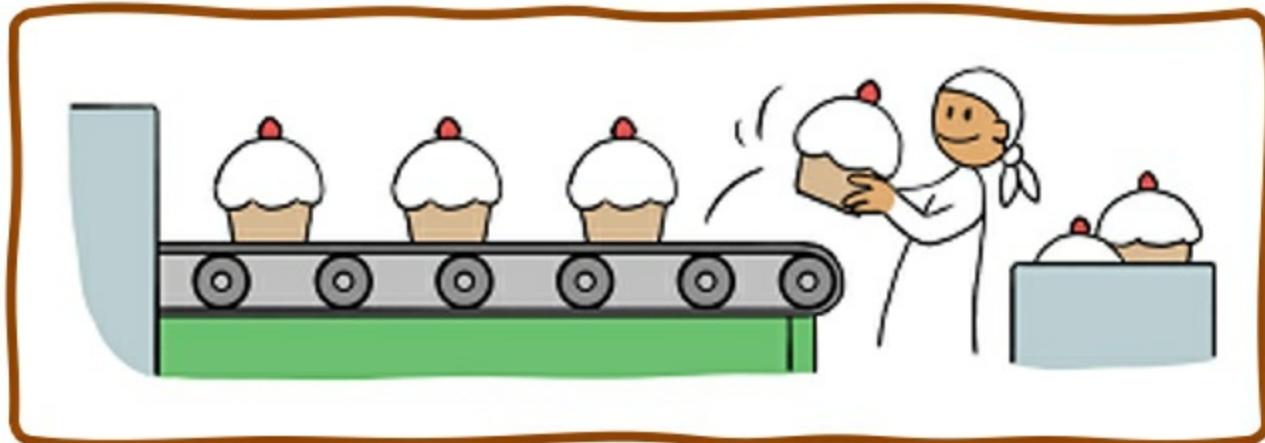
2 – Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.



Changes can be good for a project if they allow us to deliver a late-breaking, high-priority feature. Yet, in non-agile projects, changes are often seen as unfavorable; they may be considered "scope creep" or blamed for the project deviating from the plan.

Agile approaches favor lightweight, high-visibility techniques for managing change, for example, continuously updating and prioritizing changes into the backlog of work to be done. Agile's well-understood, high-visibility approach for handling changes keeps the project adaptive and flexible as long as possible.

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



This principle emphasizes the importance of releasing work to a test environment and getting feedback quickly. Agile teams need input on what they have created thus far, to see if they can proceed, or if a change of course is required.

Delivering within a short timeframe also has the benefit of keeping the product owner engaged and keeping dialogue about the project going. With frequent deliveries and demos, we will regularly have results to show the customer and opportunities to get feedback. Often at these demos, we learn of new requirements or changes in business priorities that are valuable planning inputs.

It's human nature to want our work to be as perfect as possible before sharing it. However, we are doing ourselves a disservice by holding on to our work for so long. It's better to get feedback early and often to avoid going too far down the wrong track.

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

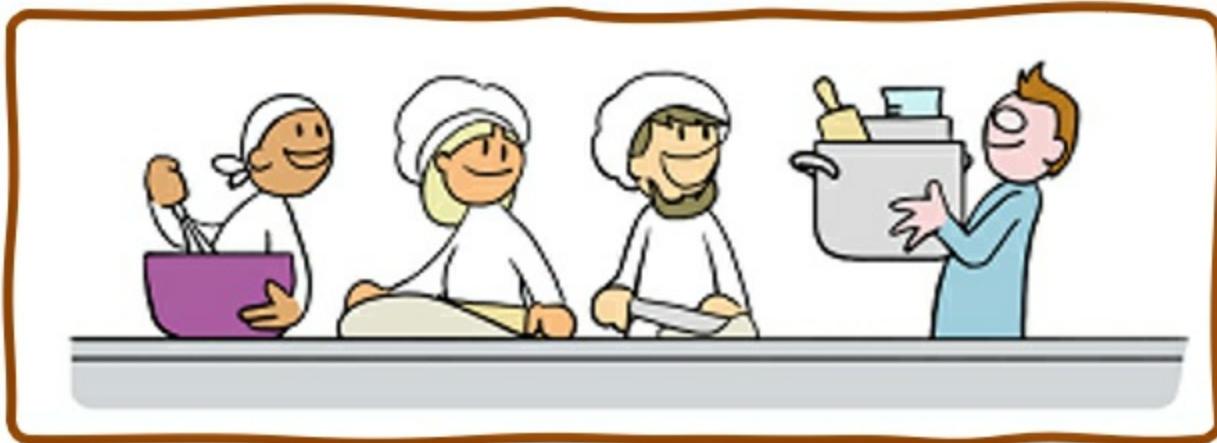


The frequent deliveries and demos mentioned in principle 3 are one example of how business people and developers work together throughout the project. Daily face-to-face engagement with the customer is one of the most challenging principles to ensure from a practical standpoint, but it is worth pushing for. Written documents, e-mails, and even telephone calls are less efficient ways of transferring information than face-to-face interactions.

By working with business representatives daily, we can learn about the business in a way that is far beyond what a collection of requirements-gathering meetings can ever achieve. As a result, we are better able to suggest solutions and alternatives to business requests. The business representatives also learn what types of solutions are expensive or slow to develop and what features are cheap. They can then begin to fine-tune their requests in response.

When it isn't possible to have daily interactions between the business representatives and the development team, agile approaches try to get the two groups working together regularly in some way, perhaps every two days, or whatever type of frequent involvement will work. (Some teams use a "proxy customer," in which an experienced business analyst [BA] who is familiar with the business interests serves as a substitute, but this isn't an ideal option.)

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



It is more critical for a project to have the best people possible than the best processes and tools. So, making sure smart and motivated people are on the team is likely to make a big difference in whether our project is delivered successfully and efficiently.

While we may not always be able to pick our dream team, we can motivate and empower the team members we do have. Agile approaches promote empowered teams. People work better when they are given the autonomy to organize and plan their own work. Agile practices advocate freeing the team from the micromanagement of completing tasks on a Gantt chart. Instead, the emphasis is on craftsmanship, peer collaboration, and teamwork, resulting in greater pride and productivity.

Knowledge work projects involve team members who have unique areas of expertise. Such people do their best work when they are allowed to make their own decisions and local planning for the project.

For leaders, this doesn't mean surrendering involvement or abandoning the team to fend for itself; instead, we recognize that our team members are experts in what they do, and we provide the support they need to ensure they are successful.

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



Written documents are great for creating a lasting record of events and decisions, but they are slow and costly to produce. In contrast, face-to-face communication allows us to quickly transfer a lot of information in a richer way that includes emotions and body language.

Of course, face-to-face conversations can't be applied to all project communications, but agile teams aim to follow it whenever possible. This is one example of how agile methods need to be customized or scaled for each project. As team sizes grow, it becomes harder to rely on face-to-face communications, and an appropriate level of different format communications need to be introduced.

7 – Working software is the primary measure of progress.



By adopting "working software" (or "working systems") as a primary measure of progress, our focus is shifted to working results rather than documentation and design. In agile, progress is assessed based on the emerging product or service we are creating. Questions like "How much of the solution is done and accepted?" are preferred over "Is the design complete?" since we want to

focus on usability and utility rather than conceptual progress.

This definition of progress as "working systems" creates a results-oriented view of the project. Interim deliverables and partially completed work will get no external recognition. We want to instead focus on the project's primary goal—a product that delivers value to the business.

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

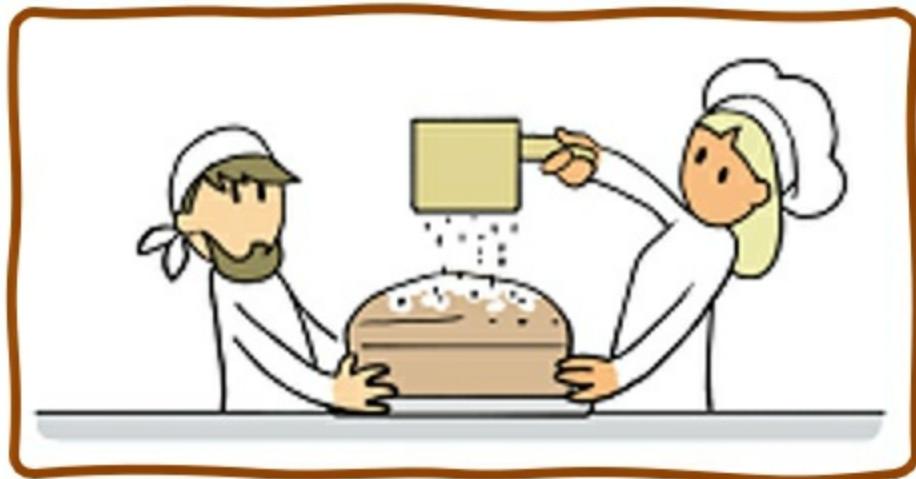


Agile methods strive to maximize value over the long term. Some of the rapid application development (RAD) techniques that preceded agile promoted—or at least accepted—intense periods of prototyping prior to demos. Yet, teams working long hours over an extended period results in burn-out and mistakes. This is not a sustainable practice.

Instead of long, intense development periods, agile approaches favor a sustainable pace that allows team members to maintain a work-life balance. A sustainable pace is not only better for the team; it benefits the organization as well. Long workdays lead to resignations, which means the organization loses talent and domain knowledge. Hiring and integrating new members into a team is a slow and expensive process.

Instead, working at a pace that can be maintained indefinitely leads to a happier and more productive team. Happy teams also get along better with business representatives than do overworked teams. There is less tension, and work relationships improve.

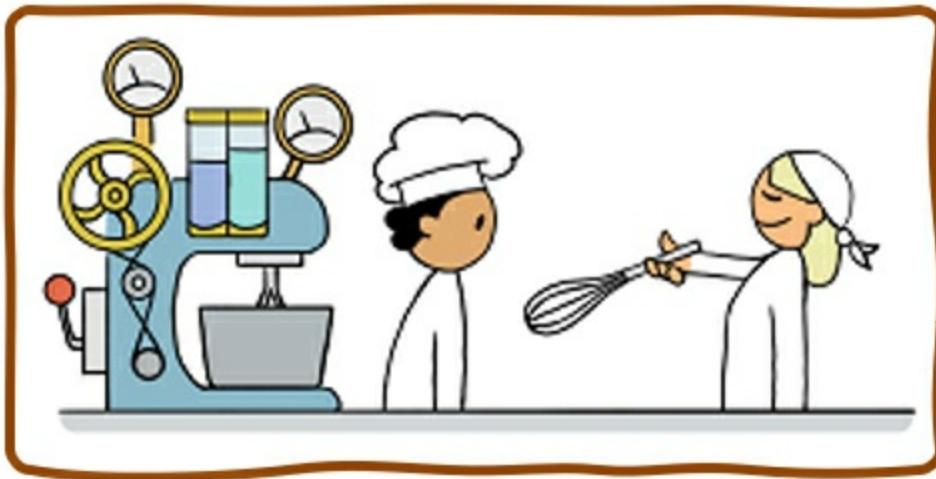
9 – Continuous attention to technical excellence and good design enhances agility.



An agile team needs to balance its efforts to deliver high-value features with continuous attention to the design of the solutions. This balance allows the product to deliver long-term value without becoming difficult to maintain, change, or extend. Preventative maintenance and cleaning up code are preferable to fixing problems. This helps the project run more smoothly and speeds up the team's progress.

In the software world, once the code base becomes too messy or tangled, the organization loses its ability to respond to changing needs. In other words, it loses its agility. So, we need to give the development team enough time to refactor. Refactoring is the housekeeping, cleanup, and simplification that needs to be made to code to ensure it is stable and can be maintained over the long term.

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



The most reliable features are those we don't build—since there is nothing that could go wrong with them. In the software world, up to 60 percent of features that are built are used either infrequently or never. Because so many features that are built are never actually used, and because complex systems have an increased potential to be unreliable, agile approaches focus on simplicity. This means boiling down the requirements to their essential elements only.

Complex projects take longer to complete, are exposed to a longer horizon of risk, and have more potential failure points and opportunities for cost overruns. Therefore, agile methods seek the "simplest thing that could possibly work" and recommend that this solution be built first. This approach is not intended to preclude further extension and elaboration of the product; instead, it simply says, "Let's get the plain-vanilla version built first." This approach not only mitigates risk but also helps boost sponsor confidence.

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

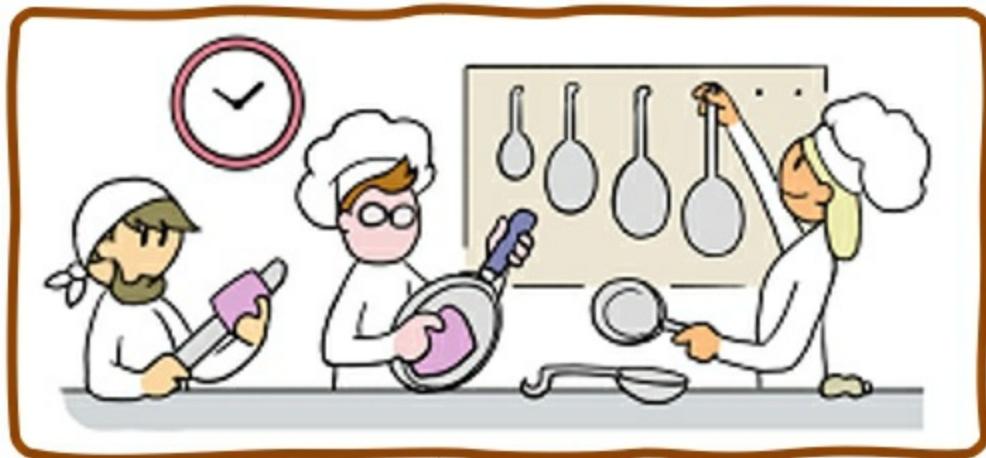


To get the best out of people, we need to let them self-organize. It allows people to find an approach that works best for their methods, their relationships, and their environment. They will thoroughly understand and support the approach because they helped create it. As a result, they will produce better work.

Self-organizing teams that have the autonomy to make local decisions have a higher level of ownership and pride in the architectures, requirements, and designs they create than in those forced upon them or "suggested" by external sources. Ideas created by the team have already gone through the team vetting process for alignment and approval, so they don't need to be "sold" to the team. In contrast, ideas from outside sources need to be sold to the team for the implementation to be successful, which is sometimes a challenging task.

Another factor that supports this principle is that the members of a self-organizing project team are closest to the project's technical details. As a result, they are best able to spot implementation issues, along with opportunities for improvements. So instead of trying to educate external people about the evolving structure of the project, agile approaches leverage the capacity of the team to best diagnose and improve the project's architectures, requirements, and designs. After all, the team members are the most informed about the project and have the most vested in it.

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



Gathering lessons learned at the end of a project is too-little, too-late. Instead, we need to gather lessons learned while they are still applicable and actionable. This means we need to gather them during the project and, most importantly, make sure we do something about what we've learned in order to adjust how we complete the remainder of the work.

Agile approaches employ retrospectives to reflect on how things are working and identify opportunities for improvements. These retrospectives are done at the end of each iteration, ensuring that the team has regular opportunities to review their process. An advantage of doing retrospectives so frequently is that we don't forget about problems and issues. Compare this to conducting a single lessons learned review at the end of a project, in which team members are asked to think back over a year or more to recall what went well and where they ran into issues.

Another disadvantage of only gathering lessons learned at the end of a project is that the lessons won't really be helpful to the organization until another project with a similar business or technical domain or team dynamics comes along. At that point, it is easy to dismiss the lessons learned from an earlier project as not applicable to the current situation. On an agile project, we capture the lessons learned as we progress, so we can't pretend they aren't applicable. We know they are relevant, and we are motivated to tune and adjust our process accordingly.

Unlimited Agile Practices

AGILE IS A MINDSET



DESCRIBED BY
4 VALUES

DEFINED BY
12 PRINCIPLES

MANIFESTED THROUGH
AN UNLIMITED NUMBER
OF PRACTICES

CREATED BY AHMED SIDKY FOR ICAGILE | SHARED WITH PERMISSION

There are thousands of agile practices documented in books, blogs and presented at agile conferences every year and likely many times more that never get reported. We do not need to learn them all; because once we understand a core set, we can see the themes, grasp the goals, and help teams create their own tailored ways of working that support the agile mindset.

In this section, we will explore some common agile practices and highlight the reoccurring agile values at play. Let's start with some popular techniques often seen on Scrum teams.



Daily Stand-up meetings – These are the quick, inter-team coordination meets held daily where team members share with their colleagues:

- What they have been working on (or completed),
- What they plan to work on next,
- If any issues or blockers are hampering their progress.

Agile Concepts:

- **The team owns the work** – team members report to each other, not the Scrum Master or some project manager authority role.
- **Transparency** – openly share information, good and bad, so people stay informed and can make better decisions



Sprint Demo – At the end of every sprint (usually one or two weeks long) the team demonstrates what has been built to the business and confirms what to work on next.

Agile Concepts:

- **Frequent delivery** – Deliver working software frequently. Working software is the primary indicator of progress.
- **The team owns the work** – it is the team that demos the work, not the Scrum Master or Product Owner. This demonstrates and builds ownership of the evolving solution.
- **Focus on business value** – Since the backlog is prioritized by business value, the team should be demonstrating the highest business value work items completed. Also, the discussions on what to work on next also focuses work by business value.
- **Transparency** – openly share information, good and bad, so people stay informed and can make better decisions



Product Backlog – The ordered list of work for the project/product. Prioritized by the Product Owner based on business value. Creates a single queue of work items to focus on.

Agile Concepts:

- **Focus on business value** – The product backlog is prioritized by the product owner, usually a business representative, not the project manager or other team member, to ensure the project focuses on business value.
- **Transparency** – By putting all work items in a single, highly visible queue, everyone can see the full scope of work to be accomplished. This (hopefully) eliminates side-agreements or under-the-table agenda items being worked on. Also, since change requests are prioritized in the backlog, they bring visibility to these elements and likely completion dates.



Release Planning – The process of the product owner and development team collectively meeting to discuss, prioritize and estimate features for the next release. By engaging the do-ers of the work in the planning process, we simultaneously: 1) get better insights into technical work involved, 2) generate better buy-in for the estimates created and a stronger commitment to meet them.

Agile Concepts:

- **Focus on business value** – The business (through the product owner role) drives the

planning process.

- **Transparency** – Features and stories from the product backlog are refined and estimated to create a release roadmap that illustrates target dates for key components of the product or service being developed.



Sprint Planning – This is the planning process one level below release planning. The product owner and development team collectively meet to discuss, prioritize, and estimate the next one or two weeks' worth of development.

Agile Concepts:

- **Focus on business value** – Work is prioritized by the product owner
- **Engage the team in decision making** – The team makes local decisions about how best to undertake the work, how to self-organize, and what order to undertake technical tasks.
- **Transparency** – All estimates and progress are discussed openly within the project team. Details about progress, issues or setbacks are discussed daily at the daily stand-up meeting.



Retrospective – A workshop held at the end of each sprint/iteration to review progress, process and people aspects of the project. These regular inspect, review and adapt sessions typically result in suggestions of things to try differently in the next sprint/iteration. By conducting frequent, short-scale experiments, teams can inspect, adapt and improve rapidly throughout delivery.

Agile Concepts:

- **Inspect and adapt** – At regular intervals, the team reflects on becoming more effective, then tunes and adjusts its behavior accordingly.
- **Engage the team in decision making** - The best architectures, requirements, and designs emerge from self-organizing teams. Continuous attention to technical excellence and good design enhances agility.
- **Transparency** – Be open to talking about issues and ways to improve. Acknowledge there are constantly ways to get better. Recognize and thank teams for looking to improve their delivery capabilities.



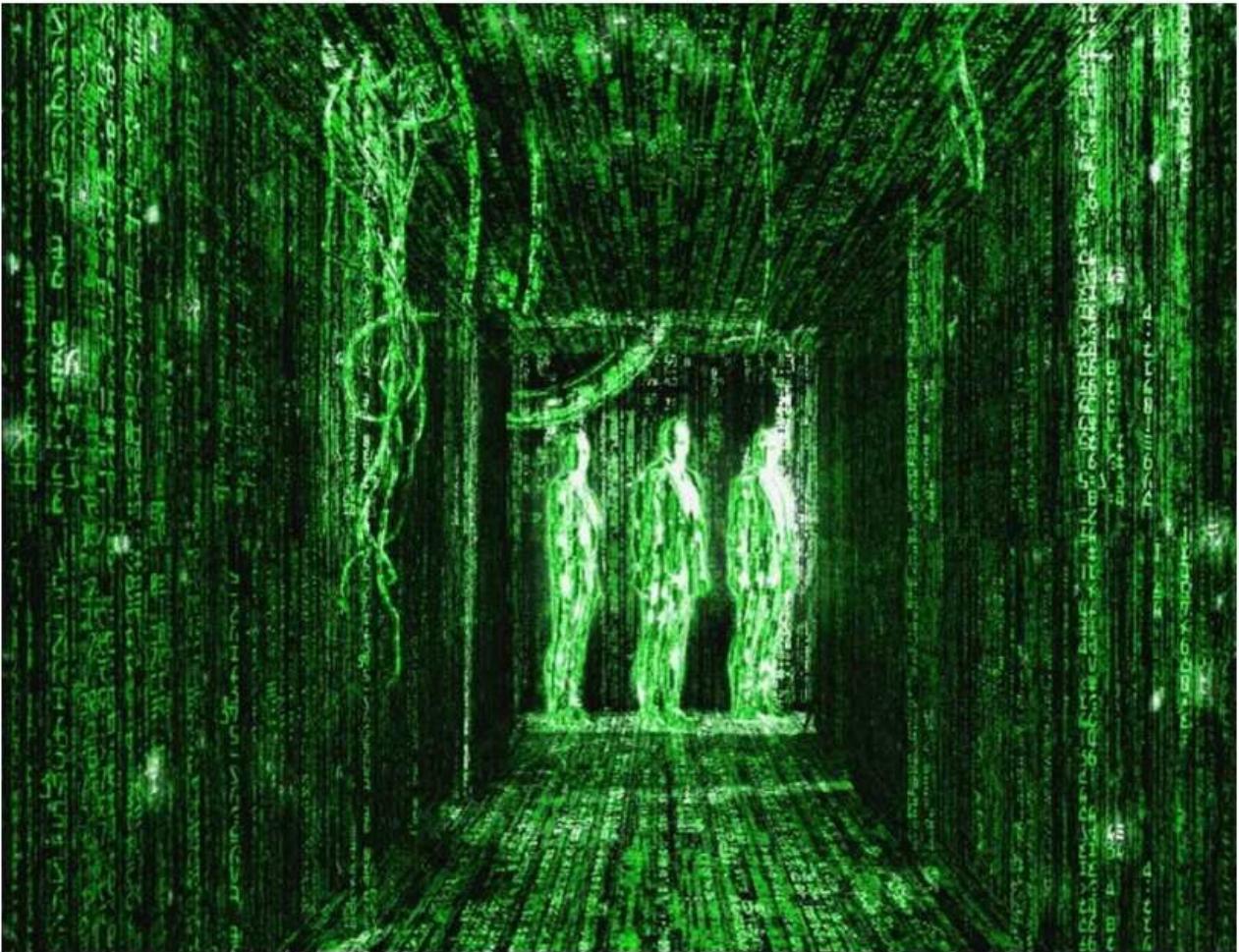
Kanban/Task Boards – These are large public or publicly accessible displays of work done, in-process and waiting to start. Kanban boards make the team's work visible.

Agile Concepts:

- **Transparency** – It shows what is being worked on, what has been completed and what is coming next. This information is not the domain of just the project manager, everyone benefits from knowing about it.
- **Engage the team in decision making** – By sharing the project plan visibly, team members can better alert us to potential problems and solutions.

Seeing the Agile Matrix

In the sci-fi movie “The Matrix”, the hero, Neo, develops the ability to “see the code of the Matrix.” This is the computer simulation he is living inside. Once he sees this, he understands how things work and can move faster and is more powerful than ever before. It is an “a-ha” moment; now things make sense, he can see the structure, the patterns of his world and manipulate them.



It is the same with developing an agile mindset. Once you realize agile is based on a few core concepts, you begin to see them repeated everywhere. These concepts include:

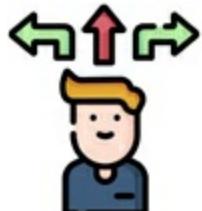
- Focus on delivering value
- Build incrementally
- Gather early feedback
- Inspect, adapt and learn as you go
- Let the team decide as much as possible
- Be transparent and show progress, good and bad

With these ideas in mind, practices such as estimating via planning poker make a lot more sense. We are engaging the team in defining their estimates. We are using a visual, transparent process. It is iterative and incremental. There is inspection and the ability to adapt the estimates if outliers are found.

Everything agile teams do reflect these values. Information radiators are about being transparent and visual. Voting on decisions is about letting the team decide. We do not need to learn every agile practice, because we will quickly be able to understand any of them once we recognize the agile mindset, values and principles.

When making project management decisions, we can apply these agile concepts. Engage the team, be transparent, focus on value, get early feedback, etc. These are not complex concepts to grasp, and what many of us intuitively try to do anyway. That's why agile, for many people, feels like common sense.

However, it can be quite different from the analytical world of traditional project management that aims to specify everything upfront before executing a detailed project plan.



Agile Suitability and Approach Selection

Agile approaches work exceptionally well for collaborative, exploratory projects where we are all finding the best way towards a goal that might be uncertain or emergent (with evolving requirements.)

They do not work so well for billion-dollar infrastructure projects that need person-years worth of upfront planning.

The next chapter on suitability filters and hybrid approaches provides some tools to help determine the appropriate development approach for different project types. Until then, we will end with some additional guidelines for project managers tasked with executing agile projects.

Additional Guidance for Project Managers – The Declaration of Interdependence

A lesser-known cousin to the Agile Manifesto, the Declaration of Interdependence was created a few years later. It describes principles that project managers can apply to support agile teams. It defines six concepts for supporting agile teams.

DECLARATION OF INTERDEPENDENCE



We Increase return on investment by making a continuous flow of value our focus.



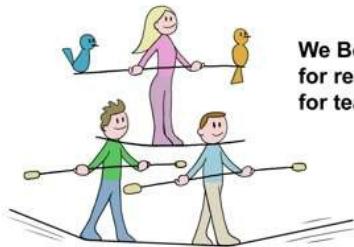
We Deliver reliable results by engaging customers in frequent interactions and shared ownership.



We Expect uncertainty and manage for it through iterations, anticipation and adaptation.



We Unleash creativity and innovation by recognizing that individuals are the ultimate source of value and creating an environment where they can make a difference.



We Boost performance through group accountability for results and shared responsibility for team effectiveness.



We Improve effectiveness and reliability through situationally specific strategies, processes and practices.

we will review them in turn.

1 – We increase return on investment by making a continuous flow of value our focus.



Amaze your customers; keep giving them what they ask for!

Concentrate on developing features the business asks for: This is how we can get the best benefits for the business and support for the process. When our projects consistently deliver business results, they are hard to cancel, or deny requests from.

2 – We deliver reliable results by engaging customers in frequent interactions and shared ownership.



When planning interaction with the business, try to be more like the good neighbor you see frequently and can easily call upon, rather than the intrusive relative who moves in for a while and then disappears for a year. We want regular and engaging business interaction, not a huge, upfront requirements gathering phase followed by nothing until delivery. Frequently show how the system is evolving, and make it clear the business drives the design by listening to and acting on feedback.

3 – We expect uncertainty and manage for it through iterations, anticipation, and adaptation.



Since software functionality is hard to describe, technology changes quickly, and so do business needs. Software projects typically have lots of unanticipated changes. Rather than trying to create and follow a rigid plan that is likely to break, it is better to plan and develop in short chunks (iterations / sprints) and adapt to changing requirements.

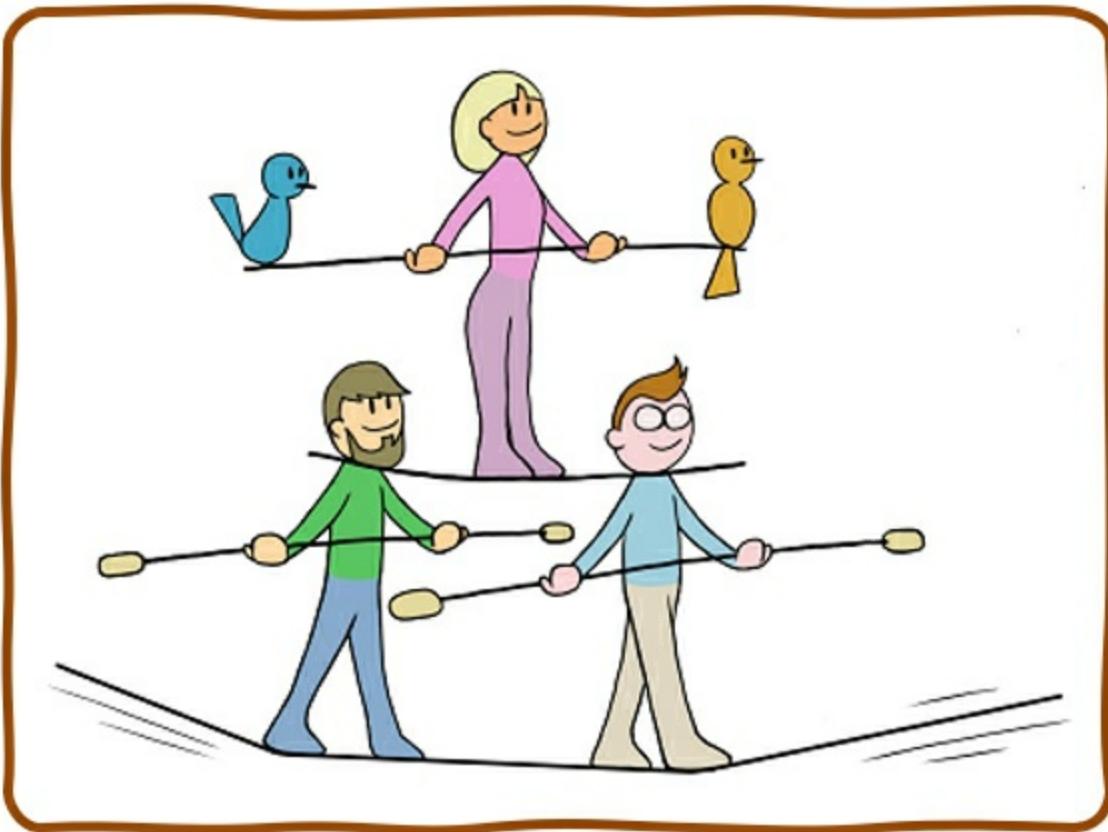
4 – We unleash creativity and innovation by recognizing that individuals are the ultimate source of value, and creating an environment where they can make a difference.



“We manage property and lead people; if you try to manage people, they feel like property.”

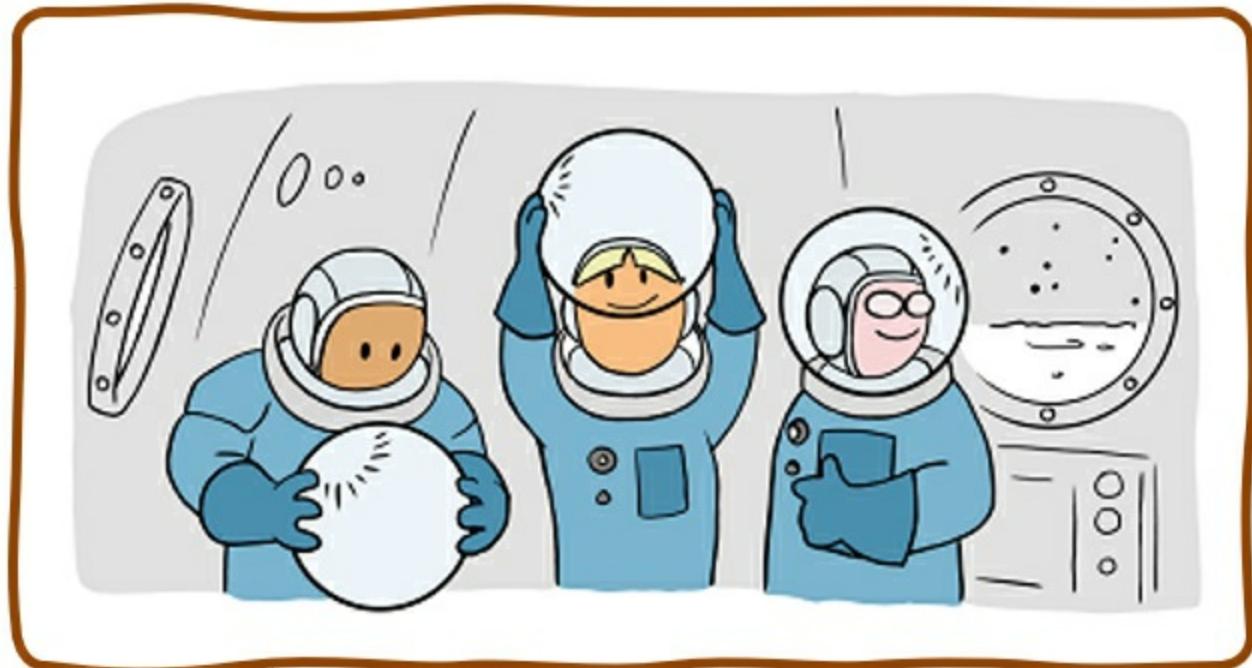
Projects are completed by living, breathing people, not tools or processes. To get the best out of our team we must treat them as individuals, provide for their needs and support them in the job. Paying a wage might guarantee that people show up, but how they contribute once they are there is governed by a wide variety of factors. If you want the best results, provide the best environment you can.

5 – We boost performance through group accountability for results and shared responsibility for team effectiveness.



Everyone needs to share responsibility for making the project, and the team as a whole, successful. We can help by empowering the team to make their own decisions. When people are more engaged in a process, they are more committed to its outcome and success. In short, people care more about things they had a hand in creating than things given to them or imposed upon them.

6 – We improve effectiveness and reliability through situationally specific strategies, processes and practices.



Real projects are complex and messy. Rarely do all the ideal conditions for agile development present themselves. Instead, we have to interpret the situation and make the best use of the techniques, people, and tools. There is no single cookbook for running successful projects; instead, we need to adjust to best fit the project ingredients and the environment we are presented with.

Summary

Agile represents a collaborative and cooperative way of working. It is ideally suited to many of today's uncertain projects. It is by no means a silver bullet, and there are times when an alternative or supplemental approach might make more sense. Yet, it represents a critical set of tools for modern project managers to have in their toolkit.

Case Studies Profiling Different Life Cycles

Introduction

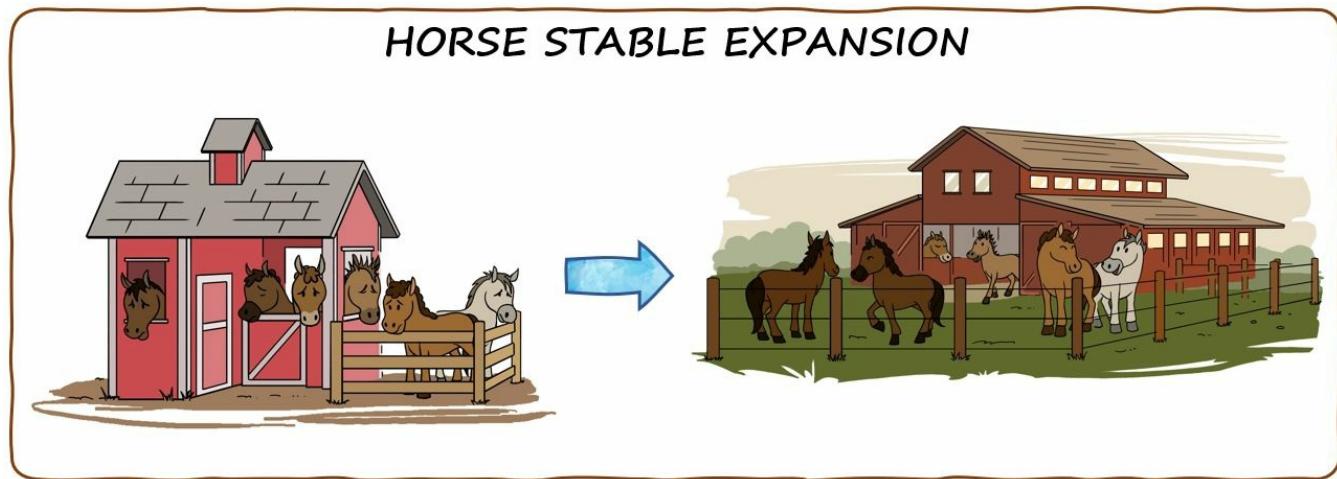
This chapter presents three case study projects that demonstrate when to use predictive, agile and hybrid approaches. It features three different projects planned this year for the fictitious “Pesky Pals Petting Zoo.” These are:

1. Horse Stable Expansion
2. Pig Food Vending Machine
3. Badger Den Webcam



These case studies go into more detail than you will likely need to know for the exam. However, they help explain where, why and when one life cycle approach is chosen over another, which is good to know for creating your big picture view of tools and techniques.

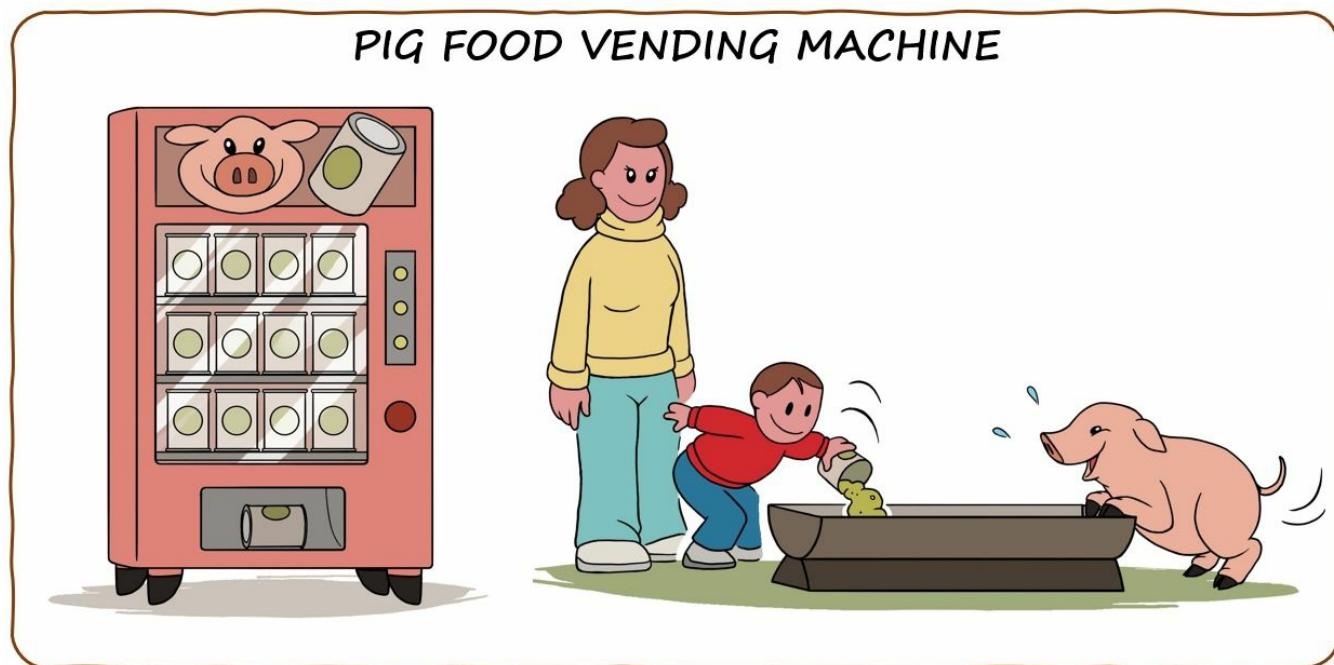
1. Horse Stable Expansion. The first project is to expand the horse stables and exercise paddock. A combination of a successful endangered horse breeding program and an increase in horse rescues has led to overcrowding in the equestrian exhibits.



This is a large, costly project that will take about one year to complete. Designing and building animal enclosures is a well-defined problem domain. Pesky Pals has additional requirements for public viewing spaces and safety measures over-and-above a regular stable, but these requirements are also well defined and understood. This project will use a predictive, plan-driven approach. After these case-study summaries, we will explore why.

2. Pig Food Vending Machine. The second project is to create the pig food vending machine. This is a revenue generation project. Feeding time at the zoo is a favorite for both animals and

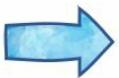
patrons. People like to see the animals excited and enjoying their food. So, the idea is that people can pay to get a cup of food to feed the pigs. The zoo needs to feed the pigs anyway, but this way, they can get other people to do it and charge them in the process.



This project combines some known technologies (food vending machines) and processes (local authorities food sale approvals) with some less well-known ones (converting machines to handle pig food and monitoring pig food consumption.) Since this project combines known and unknown technology and approvals, it will use a hybrid approach and life cycle.

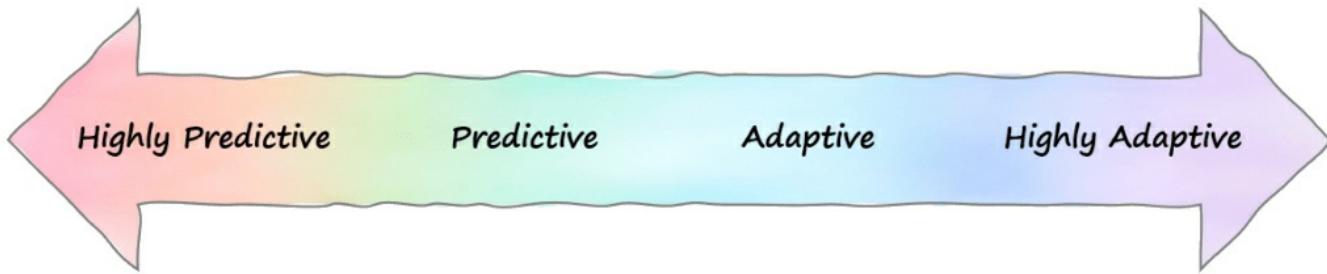
3) Badger Den Webcam. The third project is to build a website to view a new badger den webcam. This project will be using established technology (commercial night vision webcams and a viewing website). However, because technology projects are outside the normal domain for Pesky Pals staff and volunteers, it represents some uncertainty. Also, because it involves software development, it has been decided they will be using an agile approach that fits the iterative and incremental nature of software development.

BADGER DEN WEBCAM

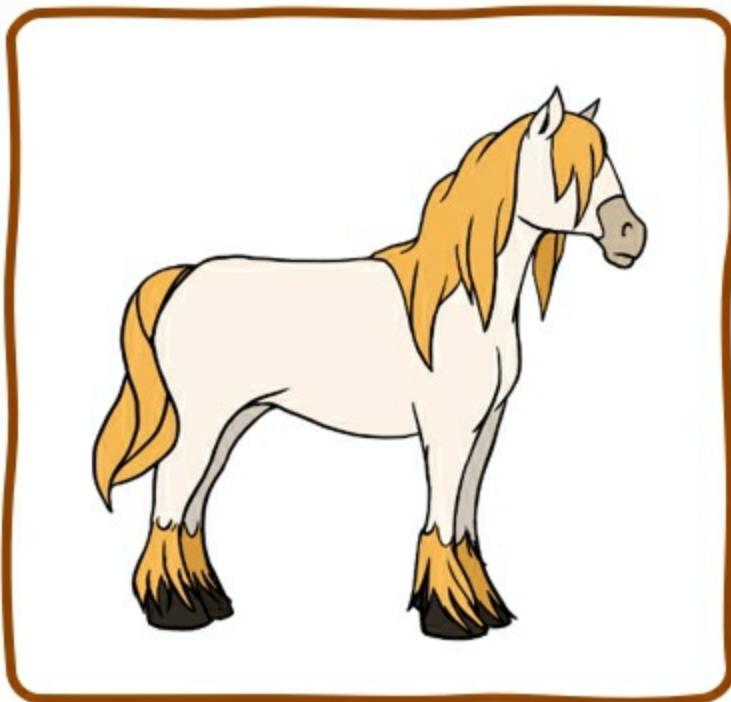


The Life Cycle Spectrum

Project life cycles exist on a spectrum from “Highly Predictive” (single-pass, serial, waterfall) through hybrid life cycles, all the way to “Highly Adaptive” (iterative and incremental, agile, lightweight.) This spectrum of approaches is shown below.

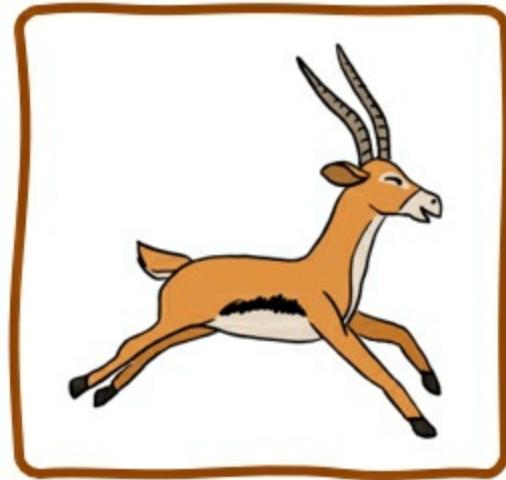


Throughout this book and the PM Illustrated website, we use animals to depict different project life cycles. This is to help make them fun and memorable.



We use strong but slow Mr. Carthorse for traditional/predictive projects.

We use a fast but small Ms. Gazelle to depict agile lifecycle projects.



A hybrid is a mixture of two (or more) elements. In project life cycle discussions, hybrid approaches combine some aspects of predictive and agile lifecycles. As a result, they are neither predictive nor agile. However, they might represent a practical approach for an organization that cannot be one or the other.

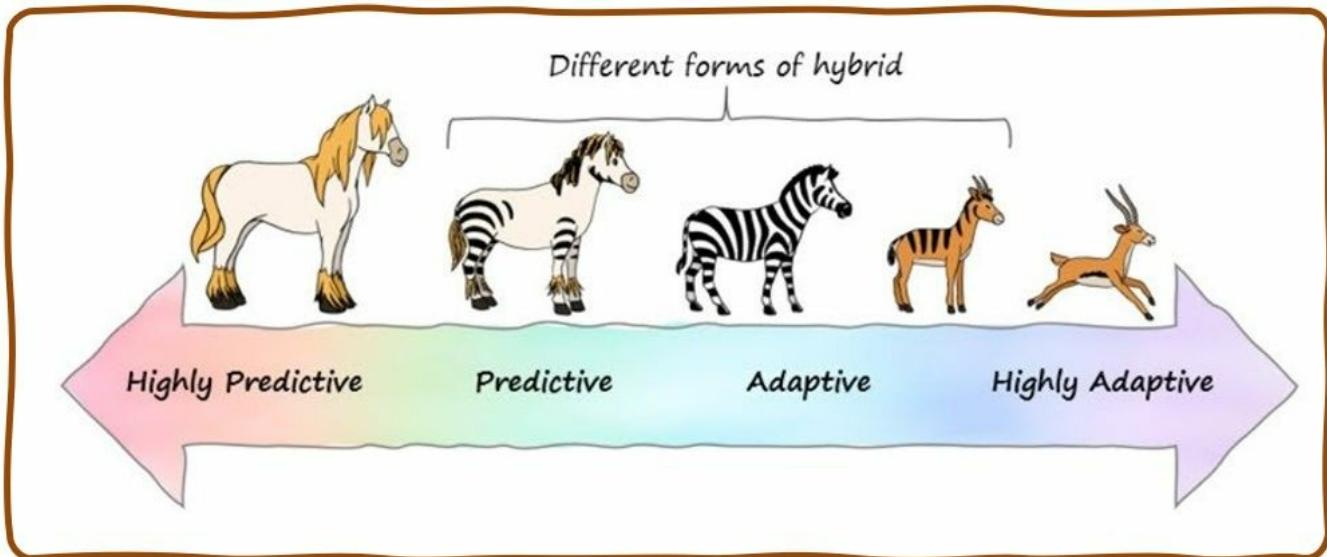
We use Mx. Zebra to depict hybrid projects. Half black, half white Mx. Zebra is stronger than Ms. Gazelle and faster than Mr. Carthorse.



Mx. Zebra is also slower than Ms. Gazelle and weaker than Mr. Carthorse, but they have fancy stripes!

Some organizations use a hybrid approach as they transition from a predictive approach to an agile approach. During the transition period, they may still have remnants of predictive processes. Others use a hybrid to link their predominantly agile teams with decidedly non-agile other units.

Hybrids can exist anywhere on the spectrum, from Highly Predictive to Highly Adaptive.



We could have a hybrid approach that is mostly predictive with just a few agile adaptations (say, holding monthly demos and retrospectives.) We could also have a life cycle that is almost entirely agile but adds additional oversight or documentation.

Factors such as the criticality of the product or service being created, complexity and uncertainty, or skillsets required should influence selecting the most appropriate life cycle.



For the exam, assume your project's approaches will be tailored based on project characteristics.

Evaluating the Case Study Projects

Task “2.13 Determine Appropriate Project Methodology/Methods and Practices” explains core concepts we should be aware of when evaluating which approach and life cycle to use for different project types. Rather than repeat that content here, we will summarize it. Refer to task 2.13 for further explanations.



No Single Best Approach

There is no best way of executing every project. If there were, it would have been automated by now and project managers made obsolete. Because all projects are different (even building the same house in a new location will have new variables, stakeholders, conditions, and constraints, we need to select the appropriate execution strategy and approach.



Traditional, Predictive Approaches

Traditional, predictive approaches (sometimes called Waterfall or plan-driven) are great for defined, repeatable projects. They can be planned in detail upfront and then executed by following this plan. The mantra “Plan the work, work the plan” captures the character of the approach well.

Deliverables such as Gantt charts, network diagrams, work breakdown structures (WBS), and detailed specification documents are commonly associated with traditional, predictive approaches.



Agile Approaches

Agile approaches work well when solving new problems with high rates of change and uncertainty. They focus on communication and collaboration while they iteratively build, inspect, and adapt. They evolve towards an emergent solution that might not have been knowable at the start of the project. In other words, they adapt as they go to meet unclear but emerging requirements.



Hybrid Approaches

Hybrid approaches combine elements of both traditional and agile life cycles. So, for instance, a hybrid approach may still do a significant amount of upfront planning but then execute iteratively, perhaps with iterations of one month in duration, which is much longer than the typical agile project.

Project Suitability Assessment Tools

There are many assessment models and tools that attempt to predict the most appropriate project approach and life cycle to follow based on project and organizational characteristics. They all have some merit and limitations.

We should not underestimate the impact of personal choice and bias either. If someone is convinced that waterfall, agile, or Approach-X is the best way to run a project, they will likely find ways to have better results using that approach than something else forced upon them.

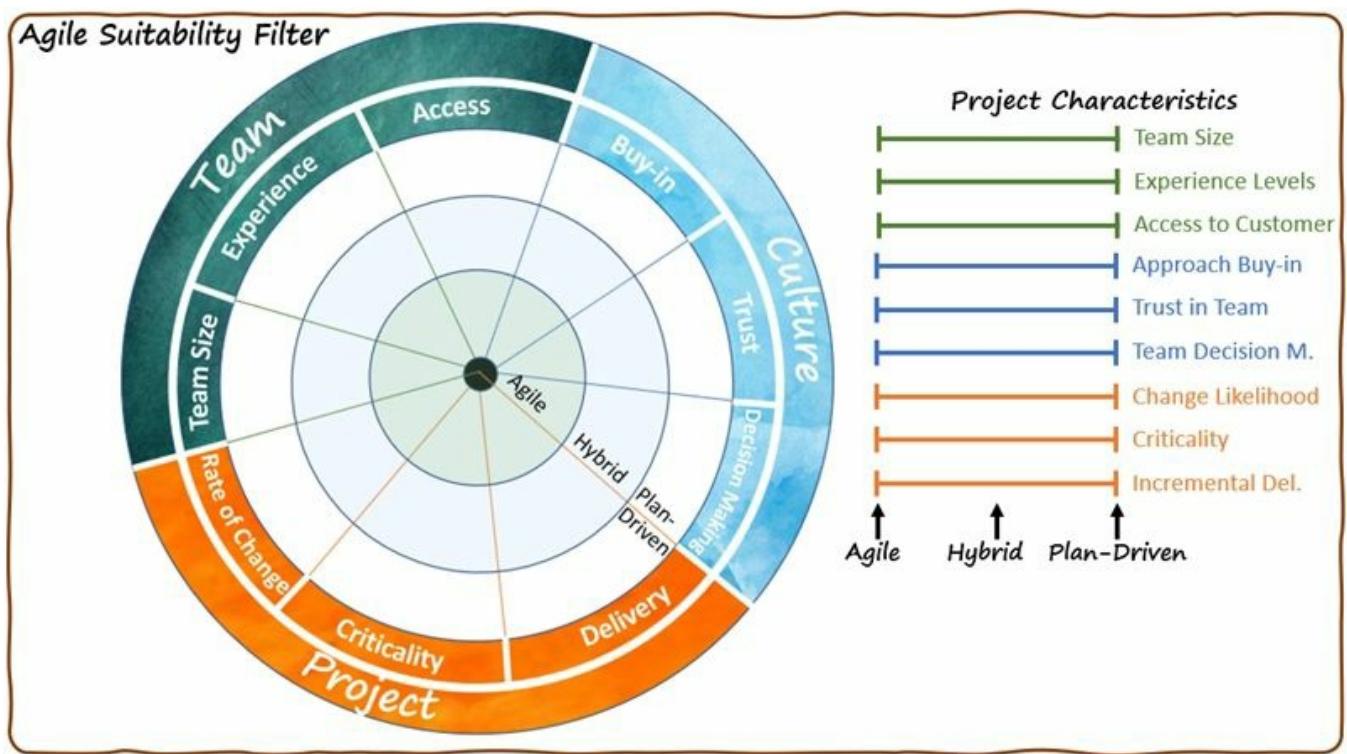
However, bias aside, suitability filters attempt to make the selection process less subjective

and more objective by assessing factors that influence how well an approach fits the situation.

The Agile Practice Guide bundled with the PMBOK Guide 6th Edition contains an appendix on Agile Suitability Filter tools. It presents a hybrid model based on several popular suitability filters that helps assess which lifecycles are most appropriate given various circumstances.

The Agile Practice Guide is a free resource for PMI members, and we will use it to assess each of the case study projects and recommend the approach to take.

Using a radar chart to plot a series of scores ranging from ideal-for-agile to ideal-for-predictive, the Agile Practice Guide suitability filter creates a visual summary of fits and gaps for further stakeholder discussion.



The image above shows a blank Agile Suitability Filter assessment. The chart is completed by answering questions about each of the 9 topics. The questions are scored on a continuum from a good fit for agile (the green area near the center of the chart) to better suited for a plan-driven approach (the white areas near the outside of the chart.) Scores between these areas (the pale blue area) indicate a hybrid approach should be considered.

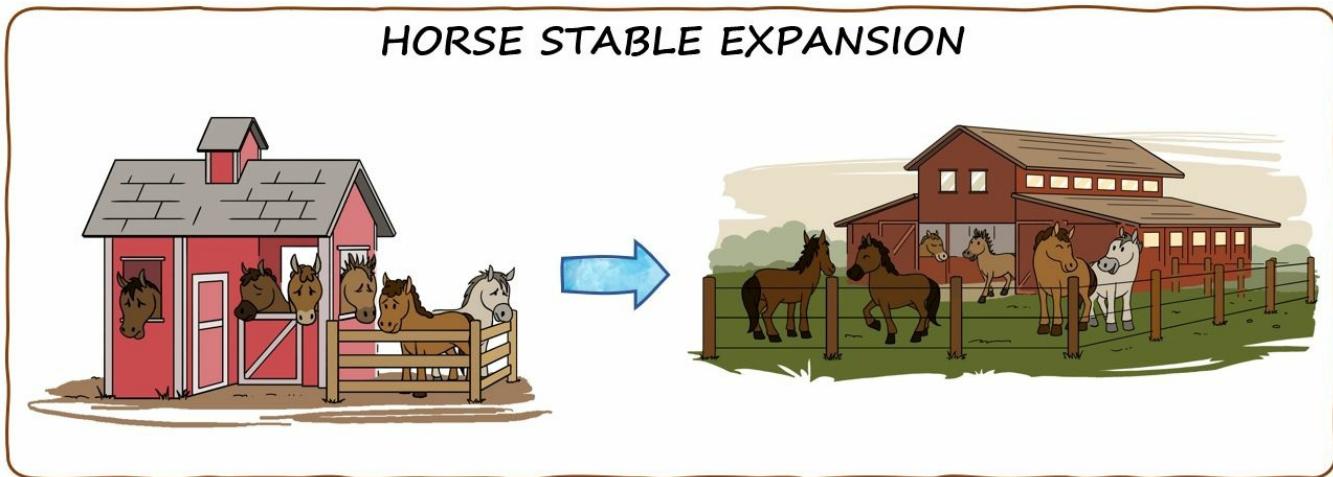
Answering the Agile Suitability Filter assessment questions should be a collaborative discussion with the PM, team and ideally representatives from the sponsor group and customer community. Walking through and scoring the nine categories helps ensure the discussions are more objective than single "I think we should use approach X" type conversations.

However, the questions are deliberately open-ended to promote discussion around project factors rather than mandate one approach over another.

Let's use the Agile Suitability Filter radar chart to assess our three case study projects:

1. **Horse Stable Expansion**
2. **Pig Food Vending Machine**
3. **Badger Den Webcam**

1. Horse Stable Expansion



Starting the assessment with the **Project** characteristics. When we look at the questions in the Agile Practice Guide, it asks us to consider the following sub-categories:

- **Likelihood of Change** – What percentage of requirements are likely to change or be discovered on a monthly basis?
- **Criticality of Product or Service** – What is the potential impact of a failure in the product?
- **Incremental Delivery** – Can the product or service be built and evaluated in portions?

For the horse stable project, once the building is designed, the requirements should be fairly stable (pun intended.) While there will inevitably be some changes throughout the project, that percentage compared to the overall scope should be low each month. Well below 5% of the total for monthly changes in requirements. Using the Likelihood of Change scale from the suitability filter (shown below), this scores change at the far end of the scale (10.)

LIKELIHOOD OF CHANGE

What percentage of requirements are likely to change or be discovered on a monthly basis?

50%

1



25%

5

5%

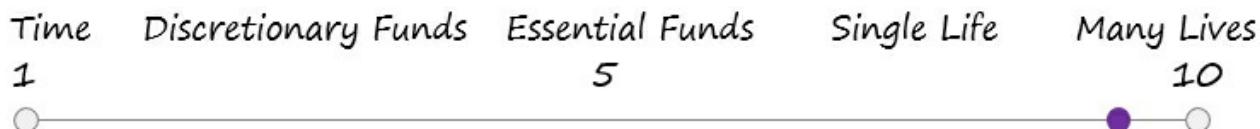
10



The next sub-category, “Criticality,” asks us to consider what is at stake. If the product or service fails, what could we lose or jeopardize? Given this is a public structure, a fire or collapse could result in losing one or more lives. So, we would score it towards the high-end of the scale (9.)

CRITICALITY OF PRODUCT OR SERVICE

What could loss due to a failure or defects in the product or service impact?

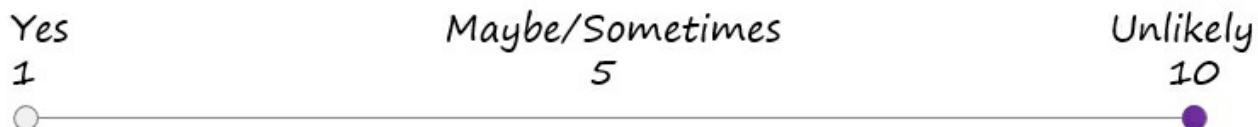


The final Project category is the Suitability for Incremental Delivery. Some products can be economically built and evaluated in small chunks or increments before committing to doing more work or adjusting the approach. Physical construction projects do not typically lend themselves to this sort of incremental delivery.

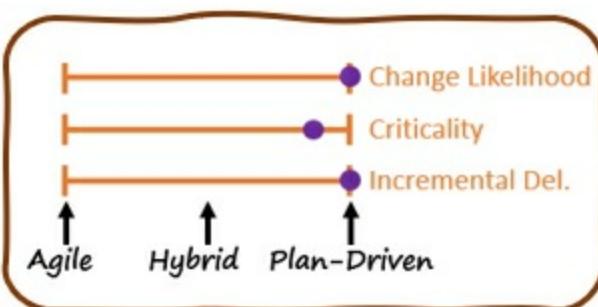
Due to economies of scale, we cannot easily evaluate a portion of a concrete floor because it is most economical to pour it as one large task. Dependencies get in the way too. We do not usually evaluate exterior cladding or roofing materials until the foundations and framing are complete. We can look at samples, but it is not the same as evaluating a portion of the real product. For these reasons, incremental delivery is unlikely.

INCREMENTAL DELIVERY

Can the product or service be built and evaluated in portions?



Looking at the Project sub-categories as a group, we see them clustered towards the Plan-Driven end of the slider lines.



Next, let's review the **Team** category. The assessment question asks us to consider the total number of core team members. A core team member is someone who does some work required for project completion. So, a "do-er" as opposed to a "keep-informed", or "ask opinion from" type stakeholder.

For the horse stable expansion, there will be various sets of core stakeholders during the project life cycle. There could be an architect and designers, a crew to do site clearance, a potentially different team to do construction and then various trades for plumbing, electrical, mechanical, roofing, landscaping, etc.

Let's say 50 people in total doing work on the horse stables. Not all at once, but instead throughout the life of the project. These groups will have to communicate with each other, or their project managers or supervisors, to ensure an efficient build process.

According to the Agile Practice Guide completion guidance, a team size of between 46 and 60 core members gives us a middle-of-the-scale score of "5" for Team Size.

TEAM SIZE

What is the size of the core team? Use this scale: $1-9 = 1$, $10-20 = 2$, $21-30 = 3$, $31-45 = 4$, $40-60 = 5$, $61-80 = 6$, $81-110 = 7$, $111-150 = 8$, $151-200 = 9$, $200+ = 10$

1



5



10



The next question in the Team category asks about team Experience Levels. Having at least a few experienced team members is preferable for agile approaches with fewer detailed specifications to work from, less how-to documentation, and more local decision-making.

This is difficult to evaluate for our construction project since we may not have experience working with all the team members from all the different work crews. Let's make a conservative estimate of between Partial and No.

EXPERIENCE LEVELS

Does the team have enough experience to make sound judgements without detailed specs.

Yes



Partial



No



The final question in the Team category is concerned with Access to the Customer/Business. When access is direct and easy, questions and clarifications can be quickly answered. When it is not possible, we need to rely more on detailed specifications and change control processes.

Let's assume the Pesky Pals Petting Zoo sponsor has better things to do all day than hang around the construction site or be on the phone, so we will score this as an (8).

ACCESS TO THE CUSTOMER/BUSINESS

Will the team have daily access to at least one business/customer representative?

Yes

1



Partial

5

No

10



Our slider scores for the Team category two scores of 5, 6 and 8 would look like this:

Project Characteristics



Organizational **Culture** is the final category. The first questions ask if there is senior sponsor buy-in for using an agile approach on this project? Let's assume a more traditional approach is expected and score this as No, with a value of (10).

BUY-IN TO AGILE APPROACH

Is there senior sponsor understanding and support for using an agile approach?

Yes

1



Partial

5

No

10



The next two questions cover trust in the team to transform the sponsor's vision into a successful outcome and will the team be given autonomy to make their own local decisions. Let's answer these as somewhat trusting of the team (5), but more cautious about giving them autonomy (8).

TRUST IN TEAM

Is there confidence the team can transform the vision to a successful product or service?

Yes

1



Probably

5



Unlikely

10



DECISION-MAKING POWERS OF TEAM

Will the team be given autonomy to make their own local decisions about how to work?

Yes

1



Probably

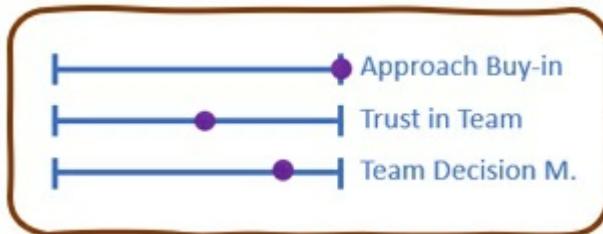
5

Unlikely

10

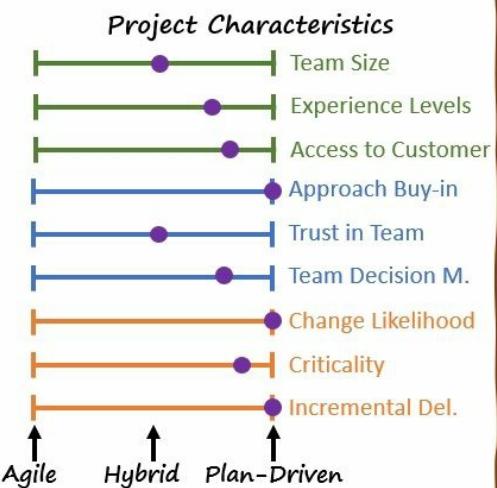
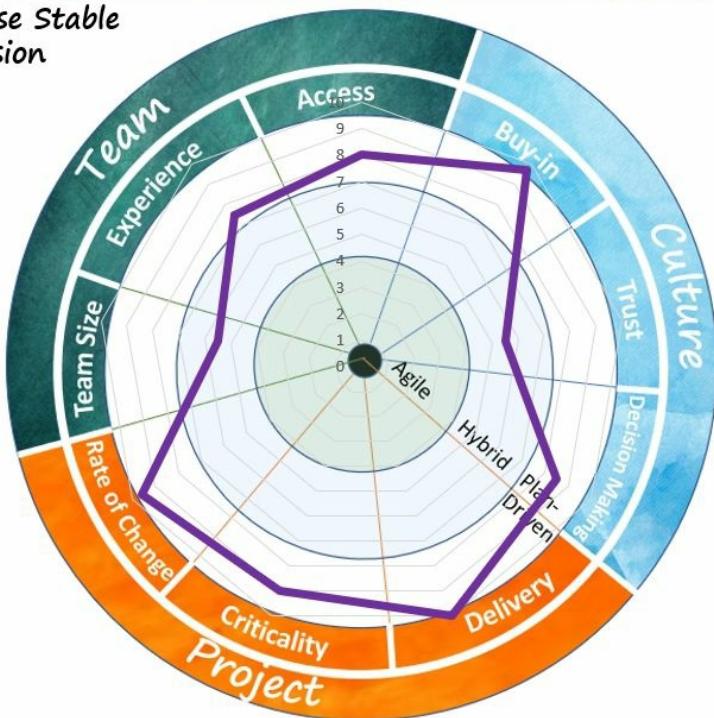


These scores would set our sliders for Culture to the following values:



Completing the assessment with these scores would result in the following radar chart plot.

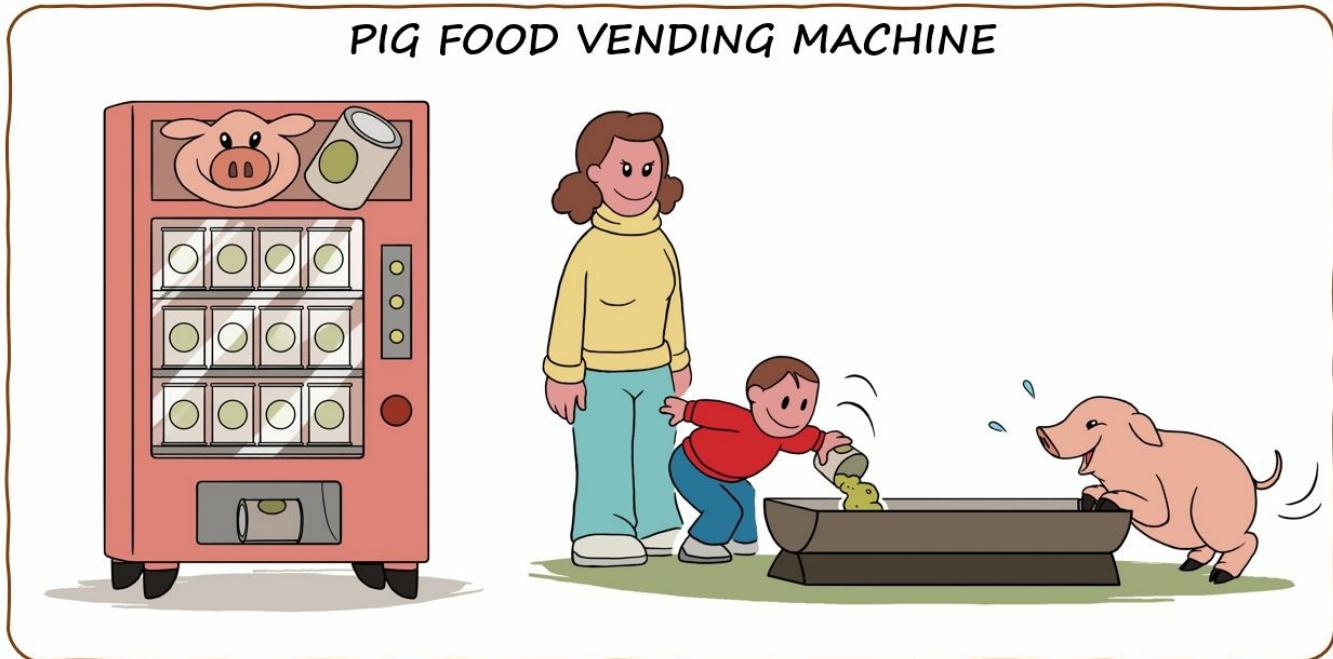
1. Horse Stable Expansion



The purple plot-line shape is mainly in the white, Plan-Driven region, indicating those who completed the questionnaire believe a traditional, waterfall type approach is probably the most appropriate.

In a couple of places (Team Size and Trust) we score more in the Hybrid region. This is because the project is not especially large in terms of people, and we (rightly or wrongly) trust these people to do a good job. Maybe we could lighten up on supervision, or more prudently, perhaps we should proceed with normal levels of oversight and see how things work out first.

2. Pig Food Vending Machine



The pig food vending machine project is very different from the horse stables expansion project. It is the brainchild of animal caregiver and visitor-liaison Pam Fields. Pam has talked zoo handyman Bill Harris into offering help also.

Pam noticed everyone (the animals and visitors) enjoyed feeding time. She wanted to share some of the thrill and appreciation she received from the animals with the guests at Pesky Pals. She also saw it as a double win for the zoo. Guests would willingly buy food to feed the animals that Pesky Pals have to feed anyway. The zoo gets additional revenue, and the guests get a richer experience interacting with the animals.

Lambs and baby goats are visitor favorites, but the lambs are more skittish and need closer supervision to ensure the smaller animals get their fair share of food. The goats can get too boisterous and like to jump at, chew on, and head-butt anyone who comes close when feeding, so these animals were not the best candidates. However, the young pigs eat anything, seem to get their fair share, and while they make a lot of noise, they are generally safer to be close to.

Visitor numbers vary depending on weather, school holidays and what else is happening in the area. Rather than set up a pig-food stand staffed by a volunteer, using a vending machine seemed like a good way to cope with the variable demand for pig feeding.



Project Uncertainties

Technical

Pam thought it would be a straightforward project. Just reuse an old soft drink vending machine to dispense paper cups filled with pig food pellets. However, vending machines rely on strict tolerances of standardized cans to dispense them. Lumpy paper cups do not work. Some machines are more versatile and use screw threads to drop packages. However, these tended to spill the food and eventually jam when it became lodged in the flappy door hinges.

A cafeteria-style vending machine with doors that open is one choice, but these are for indoor use only. Vendomax vending machines have offered to build an outdoor version for \$10,000, but a shelter for an indoor device might be sufficient.

Legal

Children might eat the pig food and get sick. People may claim the pigs are being over-fed and sue Pesky Pals for animal abuse. Luckily Pesky Pals already operates a small café and so has a food permit. They are also licensed as a farm so they can keep and feed livestock. They do not have any legal council though and are concerned about children eating the food and claims of improper feeding.



Approach Evaluation

Ordering a machine and obtaining permits are defined, well documented, recognized processes with long lead times. Experimenting with food containers, designing graphics for the machine, and testing it with customers is less well known.

Let's run the project through the same Agile Suitability Filter from the Agile Practice Guide. Rather than show the slider questions again, we will focus on the results.

Project Characteristics:

- **Likelihood of Change** – What percentage of requirements are likely to change or be discovered on a monthly basis?
- **Criticality of Product or Service** – What is the potential impact of a failure in the product?
- **Incremental Delivery** – Can the product or service be built and evaluated in portions?

Likelihood of Change – The core concept of a vending machine to dispense food is relatively well known and stable. However, converting the machines for pig food and navigating legislation is not a core competency for the team of Pam and Bill. So, there is a reasonable likelihood that

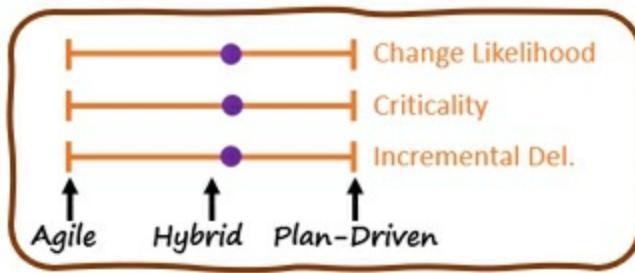
scope and requirements will change (or be discovered) each month. Guestimate score, somewhere in the middle of the range (6).

Criticality of Product or Service – The project is a small, hopefully, revenue-generating project for Pesky Pals. Unlike the horse stable extension project that will consume 80% of the zoo's working capital, vending machines are much cheaper.

Also, since the zoo plans on selling 2c's worth of pig food for \$3 a cup, the financial risk should be low. However, if children eat the pig food and get sick (despite the warning on the cup), there is a potential for legal exposure. Guestimate score (6).

Incremental Delivery – Buying an incompatible vending machine would be a single large mistake, but if they go the custom Vendomax machine route, the supplier will work until the zoo is satisfied. Machine graphics, portion sizes and cup types can be iterated and evaluated quickly.

So, there is a large single purchase and then scope for iterative development on the remainder of the scope. Guestimate score, also a (6).



Team Characteristics

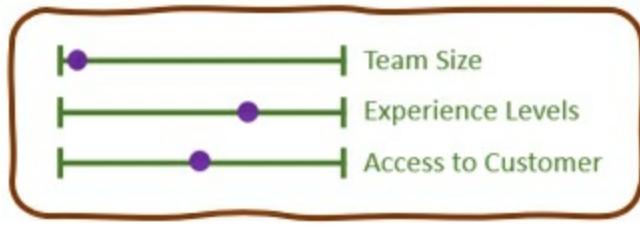
The team characteristics evaluate:

- **Team Size** – is it small and easy to share information?
- **Experience Levels** – Are there enough experienced people to lead the work autonomously?
- **Access to the Customer** – Is the customer available to answer questions and provide clarification?

Team Size – The core team will be Pam and Bill. There may well be a person or two to work with at the vending machine supplier, but the group will be small and with the range for a score of (1).

Experience Levels – Pam and Bill know about feeding the animals, interacting with guests and general DIY, but are not vending machine specialists. The estimated score is (7) – which is largely inexperienced.

Access to the Customer – Pam has a good understanding of what customers like and want. However, nobody really knows if people will pay \$3 for a cup of pig food, or if they will do so regularly. Also, what other facilities might be required? A hand washing station, perhaps? Given the potential for unanticipated customer requests, we will score this as (6).



Culture Characteristics

The culture characteristics evaluate these three topics:

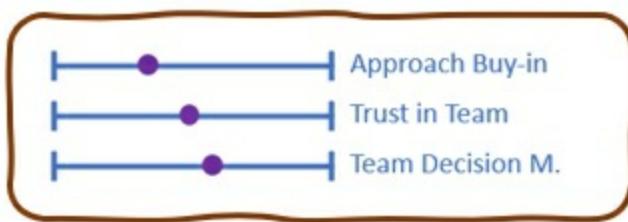
- **Approach Buy-in** – Is there senior sponsor understanding and support for using an agile approach?
- **Trust in Team** – Is there confidence that the team can transform the vision into a successful product?
- **Decision-Making Powers of the Team** – Will the team be given authority to make their own local decisions about how to undertake work?

Approach Buy-in – There are a couple of factors to consider. On the one hand, an iterative and incremental approach will help explore the project uncertainty. On the other, permits and long lead times would benefit from detailed plans. This illustrates why a hybrid, a combination of approaches, is likely preferable. Score (4).

Trust in Team – While we probably trust Pam and Bill to do the best they can, we have to acknowledge this project is likely outside their core competencies. So, again, a score somewhere in the middle of the scale. Score (5).

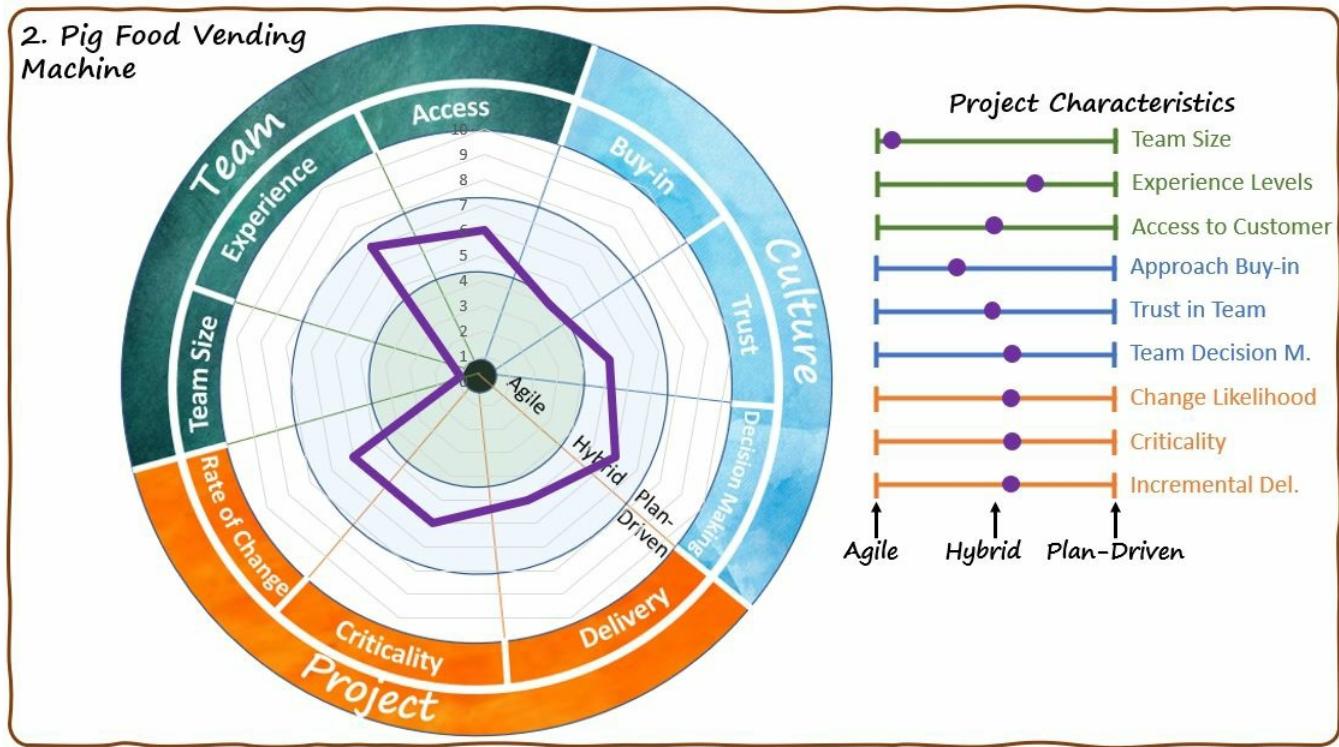
Decision-Making Powers of the Team – Pam and Bill have been entrusted to make decisions, but they will probably need additional outside guidance too. Score (6).

These scores would set our sliders for Culture to the following values:



The final assessment plot for the Pig Food Vending Machine would look like this:

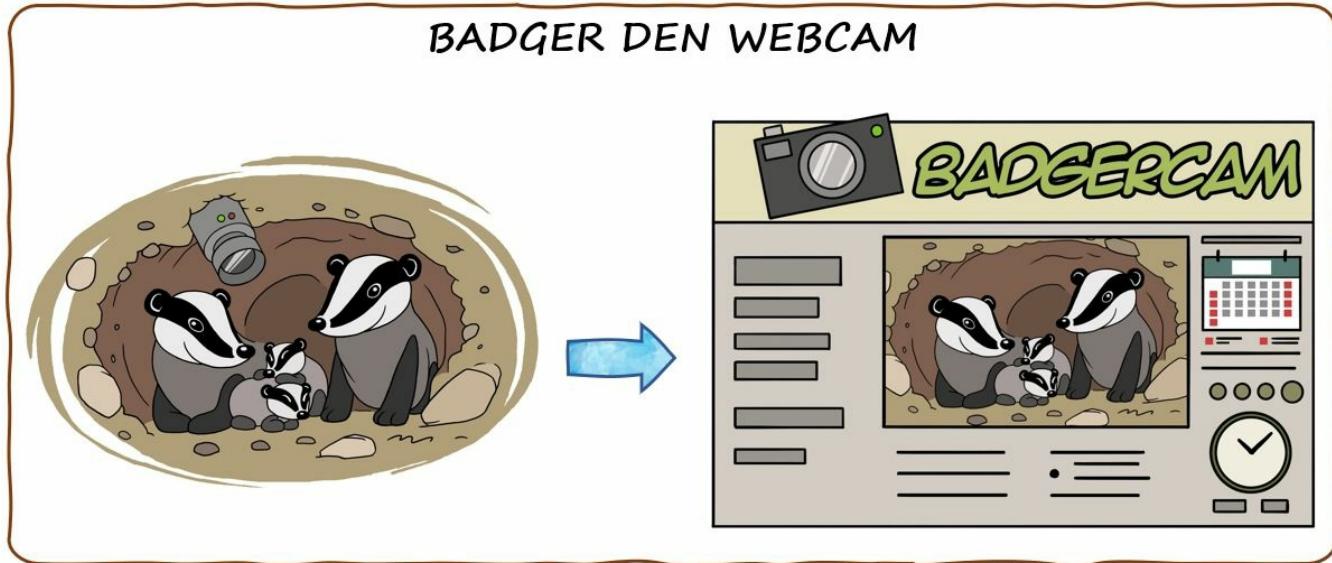
2. Pig Food Vending Machine



Team Size is the anomaly here. Having such a small team certainly places it in the sweet spot for an agile approach with minimal process and documentation overhead. However, the need for external support and potential liability exposure help move the majority of the scores into the Hybrid zone.

This is mainly an agile project with additional provisions for a large purchase and extra checks and balances because of the criticality exposure.

3. Badger Den Webcam



Some of the Pesky Pals residents are nocturnal and shy. Because of this the badgers do not get the attention they deserve. Senior keeper Gwen Powell suggested Pesky Pals invest in a night vision webcam and create a website so people can view the badgers.

The Pesky Pals board reviewed Gwen's request but has not approved it yet, since there are concerns about the horse stable expansion running over budget. However, they have confirmed that if the stables complete on budget, this should be one of the next initiatives.

The website planned to view the webcam footage will also feature ads to remind people to come and visit Pesky Pals, announce events, and encourage people to sign up for newsletters, etc. Pesky Pals does already have a website, but it was created by a former volunteer who has now moved away, and it is difficult to update. A link on the Pesky Pals web page will take viewers to the badger den webcam page that will be its own new website.

Badgers give birth in February and have between 1 and 5 young (usually 2 or 3.) A generous donor at the Christmas fundraiser surprised Pesky Pals with a \$10,000 donation, requesting they "Do something fun, kids will enjoy." Over the Holidays, the board agreed to fund the webcam project. Now they have just over a month to complete the project before the badger birth bonanza website launch.

Gwen's daughter, Elen, works for WebStorm Promotions, a local online branding and SEO company. They have offered to undertake the basic website work for a charitable organization special fixed-price of \$7,500 and use the remaining \$2,500 for online advertising and promotion.



Approach Evaluation

Using the agile suitability filter one last time for the badger den webcam provides the following results:

Project Characteristics:

- **Likelihood of Change** – What percentage of requirements are likely to change or be discovered on a monthly basis?
- **Criticality of Product or Service** – What is the potential impact of a failure in the product?
- **Incremental Delivery** – Can the product or service be built and evaluated in portions?

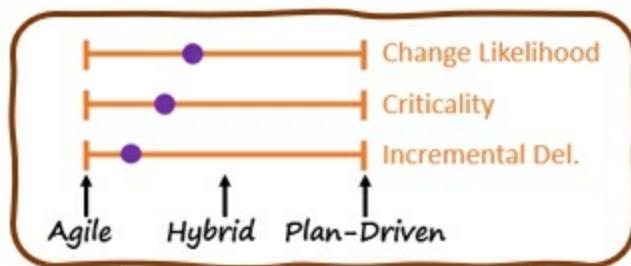
Likelihood of Change – The basic idea for the webcam site should be fairly stable, but options to save clips, skip to the last activity, view other user favorited clips, etc are still quite vague. Also, the requirements for Pesky Pals promotions and newsletter signup/content have not been defined.

For the moment, a provisional estimate of the percentage of requirements that may change, on a monthly basis, has been set at 30%, resulting in a score of (4).

Criticality of Product or Service – A \$10,000 donation is significant for Pesky Pals, that would buy a lot of animal food for during the winter months when the zoo does not get many visitors. It has been assigned a value somewhere between “Discretionary Funds” and “Essential Funds” earning a score of (3).

Incremental Delivery – The installation and positioning of the night-vision webcam needs to be a single, one-off activity to minimize disruption to the badgers. After this, the website can be iterated upon and built incrementally. So, a one-off activity followed by iterative work. This has been assessed as a (2).

These scores are shown below.



Team Characteristics

The team characteristics evaluate:

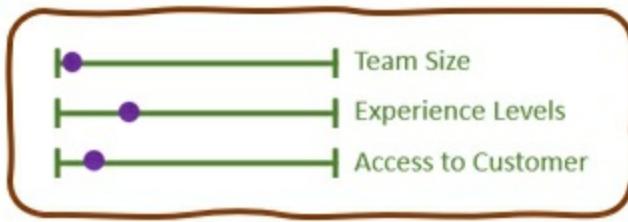
- **Team Size** – is it small and easy to share information?
- **Experience Levels** – Are there enough experienced people to lead the work autonomously?
- **Access to the Customer** – Is the customer available to answer questions and provide clarification?

Team Size – The team will be small, consisting of Gwen as product owner, Elen as lead developer and three other WebStorm Promotions staff working part-time, as required on UX design, security, and promotion. With a core team of 5 people, this puts the team size in the 1-9 category, scoring (1) on the scale.

Experience Levels – The WebStorm Promotions team have a lot of relevant experience. Not only at web design, but also working with each other. The only uncertainty is having Gwen as a product owner. She knows about badgers, but not so much about the roles and responsibilities of being a product owner. Weighing these factors experience levels are assessed as mostly experienced and assigned a score of (3).

Access to the Customer – Gwen has agreed to be available as required to answer questions via WhatsApp about the website. While not as useful as having her in the WebStorm Promotions office, her enthusiasm and drive to see the Badger Den Webcam completed before the birth of this year's badger cubs is evident to everyone she interacts with. A side benefit of having her daughter as lead developer also means she can ask her mother at home for more info on any requirements. Score (2).

The three Team scores look like this:



Culture Characteristics

The culture characteristics evaluate three topics:

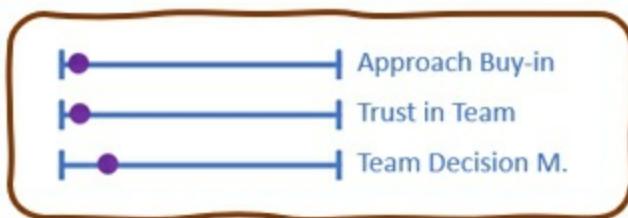
- **Approach Buy-in** – Is there senior sponsor understanding and support for using an agile approach?
- **Trust in Team** – Is there confidence that the team can transform the vision into a successful product?
- **Decision-Making Powers of the Team** – Will the team be given authority to make their own local decisions about how to undertake work?

Approach Buy-in – Absolutely, the Pesky Pals board and Gwen are bought into using agile's iterative, incremental approach with lots of demos to develop the new Badger Den Webcam website (1).

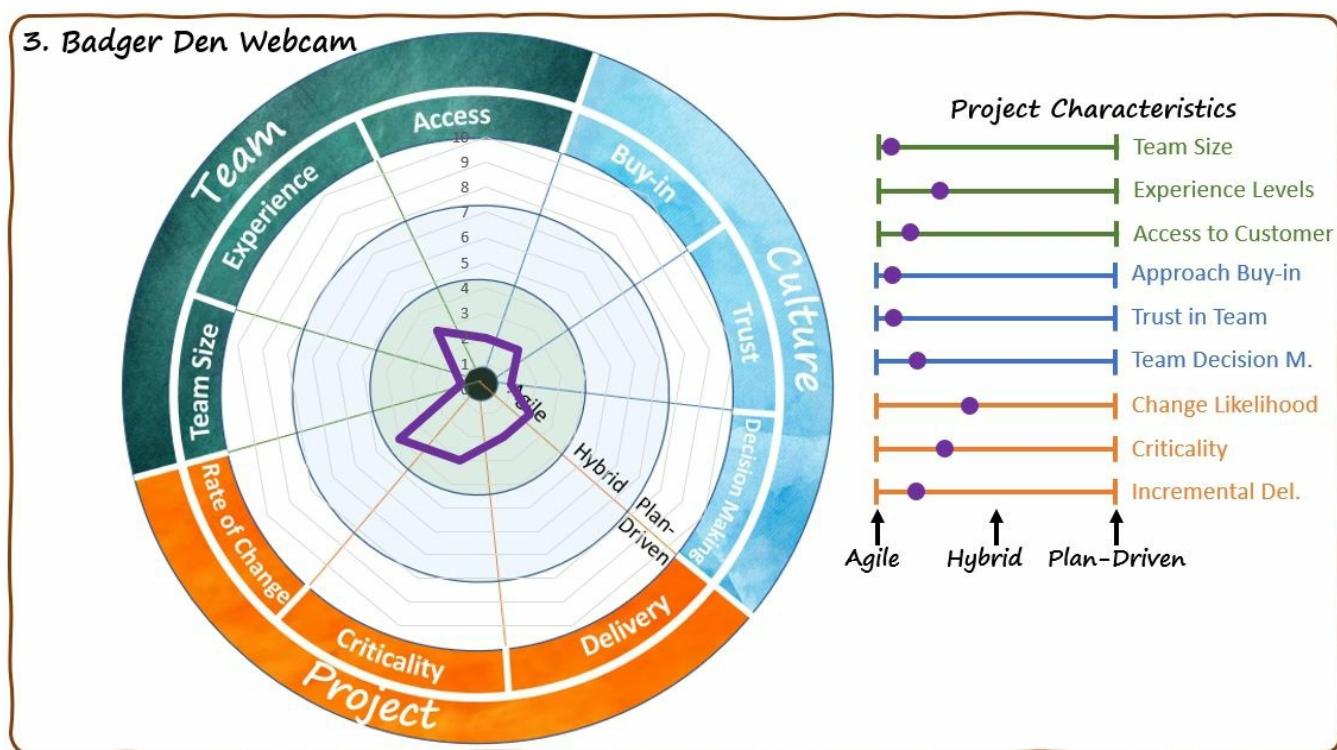
Trust in Team – Pesky Pals are also confident the team fully understands the goal and is trusted to deliver what is required. Score (1).

Decision-Making Powers of the Team – While the technical team has been given authority to make decisions, Gwen will have to get promotional materials approved by the Pesky Pals board. Some members can be slow to respond. However, she has been assured it is OK to use her own judgment if she does not hear back from requests for input within 3 days. To reflect this potential for slight delays, the Decision-Making score has been increased from an ideal (1), to a (2).

These scores will set our sliders for Culture to the following values:



The complete assessment plot for the Badger Den Webcam looks like this:



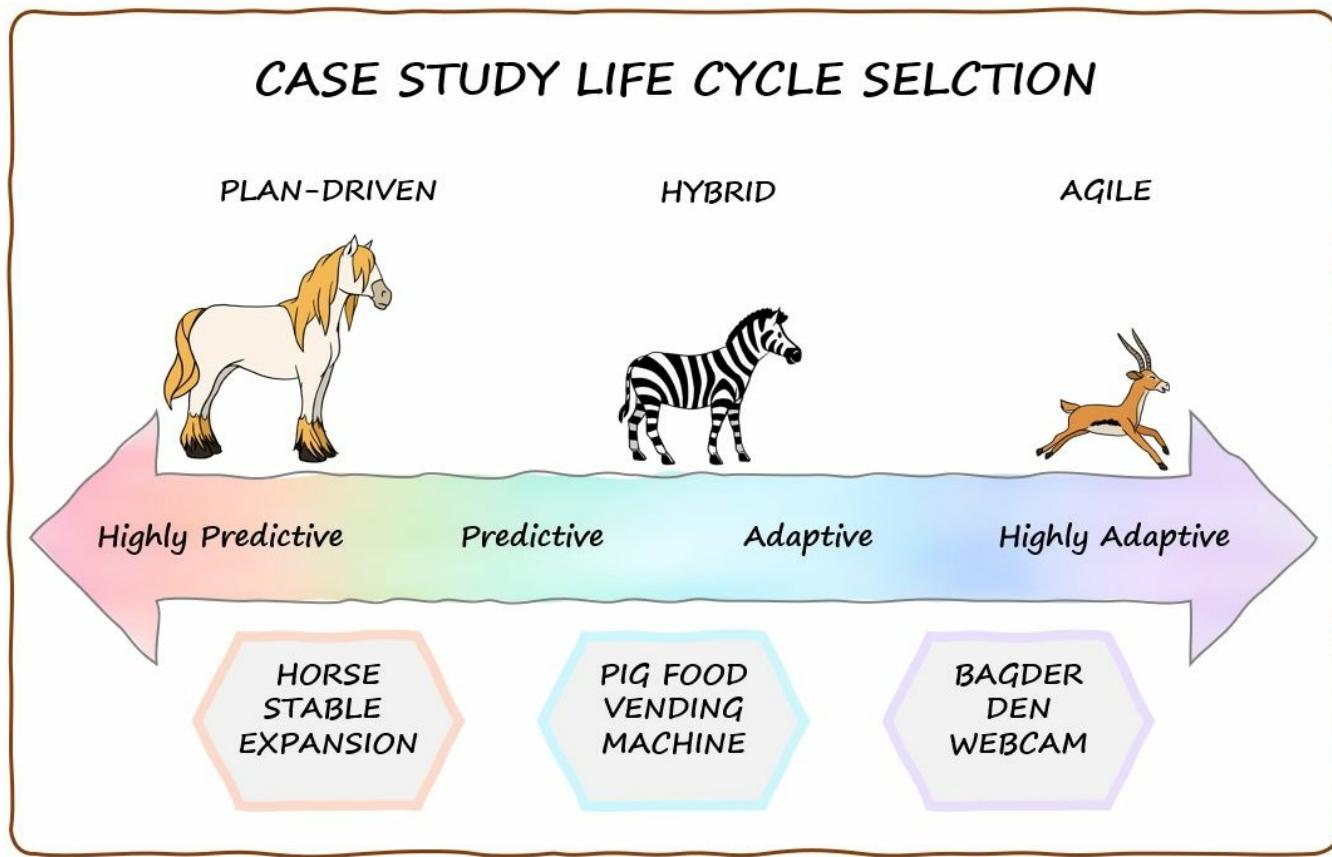
The Badger Den Webcam project scores entirely within the green Agile zone. This indicates an agile approach should be a good fit for this project.

Case Study Summary

The Agile Suitability Filter allowed us to analyze the project characteristics of our three case study projects. By assessing factors within the categories of Culture, Team and Project we were able to make the following recommendations.

1. **Horse Stable Expansion** – A plan-driven approach to reflect little expected variation from plan.
2. **Pig Food Vending Machine** – A hybrid approach to balance innovation and regulatory compliance.
3. **Badger Den Webcam** – A high-tech, software focused project that would be ideal for an agile life cycle.

As shown below:



Outliers and Mitigation Strategies

The case study projects were deliberately chosen to allow us to compare and contrast some common project types. We need to understand the basics before tackling more challenging project classifications. However, as a side effect, they were quite clear cut and easy to differentiate.

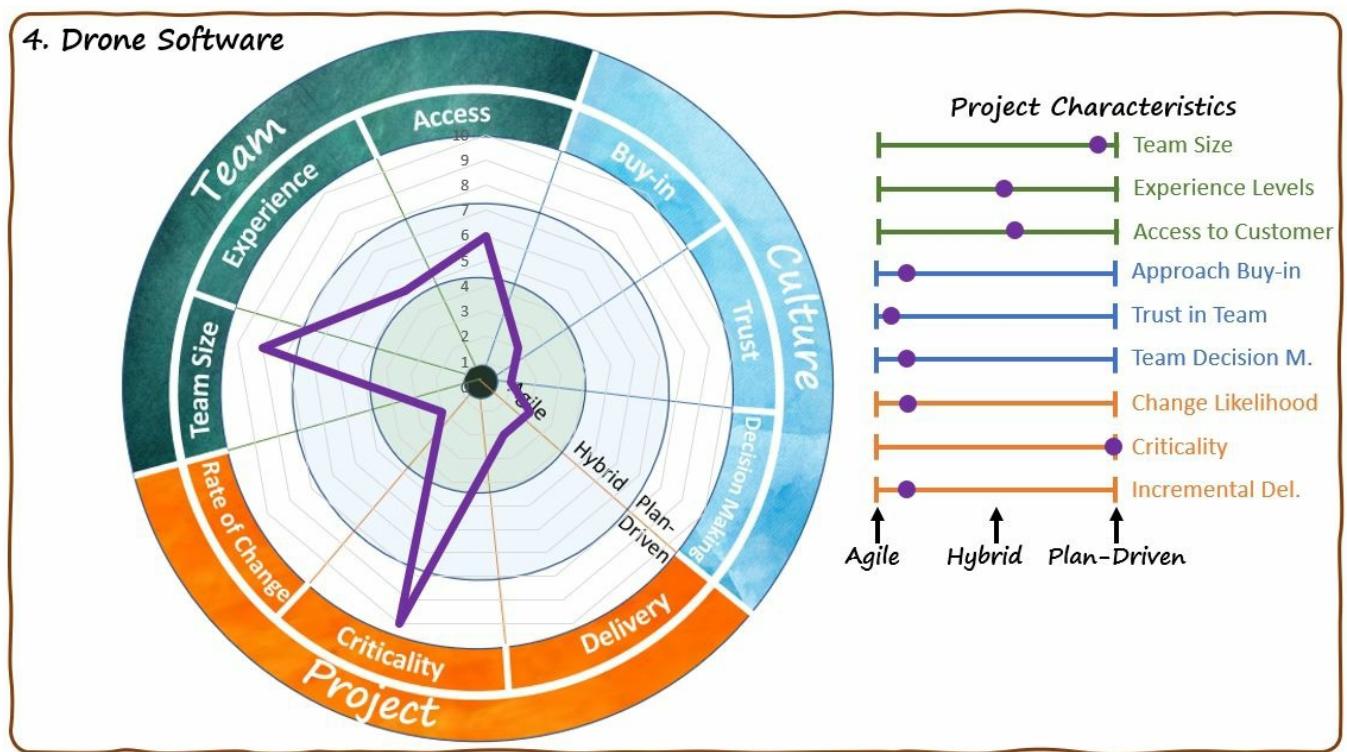
Yet, as we know, life is often not so simple. Instead, we sometimes see outliers or spikes that take an otherwise traditional or agile-suited project into a problematic area. Let's review a couple more real-life examples:



4) Drone Software

Imagine you worked on a project developing software for U.S. Air Force drones. The software is complex, uncertain and needs to evolve quickly as new requirements are passed along in response to changing needs. It sounds like a great fit for agile, but the core Team Size is “175” people and the Criticality (impact of product failure) is potentially “Multiple Lives” since the drones are armed.

Plotting the project characteristics gives us the following:



Team Size and Project Criticality spike outside the agile zone and past the hybrid zone, very much into the realm of plan-driven projects. How should we handle this?

The solution adopted successfully by a major software provider for the U.S. Air Force’s autonomous vehicles division was to encapsulate its agile development in a wrapper of more traditional operation.

To even do business with the U.S. Air Force, companies need to pass rigorous upfront security qualifications, and go through a detailed request for proposal (RFP) bidding process that goes much deeper into requirements gathering than agile approaches typically recommend.

Then, at the back end of the delivery process, teams must generate large volumes of documentation, including traceability of test results back to each requirement. This is, again,

beyond what agile project teams usually produce, but a prerequisite for doing business with the U.S. Airforce.

Throughout project execution, suppliers are monitored closely by a comprehensive governance program that evaluates designs, code and security procedures. Vendors must also provide detailed reporting of progress, risks and issues, along with projections of estimates at completion.

How an agile core is wrapped with a more traditional outer layer is shown below:



Despite all the oversight constraints, the supplier operates with an agile core for software development. The teams maintain a backlog for functional and non-functional requirements and work in two-week sprints. They have daily stand-ups, internal demos, retrospectives and collaborative planning workshops. They are empowered to make local decisions and resolve issues that do not impact external parameters.

However, their external operating environment is rigid and not very agile friendly, but they find a way to use agile approaches to add value. Short iterations and experimentation allow them to confirm directions and explore risk areas quickly and proactively. Their short cycles and inspect/review activities also allow them to learn and adapt quickly.

This is truly a hybrid solution, using agile and traditional elements together to better meet the client's needs and situation.



5) Agile Development + Traditional Deployment and Training

Another example of when to use a hybrid approach would be when we have two (or more)

different types of work within the same project.

Consider a project to design, build, deploy and train 20,000 social workers to use a new body-cam system. The design and build portion of the software system is likely to be very dynamic, benefiting from an agile approach. Purchasing and deploying 20,000 body cams with providing appropriate training is a major logistical project in its own right.

As project managers, we often get tasked with undertaking both kinds of work within the same project. So which life cycle do we choose? The intelligent answer is both. Use an agile approach for the software system followed by a more traditional approach for the purchasing, roll-out and training work.

Hybrid Approach - Agile then Traditional

AGILE

TRADITIONAL

Agile Software System Development

Traditional Roll-out and Training

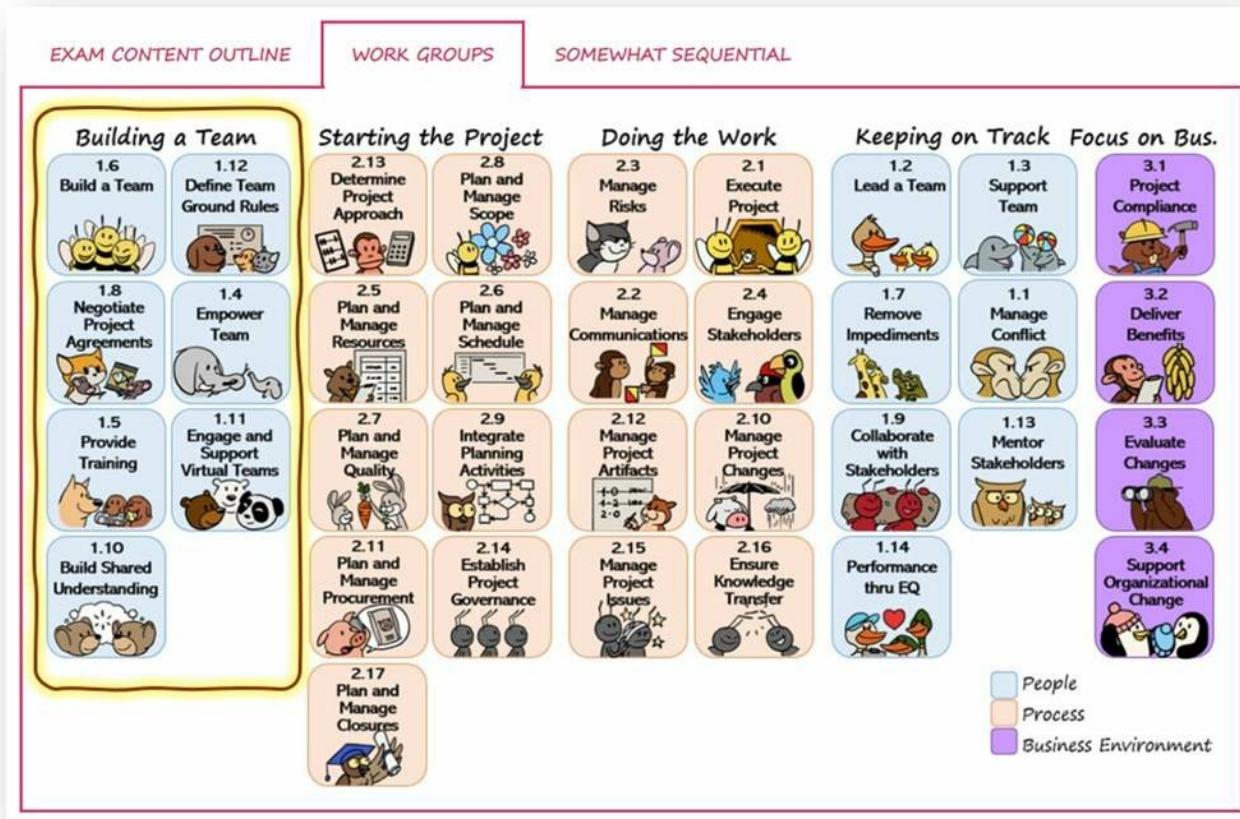
There are many ways of mixing traditional and agile methods to create hybrid approaches. The Agile Practice Guide (a free download for PMI members) has more examples.



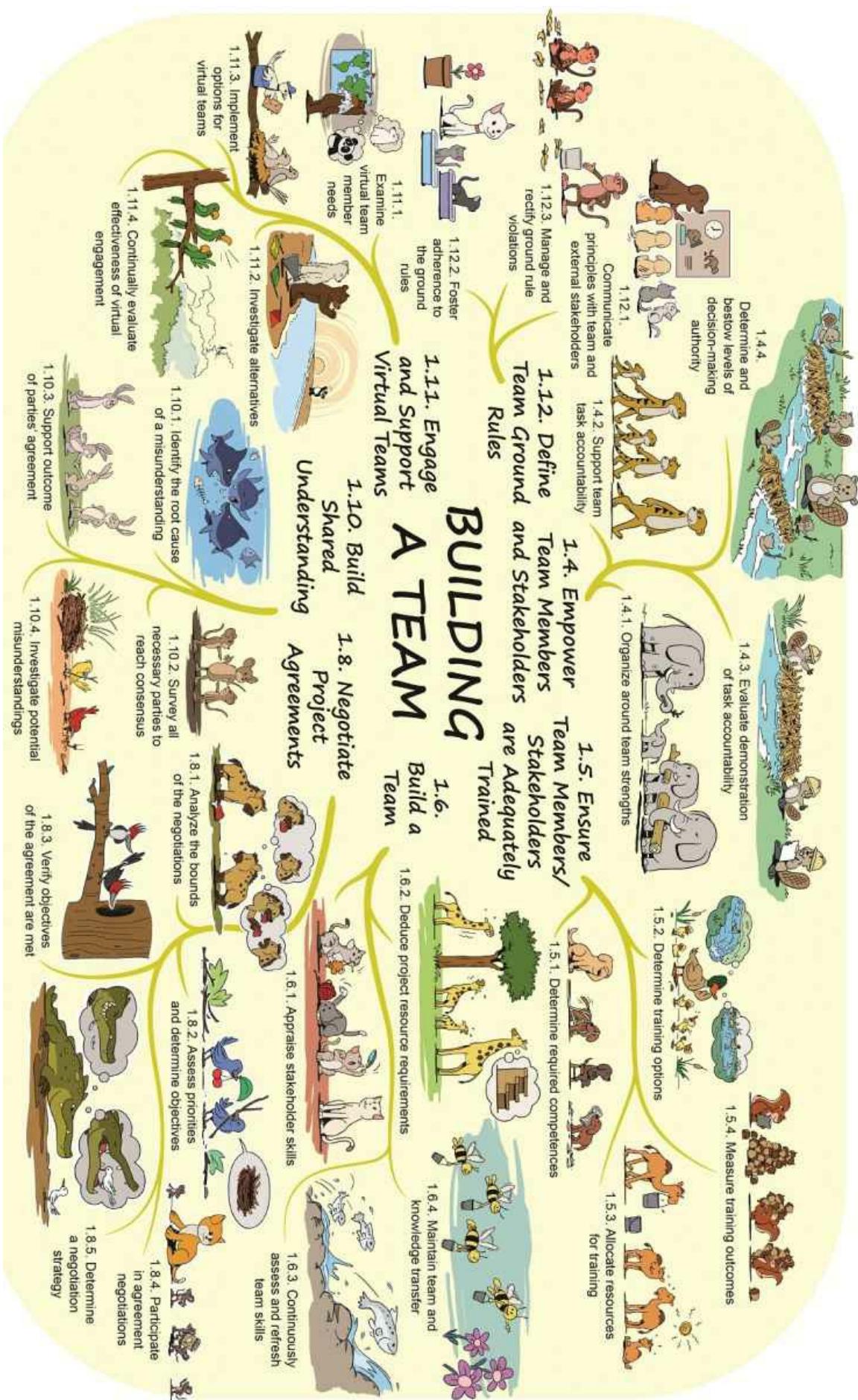
Note: As mentioned at the start of this section, this coverage of the Agile Suitability Filter in this section has been extensive to drive home what type of project characteristics might influence project life cycle selection. The Agile Practice Guide that describes the suitability filter is one of the reference sources for the exam. However, you should not expect as much coverage on the exam as we went through here. Expect maybe one question on how to determine the most appropriate project life cycle, yet it is an important topic that frames all the agile and hybrid techniques, and now you likely understand it better than most people.

WORK GROUP 1 – BUILDING A TEAM

Now we will start exploring the content in the “Building a Team” portion of the Exam Content Outline. The tasks in this group are highlighted below. They include “1.6 Build a Team”, “1.12 Define Team Ground Rules”, etc.



Building a Team - Mindmap



1.6 Build a Team



Projects are people driven

Before we get into building teams, let's take a moment to talk about the importance of people in projects. Project management can seem full of technical terms and processes. We use techniques like earned value analysis and work breakdown structures but do not get fooled into thinking these are the most important aspects of executing projects.

Projects are people-driven. People think of ideas for products and services, and we create projects to produce them. People execute these projects, and yet more people use and the products and services they make. It is not turtles all the way down; it is people all the way down.

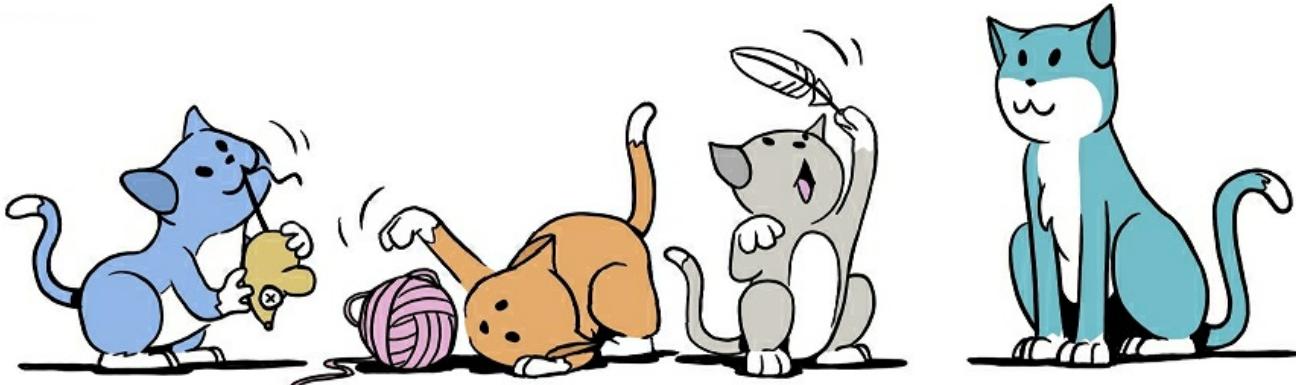


Building a Team

Building teams is one of the most critical parts of project management. Teams do the work, teams solve problems, teams deliver results. With the wrong team or a suboptimal team, those results may not be what the sponsor asked for or what our customers wanted.

So, building a team is key to success. In theory, we could hire the perfect team (if such a thing exists), but I suspect they are busy elsewhere. We could recruit the right people, use or train those people we already have, or use who we get assigned / can find around the place. In reality, most projects use various strategies. As project managers, our goal is to do the best with what we have, be creative in finding and recruiting necessary talent, and be diligent in training and development.

1.6.1 Appraise Stakeholder Skills



(Catalog the current skills and determine if any others are needed)

The activity “Appraise stakeholder skills” aims to assess the skills we have and the skills we need to deliver the project outcomes. This can be done through a variety of approaches, including:

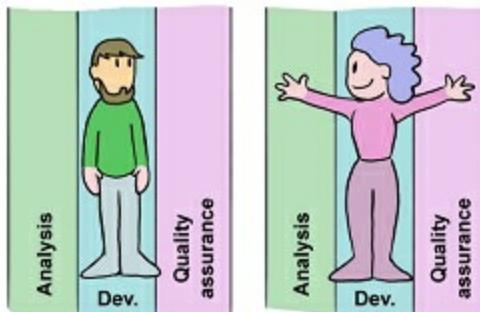
- Structured interviews – skills assessments and matrices
- Attitudinal surveys – skills and mindset data collected by a survey
- Ability tests – more common when recruiting new team members
- Focus groups – collective reviews of what we can do and where we need help

Balance Fill Skill Gaps with Resiliency

After identifying the skillsets needed for the team, we should look at capacity and potential skill-shortage risks. Having a critical skillset provided by just one person could represent a single source of failure if they left or could not work. So, some overlap in skills can be beneficial.

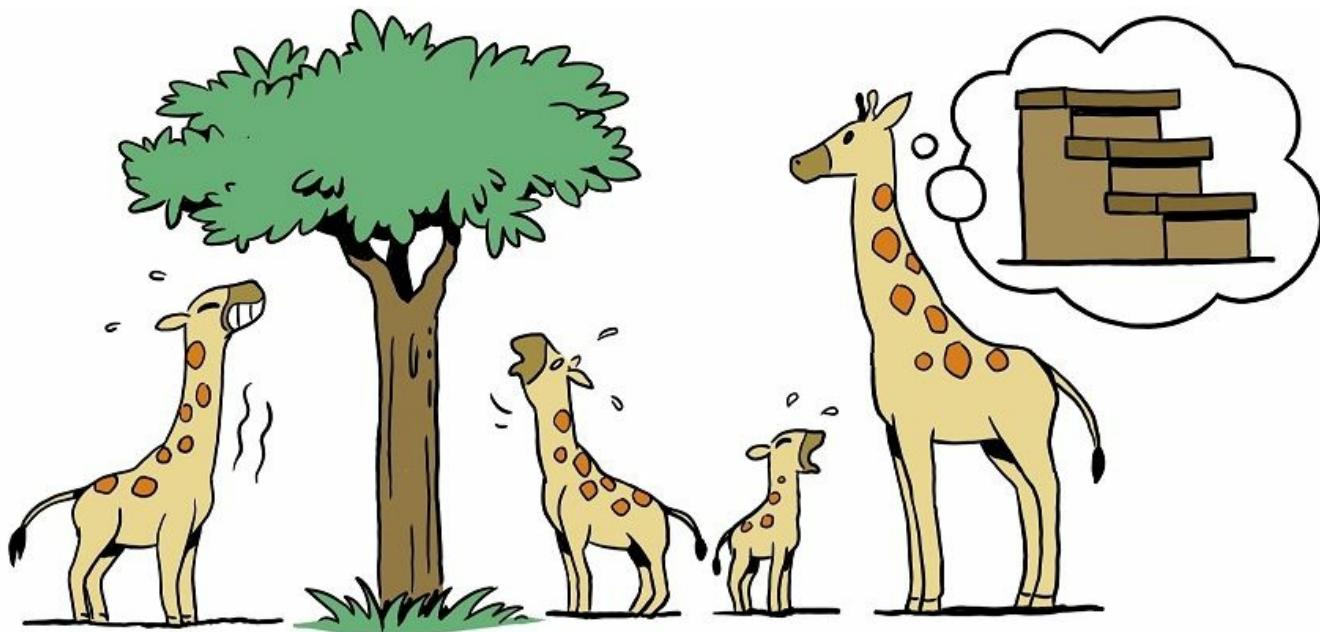


Agile approaches encourage “generalizing specialists” and promote the concept of “T” shaped people. “I” shaped people have skills in one only domain. They are like the letter “I”, deep and narrow. “T” shaped people augment their deep skills in one area with some broader (shallow) skills in others so they can help out in these areas too, if need be.



“I” Shaped and “T” Shaped People

1.6.2 Deduce Project Resource Requirements



(Identify where the team needs support and growth)

Part of planning a project is analyzing what will be required to complete it. This will include material, tools, capabilities and people. (I am not a fan of calling people “resources” since it implies they are interchangeable units to be used or consumed, but some terms are slow to change.) We need to list all skills and roles required for successful project completion.

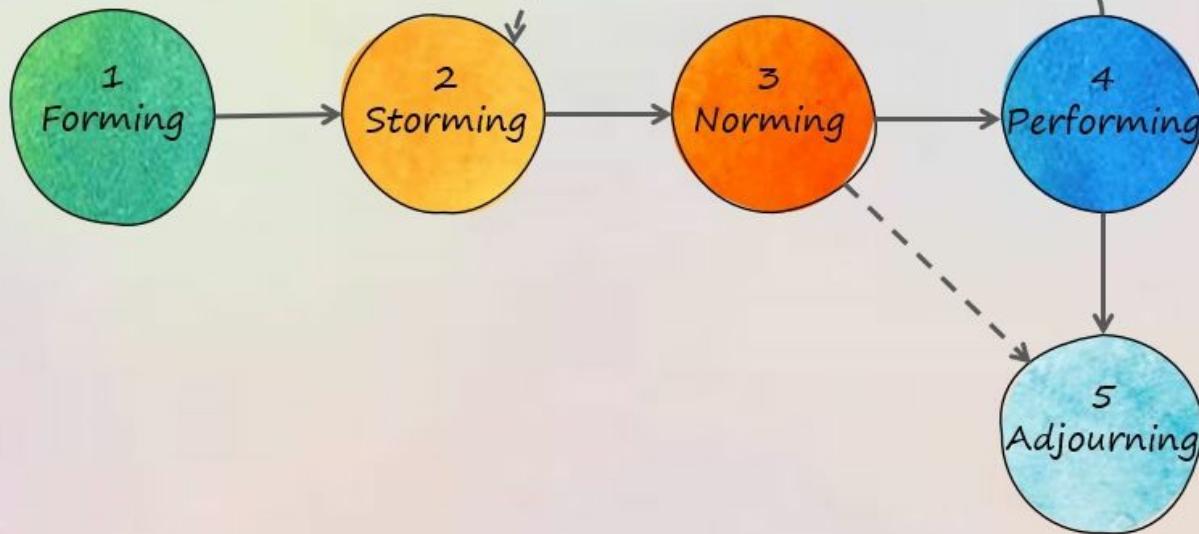
Tools commonly used to do this include:

- Skills lists – recording what is required and maybe also when and in what quantity
- Resource schedules – a breakdown of when people are needed
- Rate tables – financial information about the cost of engaging people
- RACI Matrix – a table showing who is Responsible, who is Accountable, Consulted, and Informed
- Virtual teams’ requirements – technology needed, additional engagement forms and documentation

Team Formation

The Tuckman model of team formation is a useful tool for discussing how teams often develop. The Tuckman model describes five stages of team evolution.

Tuckman Stages



1 Forming is when team members first meet each other. Team members are trying to identify where they fit in. They may seem polite, quiet and can be reluctant to share their thoughts.

2 Storming, now conflict and competition arise as people try to establish how best to work together and who calls the shots.

3 Norming, the team settles down after determining people's roles and ways of working.

4 Performing, some, but not all, teams enter the performing phase of being comfortable with each other and able to collaborate effectively.

5 Adjourning is when the work ends, and the team begins to disband.

As indicated by the dotted arrows, performing teams can go back to the storming stage if a disruption occurs. The most common cause for this is the addition or subtraction of a team member. Now the team has to go through storming and norming again with the changed dynamic.

Also, groups may go from norming direct to adjourning without ever reaching a performing stage if some element of their development was not addressed.



In traditional approach environments, it is normal for project managers to create a Project Management Plan that includes team information, such as:

- Team members assigned to the project
- Their roles and responsibilities
- Stakeholder directory
- Project organization charts

For large projects, there may be a separate Resource Management Plan that outlines talent management attributes such as:

- Competences – What skills and capacities are required
- Identification of resources – which people are being requested
- Acquisition of resources – How they will be found and assigned to the project
- Roles and Responsibilities – what they will be doing
- Project Organization Chart – who reports to who
- Resource management – Schedules and direction on how people will be engaged, managed, and eventually released.

Team Operation

Once teams are formed, how they behave and operate can vary based on the project approach used.



When using an agile approach, teams self-organize and collaboratively determine who will do the work items. Work is typically stored in a backlog.



When using traditional project management approaches, the project manager assigns work to team members from a work breakdown structure.



Hybrid approaches can use some variation of these approaches. For instance, teams may operate in short iterations working from a backlog, but have tasks assigned to them rather than self-organize.

Building High Performing Teams

There is a big difference between a high-performing team and a bunch of people assigned to a project. Building high-performing teams takes effort and an appreciation of what makes teams effective. This quote from “The Wisdom of Teams” by Katzenbach & Smith describes some core attributes of high performing teams:

“A small number of people with complementary skills who are committed to a common purpose, performance goals and approach for which they hold themselves mutually accountable.”

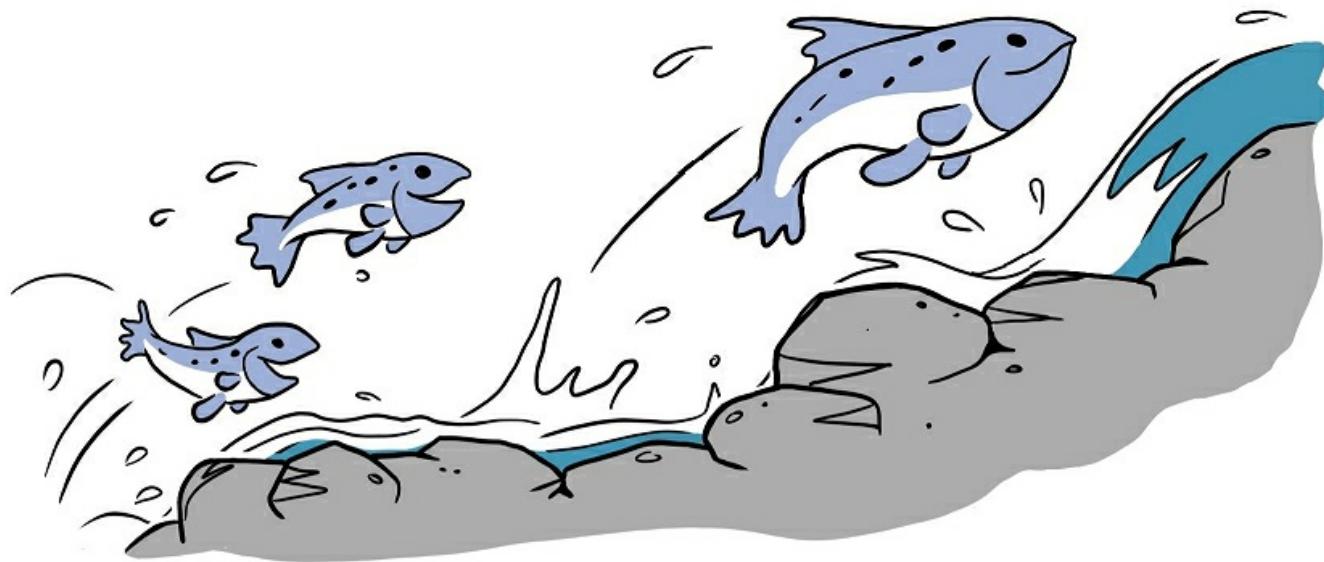
So as project managers, our job is to help assemble teams with the necessary complementary skills required for the project. Also, unite them behind a common purpose using a vision, charter, and definitions of done, etc. Then help establish measurement and performance goals along with building an environment that fosters mutual accountability. This is no easy feat, but topics that we will explore as we tackle related tasks such as 1.4 Empower team members and stakeholders, 1.10 Build shared understanding, and 1.12 Define team ground rules.

Diversity and Inclusion

Not only is building diverse and inclusive teams the morally correct thing to do, but it also strengthens teams and brings additional insights. Having a broad spectrum of experiences, ages, cultures, outlooks, ethnicities, socioeconomic status, and genders make for a more robust team.

Diverse teams are less likely to be blindsided by the needs of a missed demographic or sucked into groupthink. Diversity leads to better creativity and innovation. Two minds are better than one only when they are different. Do not pay twice (or ten times) for the same opinion.

1.6.3 Continuously Assess and Refresh Team Skills to Meet Project Needs



(Learning is a journey, skill requirements will evolve, keep them fresh)

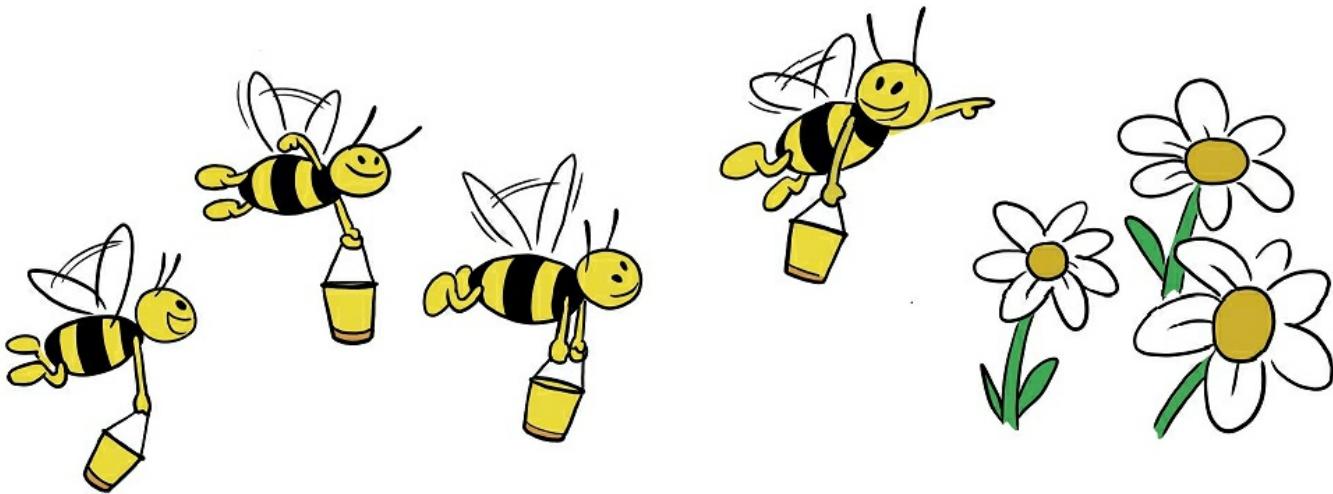
The skills required to execute a project may evolve over time. As new stakeholders or technologies are encountered, it may be necessary or just beneficial to update team skills with

extra training or mentoring. Project managers must continuously assess and refresh team skills to meet the project needs.

Training is also a powerful intrinsic motivator, meaning people like to feel that they are progressing in their careers and gaining new skills. Providing ongoing opportunities for training and growth is an essential tool in employee development and retention.

Training goals should be part of an employee's evaluation and recognition plan. It forms one element of describing how team members are reviewed, rewarded and recognized.

1.6.4 Maintain Team and Knowledge Transfer



(Keep the team functioning and share information)

We do not just build a team once and assume our work is done. Effective teams need continuous support to help them function and should be encouraged to share information. On traditional projects, weekly check-in meetings, monthly review meetings, phase gate reviews, annual 360-degree review sessions, and lessons learned workshops all provide opportunities to monitor and improve performance.

Agile teams discuss blockers or impediments during the daily standup meeting if any have arisen. They also hold frequent retrospectives to review the people, process and technology aspects of the project to see what can and should be improved.

Knowledge Sharing

Sharing information is critical for projects to succeed and occurs in many forms. Inside projects, team members share information about what they are working on via status reports and providing visibility into plans, designs and specifications. Knowledge and learnings are captured in lessons learned reviews and made available to relevant stakeholders.

Agile teams go out of their way to make a lot of information visible. Information radiators (big visible graphs displayed publicly) share important metrics. Kanban boards and frequent demonstrations show what people are working on. Daily standup meetings discuss what people are

working on and any issues encountered. Retrospectives share feedback, observations and ideas for improvements.



Sharing good news and what went well is easy. The best organizations freely share (internally) all the things that went wrong, caused problems or still confuse them. That way, other teams can avoid the same issues or be better prepared for the challenges. It takes courage to share failures, and junior project managers often feel pressured to perform and prove themselves.

However, wherever appropriate, share the problems encountered too. It is one way the best-performing organizations improve faster than their competitors.

Virtual Teams



Virtual teams (also called remote teams) often miss out on overhearing each other's conversations, water cooler talk and the ease of face-to-face chats. To make up for this, they often rely on more video conferencing, instant messaging, email and documentation. These formats have some advantages and can typically be recorded or consumed at any time (asynchronously). However, virtual teams know this in advance and so can plan to use technology such as wikis and online information tools like Slack, Trello, Jira, and ADO to share information.

1.12 Define Team Ground Rules



What are Ground Rules?

Ground rules are clear agreements on how team members will treat each other and behave as part of the team. They help guide the behavior of team members to a level that the group finds acceptable. Ground rules can cover anything from how team meetings will be run to how the team will handle conflict and decision-making.



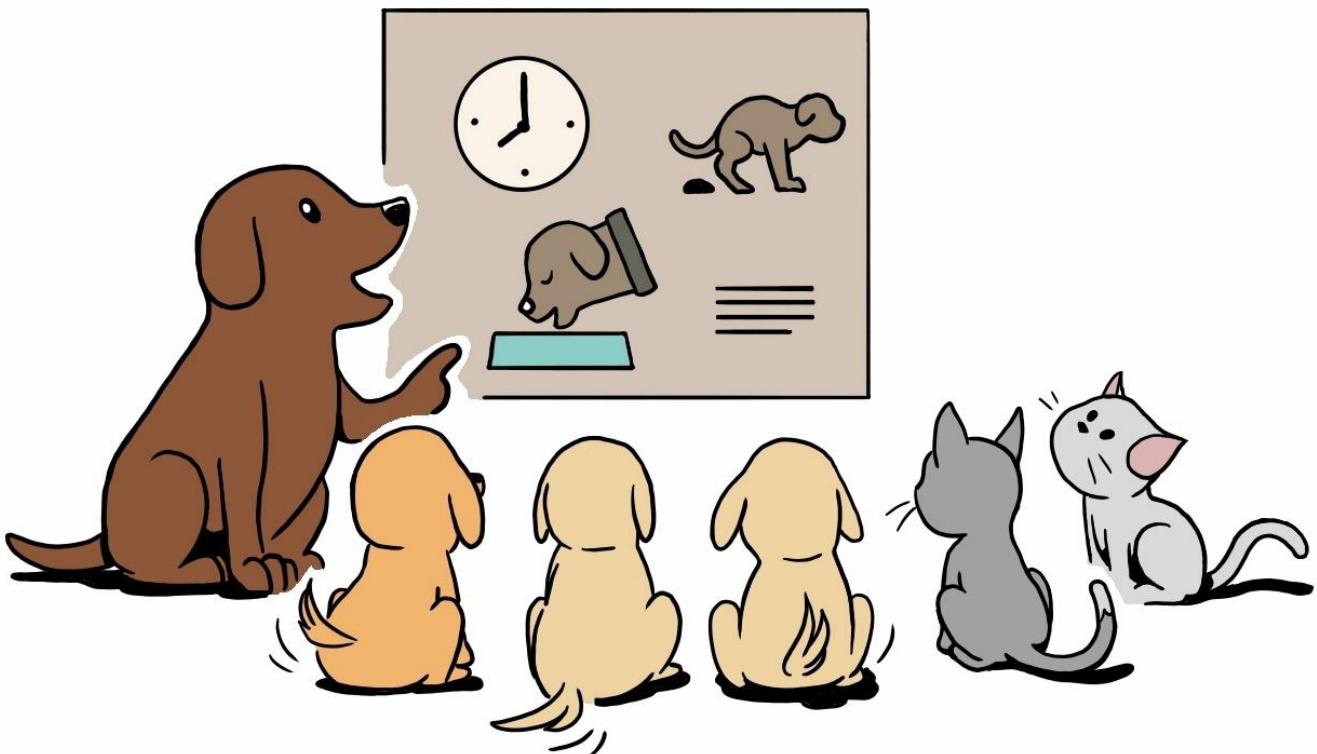
Why Have Them?

Without team ground rules, current behavior and habits become the de-facto ground rules of what is acceptable. This can be a problem if these habits are not aligned to project or organizational success or are disrespectful.

Creating team norms and ground rules set some base behavior and communication expectations. It decreases the risk of confusion because people know what is expected and do not have to second-guess how to act. This can lead to improved performance through clear expectations and fewer misunderstandings.

1.12.1 Communicate Principles with Team and External Stakeholders

(Full ECO Definition: Communicate the organizational principles around ground rules with the team and external stakeholders.)



(Jointly define and agree to the team ground rules, for both internal and external stakeholders)



How Do We Create Them?

Ground rules should be created collectively when the project starts. The project manager or an interested team member should lead the team in brainstorming what ground-rules they wish to establish. One technique for sparking ideas is to ask team members to think about the best teams they have ever worked on. What made it special? Why did it work so well? Let's try and recreate that magic here.

If getting started is difficult, or not enough suggestions are forthcoming, consider referring to lists of common team ground rules such as [this one](#). Once ideas have been suggested, the team must negotiate which items there is a strong consensus for. If some people are in favor, but others are not, hold it as a candidate for now. A small list with a universal agreement is more powerful than a list that contains concepts some members are not in full support of.

The ground rules should be displayed in prominent places such as team rooms and project websites. This is so that we are frequently reminded of them and can easily refer to them if we

have to remind someone else about them.

Also, consider how the team will interact with stakeholders outside of the project team. When will we communicate? How will we collaborate? Who will escalate issues? Teams often have dependencies with other projects and groups. Managing these expectations and having appropriate communication protocols, shared calendars etc., is critical for success. So, the team charter should address both internal and external communication standards.

Ground rules should be continually evaluated and updated as needed throughout the project. If you have inherited a team that does not have ground rules (or you forgot to define them when starting your project), it is never too late to start. Conducting a short workshop to collectively define team norms and ground rules is a great way to realign a project.



When first creating ground rules with a team, resist the temptation to get bogged down creating detailed or complex ground rules. Remind people that they will be reviewed and updated in the future as needed. Often “less-is-more” from for simplicity and ease of recall.



Team Charters

In addition to posting in a high visibility location, team norms and ground rules are often documented in a Team Charter. This document captures and shares the values, agreements and practices the team defined that describe how they intend to work together.

Some typical sections and the types of topics addressed in a team charter include:

Shared values – E.G., Respect everyone’s opinion, listen to all perspectives, speak up when we violate our agreements

Shared norms – No cellphone use during client demos and meetings, core overlap hours 10:00 am – 3:00 pm

How and when we meet – Daily standups will be at 9:30 am in the team room

Communication forms – Use Slack and Teams for shared questions and announcements

How we make decisions – All decisions that impact the team will be made collectively. We will use Fist of Five majority voting. Decisions impacting stakeholders outside of the project may be escalated to Pam, the program manager.

How we handle conflict – Pistols at dawn (or see [1.1 Manage Conflict](#) for ideas)

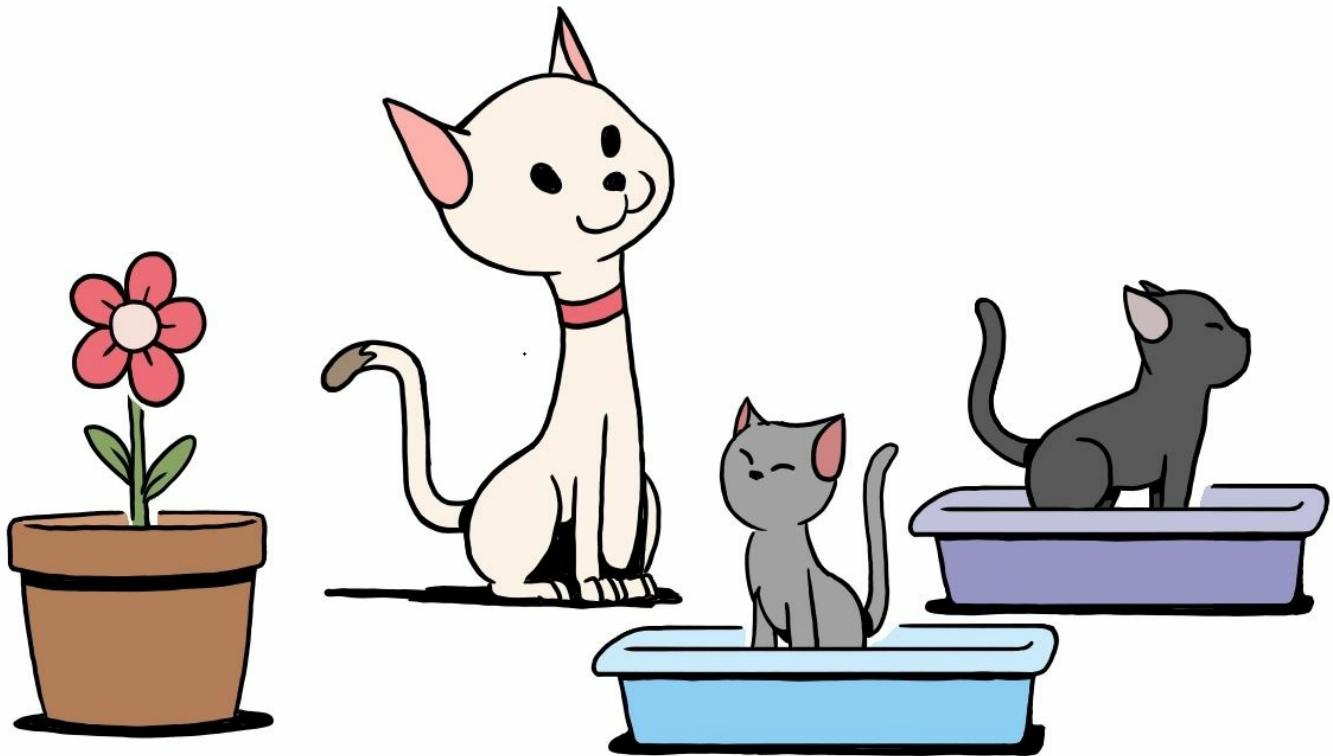
How we inspect, adapt and improve – We will review the Team Ground rules at a minimum every quarter, but anyone can request a review at a retrospective.

How we will handle feedback - We value constructive feedback. - We will avoid being defensive and give/listen to feedback constructively.

How we will celebrate - We will recognize and celebrate individual and team accomplishments.

1.12.2 Establish an Environment that Fosters Adherence

(Full ECO Definition: Establish an environment that fosters adherence to the ground rules.)



(Model the desired behavior and hold people accountable)



Model the Desired Behavior

How we behave as the project manager or team lead plays a vital role in setting (or eroding) adherence to the ground rules. We may not be aware, but as Scrum Master / project manager / team lead we are watched by the team. What we do (and do not do) is noticed and used (maybe subconsciously) to validate other team members' decisions and actions.

In section [1.2 Lead a Team](#), we saw that an excellent leader's most frequently admired characteristic is honesty. If we encourage the team to define ground rules and then break or bend them, nobody else will respect them either. So, we have to be sure we honor them and refer back to them when necessary.

PMI has a Code of Ethics and Professional Conduct which we also need to understand and follow. All PMI members and non-members applying for a PMI certification, such as the PMP, must agree to comply with the code of conduct. PMI also has an [Ethics in Project Management Toolkit](#) that contains helpful resources such as a project manager self-assessment and team self-assessment.



Remind People of the Ground Rules

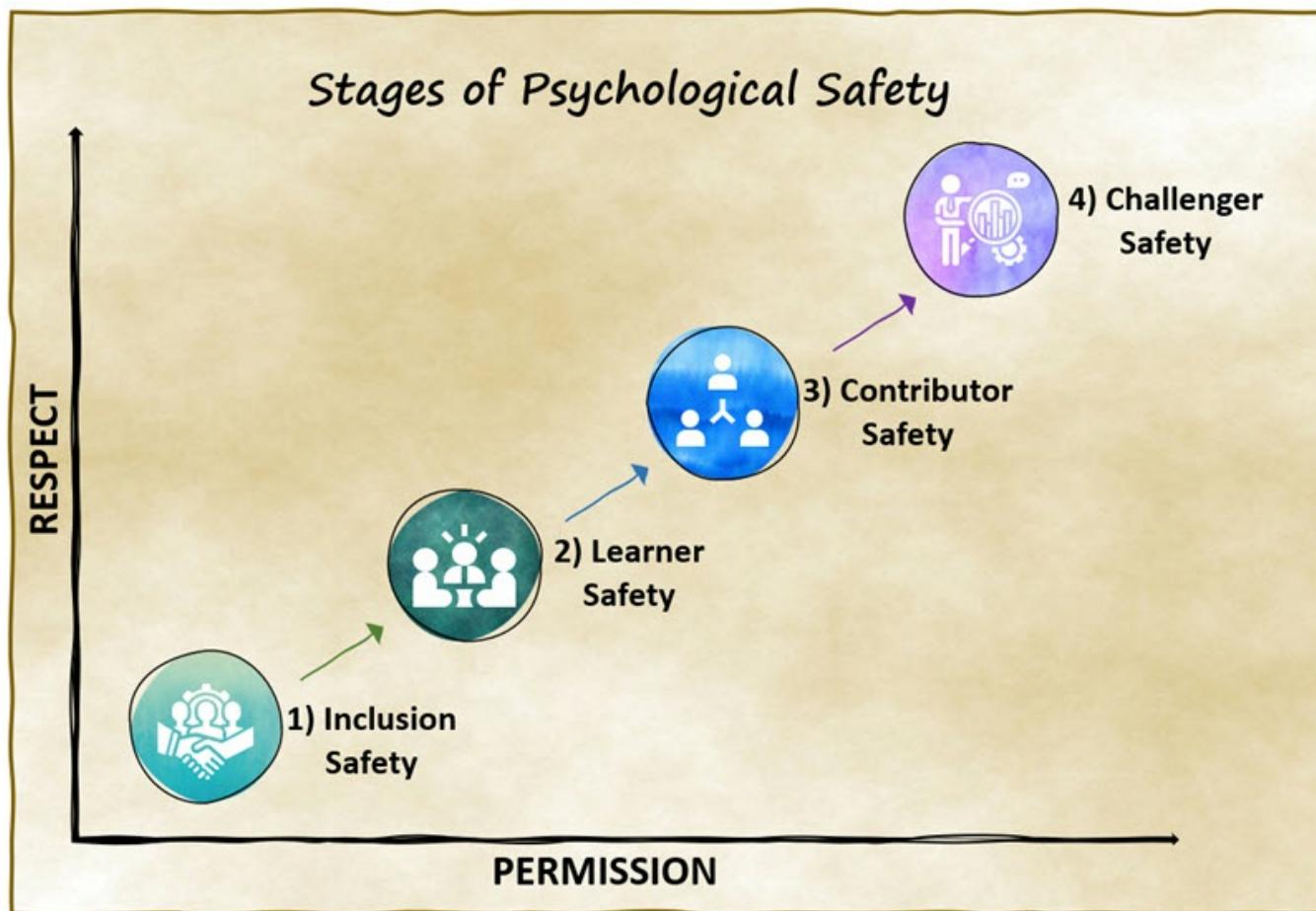
Refer back to the ground rules to remind people of their existence and relevance. This can be in the form of a potential violation, such as “I was going to book the new workshop series, but remembered we agreed to discuss timings as a group.” Or, as a confirmation of a ground rule, “As per our ground rules, I posted the demo schedule to the team site.”

Obviously, you would not refer back to the ground rules all the time like this. However, it could be a helpful, gentle reminder if the team members seem to forget or ignore them.



Team Ground Rules and Psychological Safety

Collectively creating ground rules helps the team establish some basic psychological safety. Since they are jointly defined, they help people feel like they belong to a common team which is part of 1) Inclusion Safety.



The subsequent steps of 2) Learner Safety (feeling safe to ask questions), 3) Contributor Safety (feeling safe to share your work and receive feedback), and 4) Challenger Safety (safety to question the status quo) all build on having ground rules. Spending a couple of hours defining team norms will not instantly create psychological safety, but it is a helpful first step.

1.12.3 Manage and Rectify Ground Rule Violations



(If ground-rule violations occur, resolve them appropriately)



Call Out Ground Rule Violations

It would be wasteful and hypocritical to go to the trouble of creating team ground rules only to ignore them when we see them being violated. When we witness a breach, we should call it out. There is probably no need to get pedantic or overly harsh. Most ground-rule violations tend to be in the spur of the moment. Such as during a heated discussion talking over a quieter team member and not allowing them to contribute.

So, diplomatically, model the desired behavior and call out the violation. For example, “Joe, I noticed you were angry at Vikas when he reported the nozzle test failed. Remember, we agreed *It is okay to be the messenger with bad news. You can expect a problem-solving response.* As one of our ground rules. I understand you were frustrated, but we should not take it out on the messenger.”



Encourage Team Enforcement

Ideally, the team should police itself against the ground rules it jointly created. This might take some practice to establish, but having the project manager as the sole enforcer is ineffective. When violations occur or when the ground rules are being discussed, ensure the team ownership is emphasized. So, refer to them as our ground rules or the team ground rules, not the organization's or even the project's which might be more associated with only the project manager.



Handling Serious Offenders

Nobody likes having to remove team members, but sometimes it is the best thing for the team. Repeat offenders, bullies and discrimination are reasons why team members may need to be removed if coaching and then HR intervention do not work.

Underperformance might also be an issue, but people should be allowed to learn and improve. Only then, if the effort is not there, should HR be consulted and options for reassignment or removal be considered.



Dealing with underperforming and problematic team members is one of the most challenging and draining activities project managers contend with. The combination of team ground rules, the code of ethics, and knowledge and support from HR will help somewhat.

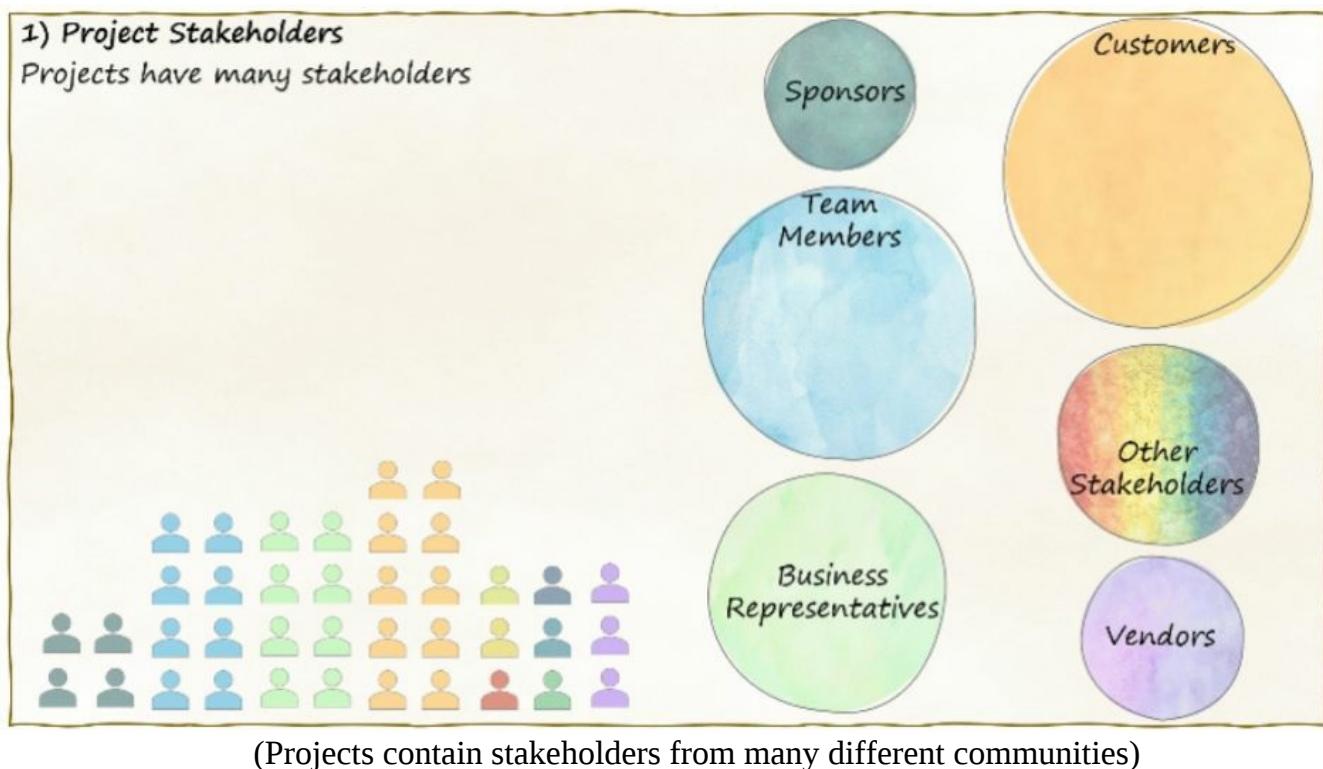
1.8 Negotiate Project Agreements

Projects are people-driven, and we need project agreements to help ensure the various groups of stakeholders operate successfully.

Projects engage multiple sets of stakeholders; these groups include:

- **Sponsors and executives** who envision and commission new products and services, or fund changes to existing ones
- **Team members** who help analyze the work, define what is required, then build and deliver the project outcomes
- **Business representative** who explains what is required and provide feedback on work products
- **Customers and users** of the new or modified products and services who use it
- **Vendors and suppliers** who help deliver portions or significant components of the solution
- **Other stakeholders** such as advisors, reviewers, subject matter experts and third-party contributors

While these stakeholders act as their own communities, projects bring them together as a single ecosystem.



2) Project Communities

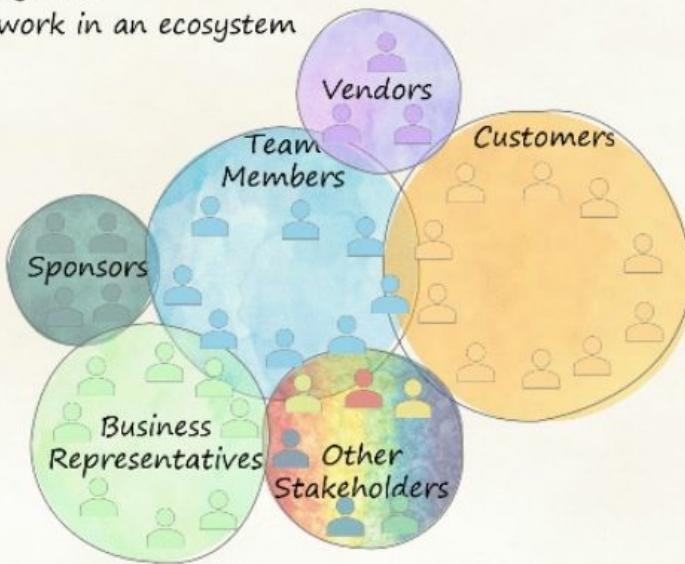
Stakeholders act in communities



(These stakeholders often continue to serve their communities even while on a project)

3) Project Ecosystem

Communities work in an ecosystem



(A project is an ecosystem which different stakeholder groups participating)

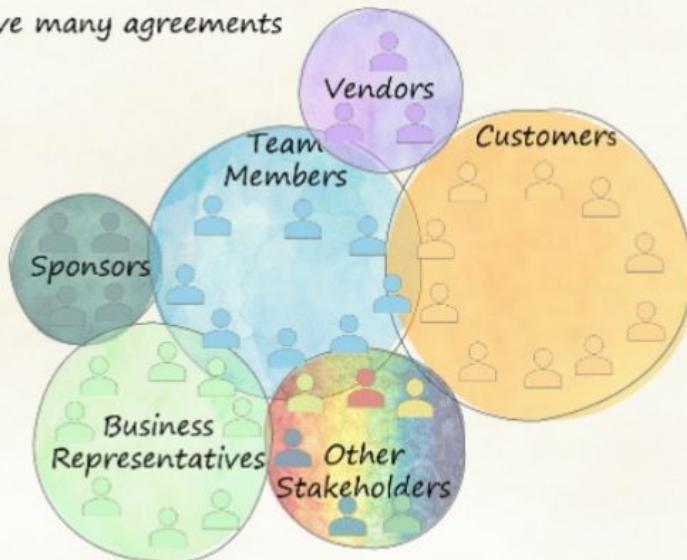
These groups have different motivations and objectives. Getting everyone to operate in a way that produces the desired end goals requires a variety of informal and formal agreements. The Process domain task “2.11 Plan and Manage Procurement” explains the mechanics of the procurement process. This People domain task: “1.8 Negotiate Project Agreement” deals more with the human dynamics of agreements.

It includes creating agreements around topics such as:

- How are we going to communicate and collaborate within our own community?
- How are we going to coordinate with the other groups in the project?

4) Project Agreements

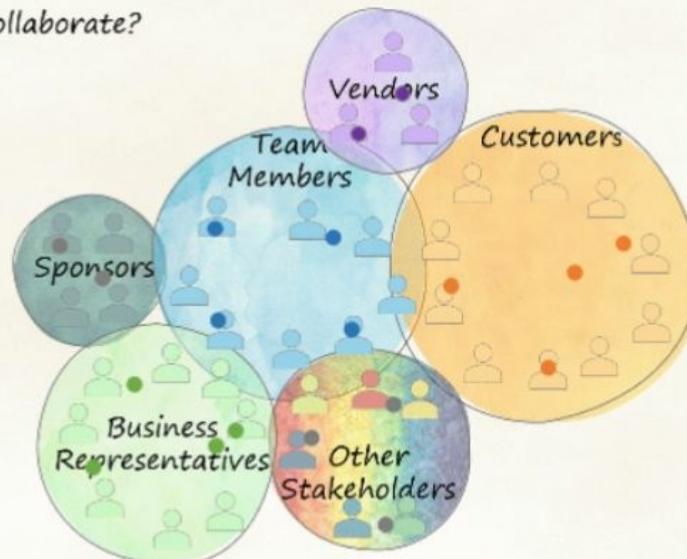
Ecosystem have many agreements



(These groups often create operating agreements)

5) Project Agreements

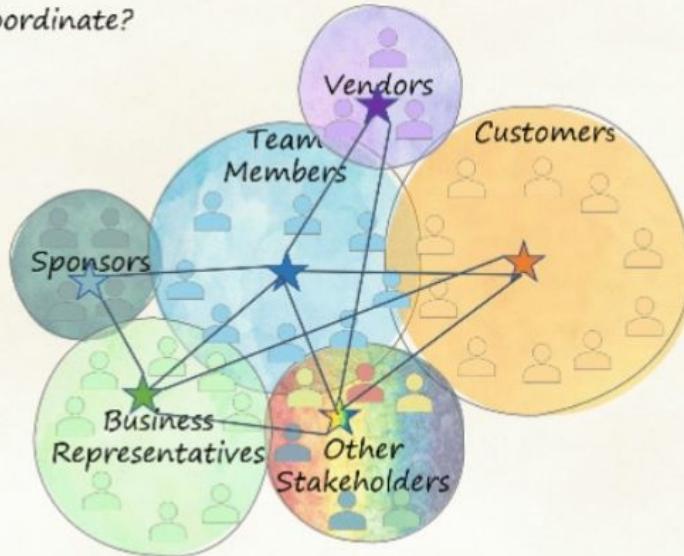
How do we collaborate?



(As project managers, we need to facilitate collaboration and communication)

6) Project Agreements

How do we coordinate?



(Project agreements between stakeholder groups help stakeholders coordinate work)

The answers to these questions about collaboration and coordination are through project agreements.

One of the first project agreement documents often created for a project is the Project Charter. The project charter sets out definitions of high-level objectives, who will be involved, and the project's general approach.

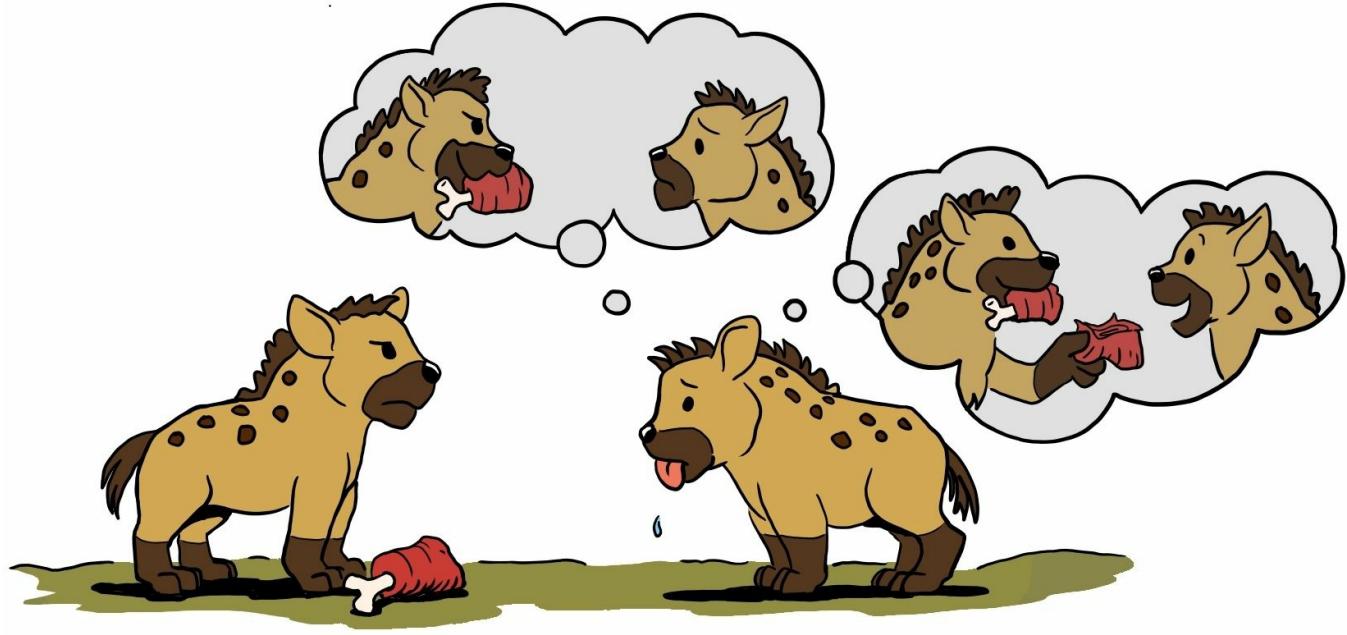
Then, as we define the project, build teams, and come together to kick it off and start work, many other agreements are created. Some are formal, such as statements of work, or definitions of done. Others might be less formal, such as meeting norms, that depend on the project team, the organization and the bounds of the agreement.

We negotiate to ensure there is a mutual understanding and agreement between parties before starting work. Agreement documents vary in detail and formality, but typically include:

- A Statement of Work (SOW)
- A schedule with milestones and dates
- Team norms
- Team charter
- Pricing and payment terms with incentives and penalties
- Inspection, quality requirements, and acceptance criteria
- Definition of Ready
- Definition of Done
- Contract terms and conditions
- Change request procedures
- Performance reporting expectations
- Go live agreement

- Termination clauses and dispute resolution
- Warranty and support agreements, including Service Level Agreements (SLAs)

1.8.1 Analyze the bounds of the negotiations for the agreement



(Examine the possible outcomes and scope of the agreement)

Before getting into any kind of negotiation, it is worth understanding how and when people agree. That way, we can approach the process better prepared and more likely to achieve a positive outcome.

The conference paper [Negotiating for Success: Are You Prepared?](#) Provides some useful guidance for understanding and conducting negotiations. These include:



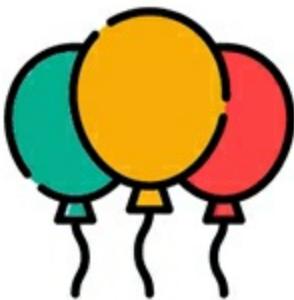
Be patient – Develop rapport, carefully answer questions that come up, take time to reach satisfactory agreements.



Be positive – People want to deal with those they like. A positive attitude builds confidence and credibility. People are more likely to want to come to an agreement with someone they can get along with.



Gather information – Ask probing questions. Find out as much as you can about deadlines, goals, costs etc. When you show a genuine interest in people and are positive, people will be much more willing to share information.



Float trial balloons – Ask questions such as “What if we could provide key features in release 1 and the others later?” These questions make no commitments but explore reactions about options the other party may be willing to consider.

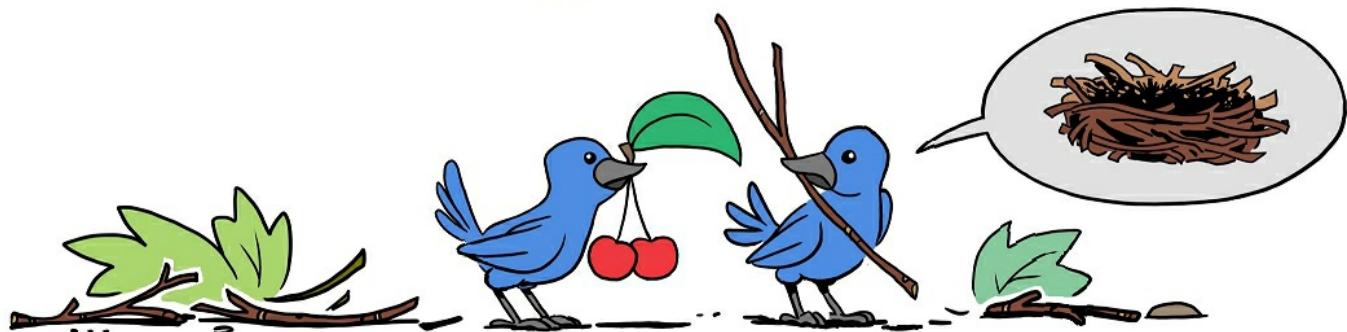


Know your opening offer, but ask theirs – If you estimate the project will take between 4 to 6 months. Ask the customer when they want it, and they may respond in 8 months, in which case you have a cushion.



Know your bottom line – When negotiating, knowing these limits determines whether you should continue or walk away.

1.8.2 Assess priorities and determine ultimate objective(s)



(Understand the priorities at play and what is critical right now)

We do not need to make all the agreements upfront. Some agreements, such as service level agreements, might be better made closer to the point of use when we know more about the product or service in question. Likewise, we should agree about team norms and communications early in a project, but maybe warranty and support agreements can come later.

Once we have the timings of the necessary agreements established, we then look to the priorities and objectives of the arrangements themselves. For instance, there are many ways to negotiate agreements on the scope.

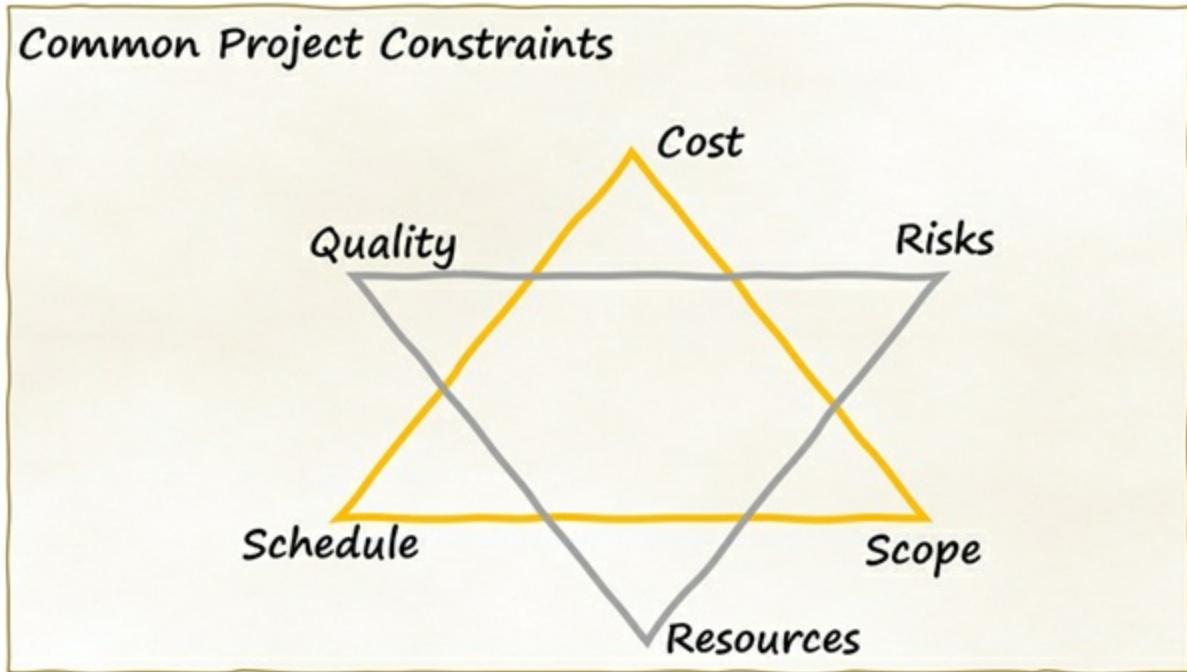


On a traditional project, we might check for conformance to requirement specifications, statements of work, quality reports or inspection statements.



When using an agile approach, we might look for Product Owner approval and features meeting the Definition of Done.

The above examples focus on project scope, but agreements can be set, and priorities negotiated on any project constraint. Some typical project constraints are depicted in the Gold and Silver triangles. The gold triangle shows the classic triple constraint of cost, schedule and scope. The silver triangle reminds us of the secondary, but still critical, constraints of quality, risks and resources.



We need to assess which constraints are priorities to our sponsors and other important stakeholders. Sometimes the budget is the primary constraint and project priority. Other times it might be schedule, such as having something to demo by the trade show. Other groups might prioritize quality or risk reduction.

Understanding the priorities for various stakeholder groups helps achieve acceptance and agreement that we have met their objectives.

1.8.3 Verify objective(s) of the project agreement is met



(Inspect the outcomes and verify the objectives have been met)

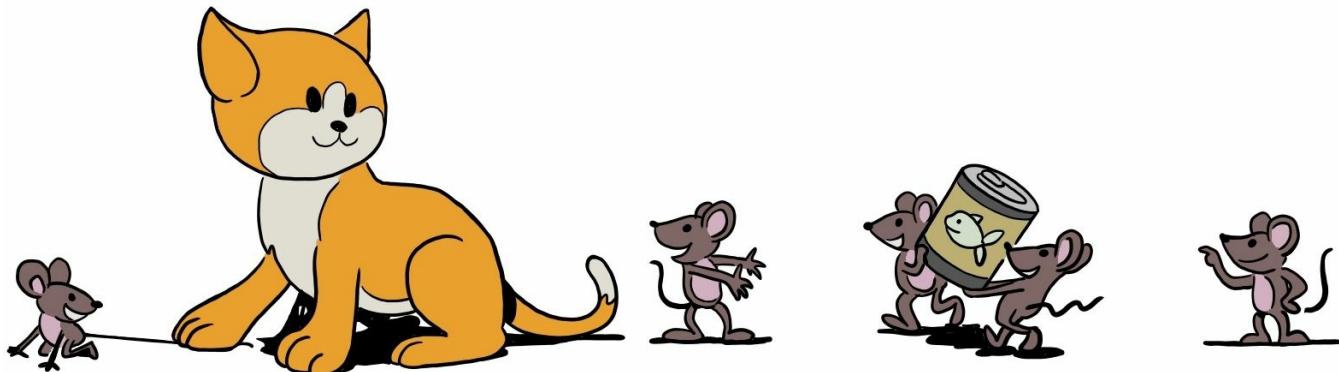
As the project progresses, we should ensure project agreements are being met. This relates to the emerging product or service being created or modified and our internal and interim agreements. For instance:

- Are we following our team agreements about meeting etiquette?
- Are we communicating issues as well as achievements?
- Are reviews, inspections and signoffs occurring within the timeframes agreed to?

For the project outcomes and deliverables, there are many ways of verifying the objectives of the project agreements are being met.

- Phase gate reviews
- Product demonstrations
- Acceptance criteria sign-offs

1.8.4 Participate in agreement negotiations



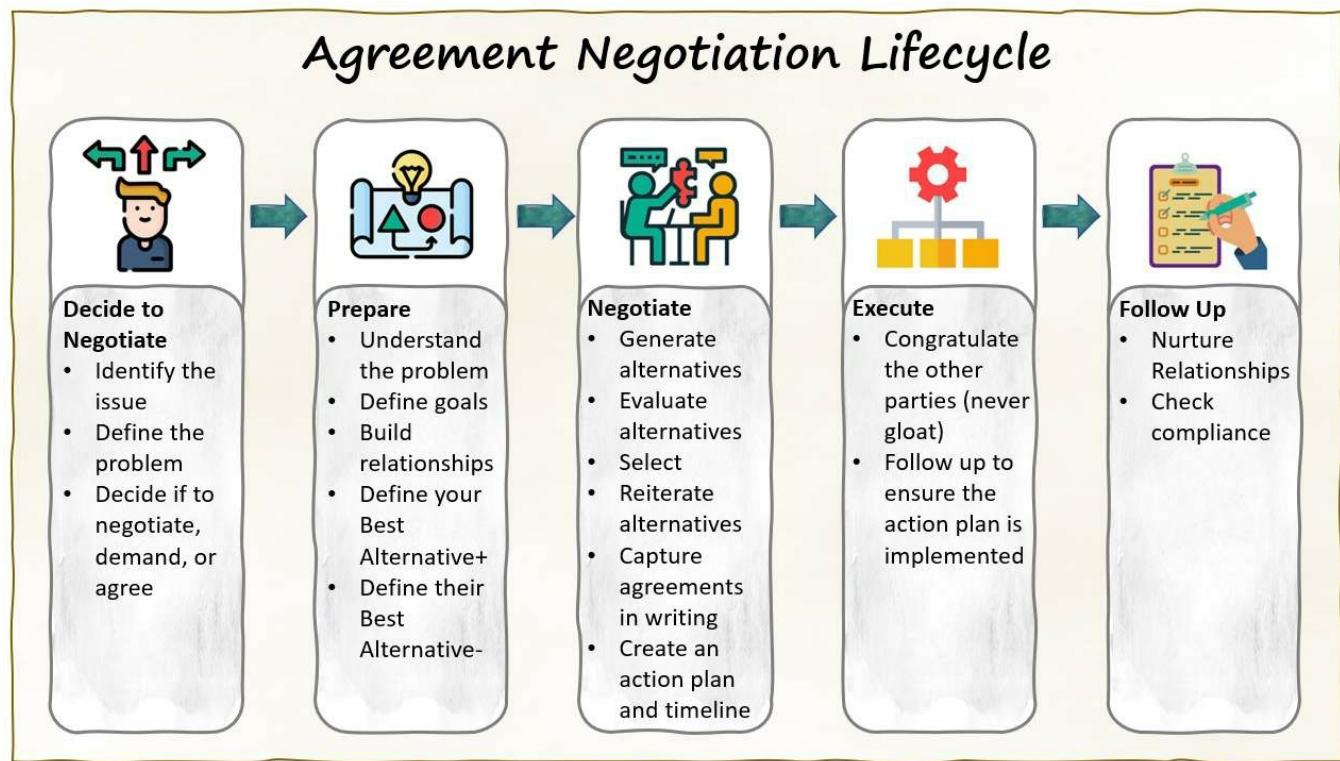
(Undertake negotiations)

The agreement lifecycle starts with determining if we need to create and negotiate an agreement at all. Sometimes after examining the issue, we might decide not to engage, or to just acquiesce to the other party. Assuming we do engage and want to form an agreement, the next step is understanding the problem further and defining the goals.

Building cooperative relationships helps the agreement process even if it seems win/lose in nature. In any negotiation, we need to understand our best alternative and try to present it positively. We also need to be on the lookout for any negative implications of counteroffers.

We should generate and review alternatives, selecting the best option and capture it in writing or via a photo of a whiteboard for less formal team agreements. It is a good idea to create an action plan for what happens next and what happens if the deal is broken in the future.

Finally, execute on the agreement, nurturing the relationship and checking compliance. The agreement negotiation lifecycle is depicted below:



1.8.5 Determine a negotiation strategy

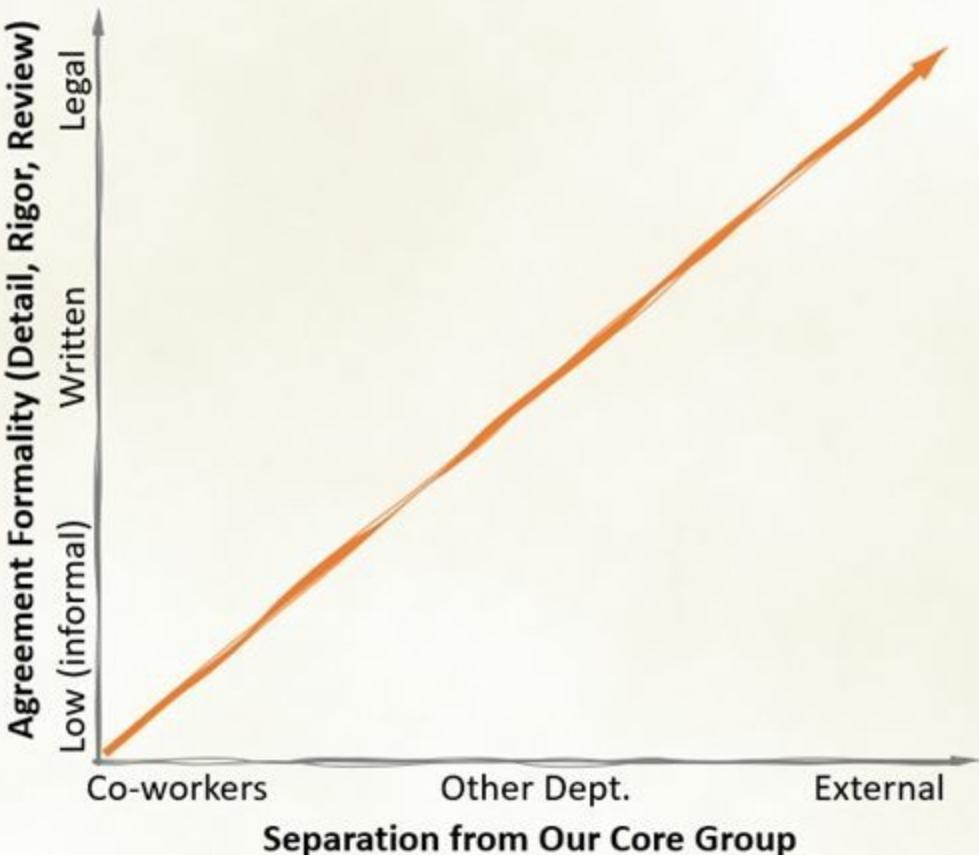


(Choose the best strategy for the situation)

When it comes to actually negotiating project agreements, having a strategy is critical. Internal and external agreements will likely be very different in their nature.

Trust tends to diminish as distance and stakes increase. As a result, inside our own group, agreements might be informal and verbal, then as we start dealing with other departments, they get documented, and finally, for external parties, we use very formal, legal agreements.

Agreement Formality



External agreements with vendors, suppliers and 3rd parties are typically legal documents signed off by both parties and subject to legal review and strict change control. Some internal agreements might also be quite formal, such as service level agreements that have high impacts. We need to ensure the rigor we employ is suitable for the (worst case) scenario.

Negotiation strategies aim to find a mutually acceptable solution to a shared problem. We can employ one of a few approaches:



Hard (controlling) – Adversarial, assuming that the other party is the

enemy and the only way for us to win is if they lose. Negotiation is aggressive and competitive.



Soft (giving in) – Conceding to maintain a good relationship. Here we can get taken advantage of in our effort to please. While the agreement is quickly reached, it is usually a poor one.



Principled - Separate the people from the problem, focus on the interests, not positions and generate options for mutual gain. Then select the best alternatives based on understanding each group's objectives.

People are repeatedly conditioned to think relationships are win or lose. However, there is a third alternative where nobody loses – a win-win or synergy. It usually takes longer to find, but is worth the effort and leads to more collaboration in the future.

When negotiating agreements, remember to:

- Develop good working relationships with the people you are negotiating with
- Listen and understand their interests
- Explore suggestions to find an elegant option
- Using external standards and benchmarks for ideas
- Develop Best Alternative options for discussion
- Make carefully crafted commitments explaining what you will do, not do.

Using these guidelines, we can create project agreements suitable for the factors under review and fit for purpose in terms of speed, rigor and control.

1.4 Empower Team Members and Stakeholders

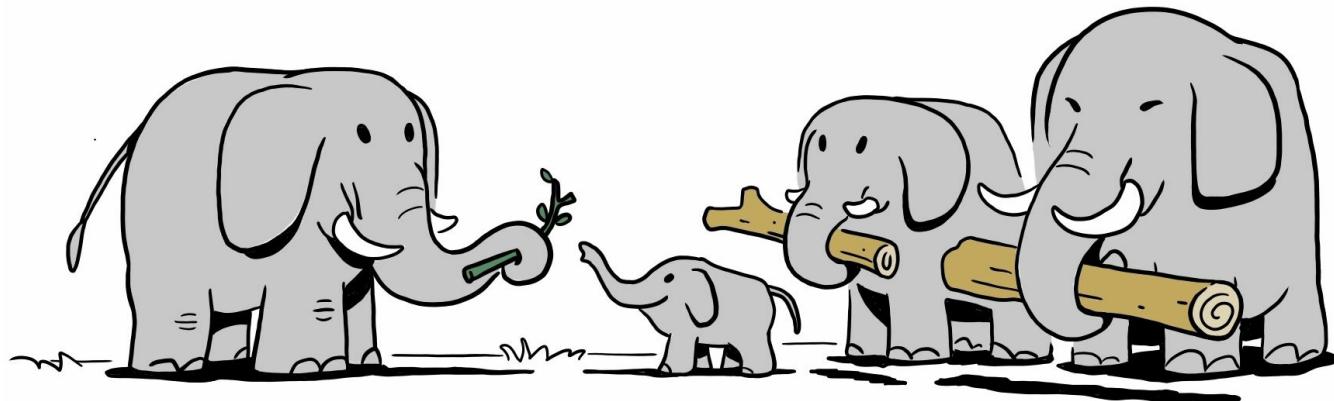
What is Empowerment?

Empowerment is the act of granting power or authority to perform actions or duties. It means letting people be in control of some things. It does not mean giving up all control or influence. For example, we can empower teams to make local decisions that concern themselves but escalate decisions impacting other teams or stakeholders.

That Sounds “Soft” Why not Just Tell People What to Do?

When we consult the people doing the work, we get better insights into the issues, risks and level of effort involved. This better data is useful, but the real benefit comes from the motivational advantages of empowered teams.

1.4.1 Organize Around Team Strengths



(Plan around team member strengths)

Letting teams self-organize, make decisions and solve their local problems puts them in control of their work. When team members decide how to work together and which approaches to use, they gain autonomy and mastery of their work. The book “Drive: The Surprising Truth About What Motivates Us” identifies job autonomy and mastery (along with having a clear purpose) and the core components of motivation.

The alternative, giving out tasks and instructions, is like pushing rope; it is unproductive and can go in the wrong direction. Instead, defining short-term goals and letting a team self-organize allows them to pull the rope connecting their progress to that goal. Work is better aligned and more rewarding for the team. They go faster since they enjoy working that way.

These ideas may still sound “soft,” and some teams may need clear direction and close supervision to get any work done. However, where possible, treating people as adults and acknowledging their skills makes sense. Tapping into the motivation for why people pursued their careers and providing trust usually pays dividends.

Who do we Need?

When starting a project, we need to understand what strengths (skills) will be required and if we have them available to us. For familiar projects, the skills required might be well understood and documented. In which case, building the team starts with collecting people with those skills.

For example, if we were building a house, subject matter experts in our organization would tell us about the types of architects, carpenters, plumbers and electricians we would need.

For new or uncertain projects, we will not be so sure. We can analyze the likely work required and infer the skills needed to do it. This could be done by analyzing high-level scope statements, feature requests, preliminary work breakdown structures or product backlogs.

For instance, building a new door lock that uses AI to recognize approved users from biometric data (gait, facial recognition). We can determine that we will need people with AI skills for the software parts and engineering skills for the door lock components, but the exact nature of the skills may not be knowable in advance.

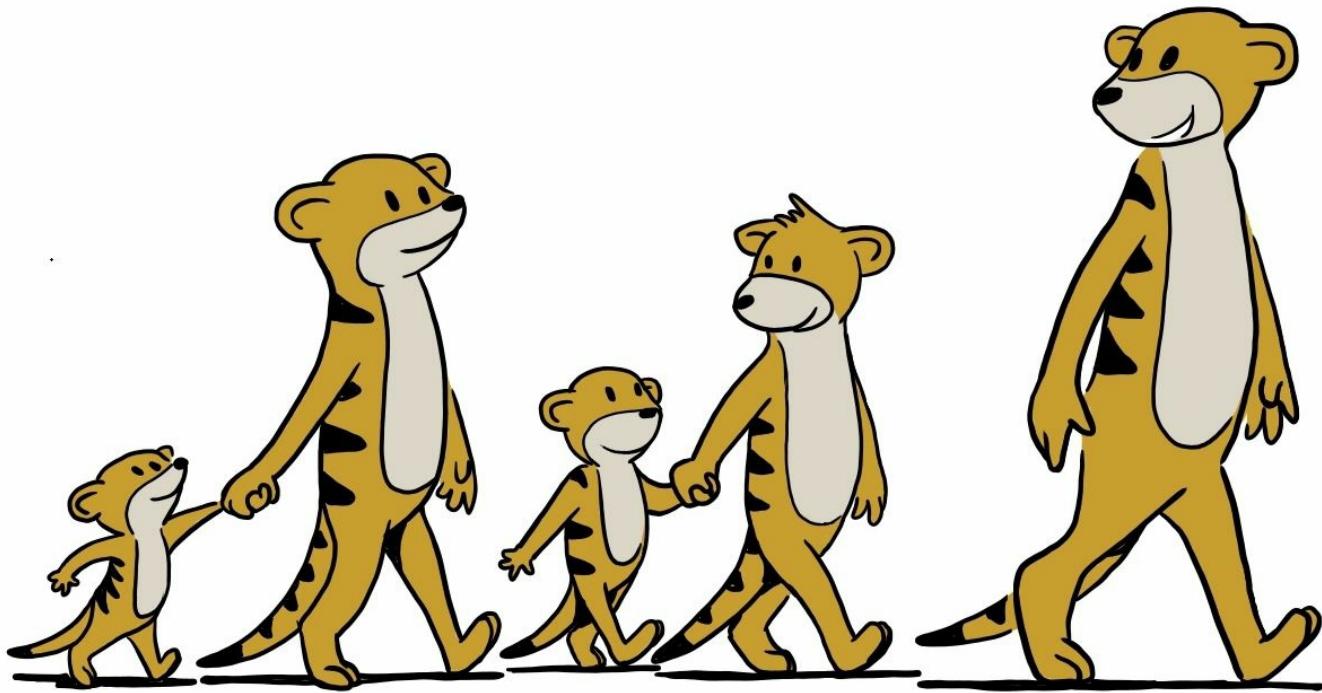
Before we can organize around team strengths, we need to understand what those strengths are.

SWOT analysis where we identify Strengths, Weaknesses, Opportunities and Threats can be a useful place to start.

Some organizations maintain skill and competency information; others may hold team led SWOT sessions to create lists of competencies and additional skills required. Skills can be grown through training, mentoring, or pairing inexperienced people with more experienced staff. Work should be undertaken by appropriately skilled and experienced people.

Once we know the skills available to us, we can organize ourselves to set up for success. This involves mechanisms for making upcoming work visible so people can see what will be needed and those items they can work on. It also includes creating structures, so team members are accountable for tasks.

1.4.2 Support Team Task Accountability



(Encourage team accountability)

Both traditional/predictive and agile/adaptive approaches have mechanisms for tracking task accountability. If you create a hybrid approach, make sure it has one also. The elements tracked will include details of the work that needs to be done, how to perform the work, and who will perform it.



Work breakdown structure dictionaries and work package descriptions document the relevant tasks and assignees. There should also be descriptions of how this work will be tracked and managed.



Team members select/commit to work items (user stories) from the product backlog that have been identified by the product owner (business representative) as ready for development. This occurs during iteration planning, where the team agrees on what will be done, how and by who. These user stories are then typically tracked and managed on a Kanban board or in an agile tracking tool such as ADO, Jira, VersionOne. These tools show who is assigned to each task and the status of the work.

Supporting task accountability is critical for maintaining forward progress. We need to know who is working on what, what the status is, which tasks are still without an owner, etc.

Teams define how they will work together during team chartering and creating team norms. This will include how they select work, show its status and escalate issues.

1.4.3 Evaluate Demonstration of Task Accountability



(Periodically check to make sure things are progressing as they should be)

Organizing around strengths and supporting task accountability are good starting points, but we also need to follow-through and make sure work is getting done well. This involves checking in on the work being done and the workers doing it.

In a traditional project environment, we ensure work packages are defined, assigned and completed to schedule, budget and quality requirements. In an agile project environment, instead of WBS work packages and assigned tasks, we might be using a backlog of user stories and checking that those identified by the product owner are getting worked on in the selected sprint or iteration. The names change, but the ideas are very similar.



Agile has a less formal assignment of work since teams are supposed to self-organize and collectively decide who will do what. The weekly or biweekly demonstrations and retrospectives provide an opportunity to see if tasks are getting done and review task accountability workflow and any potential issues. Retrospectives also provide opportunities to design experiments to try in subsequent iterations to achieve better results.



Traditional projects can use milestones, phase gate reviews and scheduled inspection to evaluate task accountability. The progressive elaboration concept of updating and further detailing plans based on emerging information allows for adjustments and improvements throughout the project.

1.4.4 Determine and Bestow level(s) of Decision-Making Authority



(Assign appropriate decision-making levels)

We should make decisions at the appropriate level. The goal is to move decision-making to the people doing the work - the team. This means empowering the team to make local decisions that impact them and their work.

However, sometimes the team may not be ready for this initially. They may fail to reach consensus or make decisions that are sub-optimal. Here they may require more direction and support to begin with, progressively adding more decision-making authority until they can successfully make the bulk of their local decisions independently.

Teams may elect to defer most technical decisions to subject matter experts on the team or discuss and vote on major decisions as they arise. Empowering the team to make their own local decisions helps morale but can slow the process if not supported by proper tools.

The one good thing about having just a single person making all the decisions is that they should at least be quick (even though they may not be right or popular). Using an empowered team approach, we need ways to quickly consult with everyone and then move forward with the best option.

Team decision-making techniques need to provide ways to engage multiple insights and arrive at the best option. The following list describes some popular decision-making approaches:

Simple Voting



Simple voting “For” or “Against” by a show of hands is quick and easy but can miss a better third alternative. Perhaps someone has a suggestion to tweak the options being voted on? A simple “For” or “Against” vote omits refinement.

Roman Voting - Thumbs Up/Down/Sideways



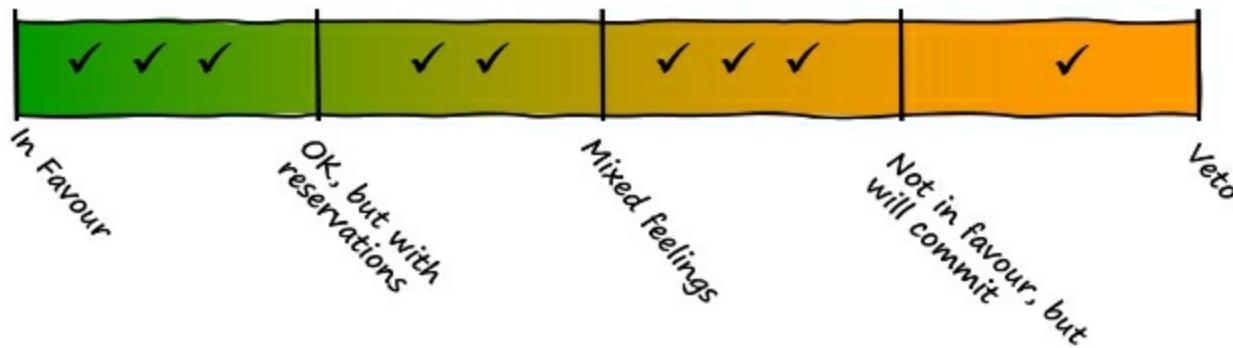
Using a simple thumbs-up, down, or sideways is a quick way to achieve a simple vote. People with a thumb sideways are then asked why they could not make up their mind. Sometimes they are just neutral; other times, they have a conflict, concern or questions that need further investigation.

Dot Voting



Dot voting is a team activity where everyone gets an agreed to number of votes to assign as they wish to a set of choices that have been identified and outlined. Team members cast their votes by placing sticky dots or ticking on representations of the options. After everyone has voted, the dots (or ticks) are counted, and a winning choice is announced.

Jim Highsmith's Decision Spectrum



Using this model team members are asked to indicate with marks where on a spectrum from “fully in favour” through “mixed feelings” to “No, veto” they feel about the decision at hand. It allows people to indicate support for a decision and air their reservations at the same time.

Allowing people to register their concerns is an essential component of achieving agreement to go forward while respecting dissenting views and keeping everyone engaged. People indicating they are not entirely in favor are then invited to share the concerns, but often just being able to register reservations is enough to allow people to commit to a new direction.

Fist of Five Voting



The Fist of Five approach combines the speed of thumbs up/down with the degrees of agreement from the Decision Spectrum. Using this approach, people vote using their hands and display fingers to represent their degree of support.

A small problem with this approach is that two standards have emerged, and so you really need to be clear upfront if 5 fingers mean “full agreement” or “no, stop”. One model (popularized by the American Youth Foundation) registers support by finger votes, a fist (no fingers) means no support, 5 fingers means total support and a desire to lead the charge.

More Arguments?

Empowered teams making their own decisions have more debates than non-empowered teams who instead follow instructions. These debates and constructive disagreement allow for ideas to be tested by the team before making a decision. This involvement in the decision process generally leads to more commitment to the choice reached. Yet, it can appear empowered teams debate and argue more than other groups. As long as the opinions are fact-based and respectful, this is not a problem.

However, if arguments become personal or are dominated by the same people, this needs to be addressed. If discussions are not engaging insights from the other team members, this is no longer an empowered team. In this case, the conflict must be addressed, and expectations reset.

Usually, calling out non-fact-based criticisms and making sure everyone’s voice is heard only needs to be done a couple of times before the team catches on and self-polices in the future. Some groups build guidelines for discussion and debate into their team norms or team charter.

Further Forms of Empowerment

Empowerment extends beyond decision-making authority to many aspects of the project, including planning, estimating and risk management. The following benefits are achieved when we engage the team in:

- **Planning** – this results in more practical plans based on what work is viable, given the current situation.
- **Estimating** – incorporating the first-hand experience of the levels-of-effort and additional work steps that may also be required.
- **Risk Management** – the benefits of recalling previous issues, integration challenges and 3rd party dependencies not easily identified in planning.

Empowerment Observations

Empowerment means distributing control of some things to team members.

The quote: “**We lead teams by standing behind them**” is an oxymoronic reminder that the real role of a leader is to support and empower the team. The team does the bulk of the work, and project success depends upon their success.

A great way to motivate the team is to recognize their insights and make use of that knowledge. Engage them in planning, estimation and risk management. Give them appropriate decision-making powers and tap into the intrinsic motivators of problem-solving, autonomy, mastery and purpose.

This does not mean surrendering all management, instead trialing giving more autonomy through short, controlled periods of work. Then evaluate the results and take appropriate action.

1.5 Ensure Team Members/Stakeholders are Adequately Trained

The Importance of Training

Providing the necessary training creates an environment where team members and other stakeholders can work independently without constant help or supervision from others. Training improves performance, reduces errors and can provide a valuable intrinsic motivator for people.

Cross-training (spreading skills around) also builds more knowledgeable teams where people can take over for one another as needed. This reduces the risk of skills gaps or bottlenecks/delays while waiting for specialized tasks to complete.

1.5.1 Determine Required Competencies and Elements of Training



(Assessing skills to determine training needs)

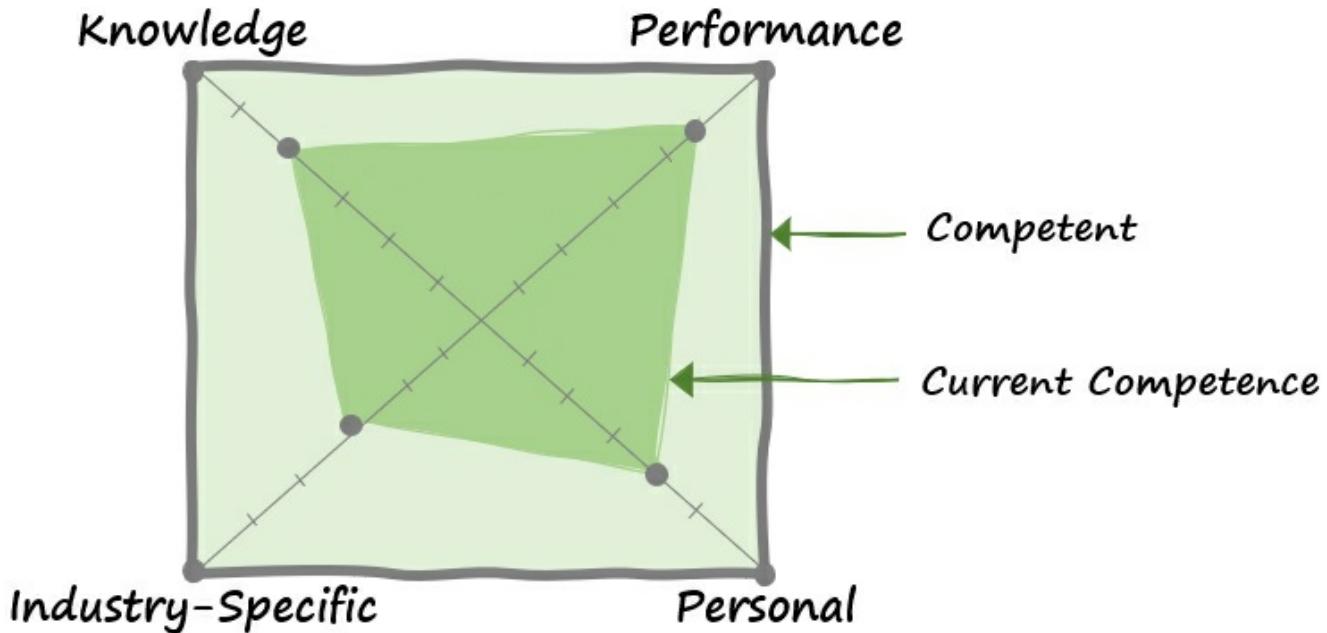
Determining the required skills and competencies can be done through assessments such as:

- Skills gap analysis
- Surveys
- SWOT analysis

As an example, we could decide team members need skills in four areas:

1. **Knowledge** – demonstrated by passing a credentialed assessment such as CAPM, PMP, DASSM, etc
2. **Performance** – ability to undertake work to particular quality and capacity standards
3. **Personal skills** – communicating, listening, leading, building relationships, support, resilience
4. **Industry-specific** – knowledge of standards, legal and safety requirements, technical tools, industry norms and terms, etc

Given these four domains, we could assess stakeholders and team members.



In the example above, we see current competence levels plotted in the inner dark green shape compared to our competent definition shown in the larger, outer square.

(This is just an example; your project may have three domains or six domains you care about. Or you may not use a competency assessment framework and just go from an informal skills-gap review.)

An example of an assessment could take into account self-assessment scores, manager scores and those of peers. Engaging others in the assessment process is useful since people often have deficiency-blindness, meaning they are not aware of their own gaps and do not know where they need the most help.

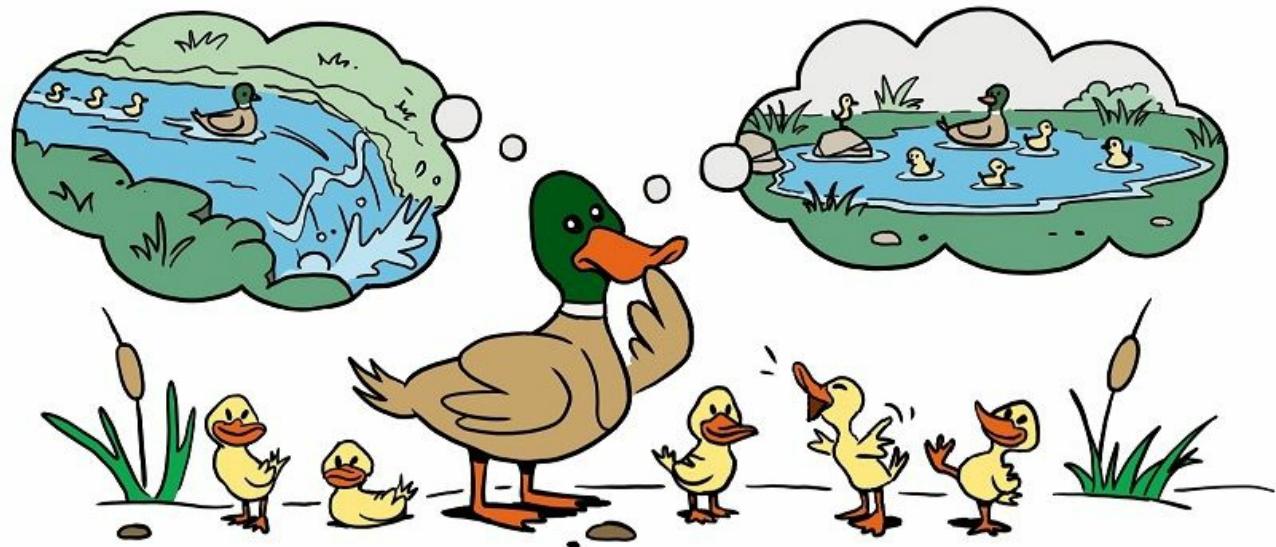
Assessing Competences							
Assessment Criteria	Required Proficiency	Importance	Self-Assessment Rating	Manager Evaluation	Peer 1 Evaluation	Peer 2 Evaluation	Average
Engages stakeholders	3 - Average	4 - Above average	3	4	4	3	3.5
Shows Empathy	4 - Above Average	5 - High	5	3	5	4	4.25
Active Listening	4 - Above Average	4 - Above Average	4	2	3	2	2.75

In the example above, a competency score of “4-Above Average” is required for “Active Listening,” and while the self-assessment score is a 4, the average score factoring in other people’s inputs is only 2.75. So, it looks like some training might be required.

Once we know what training is required, we should determine what options are available and

which to select.

1.5.2 Determine Training Options Based on Training Needs

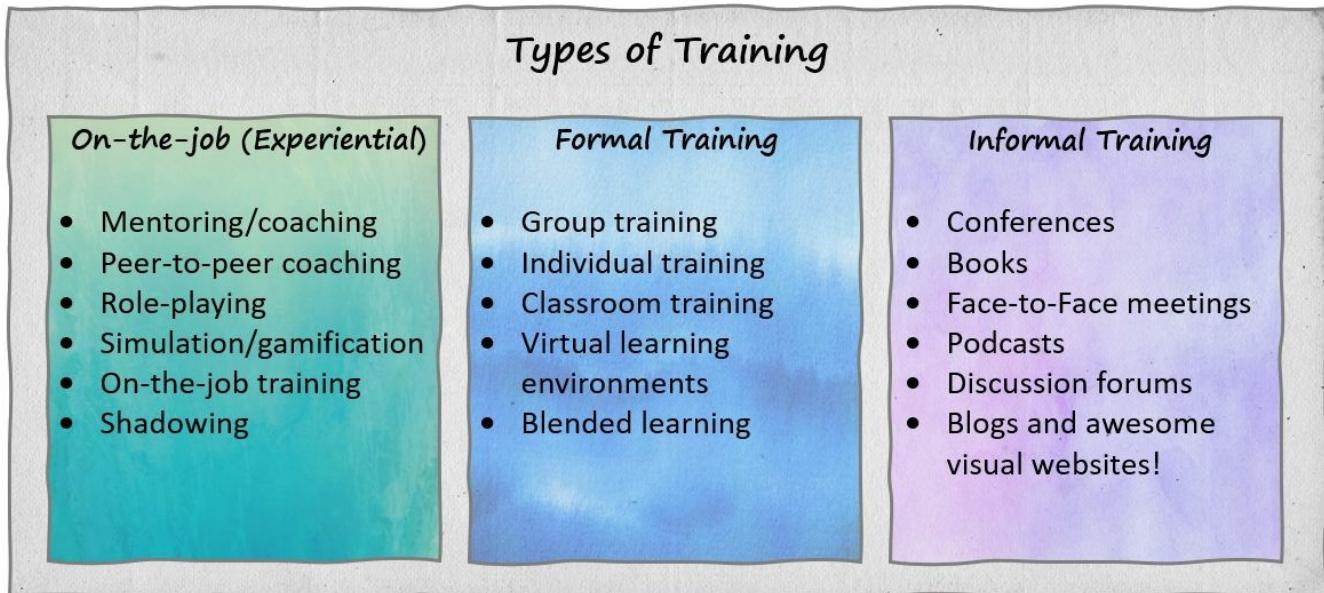


(Mother duck chooses between teaching her ducklings to swim by throwing them in at the deep-end or finding a safe, shallow pond)

There are three main types of training available.

- 1) **On-the-job Training** - experiential learning while we work
- 2) **Formal Training** – going on a course of some type
- 3) **Informal Training** – learning by ourselves

Then, within each category, many options available.



They each have their own time and cost requirements. Each will also appeal to different learning styles. We should try to match the format and learner preference to achieve the required

results efficiently. If people say they like to learn online or by observing, let them try that first, but if we do not get the results needed, different approaches may be required.



Agile approaches frequently use pairing/mentoring to share information and build skills within the team. It enables experienced team members to coach less experienced members. A good practice is to change the pairings periodically to give junior team members exposure to multiple perspectives and further share project knowledge throughout the team.

1.5.3 Allocate Resources for Training



(Make sure we have everything we need for training to be successful)

Allocating the training resources involves booking the training courses, events or supplies needed and paying for them. Then scheduling the training and making sure people are committed to taking it.

Training should be done as close to the point where it will be used as possible. Allocating resources for training involves the following tools and deliverables:

- Training and mentoring plans
- Training estimates
- Training budgets
- Training calendars

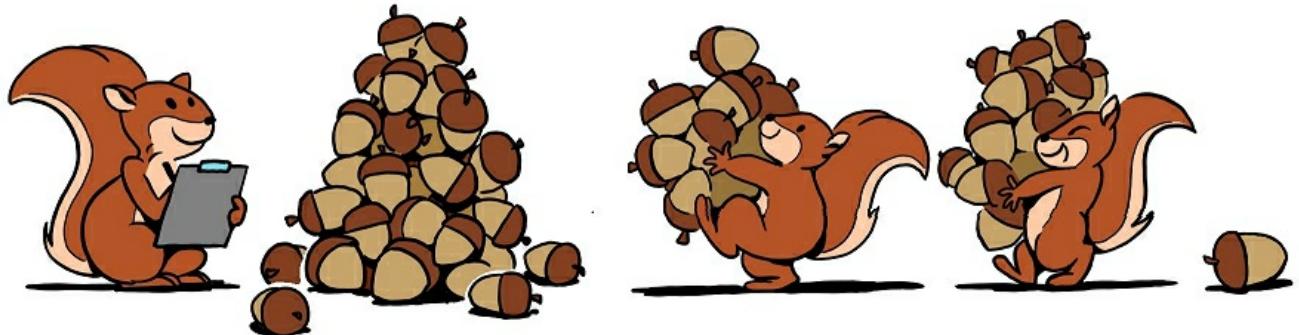
When estimating training costs be sure to include:

- Content creation, customization and updating costs
- Content hosting and delivery costs
- Instructor costs, including preparation and transportation
- Courseware printing, binding and distribution

- Venue costs, food costs
- Backfilling critical roles, if necessary, to free-up people to attend

To help ensure people attend the training, project managers should create awareness about the sessions. This can be done through training calendars, training invitations, registrations and collecting rosters of everyone who attends the whole session.

1.5.4 Measure Training Outcomes



(Measure the results of training – ideally by assessing on-the-job performance improvements)

It is not enough to organize training where required. We also need to make sure it occurs, that it worked and if it was any good. Tools we can use to measure these attributes include

- **Certificates and records on completion** – for instance, did Fred actually attend the “Anti-procrastination” course or just put it off again?
- **Training skills/gap analysis** – When we repeat our assessments, have improvements occurred?
- **Training course feedback** – Was the training worthwhile, good-value, and engaging? Should we use this approach again or look elsewhere in the future?

The Motivation of Mastery

Enhancing our skills and improving within our craft and industry is a powerful motivator for many people. It provides the opportunity for career progression and taps into our human nature that rewards problem solving and learning. Most people want to improve their skills. Maybe just to get a promotion or pay rise, but often for personal growth.



Do not underestimate the role of training for team member motivation. Ask team members what skills they would like to develop and wherever they are aligned with the project and organizational goals, try to find ways to incorporate them. If nothing else, taking the time to show interest in people’s personal and professional development will set you apart from poor or mediocre project managers and frequently generates higher commitment.

1.11 Engage and Support Virtual Teams

Virtual teams are teams where people fulfill their roles with little or no time spent meeting or working together face-to-face. Also called remote teams, they moved from being a specialized type of project environment to becoming the norm as organizations switched to work-from-home mandates in response to COVID-19.



These days, nearly everyone has experienced remote collaboration. However, there is a big difference between being forced to rapidly transition to something in an emergency and carefully designing something. Suppose the first time you have scrambled eggs is as hospital food. In that case, you may associate it with a negative experience and not appreciate it (and maybe you received an inferior version).

Fortunately, many organizations have been deliberately all-remote for many years and have built a wealth of enabling tools and techniques we can learn from. Talent is distributed, and accepting remote workers expands our pool of potential workers. It also allows us to engage people who need or choose to work remotely for health, caregiving or personal reasons.



Virtual Teams: Benefits and Downsides

Organizations can save on pricey office spaces, and employees avoid time-consuming and costly commutes and living in expensive neighborhoods just to be close to work. Of course, there are downsides too, onboarding can be slower, and people may feel lonely or not fully integrated into the team for longer periods. Face-to-face meetings are also generally better for building rapport, commitment and conveying emotions through body language.

Also, not all types of projects can be done remotely. If our job is to build a dam or tunnel, much of the work needs to occur at the physical location. However, for people engaged in knowledge-work projects, remote contribution and collaboration may be possible.

These days, technology can help teams communicate and collaborate effectively. Also, some teams may use hybrid models working a mixture of in-the-office for some days and remote for others. Technology solutions allow team members to stay in sync via tools like video conferencing, online project repositories, electronic task boards, etc.

1.11.1 Examine Virtual Team Needs

Examine virtual team member needs (e.g., environment, geography, culture, global, etc.)



(Consider the needs of remote team members)

What do our virtual teams need? Well, everything a regular team needs, of course, and likely some additional supporting technology too. Kevin Eikenberry, author of the book [The Long Distance Leader](#), describes an effective leader's dual management and leadership role and how to perform them remotely.



From the image above, we can see that we must employ various management and leadership skills to succeed.

Many of these activities, especially the soft-skills associated with leadership, take additional effort and may feel awkward for us to initiate in a virtual setting. Yet, these activities, including team building, coaching, encouraging and focussing on people, are more critical than ever in virtual team settings.

Overcoming isolation, as well as promoting motivation, collaboration and team development can all be more difficult to achieve remotely. So, we need to start sooner and work harder to be successful.



“But I’m Not Good at Technology”

Leaders and project managers are sometimes one of the older generations of workers in a

project environment. This may bring feelings of not being as comfortable with technology as younger employees. Feelings of not being good at it, that it does not feel natural, and the tools keep changing are understandable but irrelevant.

We need to get over it, ask for help if necessary, and get up to speed. Two MIT Sloan studies show that leaders who use technology are rated consistently higher in other leadership areas than those that do not. Yet, a large majority of these higher-rated leaders did not feel comfortable or confident using the tools. In other words, learn to use the tools, even if you do not like using them.

The good news is we do not need to be experts, merely competent. There is no shame in asking for help, and the process of learning-out-loud can be a powerful tool for showing we are genuine, human and modeling the desired behavior for other team members in a learning environment.

In a virtual environment, we need to spend more time on team introductions, provide contact information, and make our plans and work items visible. Storing recordings of video introductions, creating stakeholder directories, and using electronic task boards will help, but are only part of the solution.

1.11.2 Investigate Alternatives

(Full ECO Definition: Investigate alternatives (e.g., communication tools, colocation) for virtual team member engagement.)



(Try various tools and approaches to find effective ways way to collaborate)

Tools fall into two broad categories:



Asynchronous tools – allow us to get information when we need it. Like a virtual filing cabinet, asynchronous tools store project data in a variety of formats. This may include project documents, designs, models, video recordings, information radiators, etc.

Because virtual team members can work from various locations, it is more important to provide options for people to access information across a wide variety of time zones. Just because we are sleeping, it does not mean other people are not contributing or looking for project information. Providing an online source where people can participate and get information is critical for virtual teams.

Examples include: Zoho Projects, Microsoft Teams / Sharepoint, Liquid Planner and hundreds of other tools.



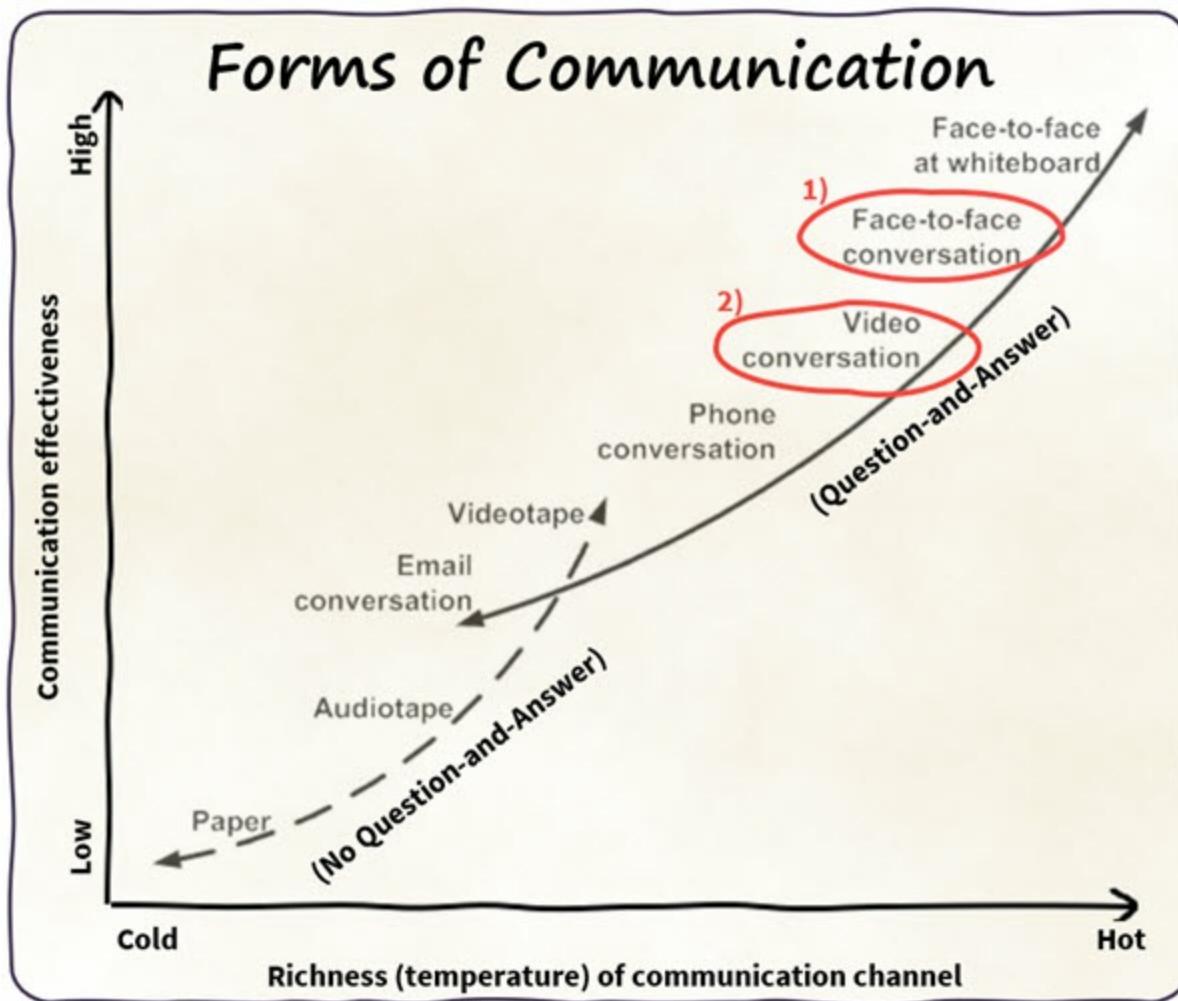
Synchronous tools – help people communicate and collaborate in real-time. These tools might feel a closer match to how we used to communicate on in-person projects. If you have something to say, you get everyone together and announce it or hold a Q&A session. Everyone had to stop what they were doing and attend at the same time to get the information and participate.

Synchronous tools include video calls and video conferencing, telephone and, to some extent, instant messaging that can facilitate near synchronous communication. They interrupt the flow of work, which might be appropriate for very high priority announcements or changes in direction, but sometimes allowing people to receive updates at their breakpoints might be better for optimizing work throughput.

Choosing your Medium

When it comes to choosing the tools and medium to use, we should consider the characteristics of various forms of communication. As shown in the image below, the most efficient (high data rate) and effective (conveying and capturing emotions) way to interact is in-person, face-to-face (1). However, this is not an option with virtual teams, so the next best thing is via video (2).

Forms of Communication



A benefit of video is that it can easily be recorded and stored for playback later - although we lose the opportunity for real-time questions and answers in that case. As we migrate further down the efficient/effective curve, we find other forms of communication.

Generally, producing documents is the least efficient because it is the most time-consuming and without the opportunity for readers to ask questions, the author has to assume a low level of knowledge to accommodate a broad audience. However, in many cases, our projects require documents to achieve approval. So, they are still needed but should not be considered the first choice if other formats that are quicker to produce or provide more options for engagement are available.



Consider Hybrid Solutions

Often hybrid solutions are used. For instance, hold a virtual kick-off workshop to introduce team members and jointly define team norms, and then write them up in a team charter for future reference. This is better than just saving the video recording because people do not want to scan through a two-hour video recording to find out what time we agreed to have the daily standup meeting.

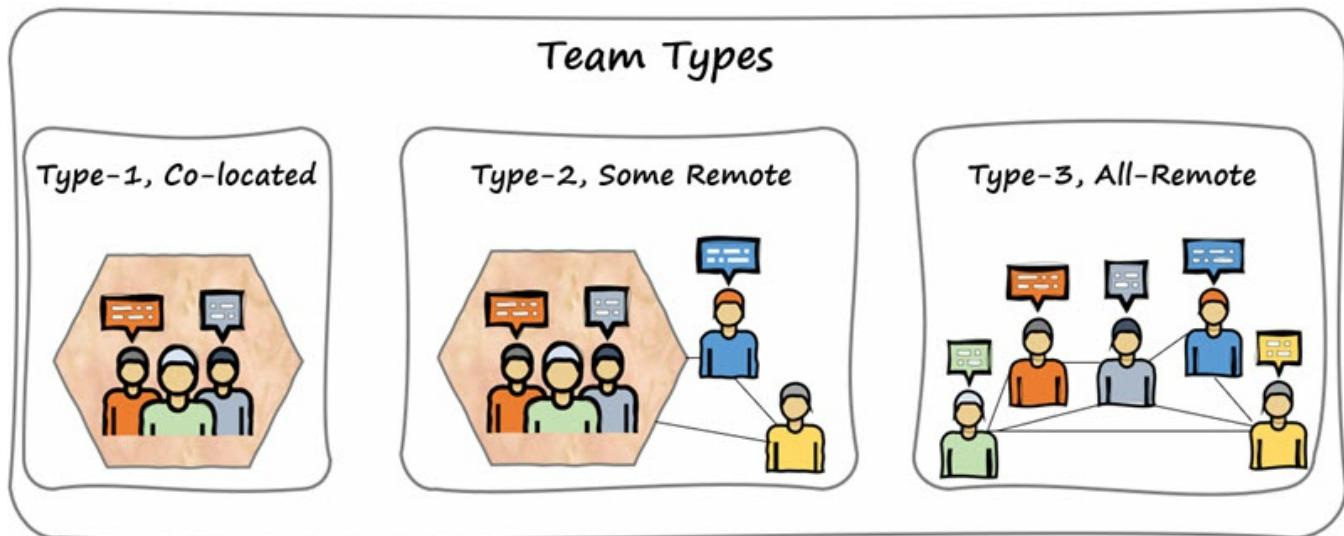
1.11.3 Implement Options for Engagement

(Full ECO Definition: Implement options for virtual team member engagement.)



(Implement the tools and approaches that work)

When considering options for engaging virtual teams, we should consider the type of team we have. The image below shows three common team types.



Type-1 teams are traditional, co-located face to face teams. Type-2 have a core co-located team and some remote members. Before the pandemic, Type-2 was the most common form of project structure and often suffered from a division of tools and communication formats used by the co-located group compared to remote team members.

Type-3, All-Remote teams do not have the two-class problem of Type-2 teams. Everyone is remote, so there is no core-team and hangers-on. Everyone experiences the same communications systems, tools and challenges.



Slower Team Formation

Team formation in a virtual environment is more challenging. The Tuckman stages of forming, storming and norming can take longer because our interactions are less frequent and

filtered through technology with small pictures of people's faces. When working remotely, people may withdraw rather than confront and resolve conflict.



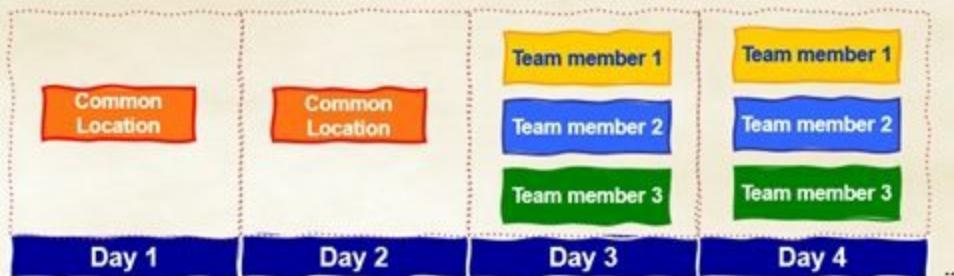
Get People Together Early if Possible

If it is possible to meet in person, even if only once or twice, this usually pays dividends to do as early as possible. Once we have met someone and worked with them for a day or two it is so much easier to pick up the phone and call them or arrange a video call than with people we have not met in person.

The diagram below depicts bringing team members together to work for a couple of days before returning to their respective workplaces.

Geographically Dispersed Teams:

- Face-to-Face early-on improves communications later
- Consider spending 80% of travel budget early
- Try to get everyone together at start



Allow Different Ways to Contribute

As project managers, we need to work harder at ensuring all voices are heard. During meetings, this may require calling upon less vocal participants for their inputs and restricting the outspoken. We should also ensure there are various ways to participate. So, instead of only using meetings, people can contribute by adding ideas to design, documents or virtual whiteboards offline.

The various ways of communicating with stakeholders should be documented in the Communications Management Plan. This deliverable can be a formal document or set of agreed norms published online. However, it should explain the format, frequency, goals and expectations

of all the major project meetings and communications.

Communication Type	Objective of Comm.	Format	Frequency	Audience	Owner	Deliverables
Kick-Off Meeting	Introduce the project, manage expectations, set	Meeting	One-Time	All Core Project Stakeholders	Project Manager	Meeting Minutes, Updated Charter
Status Report	Report of the status of the pro	Document, emailed	Weekly	All Core Project Stakeholders	Project Manager	Status report, issues log, risk log
Steering Committee	Clear issues, review performa	Meeting	Monthly	Steering Comm, PM, others as n	Project Manager	Meeting Minute Action items, up
Task Board	Show work planned, in prog	Information radiator	Real-time	All Core Project Stakeholders	Development Team	Phys task board and electronic ver
Lessons Learned Review	Capture lessons for future project	Meeting	One-Time	All Core Project Stakeholders	Project Manager	Lessons Learned Report



Provide Calendar Tools

Another must-have tool is a shared calendar with automatic timezone conversion and common-availability finding capabilities. Team members should not have to spend a lot of time determining what time it is for other stakeholders or finding a time to talk.



Encourage Innovation and Learning

A common criticism of remote teams is that it stifles innovation. The argument goes that without the water-cooler talk and chance interactions, impromptu idea-sharing does not occur to the same degree. This is a limiting way to view how innovation happens. The best all-remote organizations have figured out how to make innovation and learning everyone's job.

All-remote organization Automattic build web tools including WordPress and Tumblr (and dozens of others), employs over 1,100 people in 75 countries. They operate via a set of aspirational goals they call the Automattic Creed that emphasizes innovation and learning. These include:

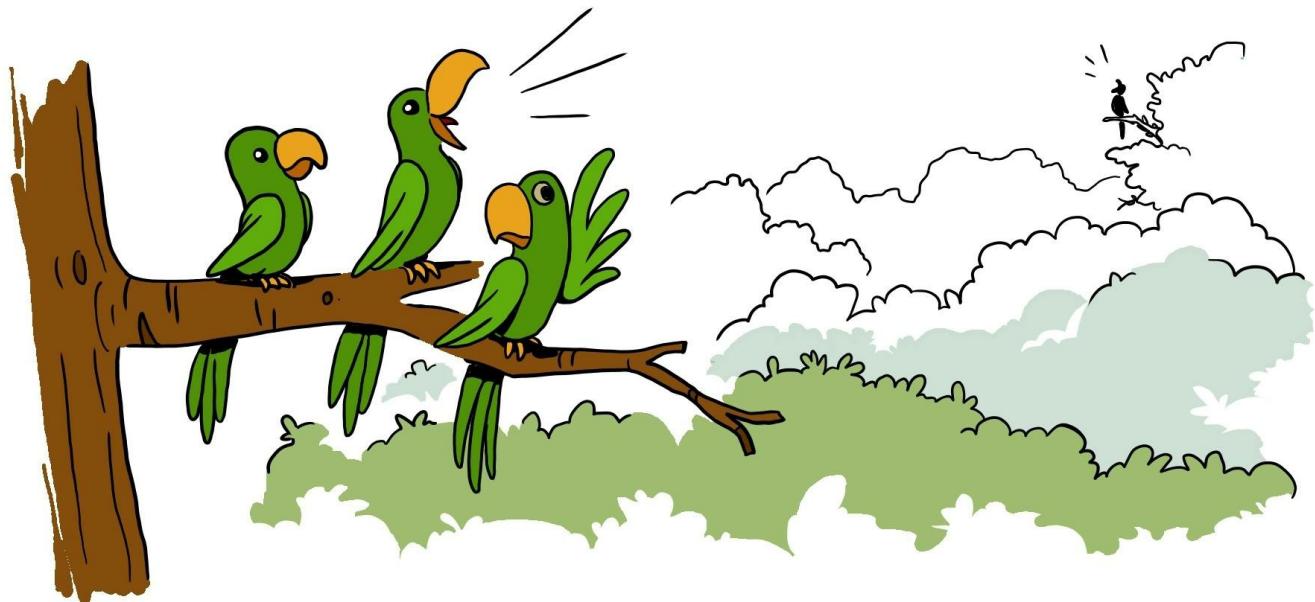
- Never stop learning
- Do not just work on things assigned
- There is no such thing as the status quo
- Never pass up an opportunity to help a colleague

- Communicate as much as possible because it's the oxygen of a distributed company

As project managers, we likely do not have the influence to bake these ideas into our organization's DNA as Automattic has. However, we absolutely have the power to suggest them as team norms and ground rules for our project team.

1.11.4 Continually Monitor Engagement

(Full ECO Definition: Continually evaluate the effectiveness of virtual team member engagement.)



(Continually check the engagement is working)



Check-in Do Not Check-on

As with in-person projects, we still need to monitor the effectiveness of team member engagement, but remotely how we do that changes. Traditional “management by walking around” or lean Gemba-walk (go see) practices are not possible. The virtual equivalent is a check-in.

Checking-in is quite different from checking-on someone. Check-on someone is closer to micromanagement and sends a “Are you working?” instead of a “How are things?” message. If we have to check if someone is working, we should not have hired them. Or maybe we should not have been hired.

We can assess if work is getting completed from variance analysis. Variance analysis involves checking task boards, WBS work package completion, daily standup meetings, and other progress evaluations, comparing work done to projections. The purpose of a Check-in is to be available to provide some of the caring and support that might be absent in remote teams. Also, to listen about issues or impediments to progress. To show some compassion and hear about what is happening.



Check-ins are a bare minimum virtual touchpoint for remote teams. They do not need a formal structure and often just asking questions such as: “How is it going?”, “Do you have what you need?”, “Is there anything I can do to help?” is enough to get things started.

(We might be thinking: “Are you even working?”, “What the heck have you been doing?”, and “When will x ever be done?” but that is not the purpose of a Check-in. As stated already, progress is evaluated separately through variance analysis. As soon as Check-ins become Check-ups or Check-ons, people will avoid them, clam up, or pre-invent a bunch of busy-work items to sound productive, and we lose the opportunity to actually connect as humans.)



Retrospectives and Engagement Surveys

Effective remote teams frequently inspect and adapt how they are collaborating and working together. Just as we look for ways to improve the product or service the project team is developing, we should also review virtual team engagement.

There are many ways to facilitate a retrospective, but as a starter, asking “What is working well?”, “What is not working?”, “What should we start?” and “What should we stop?” should return some suggestions. As a team, vote on a few experiments to try in the next period and review them when you meet for the next retrospective. Successful ideas can be made permanent, and failed experiments can be switched to better ones, or mined for their learnings.



Hybrid and traditional lifecycle projects may not have frequently scheduled events called retrospectives, but this does not prevent the same ideas from being practiced. Schedule review workshops, idea generation meetings, or engagement surveys and ask how the collaboration process and tools are working. Ongoing stakeholder engagement is critical for any project's success, regardless of its lifecycle.



Embrace the Upsides of Remote

Virtual teams certainly have some challenges. We looked at onboarding, loneliness and team formation issues. Also, not everyone has an ideal work environment or may have difficulties staying focused. Yet there are many upsides too.

Again, we can learn from established all-remote organizations who have been doing this for years and continue to refine how they engage their workforce. GitLab (makers of source code repository and DevOps tools) has 1,295 team members spread across 67 countries using its all-remote work practices.

It has its own published values and manifesto. GitLab's "CREDIT" values are:

- Collaboration
- Results
- Efficiency
- Diversity, Inclusion & Belonging
- Iteration
- Transparency

The term CREDIT also describes the good intent it assumes from its remote peers. GitLab also has a remote manifesto:

1. Hiring and working from all over the world instead of from a central location
2. Flexible working hours over set working hours
3. Writing down and recording knowledge over verbal explanations
4. Written-down processes over on-the-job training
5. Public sharing of information over need-to-know access
6. Opening up every document for editing by anyone over top-down control of documents
7. Asynchronous communication over synchronous communication
8. The results of work over the hours put in
9. Formal communication channels over informal communication channels



Once more, we likely do not have the influence to make similar principles core to our organization, but we can learn from them. So, play to the strengths:

- Recruit globally
- Offer flexible working hours to retain your best talent
- Acknowledge virtual teams need more written guidance to consume asynchronously
- Make work visible to help with collaboration and tracking
- Assume positive intent but verify
- Measure results, not attendance

1.10 Build a Shared Understanding about the Project

When we have a shared understanding, we know where we are trying to get to. So, even if things go wrong or problems arise, we know how to pick up the pieces and keep moving forward in the right direction.

Contrast this with merely completing assigned tasks. If something goes wrong, people stop work and explain the task is no longer possible, or they were doing their job, and “X” happened, forcing them to seek new instructions. Having a shared understanding allows people to keep progressing when the unexpected occurs.

Projects are full of unexpected extra steps and setbacks, so building shared understandings of vision, goals, roles and work are essential. Some of the ways we create these shared understandings include:



Project Vision – The project vision is a uniting-view of where we are trying to get to. When stakeholders clearly understand the destination, they can use it to help make their own local decisions. For instance, if faced with a technical choice, they can think, which option is most closely aligned with getting us to our project goal of achieving the project vision?

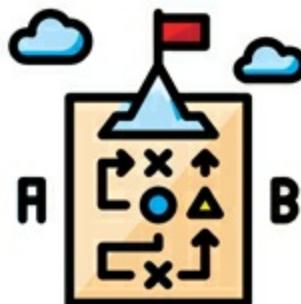
A good vision sets the team's direction and allows them to confidently travel with speed towards the goal. Not having a clear project vision is like driving in fog; we slow down, unsure of what lies ahead.



Project Charter – While the project vision focuses on “Where?” we are trying to get to, the project charter fills in the Why?, How?, with Who? And by When? details. It summarizes a wealth of project information, including the business case, high-level description of in-scope and out-of-scope items, the core stakeholders and project approach.

In terms of building a shared understanding of the project, the project charter is what we would give most stakeholders to get an appreciation of why the project was authorized and what its goals and approach are. It would be like reading a film's synopsis; all the basics of the plot,

characters and storyline should be there. However, projects sometimes veer off-plot, so other tools and deliverables would be useful to get today's view.

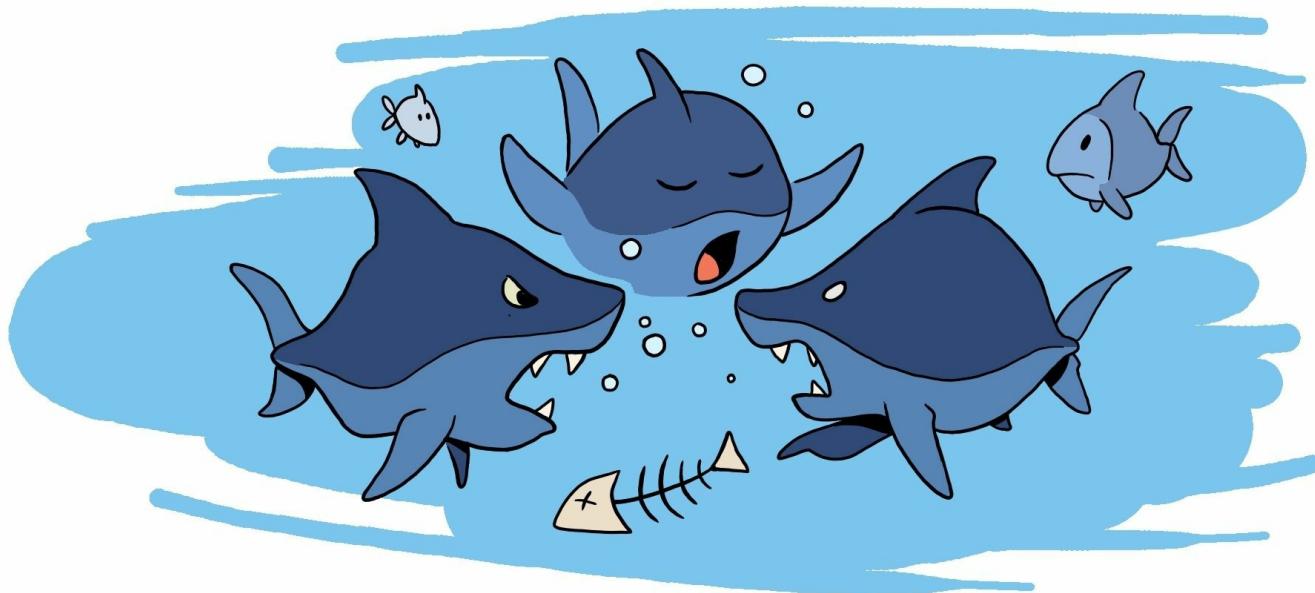


Project Plan – When we hear the term “project plan” many people think of the schedule, perhaps expressed as a Gantt chart. However, that is just one (critical) component. The project plan, also called the project management plan, integrates all the individual management plans into one document. It creates a single source of project information that contains much more than just a schedule.

The project plan also includes a description of the development approach, the lifecycle, the requirements management plan, the configuration management plan, the change management plan, and any processes or baselines used. These are all critical explanations aimed at creating a shared understanding of how functions will work and when things will happen.

1.10.1 Identify the Root Cause of Misunderstandings

(Full ECO Definition: Break down the situation to identify the root cause of a misunderstanding.)



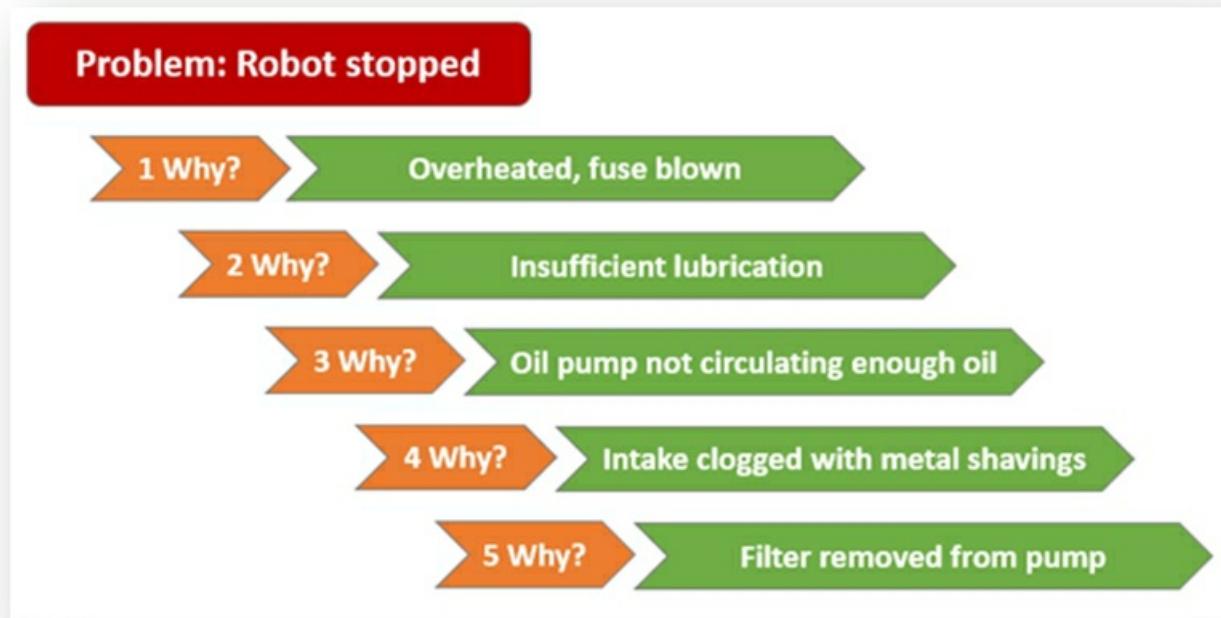
(Find out what the misunderstanding is and how it occurred)

Even with these tools to build a shared understanding, problems still arise. People get the wrong idea, priorities are misaligned, tasks get dropped, and expectations are not met. We need to get to the root cause of why it happened and then rebuild a stronger alignment to the objectives.

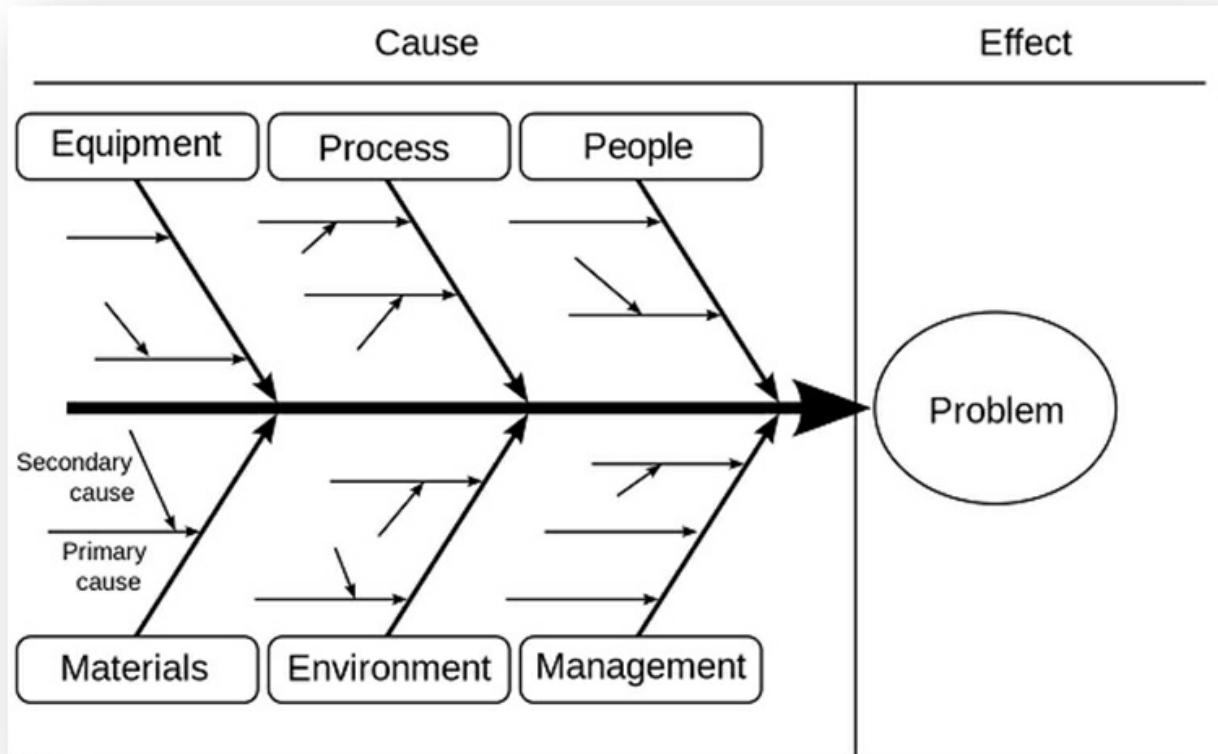


Whys

Five Whys is an exercise to discover the cause-and-effect connections in a problem and get to the root causes. It originated with Toyota and is commonly used in agile and lean approaches. Teams work in pairs or small groups and ask “Why?” five times about the problem to move past superficial answers and get to the root cause of the problem.



Fishbone Analysis – Often done alongside the Five Whys exercise, creating a fishbone diagram can help display the root cause analysis of problems. The team identifies factors that are causing the problem and looks for their likely causes. The process starts with writing the problem at the head of the fish. Then the team identifies and adds the contributing factors to the bones of the fish.



Once we know why the misunderstanding occurred, we need to rebuild consensus. Some tools for helping achieve this include:



XP Metaphor – The XP metaphor is a shorthand, a story, a way of explaining a product or service (or some portion of it) so that people can understand it more easily. Having a single, consistent metaphor helps align everyone around the same view of the product or service being created.

For example, a project team writing an oil-pipeline batch-scheduling system might use a metaphor to describe how the system works at a high level. The team may say: “The pipeline batching system works like an Outlook Calendar. Shippers buy capacity on the pipeline, which is like making an appointment in the pipeline’s calendar. No other shippers can book that timeslot because it shows as “busy” to other pipeline schedulers looking to add products to the system. The appointment lasts as long as the product is flowing through the pipeline, and once finished and

flushed, the calendar shows as free for the next customer. Pipeline schedulers try to fill up the pipeline calendar with as many batch appointments as possible to maximize utilization. They also schedule maintenance outages into the calendar as well.”



Product Box – The Design-the-Product-Box exercise is explained in [1.2 Lead a Team](#). It is an exercise to help team members and critical stakeholders arrive at a consensus about goals and define priorities for a product or service. Creating a product box for a project facilitates discussions around urgencies and success criteria. Building a shared understanding of these factors is especially useful in a compressed timeline environment when the time to market or responsiveness is paramount.



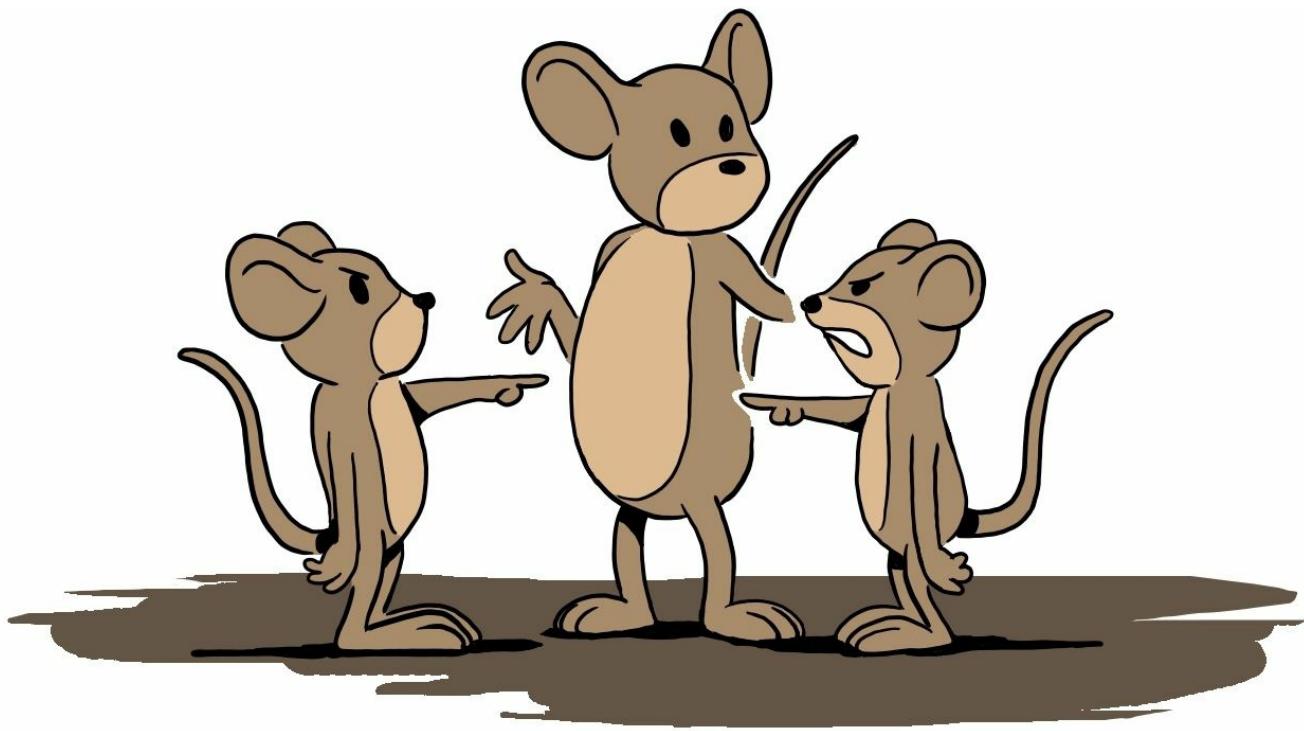
Taskboard – Finished your work and not sure what to move on next? A taskboard shows all the work recently done, work in progress (being done), and what is up next for development.

Gantt charts and work breakdown structures also contain this information, but taskboards are easier to interpret and interact with. Team members may be reluctant to open up a plan to see what's next, but having a big board in the team room or on the team website makes the work extremely visible.

The low-tech, high-touch approach is deliberate by design to encourage its use. Seeing exactly what is next for development allows people to move forward if they complete their work early or flag it as blocked with a colorful stick if they need help. Boards promote pairing and mobbing to get difficult items completed and generally raise awareness of what is on deck and what is coming soon.

1.10.2 Survey Parties to Reach Consensus

(Full EDO Definition: Survey all the necessary parties to reach a consensus)

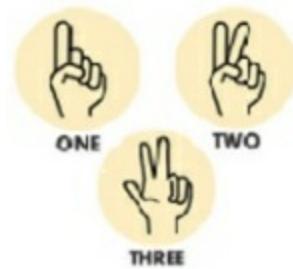


(Capture the full range of views and opinions)

In 1.2.2 Support Diversity and Inclusion, we saw how having diverse team members is a strength. The range of experience and points of view help us build better decisions with fewer blind spots. While those various points of view will likely bring a few disagreements, there is a benefit in getting everyone's input.

The challenge comes in finding efficient ways of getting people's input. If we put every little decision to the team and take an age discussing and deciding, our project will soon fall behind schedule. Ideally, we want a way to quickly reach consensus when there is broad agreement but still allow people to tell us about edge case scenarios or things we may have missed.

Listed below are some approaches that attempt to combine quickly reaching group consensus and allow individual input and consideration.



Fist to Five – A simple way to survey parties and reach consensus is to use Fist to Five voting. Using this technique, we ask the group to vote, showing support with the number of fingers raised. An open hand showing 5 fingers means full support, 4 fingers would be in favor, 3 yes, but with reservations, 2 or 1 means I have concerns.

A fist is a signal to oppose the decision that is usually followed by an invitation to share why

that person thinks it is a poor decision or a better alternative. Using this approach, we can quickly see if there is support for a decision and move on if everyone is in agreement, or investigate further if someone disagrees strongly.

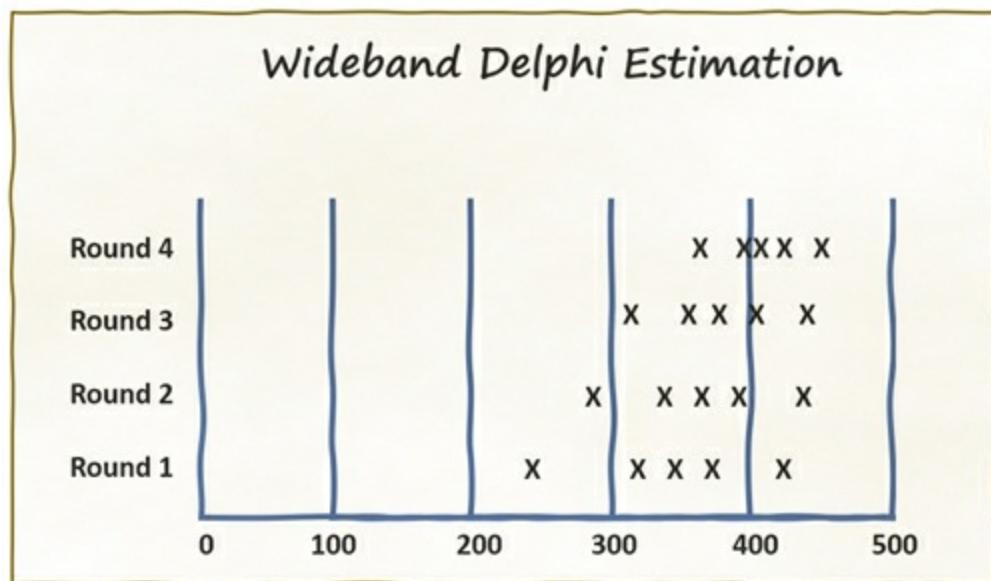


Roman Voting – If Fist of Five sounds too complicated, or not all of your team have 5 fingers, then maybe Roman Voting is a better fit. Again, we ask the group, and they use a thumbs-up for approval, sideways for do not mind, and thumbs-down for no. It is quick, easy and has the opportunity for fast consensus or further discussion.



Wideband Delphi Estimation is a team-based estimation technique where people submit estimates anonymously first to minimize cognitive biases. It aims to avoid the Halo Effect (gravitating to the most senior or respected person's estimate) and Groupthink or the Ringlemann Effect (people being lazy and just going with what others suggest.)

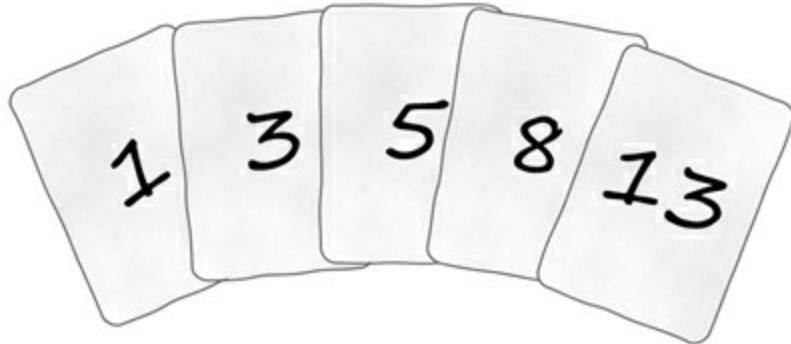
After people have stated their initial estimate, they read out the tasks and issues they identified, and after hearing from everyone, another round of estimates is conducted. After a pre-set number of rounds or an agreeable range of estimates is reached, the process stops. It allows people to contribute their ideas and hear from others.





Planning Poker – is a technique based on Wideband Delphi estimation used by agile teams to estimate work items' size. Teams use cards with numbers found on the Fibonacci sequence to represent the relative units used for the estimates, such as story points, developer days, etc.

Planning Poker Cards

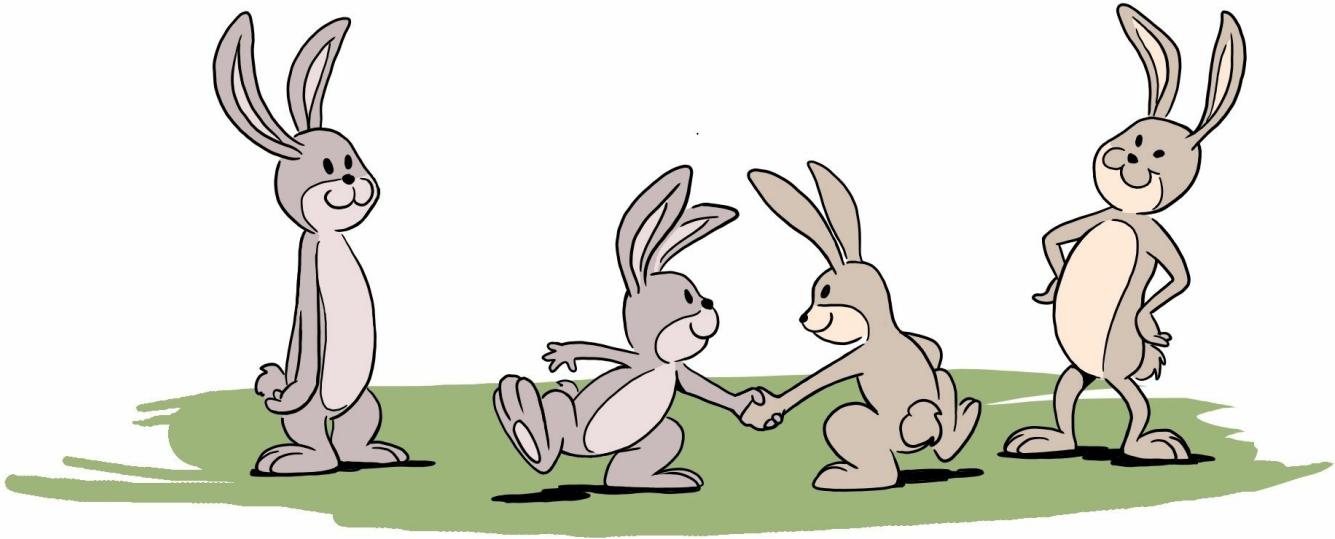


The facilitator, maybe the ScrumMaster, product owner or any team member, reads the story card. The group discusses the story briefly if clarification is needed. The facilitator will count to three, and then everyone shows their card simultaneously with the estimate they selected to develop that user story.

Showing the cards at the same time ensures that the initial estimates are not influenced by other group members. If there is consensus around the forecast, it is selected as the team estimate, and the team moves onto the next story. However, if there is a wide divergence, the outliers are discussed, and the team re-estimates in light of this new information.

Planning poker is an example of collaborative decision-making. It allows the team to move quickly when there is an agreement but also pauses to reflect on new insights when necessary.

1.10.3 Support Outcome of Parties Agreement



(Reach consensus and keep moving forward)

There are several tools we can use to help us reach agreements.



Team Agreements and Ground Rules – *Is it OK to switch off my camera once the remote meeting starts? Can I work on my report during a conference call? If I disagree with the presenter or think they are missing important information, should I interrupt them or just tell them in private later?* When we do not know how to interact or are at odds with the norms, friction will ensue.

Team Agreements help keep people aligned with agreed norms and reduce conflict. When we collectively define how we want to work together, it reduces misunderstandings and disputes. The joint creation of ground rules also builds a sense of community and team identity.

Team agreements and ground rules are covered in more detail in [1.12 Define Team Ground Rules](#).



Refer to the charter – Since the charter defines how the project will operate, it can be a great source to turn to when deciding how to support the outcome of an agreement. For instance, it might define a policy to go with the higher estimate when voting ties occur. Or that some decisions might be overruled if they are seen as a breach of a larger organizational strategy or policy.

1.10.4 Investigate Potential Misunderstandings



(Lookout for misunderstandings and identify why they happened)

Despite our efforts to plan and communicate, mistakes will inevitably be made, and misunderstandings will occur. We need to address them as best we can, investigate why they occurred, and try to reduce the likelihood of them happening again.



Retrospectives – Retrospectives are meetings/workshops held on agile projects at the end of the sprint/iteration. They are for the team to reflect back on evolving product/processes and ask what is working and what can be improved. Coming out of the retrospective are improvements or experiments to try in the next sprint/iteration.

By frequently engaging the team in review, recommendations and experiments, a couple of things occur. First, the team takes more ownership of their process and its outputs. If something is not working well, they are empowered and expected to try and fix it. Second, the discussion process shares lots of information about issues, risks and resolution ideas which improves team knowledge and leads to fewer team misunderstandings.



After Action Review (AAR) - This is a structured review or de-brief for analyzing what happened, why it happened, and how it can be done better by the participants and those responsible in the future. After-action reviews were originally developed by the U.S. Army and are now used in many organizations to build a culture of accountability.

An AAR begins with a comparison of intended vs. actual results achieved. An AAR differs from a lessons learned review or post-mortem in its narrow focus on the participant's actions. Learnings from the review are taken forward by the participants, and recommendations for others are not usually produced. As such, it is closer and more personal, looking at what we can do to improve and avoid problems in the future.

Since we want to avoid misunderstandings, we should share information and avoid knowledge silos (tight specializations.) Hybrid and agile projects emphasize transparency and developing generalists with a broad range of skills to reduce specializations



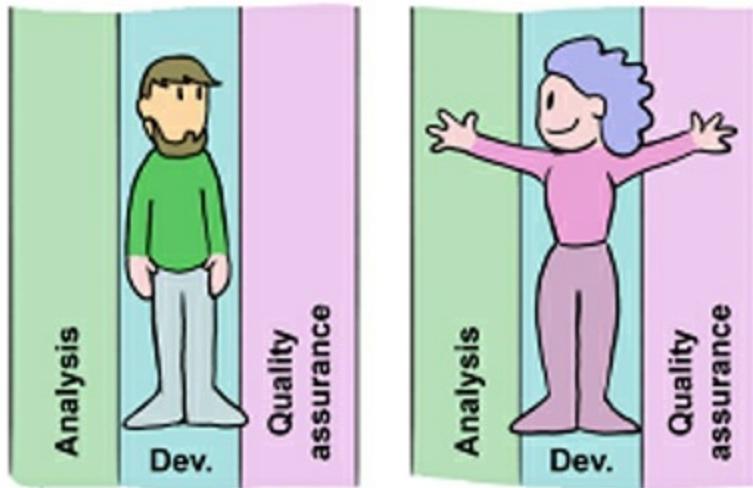
Transparency – The agile principle of transparency involves openly showing plans, work in progress, issues, defects, risks, etc. This information is not created and retained by project managers. Instead, it is created, maintained and shared with the whole team.

Taskboards and backlogs show planned work and work in progress, potentially along with WIP limits and any blocked items. By creating information radiators and using open-access tools to display impediments, change requests and defects, information is deliberately publicized to educate more team members. The idea being, by sharing this information, the team will be able to make better decisions, and there will be fewer misunderstandings.



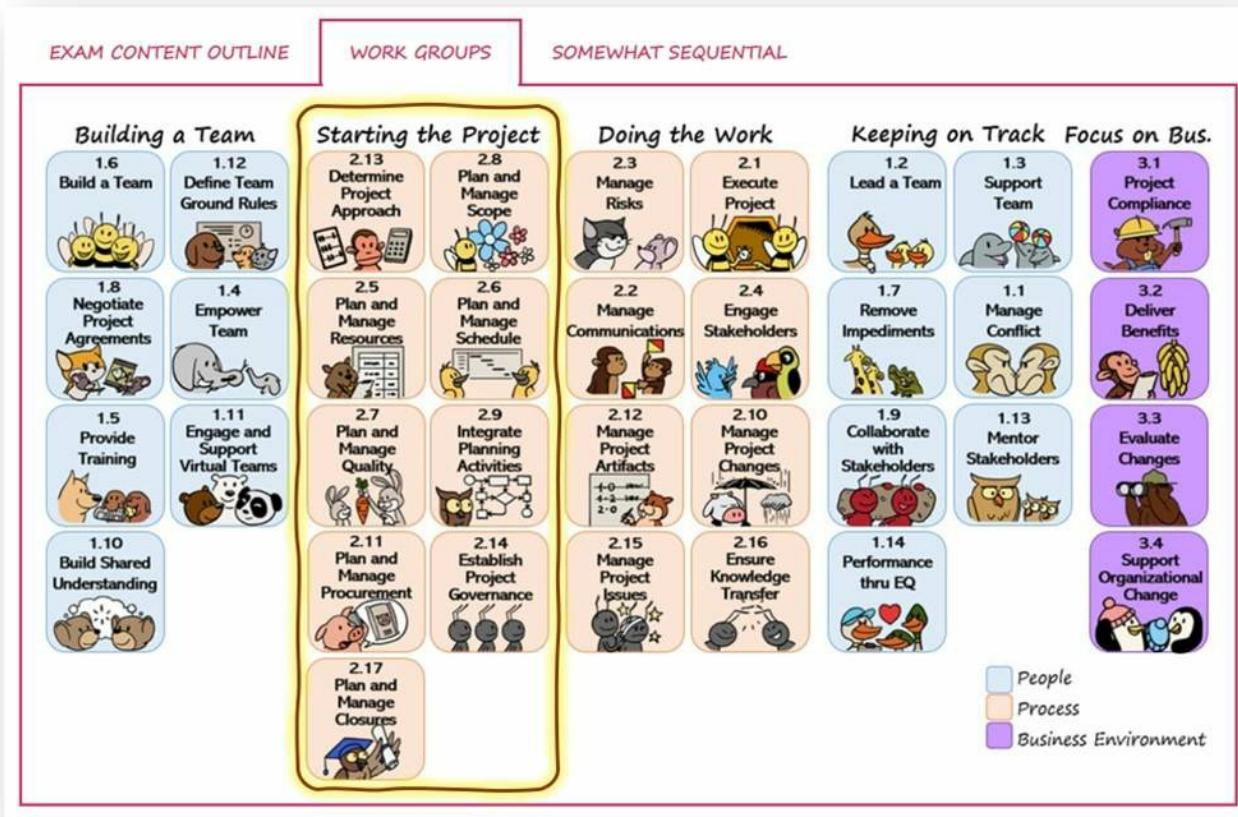
"T" shaped people – The letter “I” is narrow and deep, like the skills of a specialist who does just one thing, such as developing software. The letter “T” is broad at the top as well as deep. The term “T Shaped People” is given to generalizing specialists who, in addition to their main skill, can also help out in other areas.

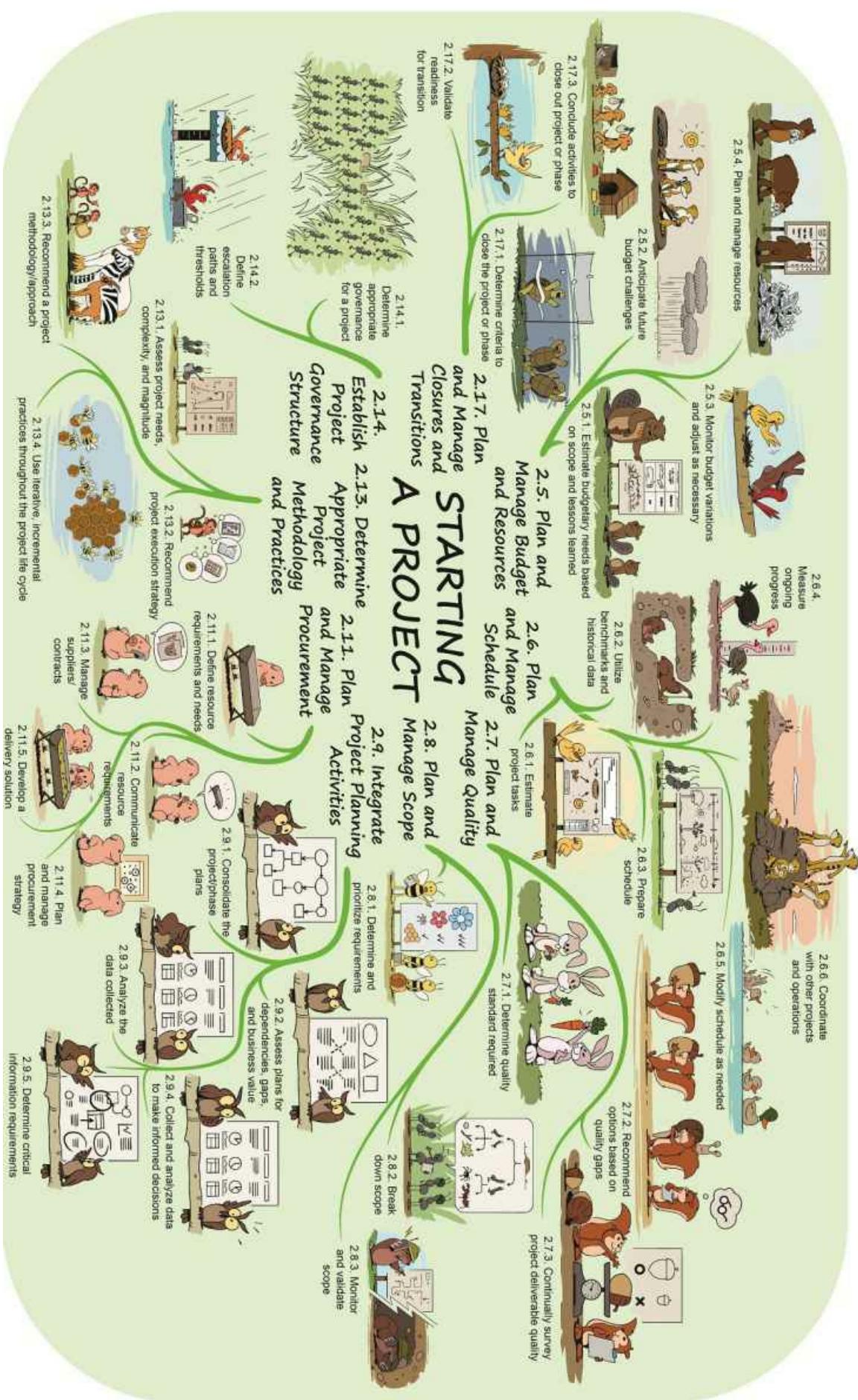
So, as well as coding, maybe they can help business analysts capture requirements or QA people with testing? Learning a little about other roles spreads knowledge around the team and reduces misunderstandings. It also helps with load balancing (resource leveling) since these people can temporarily lend a hand if some other role becomes the bottleneck.



WORK GROUP 2 – STARTING THE PROJECT

The next Work Group we will deal with covers Starting the Project.





2.13 Determine Appropriate Project Methodology / Methods and Practices



No Single Best Approach

There is no best way of executing every project. If there were, it would likely have been automated by now and project managers made obsolete. However, because all projects are different (even building the same house in a new location will have new variables and likely stakeholders), we need to determine how to select the most appropriate execution strategy and approach.

The factors to evaluate include the type of work being undertaken, level of project uncertainty, complexity, stakeholder needs, and timelines, among other considerations. These project inputs, coupled with industry and organizational norms and goals, help us make informed recommendations for the project approach.

For the PMP® exam, candidates are expected to understand the characteristics of Traditional predictive approaches, Agile approaches and Hybrid approaches. Let's recap the main characteristics again:



Traditional, Predictive Approaches

Traditional, predictive approaches (sometimes called Waterfall or plan-driven) are great for defined, repeatable projects. They can be planned in detail upfront and then executed by following this plan. The mantra “Plan the work, work the plan” captures the character of the approach well.

Until agile approaches started to gain traction in the 1990’s, most large-scale projects were executed using traditional, predictive, plan-driven approaches. Deliverables such as Gantt charts, network diagrams, work breakdown structures (WBS), and detailed specification documents are commonly associated with traditional, predictive approaches.



Agile Approaches

Agile approaches started in software development, although they drew inspiration from lean design and manufacturing. They work well when solving new problems with high rates of changes and uncertainty.

Agile approaches focus on communication and collaboration while they iteratively build, inspect and adapt. In doing so, they evolve towards an emergent solution that might not have been knowable at the start of the project. In other words, they adapt as they go, to meet unclear but emerging requirements.

These days, agile approaches are used on many knowledge work type projects that are characterized by high rates of change, complexity and uncertainty. The frequent review points, and redirection if necessary, allow teams to chase today's "moving target" projects.



Hybrid Approaches

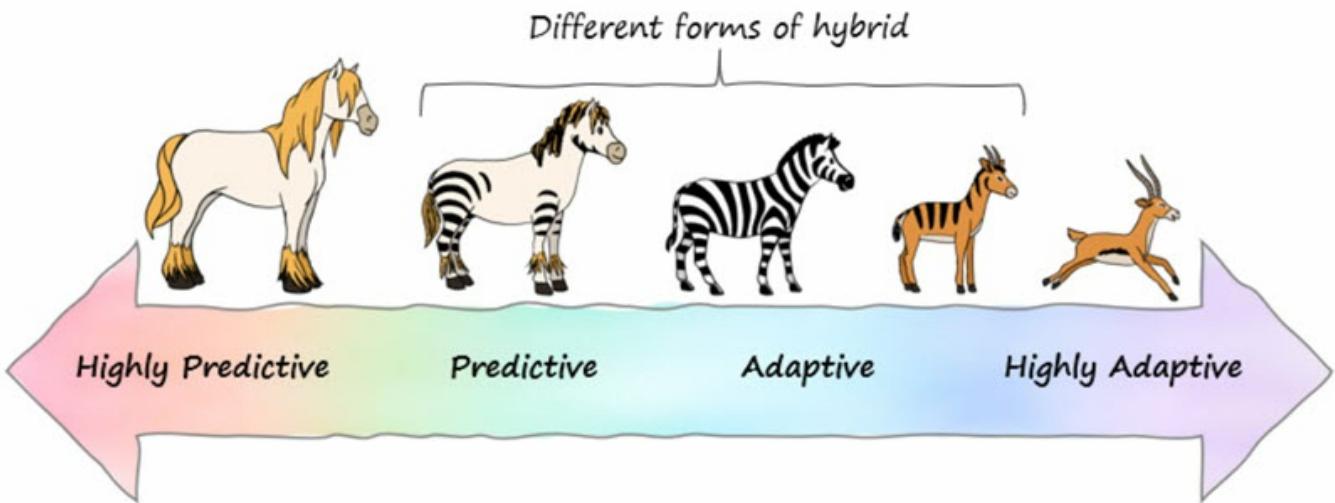
Hybrid approaches combine elements of both tradition and agile life cycles. So, for instance, a hybrid approach may still do a significant amount of upfront planning, but then execute iteratively, perhaps with iterations of one month in duration, which is much longer than the typical agile project.

An optimist might claim hybrids are the best of both worlds, while a pessimist complain they combine the worst of both approaches. The truth is probably somewhere in between, but because there is no single, standardized hybrid approach definition, usually all stakeholders need training coming up to speed with 'the hybrid' approach created for the project.



The Spectrum of Hybrids

Since hybrids are unique blends, they come in many varieties. On the spectrum from highly predictive to highly adaptive (Traditional to Agile) they occupy the entire middle ground. This means we can create hybrids that are close to traditional, predictive approaches – such as a traditional approach with a series of proof of concepts before committing to a single path. Or a hybrid that is very close to a pure agile approach, but with additional documentation, approvals and governance.



The selection and application of hybrid approaches is a large topic. If you would like to learn more, the following articles will be of help:

- Ideas around when to adopt hybrid approaches - [Article](#)
- Different structures and types of hybrid approaches - [Article](#)
- Understanding knowledge-work and how it impacts project management - [Article](#)
- A discussion about using mixed life cycle approaches on large programs of work - [Article](#)

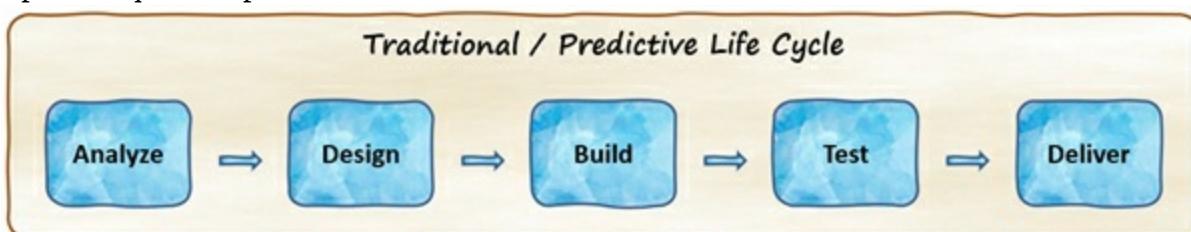


Predictive, Iterative, Incremental and Agile

Before describing different lifecycle models, first let's define some terms:

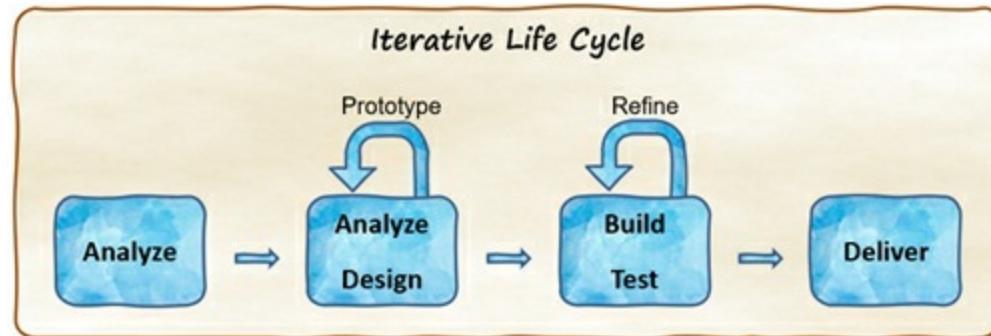


Predictive – Traditional, do the bulk of the planning up-front, then operate in a single-pass, sequential process.

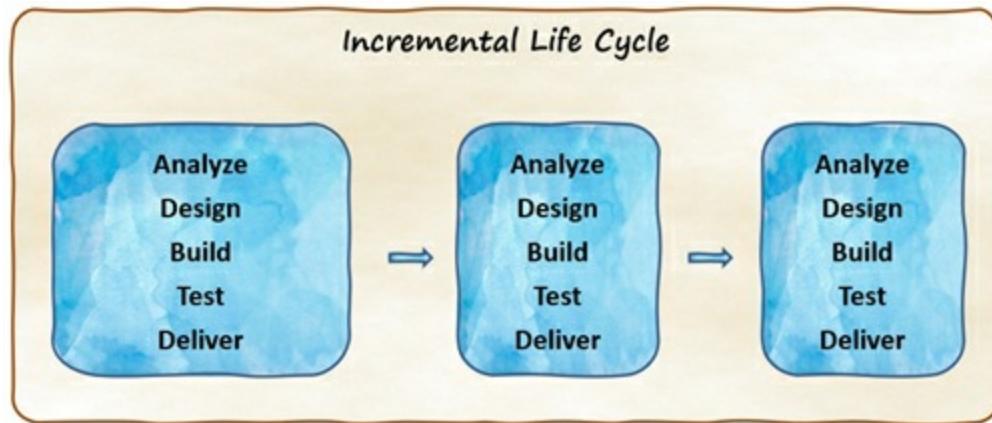




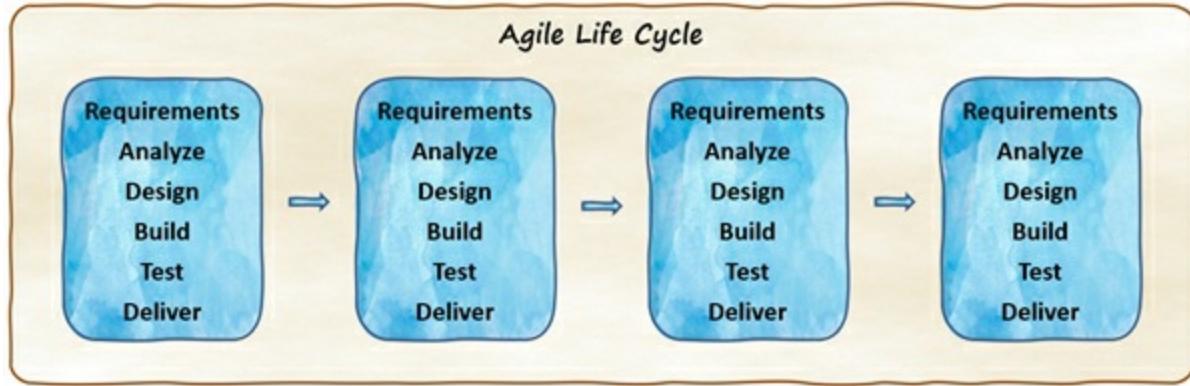
Iterative – approaches that allow feedback for unfinished work to improve and modify that work.



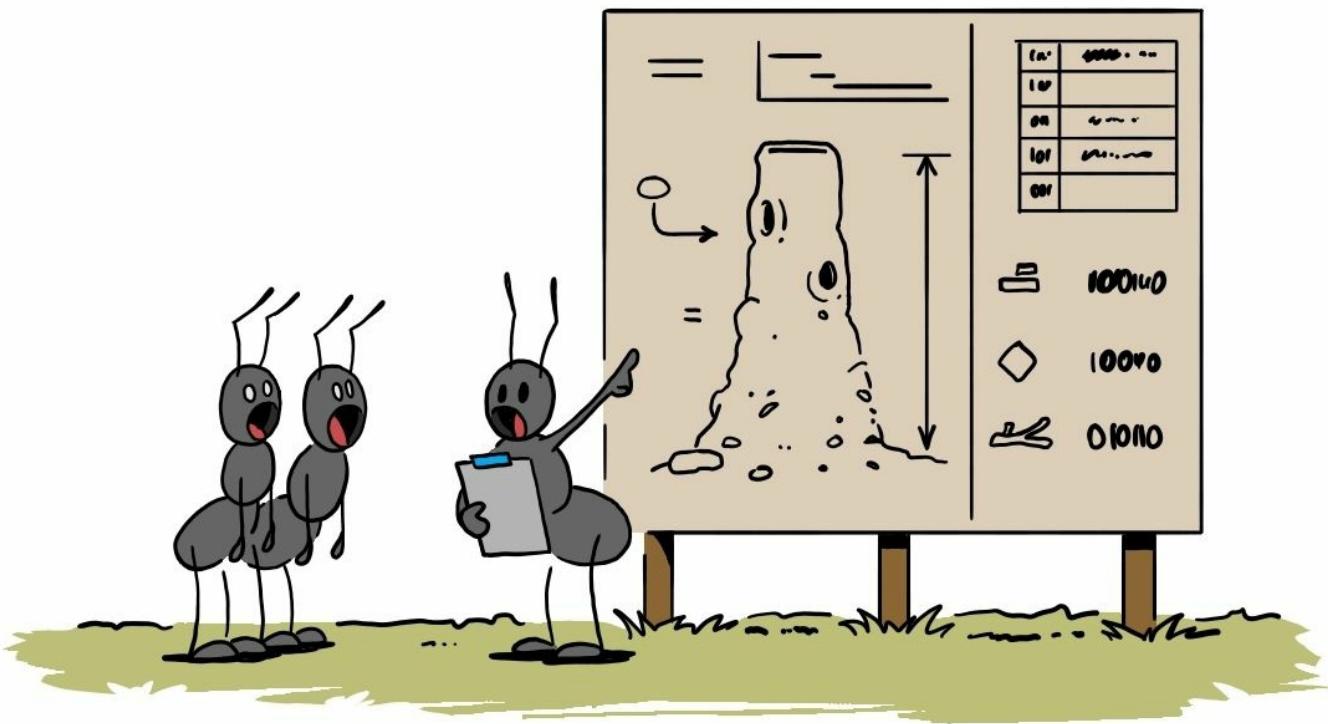
Incremental – approaches that provide finished deliverables that the customer may be able to use immediately.



Agile – approaches that are both iterative and incremental to refine work items. The teams gain early feedback on “slices” of the final solution that can be used to confirm if they are on the right track.



2.13.1 Assess Project Needs, Complexity and Magnitude



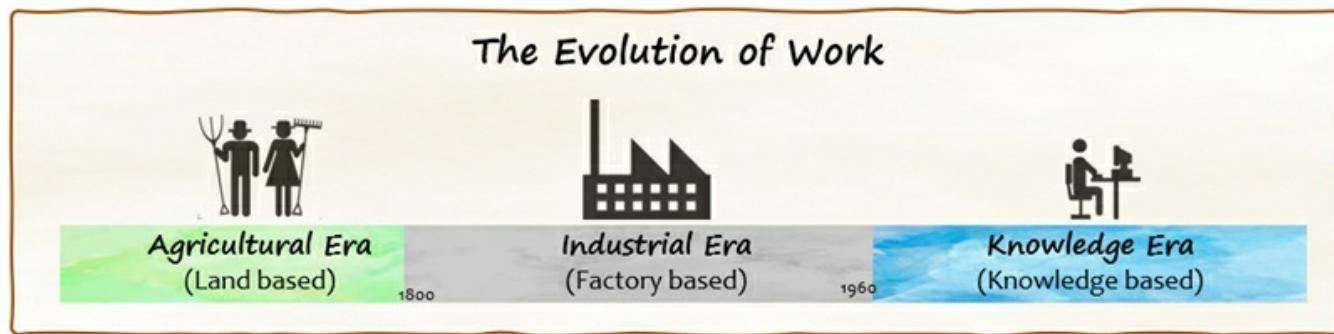
(Assess the size, complexity and nature of what it is you are trying to accomplish)



Understanding Work Types and Knowledge Work

The predominant form of work has evolved over time. Humans started out as nomadic hunter-gatherers, but mostly settled in static towns and villages when farming was adopted. The industrial revolution saw many people move from these farming communities into cities to work in factories. The last big shift in work patterns started in the 1960's with the creation of knowledge work.

The Evolution of Work



Knowledge work is any kind of work where subject matter experts collaborate to solve problems. This includes engineers, teachers, scientists, lawyers, doctors, software developers, researchers, marketing, HR and customer relations.

"Knowledge Work - People with subject matter expertise who communicate this knowledge and take part in analysis and/or development" – Harvard Business School

Since much of the industrial work has been automated, it is estimated 80% of employment in developed countries is knowledge work, or contains significant knowledge work components.



Industrial Work vs. Knowledge Work Differences

Unlike industrial work, knowledge work tends to be less defined and repeatable. It is concerned more with solving new, novel problems and manipulating information rather than raw materials.

For instance, designing a new music player involves studying customer demographics and usage scenarios. Then designing the product and software that runs it. Market testing and subsequent design revisions. There is a manufacturing process at the end of it, but the project lifecycle was mainly collaborative design and problem-solving.

Peter Drucker, the management guru who coined the term "Knowledge Worker", used the following table to help people diagnose which types of projects we are dealing with.

Industrial Worker	Knowledge Worker
Work is tangible, visible	Work is intangible, invisible
Work is specialized	Work is holistic
Work is stable	Work is changing
Emphasis is on running things	Emphasis is on improving things
More structure with fewer decisions	Less structure with more decisions
Focus on the right answers	Focus on the right questions

If your projects have the characteristics listed on the left-hand side of the table, they are likely industrial type projects. This is good news for reliable execution, traditional project management tools and techniques should serve you well.

If your projects look more like the items on the right-hand side, you are in the knowledge worker domain. You should probably move from industrial project management approaches and adopt knowledge worker ones. If you see elements from each column, you are in a hybrid environment and likely need to draw on a combination of approaches (hybrid) to be successful.

Drucker explained that many of our project management approaches are based on industrial-era work. They use concepts inspired by Fredrick Taylors Scientific Management approach that work well on large, complex, but defined projects.

Techniques like the progressive decomposition of work and detailed scheduling of tasks allows complex projects to be planned and managed. Techniques like work breakdown structures, network diagrams, and Gantt charts were taught to project managers to tame and track engineering work.

These techniques work well for tangible, stable and mostly predictable projects. As long as an organization has a history of building a similar product, then the gap to a new design or bigger scale can be reasonably estimated and planned for.



The Rise of Agile

Yet, difficulties occur when we try to use traditional approaches on intangible, unfamiliar, and new environments. Differences in understanding frequently occur when we lack physical reference points such as “I want a wooden door like this one, but a foot taller”. These differences result in more change requests, more reported defects, more uncertainties and risks.

In novel, intangible environments like software development, marketing or filmmaking things rarely progress predictably enough to follow the “Plan the work, work the plan” mantra of industrial projects. New technology evolution accelerates the rates of change. Demands to deliver faster worsen the situation.

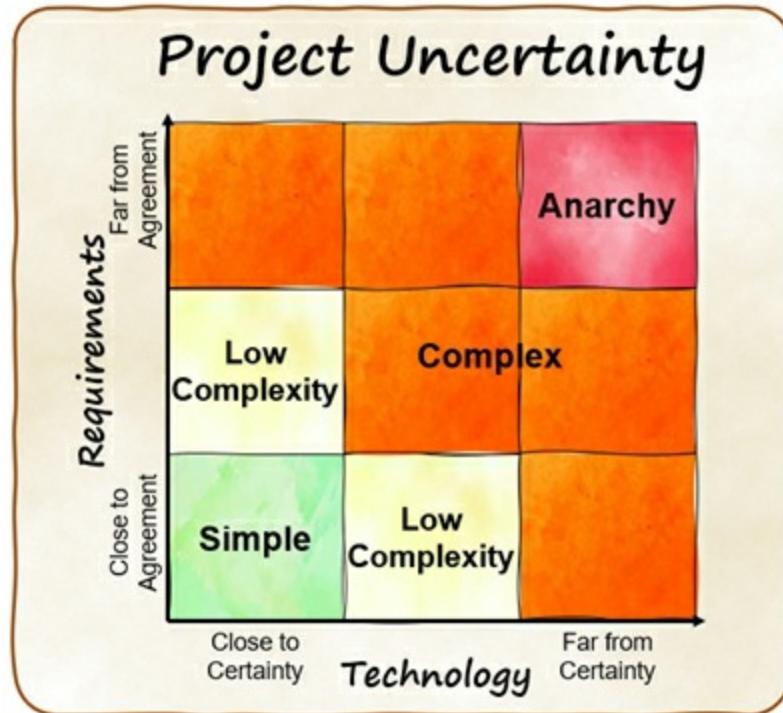
This leaves a higher proportion of new projects developing largely invisible, intangible, difficult to reference, products and services – knowledge work.

Obviously, not all project work has changed. Just as we still have farmers, we still have traditional industry and industrial projects. However, the fastest growing segment of work has changed. The increasing role of software in business also means a larger proportion of projects have at least some knowledge work component. So many industrial projects have a hybrid element.



Project Uncertainty

Project uncertainty occurs in multiple dimensions. There may be uncertainty around What exactly we are building (requirements uncertainty), or How is the best way to undertake it (technology uncertainty). A popular tool used for discussing these two dimensions is the Stacey Matrix, shown below.



Here we see Technology uncertainty on the X-axis, ranging from low uncertainty (we are close to certain about how to execute) all the way up to being far from certain. On the Y-axis we have Requirements uncertainty, again ranging from low uncertainty up to high.

The bottom-left, green square shows a simple project. It has low technology uncertainty and low requirements uncertainty. Building with familiar tools and techniques to a stable specification would be ranked in the green, “Simple” domain, using the Stacey Matrix.

Even large projects that are complicated by thousands of tasks may be tagged as “Simple” – according to this matrix. When uncertainty is low, it is safe and possible to create relatively stable upfront plans. Things may still change, but the rate of change will likely be manageable. Projects in this area are well served by Traditional/predictive life cycles.

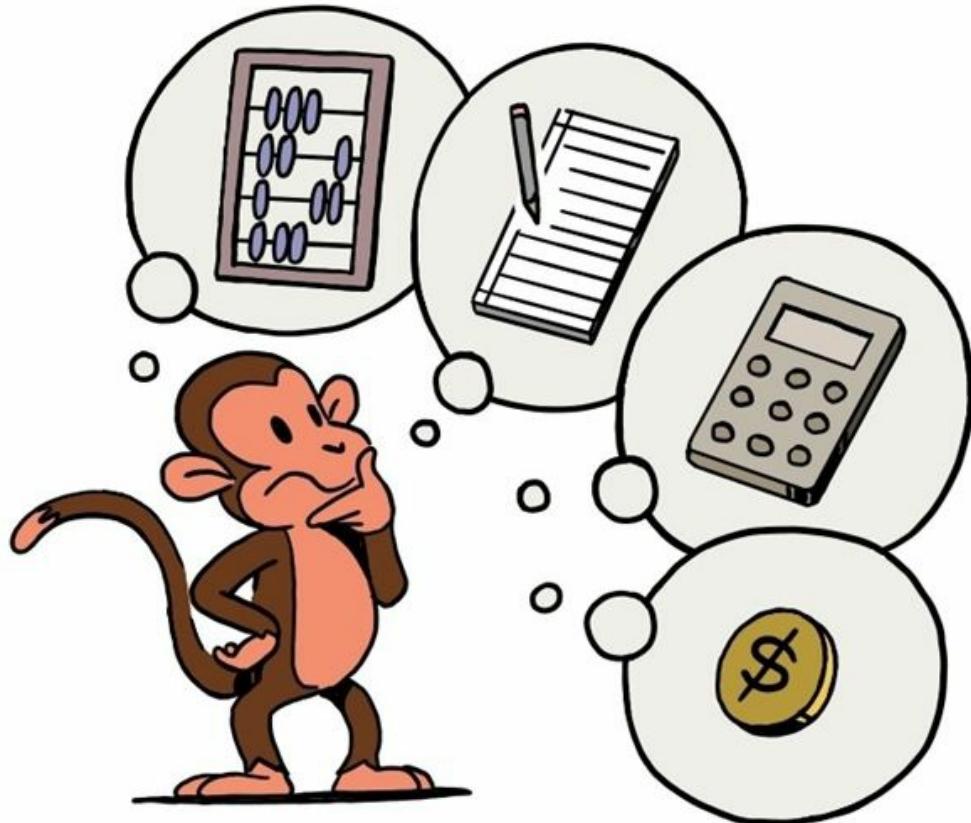
In contrast, up in the top-right, projects with very high levels of uncertainty into what we are doing and how to accomplish it, are in the “Anarchy” zone. No process or life cycle will handle it well, actions need to be taken to reduce one or both of the sources of uncertainty.

In between “Simple” and “Anarchy” lies the land of “Complex” projects. They may be “Low

Complexity” all the way up to almost Anarchy. This region is well served by iterative, incremental and agile life cycles. This is because they feature frequent feedback loops and adaptation of approach and process. They try something, evaluate it, carry on if it works and adapt if it does not. Using flexible plans such as easily reprioritized backlogs of work many mid-course adjustments are accommodated.

2.13.2 Recommend Project Execution Strategy

Recommend Project Execution Strategy (e.g., contracting, finance.)

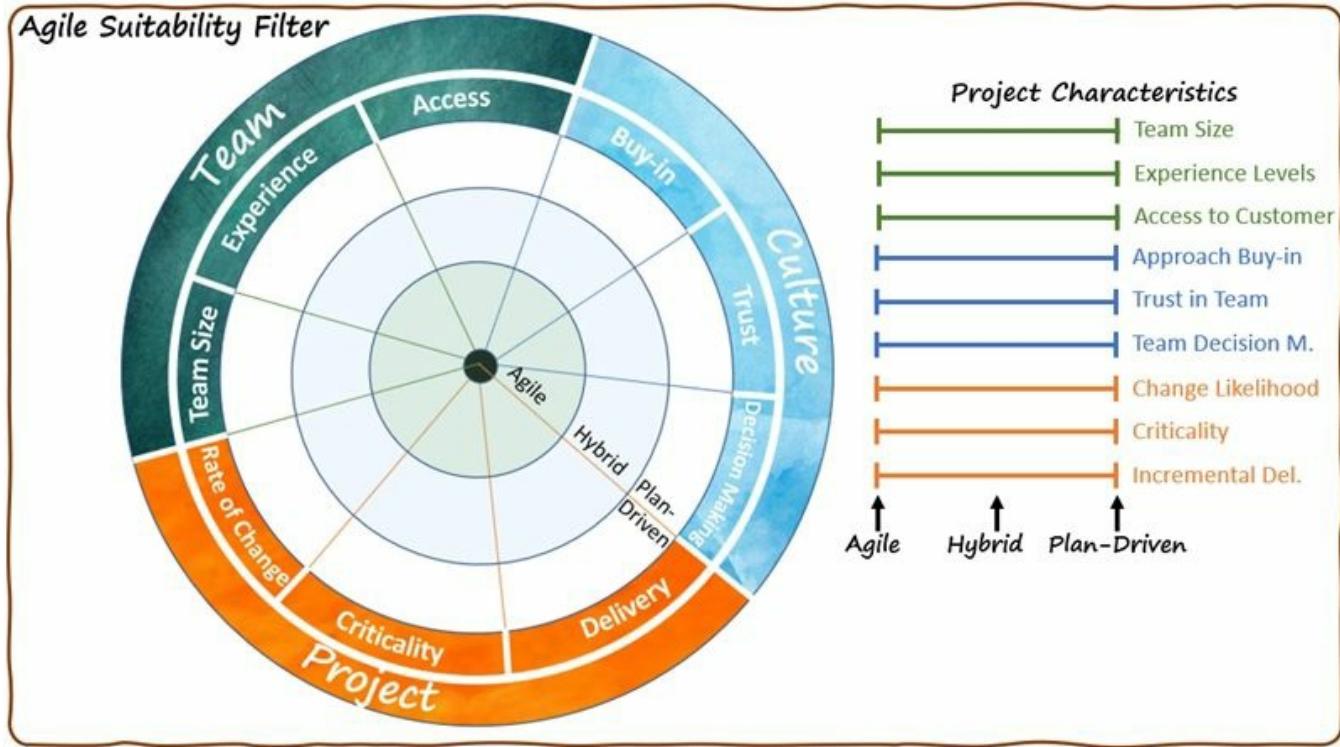


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(Assess how the project will be governed, funded, reviewed and measured)

Other factors that need to be considered when selecting a project life cycle include governance, culture, and team characteristics. The Agile Practice Guide that was bundled with the PMBOK Guide 6th Edition, contains an appendix on Agile Suitability Filter tools. These tools help assess which lifecycles are most appropriate given various circumstances.

The agile suitability filter tool in the Agile Practice Guide assesses factors such as the nature of the work being undertaken, the likelihood of changes, team access to business subject matter experts, organizational trust and buy-in, etc. Using a radar chart to plot a series of scores ranging from ideal-for-agile to ideal-for-predictive, the tool outputs a visual summary of fits and gaps for critical stakeholder discussion.

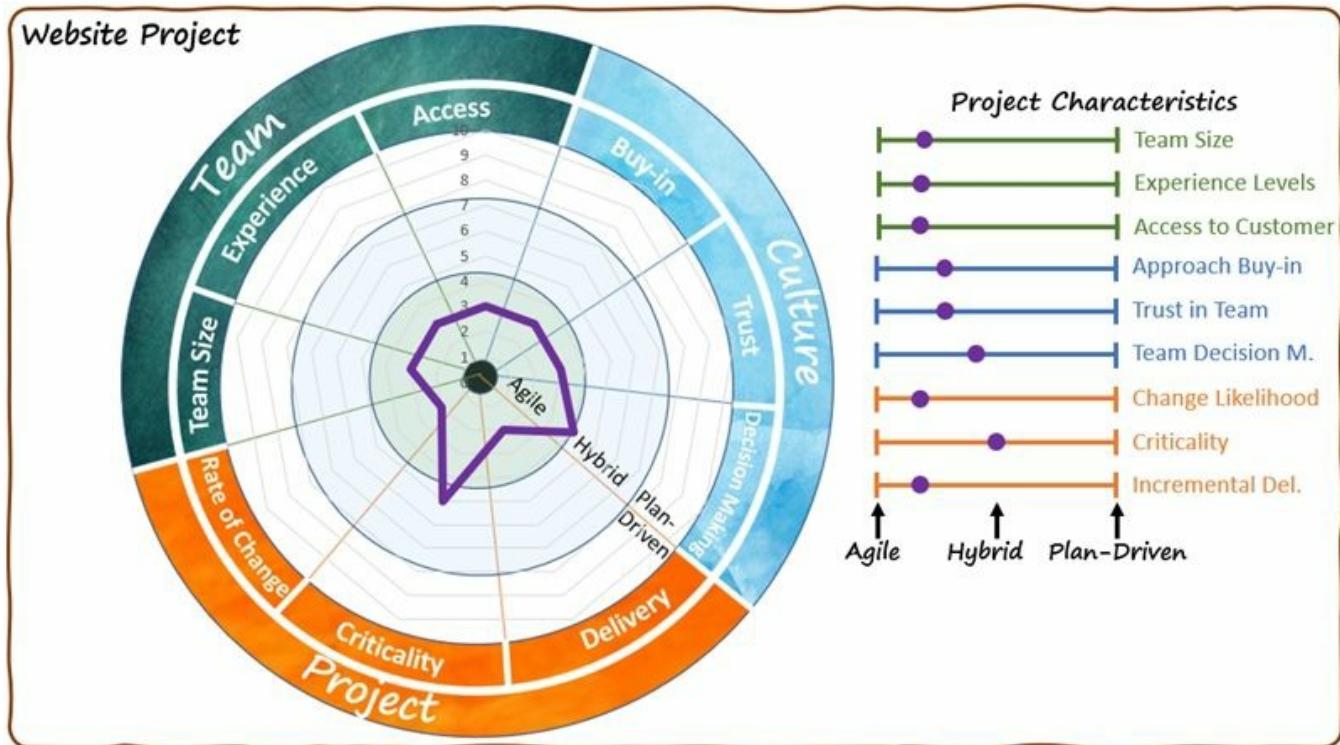


The image above shows a blank Agile Suitability Filter assessment sheet. It contains segments for Team characteristics, organizational Culture, and Project characteristics. Each segment contains three sub-categories measuring elements such as, in the Team segment, the team size, agile experience and access to business or customer representatives.

The radar chart is completed by answering questions about each of the 9 sub-domain topics. The questions are scored on a continuum from a good fit for agile to better suited for a plan-driven approach. Scores in the middle indicate a hybrid approach should be considered. In the image above, these continuums are depicted by the bars on the right-hand side of the radar chart.

The example shown below depicts possible scores for a website project.

Website Project

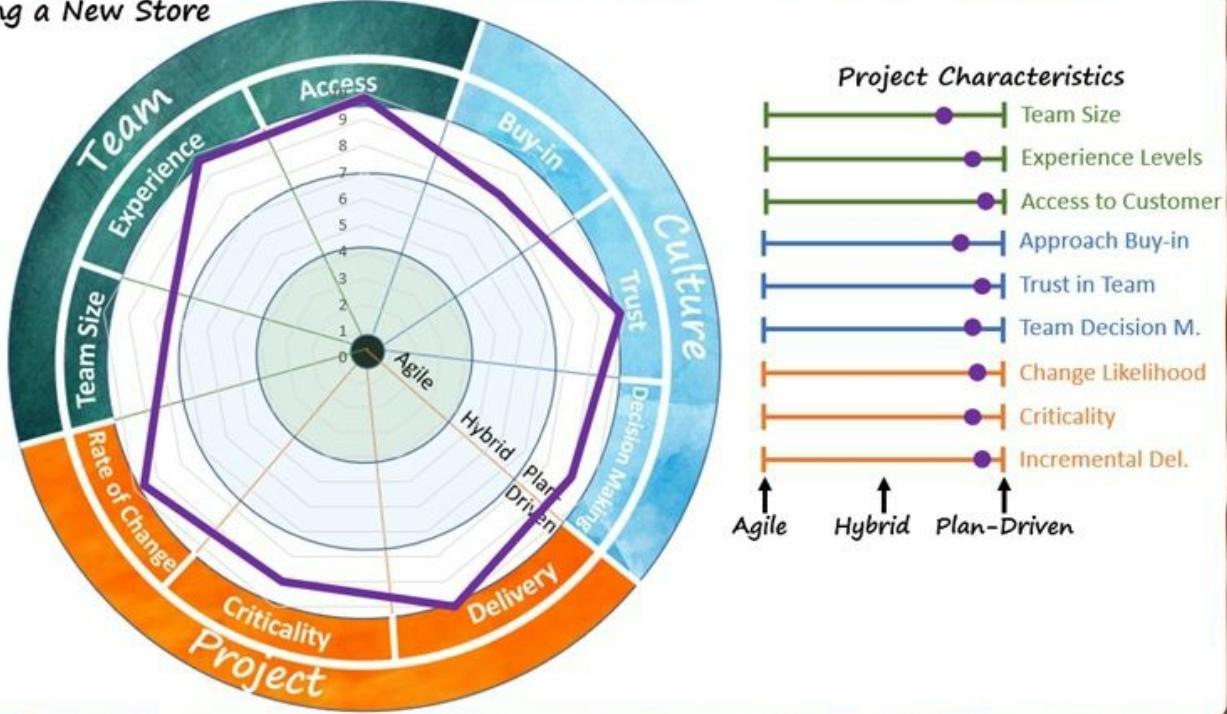


In this website project example, the scores are clustered around the centre of the chart. This indicates the project is likely suitable for an agile approach.

The Project/Criticality score is in the Hybrid zone, indicating what is at stake might be higher than the validation/verification and documentation levels normally associated with agile approaches. This does not indicate that an agile approach cannot be used, instead perhaps additional rigor and checks-and-balances might be warranted.

The example shown below depicts the scores for building a new big-box super-store and getting it ready for opening.

Building a New Store



In this example, the scores are all in the plan-driven zone. This indicates the project is likely a good fit for using a traditional, plan-driven approach.

Agile suitability filters are not definitive, instead they are just one tool that can be used to help have meaningful conversations with the interested stakeholders about approach selection. The radar chart creates a visual that people can focus on and hopefully have objective discussions around. There may be other factors such as regulatory standards or sponsor direction that over-rule the approach suggested.

“A good tool improves the way you work. A great tool improves the way you think.” - Jeff Duntemann

The example plots above were clear-cut examples firmly in the agile and plan-driven domains. In practice, we often find spikes and lopsided plots that point to hybrid solutions.

2.13.3 Recommend a Project Methodology/Approach

Recommend a project methodology/approach (i.e., predictive, hybrid, agile)



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(Choose which approach “horse” you want to ride)

Once we have assessed the work type, project details, organizational culture, and team dynamics plus discussed all these elements with the relevant stakeholders it is time to decide.

Based on the assessments performed, expert judgment and stakeholder discussions a recommendation for the most appropriate approach should be made. The final decision may reside with the project manager, PMO, sponsor or even the team, this will vary from organization to organization. Once made, we still have some degrees of freedom, as outlined in the next section.

2.13.4 Use Iterative, Incremental Practices Throughout the Project Life Cycle

Use iterative, incremental practices throughout the project life cycle (e.g., lessons learned, stakeholder engagement, risk.)



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(Build, review, communicate and learn incrementally throughout the project)

Even if we are following a single-pass, plan-driven traditional approach, some things are progressively elaborated. This means we revisit and refine them as new information emerges. The concepts of progressive elaboration and rolling wave planning have been present in traditional, predictive project management guidance long before agile approaches became popular.



Event Cadence

Agile approaches create a regular schedule for reviewing, communicating and learning. By having short cycles for build, demo, review and reflect on progress the cadence and visibility of these activities is baked into the DNA of the project lifecycle. However, there is nothing to stop regular reviews, communications, and learning being scheduled on traditional or hybrid approach projects either.

Project managers using any life cycle can schedule regular inspect, review and improve events. They can also schedule demonstrations, proof of concepts and stakeholder feedback events. Just because the regular cadence of these events are not part of the life cycle should not prevent them being added if they would be valuable. (Tip - they are usually valuable.)



Scheduling regular team recognition events and celebrations help sustain enthusiasm and build momentum for pushing through or around roadblocks and obstacles. Saving project celebrations until the project is over and successfully delivered is a beginner-PM mistake. Yes, have one then too, but find ways to frequently recognize contributions and show appreciation. It does not show you are weak, it shows you are paying attention.

“Ceremonies, celebrations, and rituals are not about the event. They’re about touching the hearts and souls of every employee.” Victoria Sandvig, Charles Schwab



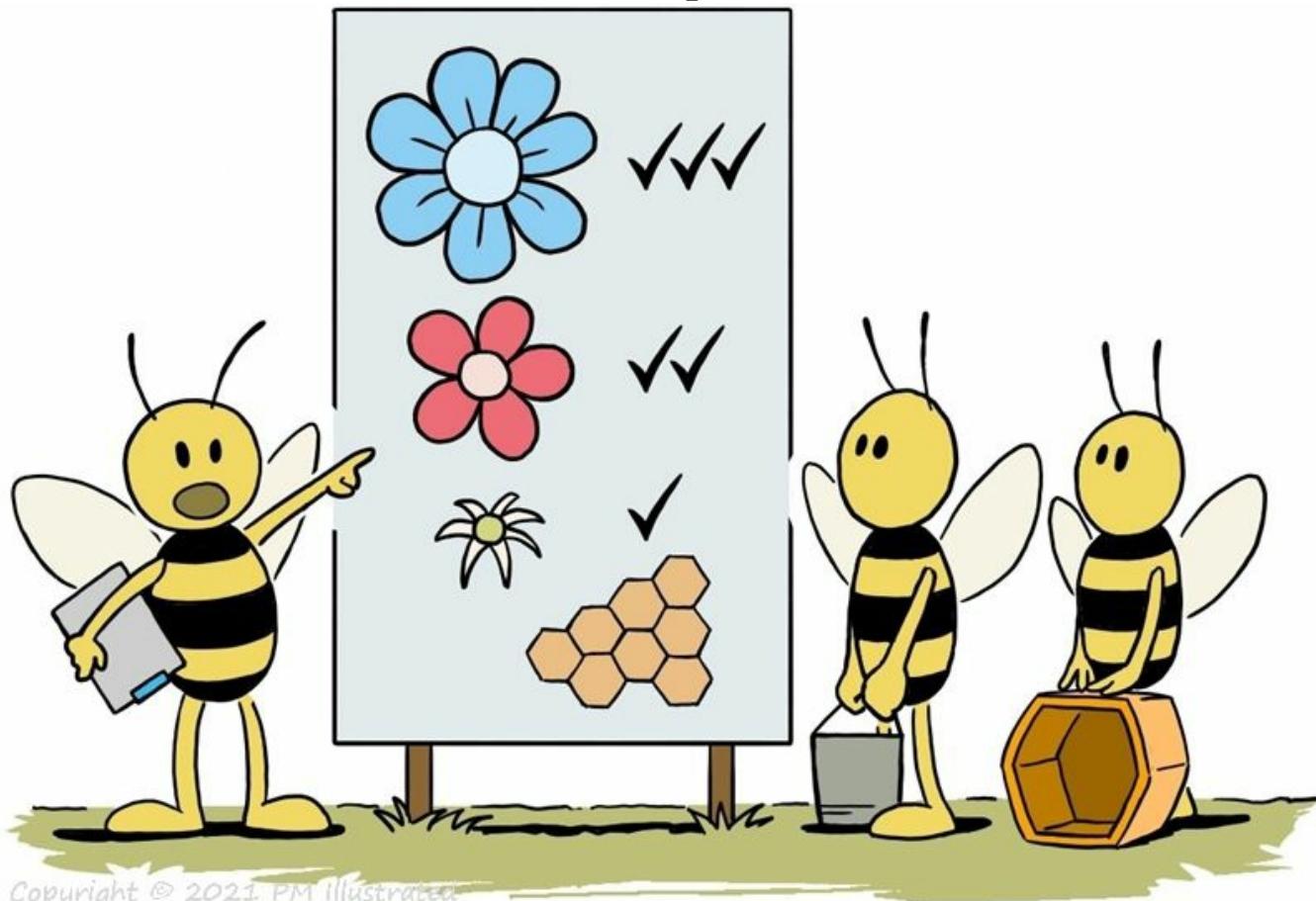
On traditional projects, phase gates provide review points for assessing progress. There is nothing to stop us scheduling interim, internal reviews where we meet with the team to review progress and suggestions for improvements. It is normal to capture lessons learned at the end of the project, but there is no need to delay improvement ideas until then. Just as we communicate frequently throughout the project, so should we learn and improve also.

2.8 Plan and Manage Scope

Scope – everything we agree to address in the project.

This task, “Plan and Manage Scope,” is integral to all the following planning, executing, controlling and tracking activities. We need to understand what is in scope for the project and, just as importantly, what is out of scope to correctly plan, estimate and schedule the work.

2.8.1 Determine and Prioritize Requirements



(Understand the scope of what we are trying to do, along with priorities)

Two plans that are used to define and explain how the project scope will be tracked and managed are:

- **Scope Management Plan** – How the overall scope will be specified and managed. This defines the boundaries of what is in scope and out of scope and how we will oversee this scope.
- **Requirements Management Plan** – How the individual scope elements, the requirements declared as in scope will be analyzed, documented and managed.



Scope Management Plan - A sub-section of the project management plan that describes how the scope will be described, built, monitored, controlled, and validated. Think of this as the boundary or perimeter of the project. Everything inside we will do; everything outside we will not.

The Scope Management Plan describes the wall around our garden and how things get in and out. What is inside are our requirements.



Project Requirement - The agreed capabilities of a product, service, or outcome that the project is designed to provide or satisfy. I.E., The things we are on the hook for creating or doing.



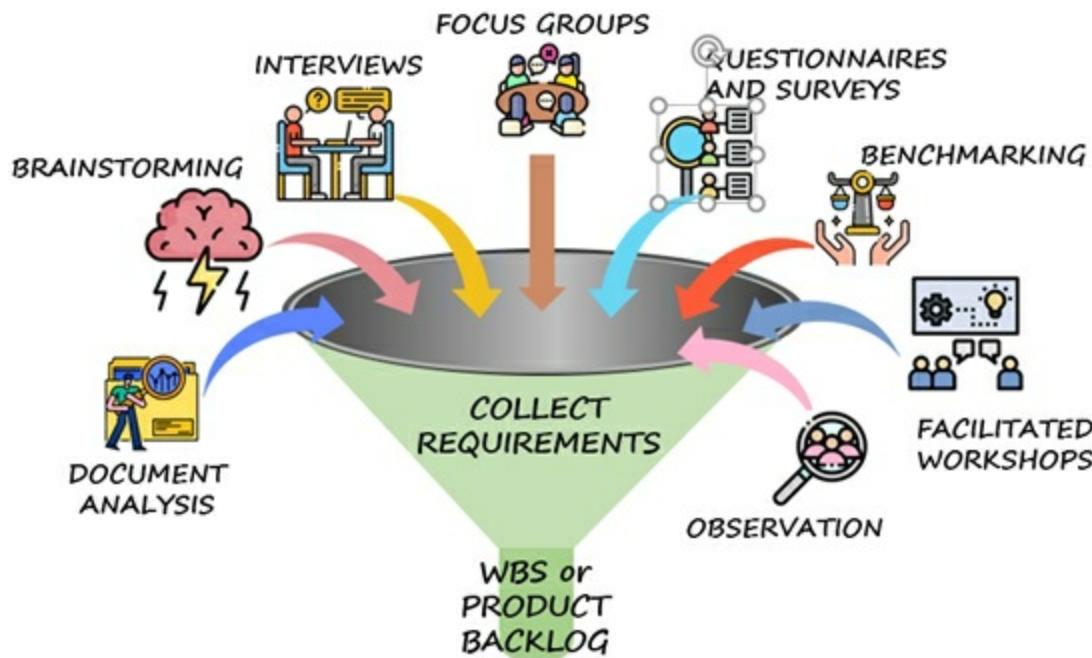
Requirements Management Plan - another sub-section of the project management plan that describes how the project and product requirements agreed as in-scope will be analyzed, documented, and managed. It may also include a description of the requirements configuration management, prioritization processes and traceability matrix.



Collect Requirements

There are several ways to identify and capture requirements. Some of the popular ones are shown below:

REQUIREMENTS GATHERING



Let's briefly review each approach:



Document Analysis – Gathering project requirements from evaluating current documentation. These documents include business plans, product descriptions, other marketing materials, strategy documents, process diagrams, competitor product documentation.



Brainstorming – A technique to generate and collect multiple ideas related to product or project requirements.



Focus Groups – bringing together prequalified stakeholders and subject matter experts to learn about their ideas and expectations for a product or service.



Questionnaires and surveys – Written sets of questions designed to quickly gather information from a large number of respondents. They can be handy when a quick turnaround is needed or to make statistical analysis more straightforward.



Interviews – Talk directly to stakeholders and ask them what they want or need from a project. They can be conducted one-to-one or in group settings.



Benchmarking – Comparing actual or planned products, processes, services and practices to those from other organizations to get ideas for improvement or requirements. “We benchmarked the features of other project management tools to see what our product features should contain.”



Facilitated Workshops – combining some elements of focus groups, brainstorming and interviews, these facilitated sessions to elicit candidate features from stakeholder groups. They are also used by some agile approaches to generate the initial product backlog.



Observation – Watching and listening to gain knowledge of a specific job role, task, or function to understand and determine project requirements.



Agile approaches emphasize a customer-centric view of requirements gathering. The product owner is usually recruited from the business, not the group doing the product

development, to ensure that customer requirements drive the project prioritization. Engaging customer representatives throughout the project at demonstrations also help ensure customer requirements are kept in focus.

Analyzing and Understanding Requirements

It is not enough to collect requirements; teams need to analyze and understand them too. This is achieved through techniques such as creating context diagrams, storyboards and prototypes.

Requirements Traceability Matrix

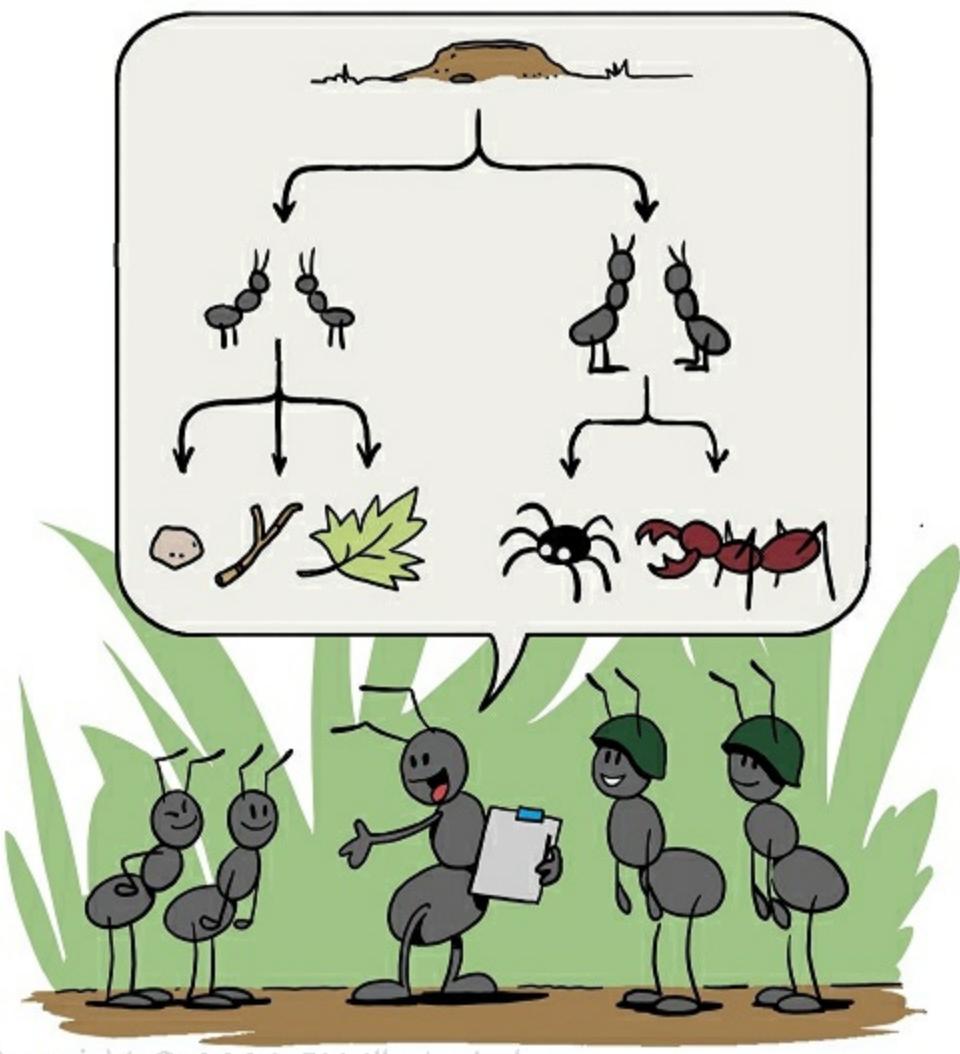
Requirements traceability is the ability to connect requirements to other artifacts, such as tests or defect reports. A Requirements Traceability Matrix (RTM) is used to track requirements and document that they have been fulfilled.

Pig Food Vending Machine - Requirements Traceability Matrix						
BRD- Section	FSD- Section	Test scenario ID		Test case ID	Status	Defects
1- Accept Payment	1.1 Coins	TS_Accept_001_Accept \$1 in any combination of valid coins		TC_coin\$1_01	Passed	
				TC_coin25c_02	Passed	
				TC_coin10c_03	Passed	
				TC_coin5c_04	Passed	
				TC_coin1c_05	Failed	Defect_01
	1.2- Credit Cards	TS_Accept_002_Accept \$1 from credit card		TC_CC_Visa_01	Passed	
				TC_CC_Amex_02	Passed	
				TC_CC_MasterC_0	Passed	
				TC_CC_Debit_04	Failed	Defect_02, Defect_03
2-Dispense Food	2.1- Ease of use	TS_Dispatch_01 One portion of "Squeaky Treats" is dispensed		TC_EasyUse_01	Passed	
				TC_EasyUse_02	Passed	
				TC_EasyUse_03	Passed	



Unless otherwise mentioned, assume determining the requirements is part of project. So, don't assume the project starts with requirements defined, instead they need to be defined.

2.8.2. Break Down Scope (e.g., WBS, backlog)



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(Break down the scope of work into manageable chunks)

After capturing the requirements, we need to break them down to the appropriate level of detail. This helps show dependencies and allows for activities such as estimation and scheduling. Traditional, plan-driven projects use work breakdown structures to manage work items. Agile and hybrid approaches use backlogs. We will examine each in turn.

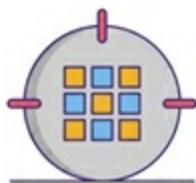
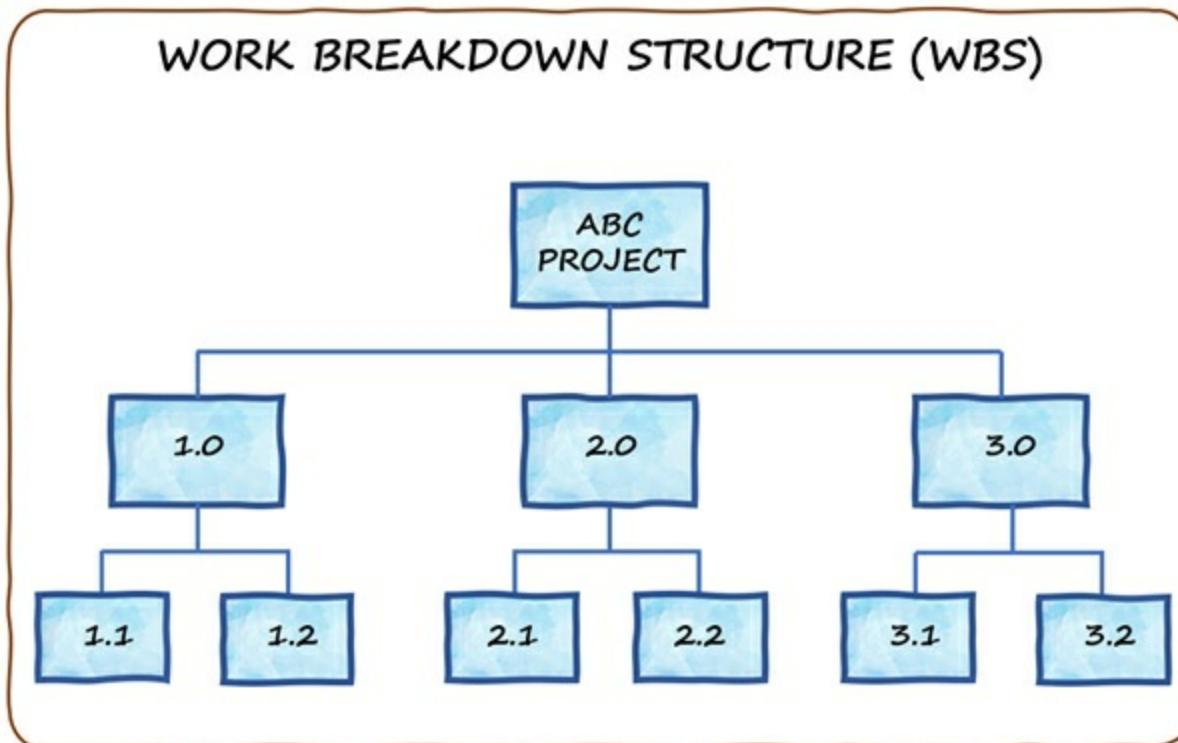


Traditional, plan-driven projects attempt to capture all the project scope in advance. Then break it down into granular elements for analysis, estimation and scheduling. The mindset is “Plan the work, work the plan.” This works great for projects that are primarily knowable in advance. However, for project environments with high rates of change and uncertainty, agile and hybrid approaches offer alternative structures.



Work Breakdown Structure (WBS)

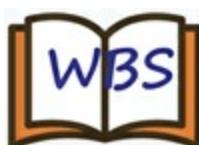
The WBS is a hierarchical decomposition of the project team's scope of work to accomplish the project objectives and create the required deliverables. The WBS organizes and defines the total scope of the project. It also shows the work in the currently approved project scope statement.



Decomposition

Decomposition is the process of dividing the project scope and deliverables into smaller, more manageable parts. A work package is the work defined at the lowest level of the WBS for which cost, and duration can be estimated and managed. These are also the lowest level of the WBS with a unique identifier.

The level of decomposition is often based on the degree of control needed to manage the project. So, the level of detail for work packages varies with the size and complexity of the project.



WBS Dictionary

A WBS dictionary is a document that lists the deliverable, activity, and scheduling information about each component in the WBS. It contains details about the task, such as:

- A description of the work
- Cost estimations
- Quality requirements
- Acceptance criteria
- Any assumptions and constraints
- Schedule milestones
- Associated schedule activities
- People and resources required to complete the work



Control Accounts

Organizations tracking performance with earned value can use control accounts to help track actuals to planned values. A control point where the scope, budget, actual cost, and schedule information is integrated and compared to earned value for performance measurement.

Items being tracked this way are identified via a numbering system called a **code of accounts**.

ID	BUDGET	ACTUAL COST	SCHEDULE	DATE COMPLETE
1.1	\$65K	\$68K	OCT 2021	OCT 2021
1.2	\$18K	\$15K	NOV 2021	NOV 2021
2.1	\$120K	\$135K	NOV 2021	NOV 2021
2.2	\$30K	\$25K	DEC 2021	-

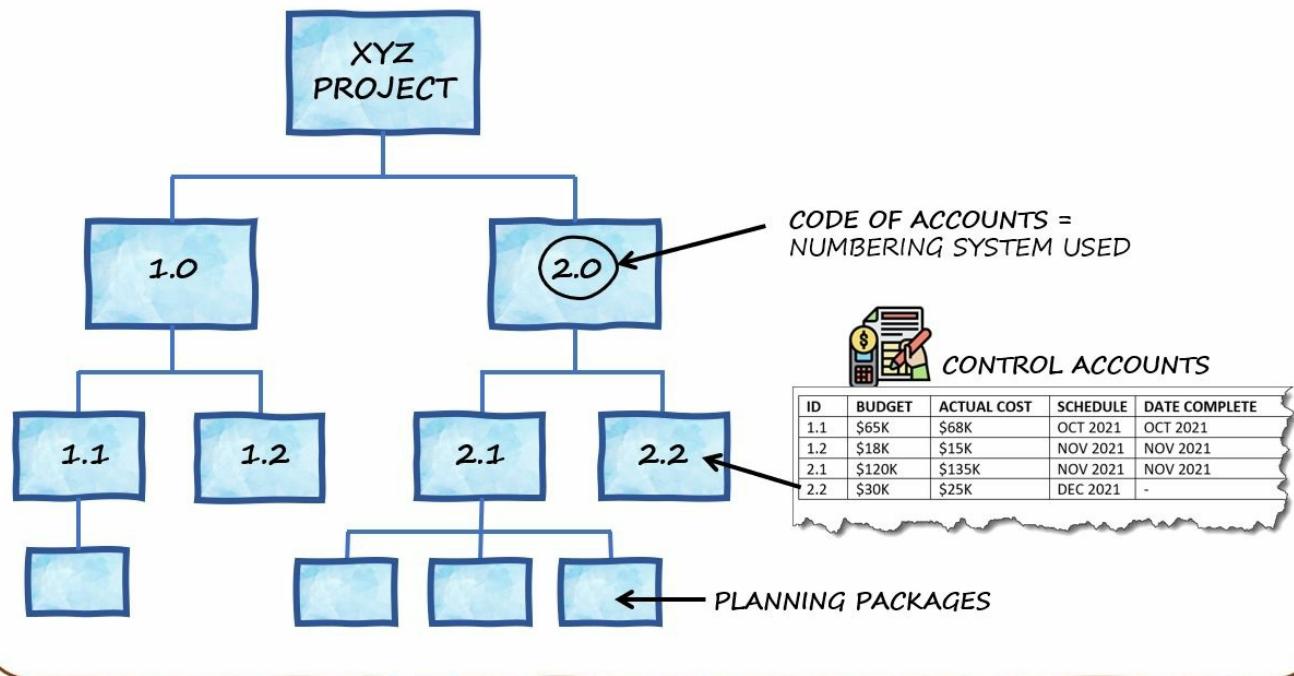


Planning Packages

Planning packages are any WBS elements below the control account level. They contain known work content but are typically not tracked with detailed schedule activities.

Control accounts, the code of accounts numbering system and planning packages are called out on the following image.

WORK BREAKDOWN STRUCTURE - COMPONENTS



Scope Baseline

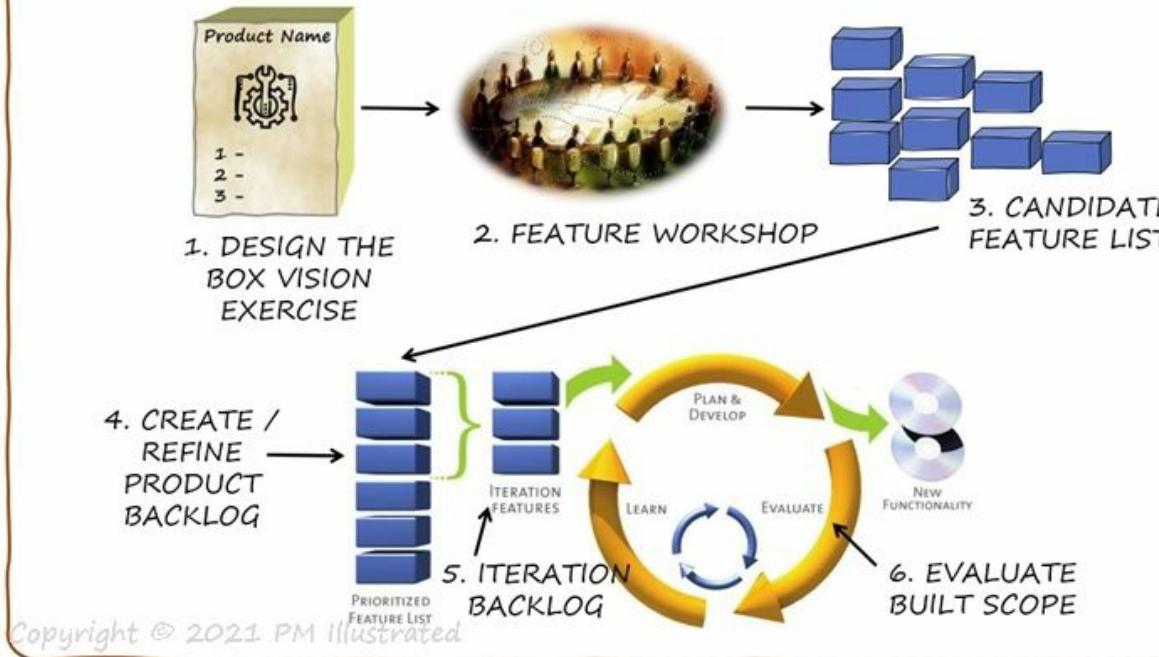
The Scope Baseline is the name given to the approved version of the scope statement, the WBS and its associated WBS dictionary and control accounts. It is used for comparison to actual results to gauge performance and can only be changed through formal change control procedures. (To prevent unscrupulous project managers from changing the baseline plan to make it look like the recent delays were planned all along!)



When there is a lot of uncertainty, complexity or change rates are high, it is not viable to adopt a “Plan the work, work the plan” mindset. Instead, agile approaches build increments of what is known, prioritized and practical right now. Then use evaluations of these increments to steer product development.

For agile projects (and hybrid using agile scope management), the overall scope management process and decomposition of features with projects looks like this.

AGILE SCOPE MANAGEMENT



Of course, projects don't just appear. Before a project is created, scope exploration may start with an idea, business case or need for product, service or enhancement. From there, strategic review, portfolio analysis, feasibility, ROI and other decisions are likely made before deciding to kick-off a project.

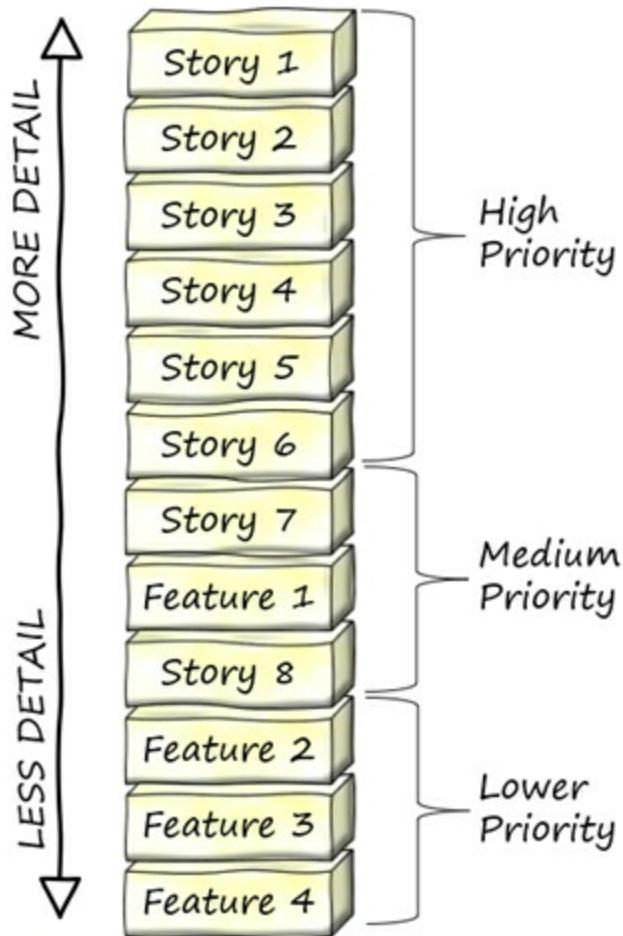
Many agile projects start with visioning work. The “Design a Product Box” 1) is a common way for project stakeholders to explore and refine scope collaboratively. Then, a Feature Workshop 2) may be used to brainstorm and develop a Candidate Feature List 3).

Working with the product owner, a Product Backlog 4) is created to list the agreed scope. The project team refines the selected backlog items to create a Sprint or Iteration Backlog 5). Finally, the increments of delivered scope get tested and evaluated during acceptance testing and the Iteration Demo 6).

Product Backlog

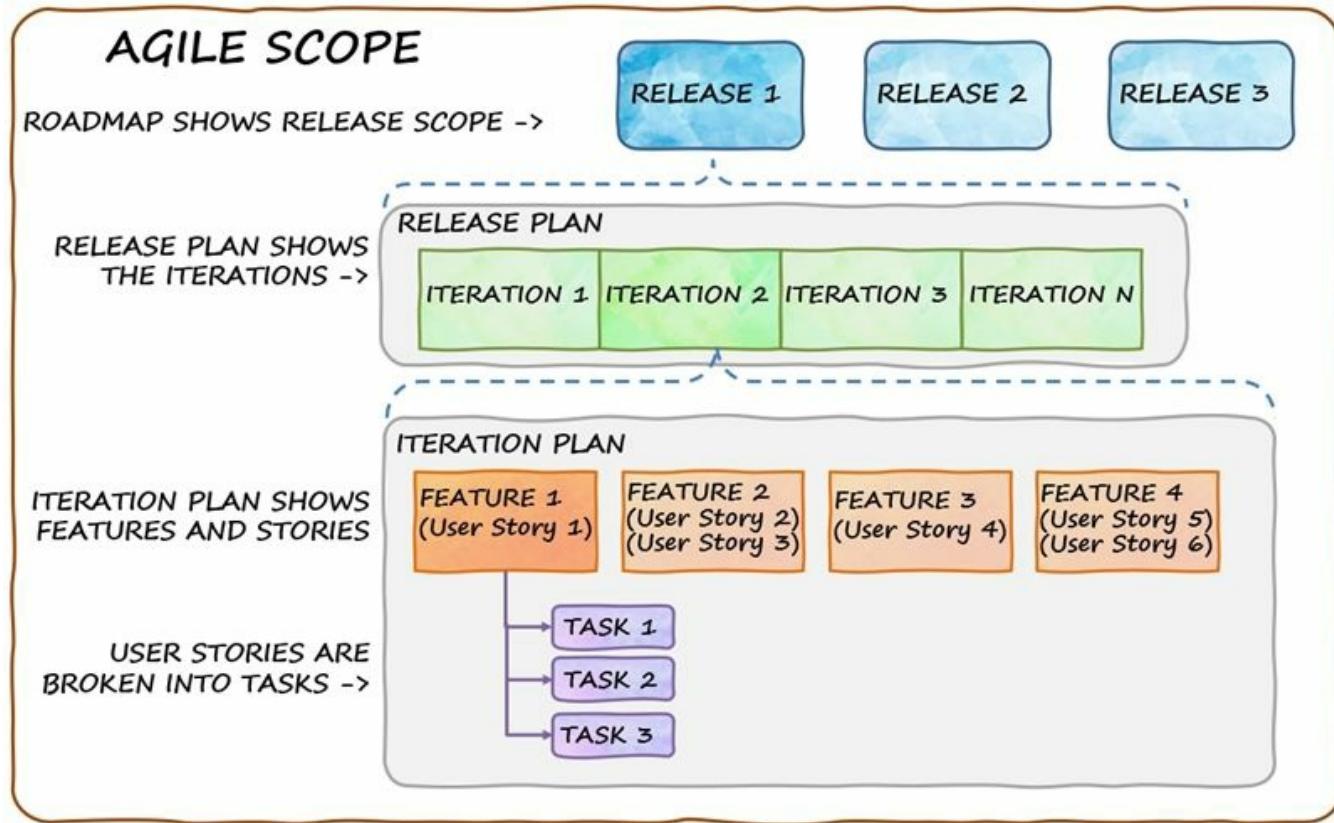
The product backlog is the container for project scope items. In this regard, it is similar to a WBS, but in others, quite different. It is prioritized by business value (and potentially risk), so not all entries are created equally. The items near the top of the backlog will be more detailed and better defined. Items near the bottom (lower priority) will have less detail.

PRODUCT BACKLOG



As the project proceeds, items are taken from the top of the backlog to be worked on, the lower priority items move up and get refined with further analysis. This way, low priority items that may get deferred or displaced by high priority items only get elaborated as they become more likely to get developed.

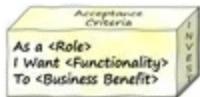
In the backlog diagram above, we see features and user stories. A more complete decomposition of agile scope planning is:



Here we see groupings of scope are batched up into releases. Each release typically comprises several iterations. Iterations deliver features that can be a user story or group of user stories. A user story is the smallest chunk of functionality typically prioritized by the product owner. The development team breaks stories down into technical tasks, but these do not always make sense to the product owner, or deliver any business value independently.



This product backlog hierarchy mimics a WBS structure hierarchy in some ways. It contains a roll-up and decomposition to a level that supports understanding details, estimation and defining acceptance criteria. Much of the WBS dictionary, control accounts and planning package information is contained in the backlog, user story information and acceptance criteria. You can read more about the similarities and differences between WBS and Product backlogs [here](#).



User Stories

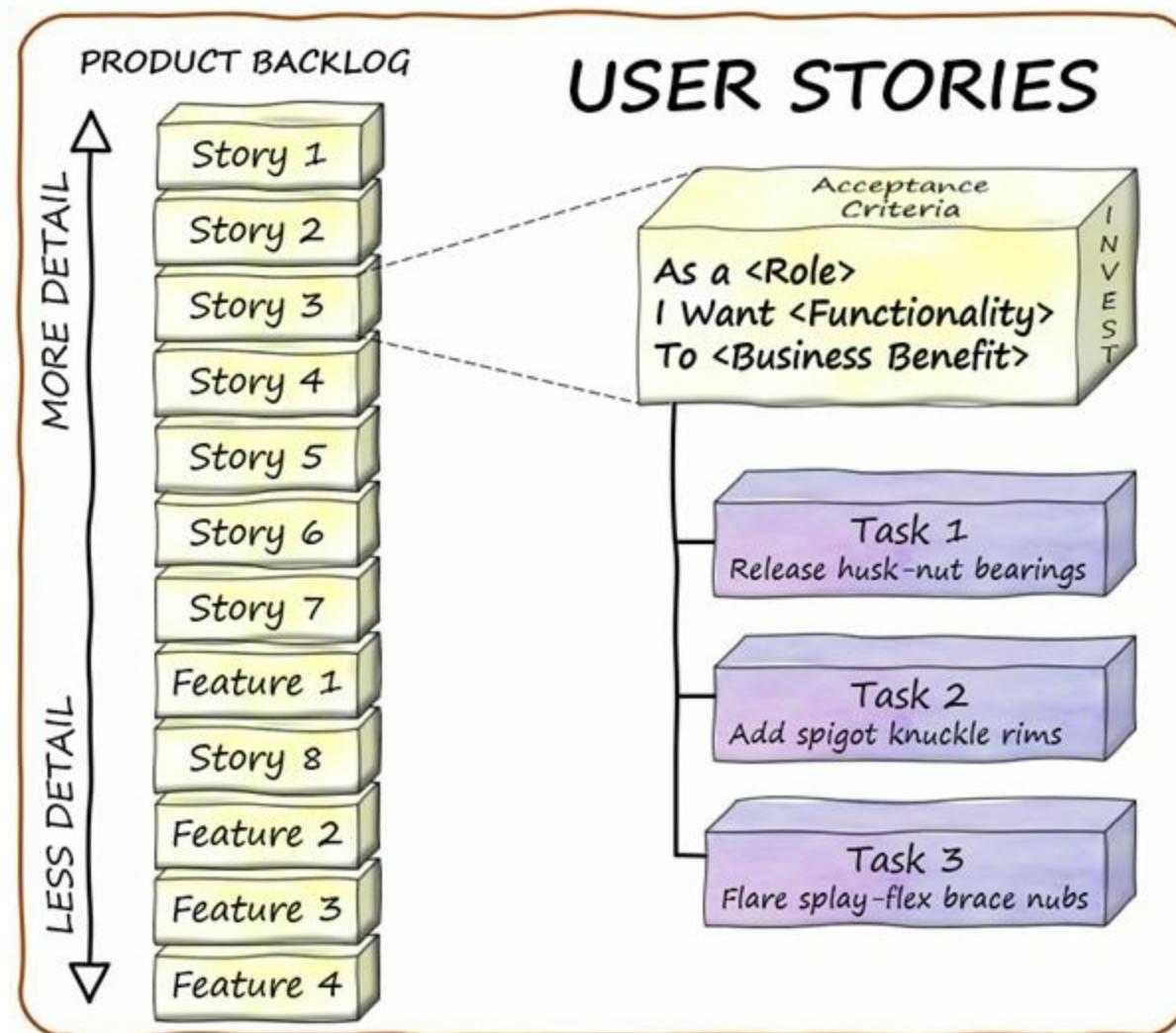
As mentioned, user stories are the central planning unit for agile approaches. As the name suggests, it is a user-focused story or explanation about some desired functionality. Taking a customer-centric view of requirements helps ensure we build products and services that are valuable.

The story components describe who is asking for the feature, what the feature is, and why that is valuable. These components of a story are often contained within the user story pattern:

As a <Role> I want <Functionality> to <Business Benefit>

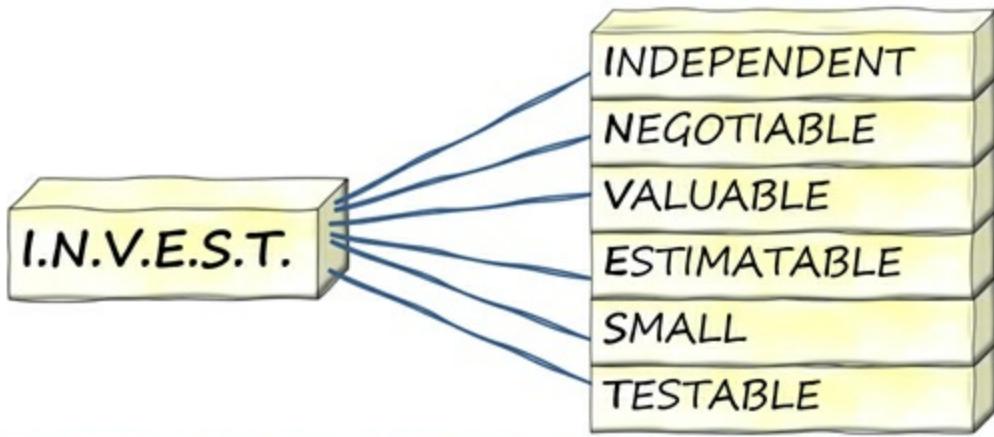
For example, “As a <Video Conferencing user>, I want to <Sign into my video conferencing sessions using facial recognition on my webcam> to <Avoid entering IDs and passwords>

A product backlog made up of user stories and the main components of a user story are shown below:



The “INVEST” mnemonic helps remind teams how to write, structure and develop robust and effective user stories.

INVEST – USER STORY CHARACTERISTICS



I - Independent: Ideally, we want to reprioritize and develop our user stories in any order.

N - Negotiable: The team should discuss stories with the product owner and make trade-offs based on cost and function.

V - Valuable: Why is it important? User stories without clearly understood value will be difficult to prioritize.

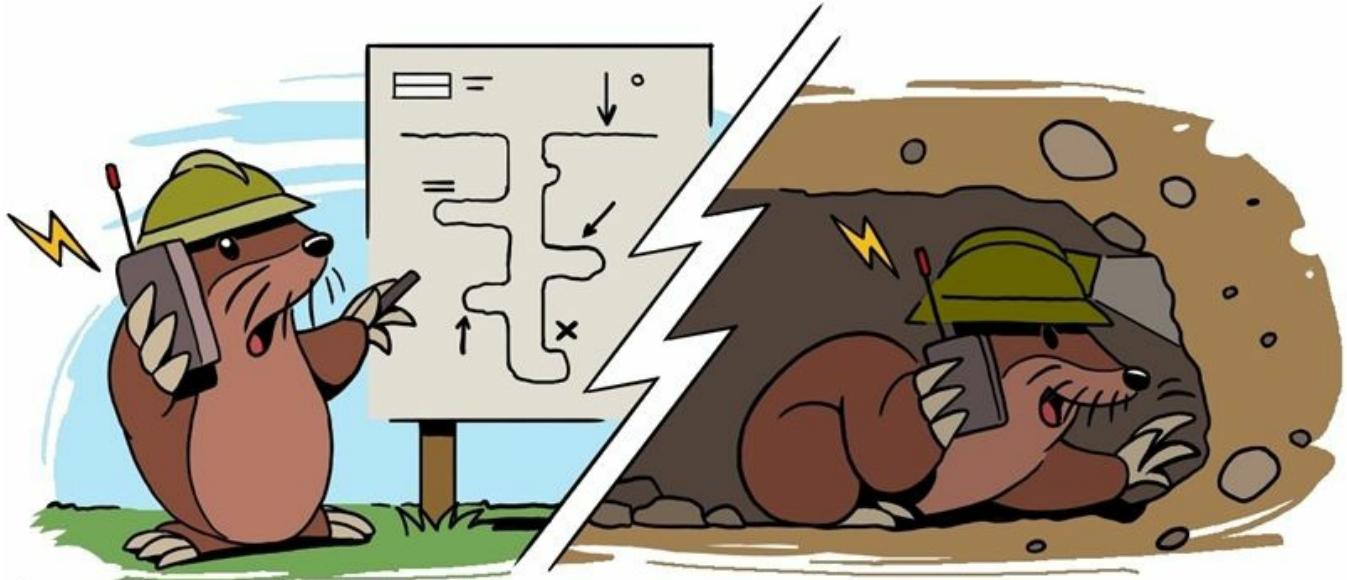
E - Estimatable: Can we estimate it, or is it too large or unknown? Making sure we can estimate a story is an important validation it is understood to a sufficient level.

S – Small: Is it small enough to get done in an iteration? Do we need to split it down? People are poor at estimating large chunks of work and they often hide risks and uncertainty. Making sure user stories are small helps reduce these risks.

T - Testable: Will we be able to test it once it's done? Having testable user stories is essential for tracking progress because agile teams often measure progress based on how many user stories have been successfully accepted.

So, we want small, independent, valuable chunks of work to estimate and test whose functions can be negotiated with the business to find the right level of cost versus performance.

2.8.3 Monitor and Validate Scope



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(Frequently confirm we are heading in the right direction and delivering the right product/service)

As the project executes, we need to make sure we are developing the scope correctly, and it is accepted.



Traditional Projects use a variety of tools and techniques to monitor and confirm scope.



Validate Scope – Actions to review and approve work packages and deliverables meet the acceptance criteria defined in the WBS dictionary. For example, performing quality checks on project outputs and updating the requirements traceability matrix.



If a question mentions “validate scope” this does not mean checking we have gathered all the requirements, instead it is referring to gaining acceptance on what has been built. So, it is more like, get sign-off approval for the items we have built.



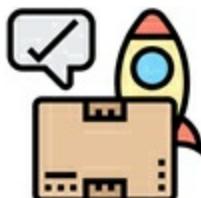
Variance Analysis - A review technique for determining the cause and degree of difference between the baseline and the actual performance. For example, comparing deliverables produced for a period against those listed on the baselined plans for the same period.



Trend Analysis – Looking for trends in data. Using extrapolation or more complex mathematical models to forecast future outcomes based on historical results. For example, predicting if the number of near-miss safety concerns continues, we can expect a safety incident if we do not change on-site behavior.



Agile approaches use the above techniques too, but place more emphasis on the following agile focused tools and techniques:



Definition of Ready – This is the team's checklist for ensuring user stories have all the required information needed for the team to begin working on it.

Examples software development team's Definition of Ready might include:

- **Form:** A well-defined user story conforming to the INVEST properties
- **Testable:** The user story acceptance criteria has been defined
- **Reasonable Size:** Estimated by the delivery team and deemed within the team's capacity
- **Ownership:** The person who will accept the user story is identified
- **Real:** The team will be able to 'demo' the user story



Definition of Done - A team's checklist for ensuring user stories have

completed all the necessary steps for it to be truly counted as “Done.”

Examples of a software development team’s Definition of Done might include:

- **Tested:** Are all unit, integration, and customer tests finished?
- **Coded:** Has all code been written?
- **Designed:** Has the code been refactored to the team's standards and satisfaction?
- **Integrated:** Does the user story work from end to end and fit into the rest of the software?
- **Builds:** Does the build script include any new modules?
- **Reviewed:** Have customers reviewed the user story and confirmed that it meets their expectations?
- **Fixed:** Have all known bugs been fixed or scheduled as their own user stories?
- **Accepted:** Do customers agree that the user story is finished?



Acceptance Criteria - The set of conditions that are required to be met before deliverables are accepted. In plan-driven projects, acceptance criteria is often recorded in the WBS dictionary. For agile approaches, acceptance criteria is often stored directly in the user story.

Formats such as “**Given <Condition>, When <Action>, Then <Correct Outcome>**” are sometimes used to capture acceptance criteria. This structure mirrors the “**As a <Role>, I Want <Functionality>, To <Business Benefit>**” template used to capture user stories.

So, for our earlier example of: “As a <Video Conferencing user>, I want to <Sign into my video conferencing sessions using facial recognition on my webcam> to <Avoid entering IDs and passwords>” we could create some Given, When Then acceptance criteria, such as:

Given <User not signed in and app looking to authenticate>,
When <Approved users face is recognized by the camera >,
Then <Login with that user's credentials>

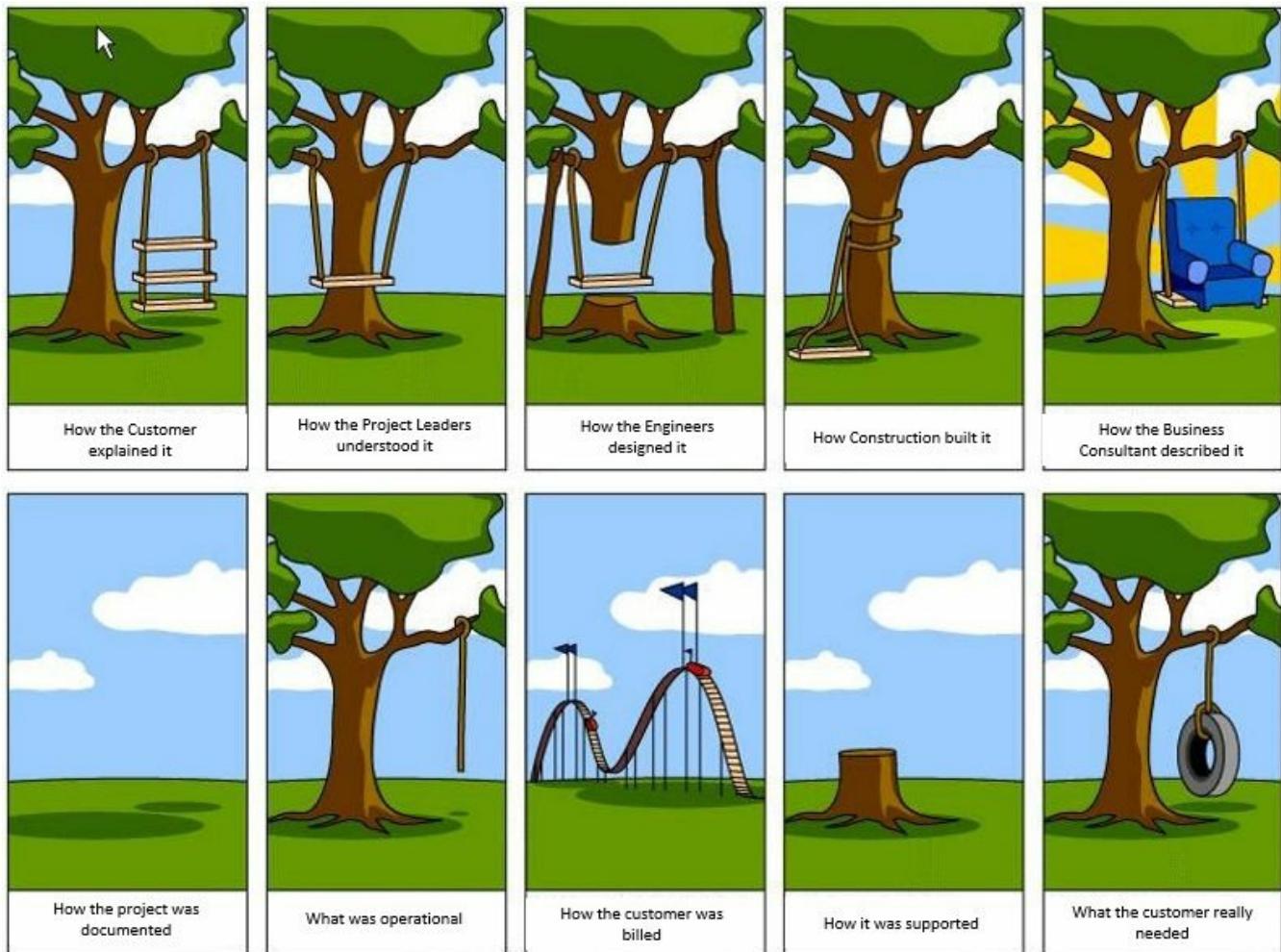
(Back in the day when user stories were written on cards. The front of the card would have the “As a <Role>, I Want <Functionality>, To <Benefit>” and the back of the card would have a list of “Given <>, When <>, Then <>” acceptance tests. These days these details are stored in agile project management tools.)



Iteration Reviews – At the end of every iteration, the team demonstrates the functionality built in that timebox. These iteration reviews (Sprint demos) allow the business and other stakeholders to see how the project scope and delivery are progressing. They act as frequent

checkpoints to validate scope and flush out any misunderstandings.

Variations of the swing cartoon have been used for over 30 years to describe common mismatches in stakeholder understandings.



A solution for the problems characterized in the swing cartoon is frequent review and verification of product increments.

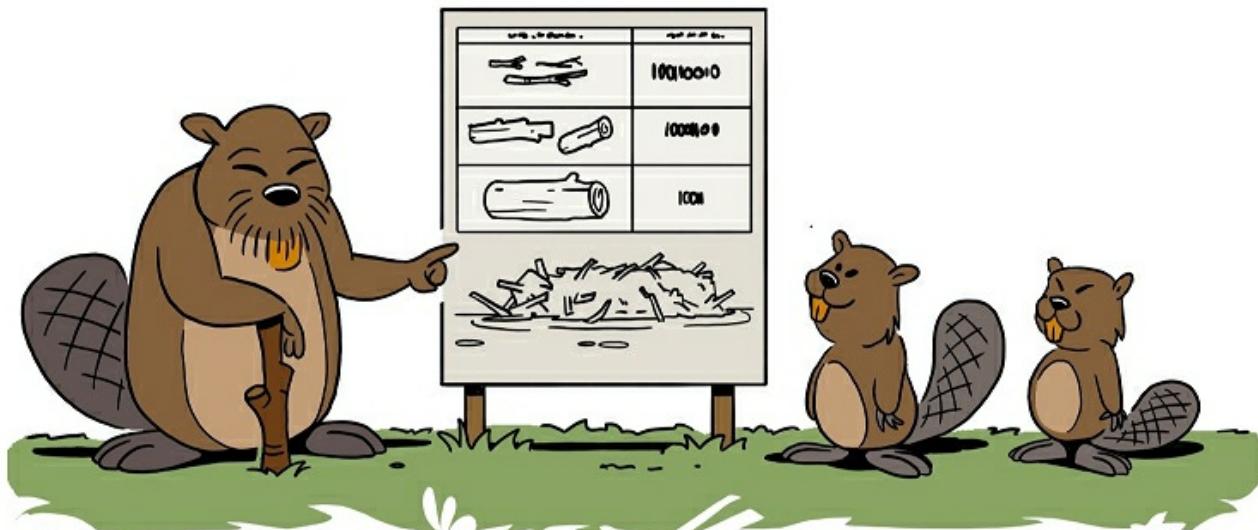
This is what we get from the Sprint demos (iteration reviews). Instead of a nasty surprise at the end of the project, we see the ongoing progress. This progress might be frustratingly slow or potentially in the wrong direction, but it only represents one iteration's worth of work. These reviews provide opportunities to intervene if what is being developed diverges from what is required.

2.5 Plan and Manage Budget and Resources

This task deals with planning the budget and resources we will need to complete a project. It covers topics such as estimating, creating an overall project budget that contains contingency reserves to handle unknowns, and monitoring budget and resource needs.

2.5.1 Estimate Budgetary Needs

Estimate budgetary needs based on the scope of the project and the lessons learned from past projects.



(Estimate based on scope and lessons learned)

Anyone who has renovated a home, raised children, or even budgeted for a vacation will know that costs can come from many areas and add up quickly. As project managers, we are expected to anticipate these costs and generate as realistic as possible estimates and budgets.



Cost estimates

Developing cost estimates involves developing an approximation of the cost for each activity and required element in a project. Costs include:

COST CATEGORIES

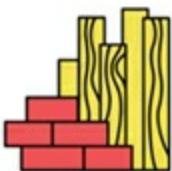


Costs such as labor and materials are classified as **direct costs**. This is because they are costs incurred only because we started the project. However, other costs such as facilities (the shared costs for buildings), services, IT equipment, etc are **indirect costs** that may also be passed on to the project by prior agreement.

Project managers need to be clear on which costs will be charged to the project when creating estimates.



Direct labor – The cost of people's time – Mala's hourly rate is \$100, and we need her for 50 hours, so that will be \$5,000.



Materials – things we consume during the project – We need 1 vending machine (\$4,000), 5 liters of paint (\$30). 50 liters of pig food \$80 and 1,000 paper cups (\$20). Total \$4,130.



Equipment – tools, supplies – We will need paintbrushes, rags, brush cleaner and rubber gloves \$25.



Facilities – any facility costs the project incurs. Bill said we can store our equipment in his shed if we pay him \$50 for his trouble.



Services – the shared costs of groups and services – such as if we had to pay for anyone's time for legal, advertising, etc.



Information technology – computing-related costs – if we incur any IT costs.



Indirect costs – Other indirect costs - such as management overhead if agreed to.



Contingency reserves – funds set aside in case things go wrong – We might want to set aside \$250 to clean up, or repair Bill's shed if we make a mess.



How to Estimate

There are several approaches we can use to estimate costs. They each have advantages and disadvantages.



Analogous Estimation – uses analogy (comparison) to previous projects where the costs are known. So, we could say, the last project like this one ended up costing \$2M, so we should use \$2M as our starting estimate.

Advantages

- It can help ensure no class of work is accidentally omitted from the estimates since it is based on similar aggregated totals.
- Helps address generally underestimated activities because it is based on final costs

Disadvantages

- Projects are rarely the same as previous ones, so direct comparison is unlikely. Then we get into “a little larger” and “easier in this area” adjustments that are usually approximations.
- Does not help price or apportion out sub-elements for management by other managers since it is a high-level summation. So, when the project starts, additional break-out discussions will likely be necessary.



Parametric Estimation – Parametric means calculation based. If tiles are \$4 per square foot and we have 320 square feet to tile, then our cost estimate might be $\$4 \times 320 +$ say, 5% for wastage after cutting edge pieces. When agile teams estimate work in story points, this is a form of parametric estimation. It requires historical data (5% wastage) and an algorithm to apply.

Advantages

- Quick if the input data is available

Disadvantages

- Likely to be inaccurate if the historical input data is no longer applicable.
- Misses non-calculation based work elements.



Bottom-up Estimation – In bottom-up estimation, we add up the estimates for all the identified work packages or the smallest identified components to create a total estimate.

This is usually based on the WBS.

Advantages

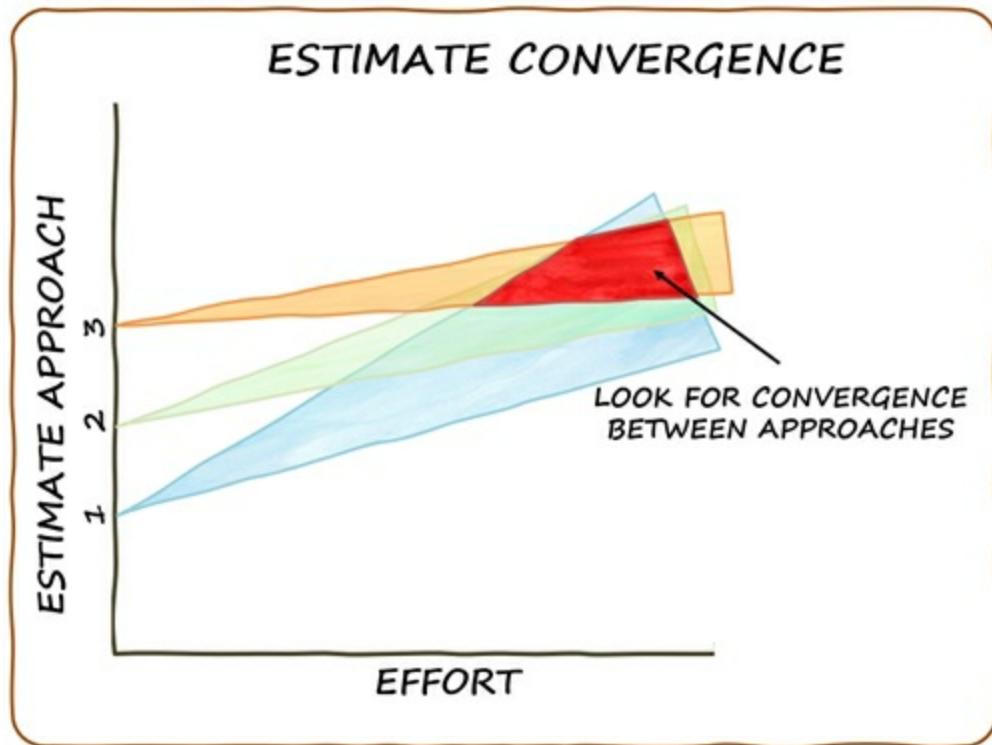
- Can be accurate if all the low-level items can be identified
- Provides sub-component costs for independent management

Disadvantages

- Can only be made after all the WBS elements are identified
- Can be very time consuming to create
- For knowledge work projects, it is often difficult to identify all the sub-components in advance



Since no estimation approach is perfect, we should consider using multiple techniques and look for convergence within the ranges they predict. If we arrive at a similar set of estimate ranges using various approaches, we can have more confidence in the forecast.



Guidelines for Estimating

Additional tips to bear in mind when estimating include:

- As well as using multiple approaches to estimation, engage multiple people. Everyone has a bias and blind spots; enlisting a small estimation team will limit individual oversights.
- Gather all the relevant input information that will help prepare the estimates ahead of time.
- Check with the resource supplier to make sure no incorrect assumptions have been made.
- Determine which estimating techniques will be used.
- Make sure everyone is clear on the units of measure that will be used (person-days, dollars, ideal time, etc)
- Consider possible risks that may impact cost – do we need to develop and include a contingency?
- Review the list of assumptions for possible additional costs or the need for contingency if any prove false.
- Make sure estimates include costs for all people involved and the resources they will need.
- Consult any relevant lessons learned registers. They contain valuable cost-estimating information—both successes and shortcomings — and can help in estimation and budgeting.

2.5.2 Anticipate Future Budget Challenges

Estimate budgetary needs based on the scope of the project and the lessons learned from past projects.



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(Use scope and lessons learned to anticipate future budget challenges)

We cannot know what the future holds. So, it would be unrealistic and irresponsible to estimate for only what we can see required today. Instead, we need to build reasonable and transparent buffers/reserves/contingencies into our estimates and budgets. This allows us to proceed when the inevitable surprise occurs.

The challenge is to create reserves appropriate to the uncertainty and likelihood of additional costs. If we estimate too low, we may have to stop the project and go back to the sponsors for more money. On the other hand, if we estimate too high, then worthwhile projects might not get funded because the ROI looks poor, or we are criticized for overly padding our estimates.

Another problem can occur when there is poor transparency or communication. For example, when asking our team for activity estimates, we should be clear if we want them to add contingency or if we will. We want to avoid the situation where everyone adds contingency, and the final estimate is far from the likely cost.

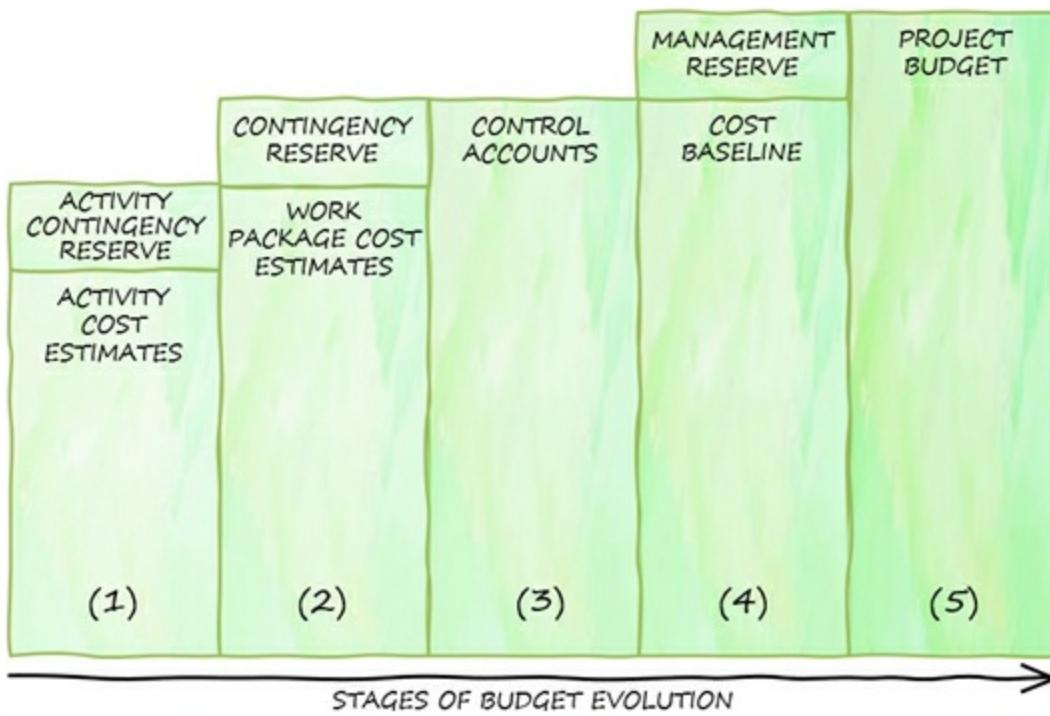
The solution is to have a clear plan and make sure everyone involved in estimating activities and reserves understands the process and communicates.

Budget Estimating Process

Estimating the project budget consists of adding the estimated costs of individual activities (or work packages) to create an approved cost baseline. This baseline budget should contain all the funding needed to complete the project.

As the project progresses, the project cost performance is then measured against this cost baseline. The typical evolution from activity estimates to project budget and a cost baseline is shown below.

PROJECT BUDGET COMPONENTS



(1) Cost estimates for the various project activities, along with any contingency reserves for these activities, are added to form work package costs. (2) The work package cost estimates, and any contingency reserves estimated for the work packages, are aggregated to control accounts (3).

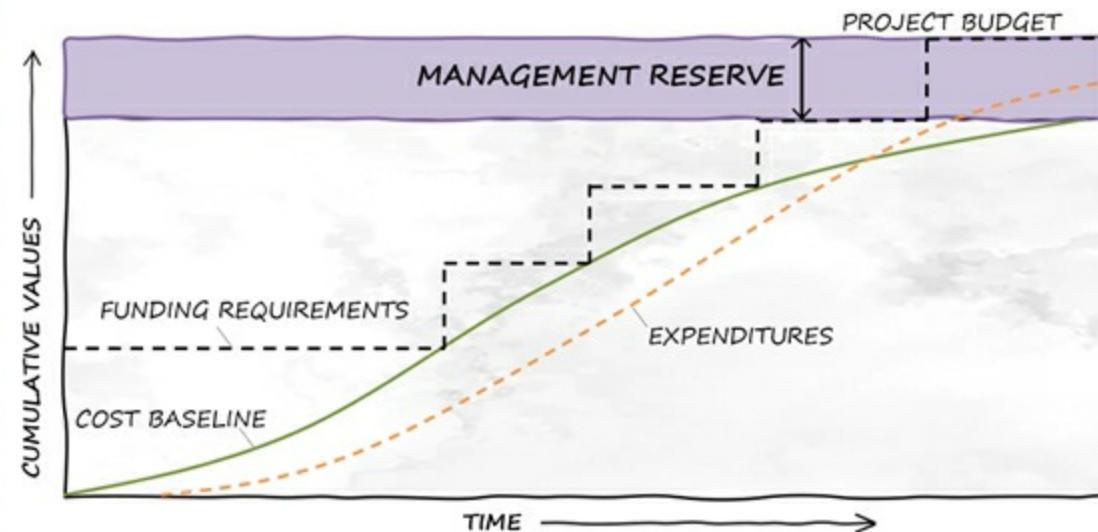
The summation of the control accounts makes up the cost baseline (4). Because the estimates that make up the cost baseline are directly tied to the schedule activities, this enables a time-phased view of the cost baseline, which is typically displayed in the form of an S-curve. For projects that use earned value management, this cost baseline becomes the performance measurement baseline.

(5) Finally, management reserves are added to the cost baseline to produce the project budget. As project managers, we do not get to access these management reserves as regular project funds. Instead, if changes requiring the use of management reserves arise, the change control process is used. Approved change requests trigger approval to add the applicable management reserve funds to the cost baseline.

Cost Baseline

The cost baseline is the approved version of the project budget, excluding any management reserves. It can only be changed through the formal change control process. It is time-phased and used as a basis for comparison to actual results.

COST BASELINE



The cost baseline will include projected expenditures plus anticipated liabilities. Here we see the cost baseline as the solid green curve and expenditures shown by the dotted orange line. Funding often occurs in incremental amounts that may not be evenly distributed, which is shown by the dotted line steps. The total funds required are those included in the cost baseline plus any management reserves needed (purple).



Guidelines to anticipate future budget challenges

Short of having a functional crystal ball to predict the future, there are good practices we can use to help planning and budgeting. These include monitoring:



Trends - Monitor project trends such as are we getting more change requests, missing small deadlines, having more quality issues than before. We can extrapolate trends to provide insights into what might happen if the situation continues. How will this impact our budgets?



Stakeholders - Keep the stakeholder register up to date and be aware of changes to project requirements if new stakeholders are added to the project.



Risks - Monitor risks and assumptions frequently. Look for new risks and changes to existing ones.



Performance - Monitor the performance of team members, suppliers and vendors. Are they on track?



Change Requests - Monitor all changes to the project and follow the Change Management System to keep them within budget if possible.

2.5.3 Monitor Budget Variations

Monitor budget variations and work with governance processes to adjust as necessary.



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(Be on the lookout for significant variations)

As the project progresses, we need to monitor the budget and be on the lookout for significant variations. The primary tool for tracking costs is the cost baseline that is usually illustrated with an S-Curve graph.



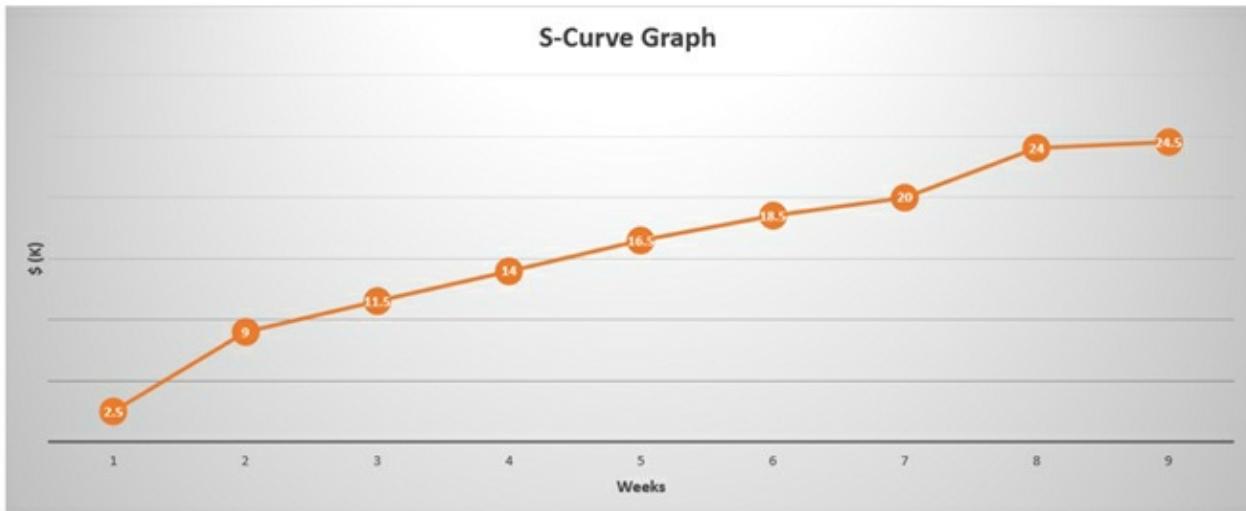
Creating the Cost Baseline

As we have seen, the cost baseline is the approved time-phased budget. Time-phased just means it is structured to show when the costs are anticipated. Here is an example based on our case study of creating a pig food vending machine.

ITEM 3.1	VENDING MACHINE	COST TYPE	BUDGETED COST (K)	WEEK								
				1	2	3	4	5	6	7	8	9
Coordination	Labor (Mala)	4.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Source machine	Labor (Mala)	2	2									
Purchase machine	Materials	4		4								
Test as-is	Labor (Phil)	2		2								
Make modifications	Labor (Phil)	4			2	2						
Test new spec	Labor (Phil)	2					2					
New Signage	Materials	0.5						0.5				
New Signage	Labor (Doris)	2							1	1		
Trial	Labor (Mala, Phil)	3.5								3.5		
Total		24.5	2.5	6.5	2.5	2.5	2.5	2	1.5	4	0.5	
Cumulative			2.5	9	11.5	14	16.5	18.5	20	24	24.5	

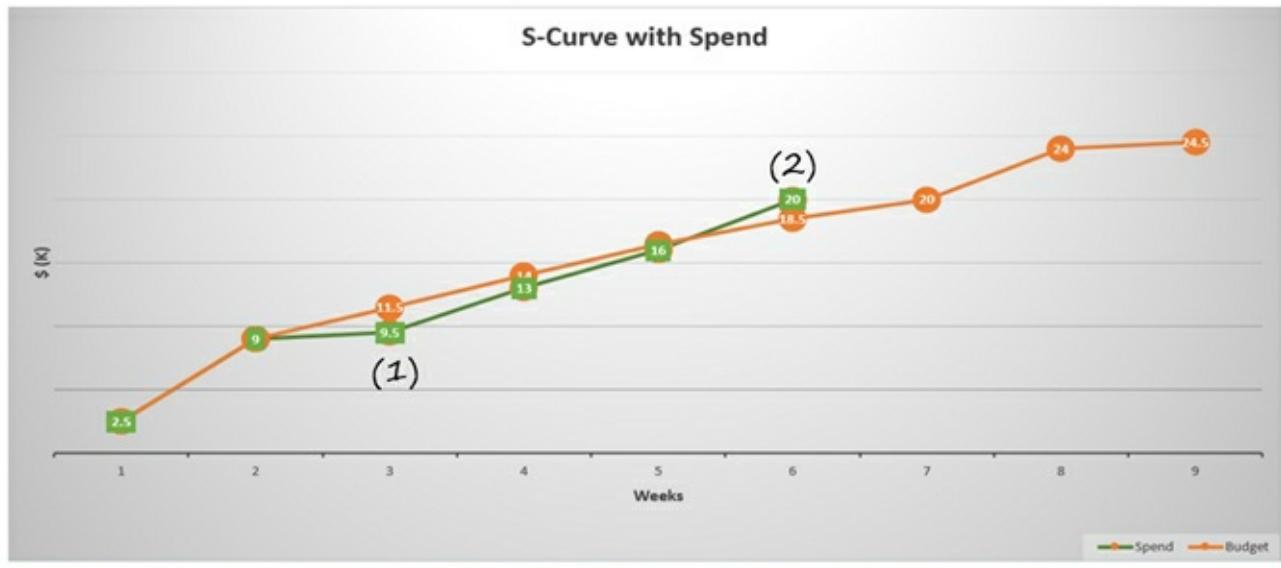
From this table, plotting the cumulative spend against the weeks, gives us the S-Curve Graph.

S-CURVE GRAPH



As project costs are incurred against the project, we can plot the actual project spend compared to the cost baseline.

S-CURVE GRAPH WITH SPEND



If there are deviations under the S-Curve, this could be a sign that we have not yet processed the payment or that the work did not occur when scheduled (1). Variations above the line might indicate unauthorized expenditures or cost overruns (2).

2.5.4 Plan and Manage Resources



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(Plan for and keep track of people and things)

Life would be simple if things progressed as planned, but they rarely do. We often start with flawed plans and are unaware of where they are deficient. Problems occur, things take longer than they should, and requirements change. Like life, it is how we choose to react to these events that determine our success or failure.

Some general tips for planning and managing projects that also relate to budgets and resources include:



Get agreement on what “Done” looks like – Make sure the relevant stakeholders agree on what the final, acceptable state of a work package or activity is. We do not want the team to think it is done, but the customer or downstream consumer of this work believes it is not finished. Agile teams use a “Definition of Done” jointly created with the Product Owner to agree on the full set of activities that need to be completed before something can be declared Done. Predictive projects describe quality requirements and acceptance criteria in the WBS dictionary. Whichever project lifecycle is being used, including hybrid, make sure people discuss and agree on “Done.”



Frequently confirm understanding – Language is imprecise, and there is often a gulf of understanding between two parties. Reduce the impact of different interpretations by frequently confirming understanding. Create prototypes, test designs and give demonstrations of product increments. The sooner we uncover a mismatch in understanding the quicker and cheaper it is to address.



Select planning horizons appropriate for the uncertainty at hand – When we know the way, we can plan the entire trip in advance. However, when in new or changing territory, we need to explore, find the best way forward and maybe back-track if we reach a dead-end. Our plans and budgets should reflect this level of certainty. Projects in hard to predict, complex, high-change environments should plan in short intervals with inspection, feedback and adaptation between periods. More predictable projects can operate with longer planning horizons.



Check-in with stakeholders – Check to see how things are going. Often when people are struggling, or issues occur, they go quiet rather than communicate the problem. Do not assume that no communications mean no issues. Go see, ask how things are, where people need help.



Track Progress – Plans are yesterday's best guesses. How are things actually progressing? Which work items are getting completed, which are falling behind, and which are blocked? Track the progress objectively. "Almost finished" is not finished.



Pay attention to risks – We go to a lot of effort to identify potential threats, analyze them, and create avoidance and mitigation strategies. Do not let this work go to waste. Frequently review the risk list. Schedule a weekly meeting in your calendar with you and the risk list if that's what it takes to ensure you revisit them frequently. Ask the risk owners how their monitoring is going. Any news? Do we need to change anything? Don't forget the opportunities either; ask what can we do this week to exploit them?



Ask the team for solutions – When faced with problems, setbacks and issues, do not be shy to ask the team for help when appropriate. They have first-hand task execution experience and may have seen similar problems before. We do not have to implement their suggestions, but they often have ideas we may not have thought of.



Proactively manage change – Not all project changes are bad. Sometimes, even late-breaking changes that bring a competitive advantage are useful. Sometimes after building a rapport with the customer or client through collaboration, a change or our suggested solution might even lead to a simplification. More often than not though, changes mean more work and more budget consumed. Change requests are processed through the change control process for predictive, traditional projects or the product owner for agile projects. When changes impact the budget, be sure to update the associated cost baseline and performance measurement baseline.

2.6 Plan and Manage Schedule

This module is all about creating and updating project schedules - for a variety of life cycles.

A project schedule is a model that presents linked activities with planned dates. It shows durations, milestones and the necessary people and resources required. Schedules let us know when things start and end, and how activities roll up to milestones or releases. Once created, they can also be used to track actual project performance against and keep stakeholders informed of progress.



Predictive projects outline how scheduling will occur using a Schedule Management Plan. This might be a stand-alone document or section in the general Project Management Plan. It describes how activities will be defined and progressively elaborated.

The Schedule Management Plan also outlines the scheduling method used (Gantt chart, network diagram, etc) and other specifics about the schedule, including:

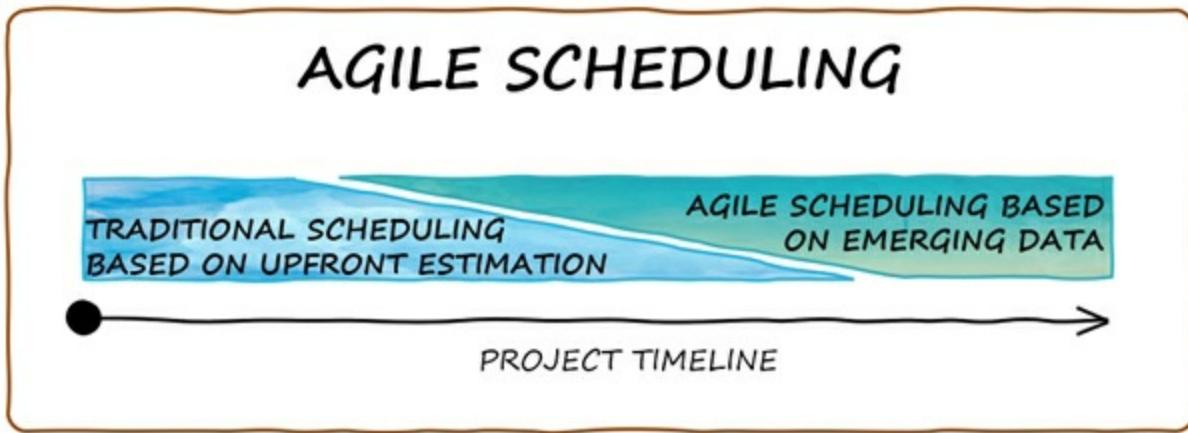
- Accuracy of duration estimates – e.g., activity estimates are +/- 20%
- Units of measure – e.g., all estimates are in person-days
- Control thresholds used to monitor performance – e.g., activities are deemed overdue 2 days past their scheduled completion date
- Reporting formats – e.g. The project Gantt chart and network diagram will be updated weekly and published as PDFs on the project portal. Estimate updates and questions should be emailed to the project manager...



Agile projects use the product backlog and release plans that typically utilize release roadmaps to schedule the project. This collaborative and iterative process involves the product owner prioritizing the backlog and selecting release candidates and the development team who provide activity estimates, dependency information, and other support.

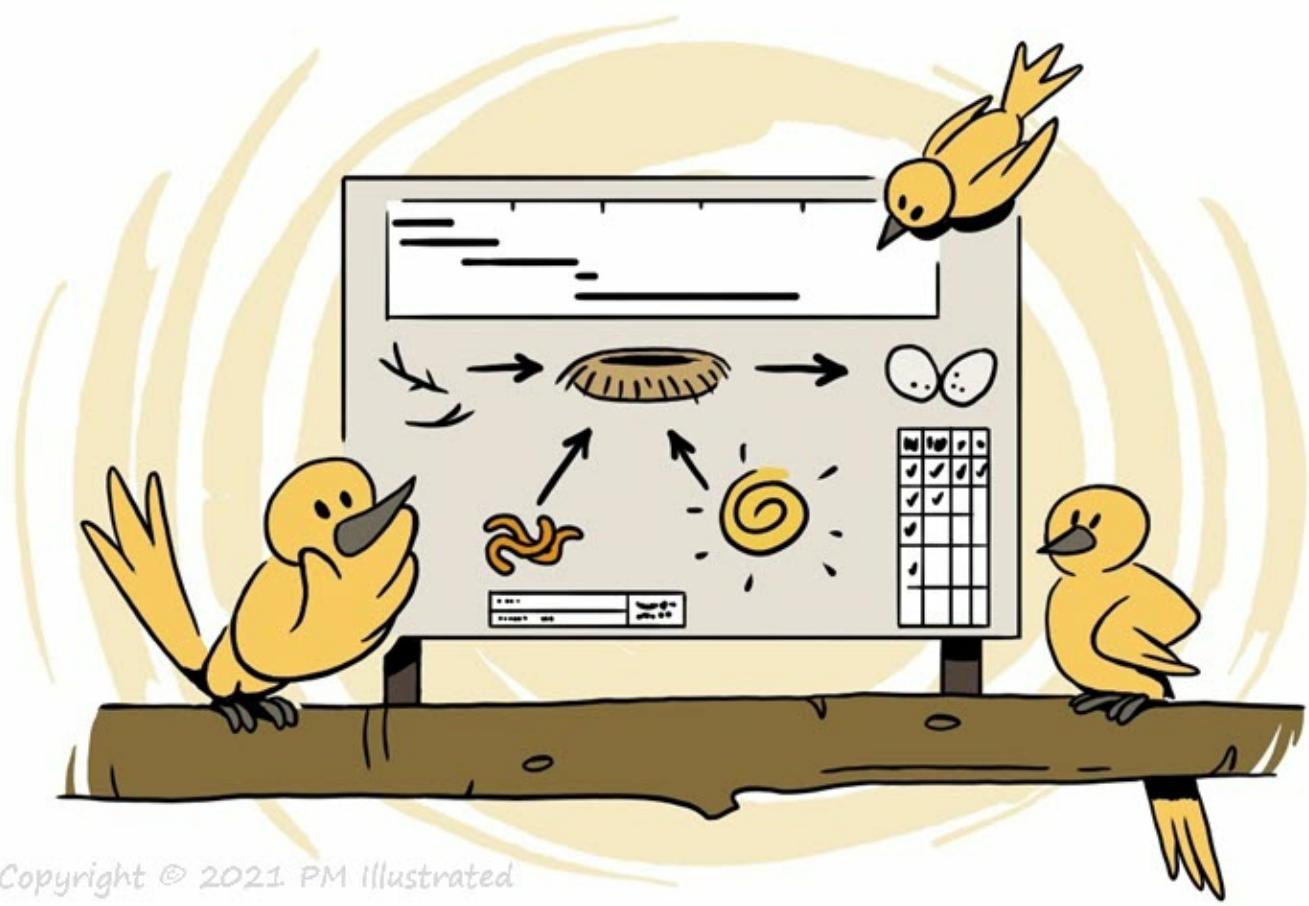
Agile schedules initially rely on traditional estimation approaches (bottom-up estimation of features, comparison to previous projects, a calculation based on story points) to create the first schedule. Then transition to more of an evidence-based schedule as production data from the team emerges.

Since agile projects exercise all of the development disciplines every iteration, we can use actual rates of progress to validate and create more accurate schedules that are net of interruptions, defect rates, new scope evolution, etc. So, typically agile projects start with wide margins of schedule variance, but then become much more predictable as they switch over to evidence-based scheduling.



Traditional approaches also refine schedules and plans as new data emerges. This is the core of progressive elaboration and rolling wave planning. What sets agile practices apart is having experience-based data about all activities and phases of development plus deployment gained in each iteration.

2.6.1 Estimate Project Tasks (milestones, dependencies, story points)



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(Estimate the activities and components that make up the project)

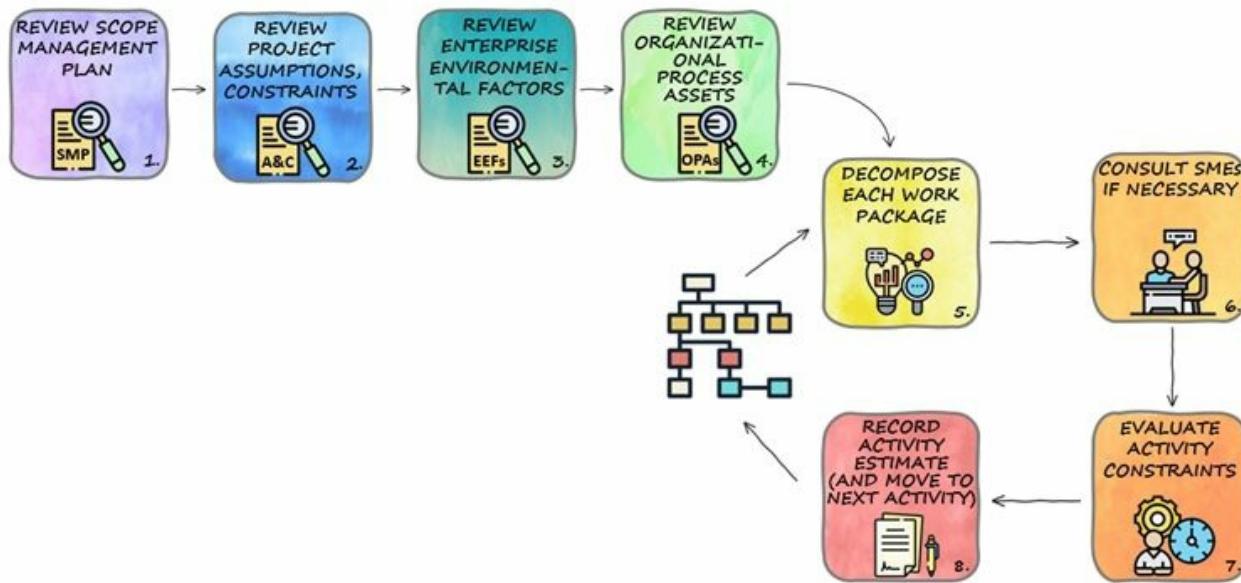
Before we can develop a schedule, we need estimates for the activities that will make up the project. These activities might be called tasks or work packages depending upon your project environment. They are the lowest level of the WBS, the smallest decomposed work package, the tasks that make up user stories in the product backlog.



Traditional Activity Estimation

We create activity estimates in a traditional, predictive project environment by estimating the WBS work packages after reviewing the relevant planning documents and artifacts. The first four steps are performed once, and the second four steps are performed for each WBS work package:

ESTIMATE ACTIVITIES



1. Review the Schedule Management Plan for guidance on the approach
2. Review project assumptions and constraints
3. Review Enterprise Environmental Factors (any policies, procedures, or legislation that exist inside and outside of the organization that will impact the way you schedule)
4. Review Organizational Process Assets (any plans, processes, and knowledge bases specific to scheduling)

Then, the real process of activity estimation begins. For each WBS element:

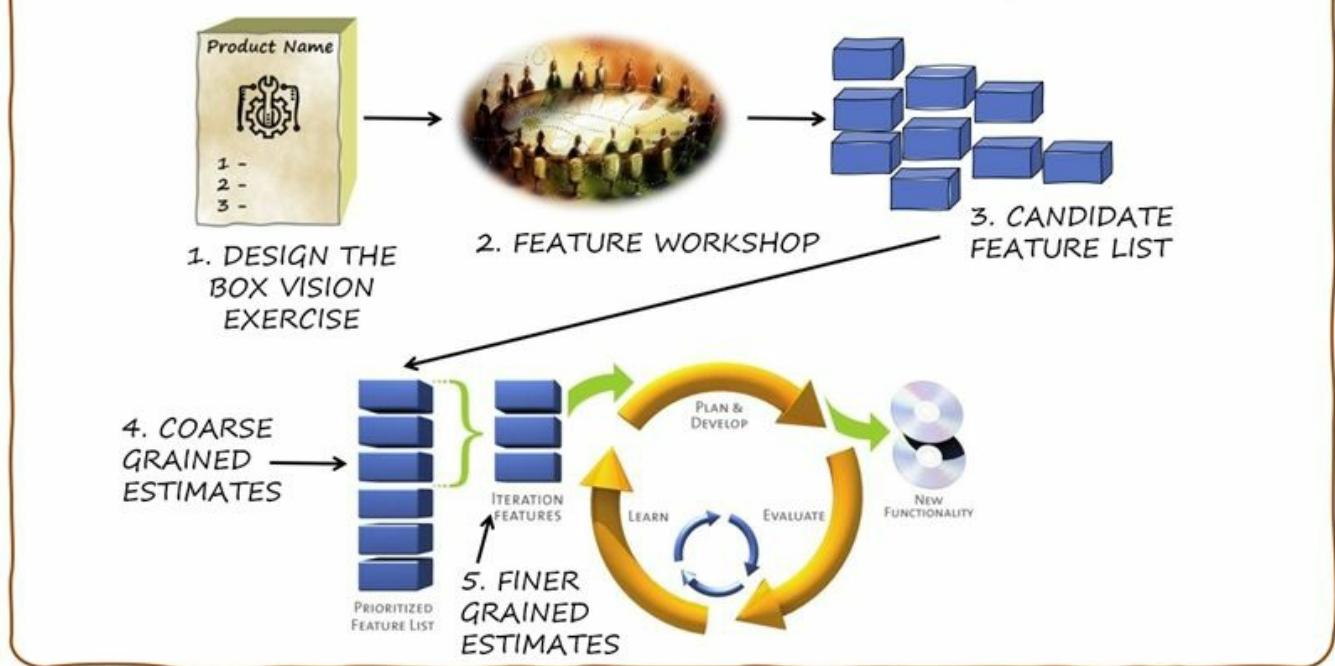
5. Decompose the work package into its smallest component parts
6. Consult subject matter experts if anything needs explaining further
7. Evaluate any activity constraints
8. Estimate the activity and record the results, then go get the next WBS work package



Agile Activity Estimation

Our description of the agile estimation process zooms out further to explain some of the earlier project life cycle activities that impact the final schedule.

ESTIMATE ACTIVITIES - AGILE



1. Project scope is likely first explored using a vision exercise such as Design the Product box.
2. Feature workshops identify the majority (80%+) of the product features. Rather than spending more time speculating what might be required, developing increments of a working solution is used to uncover the remaining 20%.
3. The candidate feature list is prioritized by a product owner into a product backlog.
4. The product owner establishes an initial release plan, working with the development team to create coarse-grained estimates for the product features/stories.
5. Before Sprint/iteration planning, the stories are refined and estimated in more detail.

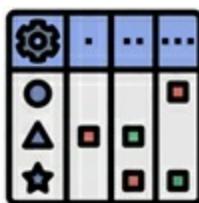
Agile approaches embrace the fact that it is usually impossible for novel, complex or high-change projects to plan everything in advance. Instead, they recommend exploration through prototypes to surface all the requirements and their relative priorities.

Starting with a backlog that we know likely contains only 80-90% of the final features means our activity estimates must include a contingency. As the project team works through the backlog, we can expect some changes and new feature requests.

The amount of work completed per iteration (velocity) and rates of scope growth are noted and used to predict completion dates. If, for example, it takes 4 months to complete 50% of the backlog, we can project another 4 months for the remaining features. Since the progress to date is net of discovery work, scope expansion, and change requests, these items will also be factored into future projections.

This all works in theory if the second half of the backlog is similar to the first half. If we saved all the problematic things until later, we are likely in for a nasty surprise. However, since backlogs

are sorted with the high business value and risky elements first, work is generally easier and more negotiable the further down the backlog we get.



Lean Pull Scheduling

Lean approaches do not use iterations and instead continually pull items from a work queue as capacity becomes available. They also spend less time estimating work items and instead ensure items are of a similar size and measure throughput.

Throughput is the number of these small items a team completes in a given period of, say, a day or a week. Cycle time is how long things take, from starting work on them to finishing them. Using throughput, cycle time, and other related metrics, lean teams can schedule work and provide estimates without producing detailed activity estimates.

2.6.2 Utilize Benchmarks and Historical Data



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(Make use of historical data to improve the schedule)



OPAs and Lessons Learned

To help with scheduling, traditional projects use Organizational Process Assets (OPAs) such as previous project plans, published industry benchmarks, and risk and issues logs from other projects. They also access knowledge bases such as lessons learned. The idea is to reuse and apply

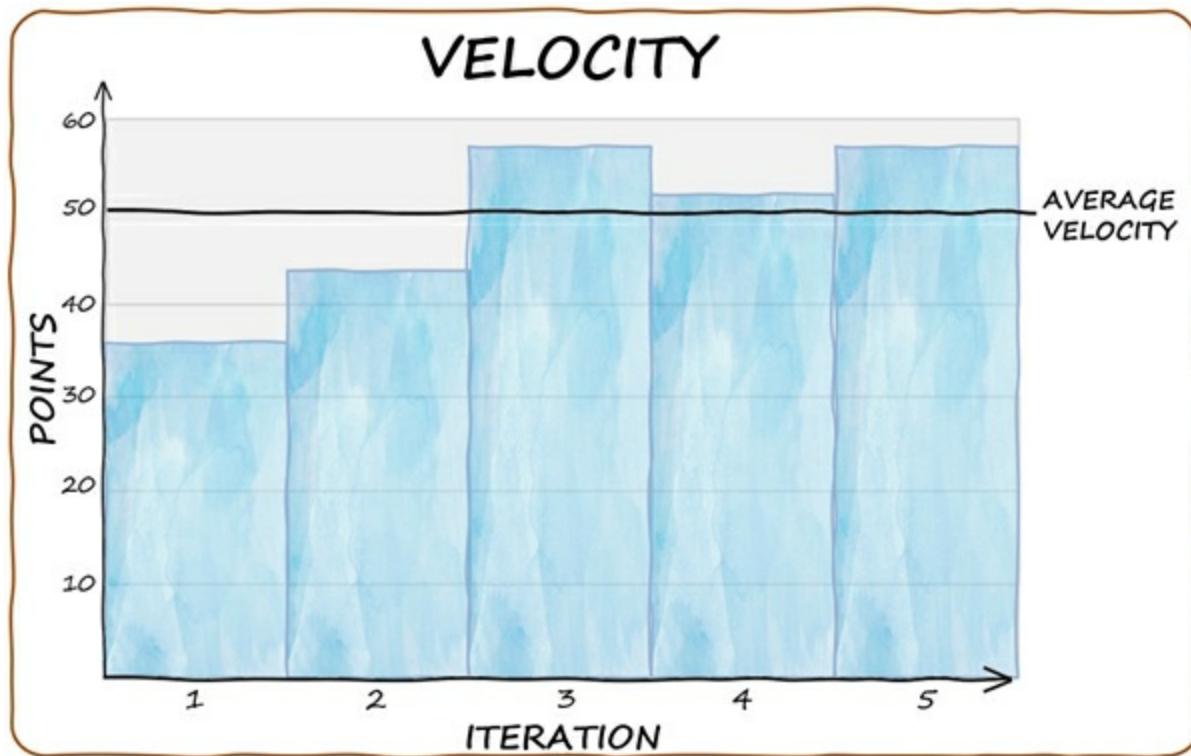
this historical information to create as robust and realistic schedules as possible.

For example, if permits and approvals typically take two months for a project of this size, then it makes sense to schedule at least two months for the same process on our new project. In addition, applying historical data is valuable for projects that share activities with previous projects. However, when undertaking essentially new work, we need a different approach.



Agile Velocity and Lean Throughput

Agile and lean approaches accept that most knowledge-work projects are unique and difficult to tie back to historical data for scheduling insights. The next best thing we can do is to ensure our future projections take into account our current rates of progress. We can also reflect back often and try to improve our rate of progress.

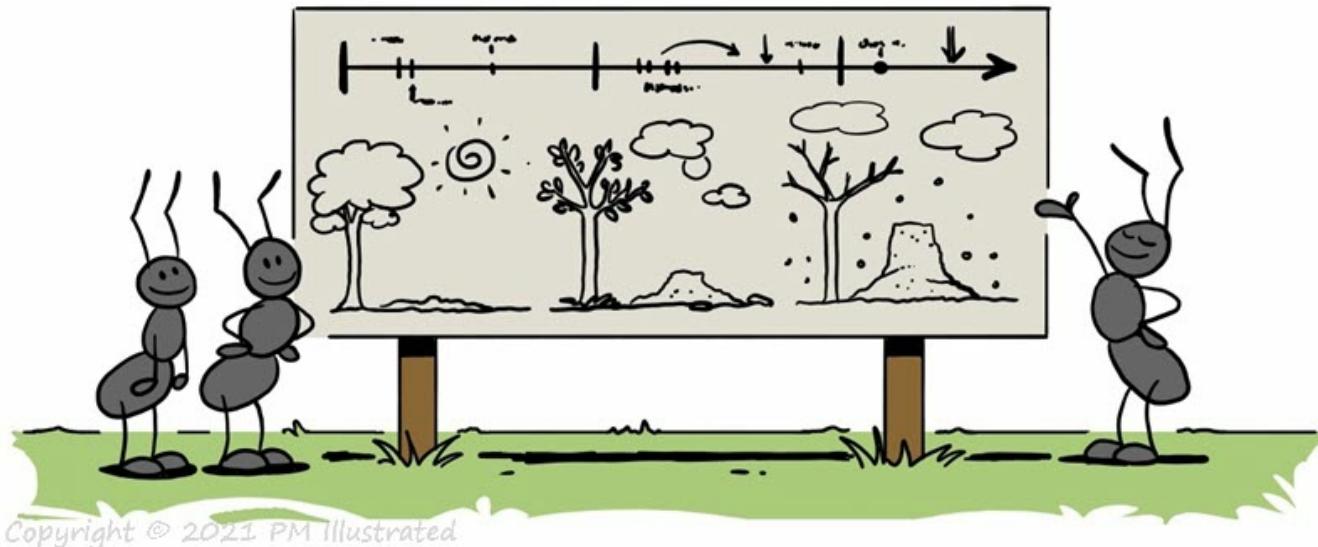


Velocity measures the amount of work (usually recorded in points) that the team can complete in a period, such as a Sprint or iteration. So, it is helpful for team capacity planning and confirming the viability of schedules. In addition, since each iteration should be exercising all of the development disciplines, it provides a valuable metric that is net of all interruptions for meetings, support, defect corrections, etc.

Teams using more of a Lean-inspired approach such as Kanban or flow-based agile use throughput to measure their rates of progress. Throughput is a count of work items completed per day, week, or month and can be used to predict future completion dates and assess the impacts of improvements.

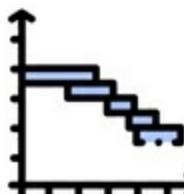
Both velocity and throughput rely on recent team performance. This means that they are not very useful at the beginning of a project since there has been no recent performance. However, as work progresses, they become more valuable than historical data from other projects since they relate specifically to this project environment.

2.6.3 Prepare Schedule Based on Methodology

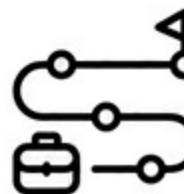


(Create the schedule based on our selected approach)

There are several ways to create and present a project schedule. Popular choices include:



Gantt Chart – A histogram-based view of the project showing activities, durations and milestones. Gantt charts also typically show precedence relationships, people assigned to the work and percent complete information.



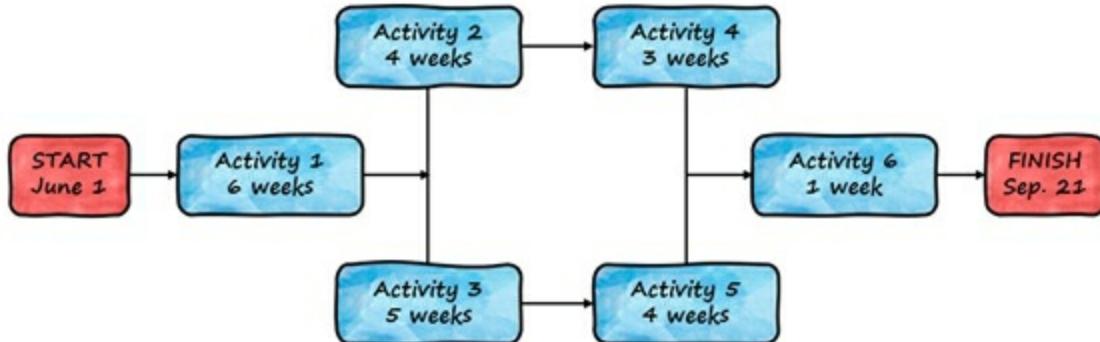
Milestone Chart – Summarized view of the major milestones of a project, usually on one page. Milestone charts are useful for senior management who do not want to see all the gory details.



Network Diagram with dates and dependencies-

Network diagrams show the schedule with start and finish dates for activities and the interrelationship of activities. This clearly shows the interdependencies of activities and may allow us to find schedule compression opportunities.

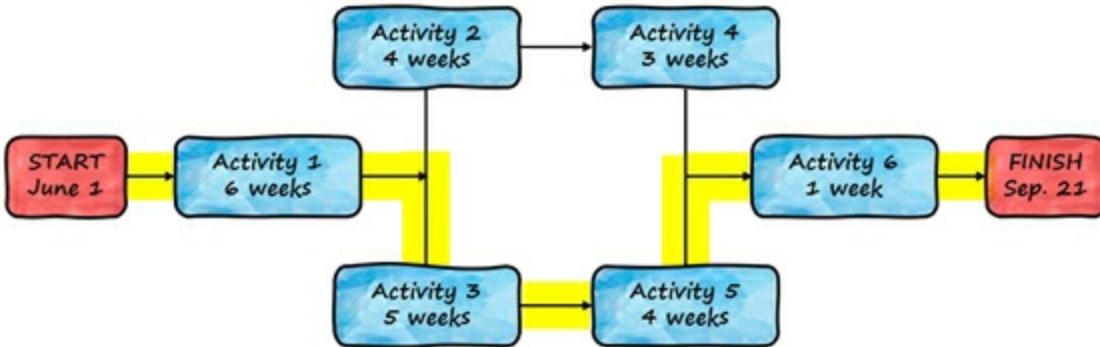
NETWORK DIAGRAM



Critical Path

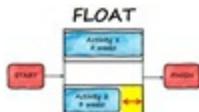
Often activities happen in parallel, so the overall project duration is not the sum of all the activity estimates. For example, in the network diagram above, two parallel paths of work occur after Activity 1 finishes. The top path (Activity 2 followed by Activity 4) will take 4 weeks + 3 weeks = 7 weeks to complete. The bottom path (Activity 3 followed by Activity 5) will take 9 weeks to complete. This longest path (highlighted in yellow below) is known as the critical path.

CRITICAL PATH



This path is critical because any delays to activities on this path will delay the Finish date. A one-week delay to any activity on the critical path would result in a one-week delay to the project Finish. Unlike a one-week delay to Activity 2 (which is not on the critical path), which would not impact the Finish date at all.

The critical path is the longest path (by activity durations) through the project network diagram. Ironically, this longest path represents the shortest time the project can be finished in.

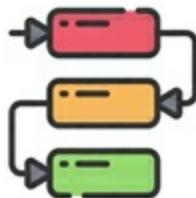


Float, Free Float, and Total Float

Activities not on the critical path have some wiggle room. For example, a delay to starting them or an overrun on completing them – providing not too much, will not delay the project finish. This wiggle room for non-critical-path activities is called **Float**.

Float is the amount of time an activity can be delayed without delaying the project finish date or any consecutive activities. The network diagram above shows that Activity 2 happens in parallel with Activity 3 and takes one week less to complete. So, we could start late or run over 1 week without a scheduling problem.

Also, since the following activity, Activity 4 is 3-weeks long, we could delay Activity 2 by up to 2 weeks before that top path now becomes the critical path. We call the first kind of float **Free Float**. It is the time we can delay by without impacting any subsequent task's earliest start dates. A two-week delay for Activity 2 is its **Total Float**, the maximum time it could be delayed by before delaying the project finish date.



Dependencies

Activities have logical relationships. The relationship indicates if the start or finish of an activity is dependent on the start or finish of another activity. For example, a building inspection cannot start until the workers have finished building the walls and roof. This is an example of a mandatory dependency, but there are others

- **Mandatory** – Contractually required or inherent in the nature of the work. E.G. By law, we cannot start the drug trials until we have finished experimenting with the formula.
- **Discretionary** – Based on knowledge or best practice. E.G. We should not move our belongings in until the lease is signed.
- **External** – Related to non-project activities. E.G. We are waiting for the 3D printers to be delivered before we begin printing prototype products.
- **Internal** – Based on things within the project team's control. E.G. We will wait for Bill to finish Activity A before asking him to start on Activity B.

Precedence Relationships

We can start moving into a home before it is fully finished, but we cannot start wearing new shoes before we receive them. Activities have logical dependencies, as shown below:



Previously the PMP® exam contained questions requiring the calculation of float and critical path. Many of these calculations have been dropped in the new exam and instead it focuses on testing understanding of why and when to perform these calculations. So, be prepared to answer questions that test your understanding of the Where, When, Who and Why ideas more than How-to.

PRECEDENCE RELATIONSHIPS

1) FINISH TO START (FS)



2) START TO START (SS)



3) FINISH TO FINISH (FF)



4) START TO FINISH (SF)



1) Finish to Start (FS) – The most commonly used relationship. After Activity 1 finishes then Activity 2 starts. E.G. After the foundation is cured, we start building the walls.

2) Start to Start (SS) – Once Activity 1 starts, so can Activity 2. This is common with long-

running activities, we may not have to wait until it finishes, but we do have to wait until it starts. E.G. Building screen prototypes and User Interface (UI) evaluation.

3) Finish to Finish (FF) - Activity 2 cannot finish until Activity 1 is finished. E.G. System changes and regression testing.

4) Start to Finish (SF) – Activity 2 cannot finish until Activity 1 starts. These are quite rare and often related to FS relationships or handovers to other groups E.G. We can only finish hand over to production for our new system after support has started.



Agile Scheduling

When using agile approaches, the scheduling process starts with the Product Owner creating a Product Roadmap that shows features targeted for upcoming releases. There is no single format for a Product Roadmap, and some examples are shown below:

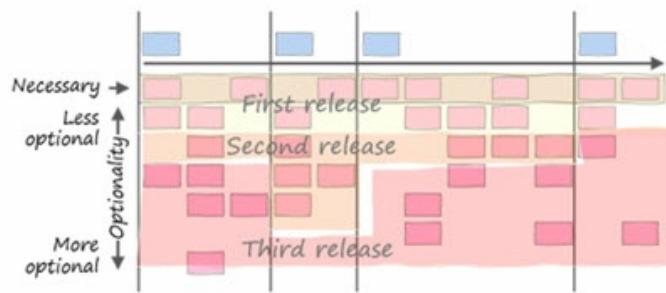
1) NOW-NEXT-LATER ROADMAP



2) TECHNOLOGY STACK ROADMAP



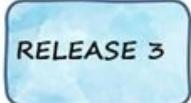
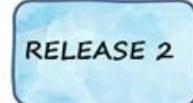
3) Release Based Product Roadmap



Product roadmaps show features and capabilities planned for releases. These releases are typically delivered by iterations of work that contain features and user stories pulled from the product backlog as shown below.

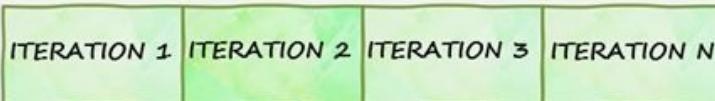
AGILE SCHEDULING

PRODUCT ROADMAP SHOWS RELEASES ->



RELEASE PLAN SHOWS ITERATIONS ->

RELEASE PLAN

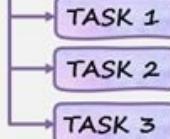


ITERATION PLAN SHOWS FEATURES AND STORIES

ITERATION PLAN



USER STORIES ARE BROKEN INTO TASKS ->



Within the hierarchy of releases, features, user stories and tasks, user stories are the lowest business understandable units of work. They represent things we can discuss, prioritize, demo and gain acceptance for with the product owner and other business or customer representatives.

If we were developing a Netflix-type movie streaming service, we might have user stories about searching for movies by genre, actor or filming location. User stories are typically broken down further into tasks that get estimated by the team. These tasks may not be business-understandable, such as what database structures and indexes we should use to support the movie search requirements.



Iteration based scheduling

During sprint or iteration planning, the team estimates the work selected by the product owner. They should know how much they can deliver by comparing the total size of the work selected (perhaps in story points) with how much work they could complete in previous sprints/iterations.



Flow-based scheduling

By ensuring work items are of about equal size and complexity, Lead time and cycle time can

predict when work items will be completed. Throughput (the number of items completed per period) can also be used to determine how long a list of work items should take to complete.



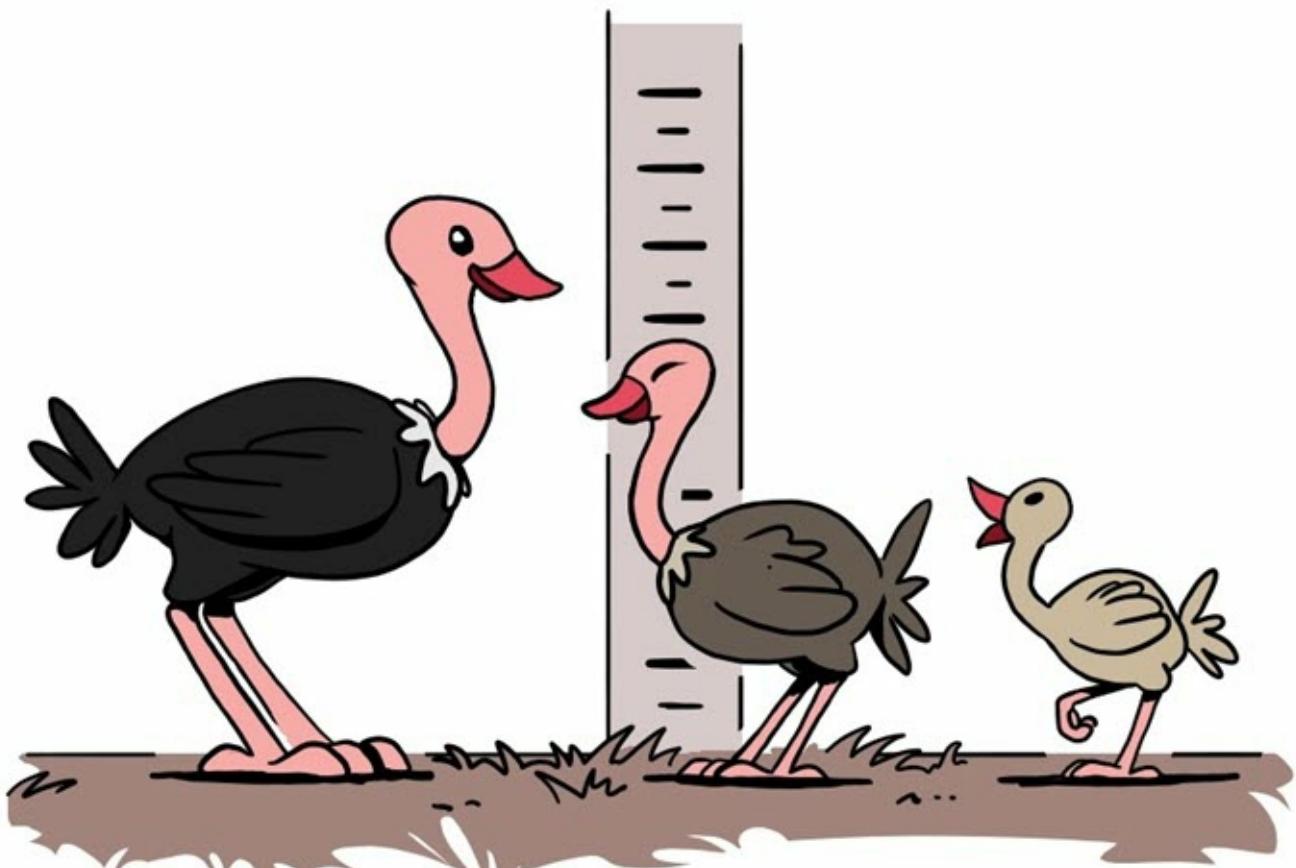
Acknowledging the Quality of the Input Data

These agile approaches lack the numerical precision and mathematical logic of traditional scheduling approaches. For example, there is no critical path calculation, no analysis of float, and less precedence weighting. These traditional techniques do work for agile projects, but we need to consider the quality of the input data and the frequency of changes.

In high-change project environments, building novel products with rapidly evolving tools, our activity estimates are often today's best guess. Applying math to a collection of guesses does not yield reliable answers. However, and this is where the danger lies, we might be lulled into thinking these schedules are accurate because we used fancy tools and techniques to arrive at them. Then next week, the product owner reprioritizes the backlog and adds new items based on demo feedback, and the projections and schedules all need redoing. Now our seemingly accurate plan has been replaced with another, and next week the process repeats.

Instead, agile and lean approaches embrace frequent reprioritization and use more straightforward tools such as “Remaining work” divided by “Average rates of progress” to provide a continuously evolving but realistic view of the schedule.

2.6.4 Measure Ongoing Progress Based on Methodology



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(Measure progress against our agreed schedule)

Once the project is running, how do we track progress? There are several options, both for predictive approaches and agile ones also. Let's examine a few.



Traditional Ongoing Progress Tracking Tools

Traditional, predictive approaches track progress against approved, baseline plans. The assumption is if we get behind, corrective action is needed. This is a valid assumption if we can create reasonably accurate upfront plans. Traditional tracking tools include:

- **Tracking Gantt Charts** – Gantt charts are not only useful for creating schedules, they can be used to track progress and roll-up percent complete figures also.
- **Earned Value Management (EVM)** – Earned value management provides tools to track progress against baselined plans. Particularly relevant to tracking schedules is the Schedule Performance Index (SPI) metric. SPI is a measure of schedule efficiency calculated as earned value (work delivered) / planned value (how much you planned to deliver). A SPI score of below 1 means we are behind schedule. A score of 0.85, for

instance, would indicate we are progressing at only 85% of the rate initially scheduled.



Unlike previous versions of the PMP® exam, the 2021 version has fewer earned value calculations. While previously candidates could expect a question or two requiring manipulating the EV formulas, the new exam focusses on testing understanding of why and when to use earned value analysis. So, understand the principles, work through some example calculations. However, be prepared to answer questions that test your understanding of the Where, When, Who and Why ideas more than How-to.



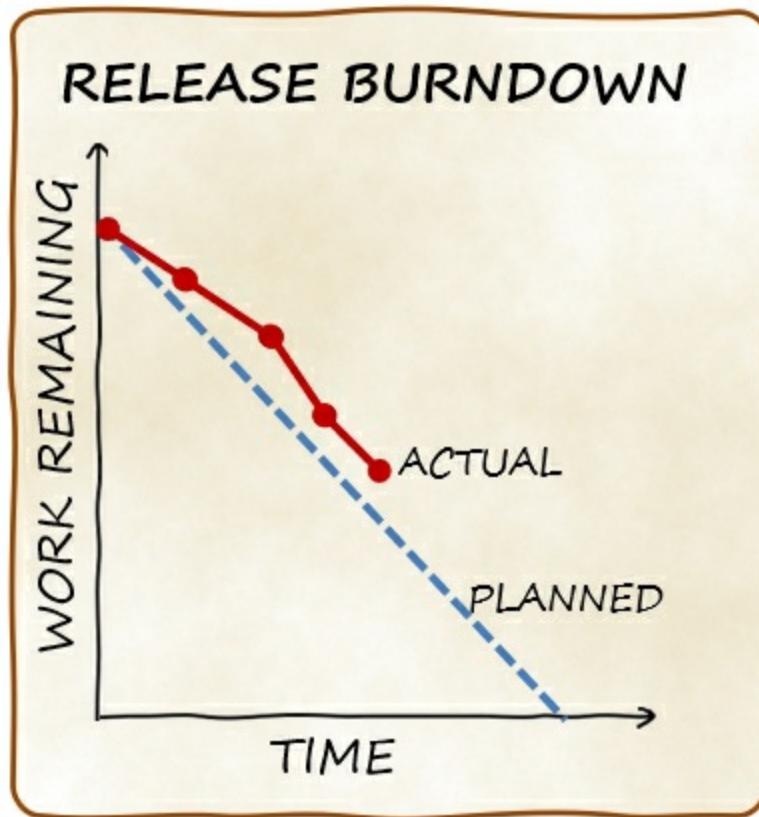
Agile Ongoing Progress Tracking Tools

Agile approaches acknowledge that initial plans are likely to change since they were made when we know least about the project (at the beginning). In these high change environments, we could spend lots of effort in analysis trying to remove ambiguity or build an increment of functionality we know about and evolve from there.

(This idea of clarification via development rather than analysis is a very different mindset that some practitioners find natural, and others find offensive. It was debated ad-infinitum 20 years ago, and while no clear winner emerged, learning through exploration has gained traction.)

Tracking progress on agile projects usually comprises of showing the rate of work completed compared to the work remaining. Then extrapolating the current rate of progress into the queue of work to predict when it should all be done. Or how much will be done by a specific date or spend amount.

Release Burndown Graphs – Show the estimated work remaining and the projected completion rate.

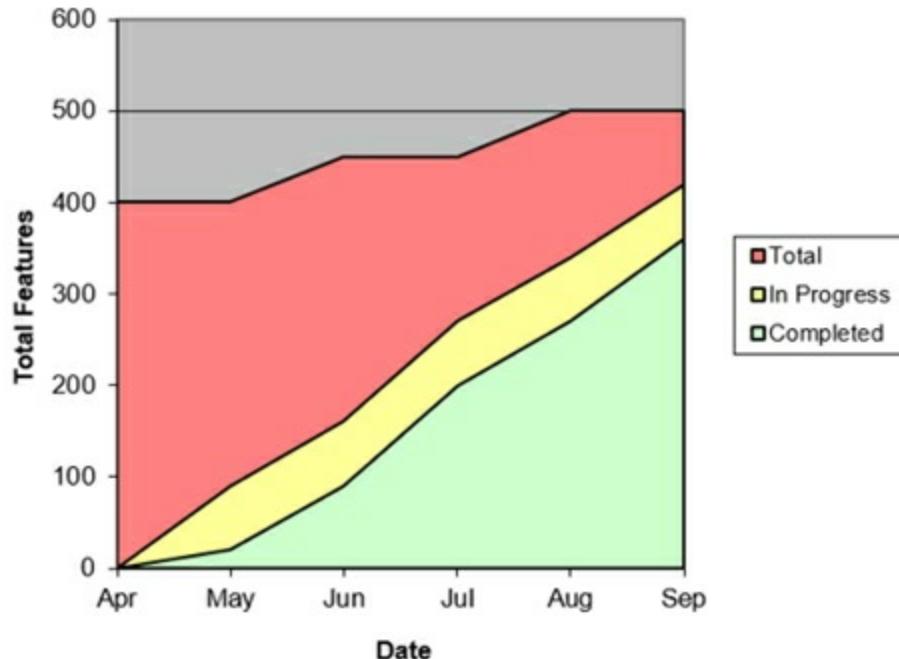


The example above shows the planned completion rate by the dotted blue line and the actual completion rate shown with the solid red line. Extrapolating the red line currently suggests the project will finish slightly late.

Cumulative Flow Diagrams (CFD) – Show the rate of completion, much like Burndown graphs, but also the rate of scope growth (if any).

CUMULATIVE FLOW DIAGRAM

Project XYZ - Feature Flow



Here the red region shows the total number of features. We started at 400, but over time this grew to 500 – maybe as more required functionality was discovered or asked for. The yellow region shows work in progress, and the green region completed work items. If we were to extrapolate the green region top line out until it hits the 500 features line, that would tell us when we are likely to finish (maybe November or December?)

Other tools exist, such as taskboards, burnup graphs and capturing client satisfaction from demonstrations. Because agile and hybrid approaches work in short increments, there are usually many opportunities to gauge progress and infer where current trends will lead us.

2.6.5 Modify Schedule, as needed, Based on Methodology



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(As things change, modify the schedule)

“No plan survives contact with the enemy” – Moltke

Stuff happens, plans change, and we need to deal with it. Therefore, a crucial part of the success of running any project is having a plan to update the plan. In other words, knowing how we will deal with all the changes that are inevitably going to happen.

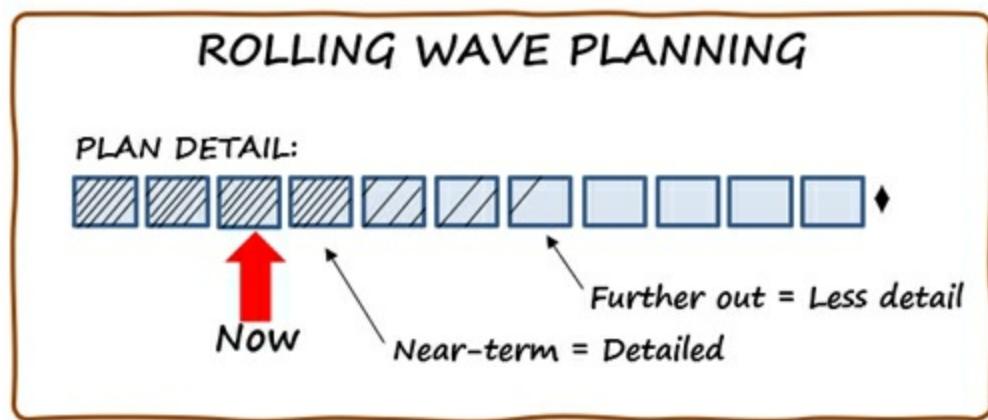


Traditional Approaches to Change

Some people in the agile community believe traditional approaches are pretty brittle and unable to change. This is not the case. Traditional, predictive projects have several mechanisms for handling change and updating plans as new details emerge or circumstances evolve.



- **Rolling Wave Planning** is an iterative planning technique in which the work to be accomplished in the near term is planned in detail, and the work further out is planned at a higher level. This way, we do not develop overly detailed plans for periods long in the future which are likely to change.



- **Progressive Elaboration** is the concept of adding more detail to our plans as more information becomes available. So, if we learn something that impacts our plans, we update them. Used in combination with rolling wave planning,

progressive elaboration helps ensure plans are crafted with appropriate levels of detail and updated when needed.

Traditional projects constantly monitor the status and progress of the project. If changes are necessary, they manage them to the schedule baseline and update the new schedule as needed. In general, deviations from the plan and the need to update the schedule are seen as an inconvenient cost that should be minimized, but processes and Change Control Boards exist to handle low to medium rates of change well.



Agile Approaches to Change

Changes are expected on agile projects. There are several functions built into the agile life cycle that facilitate frequent and rapid appraisal of changes. These include:



- **Frequent demonstrations** – Regularly bringing sponsors and customer representatives together to review the evolving product/service can seem a double-edged sword. On the one hand, we get rapid confirmation the team is building the right solution. But, on the other, we get lots of change requests and suggestions for improvements. This can feel difficult to handle at the time, but it is positive if viewed from a longer-term perspective. It is better to learn about changes or potential improvement early in the life cycle while changes are comparatively cheaper than if attempted later.



- **Backlog reprioritization** – As changes are received, they get added and reprioritized in the product backlog. Modern agile project management tools make reprioritizing stories easy and show ripple on impacts. In addition, when writing user stories, teams are encouraged to make stories independent, so there are the least possible dependencies between requirements, which also helps with reprioritization.



- **Short planning cycles** – After creating high-level release plans, agile approaches deliberately only plan the next couple of weeks in detail. This ensures the concept of rolling wave planning occurs. Additionally, the agile methods recommend keeping backlog items as largely empty placeholders until close to their development. This limits analysis and design effort to only the ideas that get developed, reducing waste.



- **Product owner works as their own Change Control Board** - As described in Task [3.3 Evaluate Changes](#), the product owner takes on all the responsibilities of a traditional Change Control Board. They evaluate, approve and sequence changes for the product backlog. This works great when we have an engaged, knowledgeable product owner, but agile projects struggle when these duties are not performed well. Project managers can help by emphasizing the significance of the role.



- **Frequent Retrospectives** – Handling high rates of change while also working efficiently through a backlog is a difficult task that requires collaboration and communications. Frequent retrospectives provide teams with a forum to review what is working and what needs improvement. By meeting weekly or bi-weekly (the most common iteration lengths), issues can be quickly surfaced, and potential solutions generated by the team for trial in the next iteration.

2.6.6 Coordinate with other Projects and other Operations



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(Communicate schedule information with other groups)

It might be tempting to keep news of delays “under wraps” while we try to catch up, but that rarely happens. So instead, project managers should share information, good and bad, to optimize value at the organizational level.



Update Program and Portfolios with Forecasts

When our project is part of a program or a portfolio, we need to evaluate if our schedule changes affect other program or portfolio components. Perhaps our delay (or acceleration) may not impact the other projects. However, if it does, the overall effect on the more extensive program or portfolio could be significant.

So, be transparent, share forecasts and updates to help planning.



2.7 Plan and Manage Quality of Products / Deliverables

Let's talk about quality. PMI defines quality as the degree to which deliverables fulfill requirements. In other words, something performs as it is supposed to.

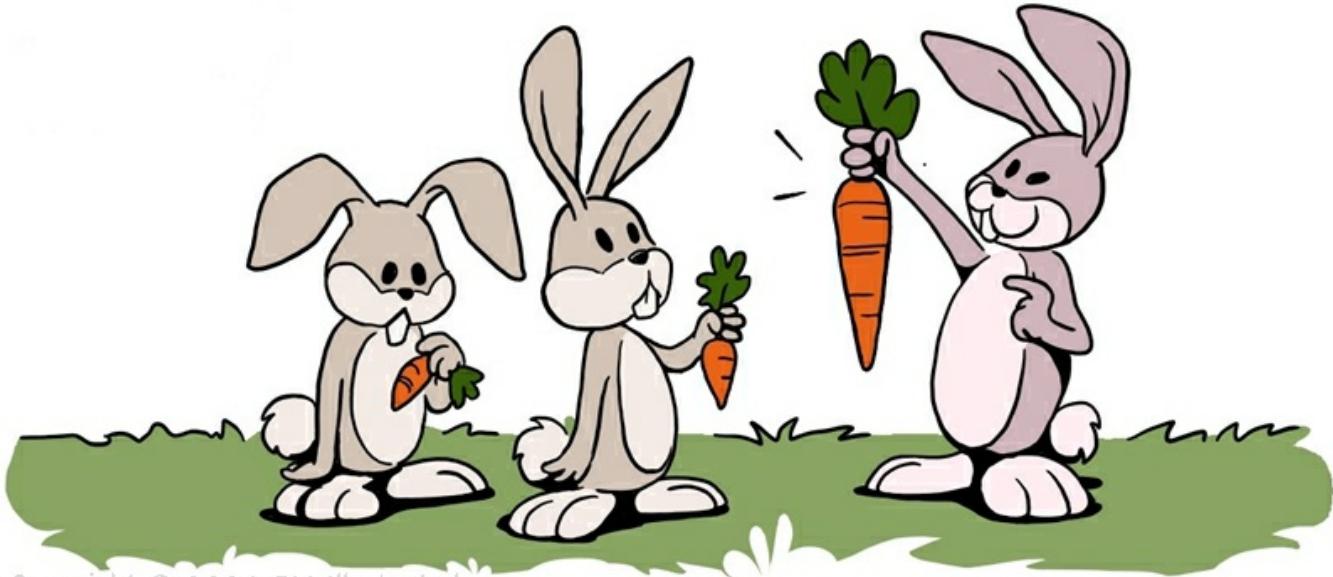
Quality management is tailored for each project. For example, the quality management attributes used for a software project is likely very different than those used for a nuclear power plant project. However, at a high-level they usually share the same three processes.

1. **Plan Quality Management** - Identifying quality requirements and/or standards for the project and its deliverables. Documenting how the project will show compliance with quality requirements and/or standards.
2. **Manage Quality** - Translating the quality management plan into executable quality activities. For example, making sure we incorporate the organization's quality policies into the project.
3. **Control Quality** - Monitoring and recording the quality management activities' results to assess performance. Also, ensuring the project outputs are complete, correct, and meet the customer expectations.



Then, when we get into executing each of these steps the specifics and what is at stake vary considerably.

2.7.1 Determine Quality Standard Required for Project Deliverables



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(Understand the standards we are measuring against)



Standards

Standards are a benchmark or model created by an authority, or by general consent.

An example of an authority creating a standard would be for the manufacture and sale of bicycles. ISO 4210 specifies "...safety and performance requirements for the design, assembly, and testing of bicycles and sub-assemblies." If an organization wants to sell bicycles and convince people they are safe. They could test their bikes to meet or exceed this standard.

An example of a general consent standard may be formed by an organization and its IT and Operations departments. They may have an internal standard that no software systems may be handed over to Operations that have more than 3 high severity issues.



Regulations

Regulations are requirements imposed by a government body. These requirements might relate to product, process or service characteristics, including how to handle compliance. For example, over 30 countries have made the ISO 4210 bike standard a regulation and if you want to import or sell bikes in that country, these requirements must be met.

De facto regulations are those that are widely accepted but not officially sanctioned. In contrast, **de jure regulations** are in accordance with law (i.e., they are officially sanctioned).



Validate Deliverables

Projects create and change products and services. Therefore, we want to make sure that any products, services, and interim outputs are validated to meet requirements. This helps ensure they satisfy the standards needed for the project to be agreed as successful.

Project teams undertake the validation of deliverables based on quality standards or acceptance criteria. Then, a customer or customer proxy, such as a product owner, performs final verification. If quality standards are not met, corrections and controls are put into action.



Quality Management Plan

The Quality Management Plan is part of the larger project management plan. It sets out how the organization's quality processes, methodologies and standards will be implemented in the project. In addition, it describes the activities, resources and labor required to achieve the quality objectives.

Typically, the Quality Management Plan contains the following sections:

- Quality standards that will be used by the project
- Quality objectives for the project
- Quality related roles and responsibilities
- Project deliverables and processes subject to quality review
- Quality control and quality management activities planned for the project
- Quality tools that will be used
- Explanations to handle nonconformance, corrective actions and continuous improvement

Animal Enclosure Expansion Project – Quality Management Plan

Contents

Applicable Quality Standards.....	2
Quality Objectives	5
Quality Roles and Responsibilities.....	7
Deliverables and Processes Subject to Quality Review	8
Quality Control and Quality Management Activities planned.....	11
Quality Tools used	16
Procedures for Nonconformance	20
Procedures for Corrective Actions.....	22
Procedures for Continuous Improvement.....	24

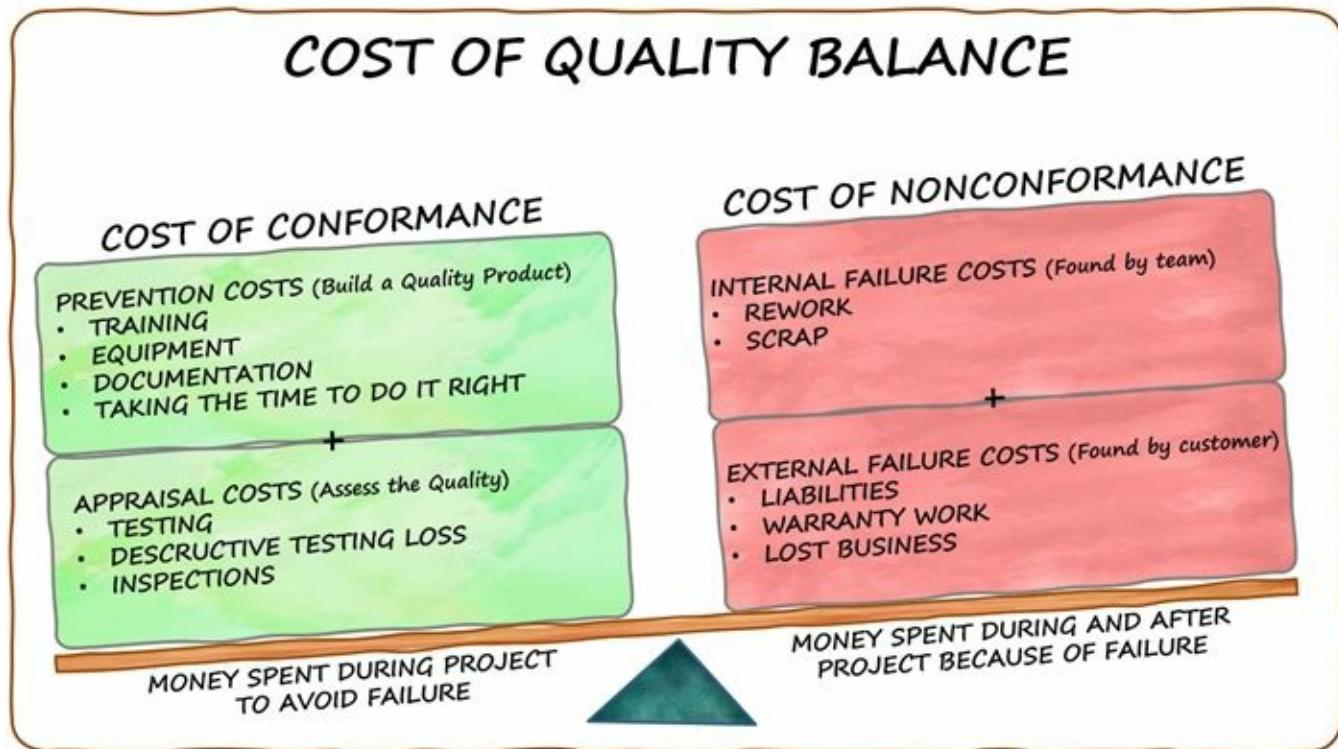
Cost of Quality

The cost of quality (COQ) associated with a project consists of one or more of the following costs:

- **Prevention costs.** Costs related to the prevention of poor quality.
- **Appraisal costs.** Costs related to evaluating, measuring, auditing, and testing.
- **Failure costs** (internal/external). Costs related to nonconformance to the needs or expectations of the stakeholders.

We should balance how much we spend on quality with how much it is worth to the organization. How much we spend on preventing quality issues (Conformance) should be appropriate to how much we stand to lose if failures are found (Non-Conformance)

COST OF QUALITY BALANCE



The optimal cost of quality (COQ) reflects a balance for investing in the cost of prevention and appraisal to avoid failure costs. We could try to achieve high quality by investing more and more in quality assurance steps. However, models show that there is an optimal quality cost for projects, where investing in additional prevention/appraisal costs is not cost effective.

2.7.2 Recommend Options for Improvement Based on Quality Gaps



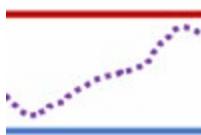
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(Look for ways to remedy quality issues)



Quality Metrics

We identify quality gaps by analysis of quality metrics. These measures can be for any project or product attribute we wish to measure. The definition of our quality metrics should also include **what** we are measuring and **how** we will measure it.



Control Limits and Tolerance

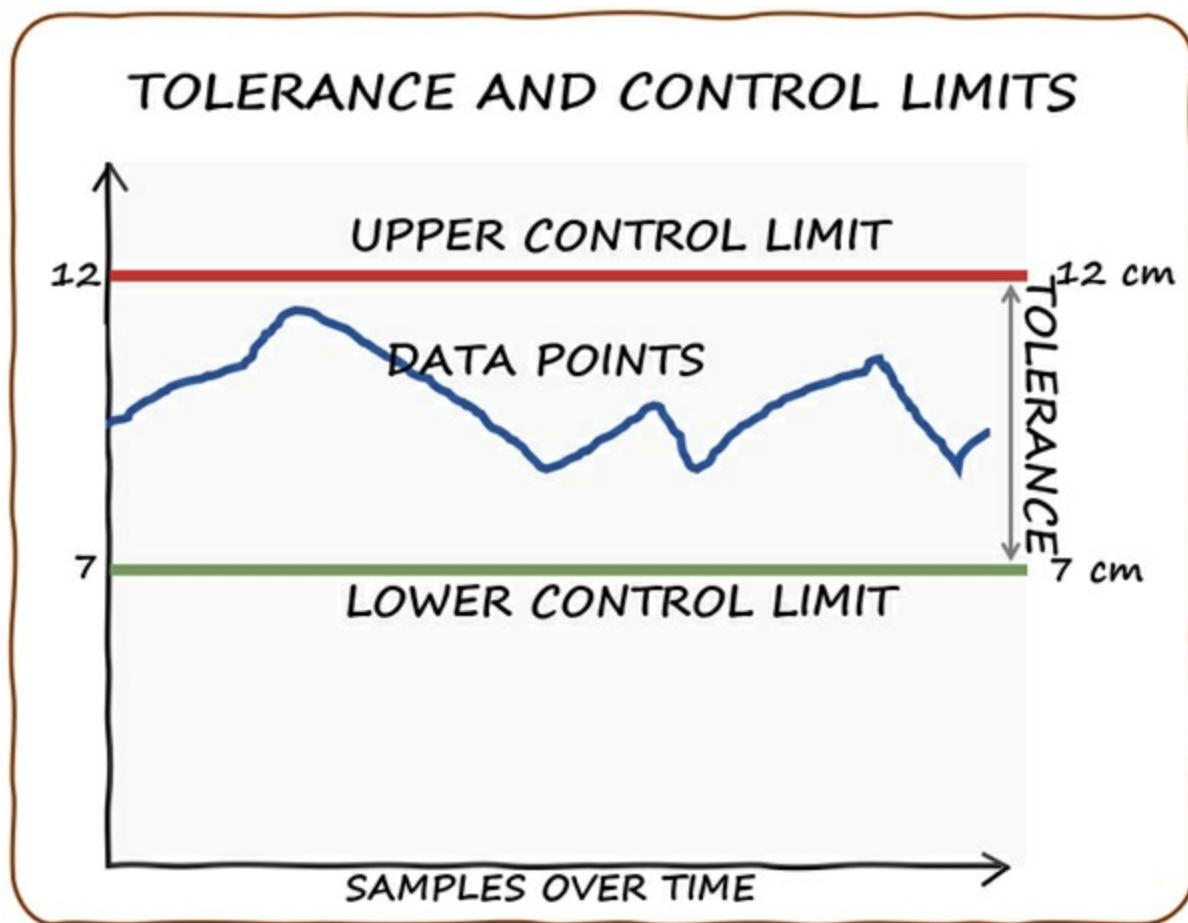
Control Limits and Tolerances

Control limits are upper and lower bounds that can be established around a project characteristic. Tolerance is the acceptable variation for a quality requirement.



For instance, for nutrition and packing considerations, our bananas must be between 18 cm and 26 cm in length. A banana below 18 cm or above 26 would be found as out of tolerance.

Tolerance is the region within these bounds that the project manager is empowered to manage between. Typically, if a tolerance range is breached (or forecast to be breached), the project manager would escalate the issue.



Quality Audit

Quality audits are structured, independent reviews to determine if project activities comply with project and organizational procedures, policies and processes. Often audits and inspections are performed by specialists from outside of the project team, such as an internal audit team or PMO. They are designed to identify that good practices are being used and find any nonconformity, gaps, and shortcomings.

When possible, audit teams should proactively offer suggestions to improve quality and productivity. They should also share good practices from other projects and highlight contributions to lessons learned and retrospectives.



Testing and validation activities

The ongoing running tests to verify project components meet specification and compliance

requirements. Testing and validations are often conducted by team members, including quality assurance staff who are part of the project team.

Quality Assurance Functions

We need to ensure the appropriate actions are taken based on the outputs of QA activities. These include:



Review - Deliverables are reviewed to verify they meet both functional and non-functional requirements.



Validate – quality assurance validates whether the deliverables are within tolerance and provides details on any variances identified.



Recommend - Where necessary, identify and suggest potential improvements to fix any defects or other noncompliance.



Escalate - When quality issues are identified, the project manager should determine if it is within the tolerance level and can be handled within the project or if it needs to

be escalated.



Quality Management Tools

A variety of charts and tools are used to analyze and track quality metrics. Some common ones include:



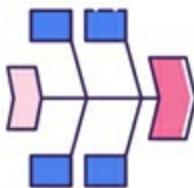
Sampling

When it is not viable or cost-prohibitive to inspect every product or deliverable, substituting a sampling of the outputs for review might be appropriate. The goal is to provide similar results in identifying quality issues while reducing the overall cost of quality.



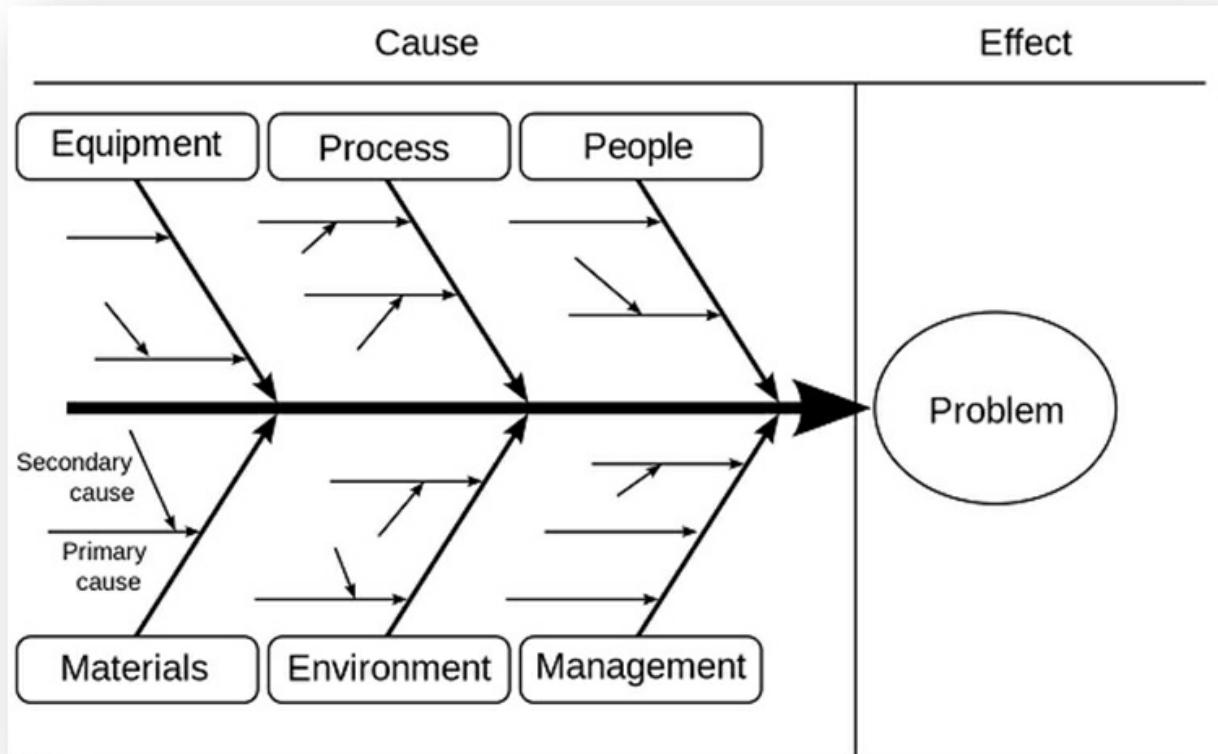
Root Cause Analysis

Root cause analysis is a technique for uncovering the source of the defect, variance or risk. It uses Failure Modes and Effects Analysis to classify the type of failure, cause of the failure, the effect of the failure and overall risk level that can help with prioritizing corrective action.



Fishbone Analysis

Creating a fishbone diagram can help display the root cause analysis of problems. The team identifies factors that are causing the problem and looks for their likely causes. The process starts with writing the problem at the head of the fish. Then the team identifies and adds the contributing factors to the bones of the fish.



QA Techniques

Additional quality analysis tools include:

- **Data gathering** – Using checklists and other sources of acceptance criteria.
- **Data analysis** - Techniques such as process analysis, alternatives analysis, document analysis, and root cause analysis.
- **Decision making techniques** – A group of techniques used to help people reach decisions.
- **Data presentation techniques** – Creating and interpreting charts such as histograms, Pareto charts, scatter charts, cause and effect diagrams, flowcharts, affinity diagrams, etc.
- **Audit reports** - Documentation from reviews used to determine if activities comply with policies, processes, and procedures.
- **Design for X** - A set of guidelines to optimize for a specific aspect of the design. The X can be reliability, cost, service, usability, safety, quality, or any other variable of interest.
- **Problem-solving techniques** – Tools and steps used in solving problems. Often including: Defining the problem, Identifying the root-cause, Generating possible solutions, Choosing the best solution, Implementing the solution, and Verifying solution effectiveness.

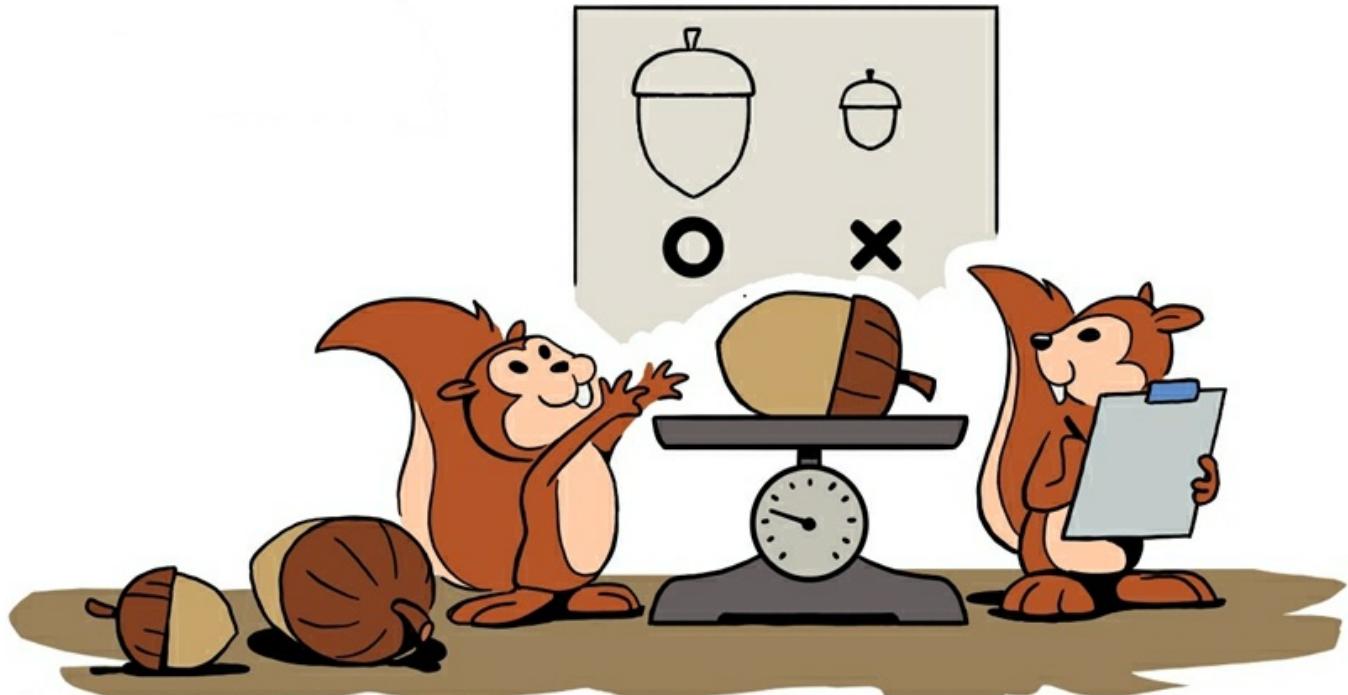


Quality Improvement Methods

Quality Improvement movements are complete thinking systems dedicated to quality and continuous improvement. They include:

- [Plan-Do-Check-Act](#) (Shewhart and Deming)
- [Juran Trilogy](#)
- [Total Quality Management](#) (TQM)
- [Kaizen](#)
- [Six Sigma](#)

2.7.3 Continually Survey Project Deliverable Quality



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(Continuously check product deliverables for quality)

Guidelines to Controlling Project Quality

- Throughout the project conduct inspections to detect quality issues.
- Techniques such as Pareto diagrams can help focus corrective actions on the problems having the greatest effect on overall quality performance.
- Using control charts with tolerances can help analyze and communicate the variability of a process over time.
- Identify ways to eliminate causes of unsatisfactory results, this is usually much cheaper

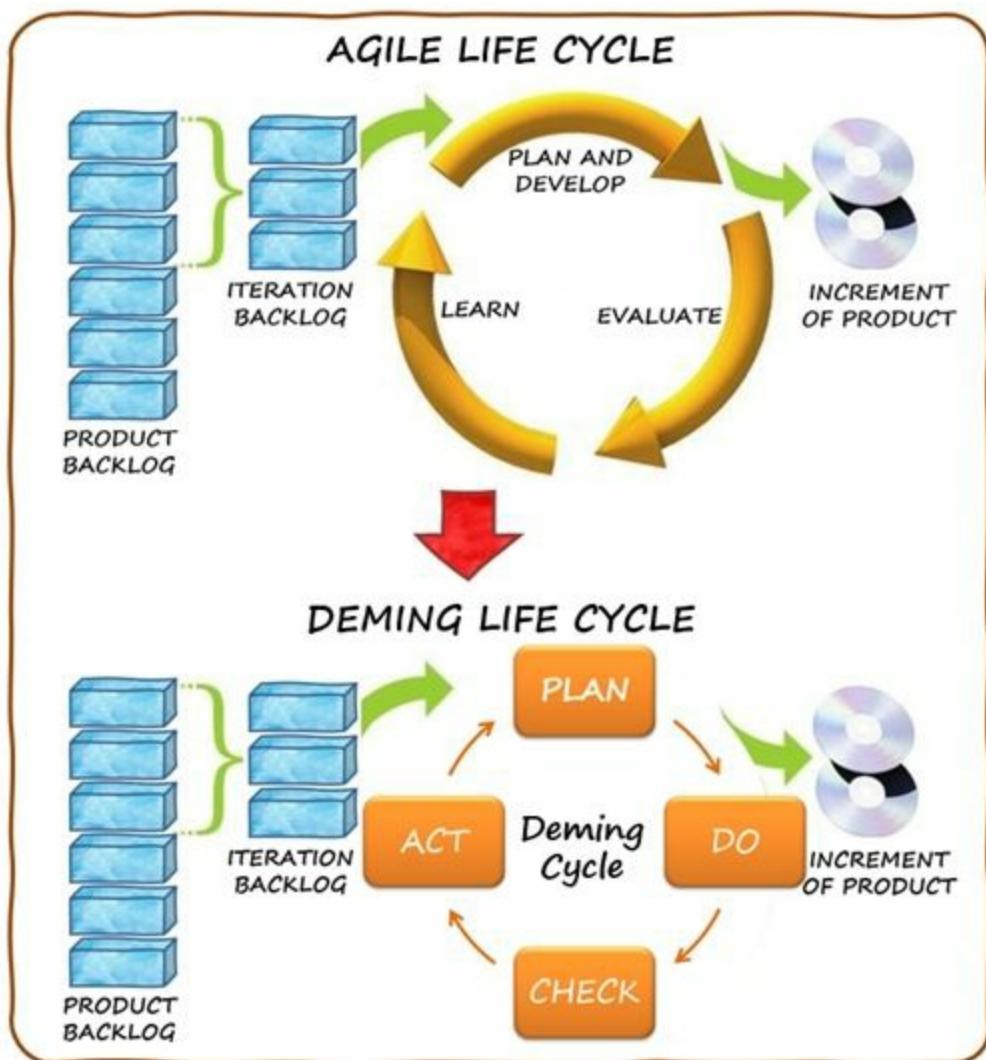
than fixing problems.

- Continue to monitor, measure, and adjust quality throughout the project life cycle.



Agile and Lean Quality Assurance

Agile approaches borrow many ideas from Lean thinking, such as the emphasis on quality and continuous improvement. Both agile and lean approaches aim to make waste visible so it can be reduced or eliminated through activities such as value stream mapping. They also promote frequent reviews to inspect the product or service being created. The plan, build, demo, retrospective activities of an agile iteration closely mirror Demming's Plan, Do, Check, Act (PDCA) quality cycle.

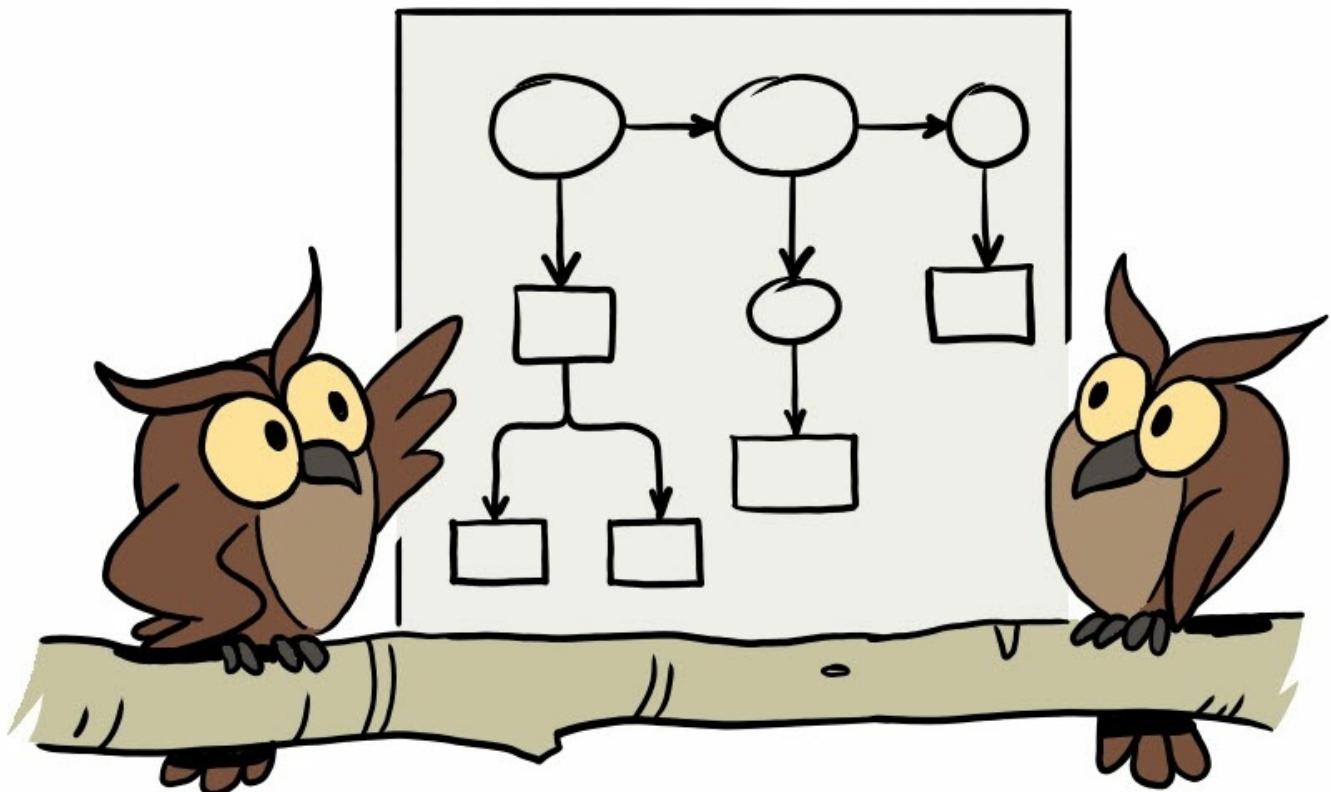


2.9 Integrate Planning Activities

Anyone managing more than one calendar understands the importance of integrating plans. If you try to track things separately, you will be doubled booked or miss something because you were looking at an incomplete view of your world. The same applies to projects, but more so since they engage so many people and activities.

Integrate Planning Activities makes sure all the separate plans for managing scope, schedule, costs, people, etc., are coordinated and integrated into a holistic master plan.

2.9.1 Consolidate the Project/Phase Plans



(Combine subsidiary plans into an integrated project management plan)

Project Management Plan

The term "Project Management Plan" has a special meaning in the PMP® exam. This is the name given to the master plan that integrates and consolidates all the subsidiary management plans. This includes baselines and other information necessary to manage the project.

The project management plan describes how the project will be run, monitored, controlled and closed. It includes the following subsidiary plans:

- **Stakeholder engagement plan** - How stakeholders will be engaged according to their

needs, interests, and impact.

- **Scope management plan** - How scope will be defined, developed, monitored, controlled, and validated.
- **Requirements management plan** - How the requirements will be analyzed, documented, and managed.
- **Schedule management plan** – How the schedule will be developed, monitored and controlled.
- **Cost management plan** - How the costs will be planned, structured and controlled.
- **Communications management plan** - How information about the project will be created, shared and confirmed and who to.
- **Risk management plan** - How the risk management activities will be designed and completed.
- **Quality management plan** - How the quality policies, approaches, and standards will be implemented.
- **Resource management plan** - How project resources should be classified, allocated, managed, and discharged.
- **Procurement management plan** - How goods and services from outside of the organization will be acquired and managed.



Lots of different plans are built, maintained and executed throughout a project. Having a single, integrated master source for all plans allows the PM to see how efforts align and dependencies flow between them. It can also help identify conflicts and gaps that will need correcting

Baselines

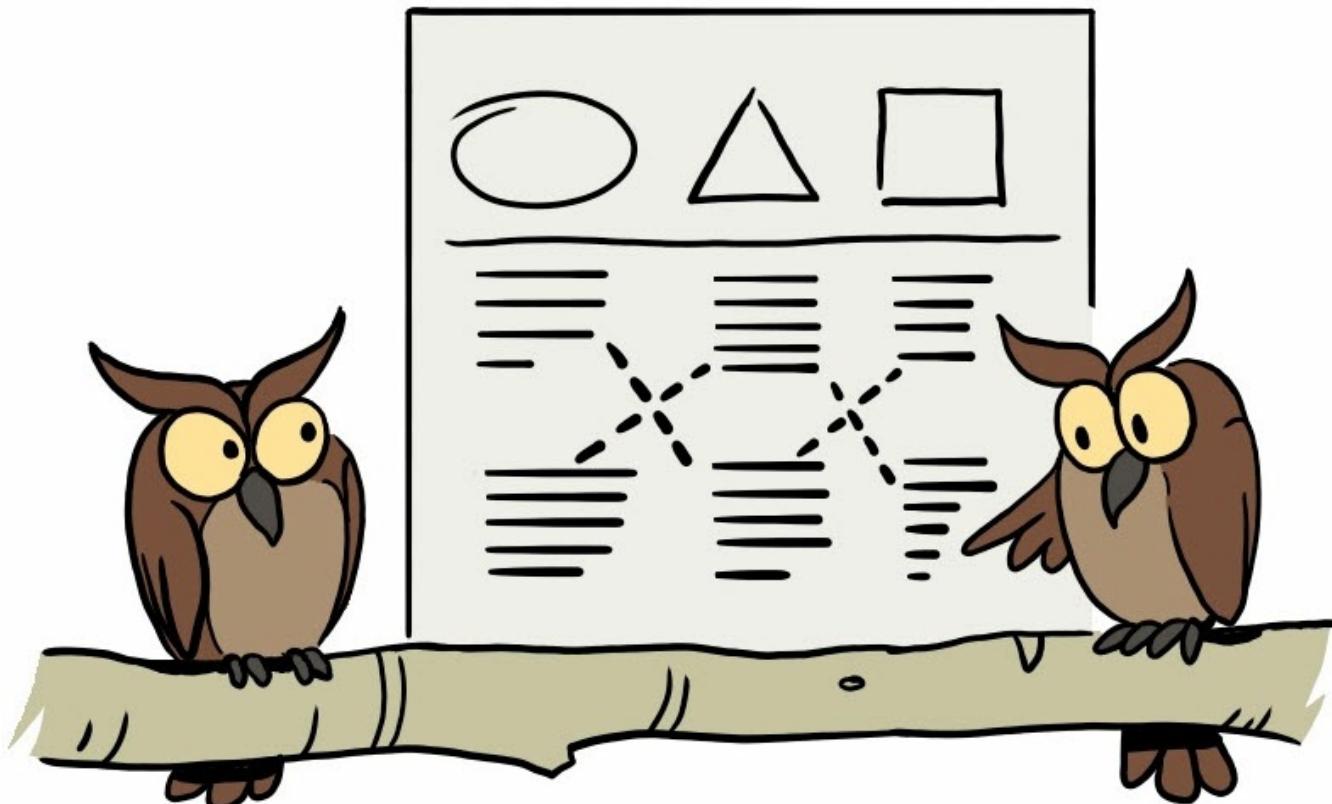
In addition to all the plans, the Project Management Plan contains any baselines used to track performance against. Common baselines include:

- Scope baseline
- Schedule baseline
- Cost baseline
- Performance measurement baseline

As the project progresses, actual values are compared to the baselined plan values for this point in time. If there is sufficient deviation from the baseline plan, corrective actions will be required.

2.9.2 Assess Consolidated Project Plans

Assess consolidated project plans for dependencies, gaps, and continued business value.



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(Once the plans are consolidated, check for any issues)

Once we have all the different plans assembled, we need to check the overall plan for untracked dependencies or missing activities/resources. Luckily these days, there are plenty of tools to assist us with these checks.



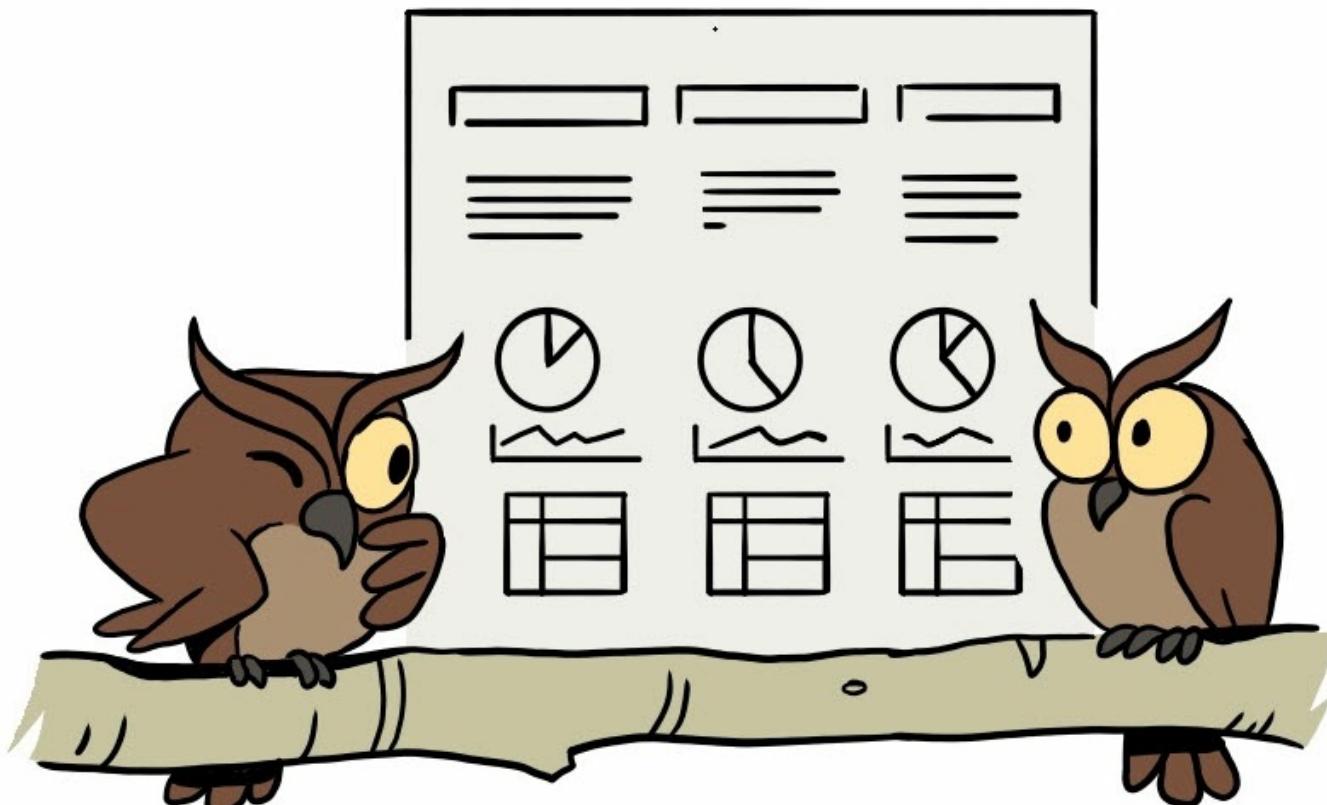
Project Management Information Systems (PMIS)

The PMBOK® and PMP® exam still refer to PM tools as project management information systems (PMIS), but you probably just know them as PM tools.

Tools popular on predictive, plan-driven projects include Primavera and Microsoft Project. For agile projects, there are hundreds, including Azure DevOps, Jira, Wrike, Target Process, Trello, Basecamp, etc.

These tools vary in functionality and ease of use but allow users to identify issues such as capacity limits, dependency violations, and skill gaps, etc.

2.9.3 Analyze the Data Collected



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(Review the consolidated plan and apply configuration management)

Some items need careful tracking; they need configuration management.



Configuration Management Plan

This plan (which is also a component of the project management plan) lists all the items under configuration management and defines how the change control board will work. It also explains how the change control system will be implemented and answers the following questions:

- What steps are necessary to evaluate the change request before approving or rejecting it?
- Who can recommend a change?
- What represents a change?
- What is the effect of the change on the project's objectives?
- When a change request is approved, what documents must be updated?

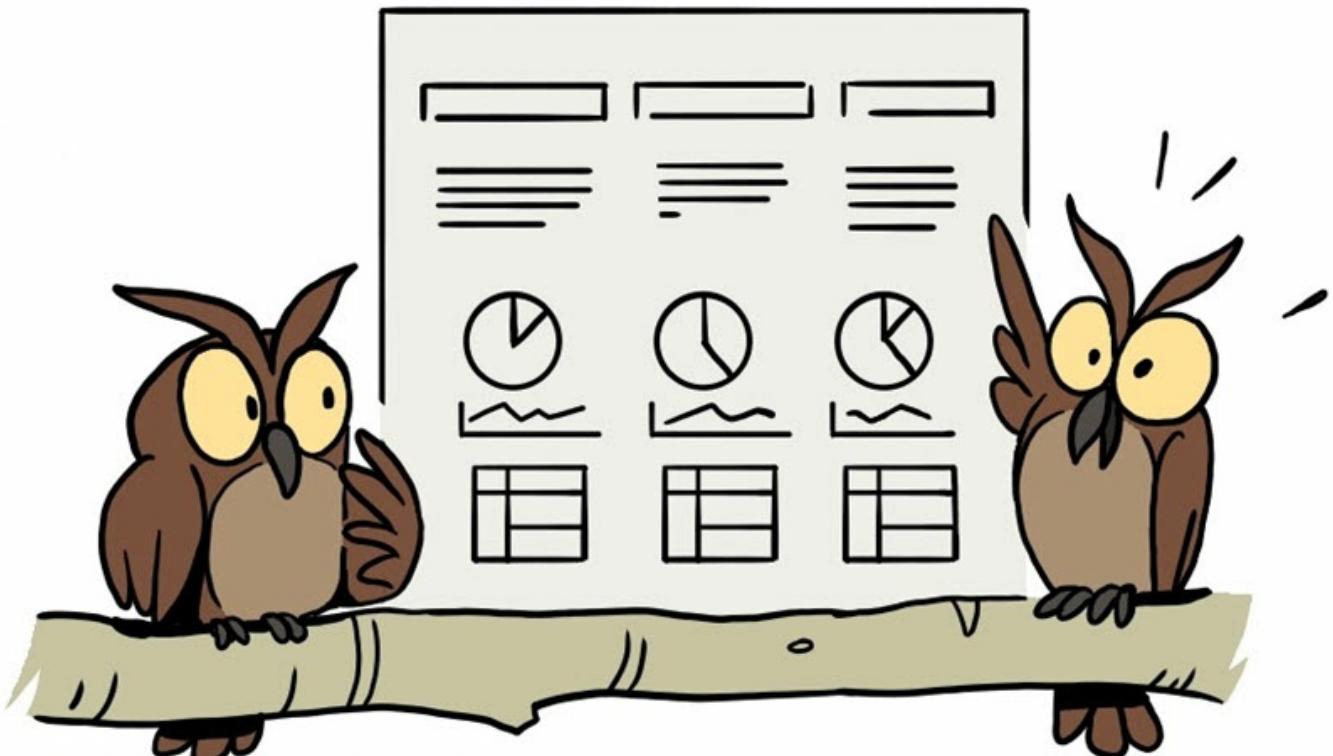


Configuration Management System

A Configuration Management System (CMS) is a collection of procedures used to track project artifacts.

These days, CMSs are usually computerized content management systems that allow monitoring and reporting on project artifacts. When a change occurs on the project, any associated configuration items should also be updated. The CMS maintains the change history of all components tracking what changed and who changed it to effectively control the versions of all the project components.

2.9.4 Collect and Analyze Data to Make Informed Decisions



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(Make intelligent decisions based on the information available)

"Planning is everything; the plan is nothing." - Dwight Eisenhower



This quote is a good reminder that the value of planning lies in the thinking and consultation process of planning, but the resultant plans will likely soon be out of date and not that useful. So, yes, we must plan, but do not get too attached to those plans. They were “today’s best guess” when they were made, but today we know more than yesterday.

Changes are inevitable, and so we should have a plan for changing our plans. This is where our Change Management Plan comes in.



Change Management Plan

This document explains how the change control process works and documents the roles and responsibilities of the change control board (CCB).

Organizational culture directly influences how an organization manages changes to a project.

An organization in a highly regulated environment tends to have a cautious, formal, and rigid culture. This leads to rigorous change management procedures, perhaps with multiple levels of approval. Organizations operating in new or rapidly evolving environments tend to have a lighter-touch approach to change.

The change management plan describes how changes will be managed and may include:

- Approval levels for changes
- The structure of the Change Control Board, if one is used
- The change control process
- The tools used to track and communicate change decisions
- The emergency change process



Change Control Boards

A Change Control Board (CCB) is a formally chartered group responsible for reviewing, evaluating, approving, deferring, or rejecting changes to the project. The board represents key stakeholders for the project and is tasked with assessing changes in terms of cost, schedule, risk, and value impact. They are created to manage all project change requests fairly.

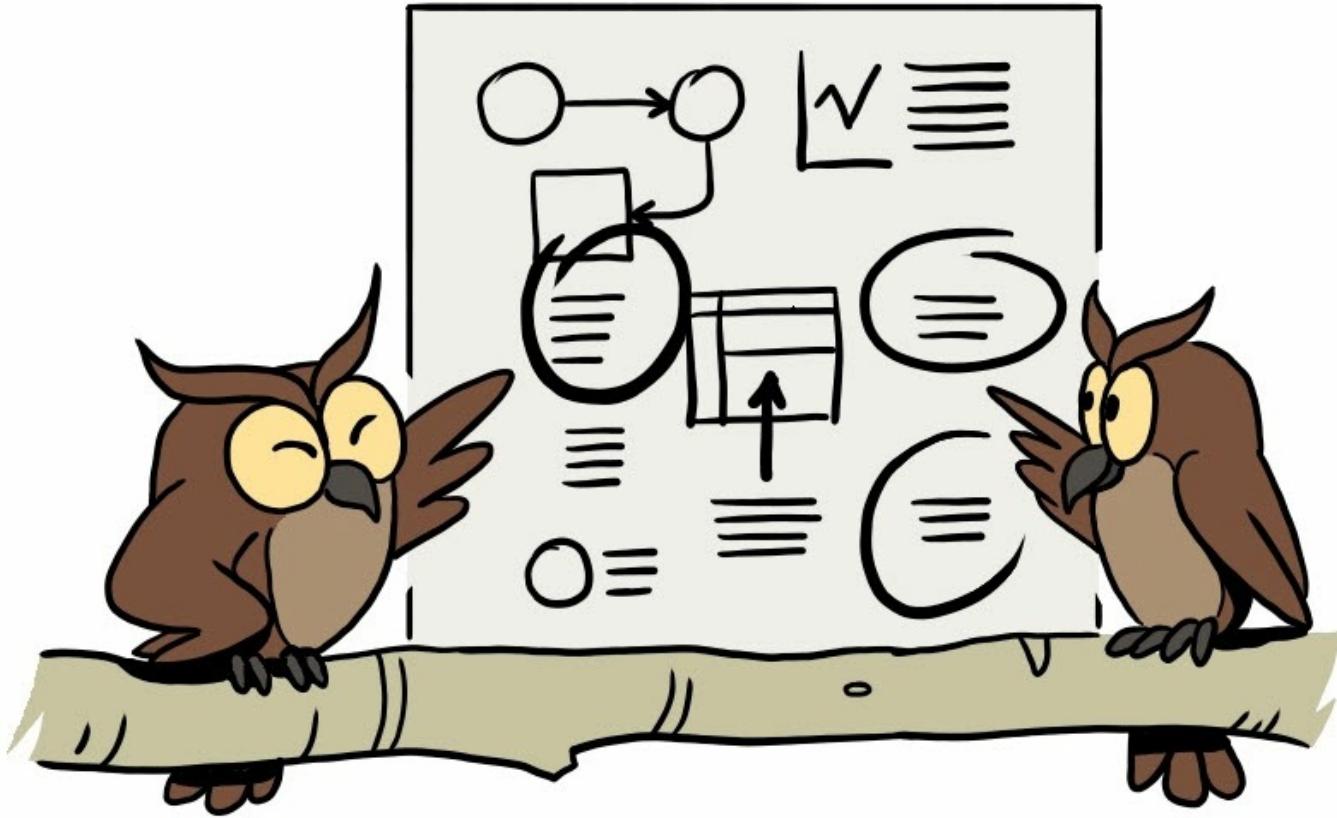


Planning in High Change Environments

Dynamic and complex projects require a robust and fast-moving approach to managing change. Agile approaches work well in these environments. Some agile approaches for managing change beyond the team level include:

- **Disciplined Agile (DA)** - a hybrid tool kit that lists hundreds of agile practices. It allows users to choose their “way of working” (WoW).
- **Scrum of Scrums** - A technique for operating Scrum for multiple teams. Focusing on how to integrate the delivery of software, especially in areas of overlap.
- **Scaled Agile Framework (SAFe®)** - A knowledge base of integrated patterns for enterprise-scale, lean-agile development.
- **Less (Large Scale Scrum)** – A scalable yet straightforward framework for taking the principles of Scrum and scaling them up to the organizational level.

2.9.5 Determine Critical Information Requirements



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(Continuously monitor progress, change requests, risks and issues)

As the project progresses, we need to continuously monitor change requests, risks, issues, and team performance. Then based on these factors and customer/sponsor guidance, update our plans to deliver project outcomes and comply with our organization's agreed procedures.



Compliance Management

Compliance management requires monitoring project information and comparing it to compliance goals and requirements. For example, most projects are governed by conditions such as:

- Appropriate government rules and regulations
- Corporate policies
- Product and project quality information
- Compliance categories
- Potential threats to compliance
- Analysis of the consequences of noncompliance
- Recommendations to address compliance needs



Traditional projects manage compliance and change through Integrated Change Management as described in 2.10 Manage Project Changes.

Using the processes described in this module, project managers integrate plans to help identify gaps, dependencies and constraints. Planning occurs throughout the project; whichever life cycle is adopted.

2.11 Plan and Manage Procurement

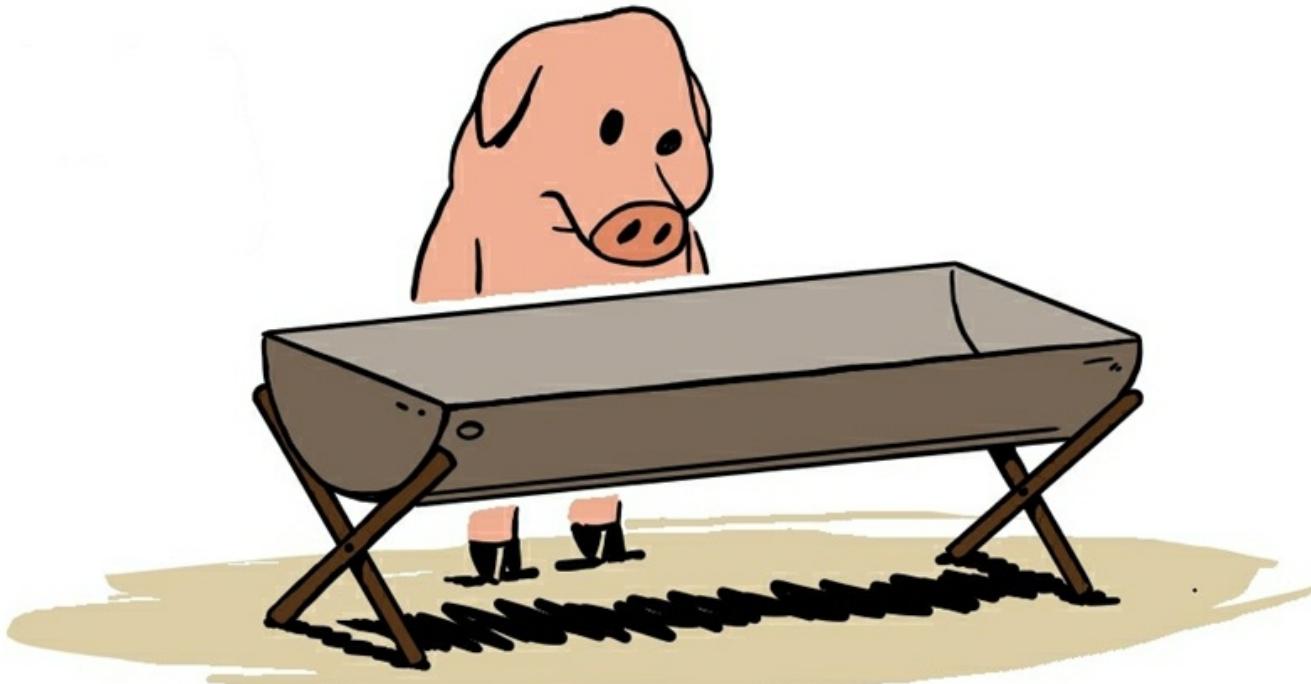
Managing procurement is a topic some project managers do not get exposed to much. Maybe your organization has a dedicated group that looks after this work. Perhaps all your projects to date have been internal or direct to a client, and nothing extra was needed.

Either way, procurement basics, including contract types and handling suppliers, are in the PMP exam, so we need to understand it. Also, even if you have a separate purchasing or procurement department, the project manager is often a critical stakeholder providing project-specific information and ensuring procurement issues do not negatively impact the project.



The terms “contract” and “agreement” might be used interchangeably.

2.11.1 Define Resource Requirements and Needs



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(Understand what the needs are)

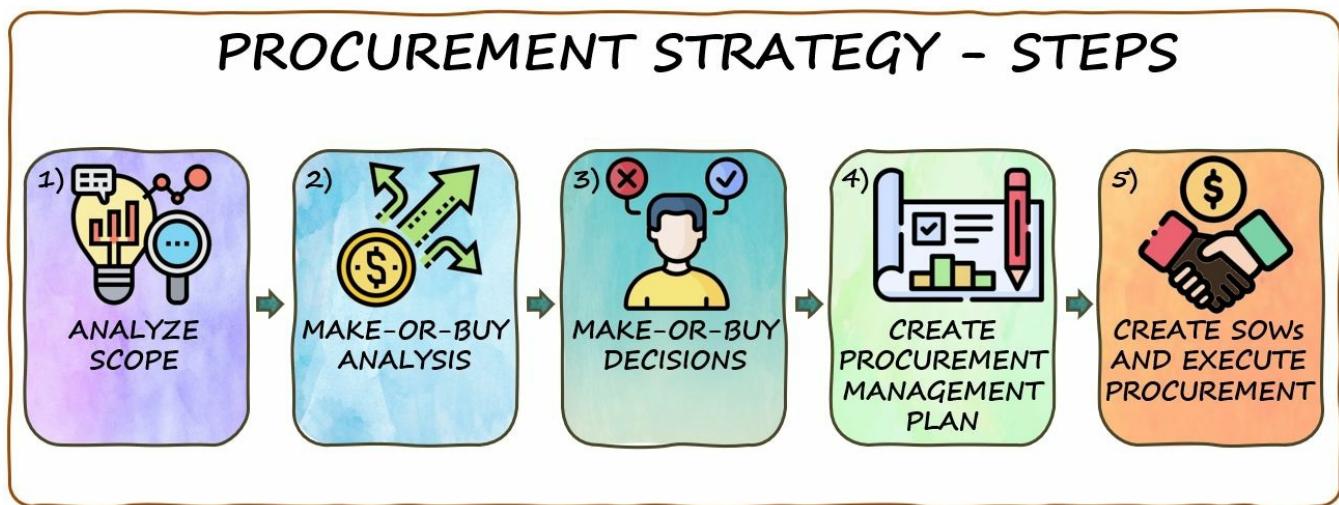
When planning a project, we analyze the scope to determine what will be required, either as part of a deliverable or something we will use along the way. Some elements we may already have on-hand, some things we can build ourselves. Everything else we have to outsource or buy, whether skills or goods, this is where procurement comes in.



Procurement Strategy

Procurement Strategy encompasses planning the procurement process. This includes

- Performing make-or-buy analysis
- Making the make-or-buy decisions
- Creating a Procurement Management Plan
- Creating a Statement Of Work (SOW) for each procurement



Make or Buy?

When performing make-or-buy analysis, information is gathered about product requirements and then an evaluation is performed between purchase or internal manufacture of the product. Factors evaluated include:

- Impacts on time, cost, or quality? (E.G., Do we have time to make it, or should we just buy it?)
- Do we have the skills? (Can we make it? Would it be as good as a bought one?)
- Is there an ongoing need for these specific skill sets? (Is it worth training or hiring for?)
- How steep is the learning curve?
- Are the required resources and skills available within the organization?

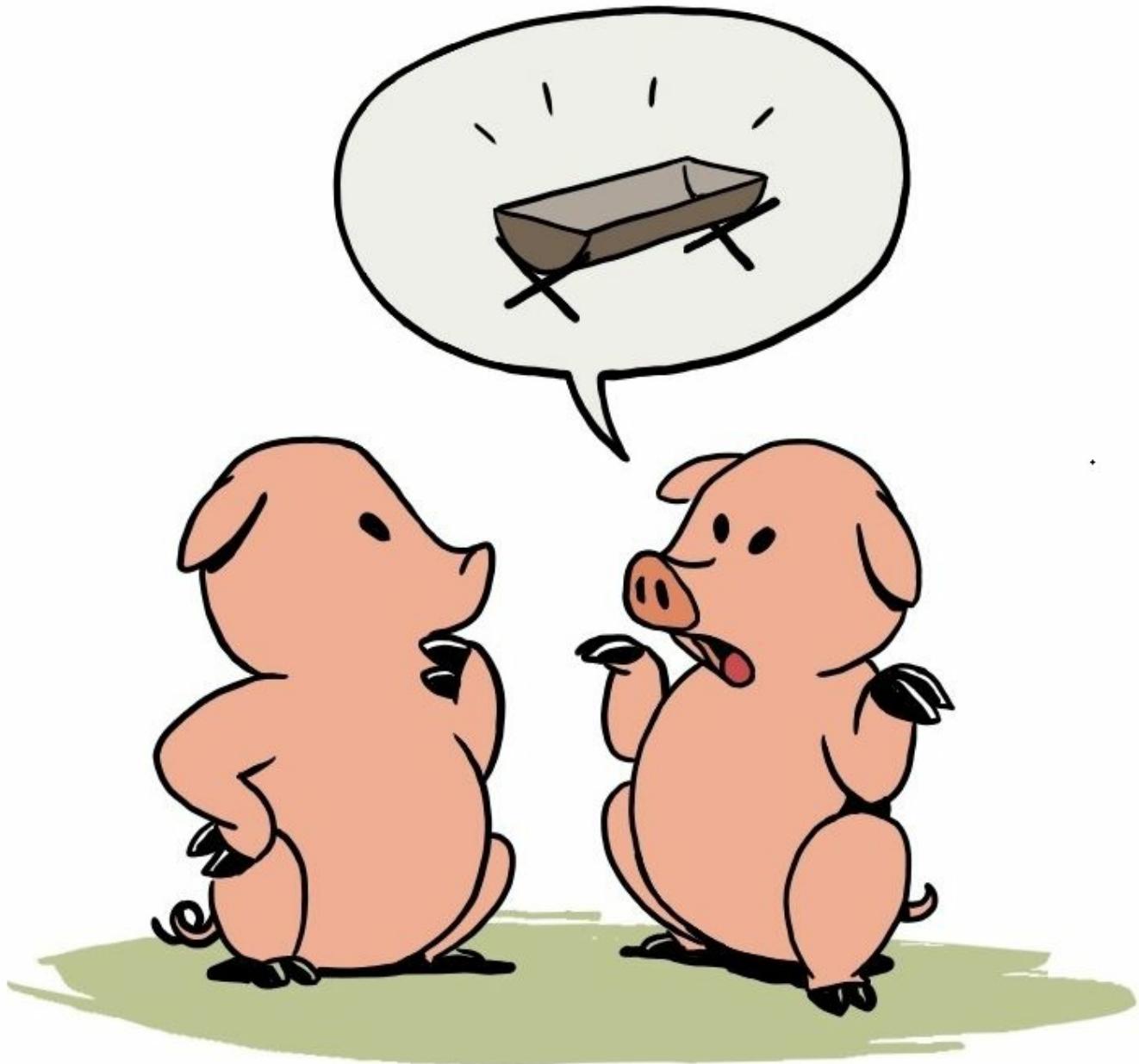
Procurement Management Plan

The Procurement Management Plan is a component of the project or program management plan. It describes how a project will acquire external goods and services. The plan defines:

- The timetable of key procurement activities
- Types of contracts to be used
- Process for obtaining and evaluating bids
- Procurement documents that will be used

- How multiple providers will be managed
- Any prequalified sellers

2.11.2 Communicate Resource Requirements



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(Describe the requirement)



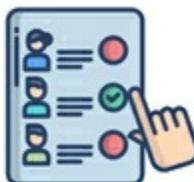
Communication

Once we know what we want to buy, we need to start communicating with prospective sellers.

Whenever dealing with people, especially external people, there is the potential for miscommunication. This could lead to a costly mistake when working in the field of procurement, so we should err on the side of over-communicating our objectives, the project needs, and success criteria.

Some tips for managing procurement communications include:

- Add vendors and suppliers to the Communications Management Plan and administer their details and communication needs like all the other project stakeholders
- Provide periodic progress reports of supplier activities
- Share notifications of potential supplier cost overruns, schedule delays or issues with relevant stakeholders
- Provide acknowledgments back to suppliers when they communicate to verify the message was received and ask for the same to confirm that communication is occurring
- Provide formal acceptance of supplier's contracted deliverables.



Source Selection Criteria

The set of attributes desired by the buyer. The list of things a seller is required to meet or exceed to be selected for a contract.

The types of things typically asked for by a buyer as source selection criteria include:

- Overall or life-cycle cost – *How much will it cost?*
- Understanding of need – *Demonstrate you know what we are asking for*
- Technical capability – *Can you do it?*
- Delivery and life cycle approach – *Tell us how you work*
- Management and technical approach – *Tell us how you operate*
- Warranty – *How long we want it guaranteed for*
- Financial capacity – *Tell us about your financials*
- Production capacity and interest – *Tell us about your capabilities*
- Business size and type – *Tell us about your org size and structure*
- Past performance – *What else have you done*
- Customer references – *Who can we go to for references?*
- Intellectual property right policies – *Our IP requirements*
- Proprietary rights – *Other rights and policies.*



Qualified Vendors

Sometimes we might have a set of approved sellers to choose from known in advance. These are qualified vendors approved to deliver products or services based on the procurement

requirements identified. The list of qualified vendors may come from historical information about different vendors, or if the requirement is new to the organization, market research can help identify qualified resources.

Qualified Vendors List

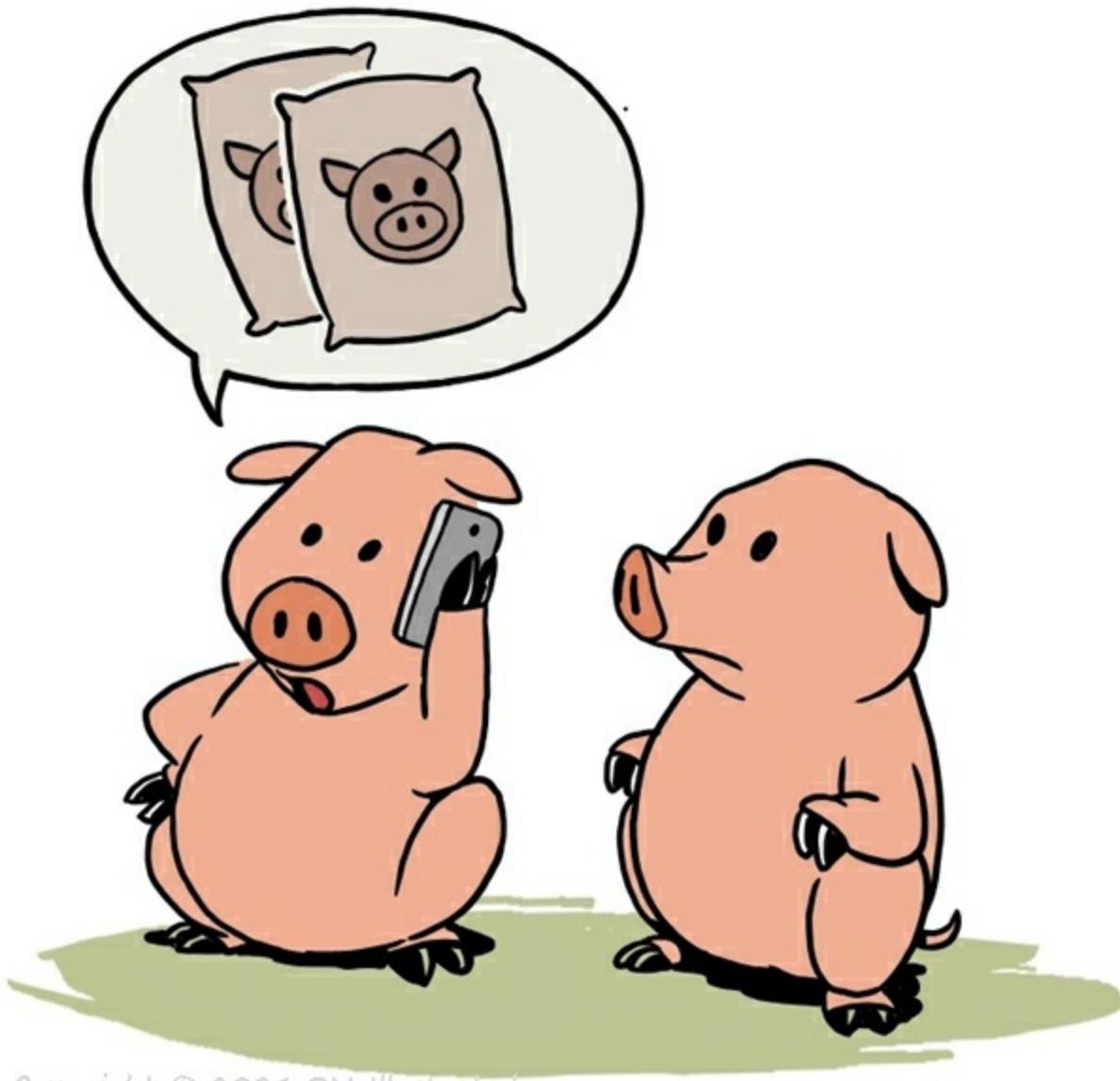
QUALIFIED VENDORS LIST

VENDOR	INDUSTRY/EXPERTISE	CAPACITY	STAFF	REPUTATION	REFERENCES
Picky Pallet Pet Produce	Gourmet animal feed supplies	1-50 sacks per week	30	Good, but costly	1) Paradise Pet Resort
Mungo's Budget Food Supply	Livestock / farm supplier	10-200 sacks per week	80	Cheap, popular, reliable deliveries	2) Jenkins farm 3) Silver Stables
Harris Livestock Supply	Livestock / farm supplier	1-100 sacks per week	10	New, high quality, and low prices	4) Porky's Farm
Nosh Nosh	Animal feed and pet outfits	1-50 sacks per week	25	Good but limited range	1) Paradise Pet Resort



When answering questions about procurement, assume you are the project manager for the buyer unless the question states otherwise.

2.11.3 Manage Suppliers/Contracts



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(Clearly outline what is required)



Contracts

Contracts are mutually binding agreements. They obligate the seller to provide the specified product or service and obligates the buyer to pay for it. Contracts are typically customized for each agreement and vary in type.

Components of Contracts

- Description of the work being done, its deliverables, and scope
- Delivery dates or other schedule information

- Identification of authority and decision making, where appropriate
- Responsibilities of both parties
- Management of technical and business aspects
- Price and payment terms
- Provisions for termination and dispute resolution
- Applicable guarantees and warranties

Common contract types include:

Fixed-price (FP) – a set fee that will be paid for defined work, regardless of the cost or effort to deliver. Suited for projects with high degrees of certainty about their scope and operating parameters.

- **Pros** - Provides maximum protection to the buyer
- **Cons** - Requires lengthy estimation and potential for padding by the seller.

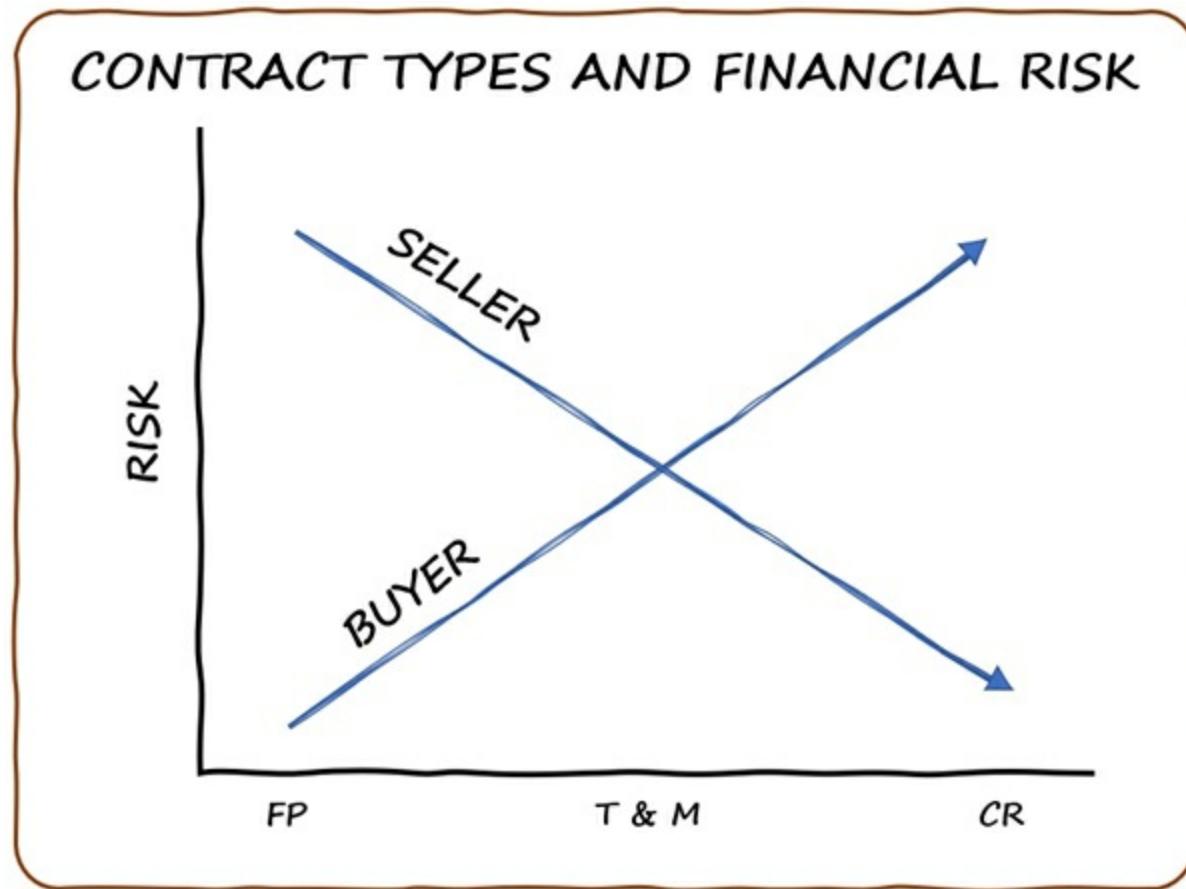
Cost-reimbursable (CR) – A contract that involves paying the seller for the seller's actual costs, plus a fee. This fee often represents the seller's margin or profit. Suited for projects where the scope or parameters are uncertain. Requires the seller to have an accounting system that can track all costs by project.

- **Pros** - Can be structured to include incentives for meeting schedule, cost or technical performance targets.
- **Cons** – The buyer bears most of the cost risk because the total costs are unknown.

Time-and-material (T&M) – A hybrid between Fixed-price and Cost-reimbursable where the buyer pays on a per hours basis plus the cost of any materials. It is suited for projects where the level of effort cannot be determined upfront.

- **Pros** – Good for projects that are difficult to estimate
- **Cons** – They can lead to cost and schedule overruns over long periods since the seller's profit is built into the hourly rate. So, there is no incentive for them to finish early. To limit this, T&M contracts often come with a Not-to-exceed clause.

Different contract types favor the buyer or the seller in the ownership of financial risk. These are shown below.



In a Fixed-price (FP) contract, the Buyer risk of a cost overrun is low as the price has been agreed on ahead of time. Conversely, the seller risk is high. Time and Materials (T&M) contracts with a not-to-exceed clause are somewhere in the middle. While Cost-reimbursable (CR) contracts have a low risk for the seller and a high risk for the buyer.



Statement of Work (SOW)

A Statement Of Work (SOW) describes a chunk of work in sufficient detail to allow prospective sellers to determine if they can provide the products, services, or results asked for.

SOWs are created from the project scope baseline and are sent to potential vendors. SOWs should be clear and specific as possible to avoid ambiguity or confusion.

If vendors are interested in bidding on the work, they respond, and the buyer evaluates their response. SOWs form the basis of other procurement documents used during the procurement process.



Bid Documents

Bid documents are used to ask for proposals from sellers. Depending on the goods or services needed, the bid documents can include a **Request For Information (RFI)**, **Request For Quotation (RFQ)**, **Request For Proposal (RFP)**, or other documents. Each is typically used when:

- **Request for information (RFI)** - when more information on the goods and services is needed from the sellers. Typically followed by an RFQ or RFP.
- **Request for quotation (RFQ)** - when more information is required on how vendors will satisfy the requirements and/or how much it will cost.
- **Request for proposal (RFP)** - when the solution is not easy to determine. This is the most formal of the RFx documents and has strict rules for content, timeline, and seller responses.

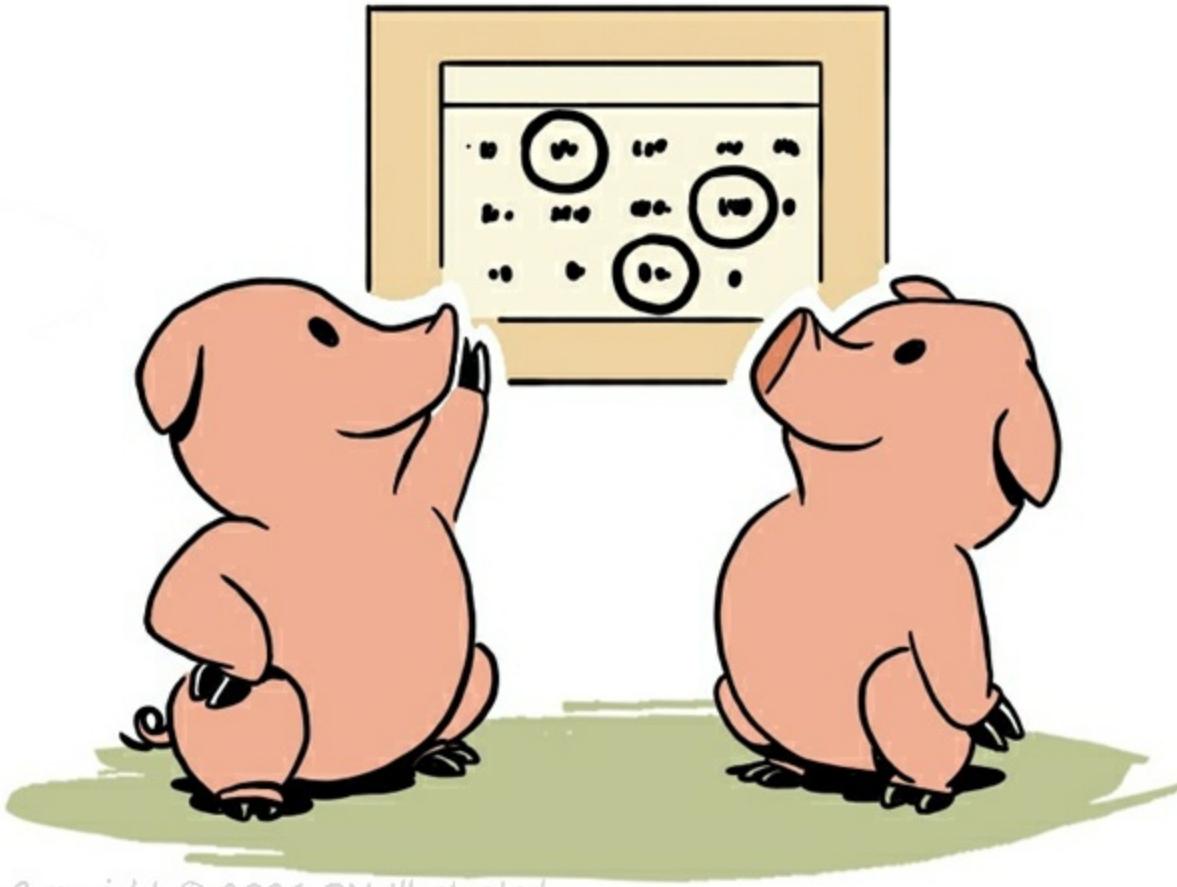


Bidder Conferences

In addition to sending out documents, organizations often hold meetings prior to submissions of a bid or proposal by the vendors. These meetings explain the requirements, terms, and conditions, and answer vendor questions.

Bidder conferences aim to ensure all the vendors have a clear and common understanding of the technical and contractual requirements for the procurement. These bidder conferences might also be known as pre-bid conferences, pre-proposal conferences, vendor conferences, or contractor conferences.

2.11.4 Plan and Manage Procurement Strategy

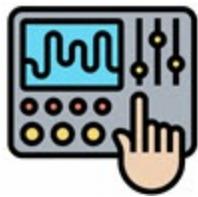


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(Put procurements in a/the plan and manage them like mini-projects)

Once an organization has evaluated the responses from sellers and selected a vendor, they then need to manage the procurement process to ensure they get what they asked for. Also, as the project progresses, they may need to handle additions, changes, and disputes.

In short, procurements need to be tracked and managed like a mini-project in their own right.



Control Procurements Process

The Control Procurements process is the act of managing procurement relationships, monitoring contract performance, making changes and corrections as appropriate, and finally closing out contracts.

Procurement activities are integrated into the overall project plan to ensure:

- The vendor's work is sanctioned to begin at the appropriate time.
- Performance reporting to monitor vendor costs, schedule, and technical performance.
- Change control is in place to ensure that changes are managed and properly approved.
- Quality controls exist to ensure that the quality of the vendor's product or service meets

requirements.

- Monitor and control any project risks associated with vendors or their work to ensure that the risks are correctly managed.



Because agile approaches are frequently used when it is difficult to define requirements, this can lead to procurement and contract challenges. Without detailed, unchanging statements of work, many vendors are understandably reluctant to enter into fixed-price contracts. Some of the contract types that have been created to mitigate this risk include:

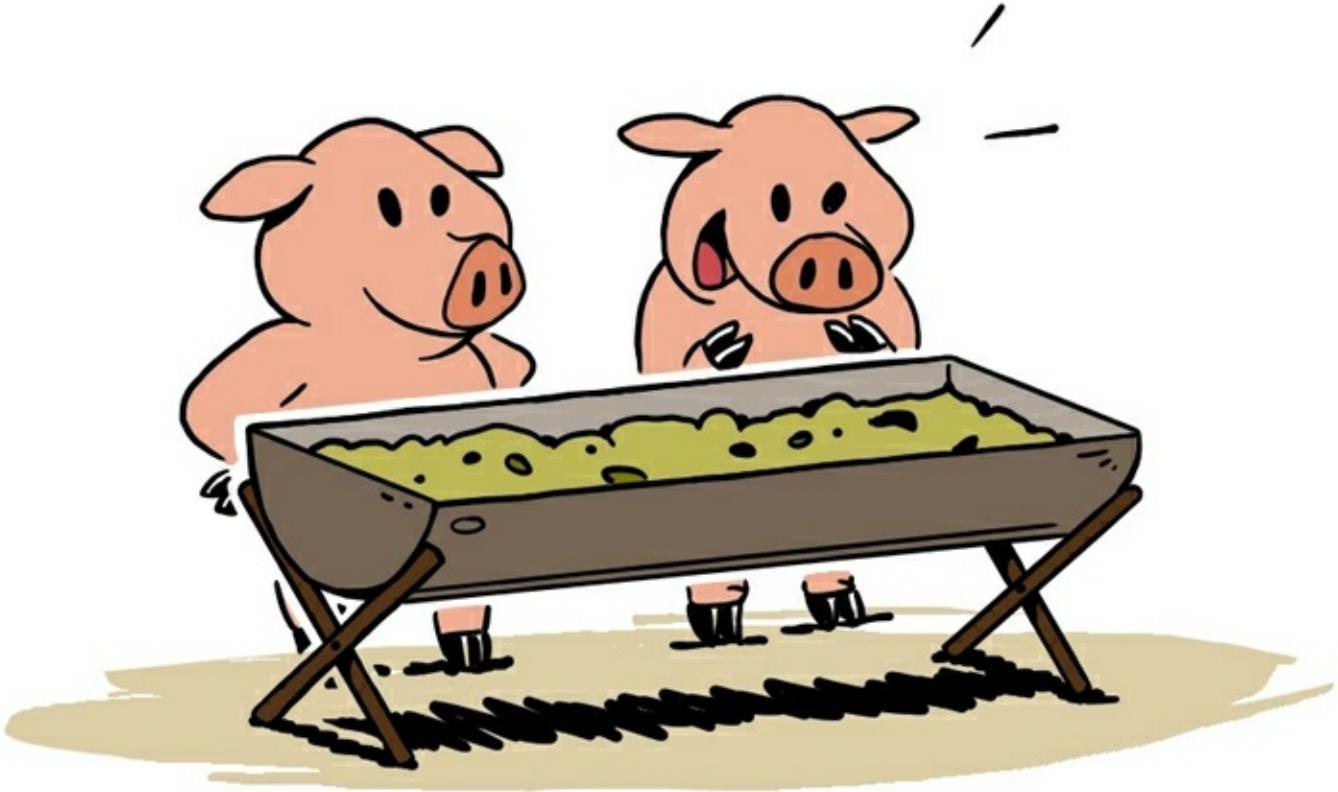
Incremental Delivery Contracts use small work packages to reduce the risk of under or over-estimating a large piece of work by breaking it down into smaller chunks. Single, large SOWs are split into smaller work packages, each with its own fixed price. As the work progresses, the vendor can re-estimate the remaining work packages based on new information.

Using incremental delivery contracts with fixed-price work packages allows the customer to reprioritize remaining work based on evolving priorities and costs. It also removes the need for vendors to build excess contingency funds into the project cost.



Due to the popularity and growth of agile approaches, the need and interest in conducting procurement aligned to agile projects have expanded. Organizations such as [Lean and Agile Procurement \(LAP\)](#) have sprung up to provide examples, case studies and training. Project managers tasked with procurement in these environments will likely find many valuable ideas.

2.11.5 Develop a Delivery Solution



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(Check quality and manage changes)

Even when the contract is in place and the vendor/seller is providing goods or services, we still need to periodically check the quality and manage changes.

Changes to contracts are tracked and managed via a Contract Change Control System.



Contract Change Control System

The system and process used to collect, track, adjudicate and communicate changes to a contract. It might be part of the project's integrated change control system or its own separate system. It specifies the process for handling contract changes and includes documentation, the dispute-resolution procedures, and approval levels needed to authorize the changes to contract details.

Standard contract change types include:

- **Administrative changes** - non-substantive changes of something minor. These are the most common type of changes. For example, “*Payment terms have been changed from Net 90 days to Net 60 days.*”

- **Supplemental agreement** – a new, additional agreement that may be related to the contract but is negotiated separately. For example, “*Starting July 1st, 2 sacks of donkey pellets will be added to the weekly order for pig food.*”
- **Contract modification** - a substantive change such as a new deadline or a change to the product requirements. For example, “*Starting July 15th, all deliveries must be made by lunchtime (12:00 noon) to avoid a 10% angry pig holdback.*”
- **Constructive changes** – any changes the buyer causes through action or inaction. For example, “*Due to sleepy pigs in warm weather, delivery quantities will be reduced by 20% July - September.*”
- **Termination of contract** - A contract may be terminated due to vendor default (issues or at the customer’s request. Defaults include late deliveries, poor quality, or non-performance of project requirements. For example, “*Due to a failure to deliver pig food when scheduled, the petting zoo is terminating the food contract and will be switching to a different supplier effective August 1st.*”



Disputes and Legal Concepts

Of course, these changes are not always popular or thought of by the buyer or seller as fair, so disputes can occur. Legal action is also sometimes threatened or taken. The legal concepts project managers need to be aware of when dealing with procurement include:

- **Warranty** - A explicit or implied promise that goods or services will meet a pre-defined standard. The standard may cover reliability, safety, quality, fitness for use, etc.
- **Waiver** - The giving up of a contract right, even if it occurred inadvertently.
- **Breach of contract** – The failure to meet some or all of the requirements of a contract. It could result in damages paid to the wronged party, litigation, or other consequences.

- **Cease and desist (C&D) letter** - A letter sent to a person or business to stop (cease) the allegedly illegal activities and do not do them again (desist). C&D letters are often used as an indication of forthcoming legal action if it is disregarded.



Closing Procurements

The terms and conditions of a contract typically specify how contracts are closed out. These terms should also be in the procurement management plan. Usually, a written notice is provided to the seller when the agreement is complete. Procurements can be closed at any time throughout the project's life, not only at the end.

The project manager should ensure that the seller provided all the required products or services and settle any remaining invoices and payments. Also, address any outstanding contracting issues. Some organizations may conduct a procurement audit to identify successes and failures of the procurement process and evaluate the seller's performance.



Since there may be many procurements in a single project, we often execute the "Close Procurement" activities much earlier than Close Phase or Close Project activities.

2.14 Establish Project Governance Structure

PMI defines Project Governance as “*The framework, functions, and processes that guide project management activities in order to create a unique product, service, or result to meet organizational, strategic, and operational goals.*”

Put another way, Project Governance is our structure for working. It helps ensure everyone makes the right decisions.

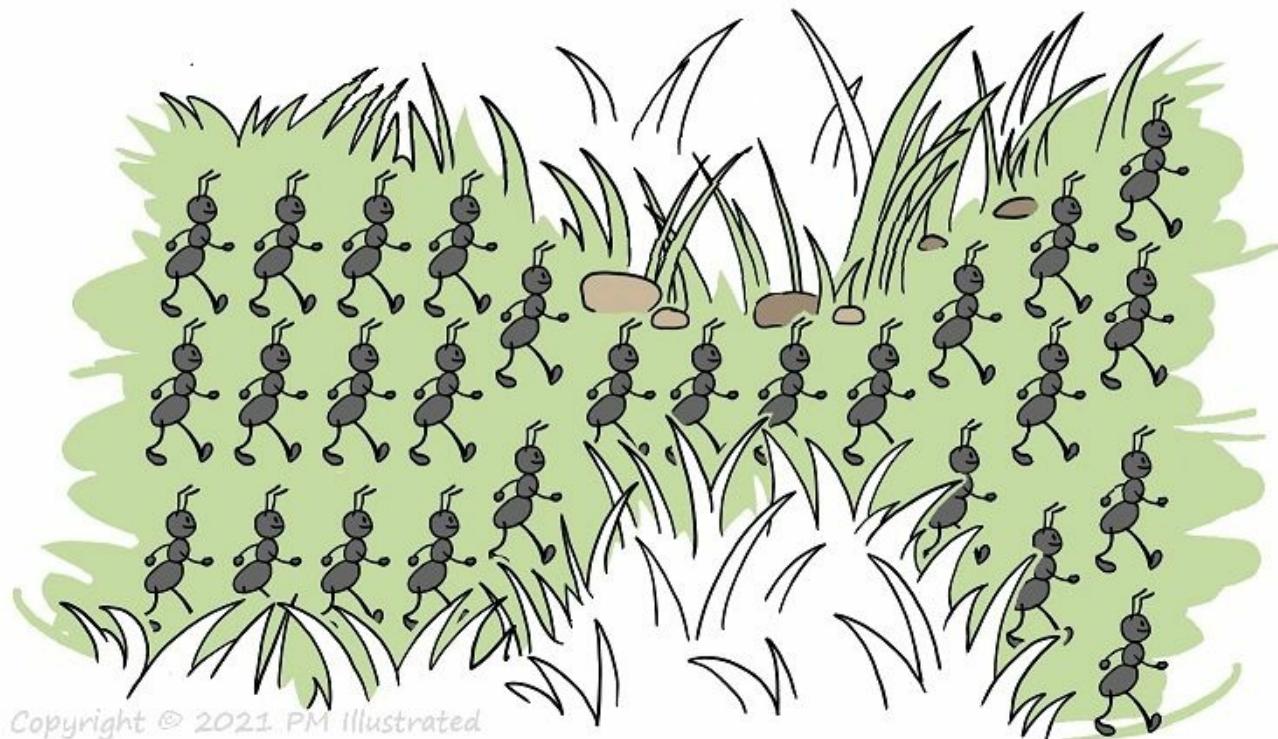


To some people from the agile community, the word "Governance" sounds controlling. A little Big-Brother-ish, heavy on oversight and direction, but as we saw in the definition above, *Governance* just means "How we are going to work." So, if you are following Scrum or XP, you have already established a governance structure for your team and business representatives.

For example, we know that the Product Owner gets to decide what goes into the product backlog and the priority of work items. Likewise, it is the team that creates estimates and makes their own local decisions. These are examples of project governance at work.

2.14.1 Determine Appropriate Governance for a Project

(E.G., replicate organizational governance)



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(Define, communicate and get agreement on project governance)

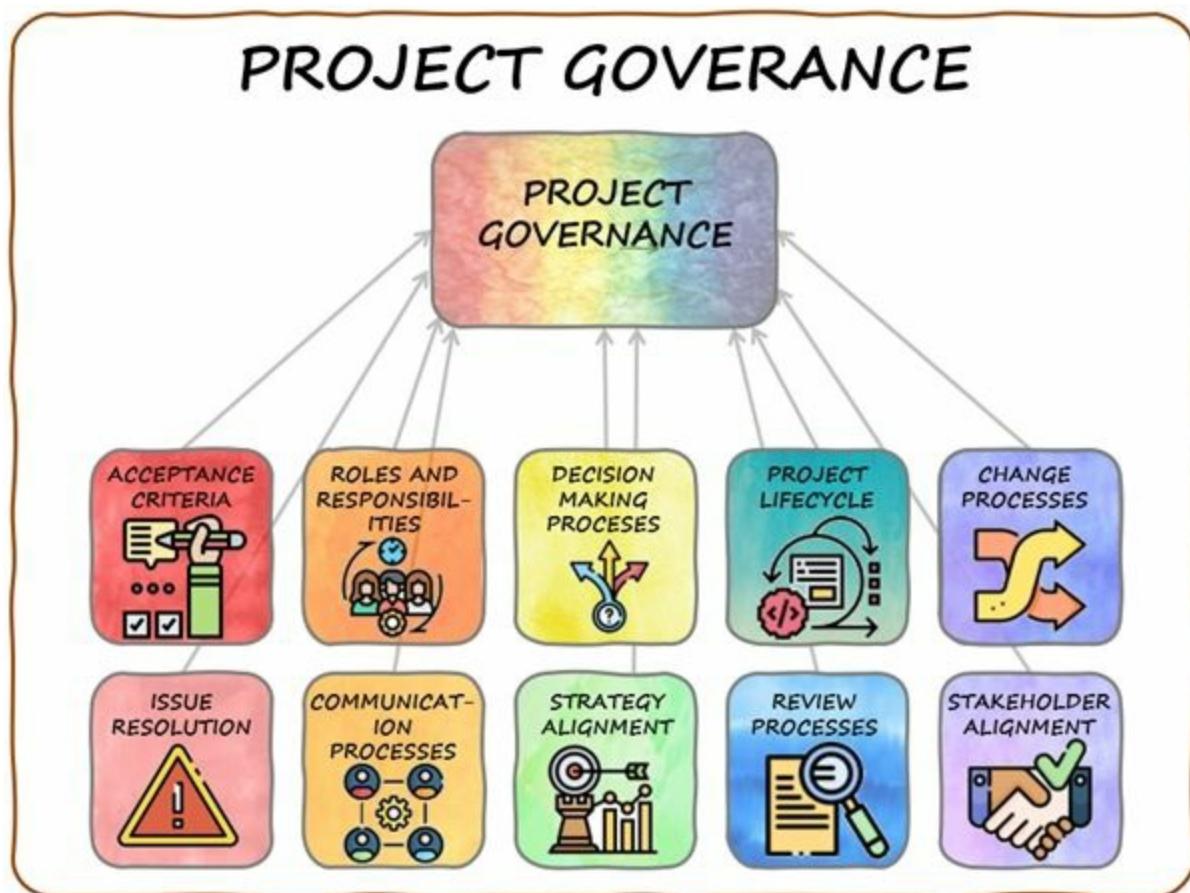
Governance typically starts at the top of a hierarchical organization. Owners, executives and stockholders decide on the strategy that ripples down to the selected and funded portfolios, programs, products and projects.

Then we get involved as project managers, Scrum Masters, team leads and project team members to execute these projects and product development activities. While we typically get some leeway and autonomy to run these initiatives, they must be compatible and aligned with the broader organizational governance structures.



Components of Project Governance

Project governance covers the full spectrum of how the project will work and operate. This includes the life cycle, how we will handle changes, make decisions, align with others, etc. The image below depicts some standard governance components.



- **Acceptance Criteria** - How will deliverables and project success be approved, and by who?
- **Issue Resolution** – How problems and issues will be resolved
- **Roles and Responsibilities** – Who does what in the project team, other groups, and external stakeholders
- **Communication Processes** - The forms and procedures for communicating
- **Decision-Making Processes** – How do things get decided, and who is involved at each level
- **Strategy Alignment** - Guidelines for aligning project governance and organizational strategy
- **Project Life Cycle** - Which life cycle approach will be used
- **Review Processes** – How will increment or stage-gate and phases be reviewed
- **Change Processes** – How changes will be handled, including who is involved for review and approval of changes above the project manager's authority
- **Stakeholder Alignment** – The process to align internal stakeholders with project process requirements



Guidelines to Determine Appropriate Governance for a Project

- **Start with the right model** - Generally, we should choose the most appropriate governance goals for our type of project and then try to keep them simple. So, if undertaking a knowledge work type project with a high possibility of change, we likely want to use an agile approach and make sure everyone understands the implications and roles involved. Or, in a well-understood and predictable domain, use a traditional life cycle.
- **Be Transparent** - We should also document and publicize our governance processes, so they are transparent to all the relevant project stakeholders. We want to eliminate confusion or people not knowing what is going on. Task boards and information radiators make our work visible. People can see what we are working on, what is coming next and what has just been completed. Likewise, visual impediment lists, risk lists and team calendars help show additional project information.
- **Governance evolves** - remember that governance is an evolutionary process, and we should take advantage of the lessons learned as we execute the project. Phase gate reviews and retrospectives are great opportunities to discover what can be improved and instigate enhancements.

2.14.2 Define Escalation Paths and Thresholds



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(Agree how you will handle exceptions, ahead of any occurring)

Don't wait until there is an issue before discussing how to handle problems. People will be emotional and difficult to reason with or gain consensus among. This is why we create and gain agreement on fire evacuation plans before there is a fire. The same goes for handling project problems and breaches of agreed governance processes.



Traditional projects are often divided into phases. After each phase, there is typically a Phase Gate that is a review point. As shown below.

PHASE GATE REVIEWS



Phase gates (also known as governance gates, tollgates or kill points) are predetermined review points where a decision is made to:

- Continue to the next phase
- Continue with modification, or
- End the project or program.

They are used to check if each phase has fulfilled the exit criteria and is eligible to move to the next step. They may review many aspects of the project, including progress, spend, sponsor confidence, user feedback, and product quality.



Escalation

Phase gate reviews typically include sponsors, PMO or steering committee members. Rather than the project manager, these stakeholders get to decide if the project continues, gets modified, or stops. They act as gatekeepers and advisors at a level above the authority of the PM. Issues and risks that occur during a phase should be escalated to this group if they threaten the acceptance criteria for a phase gate.

Be proactive, do not wait for the phase gate review to report a problem. First, try to address it within the project team. If that is not possible, escalate the issue and seek guidance from your PMO, program manager or steering committee – whoever is assigned for escalated issues.

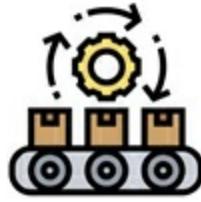


Phase Relationships

Most organizations use a **sequential relationship** between phases. Meaning subsequent phases only start when the previous phase is complete and passes the phase gate review. This reduces the risk and uncertainty levels but may reduce options for shortening a project's schedule.

Some organizations use **overlapping relationships** between phases meaning they allow elements to run in parallel. This enables workstreams to occur simultaneously, reducing the

project schedule. However, it increases the level of risk and may cause rework if something from the previous phase directly affects other currently executing to subsequent phases.



Applying Governance to the Project Life Cycle

When executing traditional life cycle projects, consider the following recommendations:

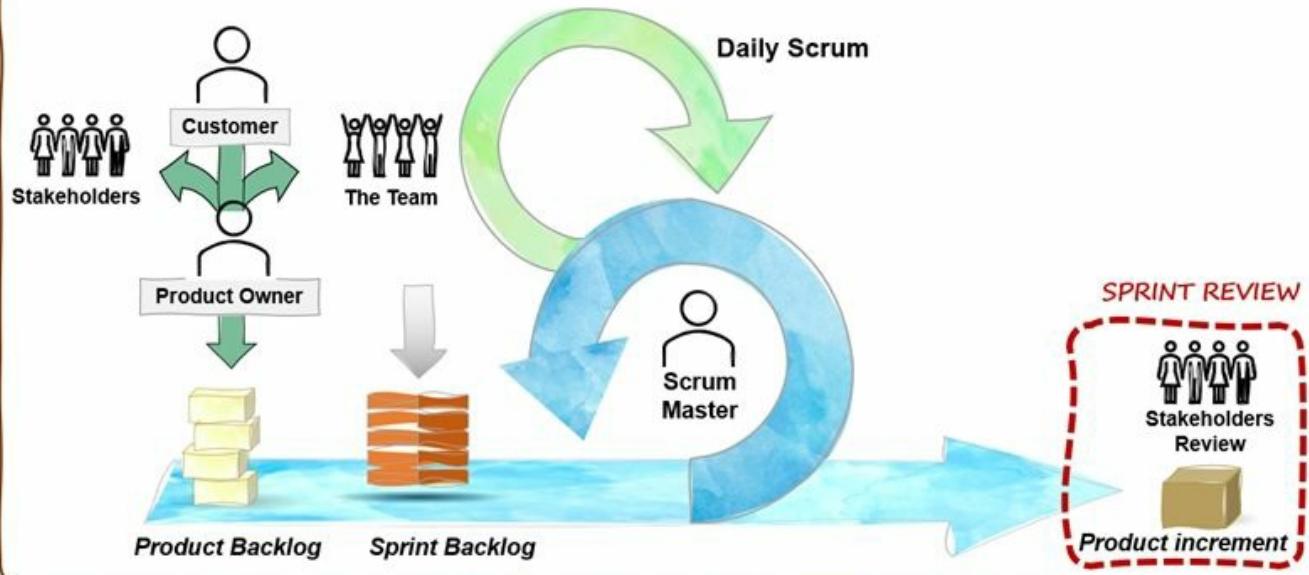
1. At the beginning of a phase, check the assumptions and risks associated with the phase's deliverables. Ask: Are they still valid? Has anything changed? Does it still look like we can successfully produce the required deliverables knowing what we do now, or do things need to change?
2. After the phase's deliverables are produced, review them to ensure completeness and acceptance. This will pre-empt any nasty surprises at the phase gate review. Be a harsh critic and look for reasons someone may object to passing the phase gate – then address any potential issues.
3. Understand a phase can be closed or the project terminated when significant risks are discovered for the project or when the objectives are no longer required. While disheartening, this is actually a good thing. We need to stop pouring time, money and talent into bad ideas and instead divert them to more productive endeavors.



Agile Governance

Agile projects typically operate without phase gates, but similar governance is ever-present. Every Sprint/iteration demo is a mini phase gate review where the product owner and other stakeholders review and evaluate the project's performance. They get to see the rate of progress and quality of the emerging deliverables while also learning about issues, budget consumed and likely completion dates.

AGILE REVIEW POINTS



As a result of the review, the product owner might reprioritize the product backlog, update the release roadmap or work with the Scrum Master and team to adjust plans or objectives. Hopefully, most of the time, the message is “Continue as you are,” but changes and even project termination are real options.

Most changes are handled by the Product Owner, who has been given autonomy to direct the project within the bounds of the charter. However, if issues, changes or general lack of progress threaten the planned benefits, the Product Owner will escalate concerns to a Product Manager, PMO or program manager similar to traditional projects to gain direction.



Hybrid Governance

Some organizations use a combination of traditional and agile governance models. They might start with a proof of concept followed by a review. Then if everything looks promising, approve agile development of the product or service.

Optionally, some organizations insert a review before final delivery. Maybe to ensure additional checks and assurances are performed prior to distribution. Perhaps to engage a larger group in the final acceptance.

HYBRID REVIEWS



As with all hybrid approaches, there are many ways of blending traditional and agile techniques together. (Whether they are needed, add value, or are inserted as an emotional or political crutch can be debated. Typically, organizations that use hybrid approaches have a valid reason for doing so, even if it is just easier than changing the surrounding mindset.)

Final Thoughts

Governance describes how project ecosystems work. While there is no single universally best model, making sure everyone understands the processes in play and having options to update them when necessary is universally beneficial.

2.17 Plan and Manage Project/Phase Closures or Transitions

Begin with the end in mind – Stephen Covey

End with the beginning in mind – Christopher Avery

Plan and Manage Project/Phase Closures deals with finalizing all activities for the project, phase, or contract. Just like starting a project, we should have a plan for wrapping one up as well.

This entails looking back at what we said we would do, and making sure we did it.

2.17.1 Determine Criteria to Successfully Close the Project or Phase

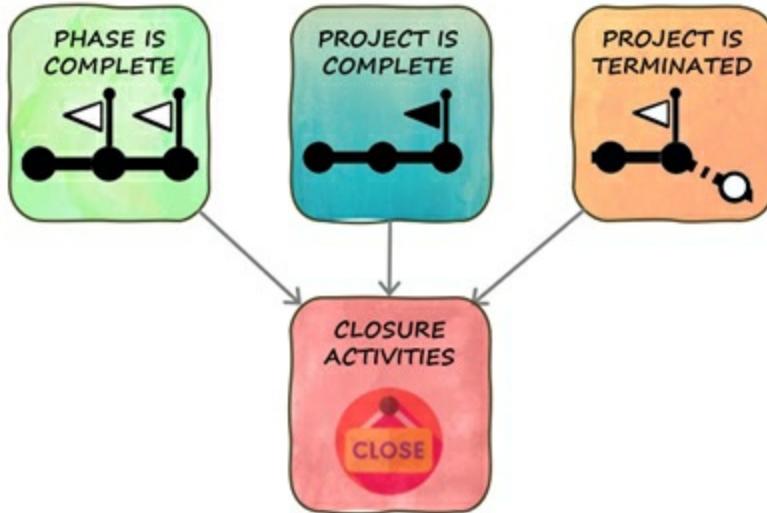


(Understand what success looks like and the route there)

Closures can commonly occur in three scenarios:

- 1) Closing one phase of a project and moving onto the next phase
- 2) The project runs its course and completes largely as planned
- 3) The project is stopped due to a problem, lack of funds, or change in business case

REASONS FOR PROJECT / PHASE CLOSURE



Sometimes external factors might arise that impact the project viability or business case. These could include: a change in laws or regulations (e.g., Bitcoin mining deemed illegal in a country), a merger or acquisition that affects the organization (e.g., Kraft bean products after the Heinz acquisition), or global or national economic changes (e.g., the cruise and airline industries during COVID-19.) Stuff happens outside of our control, and we need to deal with it.

Whatever the cause, we need to archive relevant information and confirm what planned work was completed. We might also need to release people to pursue new endeavors and close-out procurements.

2.17.2 Validate Readiness for Transition

Full ECO title: Validate readiness for transition (e.g., to operations team or next phase)



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(Determine when it is time to close a phase or project and move on)



Acceptance criteria

Acceptance criteria are the set of conditions required before deliverables are accepted. They may have been set at the beginning of the project (as requirements, performance goals, quality measures) and then, potentially, modified during the project. Deliverables that meet the acceptance criteria are typically signed-off and approved by a customer-representative or sponsor.



User Stories and Definition of Done

Agile teams typically develop the acceptance criteria for a user story as they outline their understanding of what is required. Back in the old days, when user stories were written on cards, the front of the card contained the story, and the back of the card contained the acceptance criteria.

Agile teams also develop a Definition of Done in collaboration with the Product Owner to help ensure acceptance criteria is considered before declaring a piece of work as Done. The Definition of Done for a software project might include:

- All unit tests pass
- The code has been reviewed
- Refactoring is complete

- Functional tests passed
- Acceptance and regression tests pass
- Non-Functional requirements met
- The code is documented
- The Product Owner has reviewed and accepted the User Story



Preparing for Transition

Before we hand over any new product or service, it is smart to prepare the receiving group for what will be arriving. This helps reduce the likelihood of surprise, confusion, or push-back. An important role for a project manager is to anticipate potential issues and help reduce or remove them. Think of it as greasing the tracks ahead of the change to help things go more smoothly, with less friction.

This includes considering the customers/clients as well as any support/sustainment groups. Having proper coordination and strategy for transition increases usage and adoption of project outputs. Preparation deliverables will likely include:

- Communications
- Documentation
- Training
- Support

2.17.3 Conclude Activities to Close Out Project or Phase

(Full ECO title: Conclude activities to close out project or phase (e.g., final lessons learned, retrospective, procurement, financials, resources))



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(Undertake the activities for closure)

When closing a project, the project manager should review the project management plan to ensure that all project work is completed. Also, to check that the project has met its objectives. This consists of the activities necessary for the administrative closure of the project or phase. Items to check include:

- Confirming the delivery and formal acceptance of any deliverables by the customer or sponsor
- Documents and deliverables are up-to-date and that all necessary issues are resolved
- Ensuring that all costs (including any that are delayed) are charged to the project
- Closing project accounts
- Reassigning project team members
- Dealing with any excess project materials
- Reallocating project facilities, equipment, and other resources
- All procurement/contractual agreements are closed
- Storing information for future use

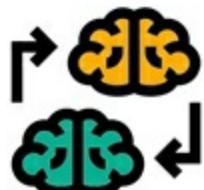
We will examine these last two major categories of procurement agreements and knowledge transfer in more detail.



Closing out Procurement and Payments

Closing out procurements can happen at any time throughout a project when work or services are complete. However, any open contracts and payments should be settled when the project ends.

We need to ensure payments made to a supplier or vendor meet the terms of the contract. (For instance, are paid within the Net-30, or Net-90-day agreements, as specified.) Formally closing out procurements and contracts also reduces the likelihood of our organization receiving invoices and charges after the project has completed.

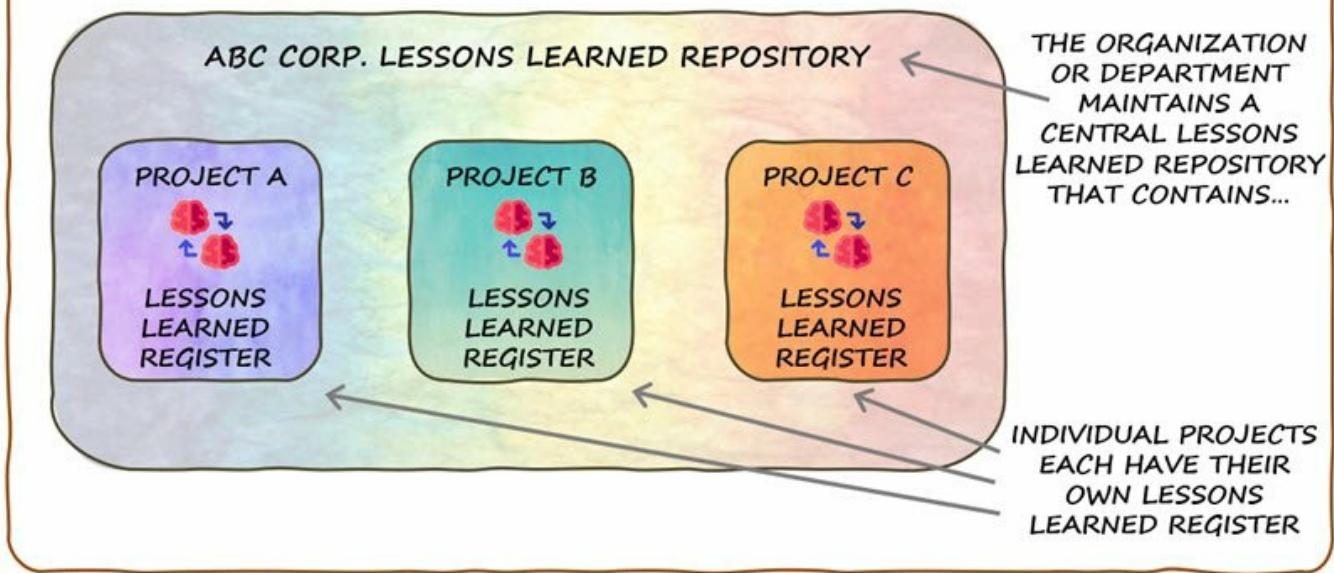


Knowledge Management

As reviewed in task [2.16 Ensure Knowledge Transfer for Project Continuity](#), project managers should ensure information that could be helpful for the team, PMO or organization is gathered, analyzed and stored appropriately.

This includes running Lessons Learned sessions with the team and other relevant stakeholders. The outputs (lessons learned) should be stored in the project Lessons-Learned Register that may get rolled up into a department or organizational Lessons-Learned Repository, as shown below.

LESSONS LEARNED REGISTER & REPOSITORY

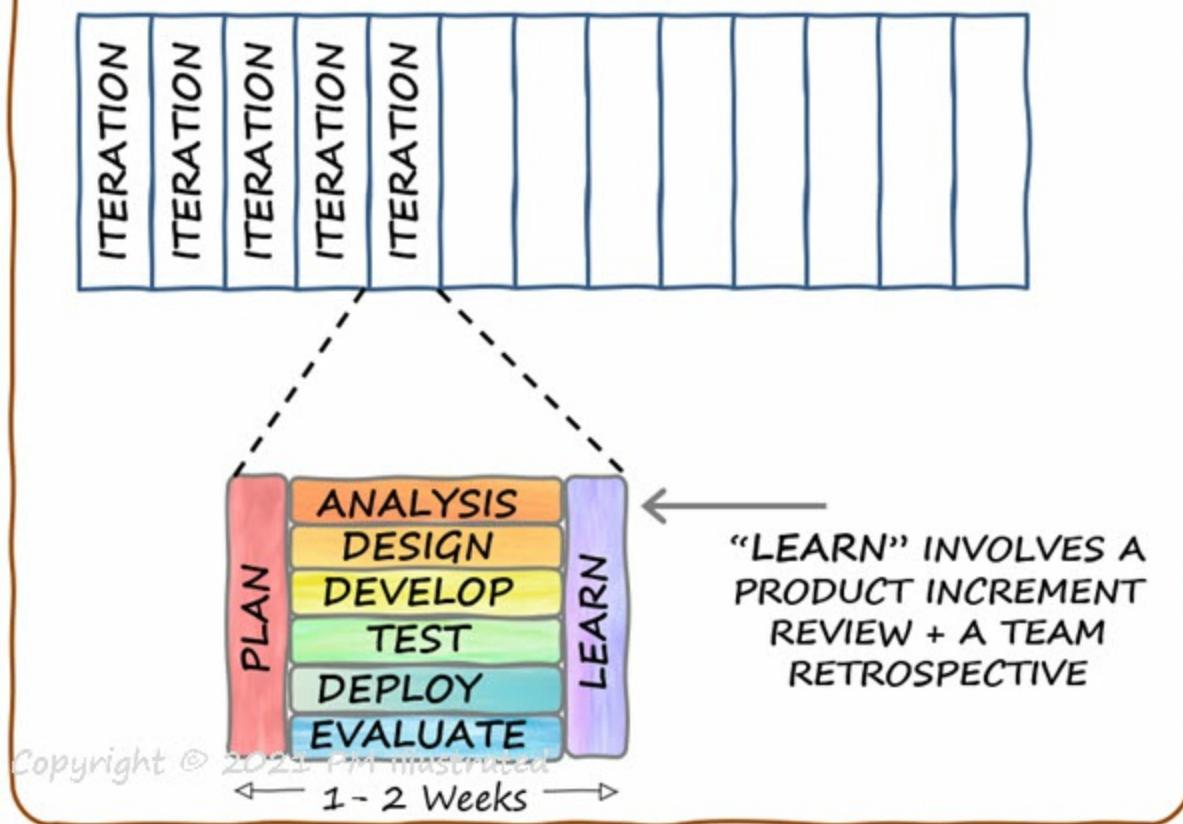


Retrospectives

Teams using agile approaches will likely be utilizing more frequently scheduled retrospectives rather than lessons-learned reviews. However, retrospectives capture similar reviews of

- What went well
- What could have been done better
- Suggestions for improvements relating to people, process and tools

AGILE RETROSPECTIVES



Tips for Closing a Project or Phase

When closing a project or phase, start with the project management plan and compare what has been done with what was planned to be done. Ask did we complete everything? Has it been formally approved and signed-off?

Make sure we release team members and set them up for success going forward. Remember to schedule and plan any team recognition events before you close your accounts and return any unused funds. Update the talent pool database to show new skills gained and increased levels of proficiency. Recognizing and looking after people is important, you never know where they will end up and if we may work with them in the future.

Document the final state of plans, checklists and logs. Even a simple entry to record "<Date> document updated with final information prior to project closure." can prevent future readers from having to guess if this is the correct/completed version of a document.

Check with your PMO to see if they have a project termination/closure checklist. Obtain

project approval and formal project acceptance. Archive a complete set of project documents and records.

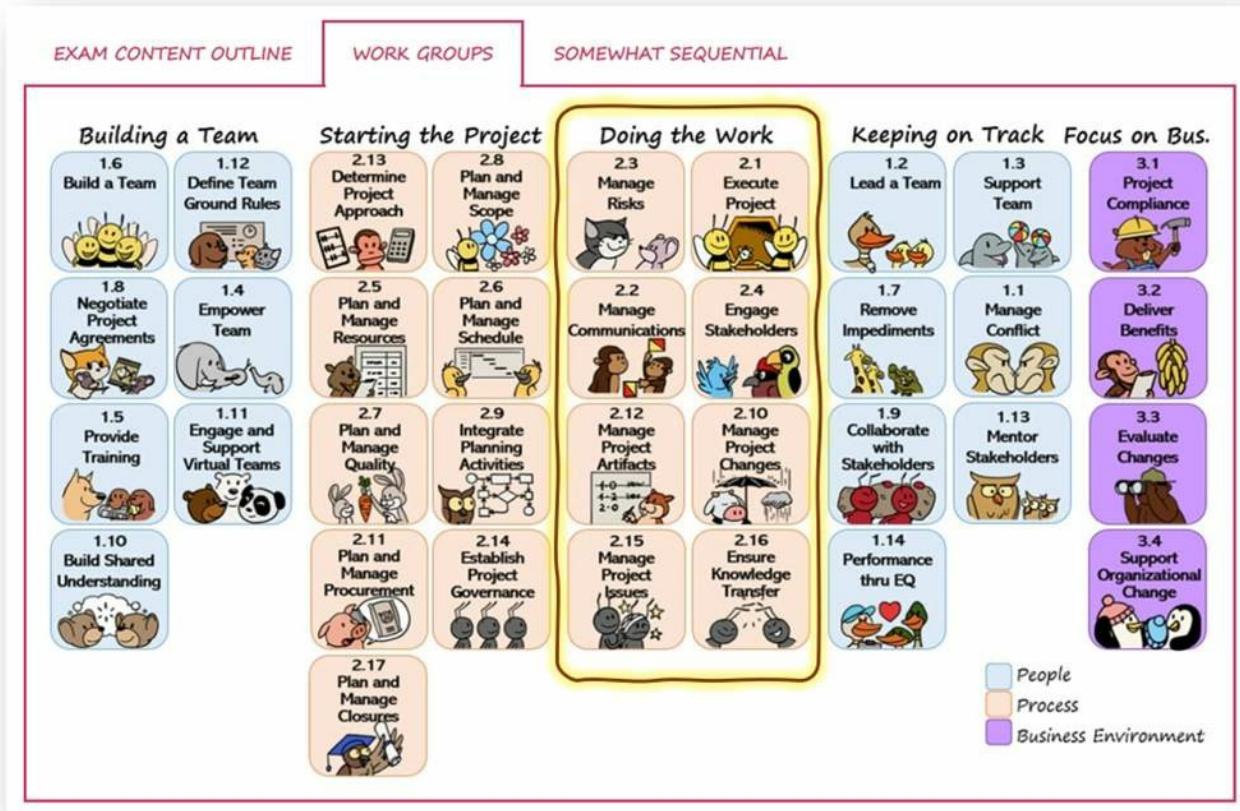


Reflect

Finally, take some time to personally reflect on the project. Ask if the organization sponsoring the work got, or will get, the outcomes they hoped for when kicking off the project? How did elements such as the people, process and tools work out?

Projects can be an emotional roller-coaster ride. Some days we are up making great progress, others we are down, mired in problems. This is part of what makes project management a fulfilling career. What would you change looking back? How can we be wiser and better prepared for the future?

WORK GROUP 3 – DOING THE WORK



Doing the Work – Mindmap

DOING THE WORK and Manage Project Issues



2.3 Assess and Manage Risks

Since projects build new products and services, it should be expected that they will encounter some surprises along the way. These might be pleasant surprises, but more often than not, they are undesirable.

Rather than just hope for the best, the responsible thing to do is to plan for these uncertainties. This is where risk management comes into play. Let's start with some definitions.



Risk

A risk is an uncertain event or condition. If it occurs, it will have a positive (good) or negative (bad) effect on the project or a project objective. We call positive risks **opportunities** and negative risks **threats**. For example, if we were planning an open-air picnic for the grand opening of a petting zoo, we could have a negative risk (threat) that rain would lower attendance. However, pleasantly warm weather could attract a much larger than expected number of people, and we can make extra income selling ice cream (an opportunity.)



Risk Trigger

A risk trigger is an event or situation that indicates that a risk is about to occur or has occurred. We can think of risk triggers as warning signs or risk symptoms. For example, dark storm clouds gathering could be a risk trigger for rain at the petting zoo grand opening picnic.

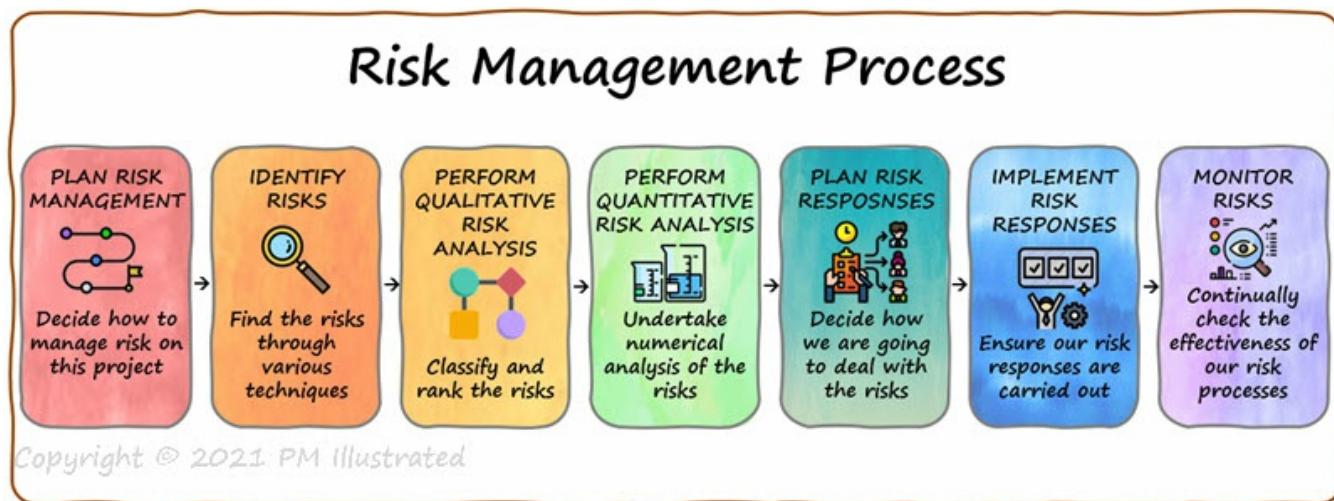


Issue

An issue is a risk that has occurred. It is no longer a possibility of harm, loss or gain, so we cannot call it a risk anymore. Instead, it has converted from being a risk to being an issue. Issues are often recorded in the project Issue log. An example would be heavy rain at the picnic. Now the risk has moved from being a threat to something we have to deal with.

Risk Management Processes

The PMBOK® Sixth Edition outlines the following risk processes. These steps provide a valuable framework for reviewing risk management activities.



Plan Risk Management

The first step, Plan Risk Management, defines how we will conduct the risk management activities for our project. Since projects vary in size, complexity, importance and development approach, we should tailor the risk management approach to meet the project circumstances.

For example, the risk management process we create for a 6-person team erecting a big-top tent one afternoon will have a different level of detail and rigor than a 300-person project to develop and test a medical device over 18 months.

Risk Appetite. The amount of uncertainty an organization or person is willing to accept in anticipation of a reward. Some organizations have a low appetite for risk and prefer to pursue low-risk endeavors. Others are happy to pursue a variety of initiatives knowing full well only a small percentage will be successful.

Risk Threshold (used to be called Risk Tolerance). The measure of acceptable variation around an objective that reflects the risk appetite of the organization and stakeholders. For example, a 10% cost overrun is acceptable, but anything above that is not.

Risk Management Plan

An output of the Plan Risk Management process is the (imaginatively named) Risk Management Plan. This document describes how the risk management process will be tailored and undertaken for the project. It can be its own stand-alone document or a sub-section in the project management plan. Common sections include:

Risk Strategy - Describes the general approach to managing risk on this project.

Methodology - Defines the specific approaches, tools, and data sources that will be used to perform risk management on the project.

Roles and Responsibilities - Defines who will be responsible for each type of activity described in the risk management plan.

Funding - Identifies the funds needed to perform activities related to project risk management and describes any contingency and management reserves.

Timing - defines when and how frequently the risk management processes will be performed. It also identifies the risk management activities to be included in the project schedule.

Risk Categories – Outlines the groupings for individual project risks. There are many different ways we can categorize risk. Some common ones include:

- **Technical** – such as risks relating to the scope, technology or technical processes used
- **Management** – for example, risks relating to our organizational structure, recruiting or communications
- **Commercial** – E.G., suppliers and vendors risks, procurement and subcontractor risks
- **External** – Exchange rates, competition, regulatory

These risk categories and subcategories can be documented and visualized via a risk breakdown structure (RBS).



Stakeholder Risk Appetite – Description of the stakeholder risk appetites and the thresholds around what they are willing to accept for each project objective. For example, up to 2-weeks variance around scheduled release dates. These thresholds are used to inform the definitions of risk probability and impact.

Definitions of Risk Probability and Impact – These are unique to our project context and reflect our key stakeholders' risk appetite and thresholds. We can generate our own definitions of

probability and impact levels or start with the organization's definitions.

For example, we may define the following values for Probabilities and Impacts to Schedule, Scope and Budget:

Scale	Probability	Impact: Schedule	Impact: Scope	Impact: Budget
Very High	>70%	>4 Weeks	Must haves	> \$2M
High	51 - 70%	2 - 4 Weeks	Should haves	\$1M - \$2M
Moderate	31 - 50%	1 - 2 Weeks	Could haves	\$500K - \$1M
Low	10 - 30%	2 – 7 Days	Would likes	\$200K - \$500K
Very Low	< 10%	< 2 Days	None	< \$200K

Probability and Impact Matrix – this table combines risk probability and risk impact for both threats and opportunities. It shows the severity of risks with various probability and impact scores.

Probability and Impact Matrix											
Probability	Threats					Opportunities					Probability
	0.9	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	
0.7	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04	High
0.5	0.03	0.00	0.10	0.20	0.40 R	0.40	0.20	0.10	0.05	0.03	Moderate
0.3	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06 IC	0.03	0.02	Low
0.1	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01	Very Low
Very Low	Low	Moderate	High	Very High	Very High	High	Moderate	Low	Very Low		
	0.05	0.1	0.2	0.4	0.8	0.8	0.4	0.2	0.1	0.05	
	Negative Impact					Positive Impact					

For example, we might estimate the threat of heavy rain at the picnic to have an Impact score of Very High (0.8) and a Probability of Moderate (0.5). Severity is the product of Impact and Probability.

$$\text{Severity} = \text{Impact} \times \text{Probability}$$

$$= 0.8 \times 0.5$$

$$= 0.4$$

(Shown with the red "R" above)

Likewise, we may rate the opportunity of "Warm enough to sell ice-cream" as Impact Moderate (0.2) and Probability Low (0.3), giving a Severity of $0.2 \times 0.3 = 0.06$ shown with "IC".

Reporting Formats – This defines how the outcomes of the risk management process will be documented, analyzed and communicated. This includes the format and fields in the Risk Register, which is the risk list or catalog used to track our project risk.

Tracking – This final section in the Risk Management Plan documents how risk activities will

be recorded and how risk management processes will be audited.

All of these sections collectively make the Risk Management Plan.

Grand Opening Picnic - Risk Management Plan

Table of Contents

1) Risk Strategy.....	2
2) Risk Methodology / Approach.....	6
3) Roles and responsibilities.....	9
4) Funding and Timing.....	11
5) Risk Categories	13
6) Stakeholder Risk Appetite	15
7) Definitions of Risk Probability and Impact	16
8) Risk Probability and Impact Matrix	18
9) Risk Reporting Formats and Frequencies.....	19
10) Risk Tracking Documents	20



Some small agile projects do not produce a Risk Management Plan. Instead, they just create a risk list. By doing so, they accept any risk management approach described in the project charter (which for an agile project is likely brief also) or provided by the PMO or Agile Community of Practice. While agile methods may appear to not document their approach to handling risks, it is a core part of prioritizing work and evaluating progress.

Agile projects prioritize user stories based on business value and risk, aiming to drive down risk (avoid or mitigate threats) early in the life cycle. Practices such as risk-based spikes, risk-adjusted backlogs, and risk burndown graphs are used to address and monitor risks throughout the project life cycle.



Identify Risks

Identify Risks deals with finding individual project risks and sources of overall project risk, along with documenting their characteristics. The process combines the following activities.

- **Expert Judgment** – use individuals or groups who, based on their experience and domain expertise, can generate insights into individual activity risks and sources of overall project risks. Again, we should engage the team in this activity. The doer's of the work often have better insights into what can go wrong than the coordinators do.
- **Data Gathering** – techniques for data gathering include:
 - **Brainstorming** – facilitated workshops of multidisciplined participants to generate and record potential risks.
 - **Checklists** – Using lessons learned documents, old risk registers and issue logs from similar projects. Sometimes generic industry lists of common risks are available to help prompt ideas.
 - **Interview** – Risks can be identified by interviewing project participants beyond the immediate team, other stakeholders and subject matter experts.
- **Data Analysis** – techniques for analyzing the data we generate include:
 - **Root cause analysis with cause and effect diagrams** – A technique designed to uncover the underlying risk. It often uses cause and effect diagrams such as fishbone diagrams.
 - **Assumption and constraint analysis** – Project estimates of benefits and value delivered are based on assumptions and constraints. This activity examines these assumptions and constraints and asks what might jeopardize them or make them invalid. This can help identify risks.
 - **SWOT analysis** – SWOT is an acronym for Strengths, Weaknesses, Opportunities and Threats. SWOT Analysis examines the project from each of these perspectives starting with the strengths and weaknesses of the project, organization and business area in general. From the strengths, opportunities are investigated, and the weaknesses examined as a potential source of threats.
 - **Document Analysis** - Risks can be identified by reviewing project documents, such as plans, constraints, previous project files, contracts,

agreements, and technical specifications. Uncertainty, ambiguity or inconsistencies may be indicators of potential risks.

Risk Register – After completing these activities to identify risks, they are documented in the Risk Register. The level of detail captured in the risk register will vary based on the size, complexity and criticality of the project. As a minimum, the risk register should contain:

- **List of identified risks** – an ID for unique tracking and a description of the risk.
- **Potential risk owner** – Someone identified to track, monitor and potentially help manage the risk
- **List of potential risk responses** – Where risk responses were identified they are recorded for consideration during the Plan Risk Responses stage.



Perform Qualitative Analysis

Perform Qualitative Risk Analysis is the process of categorizing and prioritizing the individual project risks for further analysis. It includes assessing their probability of occurrence and impact and other characteristics.

Risk Classification – There are several ways we can classify risks. Two popular approaches are effect-based and source-based. Effect-based classification looks at the effect of the risk on:

- Time
- Cost
- Scope
- Quality
- Resources

source-based classification that looks at the risk origins, such as:

- Internal to the project
- External to the project
- Technical
- Non-technical
- Industry specific
- Generic

Assess Impact and Probability

For each risk identified, assess and assign impact and probability scores. These scores may be refined with numerical value within the next step, “Perform Quantitative Risk Analysis”, for now, we are just assigning basic scores such as High, Medium or Low.

For example, with a threat about having no experienced people to help put up the big-top tent for a launch event. We might assign the probability of that threat occurring as High on a (Low, medium, High scale) and the impact to the project also as High.

Some organizations also determine Severity or Risk Exposure score as the product of Impact and Probability.

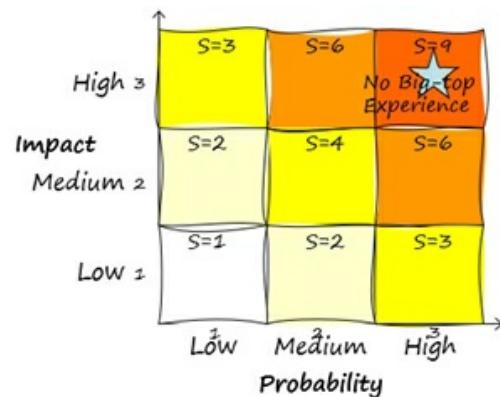
QUALITATIVE RISK ANALYSIS

- Assign Severity:

$$\text{Severity} = \text{Impact} \times \text{Probability}$$

(e.g. = “No big-top experience”
 = High (3) \times High (3)
 = 9)

- Rank risks based on Severity
- Determine which risks will need further management
- Determine overall risk rating for project



Risks can be ranked by their severity (risk exposure) scores, and we may decide not to actively manage low probability, low impact risks.



Perform Quantitative Analysis

Perform Quantitative Risk Analysis is the process of numerically analyzing the combined effect of identified individual risks and other sources of uncertainty on the overall project objectives. It involves numerical analysis techniques such as:

- Expected monetary value
- Decision tree analysis

- Monte Carlo simulation

Expected Monetary Value - By assigning a financial value to a risk impact and a percentage to the probability scores, it is possible to calculate an expected monetary value for a risk. For example, if we assess the probability of a hot day at our picnic is 25% and our estimate for ice-cream sales at \$2,000, then the expected monetary value would be:

$$\text{Expected monetary value} = \text{probability} \times \text{Impact} = 25\% \times \$2,000 = \$500$$

Expected Monetary Value, Decision tree analysis and Monte Carlo simulation are discussed in more detail in task [3.2.5 Appraise Stakeholders of Value Gain Progress](#).



Plan Risk Responses

Plan Risk Responses is the process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as to treat individual project risks. It is the deciding what to do about the risks we have identified.

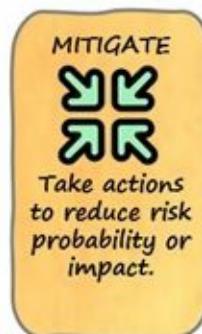
Expenditure of time and costs to undertake risk identification and analysis but then not doing anything (or enough) to avoid or reduce the threats, or exploit the opportunities, is wasteful to the organization. It is also demoralizing for the team. Instead, we should ensure the risk responses developed are added to the project plan or product backlog, so they can be implemented if/when the risk occurs.

For harmful risks (threats) we want to remove, avoid or reduce the likelihood of it occurring or its impact should it happen. For positive risks (opportunities), we aim to increase its likelihood and maximize the outcome. The common goal is to maximize value by eliminating or reducing losses and boosting gains.

Threat Response Strategies

Threats, the harmful risks, we want to avoid, side-step, reduce as much as possible. The generally accepted threat response strategies are shown below.

Risk Response Strategies - Threats



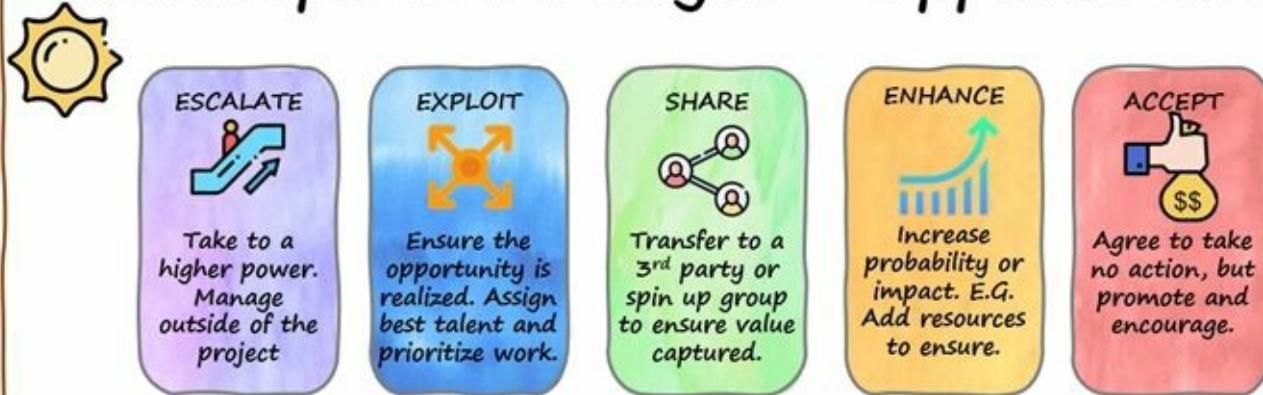
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- **Escalate** – Transfer to someone outside the project. Convince the powers that be, that this risk is significant enough that it should be handled at the program or portfolio level.
- **Avoid** – take evasive action. Find a way to eliminate the source of the risk. Maybe use a different approach or technology that does not contain the risk.
- **Transfer** - Move the risk to a group better equipped to handle it. This can include taking out insurance which exchanges exposure for a known premium.
- **Mitigate**- Make the risk smaller. Through actions, reduce the probability of the risk occurring or the impact to the project should the risk occur.
- **Accept** – For low priority risks, or those we cannot avoid or reduce, we may have to accept the risk. Here the best thing we can do might be to create a contingency reserve to help deal with the risk should it occur.

Opportunity Response Strategies

Opportunities represent the positive things that can go in our favor. These we want to guarantee, make the most of and share with as many people as can benefit from them. Strategies include:

Risk Response Strategies - Opportunities



- **Escalate** – Transfer to someone better able to ensure the opportunity occurs. Maybe someone with more influence or authority at the program, portfolio and sponsor level.
- **Exploit** – Try to drive the probability up to 100% and maximize impact. Perhaps by assigning our best people to it early and giving them everything they need to ensure it occurs.
- **Share** – Transfer the opportunity to others, either inside our organization or outside to maximize the value derived and captured.
- **Enhance** – Similar to exploit, but to a lesser degree, try to increase the probability and impact. Focus attention on the causes and prioritize this work for early delivery.
- **Accept** – Sometimes, there is not much we can do to increase the likelihood of an opportunity occurring (such as good weather). All we can do is be ready and prepared to take advantage of it, so it does not pass us by unrealized.



Implement Risk Responses

Implement Risk Responses deals with the process of implementing agreed-upon risk response actions and plans. It helps ensure the risk responses selected get actioned by generating change requests and adding work packages to the WBS or items to the product backlog.

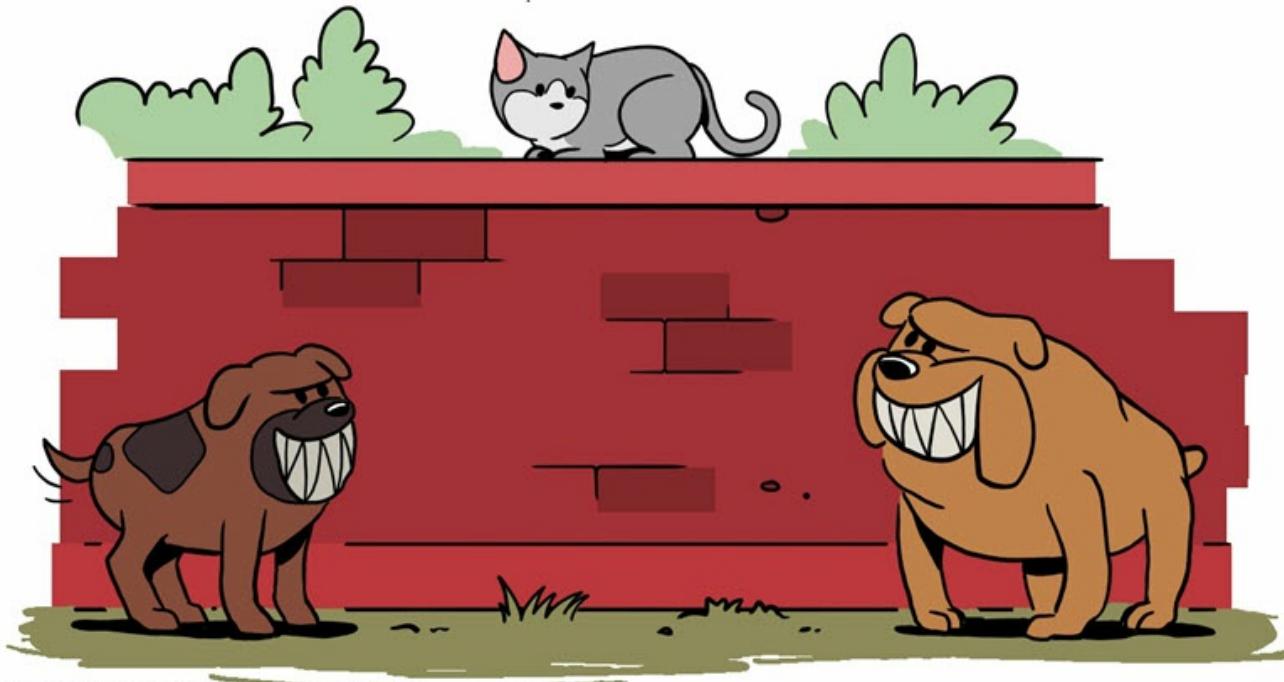


Monitor Risks

Monitor Risks is the process of monitoring the implementation of agreed-upon risk response plans. It also includes tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness throughout the project.

The effectiveness of the risk management process is monitored through techniques such as audits, meetings and data analysis of technical performance and reserves. Based on how the risk management activities are performing, updates to the project plan, or product backlog might be required. Change requests and updates to risk logs, issue logs and lessons learned register might also be necessary.

2.3.1 Determine Risk Management Options



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(Choose your approach to managing risk)



Traditional

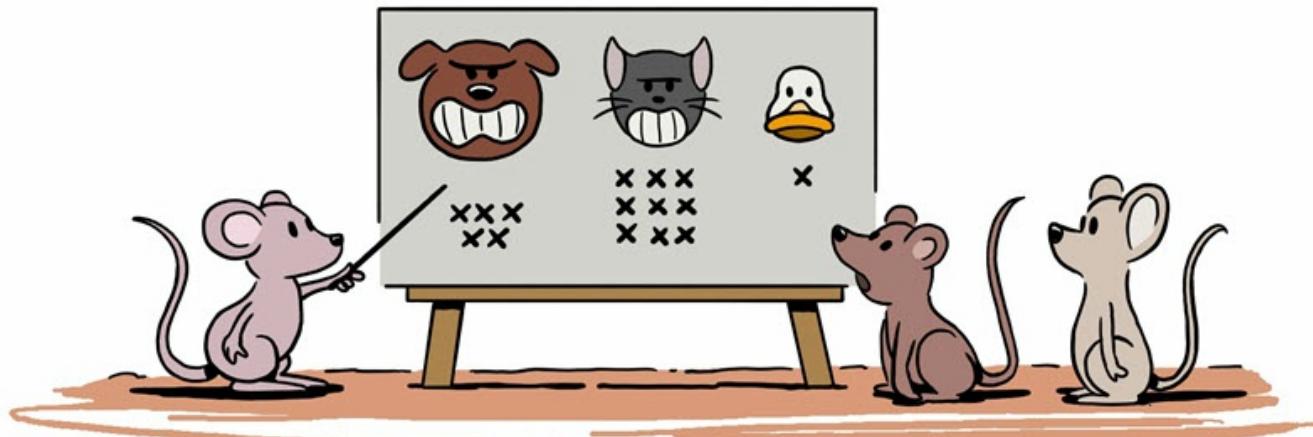
Traditional predictive project management approaches typically contain defined risk management steps and specific risk-oriented deliverables and documentation. Risk management is a conscious, deliberate activity.



Agile approaches have less visible practices focused on risk management. However, that is not to say risk management is absent from agile approaches. On the contrary, it could be argued that risk management is central to agile practices. By prioritizing the backlog based on business value and risk reduction, opportunities are exploited, and threats avoided or mitigated.

Proof of concept spikes, short iterations, frequent customer demos and feedback gathering are also focused on risk management. There may be fewer artifacts and deliverables with “risk management” in their name, but risk management principles are central to agile, and many hybrid approaches.

2.3.2 Iteratively Assess and Prioritize Risks



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(Frequently reprioritize risks)

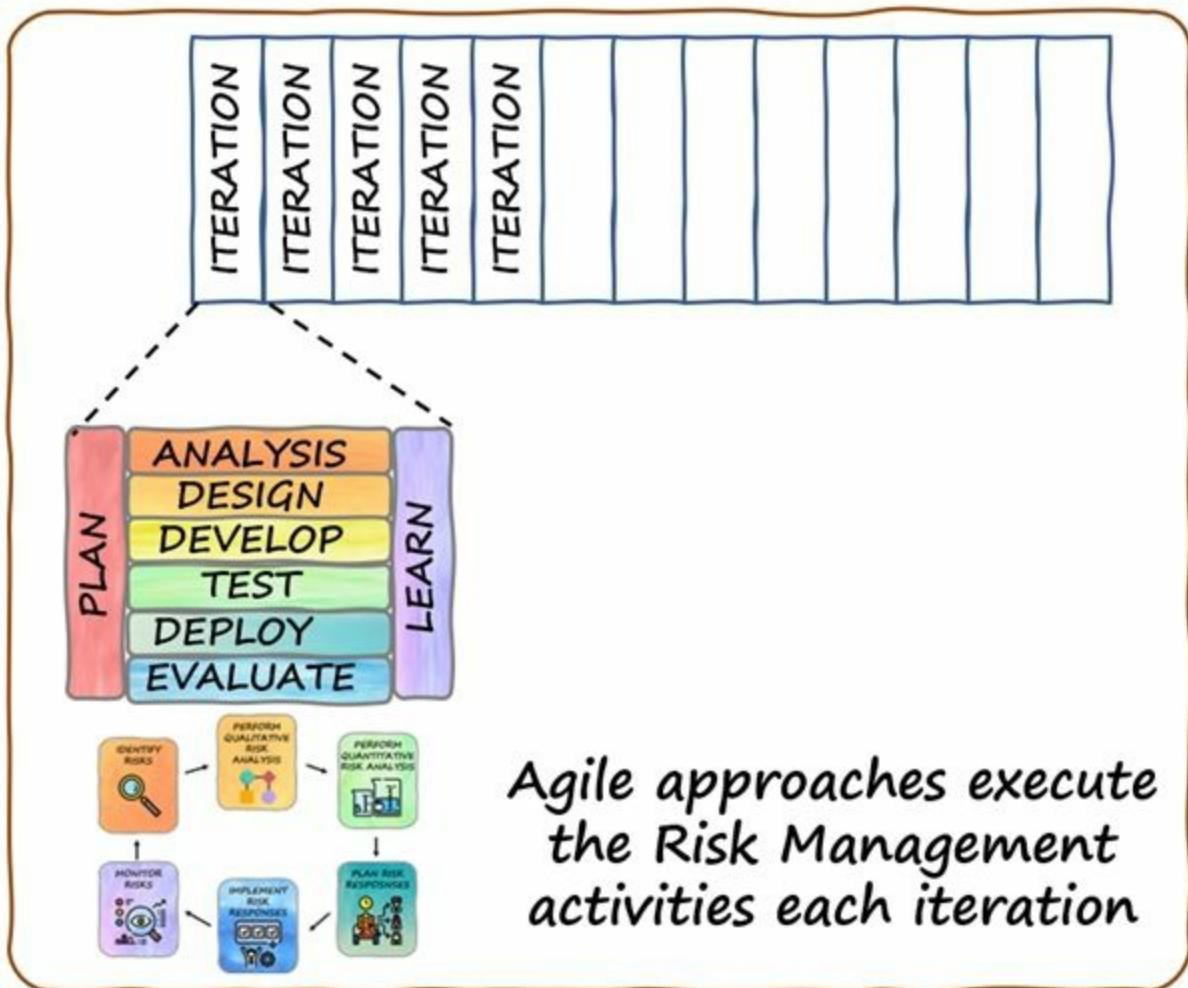
Risk Management is always an iterative process. Even with traditional predictive projects the final Monitor Risks step includes the ongoing assessment and processing of risks. So, rather than viewing the risk management process as a linear, single-pass procedure, it can be more helpful to view it as iterative.

Iterative Risk Management Steps



Now we see the Monitor Risks step links back into the ongoing process of Identify Risks that looks for new or escalating risks and runs them through the risk management process. The process is cyclical and iterative until the project completes. Then it can be handed to operations or program management to assist with long-term benefits management.

Within agile life cycle projects, these activities repeat every iteration.



Viewed with an eye towards risk management, the agile planning meetings and events can be used to ensure risk management activities are occurring on the project. Iteration planning sessions can be used to educate the product owner on selecting stories based on business value and risk reduction.

Daily stand-up meetings ask team members if they have any impediments or blockers that might be early warning signs of threats. Demos confirm the team is building the right product and it is fit for business purposes. Finally, retrospectives can be used to ask if we are managing our risks effectively and are there any new or escalating risks we need to take action. Also, what experiments, or opportunities can we pursue?

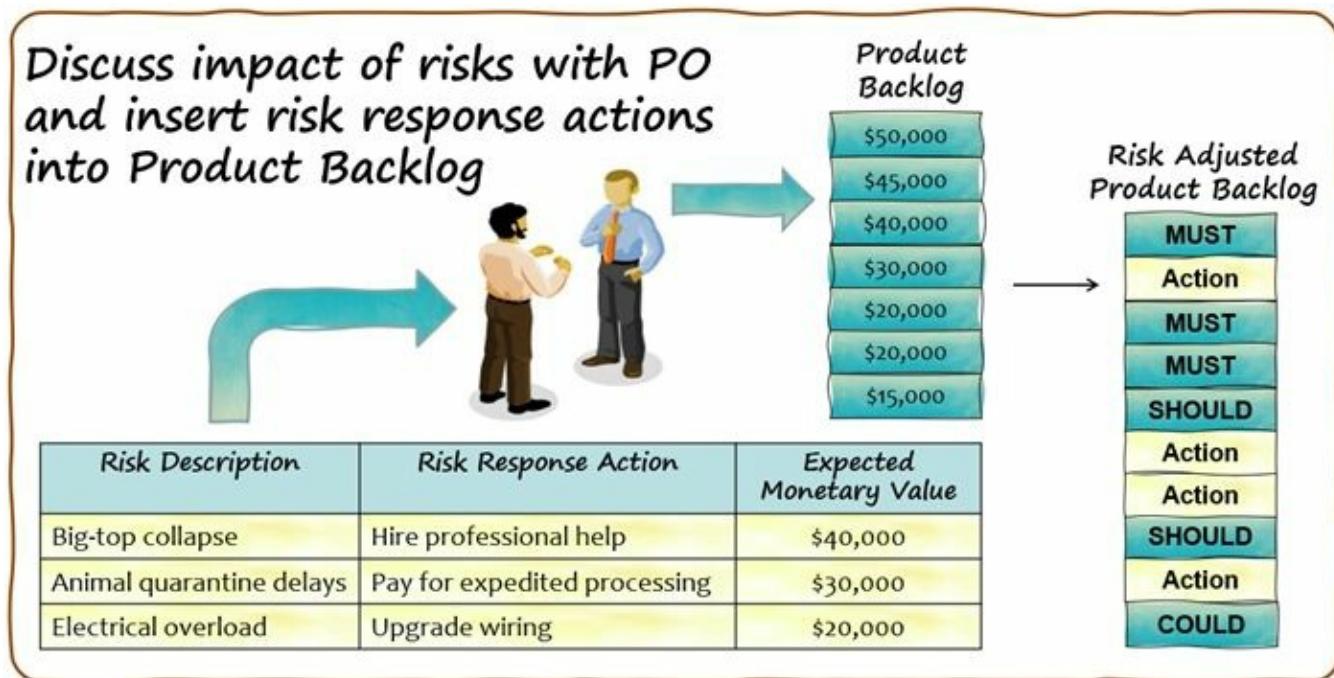


Risk-Adjusted Backlogs

Risk-adjusted backlogs is the name given to backlogs that have risk response activities

incorporated into them. They are created by working with the Product Owner to add threat avoidance and mitigation activities and opportunity enablement work into the backlog.

It is a collaborative discussion between the Scrum Master or team representatives and the product owner. The team can explain the risk impact, should it occur and the product owner estimates and compares the expected monetary value of a risk with the value of the stories in the backlog.



Ultimately it is the product owner who prioritizes the backlog. However, when they learn about the potential impacts of risks, they can decide if and where risk response action should be placed.

By avoiding or reducing threats closer to their identification, the horizon of risk that the project is exposed to shortens. In addition, by making changes earlier in the lifecycle, the costs of changes are reduced. On the flip side, capitalizing on opportunities is like getting investments done early; they have longer to accumulate. These are the compounding benefits of early and rapid risk & opportunity management.

Getting the risk response actions into the backlog is how these tasks are scheduled and undertaken. We want to ensure that all our risk management work is not supplemental to the project plan but baked right in. All too often, risk management is an activity done upfront or alongside the project but never really integrated into the day-to-day activities of the project. By inserting these new stories into the backlog, we drive risk management actions from analysis to action.

2.1 Execute Project with the Urgency Required to Deliver Business Value

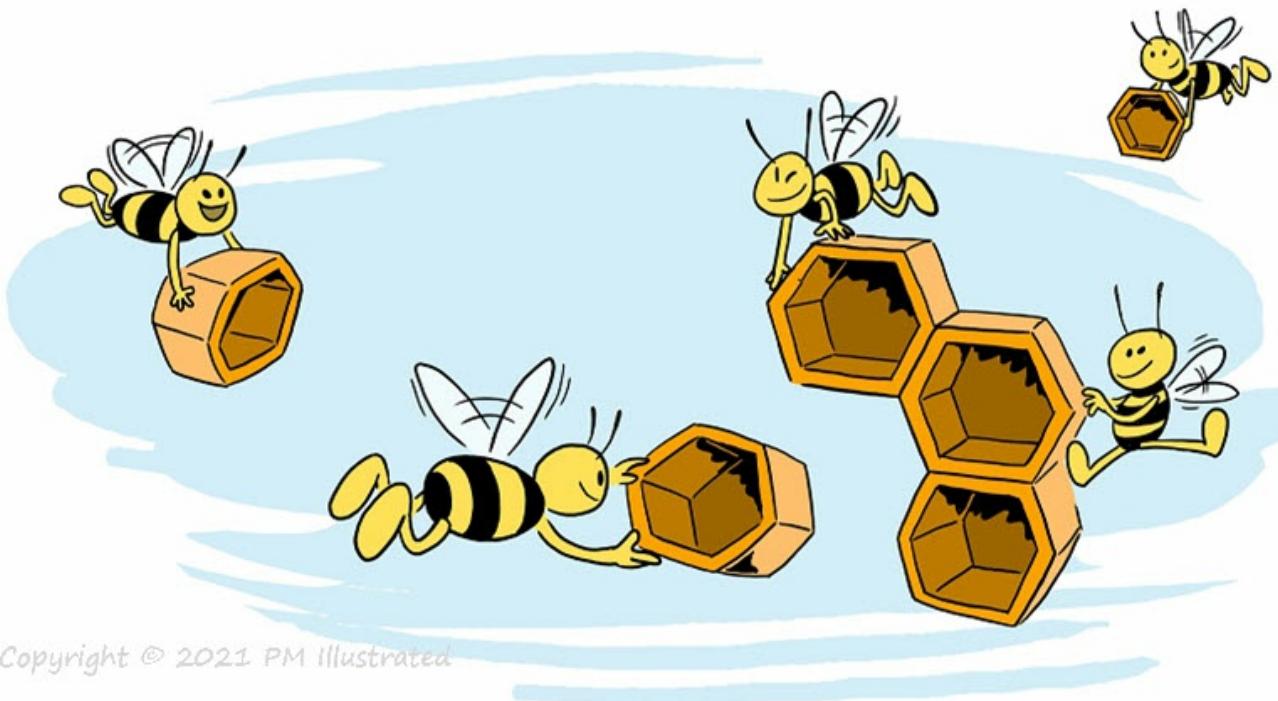


Create a Culture of Urgency

Project managers are critical for ensuring team members and stakeholders are working together with a sense of urgency. There are several tools project managers have at their disposal to help with this.

- **Project Vision** - The project manager can lead the way by articulating the project's importance and vision. Having a business representative or project sponsor explain the business need is very powerful. It helps connect the project goals with why we are assembled and the work about to start.
- **Customer Focus** – using tools such as customer personas helps keep the end-users and their needs in focus. It reminds us of who will consume the final product or service and why it is essential to complete the work to a high standard as soon as possible.
- **Deliver early and often** – establishing an early pattern of delivery on a project can help create a culture of delivery focus and accountability. It does not need to be a completed work product delivered to a customer. A design concept for internal review has the same effect. Establishing a cadence and expectation of delivery, evaluation and accountability towards the project vision helps prevent complacency.

2.1.1 Assess Opportunities to Deliver Value Incrementally



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(Where possible, build solutions incrementally with frequent feedback)



Incremental Delivery

Incremental delivery is a strategy for delivering value to the customer before the project's final release. This can be done by releasing several smaller deliveries throughout the project rather than one large one at the end. The benefits of this approach include:

- **Early Feedback** - Getting feedback from customers earlier in the process reduces rework if changes are necessary. It also provides confirmation of designs and development processes.
- **Early ROI** – By getting some functional elements out and being used sooner, there may be opportunities to gain early value and return on investment.
- **Overcomes Student Syndrome** – Student syndrome is the tendency for people to wait until near a deadline before working in earnest on the task. If a project has a one-year timeline, it might feel like we have plenty of time to settle in and then start. In contrast, if we have a demo next week, perhaps we should get started now and have something to show for ourselves.
- **Increased stakeholder involvement** – by frequently demonstrating increments of the solution, we keep stakeholders engaged. They get to see the team's progress and the team learns more about the project needs and any changing market conditions. This increased visibility and transparency, improves project communications and lowers the risk of missed requirements or delivering unsuitable products.



Cycles, Iterations, Sprints and Timeboxes

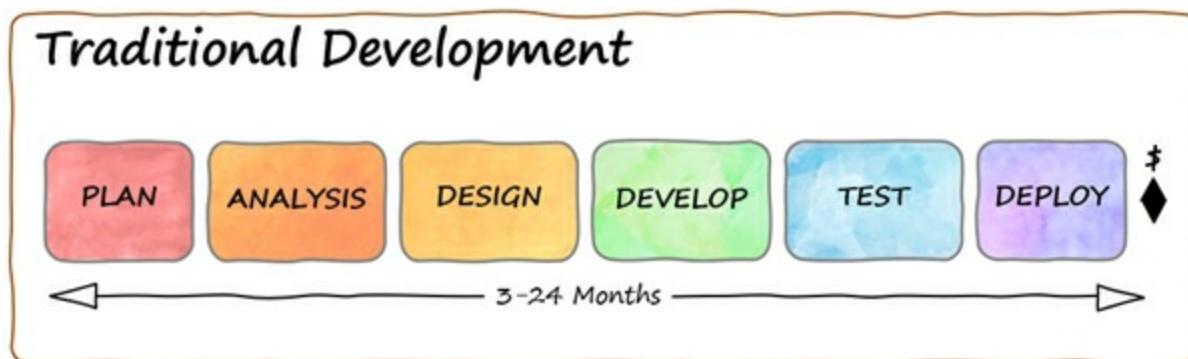
Hybrid and agile projects break the project schedule into small (typically 1 – 2 week) iterations or sprints. In these short, timeboxed periods, the project team builds an increment of project functionality then demonstrates it to gain feedback. Working in 1-2 week cycles (called Sprints or iterations), the team is never far from a demo, and the tempo remains high.

Let's take a quick refresher of the various development approaches and when they typically deliver value.



Traditional/Predictive

In traditional lifecycle projects, the major activities are conducted serially, and value is delivered at the end of the project. Projects can be of any duration; in the image below, common durations ranging from as short as 3 months up to a couple of years are depicted.

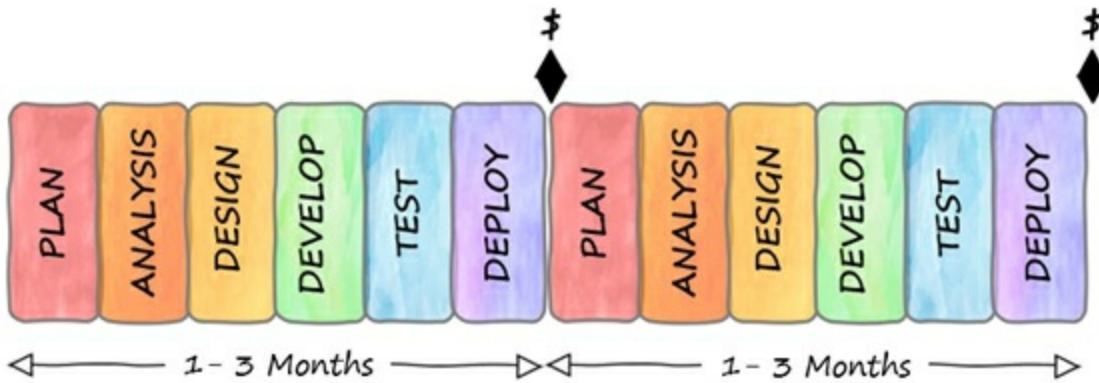


Hybrid or Iterative Development

Hybrid or Iterative development approaches have more than one deployment. They may be able to implement some functionality early to provide a partial return on investment while the remainder of the project is worked on.

There is no standard, defined pattern for hybrid or iterative development life cycle projects. They may have a couple or many releases at varying intervals. In the example shown below, an iterative development life cycle is depicted, having two releases, each 1 – 3 months in duration.

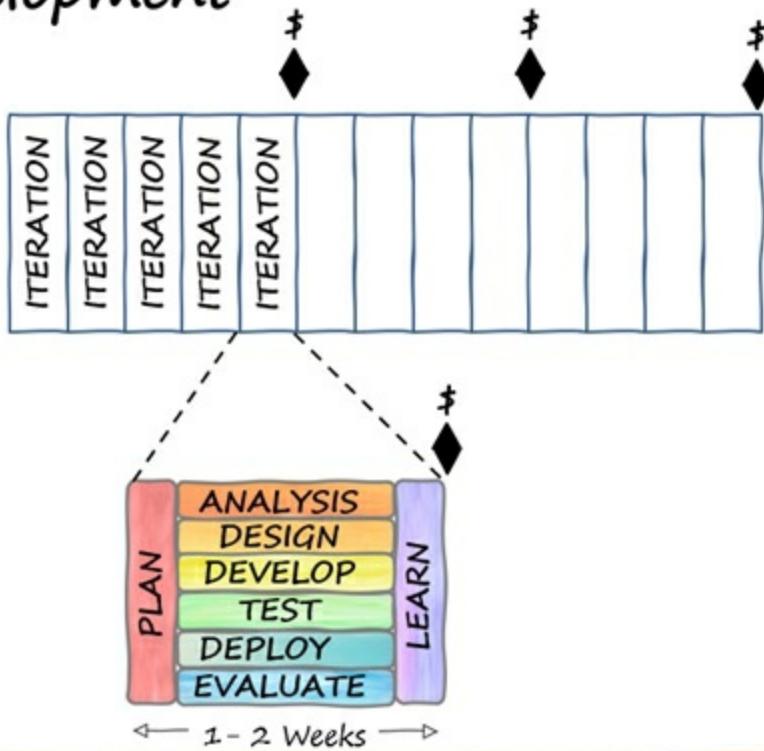
Iterative Development



Agile Development

Agile life cycle approaches have many short iterations. The duration of these iterations used to be anywhere from one week to one month, but during the last decade, most agile approaches have standardized on either one or two-week iterations. When using Scrum, these iterations are called Sprints.

Agile Development



Each agile iteration exercises all of the project execution disciplines. These include everything from planning through creating an increment of the project and gathering feedback on it. It also includes evaluating and reflecting on how both the process and the product are developing/performing.

While the result of every iteration should be a valuable increment of product, these are often batched up into more significant releases to manage the amount of change introduced. This is depicted by the intermittent currency sign milestones above.

2.1.2 Examine the Business Value Throughout the Project



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(Frequently confirm value is being delivered throughout the project)



Business Value

Let's take a moment to define business value. In a PM context, it is a quantifiable benefit derived from the project. The benefits might be financial, social, improved capability, environmental, or improved potential.

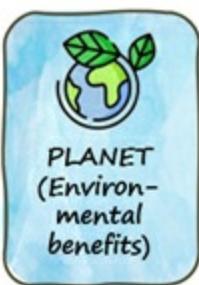
TYPES OF BUSINESS VALUE



FINANCIAL
(Increase revenue and profits)



MARKET SHARE
(Grow future potential)



PLANET
(Environmental benefits)



SOCIAL
(Create community benefits)



GROW CAPABILITY
(Technological improvements)



Financial – Earning revenue and profits for an organization or group. Some regulatory and compliance projects may not return a profit but are undertaken to avoid fines and costly restrictions.



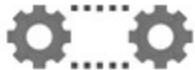
Market share – Capturing some portion of the market, maybe even at a loss, so future benefits can be obtained.



Planet – Environmental benefits such as habitat or species protection. Greenhouse gas reduction and other pollutant mitigation benefits.



Social – helping groups and individuals with health, education and social wellbeing programs.



Grow Capability – To make research and product capability breakthroughs to gain new insights and data for future benefits.

Business value should be defined from the customer or sponsor perspective, not the team or project manager's perspective. Just because we think a feature is cool, impressive, difficult to create, or elegant in our own view does not mean it is any more valuable.



Product Roadmaps

Product roadmaps are high-level graphical summaries of planned release components for a product or service. They can vary in their presentation but act as a shared vision for the direction, priorities, and progress of a product over time.

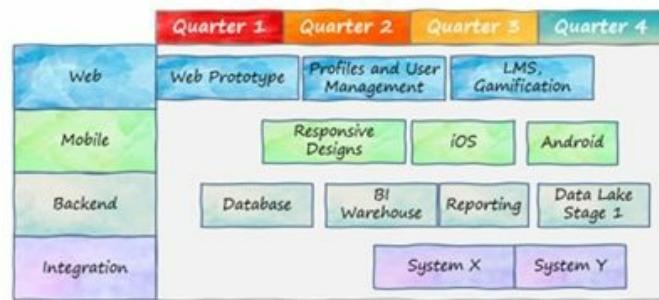
Product roadmaps are progressively elaborated as more information becomes available. They can be used to align an organization around short and long-term goals for the project or product and how they will be achieved.

The figure below shows three example product roadmaps.

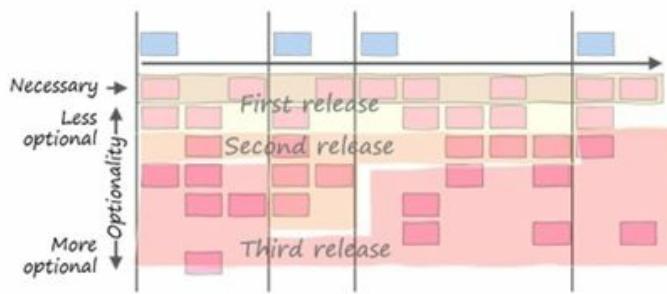
1) NOW-NEXT-LATER ROADMAP



2) TECHNOLOGY STACK ROADMAP



3) Release Based Product Roadmap



Example 1) Is a Now-Next-Later roadmap showing a time-based view of what the team plans to work on and deliver. In this example, the yellow cards depict user stories, but they could be features, epics or some other unit of functionality.



Example 2) shows a Technology Stack view of work for upcoming quarters. For each technology group (Web, Mobile, Backend, and Integration), their major deliverables are shown in the planned time period.

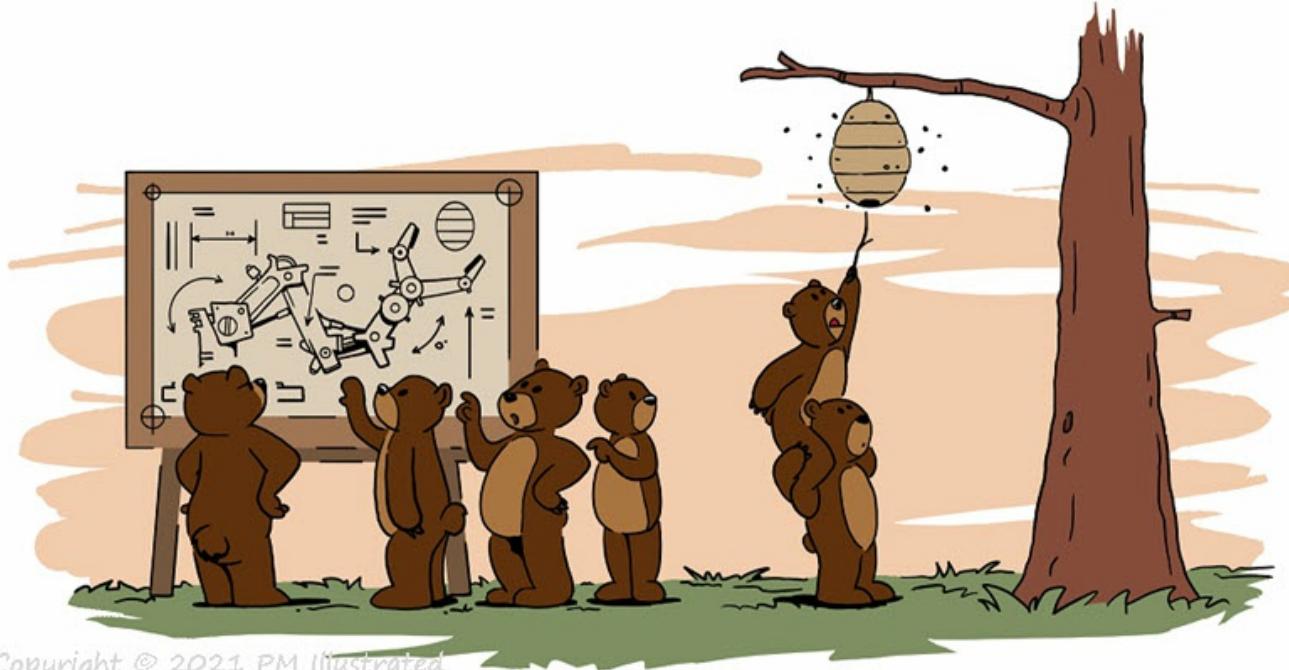


Example 3) shows a Release based roadmap with functional groups going horizontally and necessary to more optional features arranged vertically. Colored groups of stories indicate which have been selected for the first, second and third releases.

Product roadmaps should be created in a format that is valuable and makes sense for the interested stakeholders.

2.1.3 Support the Team to Subdivide Tasks and Find the Minimum Viable Product

(Full ECO Definition: Support the team to subdivide project tasks as necessary to find the minimum viable product.)



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(Look for options to prove viability as quickly and cost-effectively as possible)



Simplicity, maximizing the amount of work not done

One of the [12 Agile Principles](#) is “Simplicity—the art of maximizing the amount of work not done—is essential.” It reminds us to look for the simplest solution possible. This not only reduces work, materials, complexity, schedule and costs, but it also increases our likelihood of project success.

Including non-essential scope or features extends project timelines and increases the horizon of risk (period for things to go wrong.) It provides more time for competitors to enter the market, to be leapfrogged by new technology and customers to go elsewhere.

Generating a return on investment is never a given. Focusing on the best options for timely delivery reduces complexity and risk. Project stakeholders and clients can leave, so simplifying what we deliver is often a smart choice.



Projects as Journeys and the Value of Scouting Ahead

One analogy for projects is “going on a journey.” If the project requirements and technology are well understood, this is like repeating a journey we have done before. We still need to plan for it, and there may be unexpected interruptions or events that occur along the way, but we do not anticipate too much direction finding or backtracking.

For projects with high levels of uncertainty or using new tools or techniques, we can expect some navigation challenges, issues and new discoveries as we go. When the territory is unfamiliar, it can be helpful to scout ahead. Pilots, proofs-of-concept and the lean/agile set of approaches known by their acronyms MMF, MVP, and MBI help explore the territory.

They are light-weight explorations to test approaches, gain insights into what is required and validate technologies, materials or ideas.



MMF, MVP and MBI

Some commonly used agile terms relating to testing increments of value include Minimum Marketable Feature (MMF), Minimum Viable Product (MVP) and Minimum Business Increment (MBI).

While they all share the first word “Minimum” and all relate to the smallest increment of something, that something varies, and so we should understand the definitions.

- **MMF – Minimum Marketable Feature** – A small, self-contained feature that can be developed quickly and that delivers significant value to the user/customer.
- **MVP – Minimum Viable Product** - MVP is about learning more about the ultimate product. It tests the "bare bones", or "no-frills" functionality required for something to be deemed valuable by a potential customer. An MVP could range anywhere from not having any MMFs, to having a single MMF, to having several MMFs.
- **MBI – Minimum Business Increment** – A MBI is a description of the minimum amount of business value realized from a business perspective. MBI is more related to MMF than MVP and was developed because some organizations objected to the term “marketable” since they did not sell products. MBIs help teams validate whether or not a useful element of functionality has been delivered or an improvement has been captured. MBIs enable teams to incrementally build on success or pivot as needed.

Guidelines to Optimize and Measure Ongoing Progress

In addition to delivering the core elements of a project as soon as possible, the following techniques can help ensure projects are executed with a focus on business value.



Value Stream Mapping

Value Stream Mapping is a technique for reviewing a process and identifying value-adding

and non-value-adding activities. Teams can use it to improve their project workflow by finding delays, queues and works of waste (hand-offs, task switching, non-used talent, etc) and creating a more efficient process.



Measure what Matters

Use metrics that track and communicate progress towards value delivery. Metrics that measure attributes such as features delivered vs features remaining are more effective than, say, lines of code written since they focus on value and the end goal – finishing the project. Be wary of tangential metrics such as hours worked, or lines of code written that do not focus on value and may lead to unintended side-effects (not rewarding code simplification.)



Show Progress and Trends

Present the team's progress and show how it compares to baselines and expectations. Release burn-down graphs and cumulative flow diagrams are effective tools for showing progress and extrapolating trends.



Inspect and Adapt

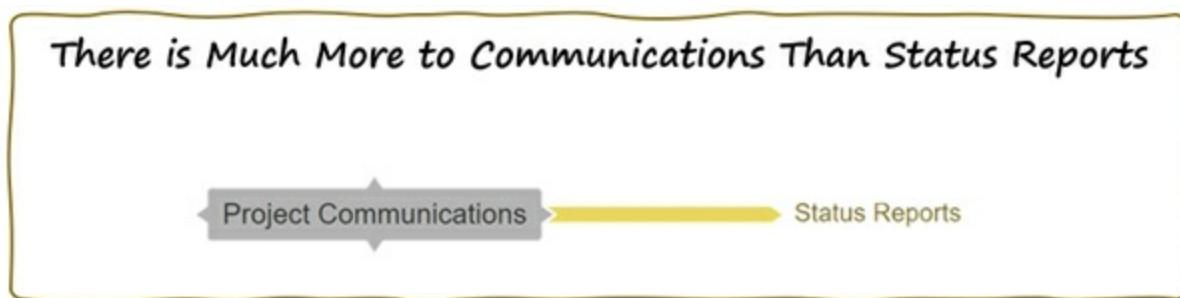
Use reviews and retrospectives to consolidate successes and correct areas where progress is not meeting expectations. Keep a focus on delivering business value and frequently check with the team for ideas to improve delivery.

2.2 Manage Communications

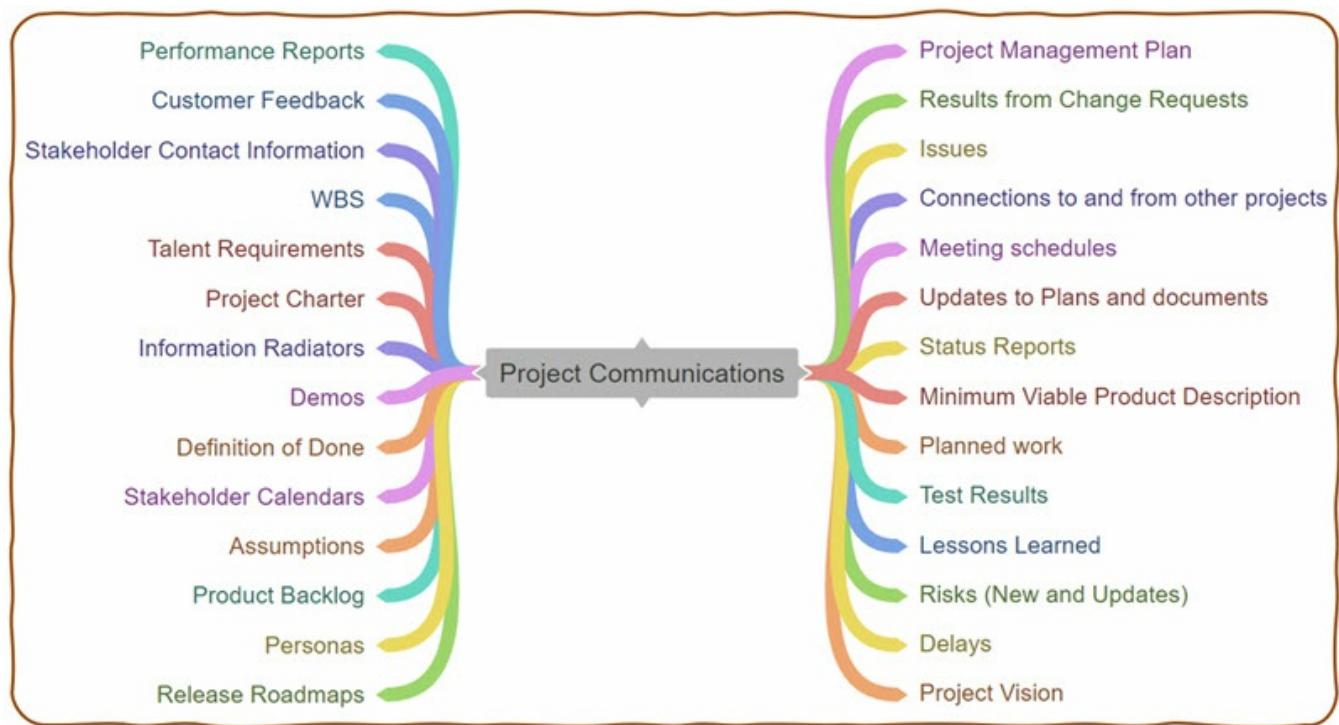
“The single biggest problem in communication is the illusion that it has taken place.” – George Bernard Shaw

Good communications are vital for successful projects. Just as the A.B.C. of sales stands for Always Be Closing (the deal), then the A.B.C. of project management stands for Always Be Communicating.

Junior project managers often think communicating is sending out a project status report.



However, this is not the case. The best project managers are constantly communicating, checking for understanding and then communicating some more. A partial list of items to express and share is shown below:



We do not need to memorize these items. Instead, we need to share a wide variety of

information. A failure to communicate is a common cause for project failures.



Project Failures due to a Failure to Communicate

Many project failures can be traced back to communication failures. It could be the failure to communicate an issue in time, the failure to check an understanding, or confirm an agreement. Projects get behind one day at a time, and issues often start small and then compound. Communications can save the project if they occur in time and with the right people.

PMI research suggests communication breakdowns account for [30%](#) of project failures. Some online discussions attribute [100%](#) of project failures to communication failures. The variation in percentages stems from how we classify issues such as changing objectives or poorly articulated requirements. Some people classify them separately from communication failures, others as a type of communication breakdown. Either way, communication is a critical skill for any project manager.

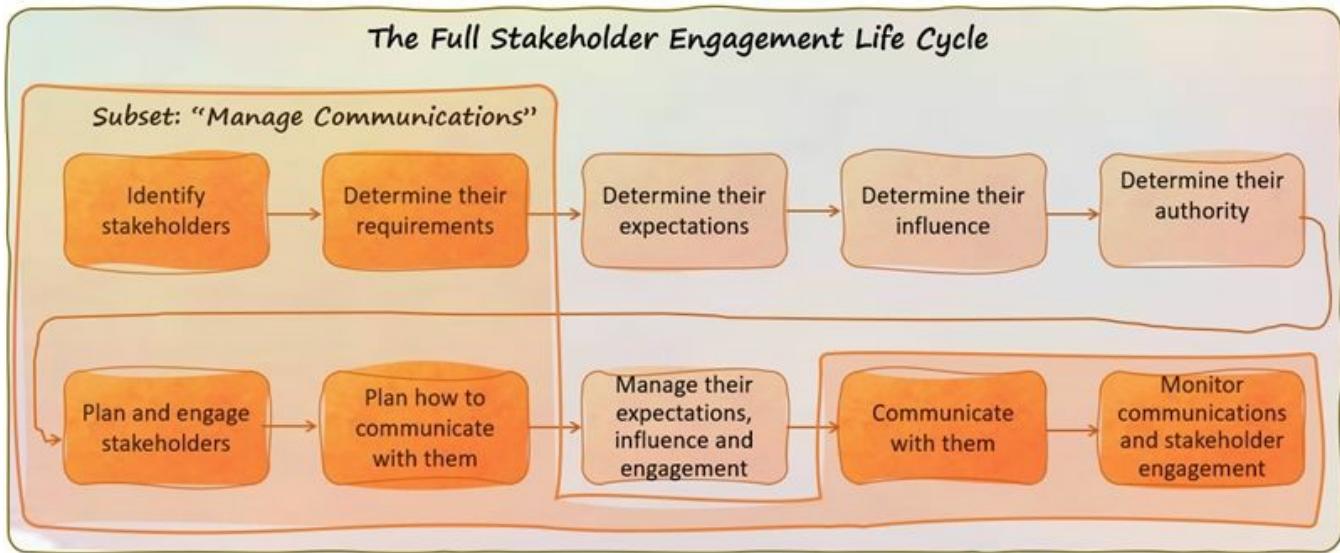


Communication Management is a subset of Stakeholder Engagement

In Task [1.9 Collaborate with Stakeholders](#), we saw how collaboration is a subset of the Stakeholder Engagement Life Cycle. It looked like this:



This task, 2.2 Manage Communications, is also a subset of the Stakeholder Engagement Life Cycle that focuses on the Communications related components, as highlighted below:



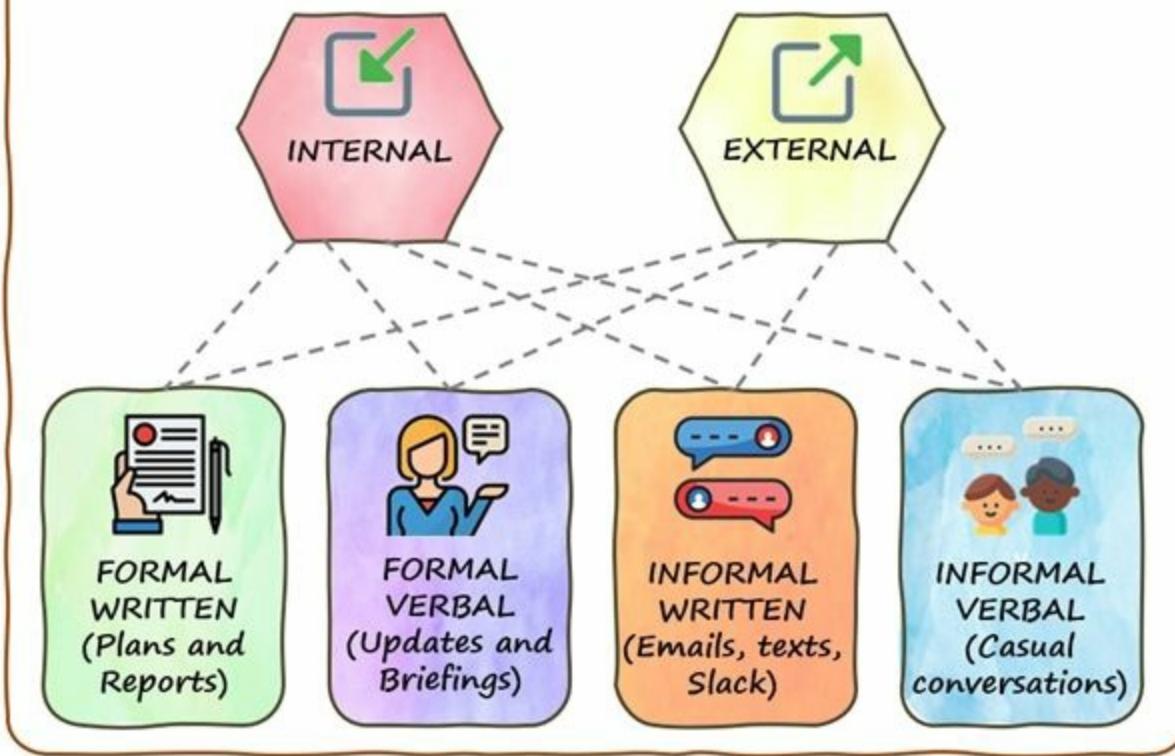
Communications management starts with identifying the people we need to communicate with. Then determining what they need, planning the communications and the mediums to use. Then we can do the actual communicating and follow up to make sure the messages were received and interpreted correctly.



Types of Project Communication

Communication can be internal (with the project team) or external (outside of the team). It can be formal or informal, written or verbal. These types and some examples are shown below.

TYPES OF COMMUNICATION



Within these communication types, there are more distinctions to be aware of.

- **Hierarchical focus** - Are we communicating up to senior management or with peers?
- **Tone** – The inflection used and the non-verbal gestures of body language.

2.2.1 Analyze Communication Needs of all Stakeholders



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(Find out who we are dealing with and their communication needs)

The first two steps of the Stakeholder Engagement Life Cycle are “Identify Stakeholders” and “Determine their Requirements.” As part of building our team and starting the project, we may

have already undertaken some stakeholder analysis and created a Stakeholder Register.

Stakeholder Register

Stakeholder registers typically contain contact, interest and influence information for each stakeholder or stakeholder group identified. Here is an excerpt of the type of information they contain.

Stakeholder Register					
Stakeholder Name	Contact information	Project Role	Project Requirements	Project Concerns	Impact and Influence Scores
Mary Pulaski	(123) 1234567 mpulaski@hmail.com	Sponsor	Compelling UI, fast and responsive	Delays, cost over runs, poor reacti	●●● ■■■
Libby Kipling	(123) 2345678 lkippling@hmail.com	Project Manager	Completion to scope, schedule, budget & q	Tech viability, Disappointed Sp	●●● ■■□
Jeff Harris	(123) 3456789 jharris@hmail.com	Product Manager	Fully functional app with all high priority	Ready for trade show, slower tha	●●● ■■■
Mitchel O'Keath	(123) 4567890 mokeath@hmail.com	PMO Representative	Alignment with IS strategy, integration	Citizen dev. risks, dependencies on	●○○ ■□□
Sanjiv Patel	(123) 5678901 sapatel@hmail.com	Steering Committee Mbr	Competitive advantage, ROI	Industry reception, costs	●○○ ■■■
Joe Corbitt	(123) 6789012 cuttiepie@hmail.com	Development Team Member	Delight the users, gain team lead exper	Team skills, lack of Xcor experien	●●○ ■□□



Agile projects may not create a formal stakeholder register. However, they likely have a Who's-Who or contact information document, spreadsheet or Wiki page on the project site to record similar details.



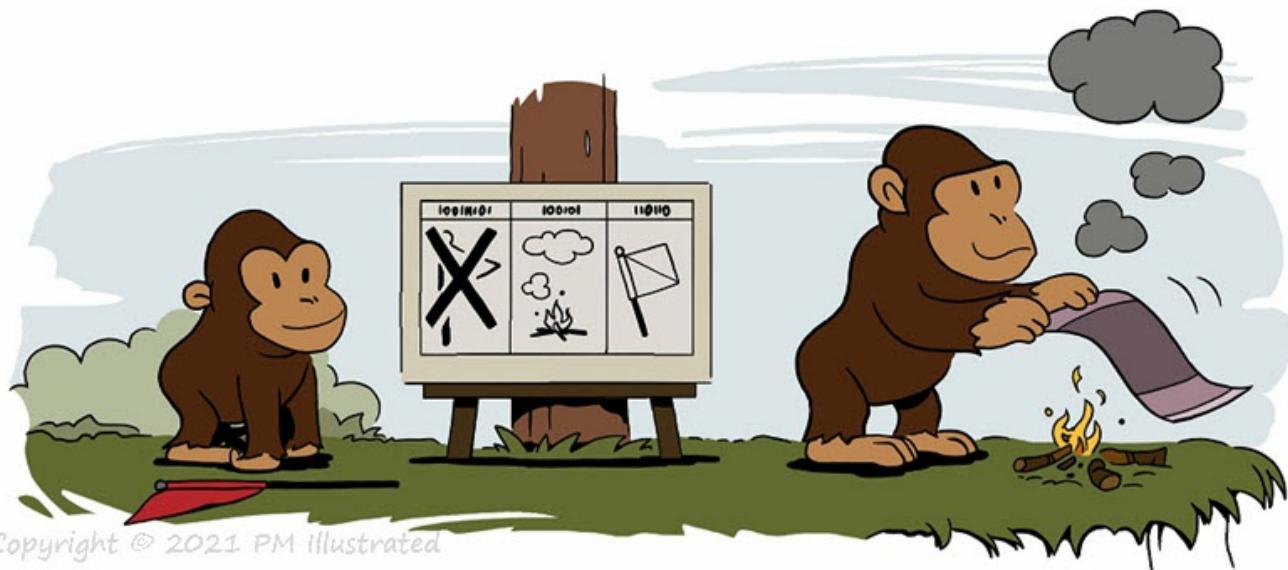
Communication Requirements Analysis

Through interviews, questionnaires, workshops, and the study of lessons learned from previous projects, the process of communication requirements analysis determines the information needs of the project stakeholders.

The goal is to define a clear description of each stakeholders' communications needs. It helps us choose the technologies, formats and frequencies for the project communications. It is the "Build Understanding" step before creating the Communications Management Plan.

2.2.2 Determine Communication Methods, Channels and Frequency

(Full ECO Definition: Determine the communication methods, channels, frequency, and level of detail for all stakeholders.)



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(Establish how people would like to communicate)

Some people prefer emails, others a website they can go to for information. Once we understand who we need to communicate with (via Stakeholder Analysis) and how they would like to be engaged (via Communication Requirements Analysis), we can now create the Communications Management Plan.



Communication Management Plan

The Communication Management Plan sets out to who, how and when we will share project information with various stakeholders. It can be a document or table on a website. The main thing is people know where to find it, and it explains how project information will be shared.

Communication Management Plan

Communication Type	Objective of Comm.	Format	Frequency	Audience	Owner	Deliverables
Kick-Off Meeting	Introduce the project, manage expectations, set	Meeting	One-Time	All Core Project Stakeholders	Project Manager	Meeting Minutes, Updated Charter
Status Report	Report of the status of the pro	Document, emailed	Weekly	All Core Project Stakeholders	Project Manager	Status report, issues log, risk log
Steering Committee	Clear issues, review performa	Meeting	Monthly	Steering Comm, PM, others as n	Project Manager	Meeting Minute Action items, up
Task Board	Show work planned, in prog	Information radiator	Real-time	All Core Project Stakeholders	Development Team	Phys task board and electronic ver
Lessons Learned Review	Capture lessons for future projec	Meeting	One-Time	All Core Project Stakeholders	Project Manager	Lessons Learned Report

Components of a Communications Management Plan

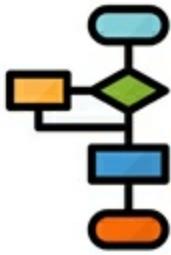
Regardless of the format of the Communications Management Plan (formal document or webpage), it should consider the following communication attributes:

- A list of stakeholders and their communication preferences
- The information to be communicated
- The language to be used, if more than one is being used
- Time frame and frequency of communications
- The person responsible for the communication
- Methods or tools used to convey the information
- Escalation process for issues that need visibility
- Glossary of common terminology
- Flowcharts of information flow
- Any communication constraints due to regulation or policies



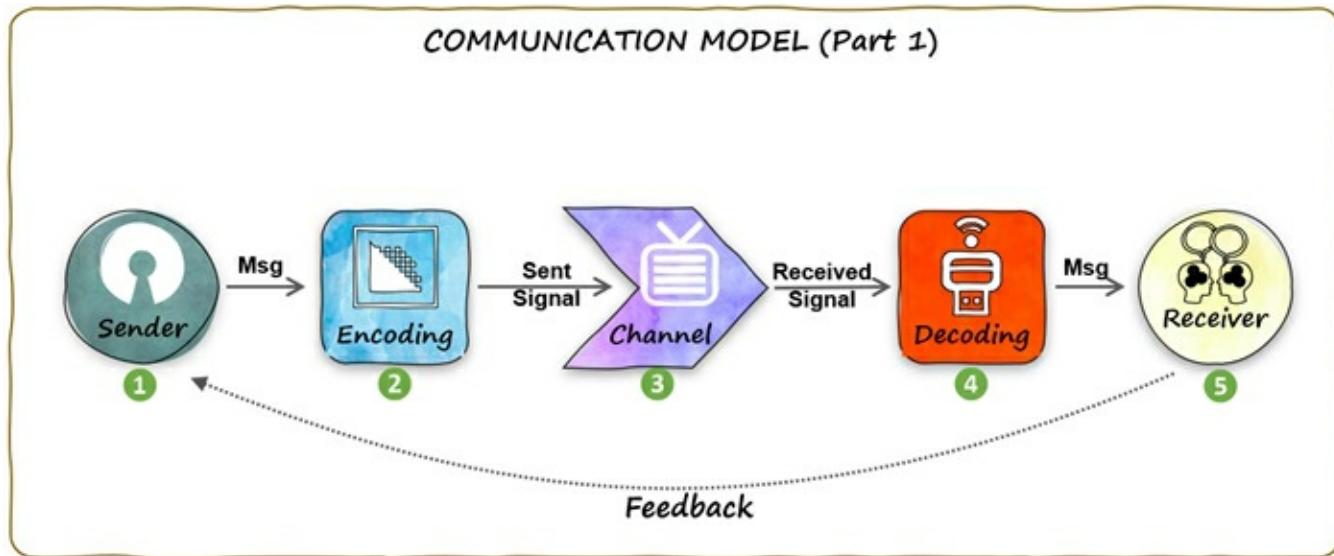
Depending on the type of project you usually work on, this rigor and planning might all sound like overkill. However, for the exam, think about large projects with hundreds of stakeholders spread around the world. With this frame of reference, the need for a plan and details about exactly who gets what information and from where makes more sense.

Before crafting and sending project information, it is helpful to understand some theory about communications. It can help us avoid common pitfalls and explain why our communications go adrift.



Communication Models

There are several widely used models of communication that help us understand the process and challenges involved. Shannon and Weaver created a popular one called “The Mathematical Theory of Communication” that looks like this:



Suppose we wanted to announce that the opening of our petting zoo has been moved from Tuesday to Thursday because rain and strong winds are forecast for Tuesday. Using this model above, we represent the sender (1); we decide to send our message via email and announce “*Opening delayed until Thursday for weather issues. Same activities and timing.*”

The wording of the email is how we encode our thought (2). The medium of written text delivered via email is the signal we send over the channel (3). People receive the signal (our email) and decode it to extract meaning (4). From this process, the receiver interprets the message (5). They may provide feedback (that also gets encoded, transmitted and decoded).

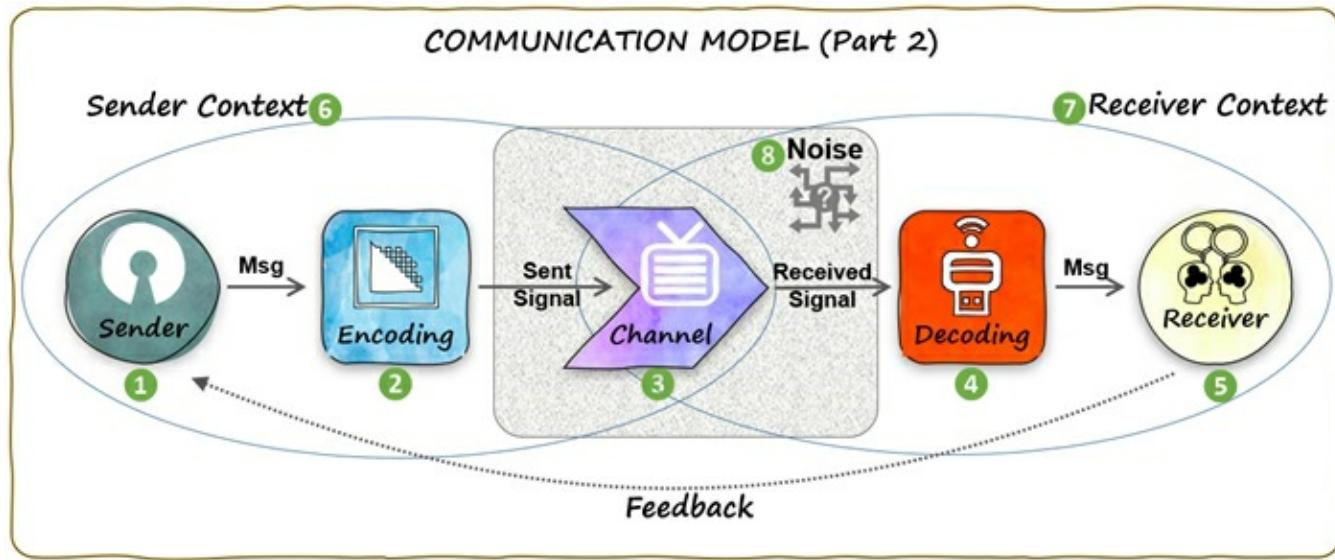


Opportunities for Error

As we all know from dealing with people, just because we have a thought and try to convey it to others, that does not mean that thought will make it through the process intact. As an example, Tina, who uses a look-and-guess method of reading, sees “*Opening delayed...*” and she panics, stops reading any further and immediately assumes the entire project is jeopardy.

Marco, whose job is to make the big-top tent weather tolerant, sees this as an attempt to publicly shame his work. Jim has been too busy relocating frogs from the picnic site to read his emails recently, but he will have all the frogs moved by Tuesday.

These examples illustrate some possible outcomes and additional elements of the communications process. The words that we choose that have a single, clear meaning for us may be interpreted differently by others. Our communications also occur in an environment with noise and information loss. Finally, the sender's and receiver's context matters, as does their intent. These additional elements have been added to the image below:



The sender context (6) impacts the encoding and channel chosen, as too does the receiver context (7). The encoded signals are sent through channels with noise and a possibility for corruption or meaning loss (8).

Language can be imprecise, and the possibilities for misinterpretation are almost endless. A simple “How did you find the meeting?” question could be answered as 1) “Long and boring” or 2) “I looked up the room location on the floor plan and walked there past the cafeteria.”

Faults with encoding, channel choice and decoding are widespread. When we consider a large project environment with different cultures, generations, technical jargon, and acronyms with multiple meanings, it’s a wonder any messages get through as intended.



Guidelines to Improve Communications

- **Prioritize:** We can check our encoding and structure the message, so the most critical information is conveyed first. If we know the cause of the delay will be scrutinized, maybe we start with “Due to inclement weather, the opening is moved to...”. Also,

assume not all of our communications will be read to the end, so move the critical information to the front in case people only scan it. Finally, having a strong or grabby Subject Line for emails and communications will increase the likelihood of our messages being opened.

- **Choose your channel:** Long lists of instructions are not best conveyed via a phone call. Text messages are great for on-the-go synchronization but may be too informal to send critical news to stakeholders you interact with infrequently. Delicate matters are best handled one-on-one in person or on the phone, where there is the opportunity for immediate Q&A.
- **Get Graphical.** Think about the type of information and message you are conveying and use the suitable medium. Consider visuals. Schedule information might be best shown with a timeline, geographic data with a map or floor plan.
- **Don't be afraid to duplicate and use multiple channels:** Our brains are all wired differently, and we all have unique preferences for both format (sound, visual, written) and medium (F2F, email, video, project website). Typically, it is safer to over-communicate and send things in multiple formats via different channels to ensure the message gets through.
- **Turn to technology:** We live in a time of unprecedented information transmission and data-filtering technology. We have more tools and channels for communication now than ever before, yet things still get mixed up and missed out. While these tools can add to the sense of "overwhelm" and channel choice, they can also be used to create safety nets and save time.

2.2.3 Communicate Project Information and Updates Effectively



(Gather and communicate project information regularly)

Throughout the project, project managers need to make relevant information available to stakeholders. This can be achieved through push communications, pull communications or a

combination of the two. Let's discuss the differences.



Push Communications

Push communications are reports, documents and messages pushed out (sent) to project stakeholders. Sending a project status report is an example of a push communication.



Pull Communications

With pull communications, people go to an information source such as a website and get the data they need. They pull the information they need. This can be from static reports, graphs and updates or in a more interactive way. Perhaps running queries, interacting with chatbots or downloading data for further analysis.

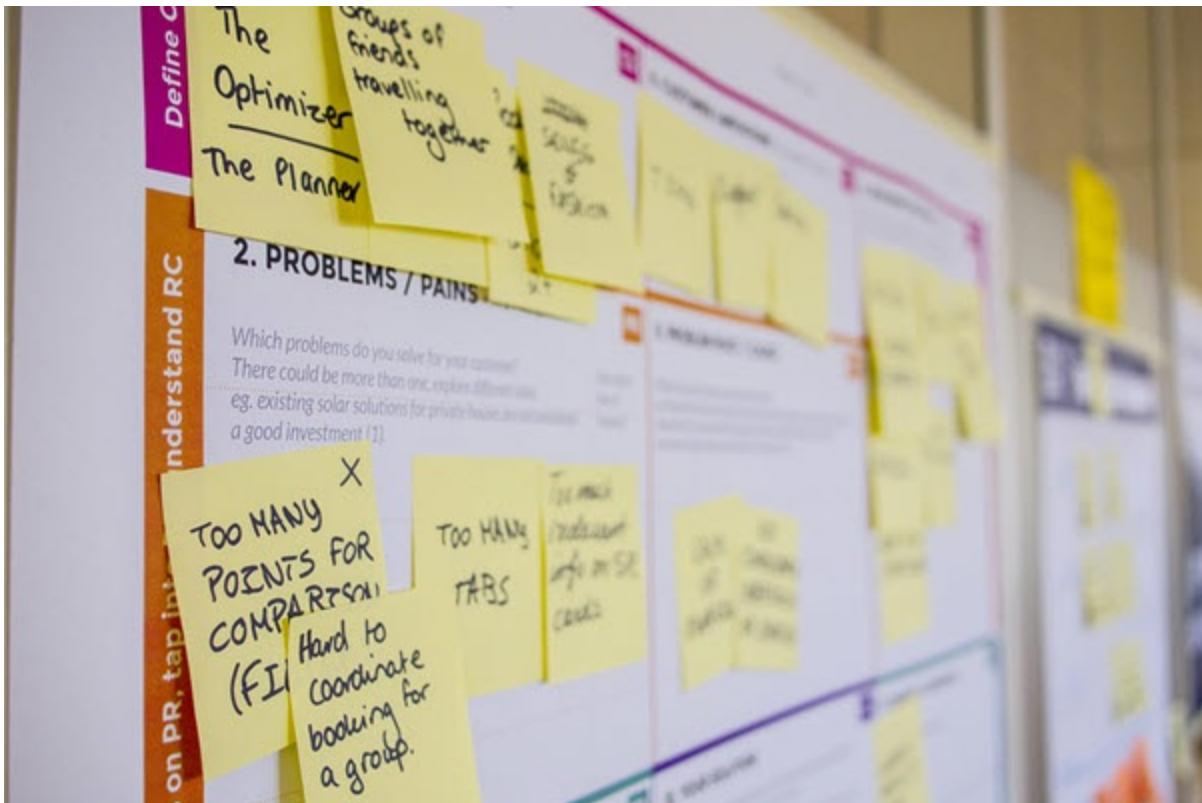


Hybrid and agile approaches encourage transparency and information sharing. Instead of sending status reports, meeting minutes and risk logs to stakeholders and hoping they are read, this information is publicly displayed in team spaces and on project websites.



Information Radiators

Information radiators are big visible charts that share project information. For instance, a task board and impediments board share much of the same information as a project status report (work done, work in progress, work planned, issues, etc.)



There are pros and cons to both sending reports and relying on information radiators. We could try to do both, but this might not be the best use of our organization's time and money. Stakeholder analysis (asking what people want and need), whether conducted formally or informally, should inform our decisions.



Product Demonstrations - Show Don't Tell

Sometimes the best way to explain what is going on is to show it. Rather than reporting on progress, hold a demonstration and show a product, solution or small chunk of one. Demonstrations are more concrete and tangible than a chart or report of progress. Any time we can see, touch and try something, we get a richer perception of it. Product demos are a great way to communicate project progress effectively.

2.2.4 Confirm Communication is Understood, and Feedback is Received



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(Ask for feedback on our communications and act on it)

“Don’t forget that feedback is one of the essential elements of good communication.” – Anonymous

It is not sufficient to communicate and assume everyone understands our message and has their information needs completed. We should be checking in periodically with people to ask if the communications are working, if people have what they need, and how to improve.

Phase gates, steering committee meetings, demos and retrospectives are all good opportunities to inspect, learn and adapt our communications approach. We should ask if we are communicating enough, appropriately and successfully.

Communication management plans help define the sets of information, format and delivery frequency at the start of projects, but this is not a once-and-done process.



Mind the Gap

Once we realize there is a significant gap to overcome between getting a thought from our heads to those of others, we are halfway to building robust and reliable communication systems. We must not assume our messages will be opened, read, interpreted or regarded with the importance we assigned to them.

We need to communicate frequently, as a minimum, in the formats requested by stakeholders and using others too, if we want to be heard and understood. Technology can certainly help. We can create reminders to check in with key stakeholders. We can set up automatic forwarding of messages from platforms we do not like to ones we prefer to use. Tools can aggregate information from multiple sources and distribute messages to many recipients through numerous channels.

By mastering some essential communication tools, we can increase our coverage and free up time for thinking about how best to craft our messages with less chance of misinterpretation.

2.4 Engage Stakeholders

Since this Process Group Task “2.4 Engage Stakeholders” is about stakeholders who are people, it should be no surprise there is considerable overlap with the content in some of the People Group Tasks. These include [1.9 Collaborate with Stakeholders](#), [1.2 Lead a Team](#), and [1.8 Negotiate Project Agreements](#). However, rather than send you over to those tasks to read about them, the key points are repeated here.

Stakeholders are anyone affected by our project or anyone who can affect it. They can be individuals or groups. The PMI definition of a stakeholder is “*Any individual, group, or organization that may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio.*”

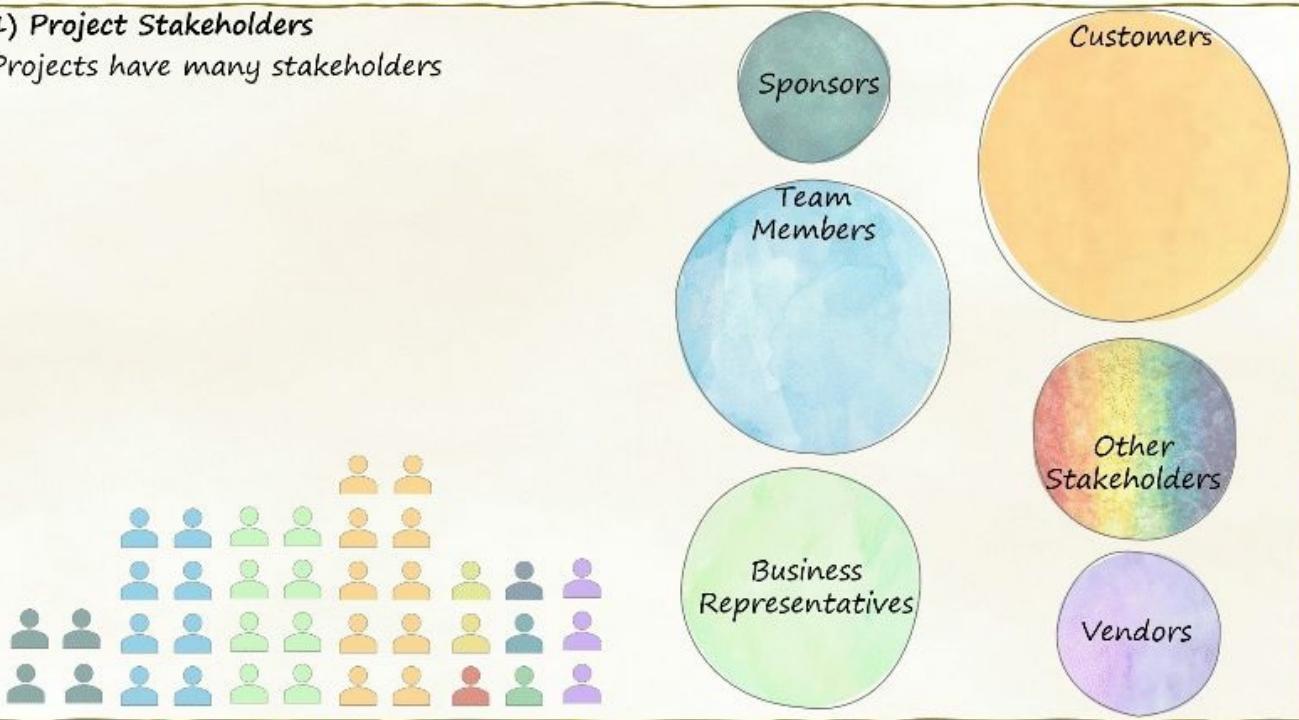
Stakeholders include:

- **Sponsors and executives** who envision and commission new products and services, or fund changes to existing ones
- **Team members** who help analyze the work, define what is required, then build and deliver the project outcomes
- **Business representative** who explain what is required and provide feedback on work products
- **Customers and users** of the new or modified products and services who use it
- **Vendors and suppliers** who help deliver portions or significant components of the solution
- **Other stakeholders** such as advisors, reviewers, subject matter experts and third-party contributors

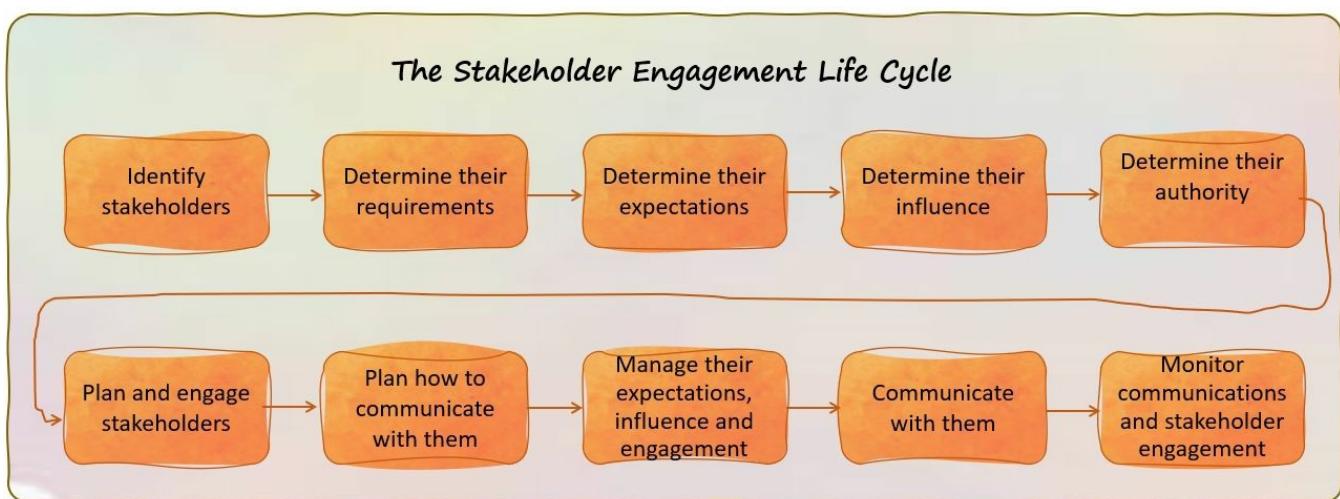
While these stakeholders act as their own communities, projects bring them together as a single ecosystem.

1) Project Stakeholders

Projects have many stakeholders



We need to understand the stakeholders within our project ecosystem. This includes understanding their attitudes, requirements, influence and authority. Then create a plan to engage with them.



Stakeholder Identification

Activities to identify stakeholders include:



The usual suspects – Review each of the common Stakeholder Groups categories and list who is impacted or can influence this project.



Ask the team – Take the same questions to the team, ask them to individually, then collectively brainstorm who the project stakeholders are.



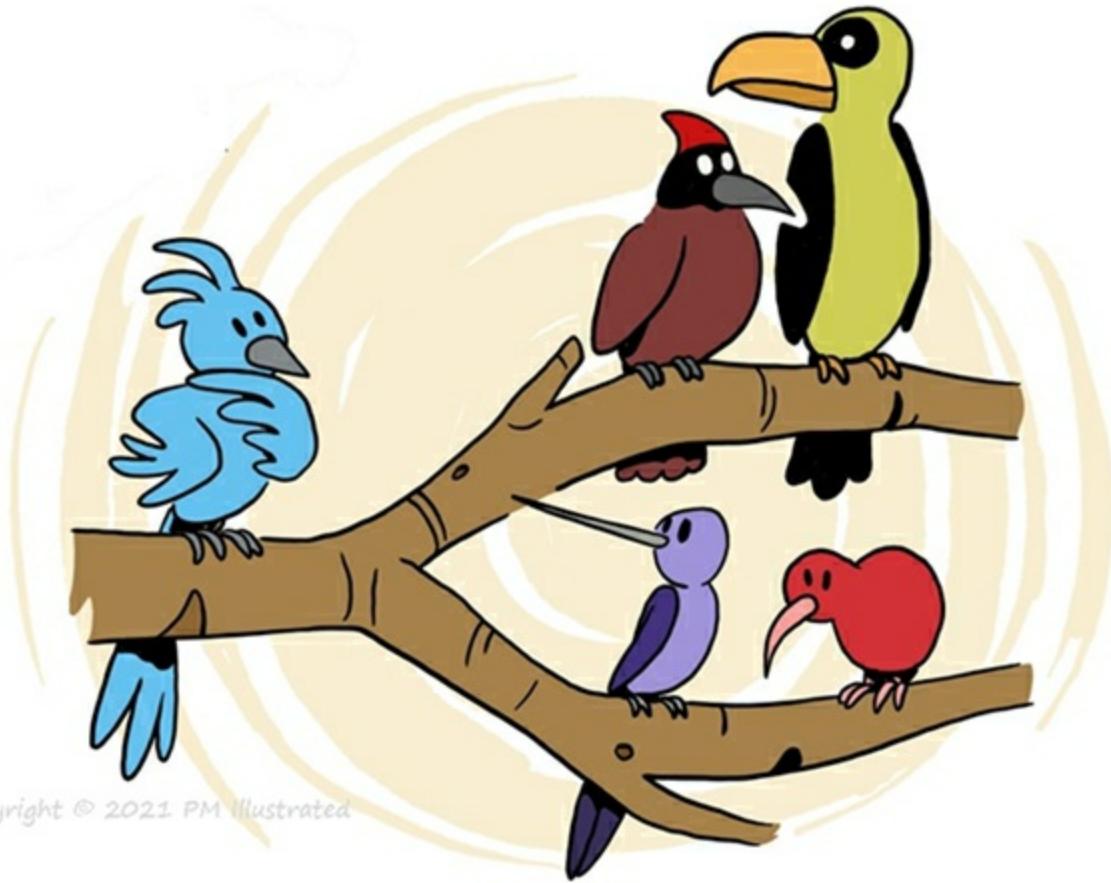
Surveys and questionnaires – Ask other stakeholders to tell us who we may have missed. Using surveys and questionnaires, we can canvas relevant stakeholders for their opinions on additional stakeholders or stakeholder groups we should consider.



Document analysis – Look at the other project documentation that might already be available such as the project charter. Anyone or group identified will be a stakeholder. Also, review the risks, assumptions and constraints. Do any point to people or groups we should be considering? Refer to other project documents that share some common characteristics. Review their stakeholder registers, lessons learned, communication plans, risk and issue logs, etc., looking for stakeholders relevant to us.

2.4.1 Analyze Stakeholders

(Full ECO Title: Analyze stakeholders using approaches such as Power Interest Grid, Influence, Impact, etc.)



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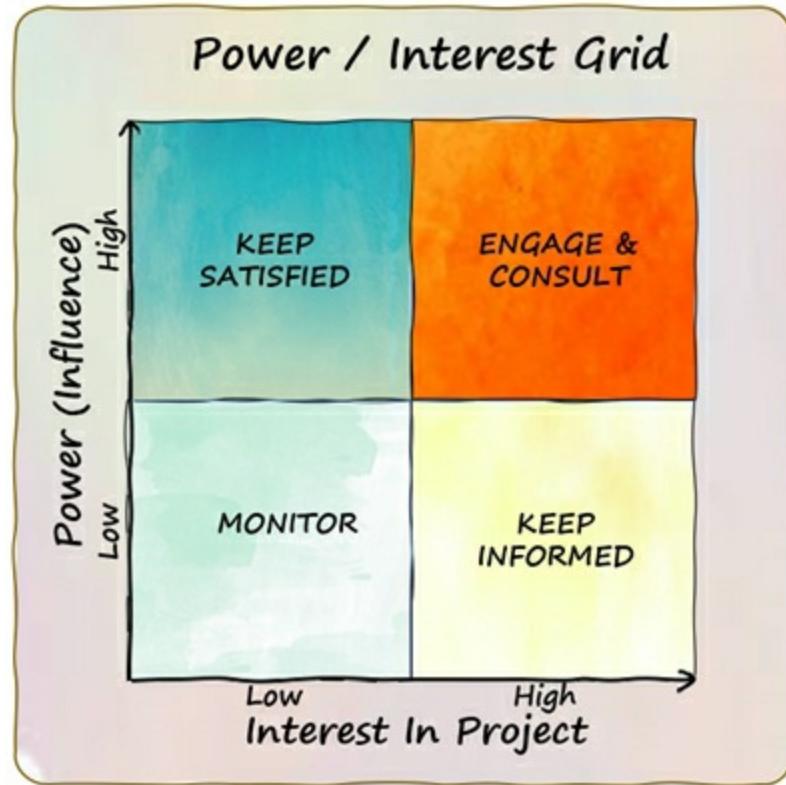
(Analyze stakeholder attributes)

After we have identified our likely set of stakeholders, we should gather information about them. Such as are they in support of our project or opposed to it? Also, do these people possess significant influence or impact on the project outcomes or other stakeholders? Understanding these characteristics will help us better plan how to communicate and engage with them during the project.

Some popular approaches for stakeholder analysis include:

Power/Interest Grids

These are plots of stakeholders categorized on a grid showing their power to influence the project on one axis and their interest in the project on the other axis.

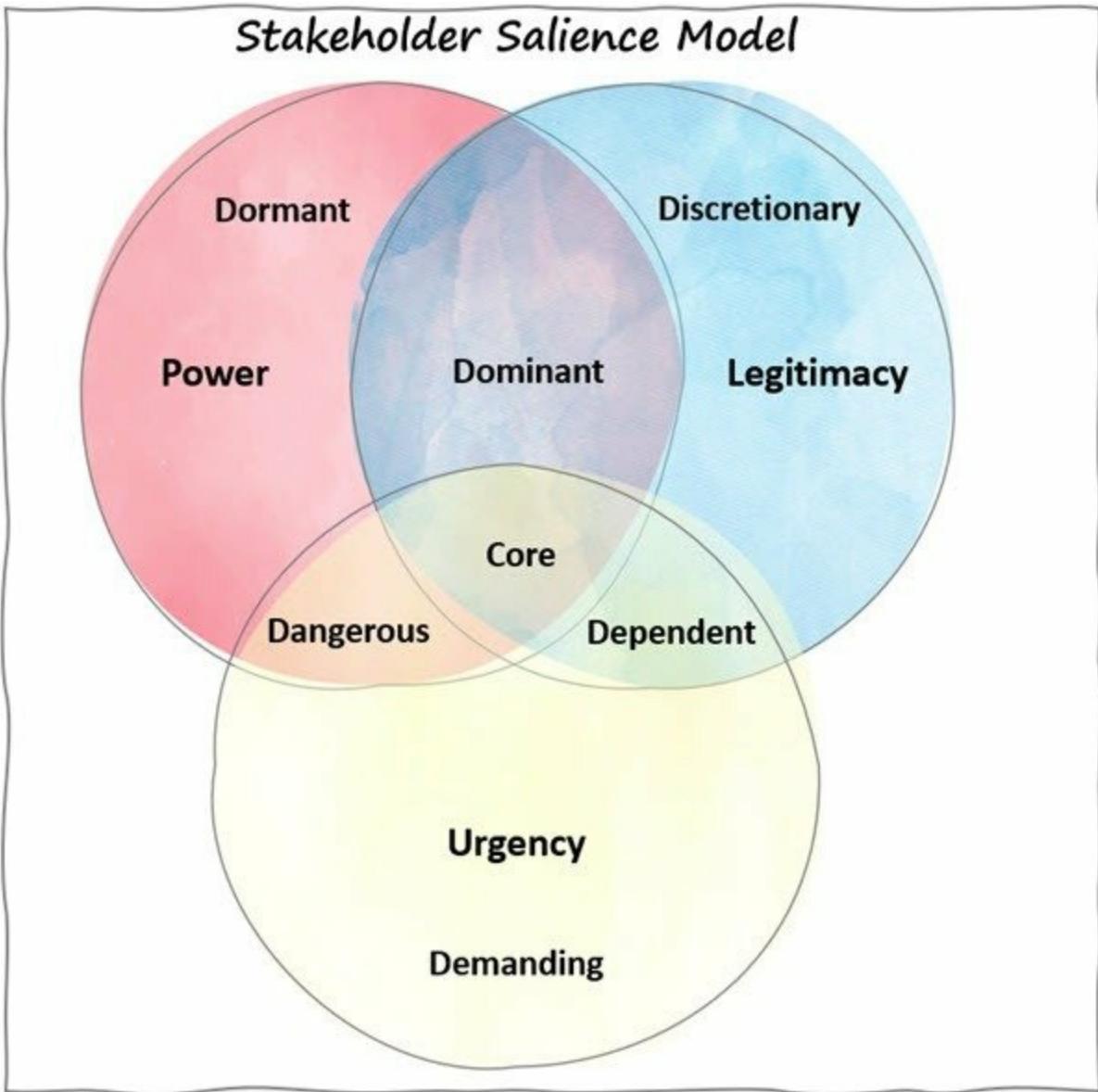


(There are a few permutations on these grids. Sometimes instead of plotting power and interest on the axes, they may plot “Power and Influence” or “Impact and Influence,” but the concepts are the same.)

Salience Model

The Salience Classification Model is a way to classify stakeholders based on the three attributes of

- **Power** – their authority
- **Legitimacy** – how appropriate their involvement is in the project
- **Urgency** – their immediate need



Where these influence circles overlap, we get subgroups of Core, Dominant, Dangerous and Dependent. Stakeholders in the central Core area need the most attention since they have power, legitimacy and urgency. Your project sponsor would be an example of someone with Core influence.

As we move further away from the Core, the strategies for working with people can flex based on their influence and the project needs. Stakeholders in the Dominant, Dangerous, and Dependent regions still need plenty of attention since they mix two influence factors. The outer Dormant, Discretionary and Demanding groups would typically be served third, behind the other groups.

The Salience Model is a useful classification tool. It helps us consider stakeholders based on their level of authority (Power), how appropriate their involvement is in terms of the project (Legitimacy) and their immediate needs (Urgency.) However, in real-life, personalities often have a strong influence on how much attention we need to dedicate to them to be effective.

During the Stakeholder Analysis of a project, we:

- Determine which stakeholders to manage closely and which will require less effort
- Determine the level of participation required from each stakeholder

- Document the interests and motivations of stakeholders in a project
- Identify the stakeholders that can make the project unsuccessful
- Look for any conflicting interests and relationships between stakeholders
- Determine communication strategies and medium best suited for each stakeholder

This analysis helps us focus our time and energy on the stakeholders that can make or break the project. It also allows us to create a communication and stakeholder strategy.

2.4.2 Categorize Stakeholders



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(Categorize stakeholders to better support their needs)

Once we have identified the likely stakeholders and assessed their characteristics such as power and influence, these details get recorded in the Stakeholder Register.

Stakeholder Register

Stakeholder registers typically contain the following information for each stakeholder or stakeholder group identified:

- Name
- Contact information
- Project role
- Project requirements
- Outcome Expectations
- Impact and influence scores
- Likely attitude about the project
- Stakeholder classification
- Associations

Stakeholder Register

Stakeholder Name	Contact information	Project Role	Project Requirements	Project Concerns	Impact and Influence Scores
Mary Pulaski	(123) 1234567 mpulaski@hmail.com	Sponsor	Compelling UI, fast and responsive	Delays, cost over runs, poor reacti	●●● ■■■
Libby Kipling	(123) 2345678 lkippling@hmail.com	Project Manager	Completion to scope, schedule, budget & q	Tech viability, Disappointed Sp	●●● ■■□
Jeff Harris	(123) 3456789 jharris@hmail.com	Product Manager	Fully functional app with all high priority	Ready for trade show, slower tha	●●● ■■■
Mitchel O'Keath	(123) 4567890 mokeath@hmail.com	PMO Representative	Alignment with IS strategy, integration	Citizen dev. risks, dependencies on	●○○ ■□□
Sanjiv Patel	(123) 5678901 sapatel@hmail.com	Steering Committee Mbr	Competitive advantage, ROI	Industry reception, costs	●○○ ■■■
Joe Corbitt	(123) 6789012 cuttiepie@hmail.com	Development Team Member	Delight the users, gain team lead exper	Team skills, lack of Xcor experien	●●○ ■□□

In the example above, we see basic contact information for the stakeholders along with their role, requirements, likely concerns and measures for their potential Impact (low, medium, or high represented by the black circles) and their likely influence (low, medium or high shown by the black squares.)



Agile projects tend not to create detailed documents recording all the project stakeholders. Ironically, for approaches that encourage adaptability and experimentation, they typically have more static roles and recommendations for engaging stakeholders. For instance, the Product Owner decides on release candidates and priorities. One document type that is commonly produced is customer personas.

A persona is a description of a customer that helps keep their goals, requirements, concerns and frustrations in focus to the development team. So, while more a requirements aid, it does describe some of the same information as a Stakeholder Register.

Persona

Name: Maria



Description:

- Maria (29) is mother to Max (5) and loves animals. She wants to inspire an appreciation for nature with her son. They visit the petting zoo 1-2 times a month.

Requirements / Values:

- Appreciates friendly, approachable feel of the petting zoo
- Thinks feeding the animals would be great activity
- Wants to get Max more actively involved beyond just watching

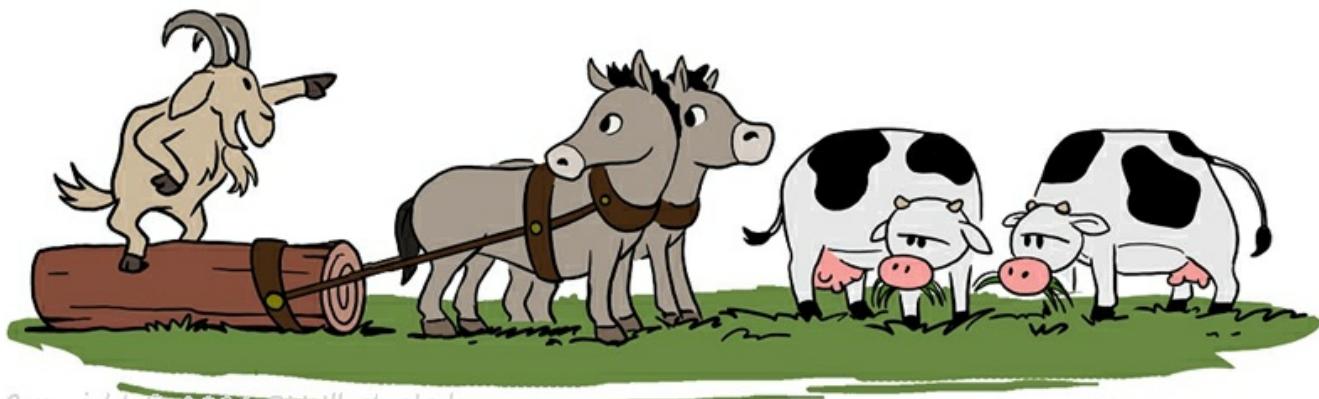
Headaches and Daily Problems:

- Concerned the pigs might have germs
- Wants to keep her son on the safe side of the fence
- Does not like slobber

Opportunities and Positive Events:

- Enjoys feeding time at the zoo the best when the animals are excited and have more interactions.
- Attended last year's behind-the-scenes zoo tour

2.4.3 Engage Stakeholders by Category



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(Get people engaged and hold them accountable)

After identifying and analyzing the project stakeholders, attitudes or support may not be where they need to be for project success. A tool for collecting and presenting engagement levels is a Stakeholder Engagement Assessment Matrix.

Stakeholder Engagement Assessment Matrix

A stakeholder engagement assessment matrix allows for a comparison between the current engagement levels and the desired engagement levels of stakeholders for successful project delivery.

Stakeholder Engagement Assessment

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Mary Pulaski	C			D	
Libby Kipling		C		D	
Jeff Harris			C		
Mitchel O'Keath				C	
Sanjiv Patel					D
Joe Corbitt			C	D	

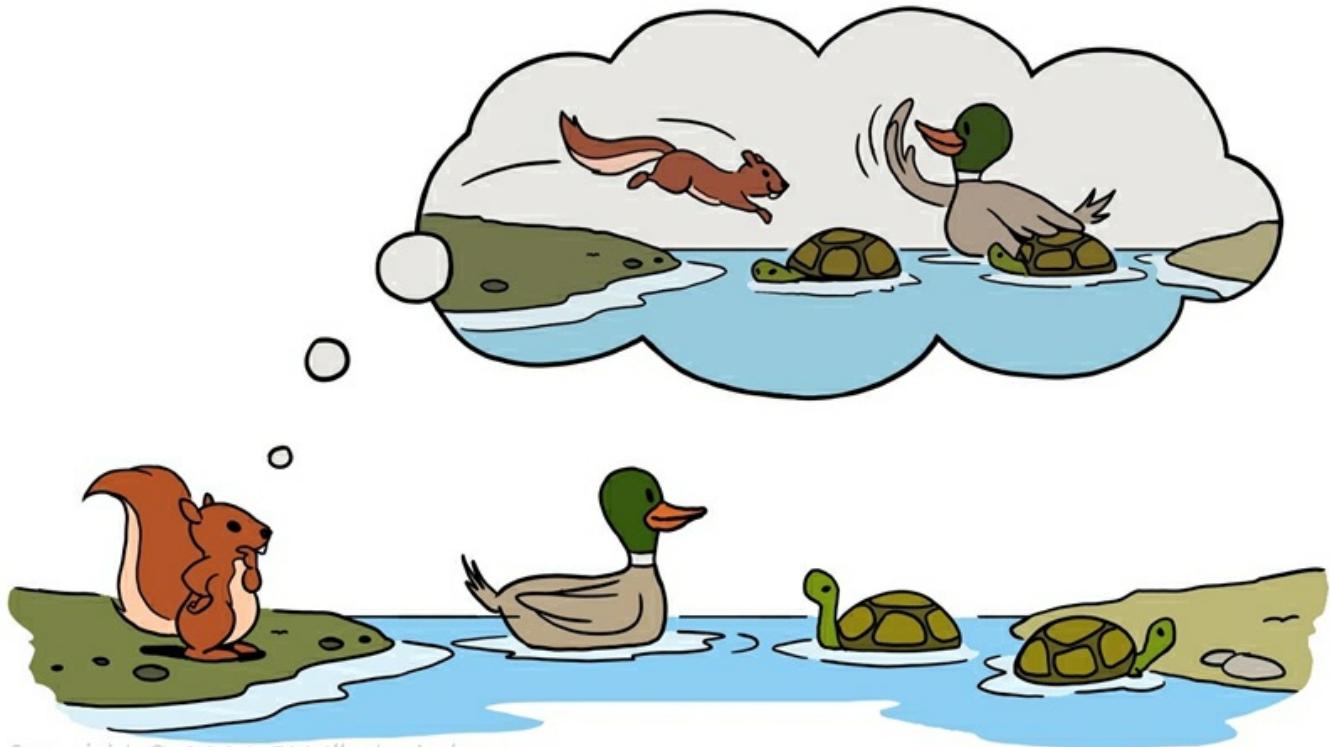
C= Current, D= Desired

The engagement level of stakeholders can be classified as follows:

- **Unaware** – Not aware of the project and its potential impacts. (“What is the Trough Chow project? I have never heard of it”)
- **Resistant** - Aware of the project and potential impacts, but resistant to it. These stakeholders will be unsupportive of the work or goals of the project. (“That pig feeding project is a lawsuit waiting to happen, and don’t get me started on the poor message it sends about measuring food intake!”)
- **Neutral**. Aware of the project, but neither in support nor opposed. (“Oh, yes, I have heard a little about it”)
- **Supportive**. Aware of the project and supportive of the work and its outcomes. (“I think it is a useful opportunity to boost visitor satisfaction, visitation and should pay for itself quickly”)
- **Leading**. Aware of the project and actively engaged in making sure that the project is a success. (“This is great, a hands-on experience no online or large-scale zoo can compete with. It plays to our strengths”)

Once we know where our main stakeholders stand on the project, we next need to plan a strategy for stakeholder engagement.

2.4.4 Develop, Execute and Validate a Strategy for Stakeholder Engagement



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(Work with stakeholders to deliver outcomes and solve problems)

Our stakeholders include the team, and the items within the WBS or product backlog represent much of what we will do. Likewise, Team Charters, Team Ground Rules and work procedures explain how we will engage with the team, but what about all the other project stakeholders? How will we engage with suppliers, sponsors, customers and all the other people and groups we identified in the Stakeholder Register?

Guidelines for engaging stakeholders include:

Create a shared view of the goal



Unite people with a common view of where we are trying to get.

People must understand and share the same vision of “Done” for the final solution and ideally incremental steps. So, spend time ensuring everyone knows where we are trying to get to. That way, when faced with their own local decision points, or forks in the trail towards project completion, they make decisions aligned with the larger goal.

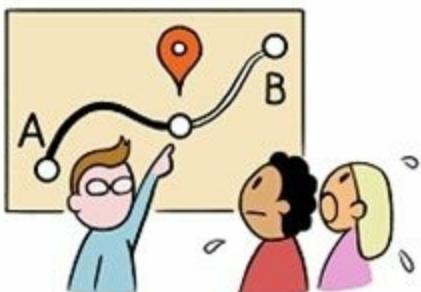
Maintain the shared vision of success



Frequently remind people about where we are trying to get to and why it is essential that we get there.

Product and project priorities can change quickly. People come and go from projects, and the market is continuously evolving. With all these changes occurring, we must frequently remind people of where we are trying to get to and why that is important. So, don't let the end goal shift or become fuzzy in people's minds. Align their expectations towards the success criteria to keep the end goal clearly in focus.

Share progress, good and bad



Share information. Make sure people know what is going on, whether this is good news or bad news.

It is crucial to be open and honest about progress, issues, and threats. People are astute and recognize if things are not being discussed. They will begin to withdraw their wholehearted commitment if they feel information is being withheld. So, share information, both good and bad, with the team and business representatives - often people surprise us with novel solutions to problems. People want to know what is going on, and we should be able to discuss topics openly.

Share forecasts to help planning



By sharing accurate updates on progress, we help people plan their work and improve their ability to prepare for the future.

When sharing forecasts and plans, we also need to share our levels of uncertainty. Future predictions are more useful when we also know the uncertainty connected to them. This can be achieved by including a confidence level, such as +/- 10%. Or using a hurricane path graph that shows the expected path for a metric with a widening margin of uncertainty the further we go into the future.

Build required involvement in project plans



If people are needed for activities, make sure they are included in the project planning. Ensure they know they are part of the plan and failure to do their part will impact that activity. Consider adding them to the critical success factors for the project.

If there is a risk that their failure to act when required might impact the project, create a risk in the risk register to reflect this. However, do not wait for the risk to become an issue. Instead, prime and confirm planned participation ahead of time. Contact them before they are needed and check they are ready to participate. It is easy for part-time roles to forget what they agreed to, when they are required, or the impacts of their no-show.

Don't forget to thank them after their contribution. Sure, it might be their job to assist, but creating small circles of goodwill can pay dividends to help future contributions and change acceptance.



Frequent Communications

The most common way we interact with stakeholders is through communicating progress, issues, status and other metrics. The Communications Management Plan is a critical document on traditional, predictive projects to explain how stakeholders will be engaged via project communications. It describes the format, frequency and distribution channels that will be used for communications.

Communication Management Plan

Communication Type	Objective of Comm.	Format	Frequency	Audience	Owner	Deliverables
Kick-Off Meeting	Introduce the project, manage expectations, set	Meeting	One-Time	All Core Project Stakeholders	Project Manager	Meeting Minutes, Updated Charter
Status Report	Report of the status of the pro	Document, emailed	Weekly	All Core Project Stakeholders	Project Manager	Status report, issues log, risk log
Steering Committee	Clear issues, review performa	Meeting	Monthly	Steering Comm, PM, others as n	Project Manager	Meeting Minute Action items, up
Task Board	Show work planned, in prog	Information radiator	Real-time	All Core Project Stakeholders	Development Team	Phys task board and electronic ver
Lessons Learned Review	Capture lessons for future project	Meeting	One-Time	All Core Project Stakeholders	Project Manager	Lessons Learned Report



Agile Communications

Given the high rates of change often experienced on agile projects, we might expect more emphasis on communications to keep everyone on the same page. However, agile projects do not create communication plans. Instead, they favor these strategies

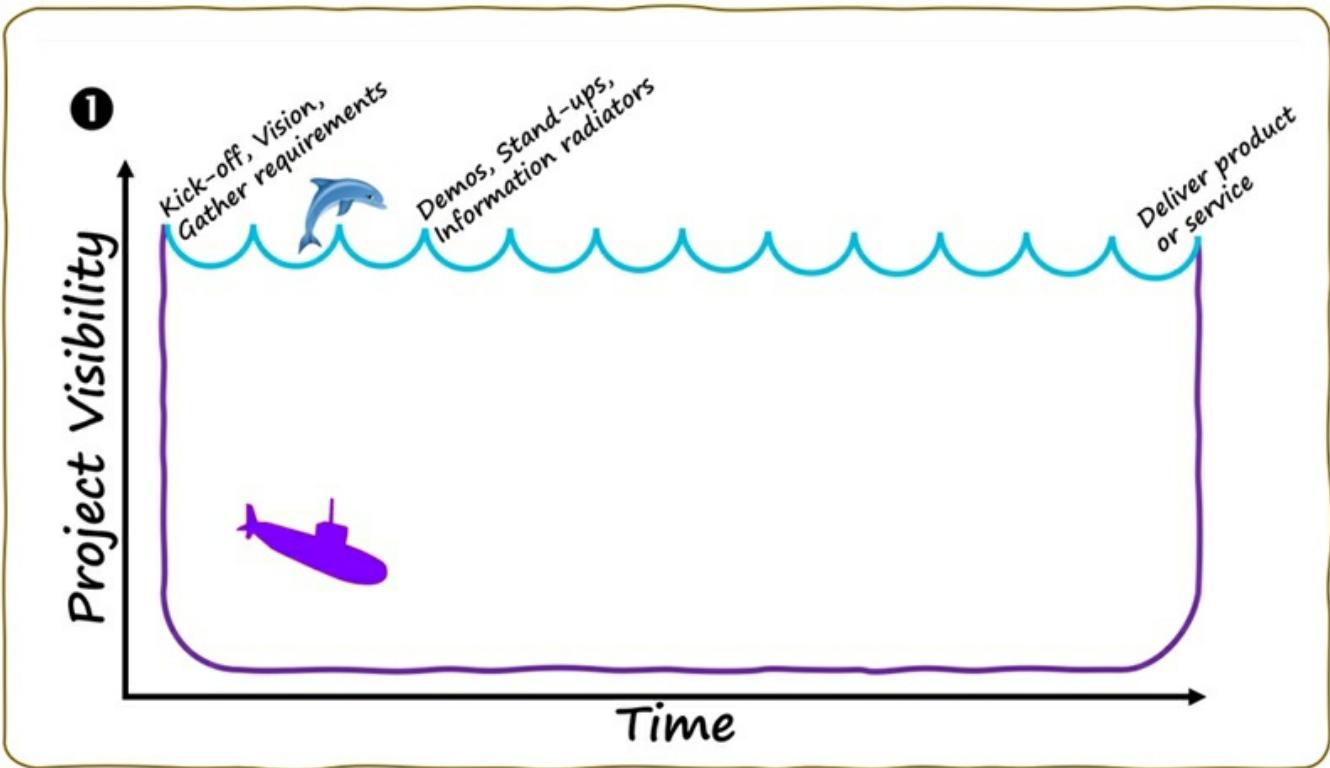


Show, Don't Tell

Despite the lack of a formal communications management plan, agile approaches emphasize communication and information sharing extensively. In fact, transparency and sharing of information are baked into many of the agile practices. Let's examine a few...

- **Demos** – Having the team demonstrate increments of functionality at the end of every iteration shows what the project has achieved to date. The demonstrations are often accompanied by project spend summaries and updates on expected completion dates. Together they provide a snapshot of progress and an opportunity for business representatives to ask questions and provide feedback.

Frequent demos mean the project never disappears for long. Instead, the team regularly surfaces from work to show where they are with progress and discuss what should come next. It is this predictable cadence of show-and-tell sessions that creates the dolphins-versus-submarines comparison.

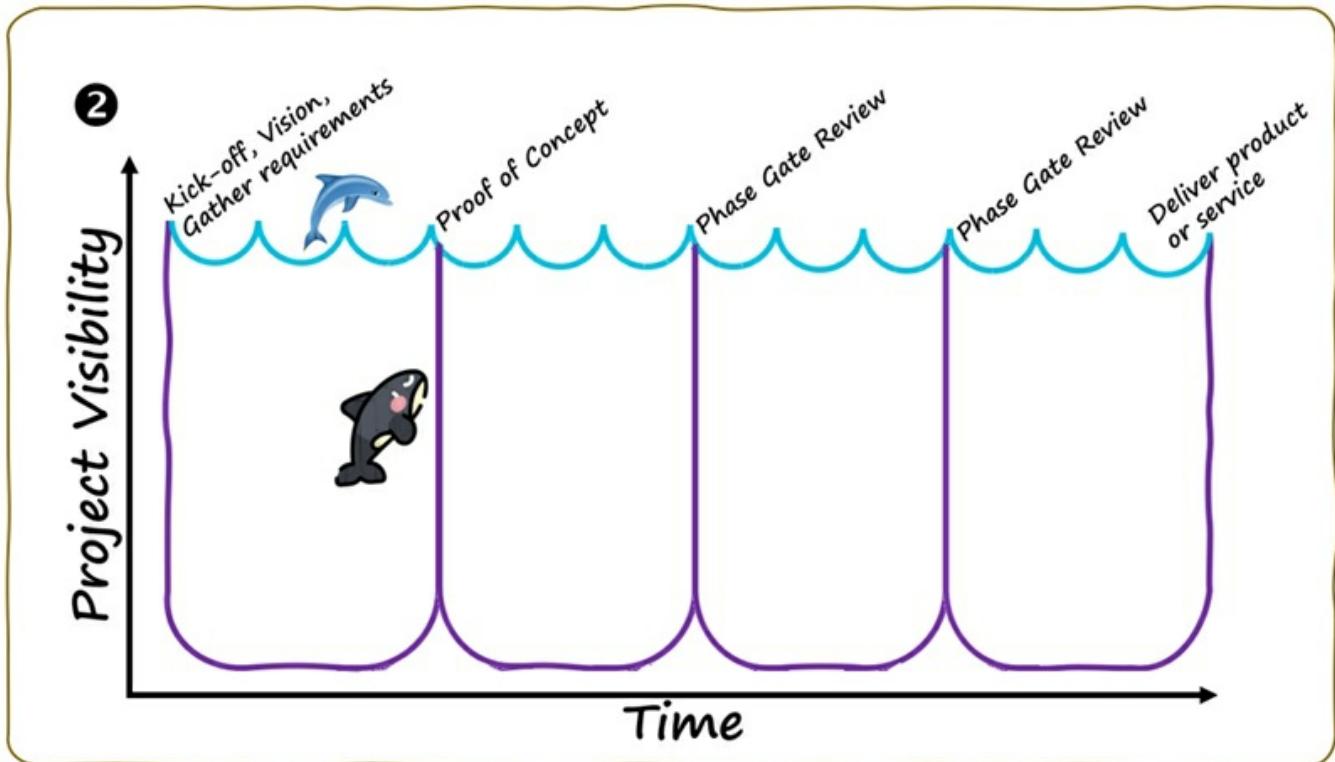


Agile projects frequently surface to show progress and discuss issues. They are like dolphins, frequently surfacing never too far from where they last submerged.

Predictive projects may have less to show the business and so have an increased reliance on communication management plans to keep everyone informed. After kickoff, a traditional, predictive project might be busy in analysis and design for long periods with only internal deliverables to show for their work. In these circumstances, they agilists claim they behave more like submarines, disappearing from view for long periods then emerging to present the solution.

Communication Realities

The dolphins-and-submarines analogy is a cute starting point to help explain some of the differences between traditional and agile communication styles. However, real-life projects are usually more complicated. Traditional projects that incorporate a proof-of-concept phase resurface and show progress. Phase-gate reviews may not demonstrate increments of a solution, but they are planned review points to assess progress, issues and funding. So, in reality even traditional projects behave more like whales surfacing more regularly.



- **Kanban boards** - The concept of “make work visible” is applied on agile projects to show what tasks are being worked on currently and the status of pending and completed items. Since knowledge work is often novel or unprecedented in the organization, it helps to have visual cues for it so people can point to it or examine its position on a Kanban board to determine its status in the development process.
- **Information radiators** – A common theme across agile approaches is to show and share information. XP has the practice “informative workspace,” Scrum encourages “transparency,” and Kanban development talks about making “process policies visible.” They all promote graphing and sharing information—both good and bad—via large charts and graphs known as information radiators.

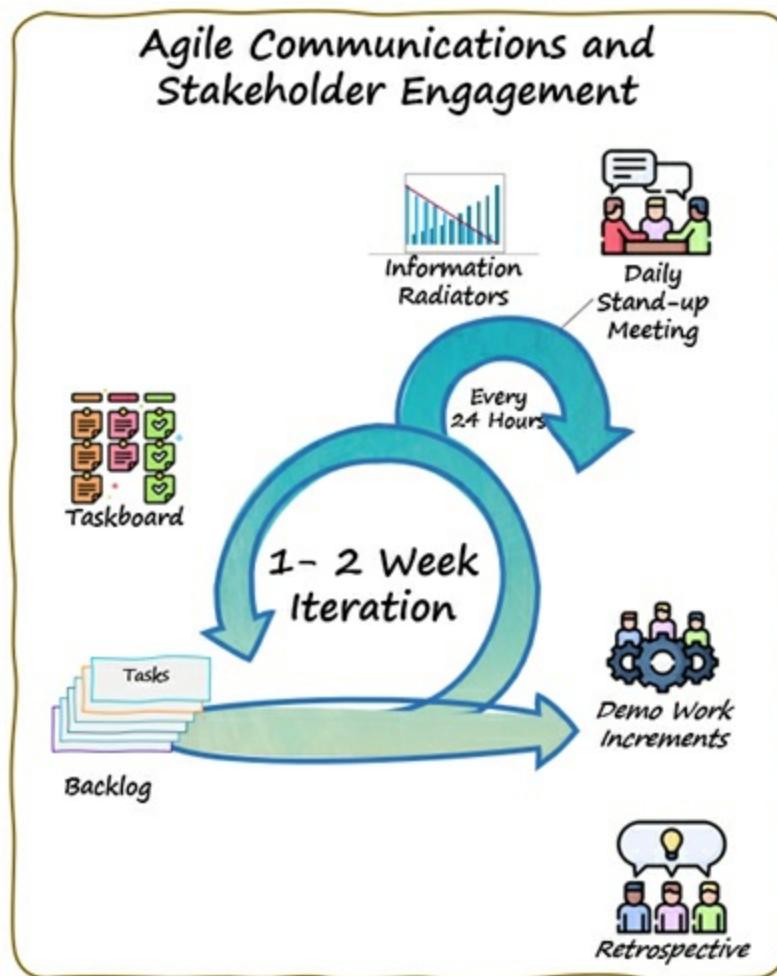
Information radiators can show any data the team wants to display. They are used by the teams but also shared broadly with other stakeholders. Development team members, rather than a project manager, typically create these information radiators and, in doing so, broaden the set of stakeholders reporting on the project.

- **Daily stand-ups** – Daily stand-ups are short (15 minute) meetings where team members share their progress, plans and raise any issues or impediments they have. It is an inter-team communication session rather than a reporting up of status to a scrum master or project manager. It facilitates collaboration, load-sharing and team planning. Other stakeholders may occasionally drop in to observe, but the goal is to help team members communicate among themselves.
- **Retrospectives** – At the end of each iteration (typically every week or two), the team

members meet to review how things are working and if any improvements can be made. This meeting is another scheduled event focused on information sharing.

The Agile Alternative to Communications Management Plans

By having multiple communication-focused events as part of the core agile practices, it removes some of the need for creating a separate communications management plan. Instead, people working in or with agile teams know there are events like demos, stand-ups and retros they can attend to learn about project performance. Likewise, there will also be task boards and other information radiators available online to get project metrics.



Downsides to Agile Information Sharing

Not everybody can attend a demo—nor wants to watch a recording of one to get a single question answered. The data on agile information radiators may not make it to all interested stakeholders, and pull systems for providing project data from websites will only work if people request (pull) the data. To overcome these issues, organizations sometimes adopt hybrid strategies.



Hybrid Communications

It is normal and often necessary to schedule additional demos or review points within predictive projects. It may also be required to create communication plans for agile projects, especially those with distributed stakeholders. We should not assume that just because the information is available that it is being consumed or understood.

So, while agile projects frequently surface to show their progress and predictive projects can seem to disappear sometimes if we do not keep close tabs on them, we need to ensure stakeholders remain engaged. We need to ask people how they want to hear about the project and ensure they know where to find the information. Check-in with them to make sure they were able to access and interpret it correctly.

We can use retrospectives and surveys in any project to learn about communication needs and wants. Given that the cost-of-change curve ramps up quickly, it is better to know about good news and bad news (in particular) as soon as possible. So, we need to keep communicating and keep asking for feedback.

2.12 Manage Project Artifacts

(The Manage Project Artifacts task is a small and straightforward component. All it really involves is understanding that project managers should know how to use document management, version control and audit trails for project documents, plans and deliverables.

If you use these tools in your daily work, you should have no problem answering questions relating to this topic. If your organization does not use configuration management or version control for its artifacts, make sure you understand the concepts and terminology.)



Project artifacts are any document, model or design related to the management of your project. As projects progress, your team will create many artifacts during the life of the project.

These artifacts are “living documents,” which means they evolve to reflect changes in the project. (They are not static, one-off documents like meeting minutes that do not update as later changes occur.)

Project artifacts need configuration management and version control applied to them. This is so changes can be tracked, and information can be retrieved at any time for your project needs or to share with other projects.

2.12.1 Determine the Requirements for Managing the Project Artifacts

Including the What, When, Who, etc.



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(Understand the artifact storage requirements for your project)

There are many plans, documents and models that make up the artifacts managed on a project. Some common ones include:

- Acceptance criteria
- Assumptions
- Business case
- Change requests
- Constraints
- Contracts
- Decision records
- Defect reports
- Economic models
- Issues
- Lessons learned
- Project charter
- Project management plans
- Slide decks
- Requirements
- Risk logs
- Scope documents
- Subsidiary project management plans



Artifacts more associated with agile projects include:

- Product backlog
- Product increment
- Product roadmap
- Product vision statement
- Release plan
- Sprint backlog
- Task boards
- Team experiments

2.12.2 Validate that the Project Information is Up to Date and Accessible

Use version control and ensure the project information is accessible to all valid stakeholders.



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(Use configuration management and version control to keep artifacts in order)

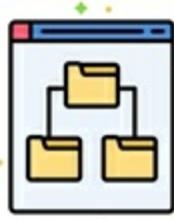
All these artifacts need to be stored securely, tracked and version controlled. Luckily, tools to perform these tasks are commonplace today and easier to use than ever.



Configuration management - is the process of managing changes to a product or service being created. We can also use configuration management systems to store, track and control our project artifacts.

Configuration management tools help:

- Control the steps for reviewing and approving product prototypes, testing criteria, and designs, plans and blueprints.
- Control product iterations and versions
- Ensure that product specifications are current



Version control - A system that records changes to a file to retrieve previous modifications made to it. Version control systems also store additional information, such as who

made the change. This way, they can perform the following services:

- Each time the file is changed, it is automatically saved and assigned a new version number
- Changes are given a date/time stamp along with the name of the user who made the changes. This creates a digital log of the artifacts' history.
- Most project management systems contain version control for essential artifacts such as the project management plans and other vital documents.

2.12.3 Continually Assess the Effectiveness of the Management of the Project Artifacts



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(Manage artifacts responsibility and check the systems work as you think they should)

It is one thing to have version control and configuration management systems; it is another thing entirely to know they work as you intended. Do not assume everything is configured correctly and storing the data you need without checking your ability to roll back a version or report on who last changed a file and what that change was. We need to have robust and reliable storage and retrieval systems.



Storage/Distribution of Artifacts

- Artifacts should be accessible to everyone who use them
- The system should suit the project's complexity—small projects do not need a complex system that would be better suited for a large project.
- Cloud-based document storage and retrieval systems are appropriate for larger projects, especially geographically distributed team members
- Features of commercial systems typically include:
 - Version control
 - Document check-out and check-in
 - User-based security
 - Email notification to specified people when an artifact is created or edited



Tips for Managing Project Artifacts

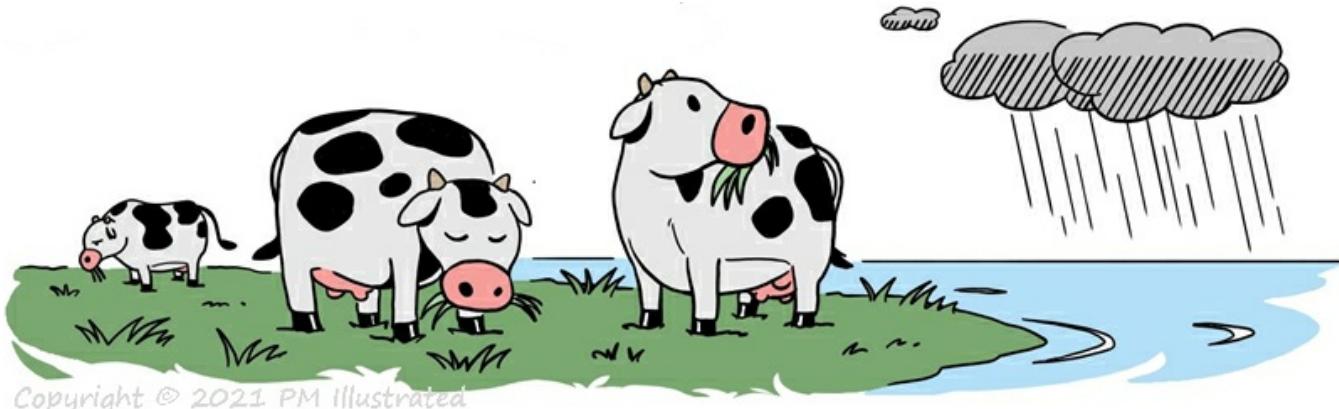
- Adopt a rigor of artifact management appropriate for your project. Safety and mission-critical projects require much more care and control than small, trivial projects. Do not use a one-size-fits-all approach.
- Learn about your organizational standards for artifact management, documentation, and audit requirements.
- Ensure the system you use has version control so you can revert back to previous versions of artifacts if needed.
- Spread the knowledge to your team, so everyone knows about the requirements for artifact management and how to correctly use the tools and systems involved.

2.10 Manage Project Changes

"It's a bad plan that admits of no modification." ~ Publilius Syrus

2.10.1 Anticipate and Embrace the Need for Change

(E.G., Follow change management practices)



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(Accept that changes are inevitable and have a plan to respond to them)

Changes to projects are inevitable.

Work is conducted over a life cycle in which the market, technology and stakeholder requests continue to evolve. Denying all changes would make managing projects simpler, but that is not a luxury project managers have.

Many things lead to project changes.



Causes of Project Changes

Common sources of changes include:

COMMON CAUSES OF PROJECT CHANGES



- **Missed Requirements** – Items that were not captured initially but are now obviously needed. “*Not only should pressing the power button switch on the hover-bike, but pressing it again should switch it off.*”
- **New Regulations** – Laws and policies change over time; these may lead to project scope changes. “*All Hover bikes must come with Wear-a-helmet stickers*”
- **Specification Changes** – Sometimes, requirements change, or testing reveals the need to change a specification. “*Upon testing, the hover-bike should default hover at 15cm (6") to avoid common obstacles such as curbs.*”
- **Inaccurate Initial Estimates** – Sometimes, the original estimate for work is wrong, and as more is learned about the tasks involved, changes to the estimates and schedules are required. “*Bill’s “10 minute” fix to the hill-stalling problem is in week 2 of development and is now re-estimated as a 4-week delay.*”
- **Market Competition** – Sometimes, competitor product releases or changing perceptions force rethinks to the original business case or project scope. “*Mega-Smash-Bikes have launched a \$999 hover-bike that will do 80 km/h (50 mph). We need to match or exceed this speed and hire more injury lawyers.*”

2.10.2 Determine Strategy to Handle Change



(Have a plan for handling changes that fits your situation)

“I can't change the direction of the wind, but I can adjust my sails to always reach my destination.” -Jimmy Dean

We need to manage project changes. How we do this varies on the development approach being used.



Traditional project management approaches have mechanisms to control changes that attempt to limit the number of changes so that only the most critical are accepted.

- This is good for preserving the original plans and baselines.
- It is problematic when there are high rates of change.



Agile approaches are more welcoming to changes and continuously reprioritize the backlog to reflect remaining work urgencies and change requests.

- This is good when everyone understands the flexibility of the approach
- It is problematic if people are expecting a largely unchanging upfront plan



Hybrid approaches attempt to bridge the significant divide between attempts to freeze upfront plans and an ongoing free-for-all of scope evolution. They use lightweight versions of traditional scope and planning artifacts such as Vision and Scope Statements.

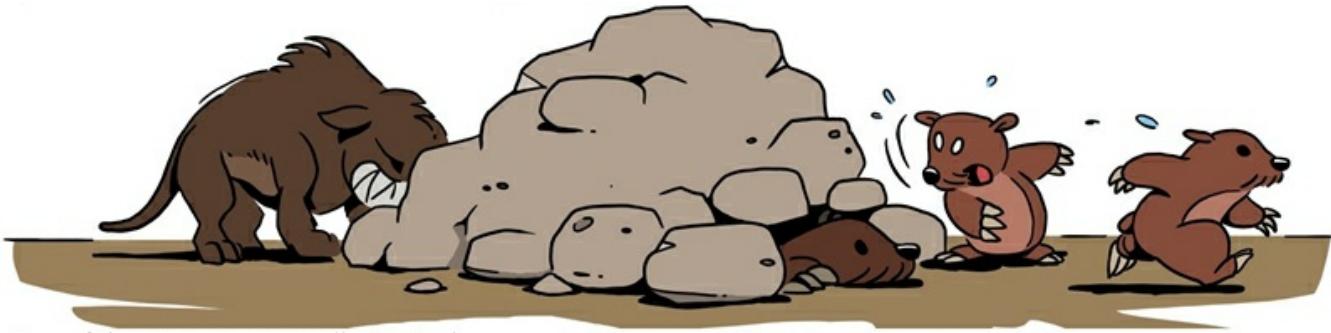
Then they gain formal agreement on the core scope of high-level release plans. Finally, they empower a Product Owner (PO) to manage scope evolution within the agreed scope boundary but require escalation to a Change Control Board(CCB) if any change or trend threatens to breach the approved scope plans.

This way, the PO can manage day-to-day changes that emerge from learning more about a product or service without the cost and delays of a formal CCB. Yet, the stakeholders know if anything significant comes up that could threaten the approved project, it will be escalated for broader consideration.

- This is good for facilitating minor changes with minimal delays and low cost
- It is problematic since the tolerances for what constitutes “managed by the PO” and “requiring escalation” will vary from project to project, along with the escalation steps

and CCB.

2.10.3 Execute Change Management Strategy According to the Methodology



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(Respond as required, based on your approach)

Let's start our explanation of managing changes with a review of how traditional, plan-driven projects manage change.



Predictive, plan-driven project life cycles define how they will handle changes in a Change Management Plan.



Change Management Plan

This document explains how the change control process works and documents the roles and responsibilities of the change control board (CCB).

Organizational culture directly influences how an organization manages changes to a project.

An organization in a highly regulated environment tends to have a cautious, formal, and rigid culture. This leads to rigorous change management procedures, perhaps with multiple levels of approval. Organizations operating in new or rapidly evolving environments tend to have a lighter-touch approach to change.

The change management plan describes how changes will be managed and may include:

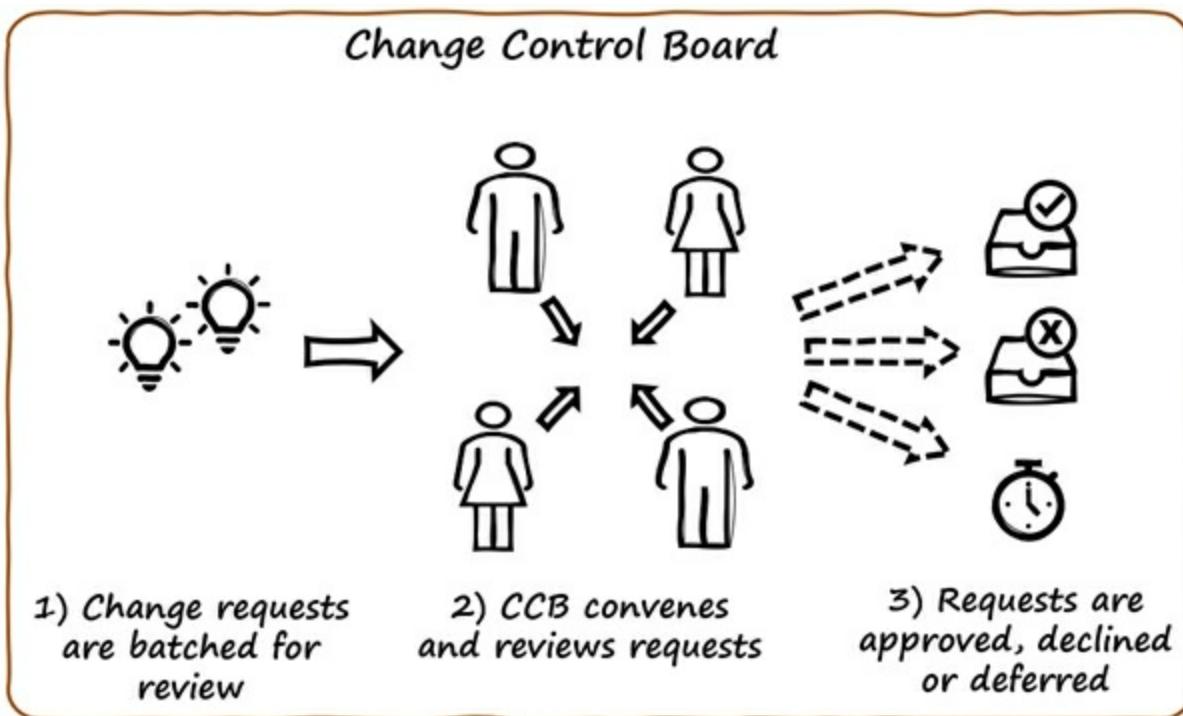
- Approval levels for changes
- The structure of the Change Control Board, if one is used
- The change control process
- The tools used to track and communicate change decisions
- The emergency change process



Change Control Boards

A Change Control Board (CCB) is a formally chartered group responsible for reviewing, evaluating, approving, deferring, or rejecting changes to the project. The board represents key stakeholders for the project and is tasked with assessing changes in terms of cost, schedule, risk, and value impact. They are created to manage all project change requests fairly.

A Change Control Board (CCB) may meet on-demand for high-priority requests or on a regular schedule, such as once a week or once a month. In addition to deciding on project changes, they are also responsible for recording and communicating such decisions.



Once a decision has been made by the CCB, the scope of the change is compared to the established tolerance thresholds. Changes within thresholds can be approved and initiated by the project manager. Changes outside of tolerance thresholds usually require the project sponsor to approve the change.

Now let's see how Agile life cycle projects undertake these activities.



Product Owner as a Change Control Board

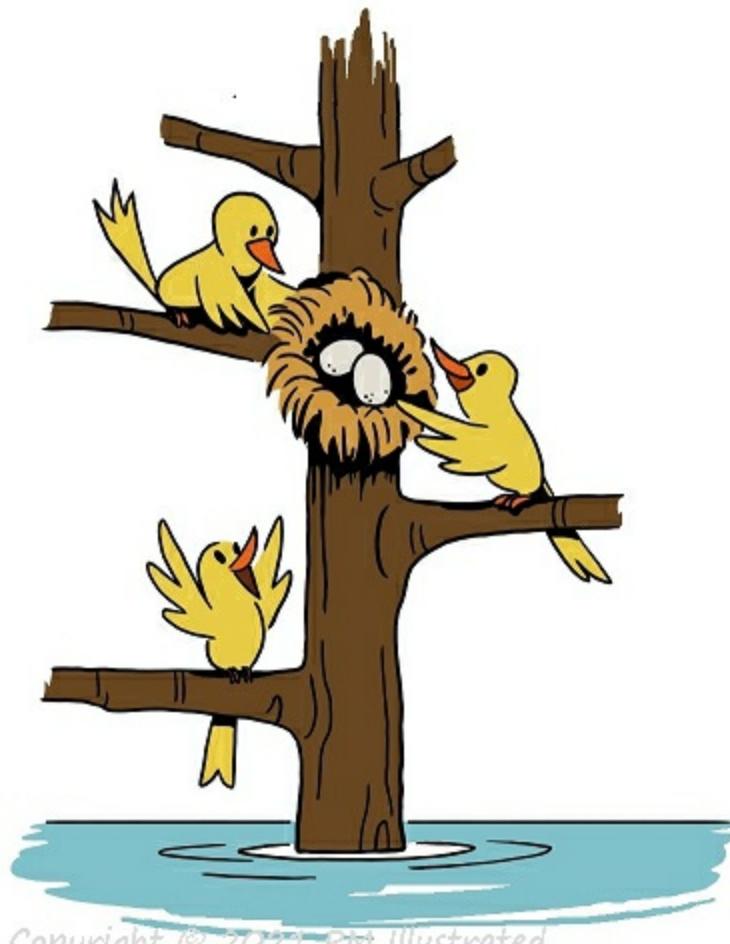
Agile approaches are often used in high change environments where many scope and trade-off decisions need to be made daily. In these situations, getting the change control board together,

bringing them up to speed about the issue or request and letting them discuss and debate the pros, cons and various options would just take too long.

Instead, the Product Owner is empowered by the business to make scope, priority and change decisions on behalf of the sponsor. They are trusted to do the right thing, act on behalf of the business and customers and manage the bulk of all change decisions themselves. Unless a change would materially impact the outcome of the project, the Product Owner approves, rejects and defers changes daily.

Product Owners often consult with the Scrum Master / team lead and members of the team to get information about estimates, dependencies and risks but otherwise have the autonomy to make project decisions.

2.10.4 Determine a Change Response to Move the Project Forward



(Choose the best response to the change)

“The measure of intelligence is the ability to change” -Albert Einstein

As the project progresses, we need to continuously monitor change requests, risks, issues, and team performance. Then based on these factors and customer/sponsor guidance, update our plans to deliver project outcomes and comply with our organization's agreed procedures.

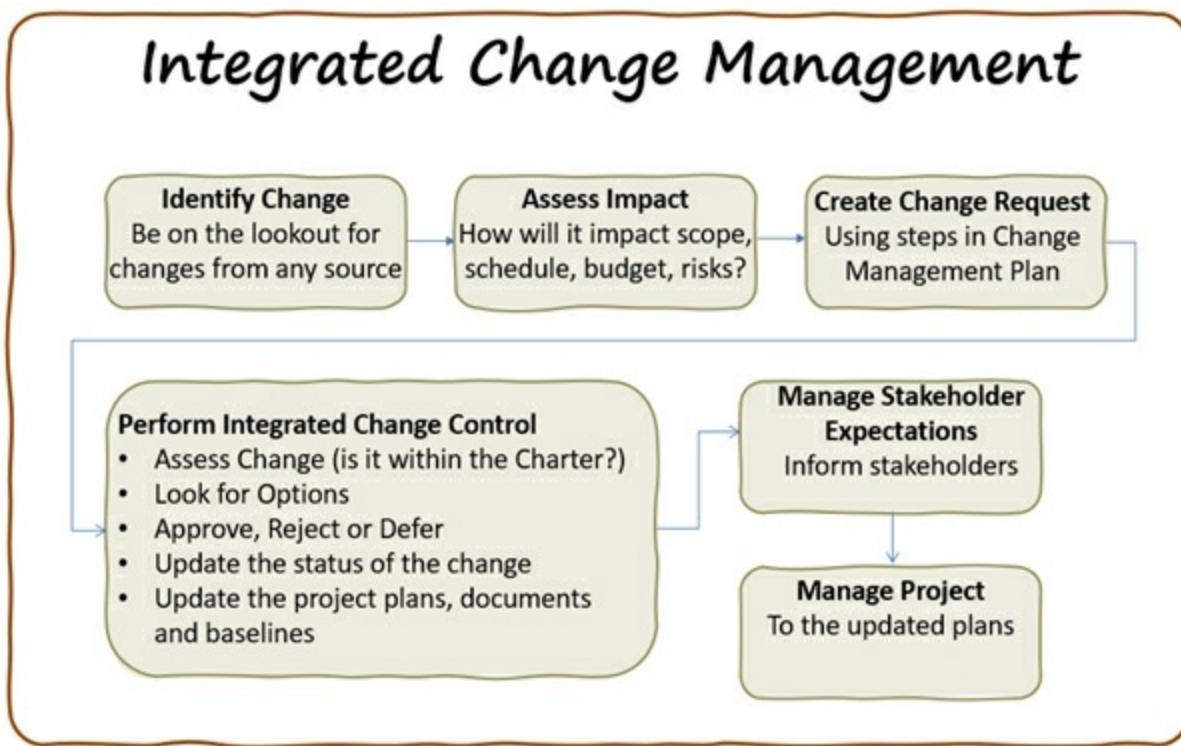


Traditional projects manage compliance and change through the process known as Integrated Change Management.

Integrated Change Management

When a potential change is identified, it is sent to the Change Control Board (CCB), which evaluates it. The CCB will assess the change to see if it is in scope as defined by the charter and evaluate its options. Finally, the CCB will decide, update the change request status, and communicate their decision to the relevant stakeholders.

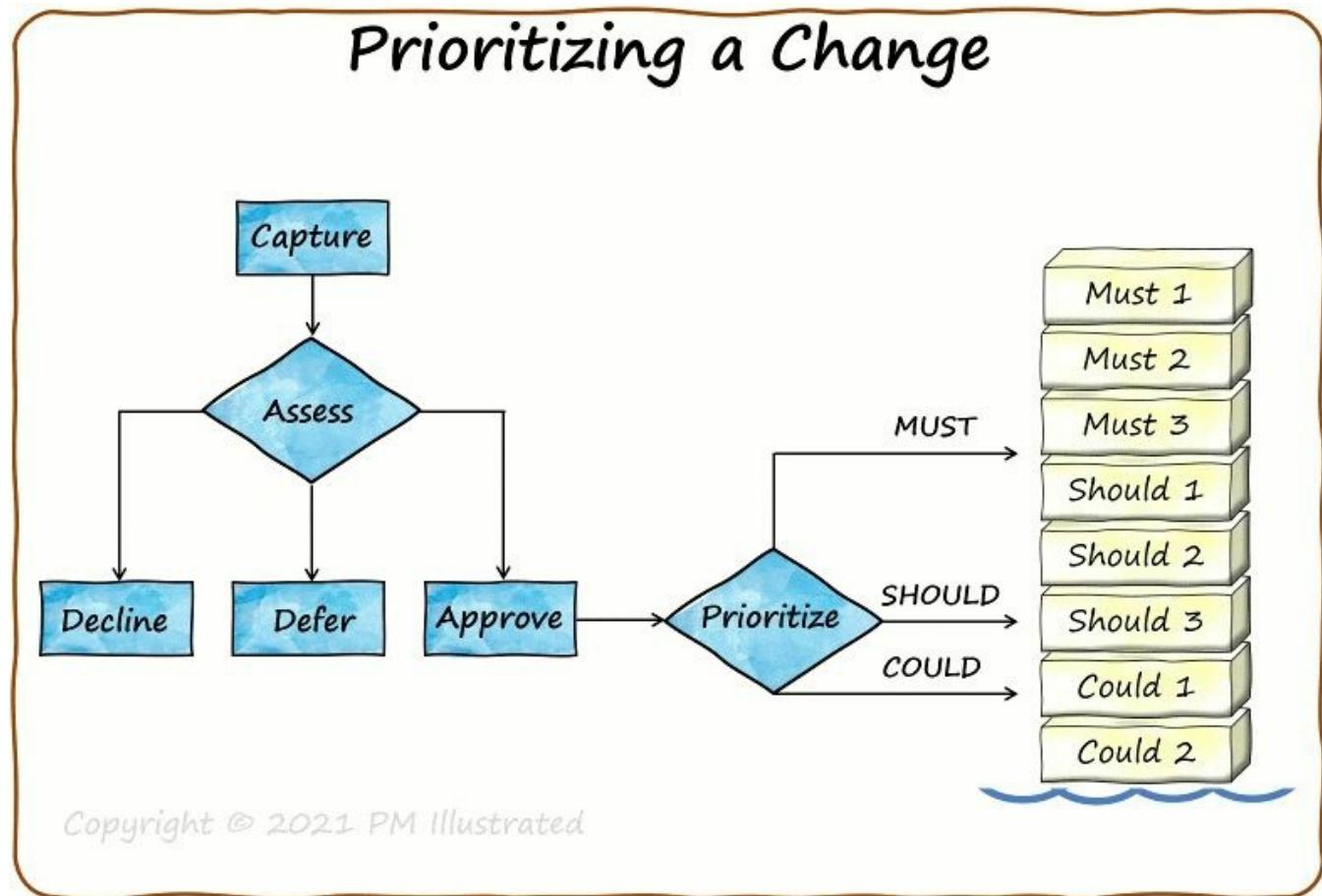
If the change was approved, the project manager can start updating and re-baselining the plans. The change is then actioned through the execution of the revised plans. The main components of this process are shown below.



Changes and the Backlog

Using agile approaches, the Product Owner is responsible for conducting similar steps as identified in the Integrated Change Management approach shown above, just by themselves and with less documentation. In addition, the Product Owner monitors the internal and external business environment, looking out for opportunities, threats and change requests that might impact the project.

When a potential change is identified, they evaluate it, consulting with other stakeholders such as customers and team members to gather the required information. Then decide whether to decline, defer or approve the change. If approved, they assign a priority and put it in the backlog, displacing lower priority items down the backlog. This process is depicted in the image below.



The diagram shows a “water-line” of agreed to work below the original backlog. If we accept a change the Product Owner and other stakeholders must accept that it displaces a similar sized piece of work with a lower priority.

We can accept changes, even late in the life cycle sometimes, but we cannot defy the laws of time and space. An important note about agile projects is that all work goes in the backlog. We do not maintain a separate list of change requests or defect fixes. Everything lives in the backlog, so priorities and remaining work is visible to everyone.



Backlog Reprioritization

In addition to new requests or changes being introduced into the product backlog, Product Owners also reprioritize items in the backlog as priorities change.

Reprioritizing the Backlog



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Using the processes described in this module, project managers conduct planning throughout the project, whichever life cycle is adopted.

2.15 Manage Project Issues

"One of the true tests of leadership is the ability to recognize a problem before it becomes an emergency." - Arnold Glasow

Throughout the life cycle of a project, we will normally face problems, shortcomings and conflicts that occur unexpectedly. These are issues and will require some action, so they do not impact the project performance.

An issue is what we have when a threat occurs. They are problems we must deal with now.

(Remember threats are the subset of risks that have negative impacts on the project. Positive impact risks are called opportunities.) So, if a negative impact risk (a threat) occurs, we now have an issue we need to address.

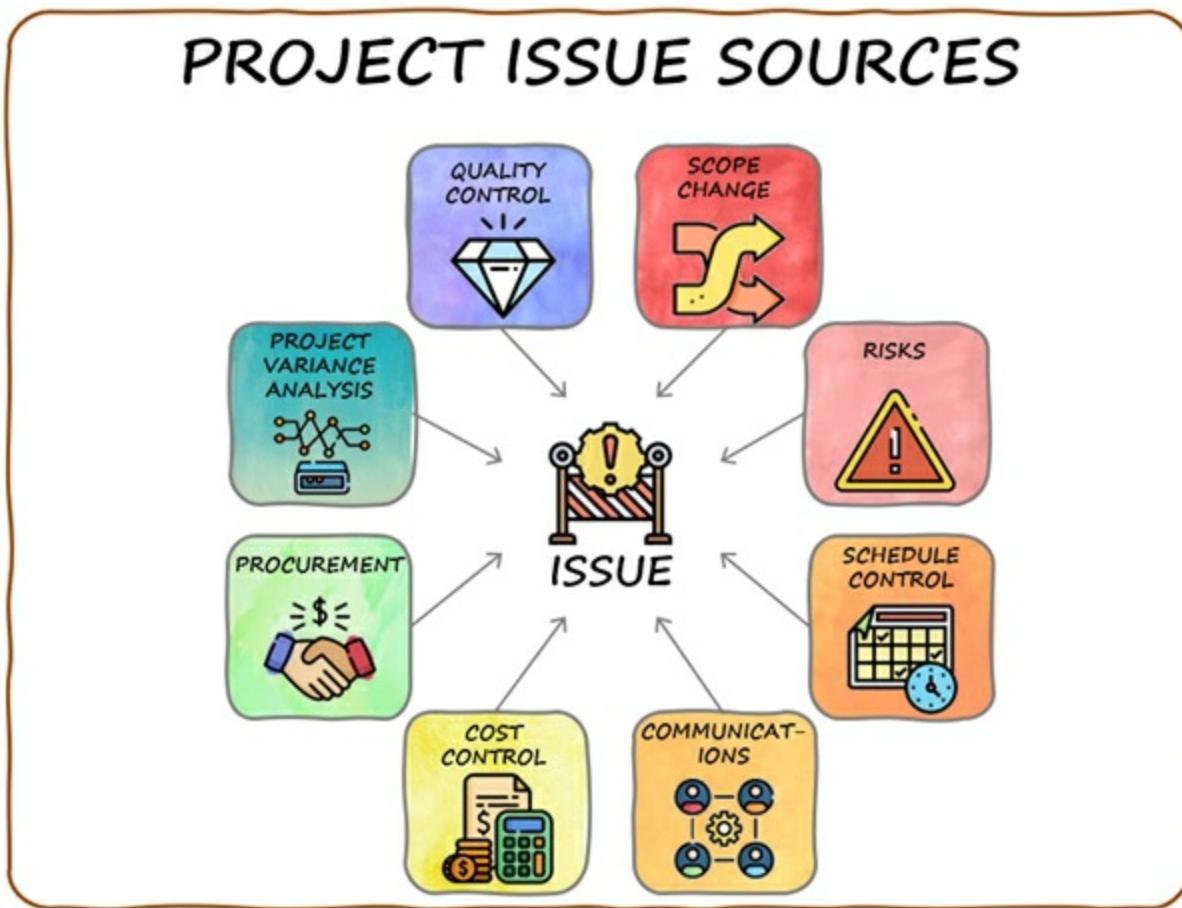
2.15.1 Recognize when a Risk becomes an Issue



(Be on the lookout for risks becoming issues)

While risks are focused on the future and can be positive or negative, issues are focused on the present and are always negative. Also, as risks are documented in the Risk Register and addressed via risk responses, issues are documented in the Issue Log and addressed via action plans and workarounds.

So, issues are some current condition or situation that may impact the project objectives. They are, in a way, action items that the project team must address now. Issues can come from a variety of sources. Common sources include:



Common areas include:

- Scope change control – E.G. We now need to deal with a change
- Schedule control – E.G. Something is running late
- Cost control – E.G. Something ended up costing more than we budgeted for it
- Project variance analysis – E.G. some project process or variable is outside tolerances
- Quality – E.G. Something needs redoing due to poor quality
- Risk – E.G. “You know that thing we were concerned about... well, it just happened!”
- Procurement – E.G. Problems with purchase or vendor
- Communications – E.G. A communications breakdown or failure leading to a problem



Issue log: The document used to record and monitor project issues. Issue logs are used to track problems, inconsistencies, and conflicts that occur during the life of the project.

ISSUE LOG

ID	Description	Opened	Opened By	Priority	Assigned	Due Date	Status	Solution
1	Goat eaten through big-top support rope	12 July	A. Miller	High	G. Harris	14 July	Open	Pen goat and replace supp
2	Chickens escaped enclosure again	9 July	A. Miller	Medium	G. Harris	11 July	Open	Fully enclose coup with chi
3	Kitten-cam offline due to DoS attack	4 July	A. Miller	High	J. Murphy	6 July	Closed	System reset and hardenni

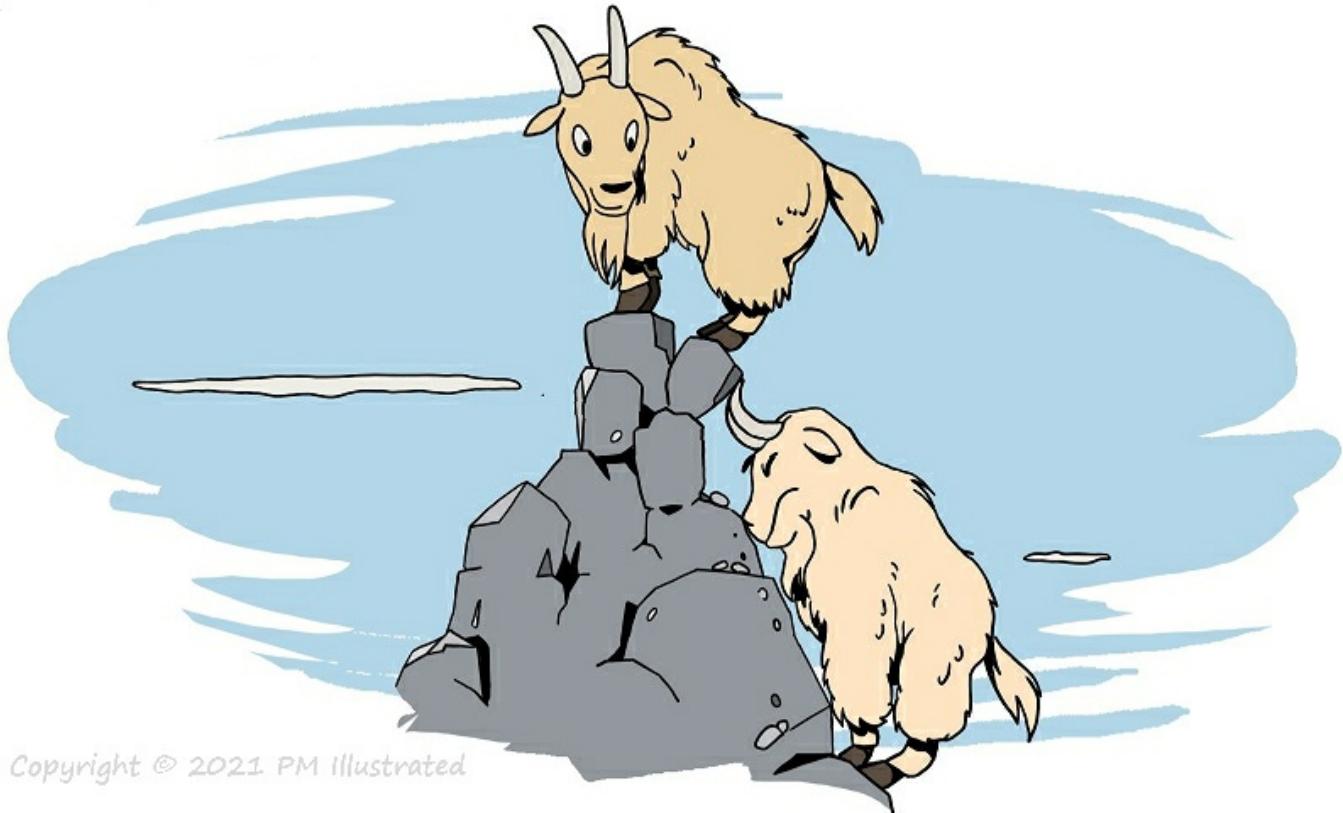
Data on issues may include:

- Issue type,
- Who raised the issue and when,
- Description,
- Priority,
- Who is assigned to the issue,
- Target resolution date,
- Status, and
- Final solution.

The issue log is updated as a result of the monitoring and control activities that occur throughout the project's life cycle.

2.15.2 Attack the Issue with the Optimal Actions

(Full ECO title: Attack the issue with the optimal action to achieve project success.)



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(Address issues as they arise)

Identifying when a risk becomes an issue and recording it in the issue log is a necessary first step, but the real work and benefit comes from addressing it.

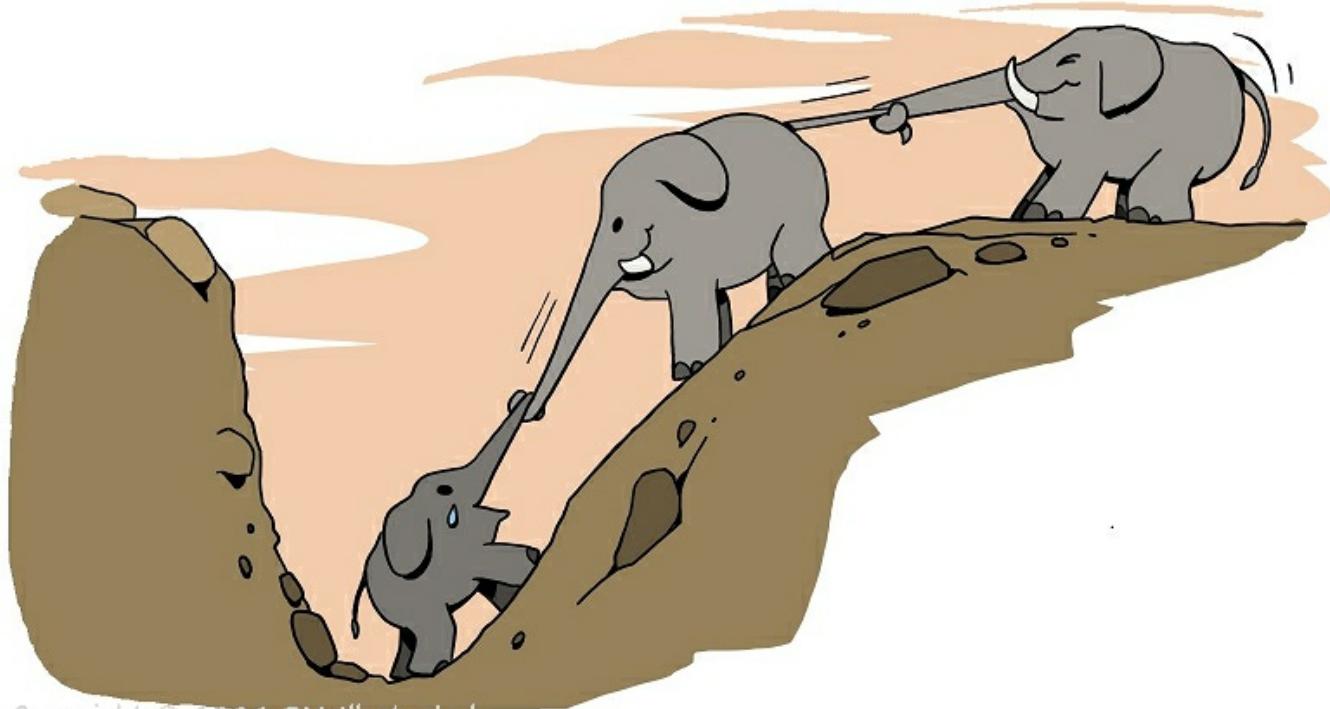
The process for identifying, recording, and resolving issues typically progresses as shown below:



- 1) **Identify** - Be proactive and on the lookout for issues
- 2) **Record** - As issues arise, promptly record them in the issue log.
- 3) **Engage** - Engage the team in issue resolution. Issues should be a regular topic of status meetings and retrospectives to keep them in mind for the team.
- 4) **Assess** - Assess the effectiveness of our issue resolution options and strategies. Ask are they working?
- 5) **Resolve** - Hopefully, we can resolve or minimize the impacts of most of the issues that arise.
- 6) **Escalate** - However, do not hesitate to escalate an issue to the project sponsor if it begins to have a major effect on the project.

2.15.3 Collaborate with Relevant Stakeholders to Resolve the Issue

(Full ECO title: Collaborate with relevant stakeholders on the approach to resolve the issues.)



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(Collaborate with stakeholders to solve project problems)

Asking for help is not a sign of weakness; it is a sign of respect and trust – Mike Griffiths.



New project managers sometimes think it is their job to solve all the problems and issues that occur on a project. More accurately, it is the PM's responsibility to ensure issues get resolved. However, often it is team members or other stakeholders who are best equipped to solve issues or create workarounds.

Obviously, we should reserve asking the team for issues that go beyond basic PM tasks. However, when used appropriately, asking for help shows we respect people's judgment and trust their recommendations. It can be a great way to empower team members. We do not need to implement every suggestion; we can thank people for their ideas and only implement the most likely solutions.



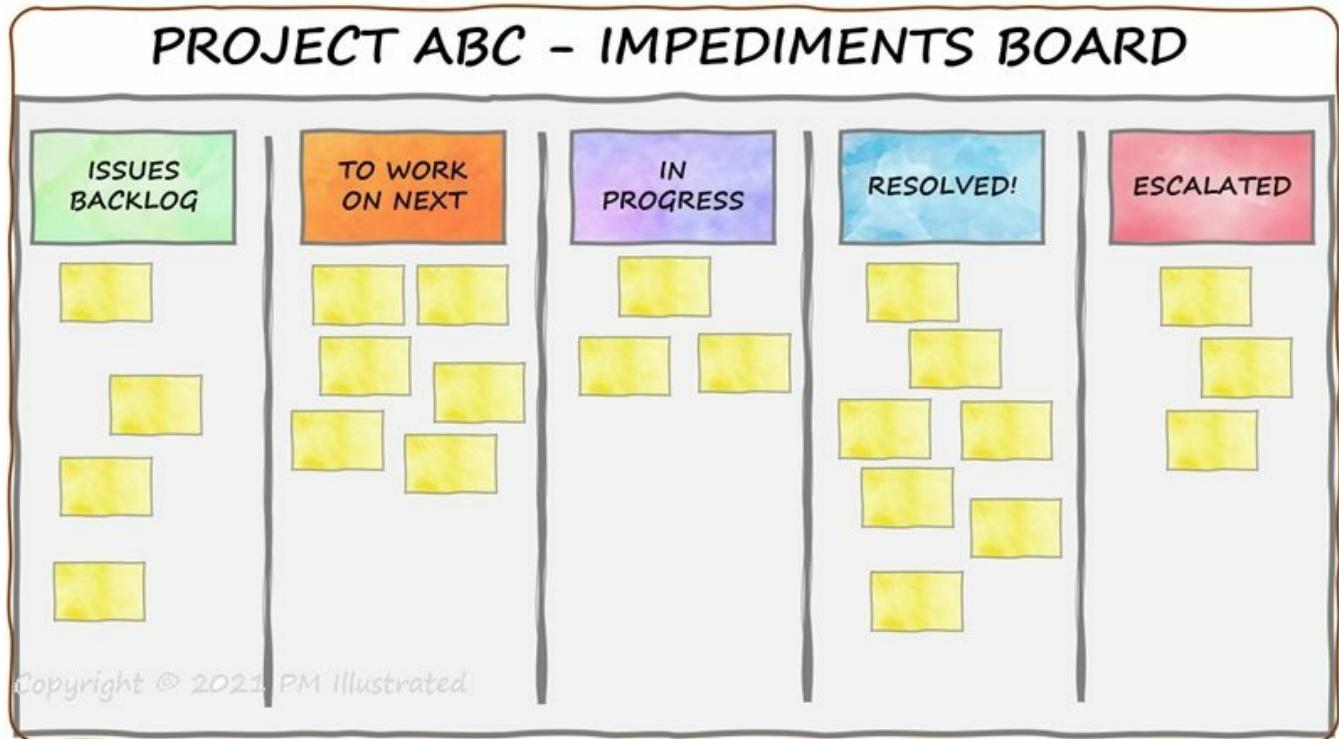
Tips for Resolving Issues

- Encourage team members to promptly report potential issues to the project manager, who will determine if they belong in the Issue Log.
- Enter the issue into the Issue Log and assign an owner, priority, and a due date.
- Monitor progress and discuss each open issue at project status meetings.
- Develop a response (also known as a workaround) to the issue and implement it.
- Assess the impact and effectiveness of the response.
- Close resolved issues and escalate issues that cannot be addressed within the project team.



Agile Issue Management

Agile teams may or may not use formal issue log documents. However, if not using an Issues Log or issues spreadsheet, then an Impediments List information radiator or Impediments board will likely be used.



Using an impediments board, the team keeps track of issues as they occur by adding them to the leftmost “**Issues Backlog**” column. Then, based on factors such as priority, impact, and ease of implementation, moves issue cards to the “**To Work on Next**” column or “**In Progress**” column. When issues are addressed, they are moved into the “**Resolved**” column. Any issues that cannot be addressed by the team are escalated by the team lead / Scrum master or Product Owner and the card moved to the “**Escalated**” column.

Maintaining a board of impediments raises visibility and awareness of current issues, which helps generate solution ideas.

(In a positive, supportive work environment having people aware of the issues might help influence behavior towards a solution or mitigating behavior. In hostile environments or those with poor worker relations publicizing issues could lead to behavior that makes things worse. Some personnel issues (such as Fred handing in his resignation) should not be posted publicly for privacy reasons.)

Daily Stand-ups and Retrospectives

The daily stand-up meeting where people describe any issues, impediments or blockers to progress is a great source for learning about potential issues. Pay attention to items that are slowing or preventing work from getting done. If they persist for more than a day or two, consider adding them to the Issue Log/board.

Likewise, review the open issues from Issue Log/board at team retrospectives. Ask the team if we could undertake any activities or experiments in the next sprint or iteration to resolve or lessen any of the open issues? For issues closed this iteration, be sure to report this information and thank the relevant stakeholders for their efforts.



Hybrid

Organizations do not need to be 100% agile to borrow ideas or tools from agile. If holding a weekly stand-up type meeting to hear about impediments would be useful, this can be added to most project teams. Likewise, if an impediments board or issues board would be helpful to raise visibility and generate solution ideas, do not be afraid to try one.

“Happiness is not the absence of problems, but the ability to deal with them.” Charles De Montesquieu

2.16 Ensure Knowledge Transfer for Project Continuity

During the project life cycle, the team, project manager and their stakeholders will learn a great deal about the business problem, technical domain and specifics of the product or service being created.

This knowledge should be captured and retained to help the people now supporting what the team delivered and also to improve the capability of the organization for future endeavors. The task “Ensure Knowledge Transfer...” concerns the tools and techniques associated with aiding these processes.



Types of Knowledge

We can divide knowledge into two categories, explicit knowledge, and tacit knowledge.

- **Explicit knowledge** is things that can be recorded with words and pictures. It is the knowledge we can store with documentation, models, diagrams and notes, then shared with others.
- **Tacit knowledge** is personal knowledge that is more challenging to describe and share, such as beliefs, experience, intuition and insights. This type of knowledge helps provide context to explicit knowledge.



Agile practitioners often claim co-located teams help share and boost tacit knowledge. While it is true that working alongside someone certainly helps accelerate the adoption of the beliefs, experience, intuition and insights that make up tacit knowledge, there is also a division in definitions too.

Agile teams often use the term “tacit knowledge” to describe all unwritten expertise. Such as how to reset the 3D printer, the fact that daily stand-ups occur 30 minutes later on Mondays, and the unwritten agreement to hold meetings in the afternoons to allow people to get work done in the mornings etc. This is tacit knowledge because it is not documented and is created by mutual agreement, but it could be written out if people took the time to record it, and more importantly, people took the time to seek it out and read it.

So, if coming from an agile background, be aware of the true definition of tacit knowledge when approaching this subject for the PMP® exam. It is not “all the undocumented team knowledge”; it is more the things that cannot be documented like experience, intuition and decision making based on hard to define criteria.

2.16.1 Discuss Project Responsibilities within Team



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(Make sure everyone knows it's their responsibility to share knowledge)

For projects, knowledge management is about ensuring the team's skills, experience, and expertise are used before, during, and after the project.

Knowledge resides in people's minds, and people cannot be forced to share what they know, nor can they be forced to pay attention to other people's knowledge. So, the most crucial part of knowledge management is creating an atmosphere to motivate people to share their knowledge.

Knowledge Management Roles

The responsibility for sharing information and ensuring critical knowledge is captured and distributed throughout an organization. Let's examine the various levels and sources of knowledge required to undertake project work.

Individual:

- Team members need to know how to do their work correctly. This includes operating within the task's scope, schedule, and cost.
- Necessary knowledge can be acquired by:
 - Reading specifications, WBS descriptions and user stories
 - Collaborating with team members
 - Examining the project's or organization's knowledge repository
 - Research

Project:

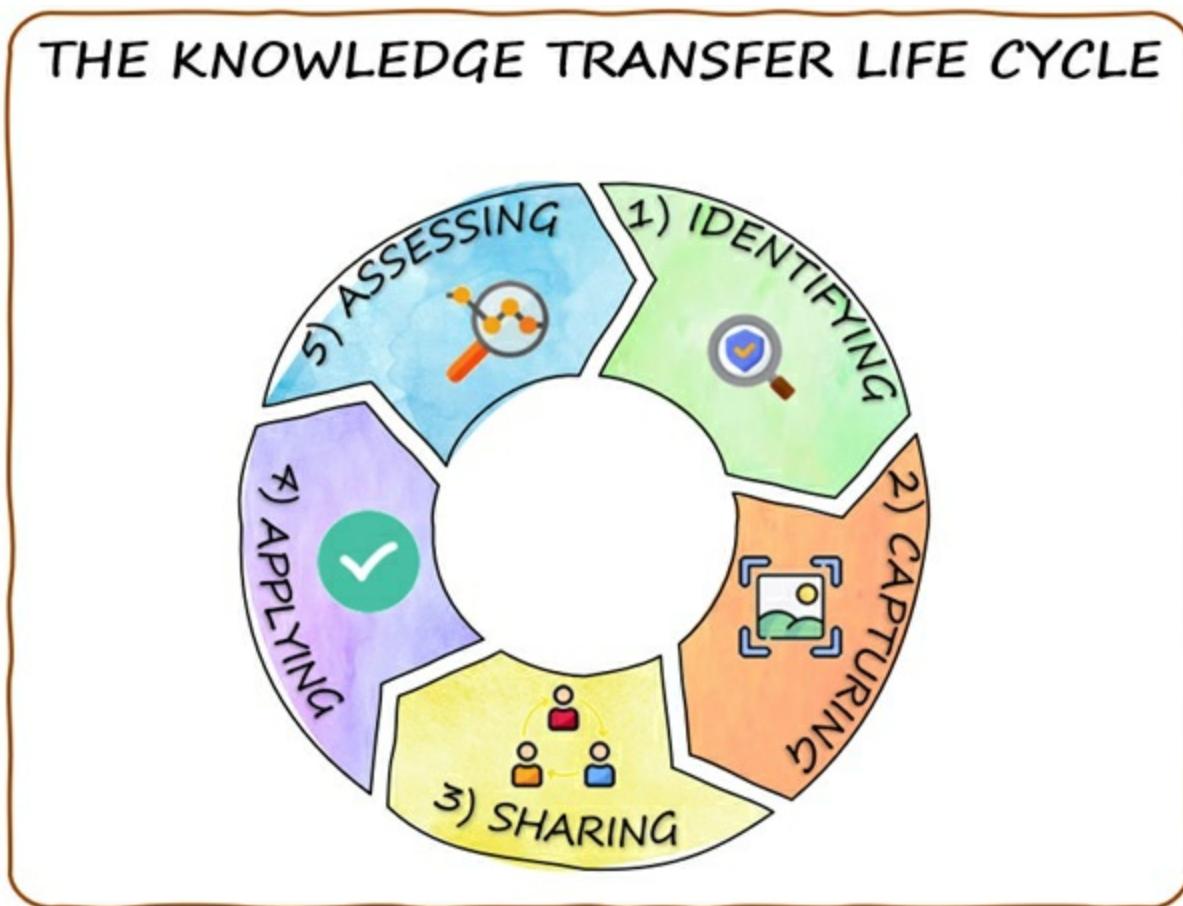
- The project manager gathers knowledge about other projects that can be applied to their project.

- The goal is to achieve the defined outcomes for the current project.
- The Project Management Office (PMO) can be an excellent source of knowledge, as it exists to define and maintain standards for project management within an organization.

Organization:

- The focus is on executing agreed to strategy through running portfolios, programs, and projects.
- The portfolio manager or program manager seeks information from peers who manage other portfolios or programs to gain and adapt this knowledge to their specific needs.

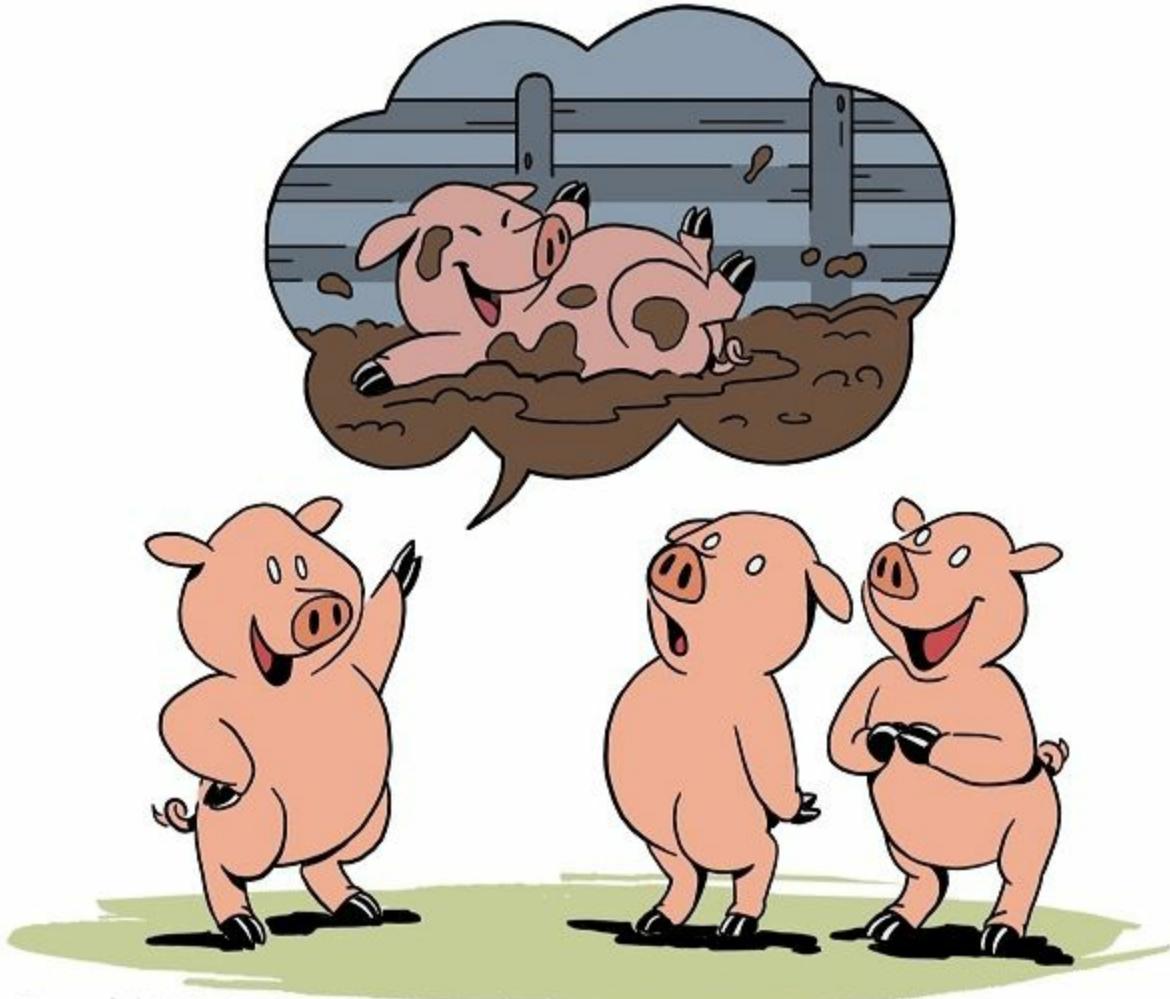
A PMI Pulse of the Profession [report on Knowledge Transfer](#) outlines the following life cycle for knowledge transfer.



- 1) Identifying:** Determine what knowledge needs to be transferred
- 2) Capturing:** Accumulate the essential knowledge that needs to be transferred
- 3) Sharing:** Establish methods for transferring the knowledge
- 4) Applying:** Use the knowledge that is transferred
- 5) Assessing:** Evaluate the benefits of the knowledge that is transferred

This model is a helpful framework for understanding the activities that need to occur for effective knowledge transfer. As project managers, we need to ensure that stakeholders understand their roles in these activities and that time and tools are available for their application.

2.16.2 Outline Expectations for Working Environment



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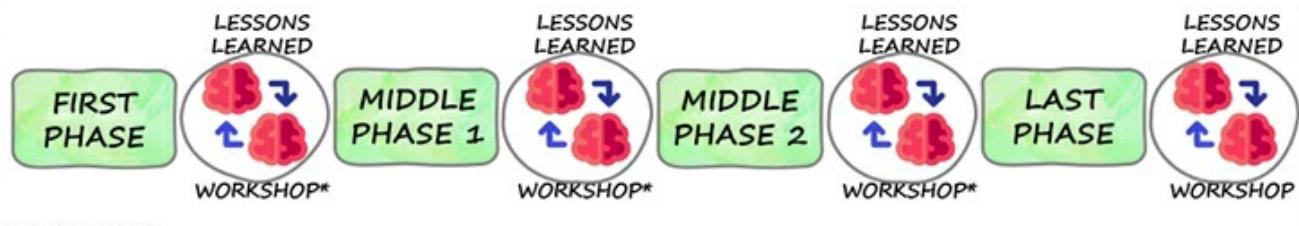
(Explain what is expected and how things will work to people)



Lesson Learned

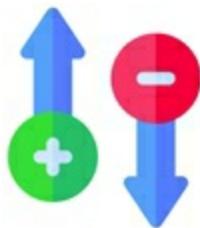
When we think about Lessons Learned workshops for traditional waterfall projects, we often only consider sessions held at the end of the project. However, lessons learned reviews should be considered after every project phase. So rather than being a single look back at the end of the project, there should be more regularly scheduled events that generate information stored in the lessons learned register.

TRADITIONAL LESSONS LEARNED REVIEWS



* IF REQUIRED

Lessons learned sessions aim to capture knowledge gained during a project that will be useful for subsequent project phases and other projects.



Positive and Negative

Organizations need to capture both positive and negative events and experiences that occur. Sometimes people are hesitant to discuss failures and things that did not go well, even though there is often more to be learned from these adverse events.

Project managers can encourage sharing both positive and negative information by not “Shooting the messenger” and be appreciative and interested in hearing about problems as much as solutions. This is easier said than done, so be aware of how you react to news and information from your team. Do not condition them to withhold bad news.

Gathering and learning from lessons helps prevent reinventing the wheel and struggling with the same issue repeatedly within your project or across your organization. So, some time and effort spent documenting lessons learned can pay big dividends in the future – assuming we genuinely learn from them.

Some tips for getting the most out of lessons learned session include:

1) Consider multiple sources of lessons. Ask what did we learn from:

- Implementing organization strategy
- Scheduling and planning
- Vendor management
- Working with customers and clients
- Teamwork
- Conflict management
- Other lessons learned

2) Model the desired behavior – be open and transparent about sharing negative information

and errors made with the team to demonstrate it is OK to communicate this type of information. For instance, it is OK to say, “I noticed an error on the status report and am sending it out again.”

3) Record findings in the Lessons Learned Register

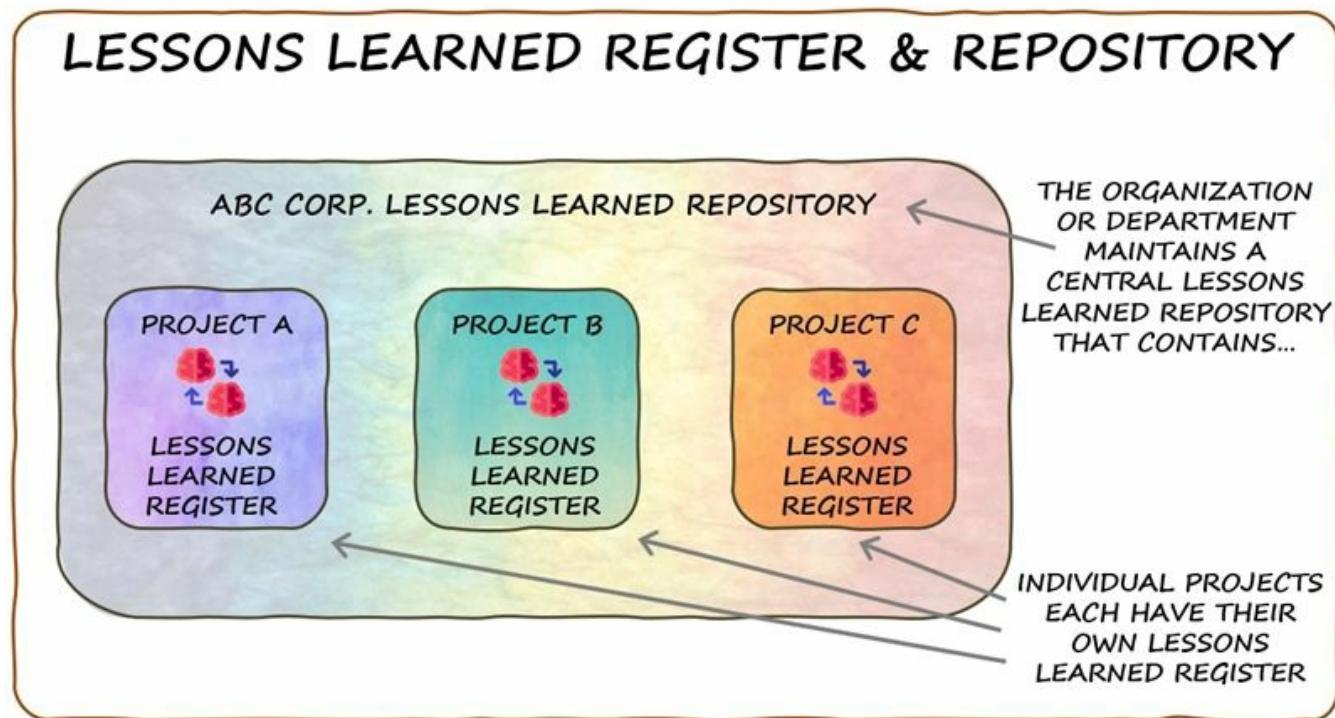


Lessons Learned Register and Repository

The Lessons-learned Register is the document used to record knowledge gained during a project. It is designed so that this knowledge can be used in this project and entered into the broader Lessons-Learned Repository that is used across all projects within the organization.

The type of information recorded in the Lessons Learned Register can include the category and description of the situation, the impact, recommendations, and proposed actions associated with the situation.

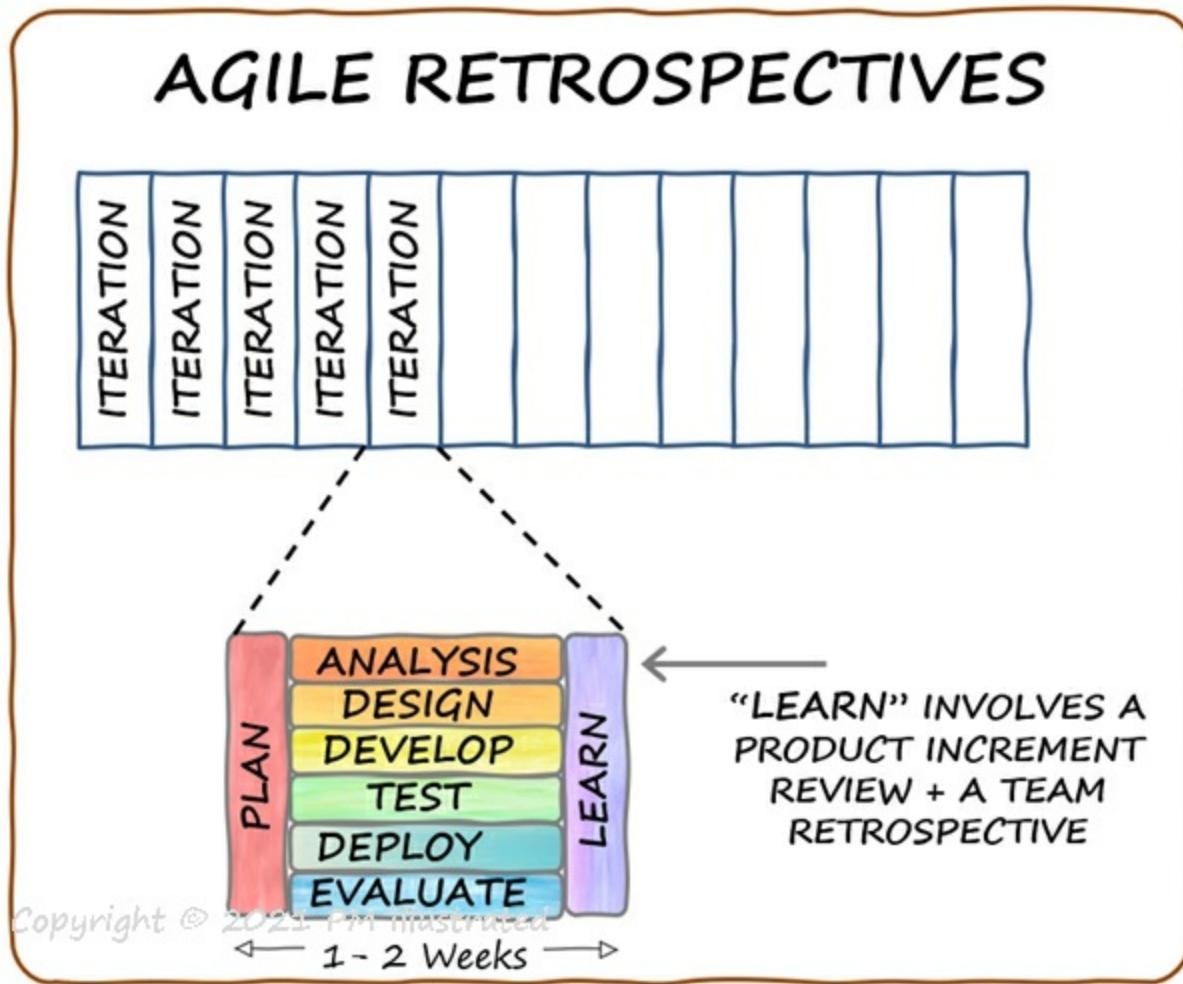
The lessons learned register can record successes, failures, challenges, problems, and other content as appropriate. At the end of a project or phase, the information is transferred to the organizational Lessons Learned Repository.



Agile Knowledge Sharing

Agile approaches swap out end-of-phase, and end-of-project lessons learned reviews for much

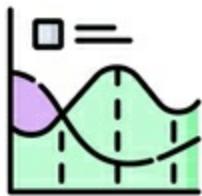
more frequent retrospectives that occur every sprint or iteration.



The “Learn” step in an iteration includes the Demo that reviews the latest increment of the evolving product and the team retrospective. The retrospective is a workshop that captures insights similar to a Lessons Learned Review and, as a minimum, asks:

- What Went Well?
- What Did Not Go Well?
- Any Recommendations or Experiments to Try in the Next Iteration?

Good retrospectives drive change and experimentation. So, there is often more emphasis on brainstorming and voting on changes to try in a retrospective than traditional teams likely discuss in a lessons learned review.



Information Radiators and Transparency

Agile teams take a different view for sharing knowledge than traditional project management

approaches. Instead of documenting project information in plans, specifications, logs and registers, they favor big-visible-charts called Information Radiators.

INFORMATION RADIATORS



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Information radiators are typically flipcharts, graphs, drawings or kanban boards displayed in high traffic areas, or on easy-to-find websites that share information with as many relevant stakeholders as possible.

The agile principle of “Transparency” promotes open and honest sharing of information to raise everyone’s awareness of work, progress and issues. It is a form of knowledge transfer similar to the goals of traditional knowledge sharing to help current and future projects – just implemented with a different set of tools.



Working Environment Expectations

Project managers should encourage team members and other stakeholders to share information, ask questions, and generally collaborate for the organization’s benefit. In some settings, this can be achieved by asking the business or customer for overview sessions to help learn more about the customer's needs. In others, having people or groups hold lunch-and-learn sessions to discuss a topic of interest. As project managers, we can help by providing food,

inviting speakers, and making sure time is allocated for learning and knowledge transfer in the project schedule.

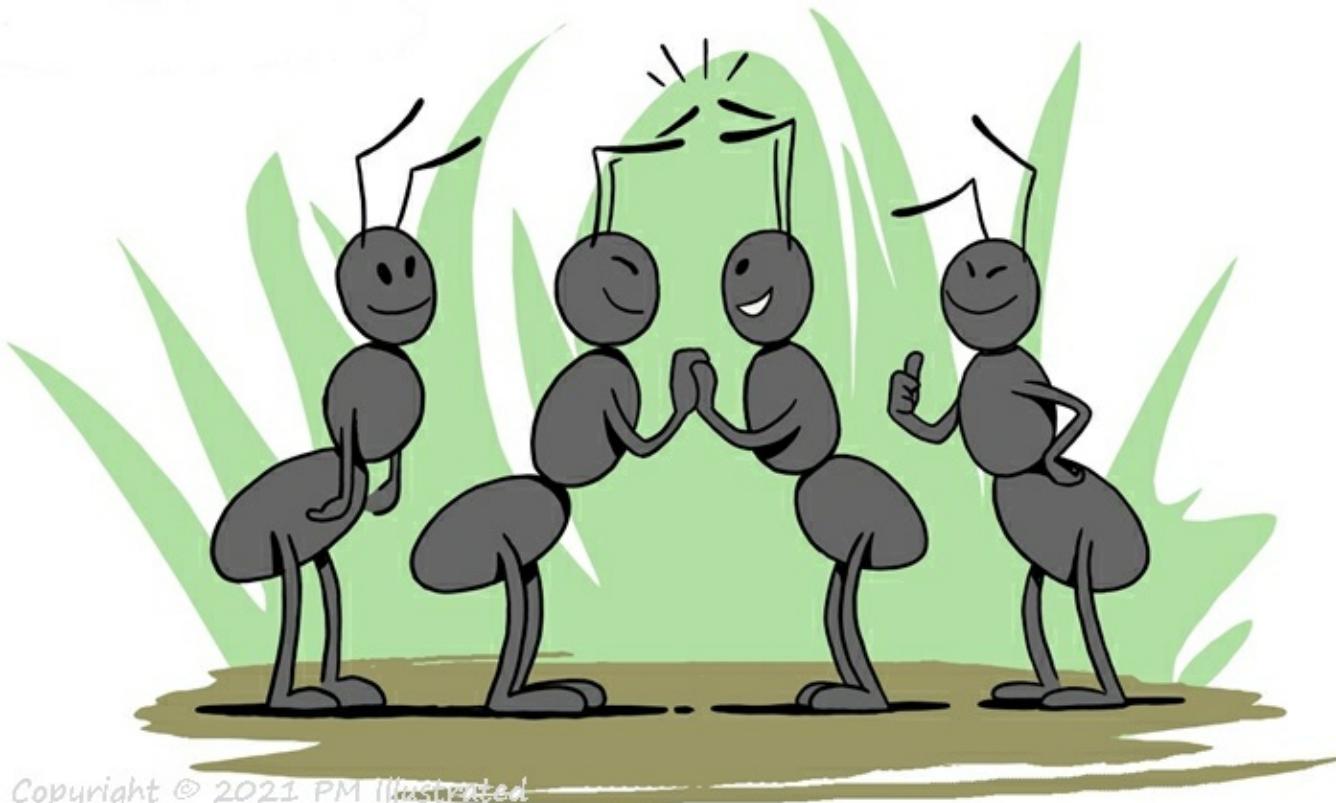


Knowledge Transfer Tools and Techniques

We can also assist by ensuring the appropriate tools and techniques to share knowledge are available. These include:

- Face-to-face communications where possible
- Video conferencing facilities when face-to-face is not possible
- Wikis, project repositories, general-purpose PMIS, intranet sites
- Telephone
- Email
- FAQs
- Printed documents

2.16.3 Confirm Approach for Knowledge Transfers



(Validate knowledge transfer is occurring and is effective)

Since knowledge transfer only occurs when individuals connect, either in person or remotely,

we need to ensure people come together and collaborate. This helps with the effective transfer of information for project work and builds and shares tacit knowledge.

Techniques for getting people together include:

- Networking and social events
- Organizing special interest groups and communities of practice
- Conferences, workshops, and other in-person and virtual events that encourage people to interact and exchange ideas/knowledge.
- Training sessions that include interactions between the participants.
- Assigning buddies, using work shadowing and assigning mentors to share information.
- Reverse mentoring – asking young workers how to leverage new technologies and trends can also help transfer knowledge and share information.



Knowledge Transfer for Remote Teams

Remote teams are simultaneously more difficult and easier to plan knowledge transfer for. They are more difficult because, without co-location, tacit knowledge is much harder to recognize or transfer. Yet, they are also easier to deal with since everyone is on an even playing field. There is no onsite vs remote worker division. No insider knowledge or water-cooler talk. Instead, everyone relies on the same electronic tools. These likely include online Project Management Information Systems (PMIS) such as Jira, MS Teams, Azure DevOps, Wrike or Trello.

Remote teams typically make more use of written documentation, Frequently Asked Questions (FAQ), video conferencing and other tools. While most organizations were forced into remote work because of COVID-19, many were deliberately remote-only long before the pandemic. We can learn lots about effective remote collaboration and knowledge transfer from these successful all-remote organizations.

[GitLab](#) (makers of source code repository and DevOps tools) has 1,295 team members spread across 67 countries using its all-remote work practices. They have their own remote manifesto:

1. Hiring and working from all over the world instead of from a central location
2. Flexible working hours over set working hours
3. Writing down and recording knowledge over verbal explanations
4. Written-down processes over on-the-job training
5. Public sharing of information over need-to-know access
6. Opening up every document for editing by anyone over top-down control of documents
7. Asynchronous communication over synchronous communication
8. The results of work over the hours put in
9. Formal communication channels over informal communication channels

Notably, items 3-7 and 9 all relate to recording knowledge explicitly and making

documentation available to everyone. These ideas are shared across other successful all-remote organizations and seem to be the key to effective remote knowledge transfer.



Knowledge Transfer in Knowledge Work Environments

Agile approaches work well in the type of project environments that Peter Drucker christened “Knowledge Work” projects.

Knowledge work projects bring subject matter experts together to collaborate on new and unique products and services. This might involve scientists, teachers, doctors, lawyers, software developers, or web designers working with the business to build something new.

Each group has specialized knowledge; typically, no single person knows everything needed to complete the project. What is being created is new or sufficiently different to the sponsoring organization that the support group for the new product or service will need a lot of information and training.

Any kind of hand-off from one group to another has the potential for losing information. Agile’s whole-team approach (one co-located group that collectively work on the solution) aims to get everyone involved working together to minimize hand-offs and knowledge transfer loss.



Minimize Hand-offs

Any type of project can learn from Agile’s one-team approach. Even when it is not possible to have a single, consistent team responsible for project execution. Try to reduce or remove hand-offs from one group to another. Every hand-off will lose some information and muddy the accountability trail.

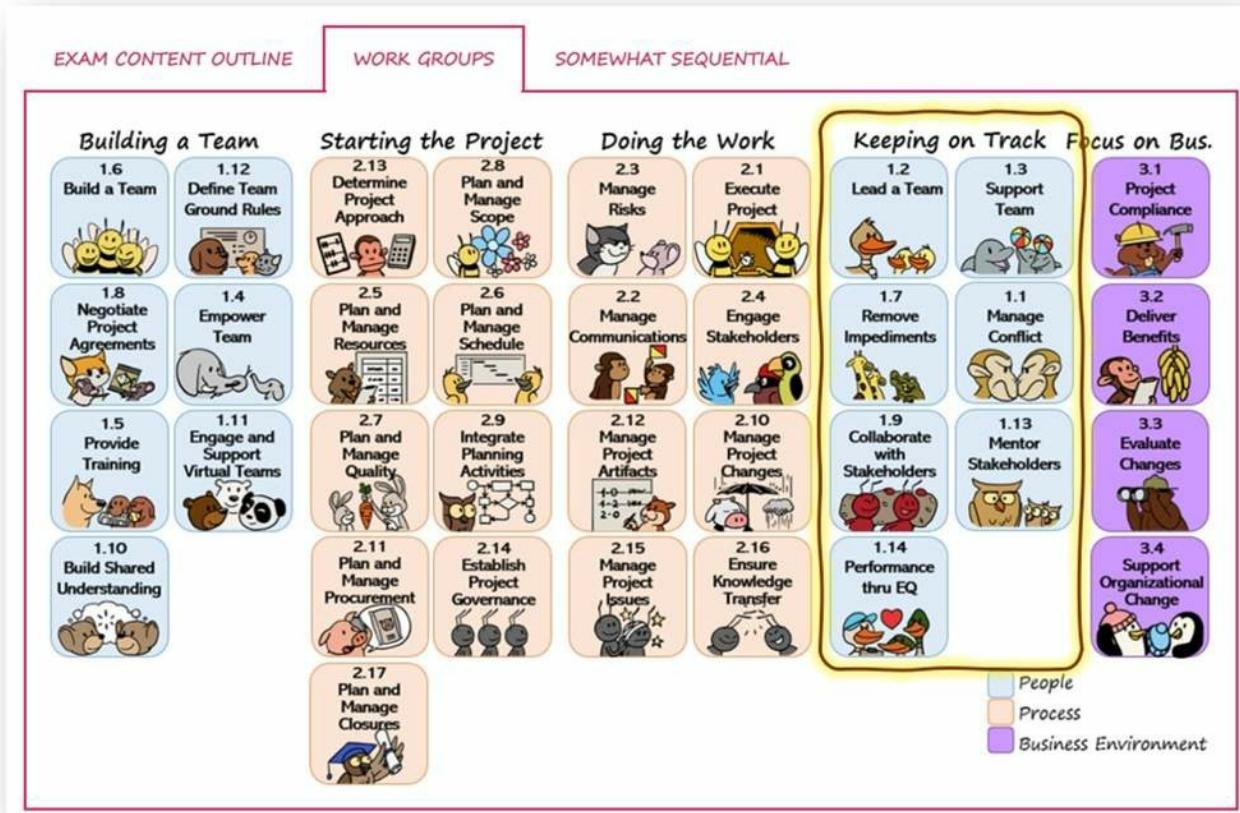
Instead, minimize hand-offs and, when required, try to use the same people instead of cycling in a new third or fourth group that will further hamper knowledge transfer.



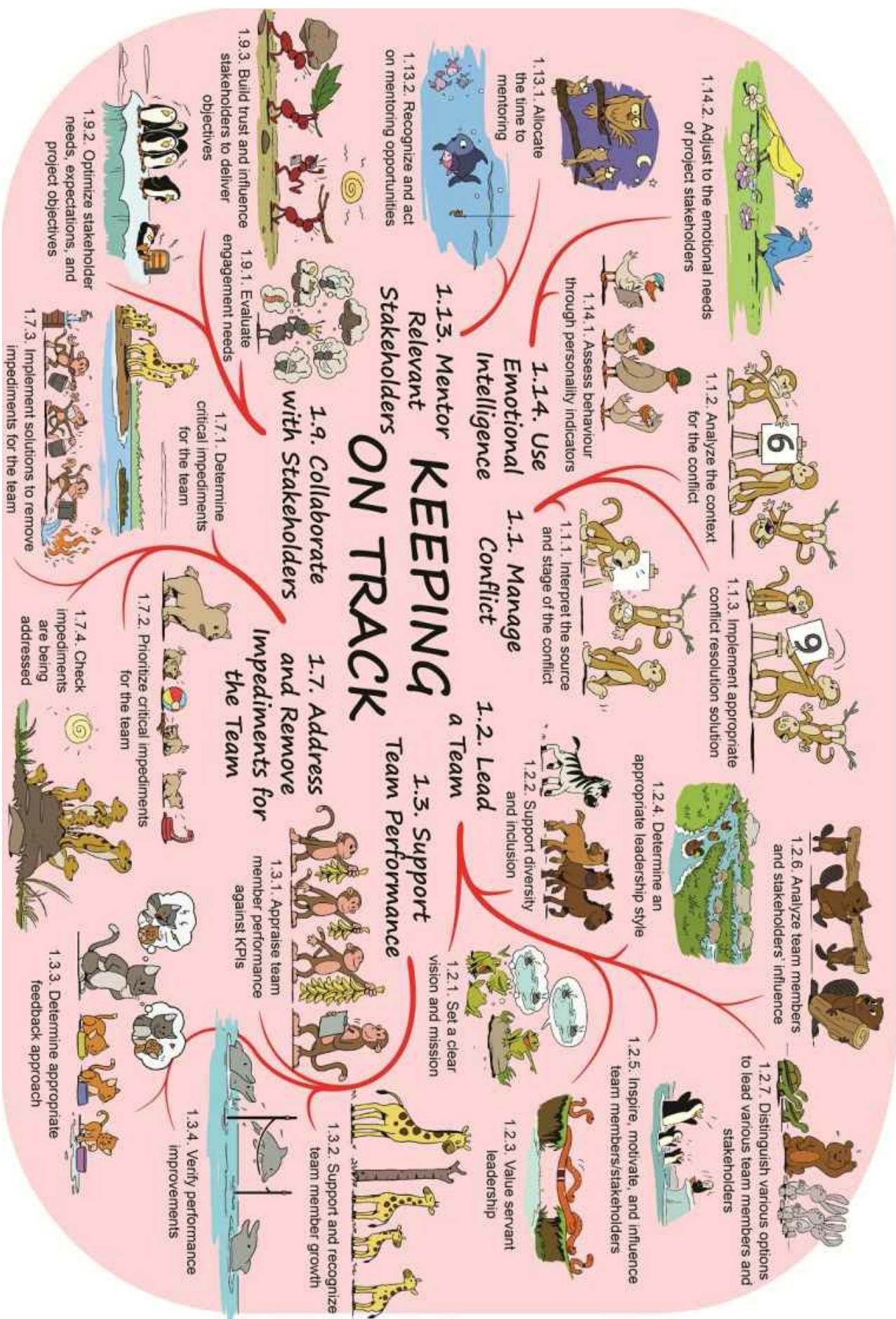
Summary

Knowledge transfer is key for project delivery, long-term product success, and organizational performance. Project managers play a critical role in providing the tools, time and temperament for encouraging the process. So, learn about the tools and techniques and help model the desired behavior to facilitate.

WORK GROUP 4 – KEEPING ON TRACK



Keeping on Track – Mindmap



1.2 Lead a Team

Leadership vs. Management

“Management is getting people to do what needs to be done. Leadership is getting people to want to do what needs to be done.” - Warren Bennis.

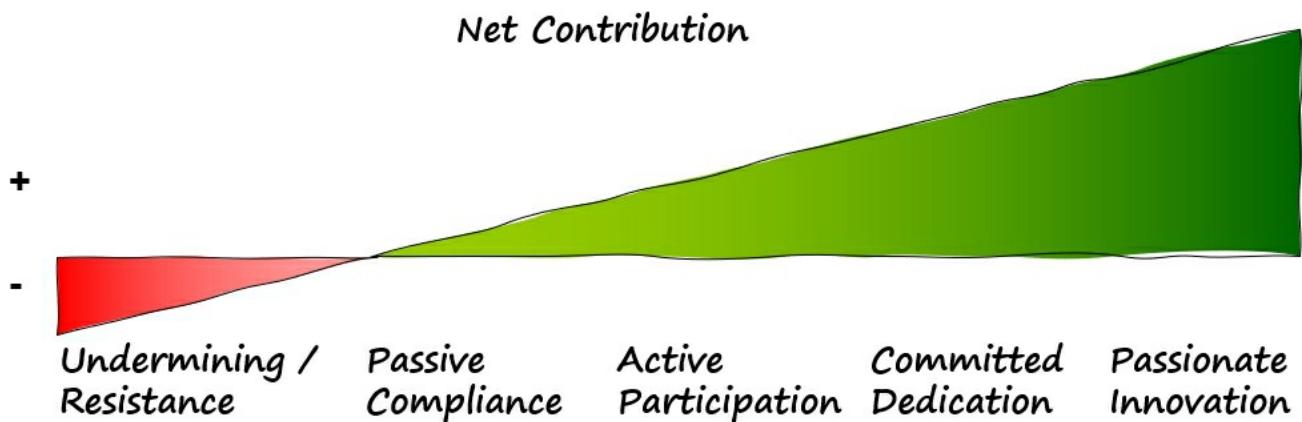
As this quote explains, leadership goes beyond directing work and instead engages the motivation of others.

For team members, good leadership makes the difference between going to work just for money and feeling like they are making a difference in a supportive environment that recognizes their contributions. Leadership skills are crucial for building high-performing teams. Leadership, coupled with management skills, magnify productivity.

Motivation and Productivity

We all experience different levels of motivation and productivity. Sometimes we are keen to do the work, sometimes any other distraction seems more appealing. This is normal at the small scale of minute-to-minute tasks. Yet, it also manifests up to our overall performance in a role.

The image below shows how team member productivity contributions can vary from net-negative Undermining or Resistance on the left-hand side all the way to Passionate Innovation on the right.



Our job, as project managers, is to move people more to the right. We use leadership skills to do this.

Leadership is a vast topic; more has been written about it throughout history than the whole field of project management. To address the critical leadership tasks and enablers covered in the PMP exam, we will briefly cover the 5 leadership behaviors from the book “The Leadership Challenge.”

1. **Model the way** – Exhibit the behavior you want to see in others
2. **Inspire a shared vision** – Reveal the beckoning summit so others can chart their own course
3. **Challenge the process** – Search for opportunities, innovate and experiment
4. **Enable others to Act** – Foster collaboration, create a climate of trust, strengthen others
5. **Recognize contributions** – celebrate the values and victories, show appreciation

1) Model the Way

Authors of the Leadership Challenge, James Kouzes and Barry Posner, conducted a 10 year study of more than 75,000 people and asked, “What values do you look for in your leader?”

They gave people a choice of 20 recognized positive traits and asked people to select their top five. Time after time, from country to country, across industries and demographics, the same four attributes emerged first.



More than intelligence, imagination or courage, these four attributes are what people look for. The number one trait is honesty. We will not willingly follow dishonest people for long. This is because emotion precedes action; it has to feel right for us to commit to them. It undermines our own sense of worth to follow someone we do not respect.

Without honesty and integrity, other personality traits or skills do not matter because people are no longer listening. We demonstrate honesty by following through on what we committed to, by not lying and showing integrity through our behaviors and actions.

Project managers should demonstrate the behaviors they wish their team to exhibit. Admit your mistakes, promote candid discussion of issues and show humility. Adopt a sharing, abundance model to information and always be communicating.

2) Forward-Looking

The second attribute, “Forward-looking,” means being able to create a clear and compelling view of where we are trying to get to. People will only willingly follow you when they think you have somewhere worthwhile in mind.

This does not only apply to high profile CEOs and visionaries like Elon Musk; the same applies to mundane projects such as repainting toilet blocks and performing office moves. People need to see you have a plan, and you can describe it effectively. We will look at how to create a compelling vision shortly.

3) Competent

Leaders do not have to be super-efficient, technical geniuses. Instead, they just need to be competent enough to guide us. A track record for getting things done is more important than domain expertise as the other team members can fill in any gaps.

4) Inspiring

People want their leaders to be enthusiastic, energetic and optimistic about the future. After all, if a leader shows no passion for a cause, why should anyone else? Emotions are contagious, and so if the leader can generate some enthusiasm for the goal, hopefully, this will spread to the other team members. No one suggests being artificially optimistic (this goes against honesty), but leaders who can inspire contribution are preferred over dull or pessimistic thinkers.

1.2.1 Set a clear vision and mission



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(Paint a clear picture of where we are trying to get to)

Linked to the Forward-looking attribute, a critical step in leading a team is creating a clear and motivating vision of where we are trying to get to.

One of the best ways to understand the importance of creating a clear vision for a project is to consider how we act when we do not have a clear vision. What do we do when we are driving in fog?



We slow down. Unclear of what lies ahead, we take our foot off the gas and proceed very cautiously. The same happens on projects. Without a clear view of where we are trying to get to, teams are hesitant. Clarity and direction allow focused effort and speed.

Vision unites and concentrates effort. To be effective, the project vision should be:

- 1) Ideal
- 2) Specific
- 3) Visual/Image
- 4) Future-Oriented
- 5) Common purpose

Project managers can do this in many ways.



Project Vision statements describe the desired end-goal and outcomes for the project. They depict the project's direction and general destination, which helps with funding and stakeholder alignment. A good vision gives project participants a reason for contributing (beyond it being their job.)

When writing vision statements, be clear, concise and have a time-horizon, yet be inspiring

about the goal to get people to want to be a part of it and with the right level of challenge, so it is ambitious but not unrealistic.

There are many templates for creating project vision and mission statements. Too many to review in this short revision format. Instead of trying to cover them all, we will instead take a closer look at just one technique called “Design the Product Box”.



Agile projects often use a vision/kick-off exercise called Design the Product Box to co-create the project vision statement. The activity is derived from “Design the brochure description” described in the book “Managing the Design Factory.” By Don Reinertsen. Later, Jim Highsmith outlined the “Design the Product Box” exercise in his book “Agile Project Management.” Since its introduction, the exercise has started to be used in hybrid and traditional project settings too. Have a look at the description below and see if it could be adapted to work on your projects.

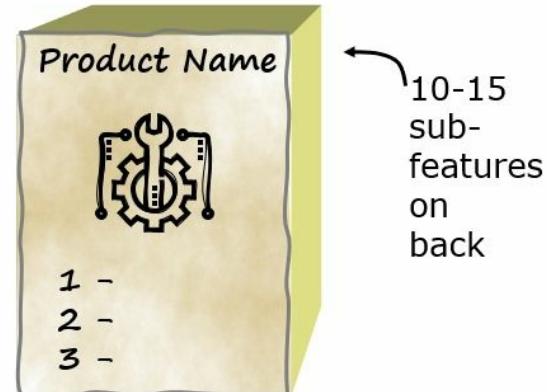
Co-Creating the Project Vision with Design the Product Box

This exercise can be used at Kick-off meetings to help clarify the project objectives and align stakeholders around those objectives. Sponsors, business and team members are split into two mixed groups to contain people from each functional area. The groups are asked to imagine that we were to sell the completed successful project outcome. Each group then has 20 minutes to design the box the product will ship in following some simple rules.

On the front of the box, they must create the product name, optionally a logo, and the top three features. Not four or five, just the three essential features for the project/product to deliver. Then on the back, they can list the next 10-15 most important features.

Design the Product Box

- Mixed Teams
- 20 minutes
- Rules
 - Front: Name
 - <Optional logo>
 - Top 3 features
 - Back: 10-15 sub features
- Teams present
- Timeboxed discussion of options
- **Facilitates:** early collaboration, prioritization of features, timeboxes, flexing of requirements



After the 20 minutes is up, each of the teams presents their product boxes and explains why

they thought their three items were the most important. The dialog that ensues as executives and business representatives who were split between teams debate the merits of their top three list compared to others is incredibly valuable.

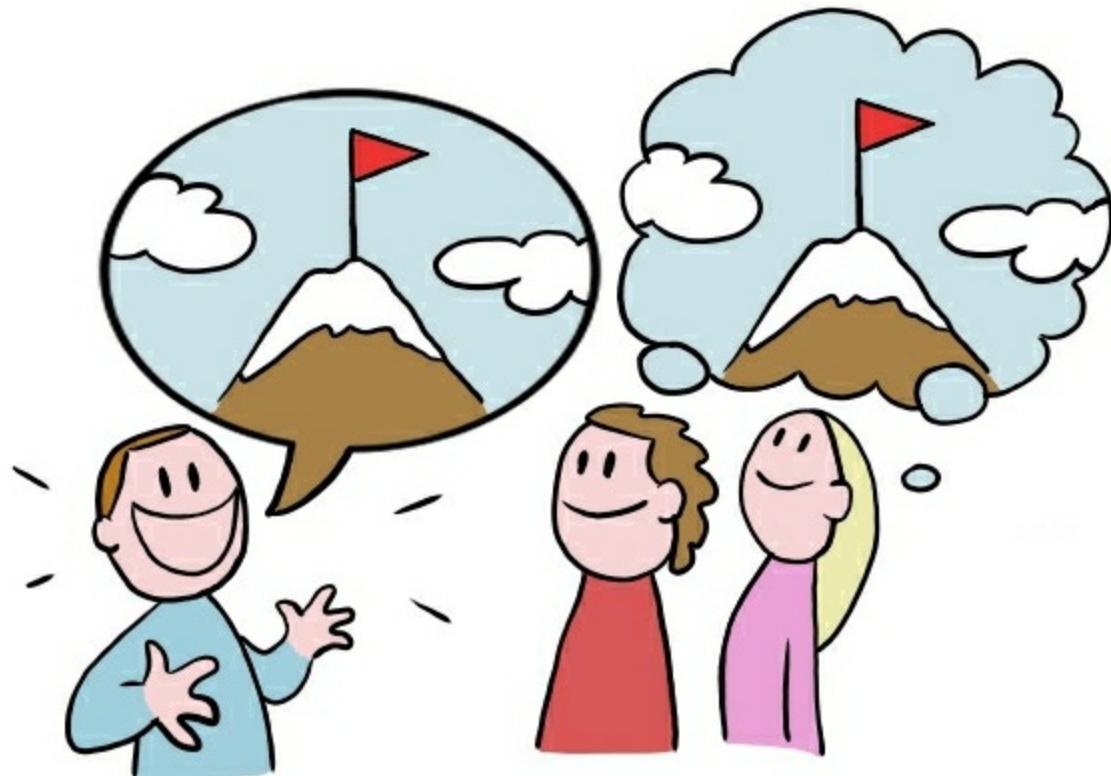
Kick-off meetings can otherwise be limp, introduction focused sessions. By using the product box exercise, we quickly drive out key project issues. A final product box is created (sometimes with executive tie-breaking), and a strong sense of purpose and vision is created.

This exercise is useful as it embodies the five principles of a good project vision:

- 1) **Ideal** – it represents some future preferred state
- 2) **Specific** – it is not generic (like statements such as “happy stakeholders”, “conforms to requirements”) but a product of a specific team addressing a definite problem
- 3) **Visual/Image** – Images are important because they connect the right and the left sides of the brain, enabling us to better understand the preferred end state.
- 4) **Future-Oriented** – providing a target to aim for in the future
- 5) **Common Purpose** – provides a common goal that stakeholders who have different skills can all work towards.

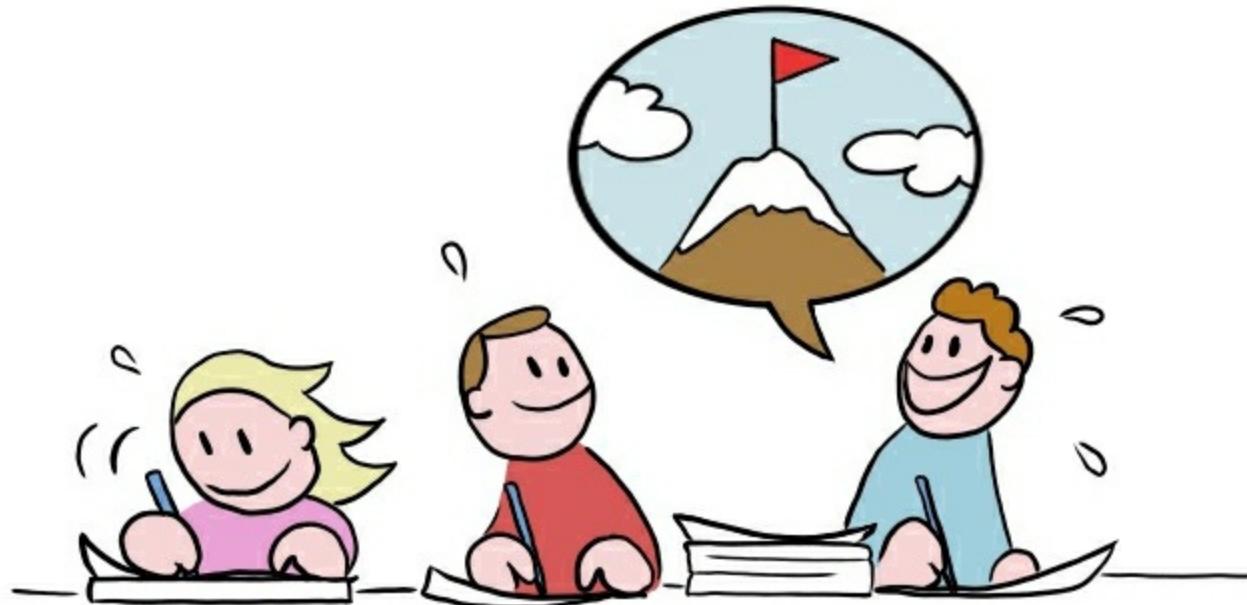
Vision Helps with Local Decision Making

Creating a clear vision for the project helps stakeholders make better local decisions aligned to the overall goal. Leadership Challenge authors Kouzes and Posner liken creating a strong vision to “Revealing a beckoning summit towards which others can chart their own course.”



Once we explain and illustrate where we are going, it will help everyone else as they make decisions in their day-to-day work. This way, when faced with their choices, or forks in the trail towards project completion, they make decisions aligned with the larger goal.

Establishing a project vision is not a once-and-done process. The best leaders spend a significant portion of their time maintaining the shared vision of success criteria. This is in part because people forget, people adopt simpler interpretations that suit their needs better, and stakeholders leave and join the project.



1.2.2 Support Diversity and Inclusion



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(Seek and encourage diversity and inclusion)

The benefits of diversity and inclusions are widespread and well documented. [This link](#) provides a comprehensive list of diversity research, which cites the following project team advantages:

- **Fewer blind spots** – Diversity brings more insights and viewpoints to all discussions
- **Improved risk management** – A wider range of experiences allows for identifying a broader set of scenarios that may happen
- **Better customer empathy** – Diverse teams have higher levels of empathy and are more likely to relate with a diverse customer base than a mono-culture team
- **Better decision making** – With more insights and viewpoints, a more extensive set of options and alternatives are evaluated, and more robust decisions made

Outside the project team, the research listed above also shows the following organizational benefits:

- **Lower employee turnover**
- **Higher employee job satisfaction**
- **Boosting company reputation**
- **Lower instances of fraud**

So, beyond the moral justification for increasing diversity and inclusion, there are clearly many business benefits. Once we acknowledge these benefits, the next question becomes, “How do we increase diversity and inclusion in our projects?”

Diversity and Inclusion How-To's

The following list of steps is a primary starting point. Project managers should also consult their own organization's policies on Diversity and Inclusion. If they are lacking, consider lobbying for more. The benefits are well documented, and the principles justified.

- 1) **Recognize that change starts with us** – We have to embrace diversity and inclusion to have any conviction or energy to effect meaningful changes.
- 2) **Education and awareness** – learn and teach how diversity is not just gender, race and religion. It also includes age, language, disability, culture, socioeconomic status, sexual orientation and other factors.
- 3) **Expand recruiting** – do not just use the typical recruiting sources - that will return the usual candidates. Consider online job boards, community colleges, and offering relocation packages to attract more diverse candidates.
- 4) **Review job post wording** - watch for masculine type language such as “ambitious” and “dominate.” These terms may be less appealing to female applicants.
- 5) **Offer flexibility** – accommodating different working hours can help people with childcare requirements or those health issues. It also allows for a better general work-life balance.

- 6) **Floating holidays** – provide flexibility for differing religious preferences.
- 7) **Strengthen anti-discrimination policies** – ensure diversity and inclusion are taken seriously and infractions are dealt with appropriately.
- 8) **Tools choice and training** – Some project tool choices might favor demographics that are already familiar with them (Kik, TikTok, Slack). Do not assume everyone will be familiar with them and provide training as required.
- 9) **Create inclusive workplaces** – provide nursing rooms, prayer rooms and whatever other space people need or want to feel included.
- 10) **Strengthen anti-discrimination policies** – create an open dialog about pay inequalities. Make sure you listen to your employees and provide leadership opportunities.

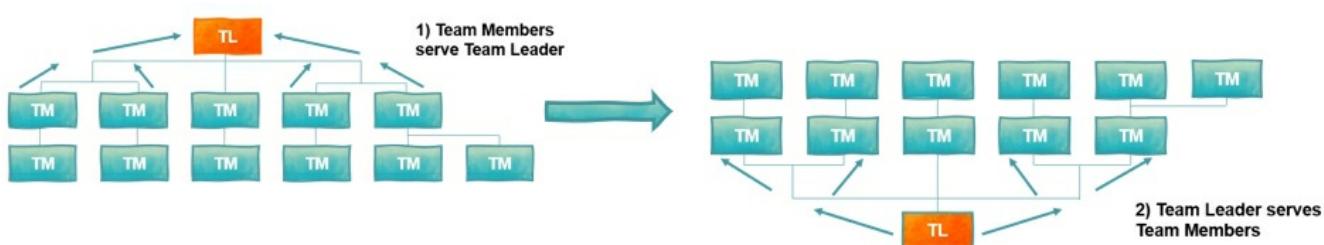
If this sounds like a lot of work, maybe you are working somewhere that needs a lot of work doing on it? Now workplace reviews are openly posted online, and roles more temporary, the workforce is more mobile than ever. Organizations that do not take diversity and inclusion seriously will lose the war for talent.

1.2.3 Value Servant Leadership



(Become the bridge to success for others)

Servant leadership was popularized by Robert Greenleaf and described a mindset and set of practices. It flips the power pyramid, so instead of the team working to serve the leader, the leader supports the team.



Servant leadership is a mindset and value system. It is based on recognizing that the team members deliver the project benefits, so the best thing a project manager can do is serve the team and help them succeed. This maximizes the amount of value they can produce and increases the capabilities and capacity of the group.

Project managers can practice servant leadership by shielding the team from interruptions, removing obstacles from their path, and ensuring the team has what they need to encourage growth. Let's review each competency in more detail.



1) Shield the team from interruptions –

A critical role of a leader is to let the team do their work. Distractions and low-priority interruptions can come from many sources. They might be requests from superfluous sources or demands for low-priority admin work. Even quick interruptions cause task-switching and interrupting the flow of the team.



Special-ops and Skunkworks teams have been effective and highly productive partly because they were separated and shielded from interruptions. So, see what you can do to keep the team protected from low-priority or non-value adding activities.



2) Remove Obstacles – Clearing the path of impediments, obstacles, and constraints is a vital role for a servant leader. It involves both observing the team and listening to them report issues, concerns or frustrations. Then, remove these blockers and ease the constraints so that team members can be more effective and deliver value.

For example, during a daily standup meeting or team meeting, someone reports delays due to a slow-performing tool and delays from a vendor. The project manager can take on the role of investigating tool upgrades or following-up with the vendor. The project manager is serving the team, doing what they can to assist with the smooth operation and maximum throughput of work.



3) (Re)Communicate the project vision - a critical role of a project leader is to communicate and re-communicate the project vision. By creating a clear image of the completed solution and project goals, stakeholders can check and align their decisions and work towards the common project objective. This is the “Reveal a beckoning summit towards which others can chart their own course” Idea. Put simply, a common vision helps keep people pulling in the same direction.

When busy executing a project, it is common for divergent views to develop between well-intentioned team members. Team member's desires for simplicity or to try new technology can diverge from business requirements. Quality analyst's desires for completeness and conformance can separate from the sponsor's wishes for rapid progress and completion.

Jim Collins in *Good to Great* writes that a trait of Level 5 Leaders (the most effective and leaders of great companies) dedicate a much higher percentage of the work time to communicating and re-communicating project and corporate vision. Kouzes and Posner believe it is almost impossible for leaders to over communicate project vision and it is a critical step for effective leadership.

So, don't have just one vision exercise at project kick-off and then assume you are done. Continually look for opportunities to communicate the project vision and new ways to illustrate and reinforce that vision.



4) Provide fuel and encourage growth -

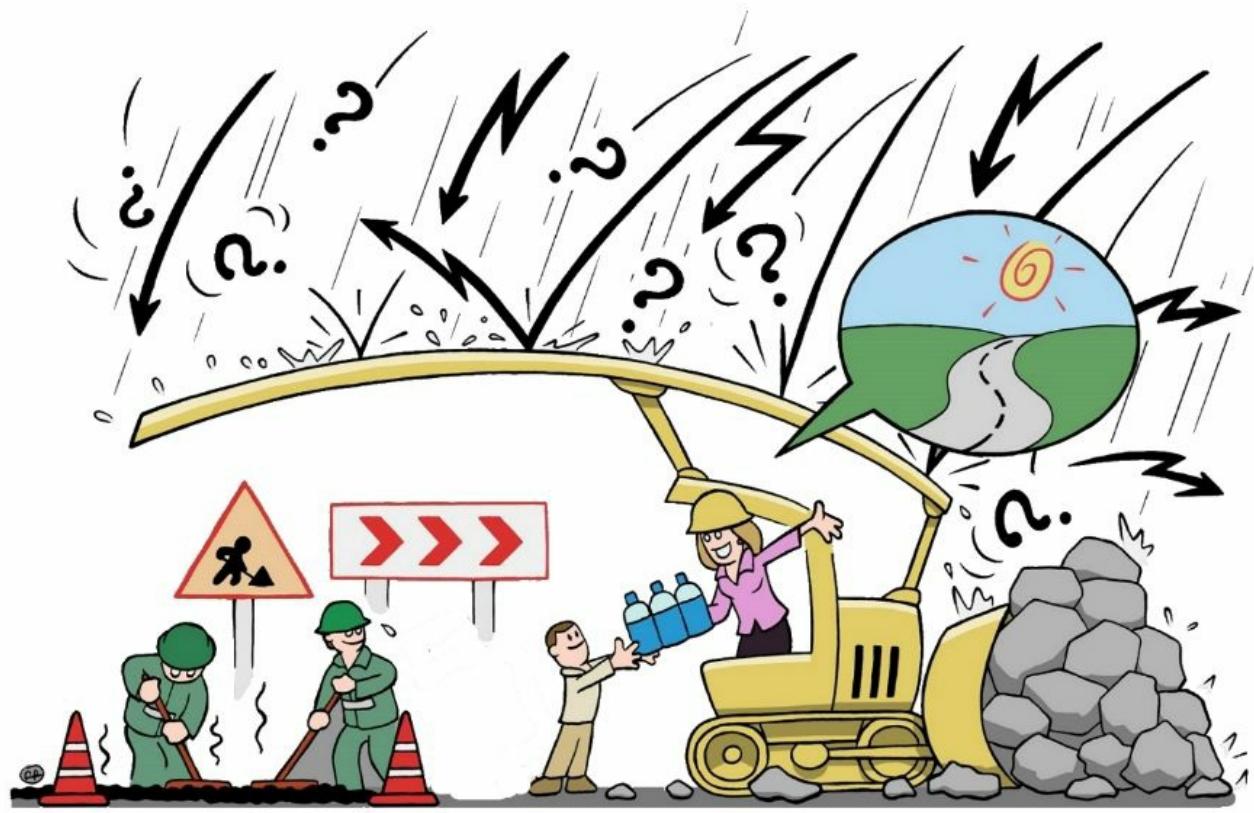
People need encouragement and support to try new things and deliver in challenging environments. Servant leaders provide what they need, whether that's help with a new tool, an introduction to a customer, or just some kind words of encouragement. Help make them successful as best you can.

We need to celebrate small victories (and, of course, major accomplishments) as we go. It is tempting to save the project celebrations to the end, but we may never meet a successful end without some regular recognition. Celebrations and recognition are momentum building exercises. We need to practice them frequently so obstacles can be broken through, and the final project goals accomplished.

Servant leaders look for opportunities to grow the capabilities of the team members. This may be through mentoring, training or providing a safe environment for people to try new skills or roles. When we show an interest in our team members' long-term success, two powerful benefits occur.

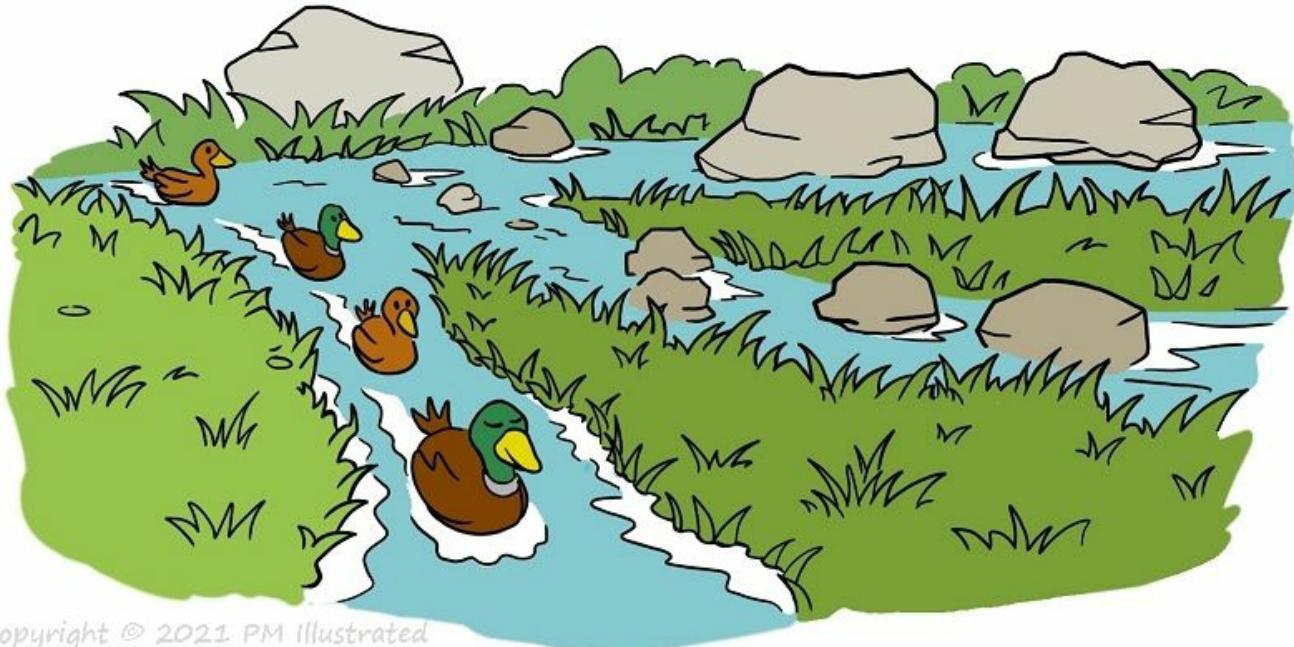
First, the team members will appreciate the interest in them beyond just filling a role. When people see the opportunity for personal growth, they are far more likely to be motivated to contribute. Second, by growing the team's capabilities, we are increasing the organization's capabilities and worth. Subsequent projects and operational work will benefit.

Putting these roles together, servant leaders facilitate rather than manage. They shield the team from interruptions, clear the path for the team, frequently remind everyone of the destination and provide encouragement and sustenance for long term success.



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1.2.4 Determine an Appropriate Leadership Style

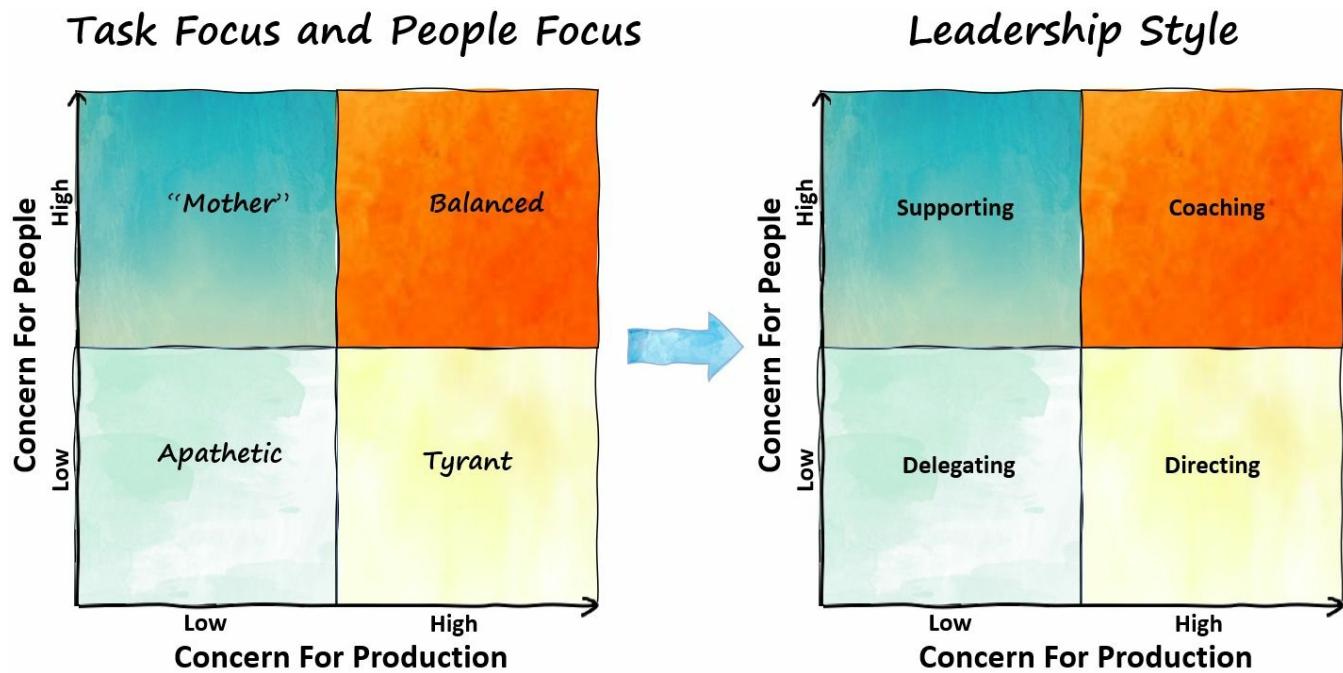


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(Choose the path that best aligns with the situation)

There are many styles of leadership, in addition to servant leadership. While servant leadership is usually the dominant theme, there will be times when the team might benefit from some emphasis in one area or another.

A project manager plays a critical team leadership role. This role needs to maintain a healthy balance for getting the project work done and keeping people motivated and engaged. It balances a concern for production and concern for people. Ideally, we want to operate in the upper right quadrants of the images below with a high concern for both people and production.



However, from time to time, priorities change, and alternative leadership styles/emphasis are required. For example, when an important deadline is approaching, it might be necessary to adopt more of a Directing style (lower right) for a short time, knowing there will be Supporting work to do afterward.

Likewise, when conflict occurs on the team, production focus might be sidelined while team issues are resolved or at least stabilized. Long term, we want to be in the upper-right coaching role, but things rarely go to plan for long. Good project managers flex their approach and focus as they adapt and aim to maximize the team's long-term productivity.

1.2.5 Inspire, Motivate and Influence Team Members / Stakeholders

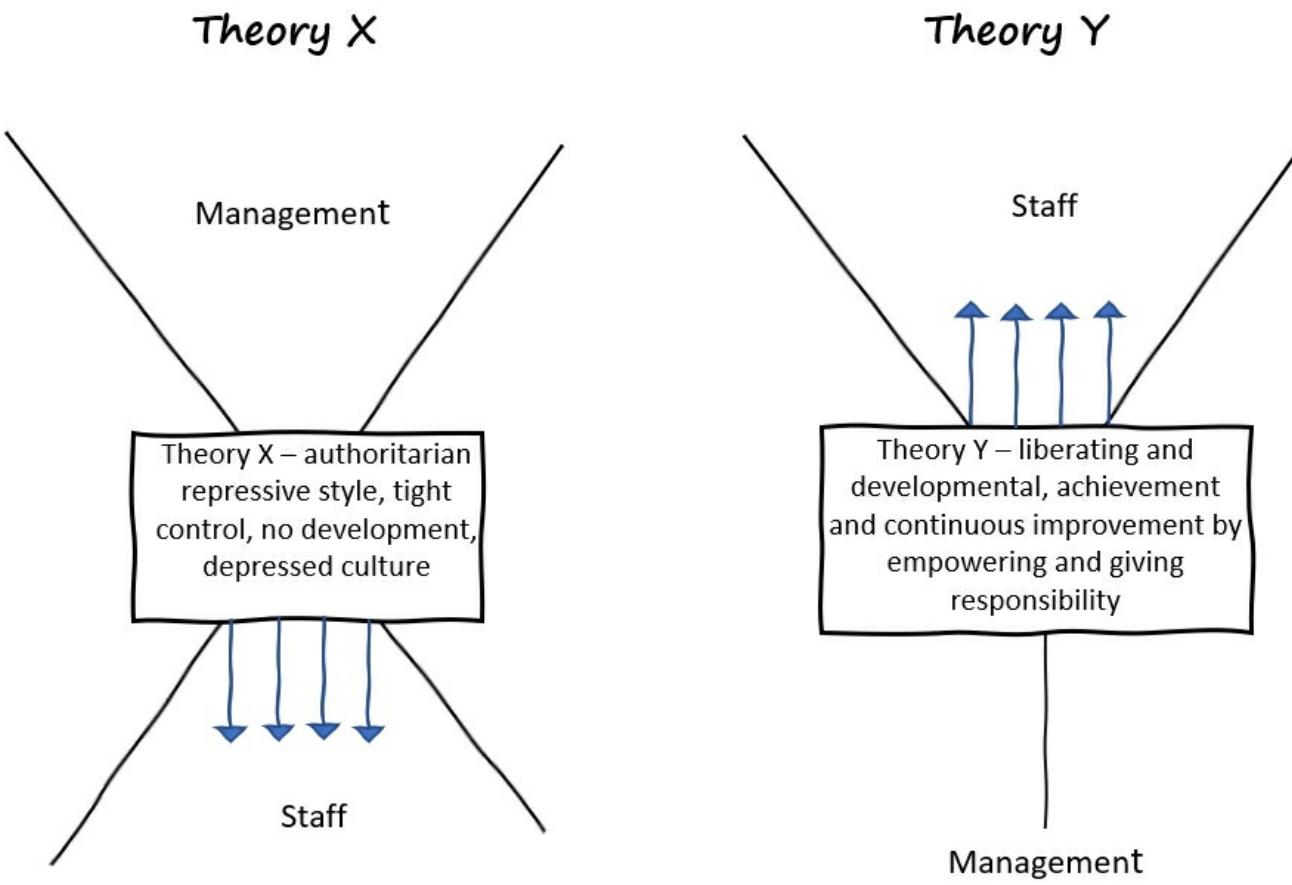


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(Create an environment where people want to contribute and do their best)

Inspiring and motivating a team can seem like a daunting task, but much of it comes down to creating a productive environment. When the right components are in place, people will want to contribute. To make such an environment, we need to understand some motivation theory.

Douglas McGregor popularized the “Theory X and Theory Y” approach to worker motivation in the 1960s. He explained that “Theory X views employees as inherently lazy and will avoid work if they can. Management believes that workers need to be closely supervised and comprehensive systems of controls developed.



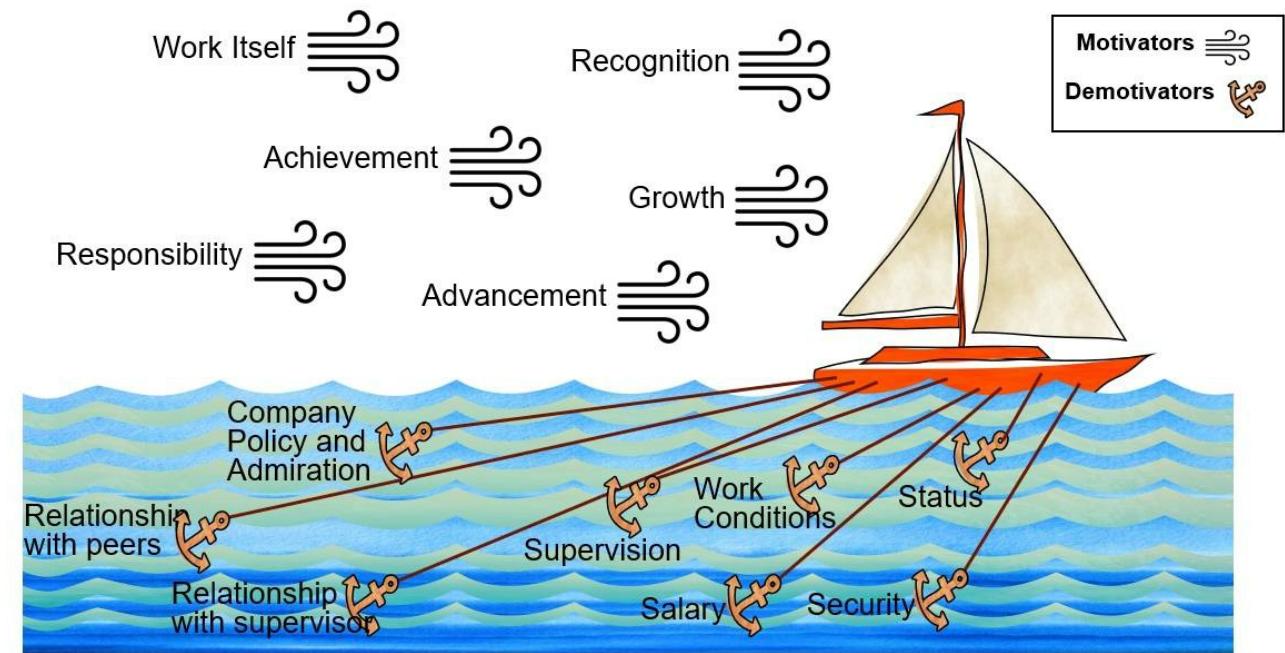
Theory Y, however, assumes employees are ambitious and self-motivated. They enjoy creative problem solving, but their talents are underused in most organizations. Managers should communicate openly with staff, minimizing the difference between superior-subordinate relationships, creating a comfortable environment in which people can develop and use their abilities. This climate includes the sharing of decision-making so that staff have a say in decisions that influence them.”

There is a close link to servant leadership here. McGregor shows “Management” above the “Staff”, suppressing them in the Theory X model and “Management” below the “Staff” elevating them in Theory Y. These days, most organizations try to adopt more Theory Y than Theory X, since it leads to better motivations. However, probably everyone has experienced Theory X at some point in their careers too.

Another popular motivation theory is Herzberg’s Two-factor theory into job satisfaction and motivation. The two factors are intrinsic (internal) and extrinsic (external). Herzberg asserted that people are motivated by intrinsic factors (such as advancement, growth and achievement) and extrinsic factors (pay, status, working conditions.)

These extrinsic factors behave more like basic hygiene. People need them to be satisfied, but they are not motivators by themselves. Yet, failure to address these hygiene factors will result in demotivation. These intrinsic motivators and extrinsic demotivators (if not present) as shown as wind and anchors below.

Hertzberg's Two-factor Motivation Theory

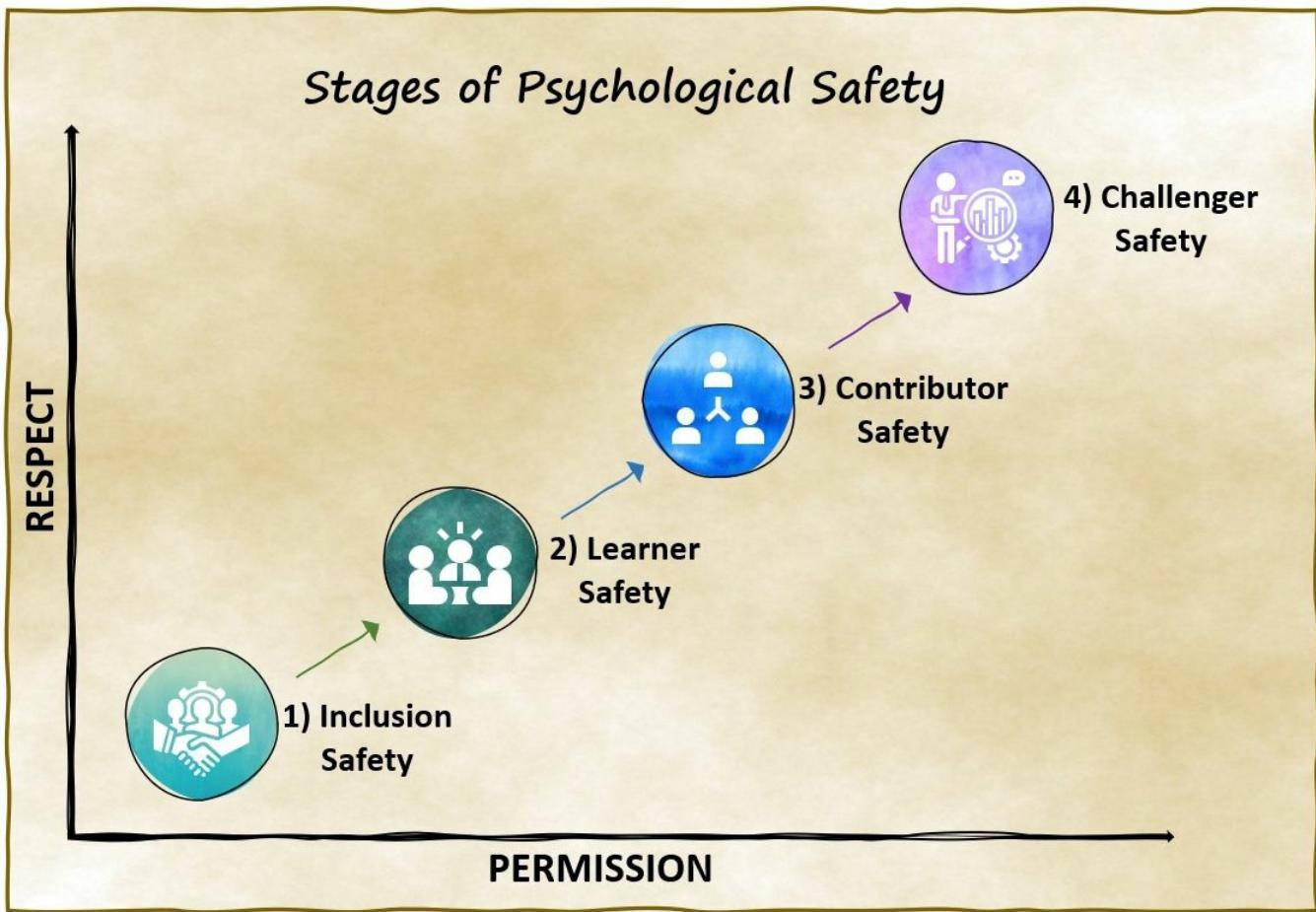


It is easier to motivate people with internal, intrinsic feelings of interesting work, accomplishment and the ability to advance in their careers. When we try to encourage people using external, extrinsic factors such as status and money, they are not as motivating. Instead, they are potential demotivators if not provided. When we know what motivates people (intrinsic motivators) and what upsets them (not having extrinsic motivators), we stand a much better chance of having happy, more motivated teams.

Psychological Safety

We need to create an environment where people feel welcomed and safe to ask questions. Without this, people will not engage or produce anything of worth. We also need to make people feel safe to create and share their work with peers and customers and suggest improvements to the process. These various levels of safety form the domain of workplace psychological safety.

Psychological safety describes how comfortable we are at interacting, contributing and questioning others at work. In the book “The 4 Stages of Psychological Safety”, author Timothy Clark outlines the following model for understanding psychological safety, which progresses through four stages:



1) Inclusion Safety - the basic human need to belong and be accepted by a group. People need to feel safe to be themselves, including any unique attributes. Without inclusion safety, people feel excluded.

2) Learner Safety - the encouragement needed to learn, experiment and grow. Safety when asking questions, getting feedback, trying things out and making a few mistakes along the way. Without learner safety, people will be unwilling to try new approaches.

3) Contributor Safety - the feeling of safety required to contribute something and have it judged by others. People will guard their work for too long without contributor safety, waiting for it to be perfect and miss out on early feedback. They will also not feel like they are making a difference.

4) Challenger Safety - having the permission and “air cover” needed to challenge the status quo. To question why things are done that way and suggest ways to make things better. Without challenger safety, retrospectives and improvement initiatives will suffer since no one will speak up and discuss what is wrong.

Project managers can establish psychological safety by modeling the desired behavior. We should admit our mistakes and ask basic questions. Having the courage to “learn out loud” shows we do not have all the answers, and it is okay and encouraged for people to be open.

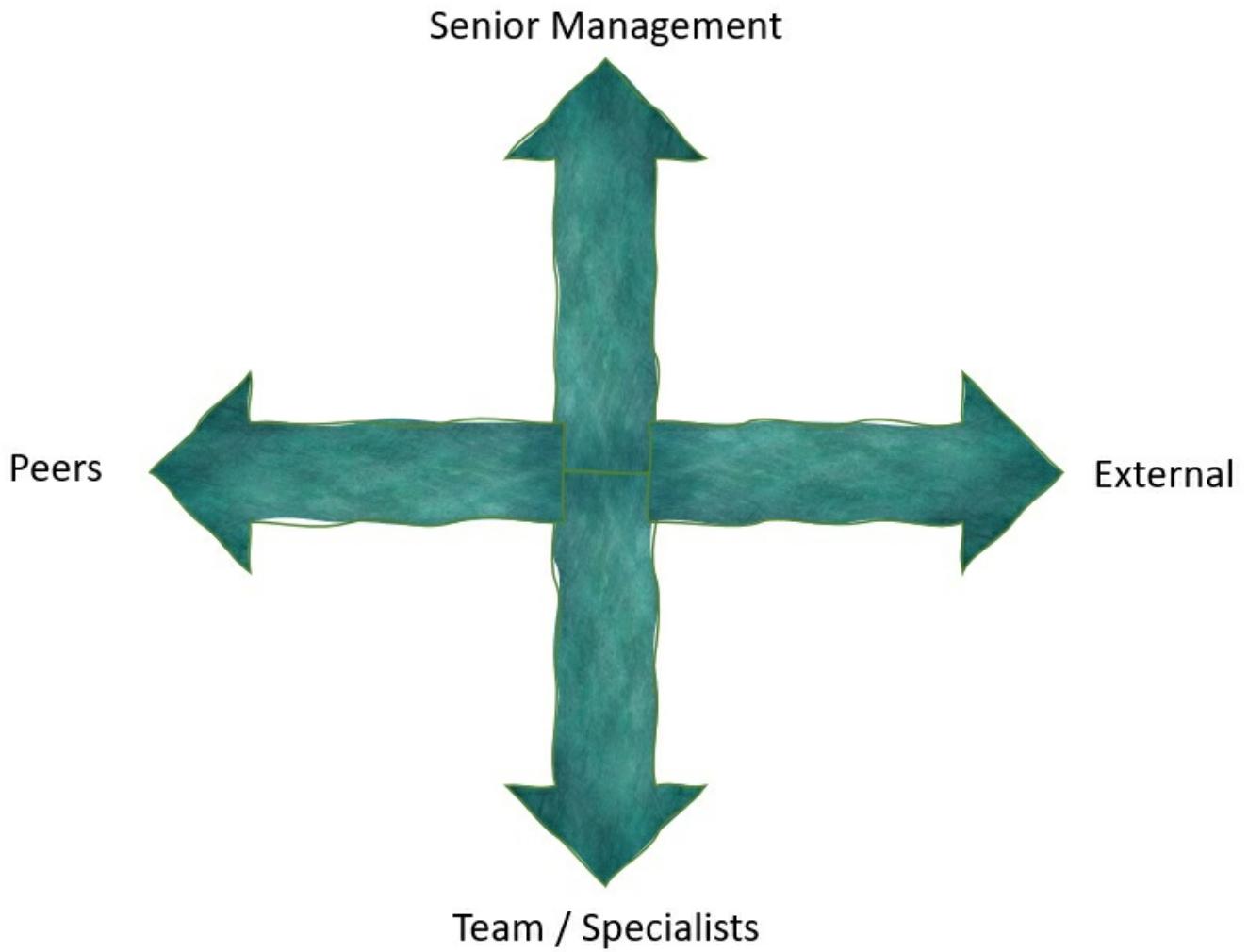
1.2.6 Analyze Team Members and Stakeholders Influence



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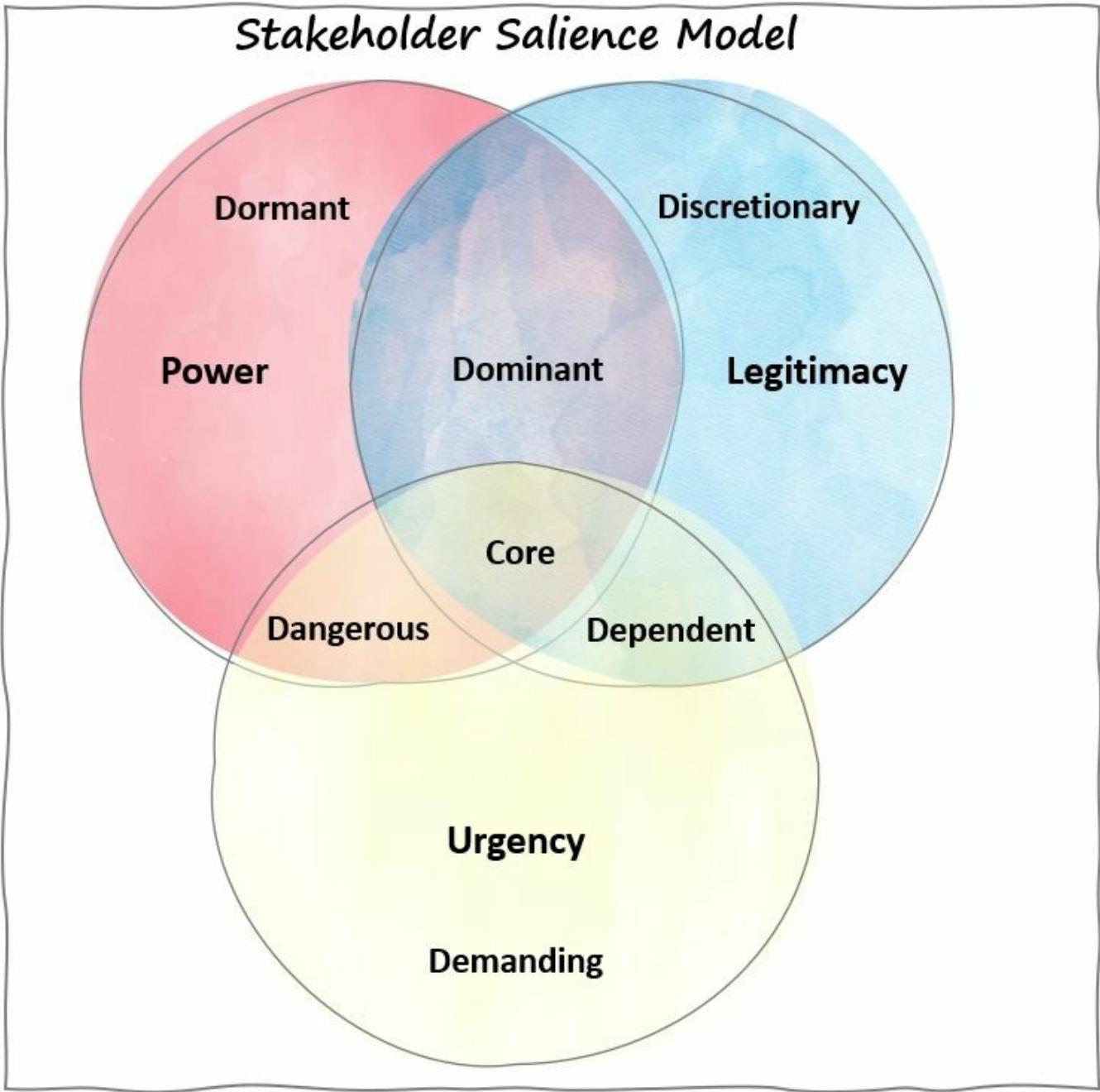
(Determine and act intelligently around influence)

Understanding influence is a crucial skill for navigating successful relationships. It helps us determine who to spend the most time listening to and how to best communicate on the project. As a project manager, our own influence travels in many directions. It goes upwards (senior management), downwards (team or specialists), outwards (external) and sideways (project manager's peers).



The Salience Classification Model is a way to classify influence based on the three attributes of

- **Power** – their authority
- **Legitimacy** – how appropriate their involvement is in the project
- **Urgency** – their immediate need



Where these influence circles overlap, we get subgroups of Core, Dominant, Dangerous and Dependent. Stakeholders in the central Core area need the most attention since they have power, legitimacy and urgency. Your project sponsor would be an example of someone with Core influence.

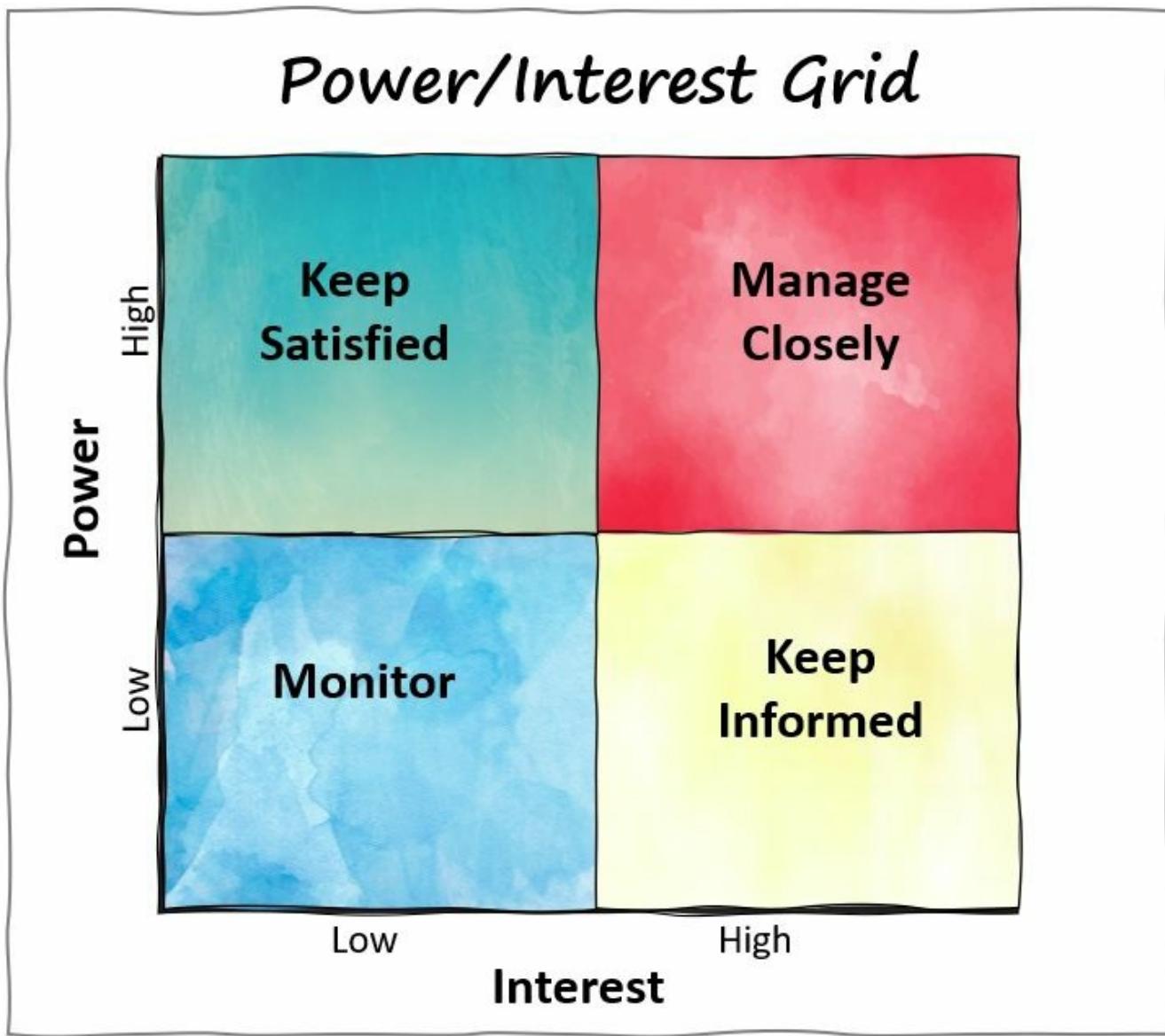
As we move further away from the Core, the strategies for working with people can flex based on their influence and the project needs. Stakeholders in the Dominant, Dangerous, and Dependent regions still need plenty of attention since they mix two influence factors. The outer Dormant, Discretionary and Demanding groups would typically be served third, behind the other groups.

The Salience Model is a useful classification tool. It helps us consider stakeholders based on their level of authority (Power), how appropriate their involvement is in terms of the project (Legitimacy) and their immediate needs (Urgency.) However, in real-life, personalities often have

a strong influence on how much attention we need to dedicate to them to be effective.

Also, the areas of overlap are not that intuitive to people. So, you might spend as long explaining the model to someone unfamiliar with it as you do discussing strategies to work with people. A simpler model is the Power Interest Grid.

The Power Interest Grid groups stakeholders based on their authority levels (power) and interest in the project.



During the Stakeholder Analysis of a project, we:

- Determine which stakeholders to manage closely and which will require less effort
- Determine the level of participation required from each stakeholder
- Document the interests and motivations of stakeholders in a project
- Identify the stakeholders that can make the project unsuccessful
- Look for any conflicting interests and relationships between stakeholders

- Determine communication strategies and medium best suited for each stakeholder

This analysis helps us focus our time and energy on the stakeholders that can make or break the project. It also allows us to create a communication and stakeholder strategy.

1.2.7 Distinguish Between Various Options to Lead Team Members and Stakeholders



(Putting the theories to use)

After categorizing our stakeholders and understanding the difference between intrinsic and extrinsic motivators, we still need to lead the team. Some team members will likely be competent, diligent and a pleasure to work with. Others, not so much.

To maximize our chances of success, we should work diligently to create a positive environment and be proactive about tackling conflict when arguments go beyond constructive disagreement. Other factors, such as creating a sense of solidarity/cohesion within the team, providing regular recognition and rewards, along with leading with emotional intelligence, all play an essential role.

Many of these topics are covered in more detail in their own sections.

- 1.1 Manage Conflict
- 1.3 Support Team Performance
- 1.4 Empower Team Members and Stakeholders
- 1.5 Ensure Team Members and Stakeholders are Adequately Trained
- 1.6 Build a Team
- 1.7 Remove Impediments/Blockers for the Team
- 1.8 Negotiate Project Agreements
- 1.9 Collaborate with Stakeholders
- 1.10 Build a Shared Understanding

1.11 Engage and Support Virtual Teams

1.12 Define Team Ground Rules

1.13 Mentor Relevant Stakeholders

1.14 Performance through Emotional

For the remainder of this section, we will focus on a couple of topics not mentioned in the list above. These are challenging the process and providing recognition and rewards.

Challenge the Process

Challenging the process may sound rebellious, and that's a deliberate motivating strategy. We should always encourage teams to innovate, grow and improve. However, "continuous improvement" may sound lame or too much like hard work to some people. "Challenge the process" – that's something I can get behind!

We can identify improvements by asking the team for suggestions, looking at problem areas and sources of waste. Then through small-scale experiments, try the suggested new approach in a controlled environment. If it works then great, we can try larger tests and make the process standard. If it fails, what can we learn from this? Is there a better way and what should we try next?



Agile approaches can use the regularly scheduled retrospective workshops to look for improvements and define experiments for the upcoming iteration. The frequent reviews and short development cycle times make it simple to build improvement into the regular process.

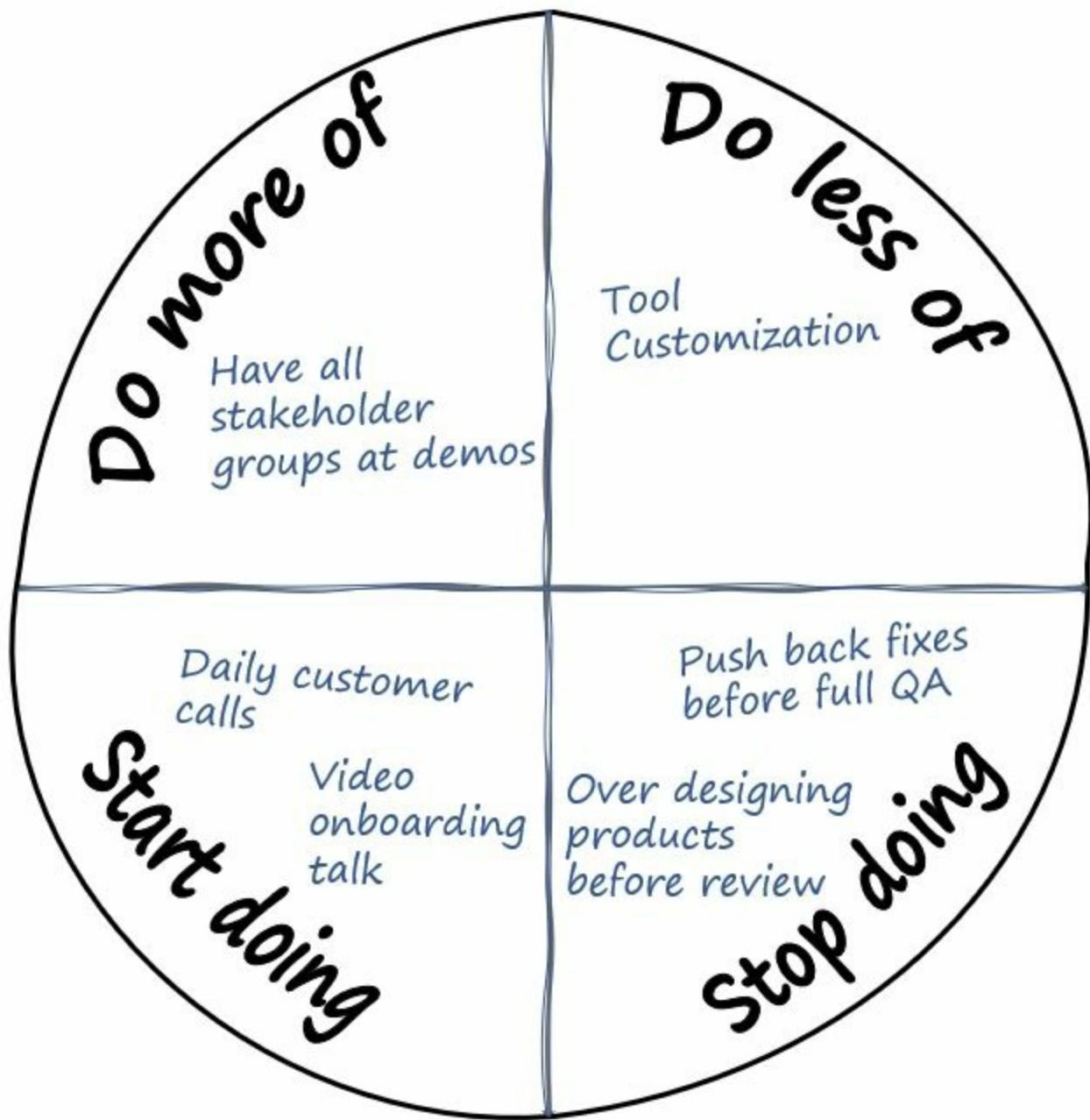


There is nothing to stop hybrid and traditional approach projects from also scheduling regular reviews and improvement trials. It just takes a little more planning. Phase gate and milestone reviews provide good opportunities, as do end of quarter look-backs.

During these reviews, the basic topics to review include:

- 1) What went well?
- 2) Where do we have opportunities for improvement?
- 3) What experiments should we try in the next period?

Another tool we can use is an Action Wheel. Drawn on a whiteboard, the quadrants of a wheel are labeled: "Do More of", "Do Less of", "Start Doing", "Stop Doing" as shown below:



The format used is less important than ensuring we regularly engage the team in ways to improve. Then, once practical ideas have been suggested, follow-through on some experiments. Asking for improvements and then ignoring them is a sure-fire way to disengage people.

Teams can bring better visibility to their ideas and experiments by using boards (information radiators) to show content, progress and outcomes.



Ideas and Experiments Board (Image Credit: Trent Hone and Andrew Jarding, MindSettlers)

As well as creating better processes for your organization, challenging the process also builds your team's sense of autonomy. When people help define how they work, they feel a stronger sense of ownership and commitment to it, which is a powerful motivator.

Autonomy, Mastery and Purpose

Daniel Pink author of “Drive: The Surprising Truth about what Motivates Us,” explains people are motivated by the internal concepts of:

- **Autonomy**
- **Mastery**
- **Purpose.**

Autonomy means giving people control over how they work. Including control over:

Task – the work they do and how they undertake it

Time – when they choose to work in the day, week, year

Technique – How they perform tasks and from where

Team – How they organize, interact and collaborate

Experiments, retrospectives, lessons learned and challenging the process all contribute to building a sense of autonomy for work.

Mastery describes the pleasure we get from doing what we love and following our passion. We are in the zone, or what Pink calls finding our flow. “Flow” is the term to describe the state of mind when time seems to disappear, and we are just immersed in the task.

Mastery comes from:

Flow – having the time, space and freedom to find and exercise your passion for a profession

Goldilocks Tasks – Not too difficult and not too easy, but just right. We need enough Goldilocks tasks to stretch, engage and indulge our desire for completion and satisfaction.

Mindset of learning – people want to learn new skills and extend their capabilities. When we create learning opportunities at work, people are more motivated.

Purpose describes tapping into people's belief that there should be more to work than just making money and success. Instead, aligning company goals with individual's aspirations for doing good and meeting a higher guiding principle.

We may not work for organizations with compelling goals or inspirational objectives. However, we can create a sense of purpose within our teams for delighting customers or surpassing targets. We should not underestimate the motivational effects of developing autonomy, mastery and purpose with our teams. They form more potent motivators than those based on rewards and recognition alone.

Rewards and Recognition

Even with autonomy, master and purpose, there is still a place for rewards and recognition. In fact, they play a hygiene role. We need them but rarely notice them and only really get upset when they are absent.

Waiting for the successful completion of a project before celebrating is too little, too late. We need to show regular appreciation as we go. Appreciations do not need to be large, but they should be thoughtful.

Recognition is often an intangible, experiential event based on behavior rather than an outcome. It is not restricted to a set time and usually unexpected by the recipient. It is intended to increase people's feeling of appreciation. Saying a sincere "thank you" for some hard work is a great place to start.

"Ceremonies, celebrations, and rituals are not about the event. They're about touching the hearts and souls of every employee." Victoria Sandvig, Charles Schwab

Rewards can be tangible, consumable items, like a gift certificate or meal voucher. They are typically given as a result of a particular achievement or reaching a specific outcome. In some environments, they might be expected when a goal is met. The purpose is to motivate towards a particular outcome and are always given with recognition too.

Creating a reward and recognition plan for a team should start with the basics of an inclusive, safe and productive work environment. Then add layers of motivation, recognition and rewards. It does not need to be like kindergarten, but it does need to be structured to avoid workplace issues and facilitate high performance.

Leading Teams is a People Skill

“You can be the world’s leading expert at PERT/CPM and Earned Value Analysis and still fail at managing projects if you don’t know how to deal with people.” – James Lewis

Project managers need to understand what motivates people to get them enthused about collaborating and actively contributing during the project's lifetime. It is one thing to be happy to work when everything is new and exciting, but most problems face conflicts, setbacks and obstacles. Leading a team during all its ups and downs requires a full repertoire of people skills.

1.3 Support Team Performance

This task, “1.3 Support Team Performance”, deals with how we assess team member performance, support team development, give feedback and verify improvements. It is in the People domain and is team focused. However, since there is no comparable “Measure Project Performance” task in the Process domain, we will also address general project tracking in this discussion.

The “Support” word in the “Support Team Performance” is significant and emphasizes the critical role project managers play in creating high-performing teams. Project managers do more than plan, direct, and dispassionately measure performance like you might evaluate a vehicle's speed and fuel consumption. Such non-invested observation will be reflected back as weak, non-committed team output. Instead, planning, care and effort must be invested to support team performance.

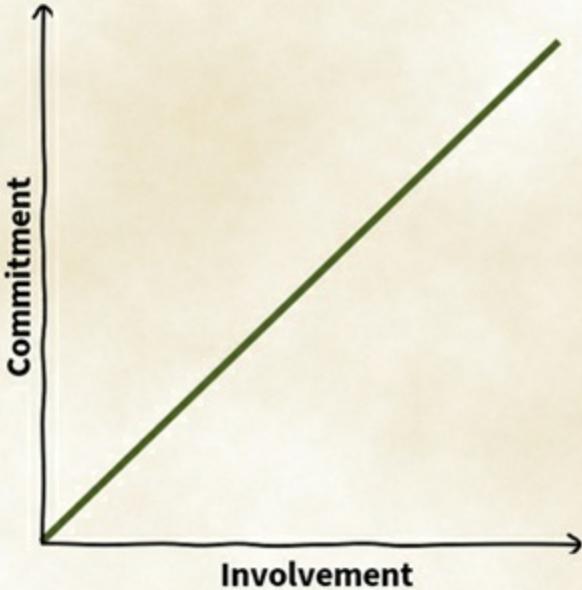
Culture and Empowerment

Performance is the product of the skills, attitudes, tools and processes used by the team. From these attributes, the team attitude, in terms of cooperation, problem-solving and motivation, plays the most significant role in determining project outcomes.

We can have the best tools and processes in the world, but without a cooperative, driven team, we are unlikely to be successful. In contrast, many underfunded, poorly equipped groups have built incredible products and services with hard-working, motivated teams. By far, people are the most significant factors, so getting these factors correct, or at least optimized given our constraints, is well worth investing in.

In task [1.2 Lead a Team](#), we looked at the motivational benefits of empowerment and psychological safety. We also investigated servant leadership and the role of protecting the team from interruptions. By engaging team members in planning, estimation, risk management and decision-making, we increase commitment to shared outcomes.

Building Commitment



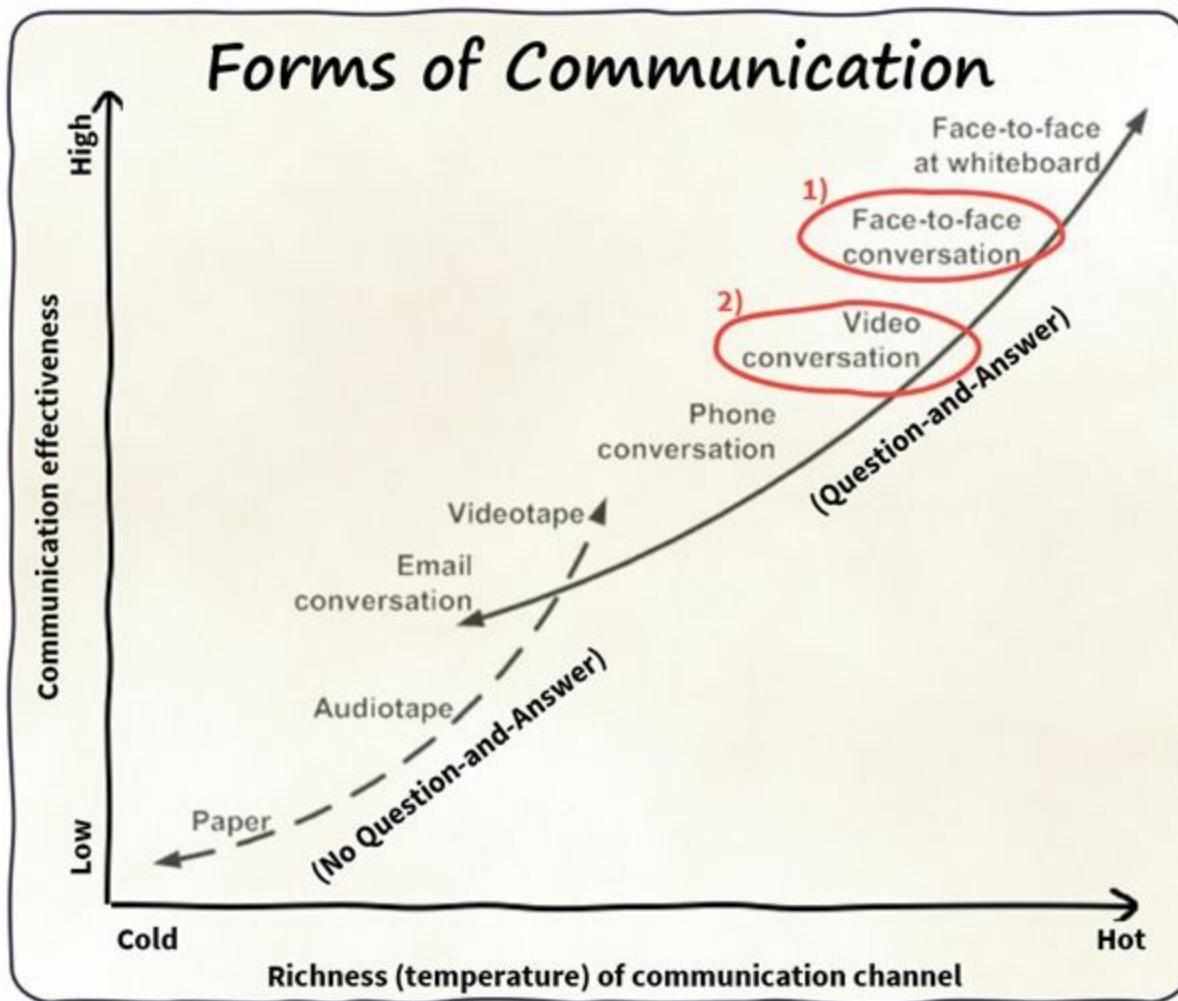
Workplace Considerations

Teams need access to project and work information to collaborate and communicate effectively. They also need to access co-workers and other stakeholders (for instance, customers, vendors, specialists) to ask questions, share information and work successfully.



The original agile way of designing workplaces to facilitate teamwork was to use small teams and colocation. Working with small teams and breaking large initiatives into multiple small teams allows everyone to sit together and communicate face-to-face. This is a quick form of communication that also allows emotion and body-language to be easily conveyed and detected. It is easier to spot if someone is confused or disengaged than if communicating via emails or documents.

Forms of Communication



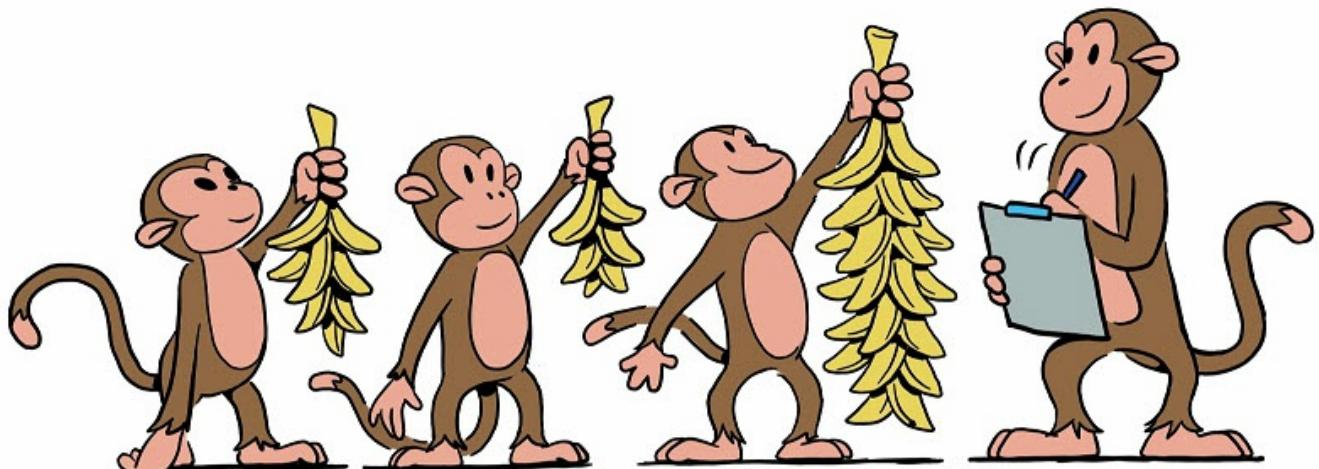
Colocation helps create open, unfiltered debate. Without the barriers of video conferencing, email or telephone, team members can more easily get to the heart of the issue with direct communication. This helps resolve confusion, conflict and build a strong commitment to decisions.

A downside of face-to-face communication is the cost of physical colocation. Talent, clients and customers tend to be geographically distributed. Now that digital marketing quickly reaches the entire world, business is increasingly global, making collocated teams problematic. With the advent of low-cost video conferencing, many of the benefits of face-to-face communications can now be achieved via technology.



Organization's work from home responses to COVID-19 accelerated the adoption of video conferencing and remote collaboration tools. Now, most organizations are practiced in using remote collaboration tools. These tools include video conferencing but also incorporate discussion threads, document management systems, project repositories and group facilitation tools.

1.3.1 Appraise team member performance against key performance indicators



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(Assess team member performance)

Key Performance Indicators (KPIs) are metrics designed to track important things we care about. The trouble is many organizations track metrics because they are easier to collect (number of change requests received) than what they really care about (customer satisfaction.)

"Not everything that can be counted counts, and not everything that counts can be counted"
– Albert Einstein.



Software projects have a particularly bad reputation for tracking things that might initially seem reasonable but, in practice, create unintended consequences. The number of lines of code written per week by a developer may seem like an appropriate way to track progress; however, it has terrible results. It leads to code-bloat (long-winded code that is hard to maintain) and does not reward simplification and refactoring that aims to clean-up code, make it tighter and easier to sustain. It also does not incent collaboration between team members. Why go and help Bob if that will only increase his code line count and worsen mine?

Instead, we need to watch out for some common metric problems:

- **Misleading Observations** – Some misguided observations can lead us astray if we do not understand the bigger picture and how things work. For a long time, people believed stars came out at night and planets and the sun revolve around the earth because this is how things appeared. Metrics with a faulty view of how things work will not help us track and respond.
- **Hawthorne Effect** – The act of measuring something makes people take notice and adjust their behavior. For instance, publicly tracking hours-worked is likely to result in people working long hours, leading to burnout, mistakes and quickly consumed

budgets. We should try to create metrics aligned to the end-goal – such as completed projects, happy stakeholders, etc.

- **Lagging metrics** – When making decisions and steering a project, an imperfect view of the future is more useful than a perfect view of the past. Auditors and accountants may want to know exactly what was spent last month, but it is more beneficial for project managers to understand that the remaining scope is likely to take 7 months to complete, not 6 months as planned, and we are likely to be 10-15% over budget. Leading metrics such as trends and projections are more useful than lagging metrics.
- **Lack of cooperation** – When people are measured individually, they may not be incented to help others be successful since this will raise the group average and may diminish their own relative performance. So rather than measuring at the individual level, measure performance at the aggregated team level. This will encourage cooperation and knowledge sharing.



Metrics are like fire; they make good servants but poor masters. We do not want to become a slave to creating time-consuming metrics. Instead, we want metrics that serve our purpose of helping steer the project forward.

The acronym SMART stands for

- **Specific** – Targeted on a singular attribute, not vague or too broad. E.G. Mean-Time-to-Failure not Good-Quality
- **Measurable** – Quantifiable to objectively evaluate progress. E.G. In days and hours rounded to half an hour.
- **Achievable** – The metric should be possible. Metrics are not stretch goals they should be attainable. Some organizations use “Assignable” for the A of SMART and specify who will do it. Either way, practical metrics with identified roles help make metrics achievable and assignable.
- **Relevant** – Something we care about that relates to the objective at hand. E.G. it is better to track features-delivered-and-accepted-by-the-client than just features-developed since some of these developed features may get rejected by the client.
- **Time-bound** – Specify when the results will be delivered.



Useful metrics should not take a long time to track or calculate. Instead, metrics should be self-generating and straightforward. Ideally leading, future-focused and relevant to the end-goal.

We use assessments to check the health of the project, diagnose problems and track project performance. Some other reasons for appraising team performance include:

- Measure and improve skills and competencies
- Increase team cohesiveness
- Solve issues
- Surface and resolve conflicts
- Improve team interactions and performance

Some techniques for appraising performance include

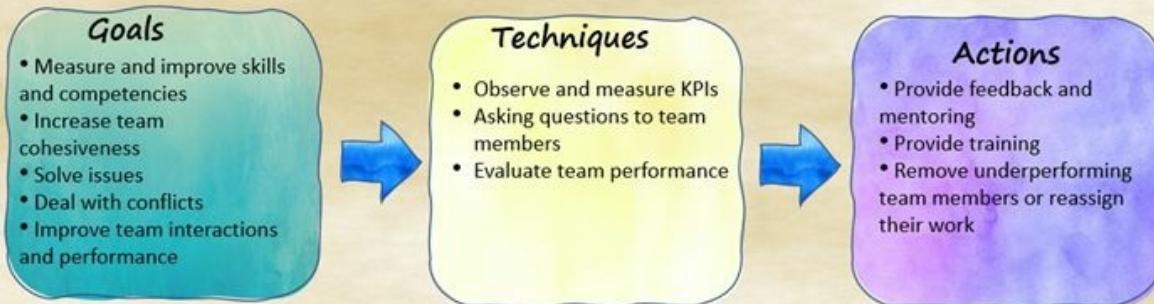
- Observe and measure KPIs
- Compare performance to goals
- Asking questions to team members
- Evaluate team performance

Actions that may come from team performance assessments include:

- Provide positive and negative feedback
- Create training plans
- Provide training
- Remove underperforming team members or reassign their work

These points are shown below

Team Member Appraisal – Goals, Techniques and Actions



Setting Objectives

In section “1.2 Lead a Team,” we saw how establishing a clear vision is essential for cementing commitment and encouraging forward progress within the team. Without a clear vision, like driving in fog, we slow down, unsure of what lies ahead. Objectives act as interim goals or stepping stones towards the final vision. Teams with clear objectives are more productive and driven than teams without them.

Project managers should collaboratively set objectives with team members to create consensus and commitment towards common goals. Objectives should be first created near the beginning of the project but then also updated and evolved throughout the project’s execution.

Objectives and Key Results (OKR)

Companies like Google, Walmart, Twitter and ING bank popularized Objectives and Key Results (OKRs). They are now used by many organizations because they are simple, flexible and goal-oriented. Typically set every quarter, they do not get stale and help link team goals to organizational objectives.

OKRs are simple and have only two components: the Objective and the Key Result. They often take the form of:

I will **[Objective]** as measured by [this set of **Key Results**].

Here is an example:

Objective: Become the market-leading online dating site

Key Result #1: Acquire 800K new customers this quarter.

Key Result #2: Increase marketing share by 20 percent.

Key Result #3: Reduce subscriber attrition by 45 percent

While simple in structure, there are some principles to follow.

- OKRs describe both **What** will be achieved and **How** it will be measured.
- **Objectives** are small, memorable qualitative descriptions of what we intend to achieve.

They should be inspirational and engaging; teams can get creative and build exciting objectives.

- **Key Results** are quantitative metrics measured to track progress towards the Objective. Each Objective should have between 2-5 Key Results that are numeric. “If it does not have a number, it is not a Key Result.” - Marissa Mayer, Google

Another example could be:

Objective: Become the most trusted dating site

Key Results:

Improve Net Promoter Score from 30 to 50.

Increase referrals to over 60%

Increase renewal rates from 65% to 80%.

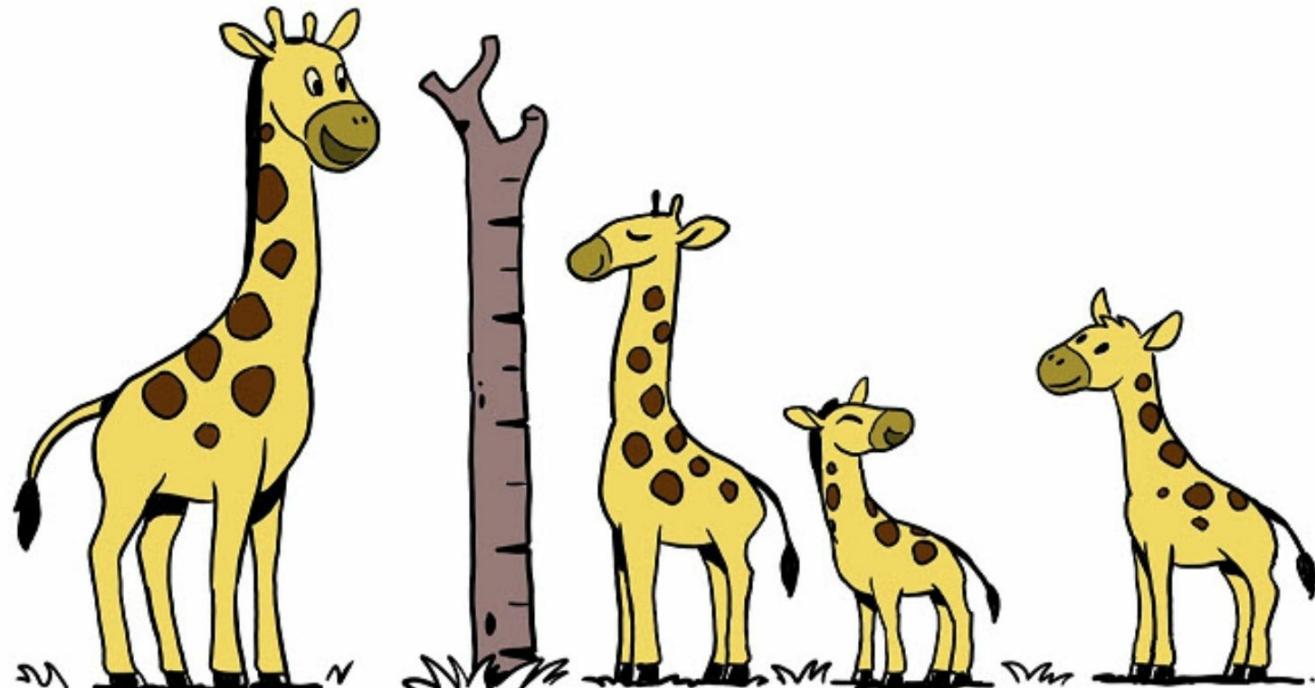
Reduce non-matched cancellations from 15% to 5%



OKRs suit agile teams since they are visible, lightweight, and regularly updated.

The regular rhythm of creating, tracking then replacing OKRs keeps them fresh and engaging for teams while retaining support with organizational targets. Changing OKRs frequently also reduces the chance of misuse or gamification that might be counterproductive.

1.3.2 Support and recognize team member growth and development



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(Track and promote team member growth and development)

One of the best ways to motivate team members is to take an interest in their professional development. When we can build elements for their growth into the project plan, they now have a personal investment as well as a professional one towards making the project successful. This may take the form of approving related training, making time for self-study, or creating an opportunity to try a new role or skill in a safe, controlled environment.



The short timeframes of agile iterations make for ideal test cycles. Maybe someone wants to try out a new role for a couple of weeks or lead a small group. Timeboxed iterations are ideal for running experiments and provide natural opportunities to review what worked, what did not and make decisions for future iterations.



Timeboxed experiments are not unique to agile. The regular cadence of agile iterations makes experiments natural, but there is nothing to stop hybrid and traditional projects from adding timeboxed experiment cycles to their plans along with the regularly scheduled tasks. Setting up a, say, monthly, continuous improvement workshop that discusses ideas to try and runs experiments can be worked into most project plans. Regularly engaging team member's viewpoints is a great way to increase their involvement and, therefore, commitment to the project's success and organizational progress.

Measure Up

In the book "[Measuring and Managing Performance in Organizations](#)," author Robert Austin, makes three key observations:

1. “You get what you measure.”
2. “You get only what you measure, nothing else.”
3. “You tend to lose the things that you can’t measure such as insight, collaboration, and creativity.”

The first point is referencing the Hawthorne Effect. The second point says that if you do not measure things, they might not get done. The third point explains that we need to be careful that our measurements do not discourage desirable behaviors like collaboration.

Agile expert and author Mary Poppendieck explains how Nucor Steel measured and promoted collaboration and creativity through a process known as measuring up. Nucor Steel is one of the

few U.S. steel manufacturers making a profit and generally good labor relations. They attribute much of their success to their incentive-based pay scheme based on productivity.

The critical component of their pay-scheme is that plant managers are not paid based on how well their plant performs but on how well their plant and other plants perform. This may sound unfair; how can they influence how other plants perform? Well, through collaboration, sharing ideas and cooperation. Similarly, departments are measured across several departments, teams across all teams, and individuals based on the whole team results. This rewards collaboration and cooperation that would otherwise be difficult to measure and encourage.

On software projects, defects could be traced back to individual programmers who introduced them, but rolling them up to an entire team is often a better way to go. It promotes information sharing, mentoring and helping each other out.

“It is more effective to measure people one level above their span of control. This is the best way to encourage teamwork, collaboration, and global, rather than local optimization” – Mary Poppendieck

Team Stage Specific Support

As teams progress through the Tuckman stages of Forming, Storming, Norming and Performing they will likely have different growth and development needs. To begin with, in the Forming stage they may need more support understanding scope, direction, priorities and developing ground rules. Later this may transition to conflict resolution and developing team norms. Finally, we hope the team will reach the Performing stage and can be supported with challenging the process and improving delivery capabilities.

Throughout all stages of team development, project managers should be looking for opportunities to build team member capabilities and promote teamwork. Some of the ways they can do this include:



- **Communicate effectively** – Make sure everyone knows what the long term, medium-term and short-term goals and objectives are. These are reflected through the project vision – See “1.2.1 Set a clear vision and mission”. Also, through release plans or quarterly objectives, the product backlog or work breakdown structure.



- **Foster collaboration** – promote and reward team members helping each other to achieve objectives and deliver results. Pairing and Mobbing



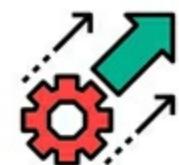
- **Develop trust among the team** – Create psychological safety, demonstrate the desired behavior of admitting when you do not have all the answers, and asking for help.



- **Manage conflicts** – Accept that disputes are inevitable and learn how to interpret the various stages of a conflict, and learn strategies for de-escalation.

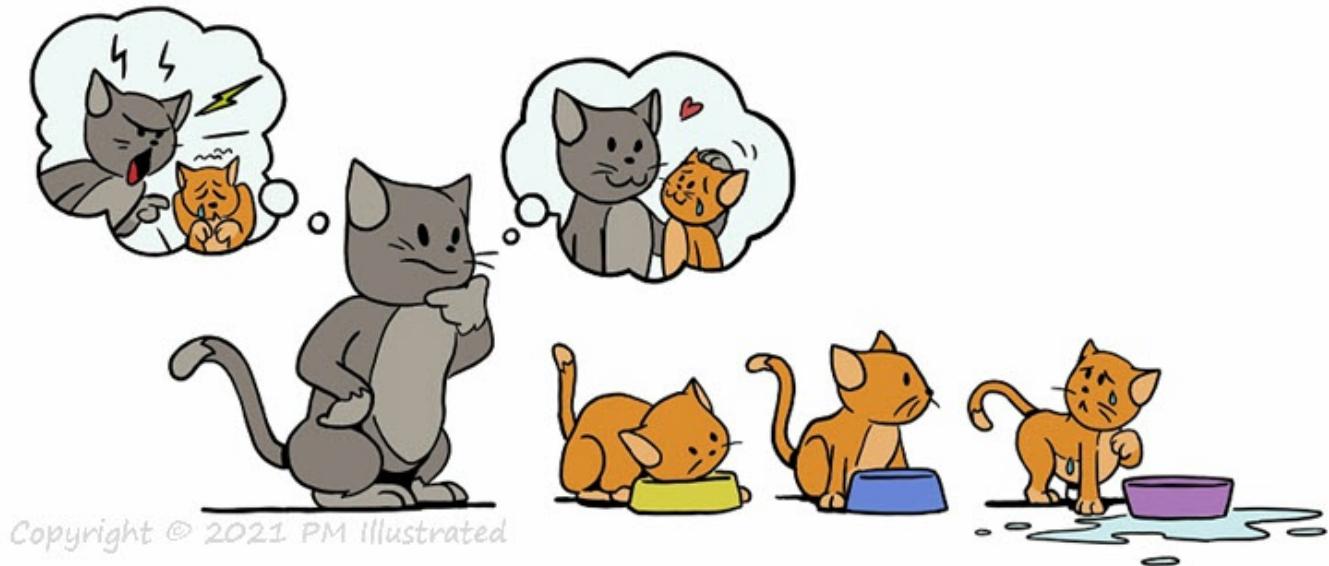


- **Promote collaborative decision-making and problem-solving** – Acknowledge team members are closer to the execution of the work than most project managers. So, we should engage their insights and perspectives in the decision-making and problem-solving process.



- **Promote continuous improvement** - Challenge the status quo, encourage small scale experimentation, constant improvement and knowledge sharing.

1.3.3 Determine appropriate feedback approach



(Choose the most useful feedback approach)

Project managers are expected to track, report and help steer all aspects of a project's performance towards success. This involves selecting and employing the appropriate tools to provide timely stakeholder feedback.

While early and continuous feedback is emphasized in agile approaches, it is essential to any project environment. As old adages warn us:

- “Projects get late, one day at a time.”
- “A stitch in time saves nine.”
- “Some things are best nipped in the bud.”

In other words, we need to be proactive with monitoring and acting on issues. This includes providing feedback, both positive and negative.

Beware of Stale Sandwiches

Some organizations use outdated and inappropriate feedback mechanisms — the annual or quarterly review with your boss in one example. Due to the infrequency of such events, they become a big deal and can lose context. This is true for both the boss who has to think of things to give feedback about, and the recipient who has to prepare a ‘defense’ recalling goals met and new objectives for the next period.



Offering feedback in a sandwich format of saying something positive, then something negative, but following up with something else positive is not the most effective way to

explain issues or invoke change. This praise sandwich format does not fool anyone, and most people are still processing the negative filling to even notice the second positive wrapper.

An example would be telling someone: “You are prompt and committed, but several people have reported they find you prickly and difficult to collaborate with, but everybody agrees your technical work is excellent.”

Feedback sandwiches are hard to swallow, and the only thing that could make them worse is to couple it with infrequent feedback of quarterly or annual reviews. These are stale sandwiches, the worst kind.

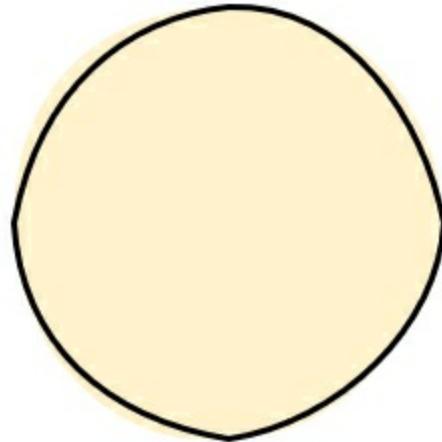
From Sandwiches to Wraps



Management 3.0 author, Jurgen Appelo suggests ditching praise sandwiches and adopting what he calls [Feedback Wraps](#) instead. It is a great concept that addresses the main issues that explain why nobody really likes praise sandwiches.

One issue is that once people get used to receiving praise sandwiches, they tend to filter-out the two elements of praise and focus only on the criticism – missing valuable positive feedback. Also, these sandwiches often miss the context that frames the feedback. Nor does it really explain the facts or feelings that are critical components of useful feedback. Finally, helpful feedback needs to explain the impacts of events and actions to show why they are significant.

The feedback wrap fixes these problems and incorporates the missing components. They are structured as follows:

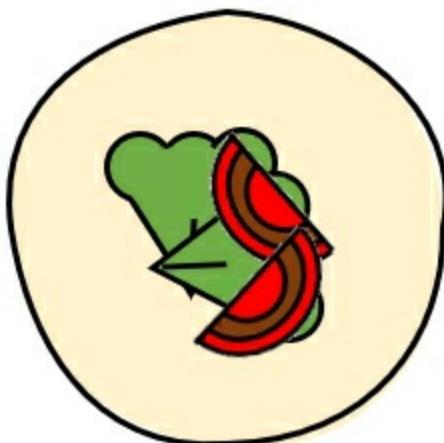


1. Describe the context - Start by describing the context to explain the situation.
“I would like to talk to you about the customer demo today.”



2. List the observations - Provide observations with examples and instances, without accusations or finger-pointing.

“The way you answered Bill’s question about when the unit will be functional seemed very abrupt, and I could see he was taken aback. He did not ask any more questions after than, and he normally asks lots.”



3. Express your emotions - Let the person know how you feel about the facts. This creates more awareness of the impact of the facts, without blaming anyone.
“I felt bad for him since he has been a vocal supporter of the project and does not understand all the technical work remaining.”



4. Sort by value - explain our needs because the receiver may not realize what is important to us.

“It is important that we keep the business representatives on our side; they help us secure funding

and remove roadblocks.”



5. End with suggestions - Allow the person to determine what needs to be done to close the gap between needs and facts, and offer a suggestion or two to move things forward.

“When the business asks questions, even uninformed ones, try to show appreciation for their interest and answer them courteously.

When providing feedback, sooner is usually better than later. Solving problems closer to their source prevents other, similar issues from developing. There is also less chance of people forgetting what happened or having different recollections of events.

Continuing the handheld food theme. As we evolve from praise-sandwiches to feedback-wraps we should consider TACOS as an acronym to help remember some important attributes of effective feedback.

T – Timely. Provide feedback as close to the event occurring as possible. Don’t save it up for a quarterly or annual review.

A – Appropriate. Some acts that deserve praise or negative feedback are minor and should be treated that way. Others more significant that might warrant extra ceremony or rigor. Don’t use a one size fits all approach.

C – Context. Explain the context and how plus why the issue/event/act was important.

O – Observations. Describe the facts and impacts without blaming or finger-pointing.

S – Suggestions. Recommend some options for moving forward, so people see solutions not just problems.

Get Agreement on the Outcome

After delivering feedback with suggestions, be sure to state what the expected actions are. We must have an agreement before the discussion can be closed. This does not necessarily mean that we are always right, and the team member must change – sometimes we may not have had all the facts, and some compromises are needed. However, do not downplay the performance expectations if the overall project performance is suffering. Then follow up on an action plan to ensure the feedback has been applied.



Providing feedback to remote team members is even more difficult because we miss some of the ability to emphasize an appropriate tone, see how people react and intervene if things start to go astray. Unfortunately, this means remote team members often receive less frequent feedback, so it is more likely to be old and stale.

Kevin Eikenberry and Wayne Turmel, authors of “The Long-Distance Leader” have the following tips for remote coaching and feedback.

- Communicating through technology creates mental and social obstacles that do not exist face-to-face. Assume positive intent from people, but be prepared to be wrong.
- Make sure job expectations are crystal clear.
- Use your webcam to communicate visual and non-verbal cues
- Check-in, don’t check-up. Schedule regular events for support and direction setting.

Project Feedback

In addition to people-based feedback, teams should always be looking for feedback on their evolving product and process. Frequent verification and validation reduces the amount of scrap and rework necessary. Defects, errors and omissions should be found as close to their source of introduction as possible. This reduces the impact of building on top of faulty work.

Projects achieve this regular feedback through testing and other quality assurance processes. Inspections and reviews are also valuable. Phase gate reviews are often accompanied by assessments to test fitness for the project to move to the next phase. This may include meeting proof-of-concept criteria, a certain amount of scope completion, or a comparison against a baselined metric.



Agile projects typically have a product demonstration at the end of every iteration. The Sprint or iteration demo shows new work to sponsor, business and customer representatives. People discuss their impressions, clarify any questions, and hear a brief review of what is planned next. Getting regular feedback from these stakeholders is invaluable for navigating high-change environments.

The same ideas apply to the processes teams use. Frequent inspection, discussion and experimentation can improve how we work together and interact with other groups and stakeholders. Agile retrospectives are also held at the end of every sprint/iteration and gather feedback and insights on the processes being used.

After discussing possible changes or experiments for teams to run for an iteration or two, the

team decides which ideas they want to take forward. The ongoing inspection, feedback and adaptation of process allows teams to adapt and improve. It is also an empowering way of working – knowing if something is not right, the team is trusted to improve it.



While retrospectives are built into agile approaches, there is nothing to stop hybrid and traditional teams from adding retrospectives or review-meetings to their planned work. There may not be the same freedom to change process. Some environments are regulated for safety or compliance reasons, but getting together and reviewing what can be improved is usually a valuable and appreciated use of people's time if the constraints are explained.

Performance Tracking Tools

Switching from tracking team member performance to tracking project performance opens the topic of metrics and reporting further. For the PMP exam, practitioners are expected to understand and apply various commonly used project reporting techniques.

We will list the basics and provide links for further information. You should know how to create and interpret them all.

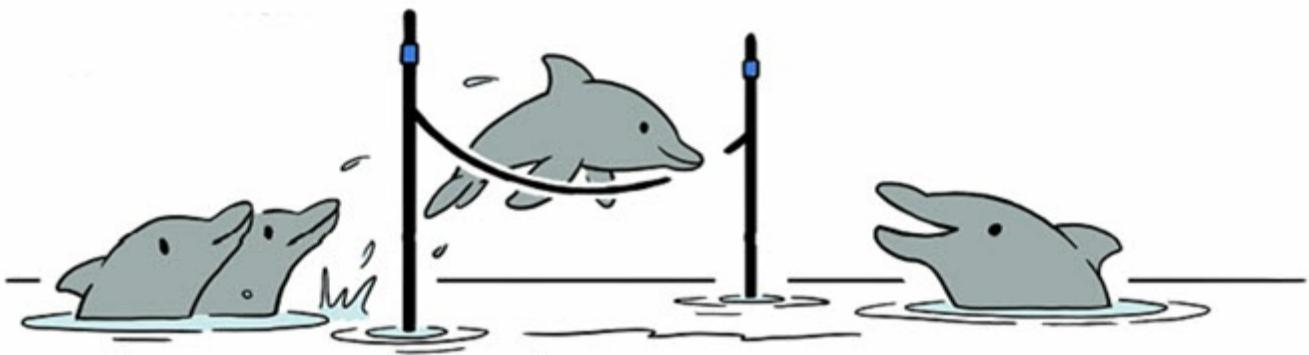
Commonly used Agile Metrics

- Throughput metrics
- Cycle time
- Burndown charts
- Burnup charts
- Information radiators
- Taskboards
- OKRs
- GQM
- NPS

Traditional project metrics

- Dashboards
- Work performance reports
- Variance analysis reports
- Quality reports
- Earned Value Management Reports
- Gantt Charts

1.3.4 Verify performance improvements



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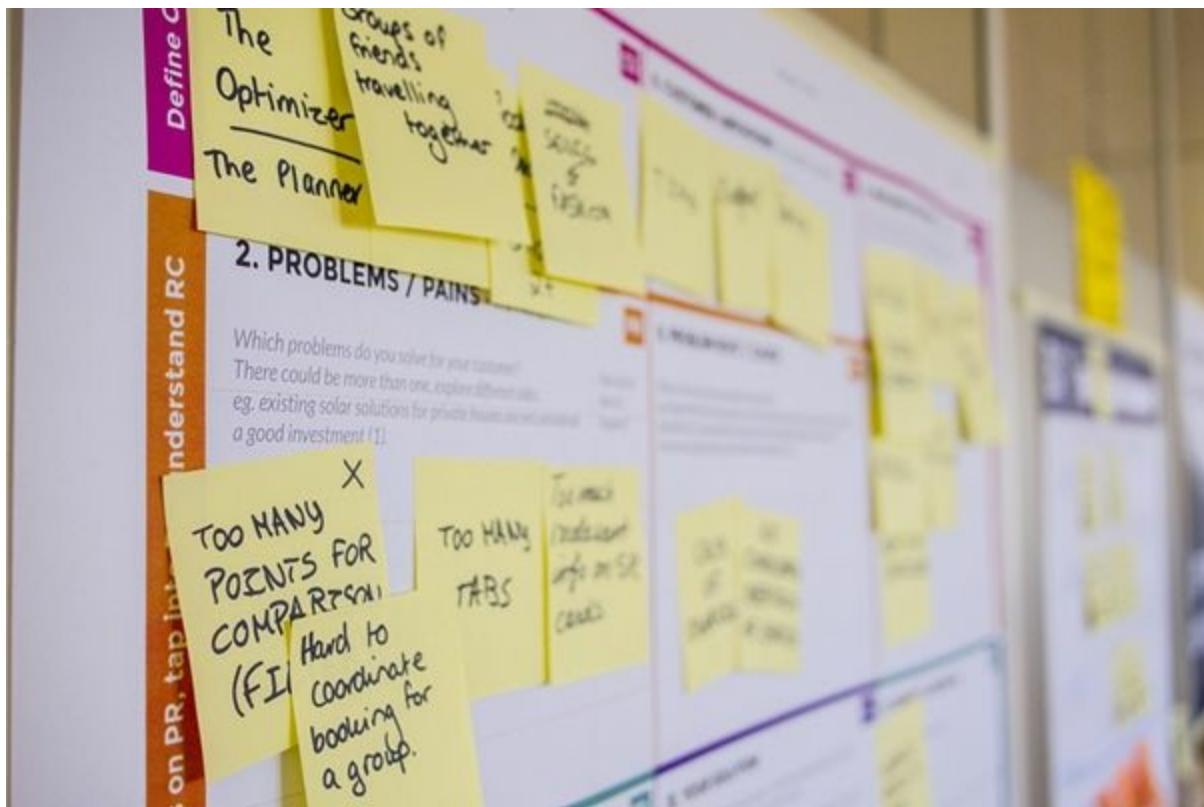
(Check how things are coming along)

It is all very well setting the stage for high performance and reporting on performance, but we also need to follow through and make sure we are producing and improving. Fortunately, well-designed metrics such as Objectives and Key Results (OKR) and Goal Question Metrics (GQM) allow us to check.

Performance reviews, retrospectives and frequent project reporting provide plenty of opportunities to check how things are coming along. We can design OKRs and GQMs to incorporate the “20% decrease in cycle time”, or the “15% increase in field test satisfaction” we need to verify improvements. It’s then a case of reporting on progress against these targets.

Trust but verify

Setting goals is admirable, but people get busy, issues arise, and targets can quickly get forgotten. So, even though we trust people, it is necessary to follow up. Making metrics visible is a great way to keep them in people’s minds. We can use the Hawthorne Effect to our advantage and create big visible charts of metrics we care about.



1.7 Remove Impediments for the Team



Impediments, also known as obstacles and blockers, are anything that is blocking the team from making progress, or is significantly slowing them down.

Impediments can be physical in nature, such as waiting for a part or materials. They can also be dependency-related, such as waiting for an approval or work to be completed by another group. Finally, they can be skill-related such as no one on the team having the required competency to complete tasks efficiently.



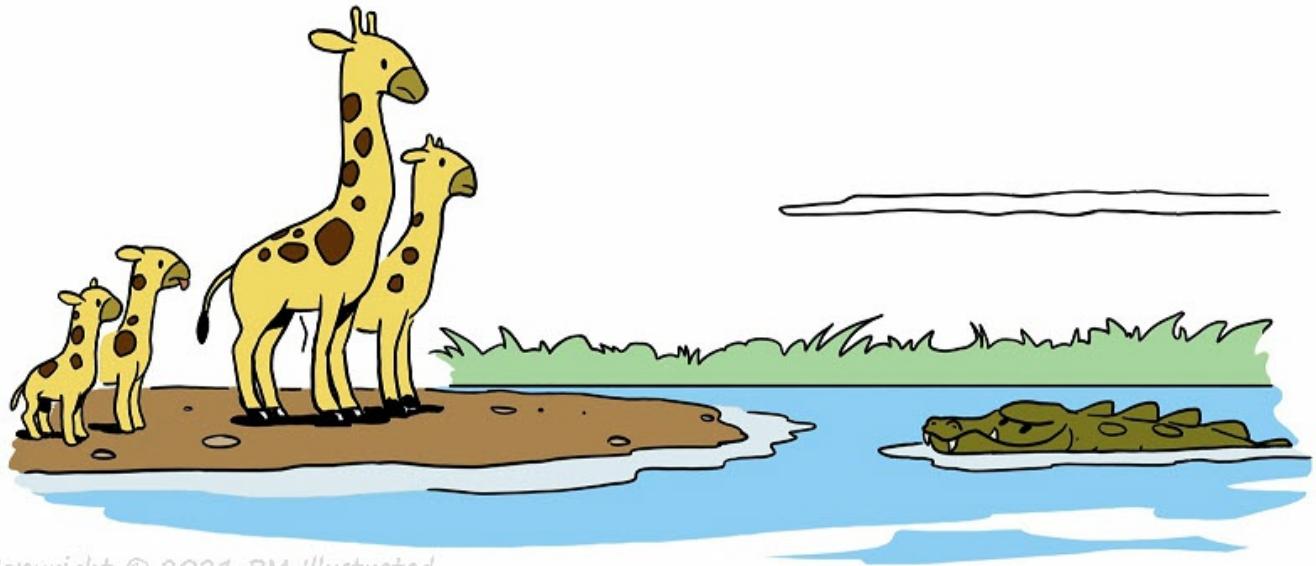
Scrum master or PM is not a Team Mom

There is a misconception that Scrum masters need to rush to remove all team impediments as soon as possible. However, this behavior goes against fostering team empowerment, autonomy and growth. The Scrum master or project manager is not a team mom – always rushing to help or do any unpleasant tasks.

Instead, servant leaders empower teams to remove their own impediments as much as possible. They also help with eliminating impediments teams cannot resolve themselves. It is similar to the quote, “Give a man a fish, and you feed him for a day. Teach a man to fish, and you feed him for a lifetime.” To optimize value delivery, we want to be building capabilities in teams. This may mean doing the work the first time if they really are stuck, but encouraging teams to do it themselves next time.

1.7.1 Identify Critical Impediments

(Full ECO Title: Determine critical impediments, obstacles, and blockers for the team.)



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(Learn to identify impediments)

Impediments large and small may lurk in many places. Once we get accustomed to looking for them, we begin to see them everywhere. The trick is knowing which to address now, and which can be tackled later. Some are very significant and act like boat anchors, pulling us down. Others are more like barnacles, individually small but significant when they accumulate.

First, we find the impediments, then, with help from the team, determine which are most critical to address.

Finding Impediments

Impediments, obstacles and blockers can be identified through a variety of activities.



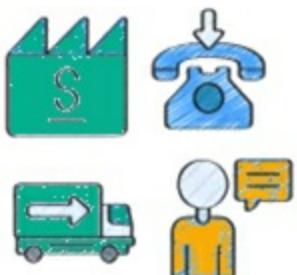
Daily standup – Agile teams often answer three questions during standup. 1) What they have been working on. 2) What they plan to work on next. 3) Are there any blockers or impediments preventing them from working or slowing progress. This third question is an open invitation to report impediments, and good team members look for ways to help. Scrum masters need to pay attention to these items to assist if other team members cannot solve them.

Answers to question 1 at the daily standup might also reveal impediments. If someone is on day three of a task estimated for one day, maybe they are blocked by something? Consider following up after standup if you think it is more than just work taking longer than anticipated.



Observation – Are team members struggling? Does anyone seem extra frustrated, agitated or upset? Perhaps they are blocked by something? Changes in behavior or failure to complete tasks might be signs of impediments. The skill in diagnosing lies in knowing when to enquire and when to hold-back and just make a mental note of the potential problem.

Micro-management is a powerful demotivator, so we do not want to intervene unnecessarily, but so is neglect when people need help! Common-sense and experience working with our team members help us identify when something is merely a temporary setback or when people are experiencing a significant problem.



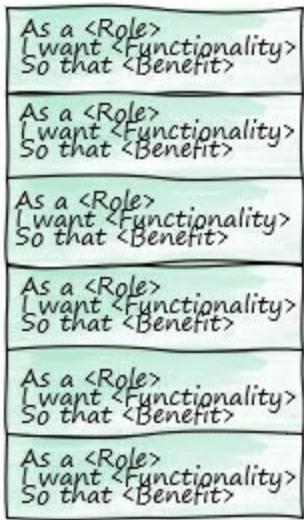
Value Stream Analysis – Value Stream Analysis is a method for analyzing a system's current state and designing a better, future state. It examines the steps to take a product or service from the beginning of a specific process until it reaches the customer or consumer. We can use value stream analysis to find queues, delays and flow problems with our own development process.

One recommended practice of lowering the work in progress (WIP) is likened to lowering the river's water level. It exposes the rocks and obstacles to flow. Once exposed, we can work on removing these obstacles. Reducing WIP can be achieved using Kanban boards with WIP limits on activities to control how many tasks can enter that activity.



Feedback – Customer observations, product demonstrations, review meetings and retrospectives all provide feedback. This feedback might provide insights into impediments, issues, or blockers to be resolved. Retrospectives focus on resolving issues and designing experiments for trialing new ideas. Typically, much of what people are reporting as

issues are constraints or impediments.



Backlog Assessment – Impediments might be expressed as dependencies in the backlog. If the work associated with “Filming the TV commercial” is dependent on the “Approval of the marketing budget,” then maybe that marketing budget approval will soon become an impediment impacting progress. Perhaps we can reduce that risk by giving it plenty of lead time and trying to get approvals early?

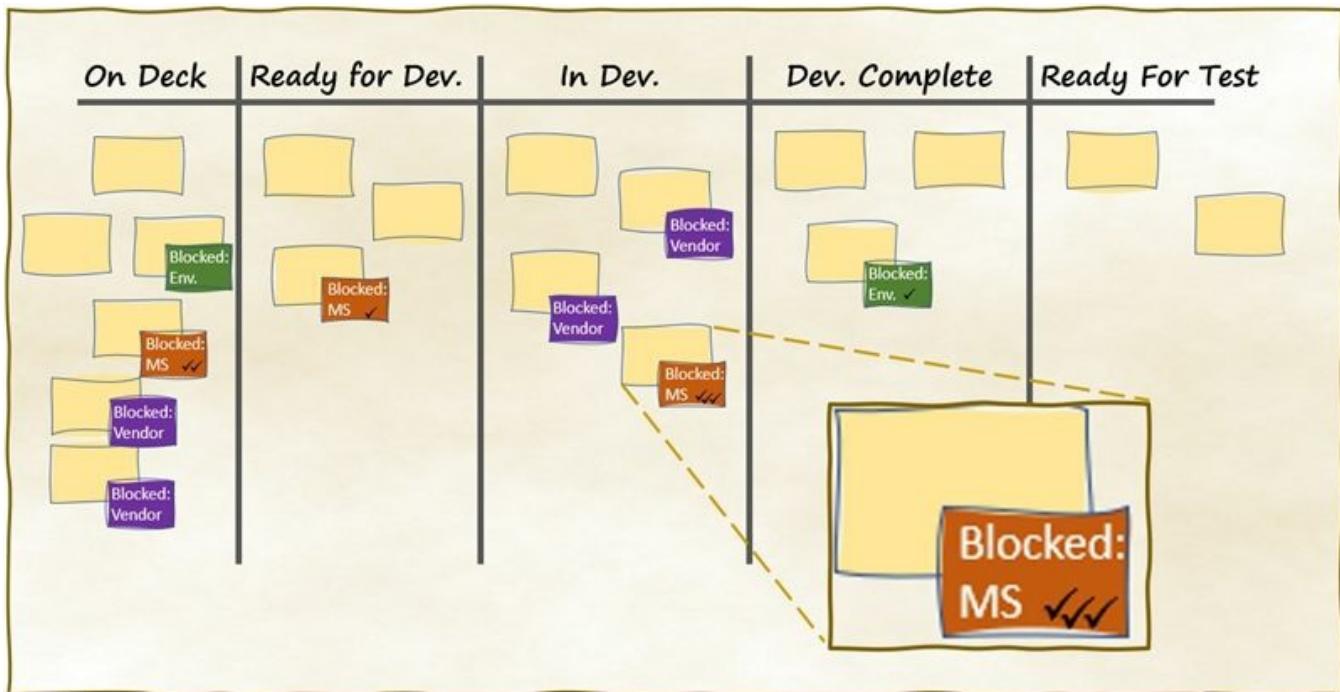


Review Risks – Obstacles or impediments might be caused by previously identified risks occurring and becoming issues. We should also remember to keep our risk lists updated. When impediments are detected, maybe they could crop up again or somewhere else? Make sure we feed the source of the impediments we encounter into our risk management process so similar threats can be managed appropriately.



Task Age Analysis – Using Kanban boards or work tracking applications, look for old or stuck work items. These are items that have not changed state for a while, indicating they might be stuck and blocked by something. Lean systems that track when work enters the system, when it changes state (from, say, design to build and when items are ready for review) create a wealth of data that can help find blocked work.

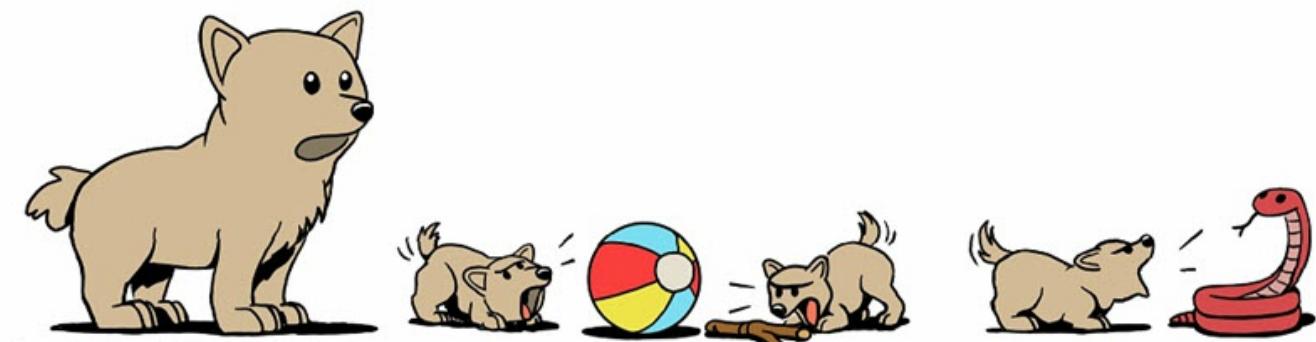
Even if not using software applications to track work age, simply adding a tick mark to items on the taskboard every day at the standup meeting will quickly identify old or stuck items. Any that have been stuck for longer than their estimated work time are likely blocked by something (or we have too much WIP)



In the image above, a team uses colored sticky notes to flag blocked items on the taskboard. In this instance the different colors represent different sources of delay. “MS” indicates the Microservices group, a different team. The team is also adding a tick mark every day at standup to show how long items have been blocked for.

1.7.2 Prioritize Impediments

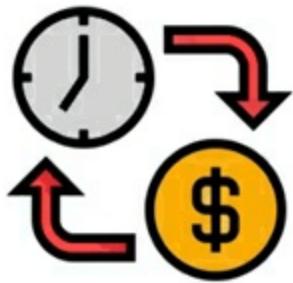
(Full ECO Title: Prioritize critical impediments, obstacles, and blockers for the team.)



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(Determine which impediments are the most critical)

Once we start looking for impediments, we will see them everywhere. Some will be minor without much of an impact; some could be very significant. We need a way to prioritize impediments, so we know which to focus our time and effort on.



Examine the Cost of Delay – Assigning financial values to impediments allows for an apples-to-apples comparison of the impacts. Most impediments contain a time component that explains for every day this item is blocked, it costs the project or organization \$x.

We should remember organization costs are likely much higher than team burn rates. Projects are often undertaken to create a return on investment via a product or service or satisfy a legal or regulatory requirement. The full cost of a delay might be a small project cost plus a large organizational cost because a competitor product gained traction, or our organization was found in non-compliance. [For more on cost-of-delay see here.](#)



Ask the Business – Just as we engage the business in defining scope, and for agile projects, prioritizing the backlog, it might be appropriate to discuss the relative priorities of impediment removal. I am not suggesting taking every small team issue to the business; they have their own problems and will likely wonder why they hired a project manager if they have to solve everything.

Instead, for impediments that have a business outcome impact, it might be worth getting their view on the priority. Maybe they are fully aware that “Joe in Accounting is slow at providing information” and have plans in hand to address it. Perhaps “Customer A is not as strategic as customer B,” and they would prefer us to remove a different impediment first. So, for business-impacting impediments, get their input on the real priority.



Ask the Team – Since most impediments are raised by team members, we should ask them which are the most critical to be solved. Maybe the issue is only temporary, and while “waiting for legal review has taken an extra week,” it is a one-off, and a more significant concern is the “shortage of testing capacity.” Teams are usually closer to the execution

of work than project managers are, so we should engage team members in determining the priority of blockers to be removed.



Impediments and problems should be discussed at the retrospectives that occur at the end of every sprint/iteration. At the retrospective, it is normal to ask the team which issues they want to tackle in the next sprint or iteration. Not all problems can be solved, and not all impediments impact the team equally. We should take an economic view of decision making and decide where best to prioritize our limited time and effort. It is usual for teams to use dot-voting or other group decision-making approaches to vote on which impediments to prioritize.

Asking the team, “if you each get three votes to distribute across these impediments, where would you like to see us focus?” is one way to engage the team in prioritizing which obstacles they would like to have removed.

1.7.3 Resolve and Remove Impediments

Use your skills and network to implement solutions to remove impediments, obstacles, and blockers for the team.



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(As a team effort, put out the fires)

Now we have found the impediments and gained insights into their significance and priority, it is time we set about solving or at least reducing them. Remember, the project manager or Scrum master is not the team mom. Where possible, we want to encourage and empower the team members to remove their own impediments.

To help get team members used to solving their own impediments, we could ask the team how they might solve an issue. If their solution is legal, morally responsible and not against company policy, we could ask if anyone thinks they could do it? If we get a volunteer, empower them to do it and follow up on the result. Praise any success in public, and review any failures privately. Building team capabilities is a core role of a servant leader.



Go See - Assuming the team was not able to fix the issue, it is now up to us as a servant leader to try and remove the roadblock. The first step is to go and make sure we truly understand the issue.

The lean approach “Gemba walk” means “Go see” or, more fully, “Go see, ask why, show respect.” It is an excellent reminder for us to, when required, go to the real place of the impediment and experience it. Only then will we fully understand what is happening, and we might realize we did not fully appreciate it initially.

Also, the act of paying attention and taking the time to care about team member issues can help people come to terms with them. Once we see how slow a machine is, how poor a vendor’s customer service is, people feel heard and are no longer suffering alone. It does not solve the problem, but the first step in resolution is often admitting there is a problem.



Remove Obstacles – Now we have been to see the problem; hopefully, we understand it better. The next step is to try and resolve it. Many problems are people problems. Perhaps accounting is difficult to deal with because nobody gives them any notice of all these unplanned project requests. Use empathy and emotional intelligence to diagnose the problem and offer to do what you can to help resolve it. Often when people see you are interested in their perspective and willing to try and help solve a problem, they will meet you halfway.

Some impediments are physical, maybe Joe’s knob-coupler machine truly is bent, and he needs a new one. Perhaps an extra forklift driver or faster production server is worth the expenditure given the full cost of delay. Maybe the problem is our process, and two levels of approval is overkill for business requested features.

Any process changes need appropriate approval. If we are operating in a safety-critical environment such as handling nuclear waste or air traffic control, there will likely be rigorous processes in place. In most organizations, leadership will be glad people are taking the initiative, solving problems and optimizing value delivery.



Escalate – Some things will be outside a circle of influence and will require escalation. If your organization has a project management office (PMO) this is a great place to start. They may know who to talk to, they may know of other projects that have solved the same or similar problems.

Likewise, if your project is part of a large program, maybe the program manager can help. If the project reports into a steering committee or sponsor group, these may be appropriate escalation points. The executives and senior people in these roles usually achieved them by getting stuff done. They typically possess the seniority and influence required to remove obstacles that team leads, and project managers cannot.

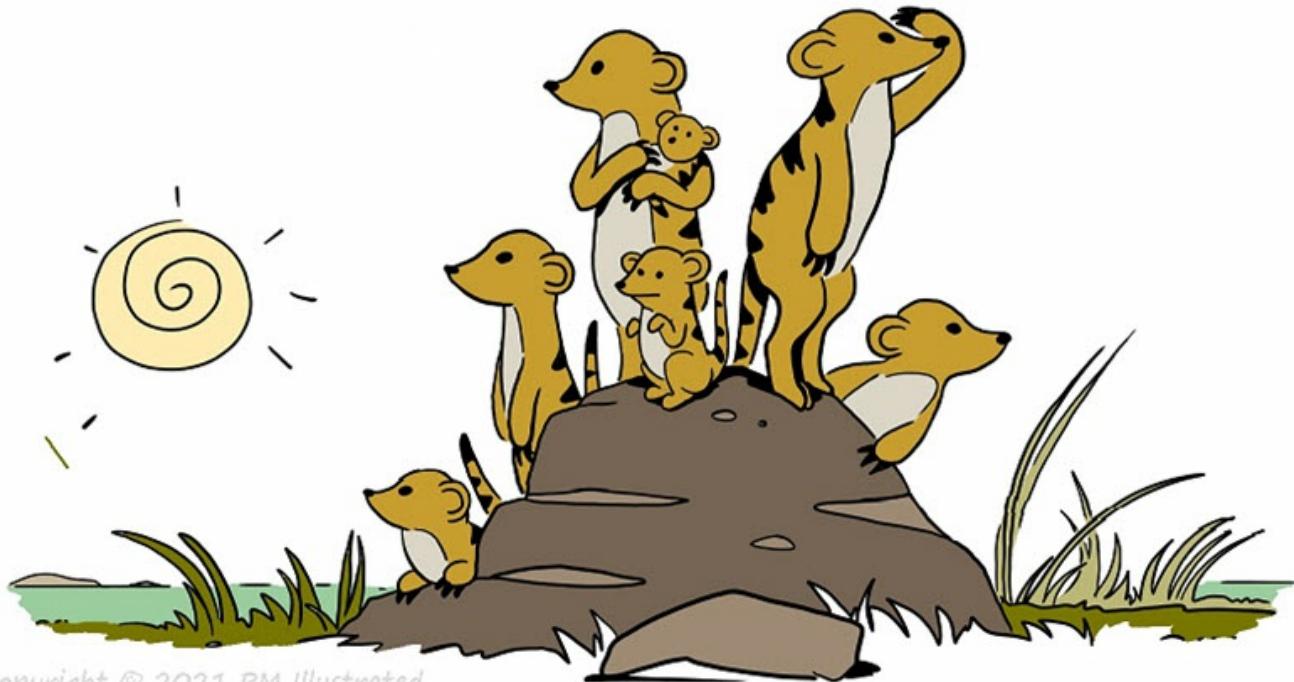
We cannot take every little complaint to the executive, since they will also wonder why they have employed a project manager. However, for blockers you cannot budge, they might be the best solution.



In agile environments, the Product Owner often has influence beyond the circle of the team and Scrum master. They typically have legitimate business knowledge and connections. Hearing a request from someone in the business, rather than from, say, the IT group, can often get the desired result.

1.7.4 Continually Ensure Impediments are Being Addressed

Re-assess continually to ensure impediments, obstacles, and blockers for the team are being addressed.



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(Remain vigilant and reduce impedance sources)

Minimizing the impacts of impediments is the critical first step. Then, once we have put out the worst of the fires, we need to be on the lookout for the next potential flare-up.



Verify the impedance is minimized. Ideally, we want to avoid or eliminate roadblocks, but sometimes the best we can do is get through as quickly as possible with the fewest casualties. As with anything unpleasant, it is tempting to hope or assume it is all past and behind us. However, we should investigate and verify.

Check back with whoever reported the impedance and see if it is fixed, better or manageable. Maybe things need a second go around. Do not assume the problem has gone away.



Visualize Impediments. Tracking impediments via big visible graphs, flip charts or visited websites helps us from forgetting them. The task board with blocked items

and days-stuck we examined earlier is an example of an information radiator, a big visible chart to keep important information visible to stakeholders. Other examples include a backlog of blockers, a Top-5 Impediments chart, a Help-Wanted, or Solution Bounty posters.

Do not be afraid to show the things keeping your team back. Obviously, do not include personnel-related impediments, but for technical and some process problems, transparency is beneficial. You might be surprised who comes up with a valuable solution. The best leaders “learn-out-loud,” meaning they admit what they do not know, ask for help and are gracious enough to appreciate solutions from anyone trying to assist.

Having impediments visible also helps review them with the team. At a retrospective, it is easier to point to the impediments board and ask if anyone has any new ideas to try or impediments to add rather than go through the whole process of creating the list from scratch each time.



Shield Team from interruptions and sources of impediments. We can reduce the number of potential delays by shielding the team from unnecessary interruption.

Maybe a team member is busy supporting an old product because someone thought they would be the best person to do it. Maybe they are the quickest person to fix it, but by not considering the full cost of delay, maybe they are not the best person to fix it.

Removing distractions allows the team to focus on the project goal. Building a strong project vision with clear objectives removes confusion and enables the project team to be more effective and efficient. By clearing the team's path, they can do their best work on the project to achieve its desired objectives.

One way to do this is to act as a single point of contact (SPOC) externally for the team. By asking that requests come through us, we can shield their team from superfluous requests and forward along the genuine ones. This allows team members to focus on other work and maintain some concentrate and flow.



Monitor impediments and progress – Check the impediment backlog, task age, blocked stories, etc. Check-in with the team, ask how things are going. Listen

for what people say and do not say. Ask if you can help with anything.

Ask opened questions at reviews and retrospectives such as, “if you had a magic wand to help us go faster, what would you wish for?”, or “Where do we need the most help.” These questions might help identify the next set of impediments.

Do more rounds of value stream mapping. Learn what our process efficiency is (ratio of value-adding activities compared to value-adding + non-value adding activities.) Ask how we can remove waste, queues and work in progress.

Do not become complacent. The theory of constraints teaches us that when we eliminate one constraint, we expose the next constraint. We are never done in the process of removing impediments and improving the flow of value.



Finding and monitoring impediments for remote team members is even more difficult. The “out of sight, out of mind” adage is true. We are often blind to the problems workers face that we do not see or experience ourselves. The remote leadership advice of “Check-in, don’t check-up” can help us. Rather than focusing on the work at play, ask how they are doing, how the process is working for them, if they need support anywhere? These types of questions, instead of “is it done yet?” type ones, are more likely to surface impediments.

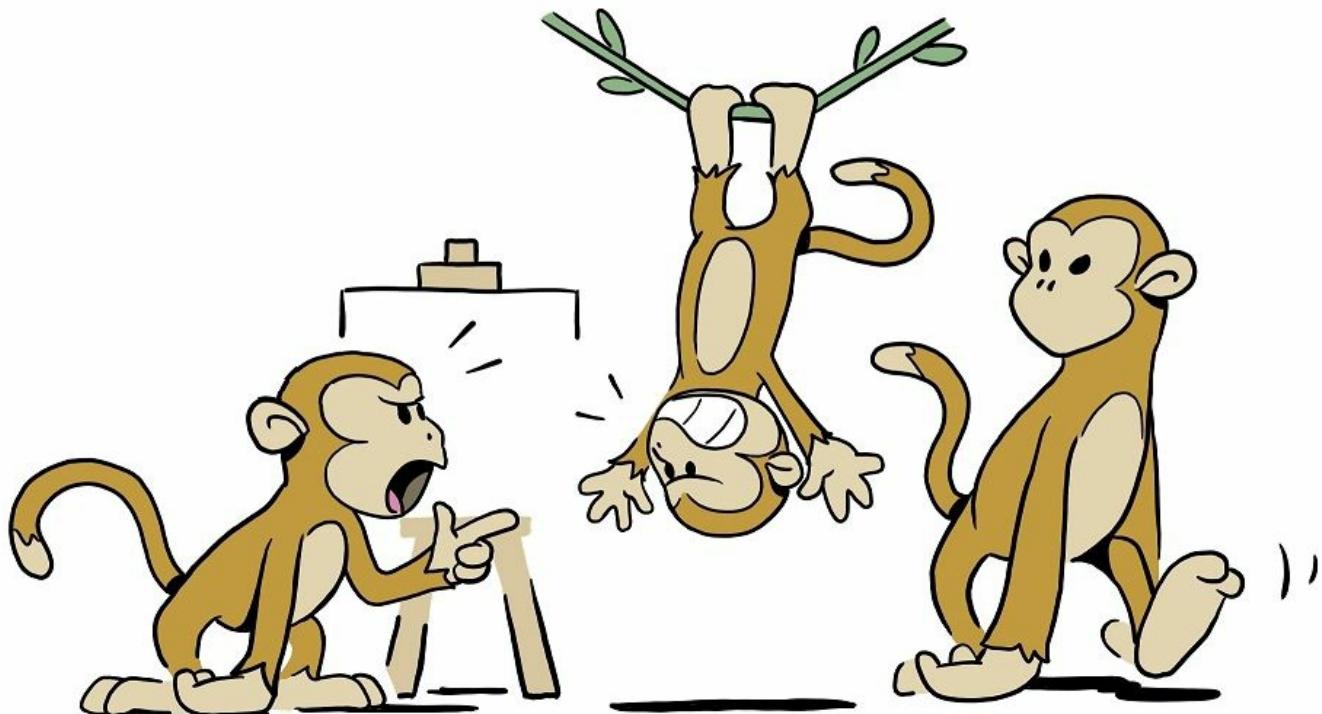
1.1 Manage Conflict

Accept that Conflicts are Inevitable

Whenever we bring people together to solve problems and build products or services, we will encounter differences of opinion and conflict. Some forms of debate and arguing are productive. For instance, debating options and the best way forward can lead to better decisions and more robust solutions.

However, when arguments escalate beyond the facts at hand to become personal or impact team performance, they need to be addressed. A critical skill project managers need to develop is diagnosing the difference between the healthy debate of options or ideas and damaging arguing.

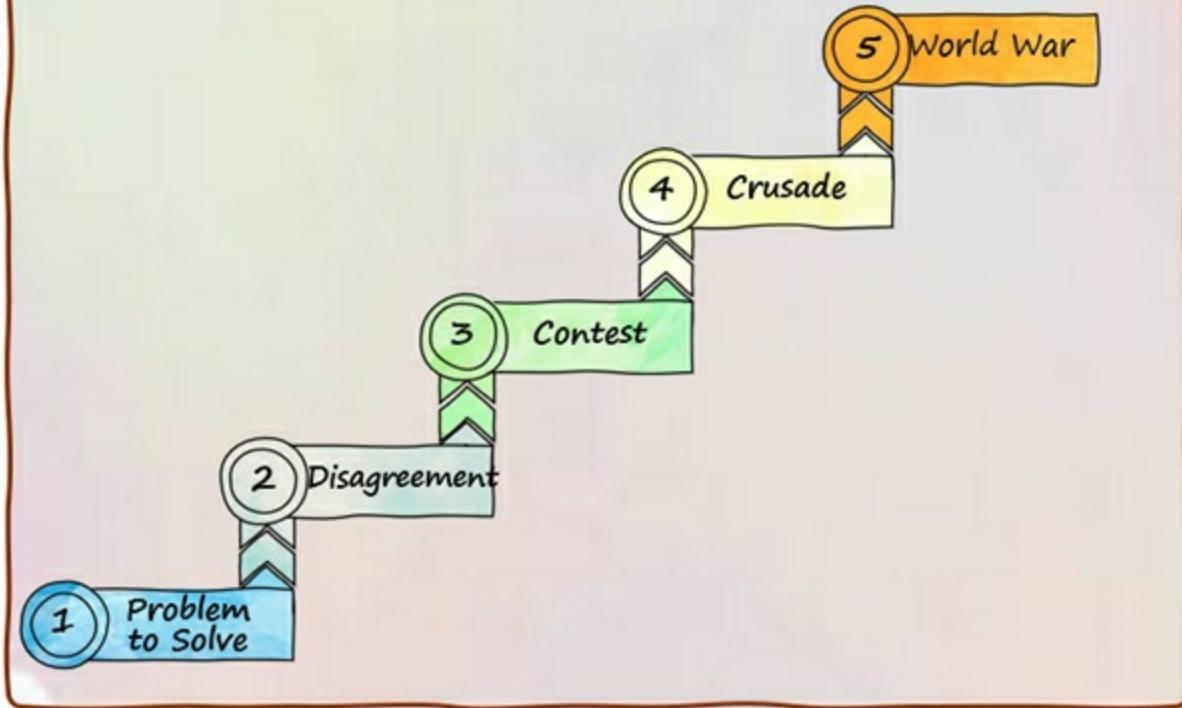
1.1.1 Interpret the Source and the Stage of the Conflict



(Be on the look-out for team conflict)

One tool for diagnosing the severity of conflict is the “Five Levels of Conflict” model developed by Speed Leas. It shows a progression from a simple problem to solve all the way to people or groups declaring war on one another.

5 LEVELS OF CONFLICT



Listening to the language and phrases the team uses and comparing it to descriptions of the five levels can help determine the stage of a conflict.

- **Level 1 (Problem to Solve)** - The language is friendly and mostly constructive. People back up with statements with facts. E.G. "Oh, I see what you are saying now. I still prefer the other approach, but I understand your suggestion."
- **Level 2 (Disagreement)** - People start to include self-protection. E.G. "I know you think my idea won't work, but we tried your suggestion last time, and there were a lot of problems."
- **Level 3 (Contest)** - The language becomes distorted with over-generalizations and magnified positions. E.G. "If only he wasn't on the team...", "She always takes over the demo."
- **Level 4 (Crusade)** -The conflict becomes more ideological and divided. E.G. "They're just plain stupid" and "It's not worth talking to them."
- **Level 5 (World War)** - The language is altogether combative, or the opposing people do not speak directly to each other. Only talking to those "on their side" and saying things such as, "It is us or them" and "We've got to beat them!"

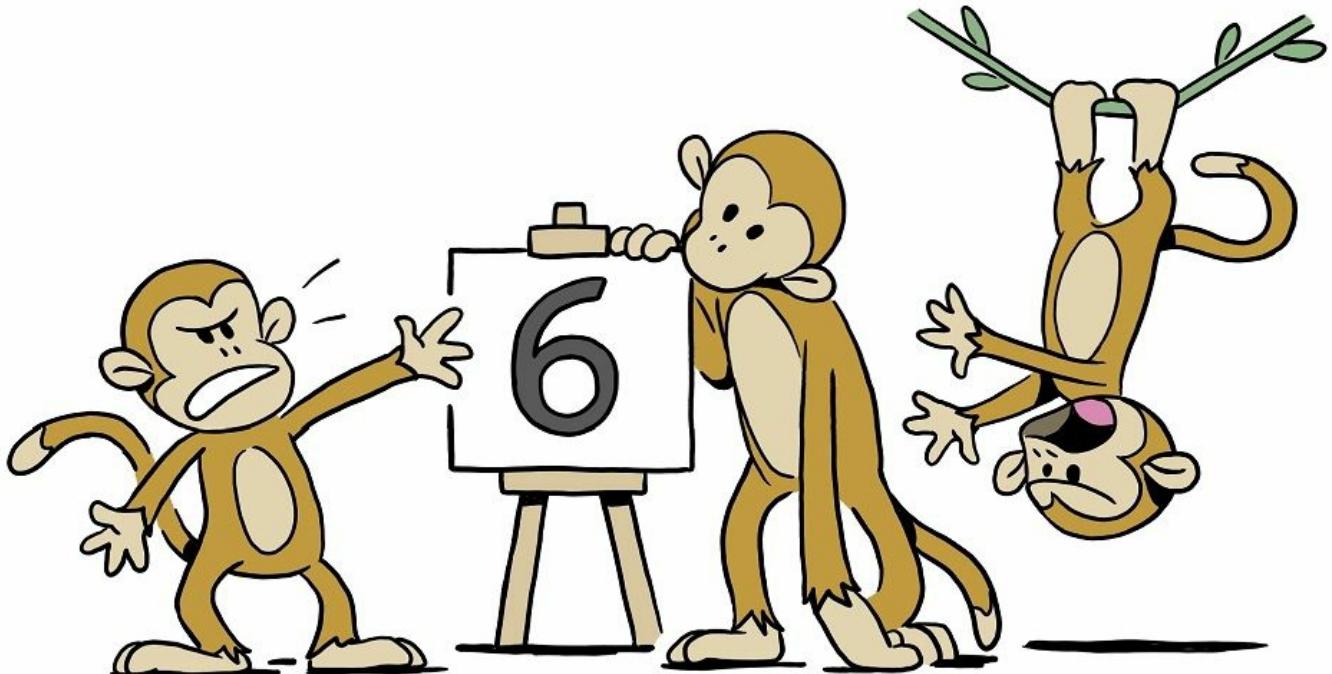
So, while conflict can escalate to toxic levels, it is crucial to understand why it can also be constructive. Teams need to feel safe debating ideas and disagreeing with suggestions in order to build commitment for outcomes. Without passionate debate, which includes good-natured conflict, team members rarely buy-in and commit to decisions.

This lack of commitment, based on a fear of conflict, then leads to an avoidance of accountability as people hesitate to call out their peers. These factors are documented in Patrick Lencioni's "Five Dysfunctions of a Team" model.



Healthy conflict is necessary for building commitment to decisions; it allows for the robust testing of ideas. This leads to a stronger commitment to the final group decision. This is why many high-performing teams seem to be continuously engaged in good-natured argument. They are trying to understand all the options, testing ideas for flaws, and consensus-building. These types of conflict are productive and desirable.

1.1.2 Analyze the Context for the Conflict



(Determine the severity of the conflict)

Analyzing the context and the words used in arguments is an excellent way to understand the level of conflict.

Healthy	Unhealthy
Testing alternatives "What if we tried..."	Generalizations "You always..."
Asking for more details "Can we see the..."	Hostility "That's garbage, we never..."
Fact-checking "Are you sure all the tests passed?"	Personal attacks "You are so full of..."
Confirming understanding 'So, help me understand, the..."	Disputing concepts without providing room for the other's point of view.

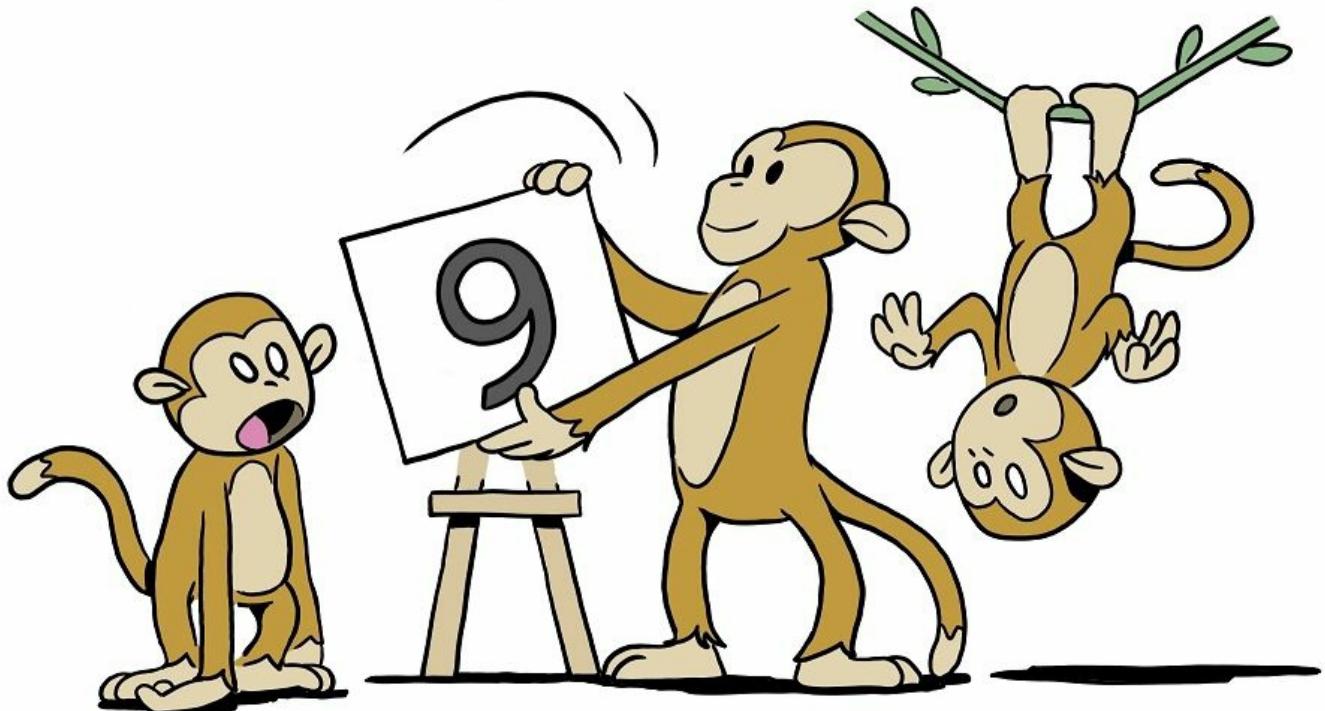
Healthy arguments are focused on the data, the facts, and ideas under discussion. Unhealthy arguments often make things personal or use generalizations to dismiss inputs from the other party. When we hear these unhealthy arguments, it is time to try and deescalate the conflict. The strategy for doing this depends on how severe it has become.

Based on the 5 levels concept, the following model suggests some de-escalation responses based on conflict level.



Using this model, if we hear examples of, say, “Level 3: Contest” type conflict, we could try negotiating and getting to the facts. This tries to take it from personal to factual.

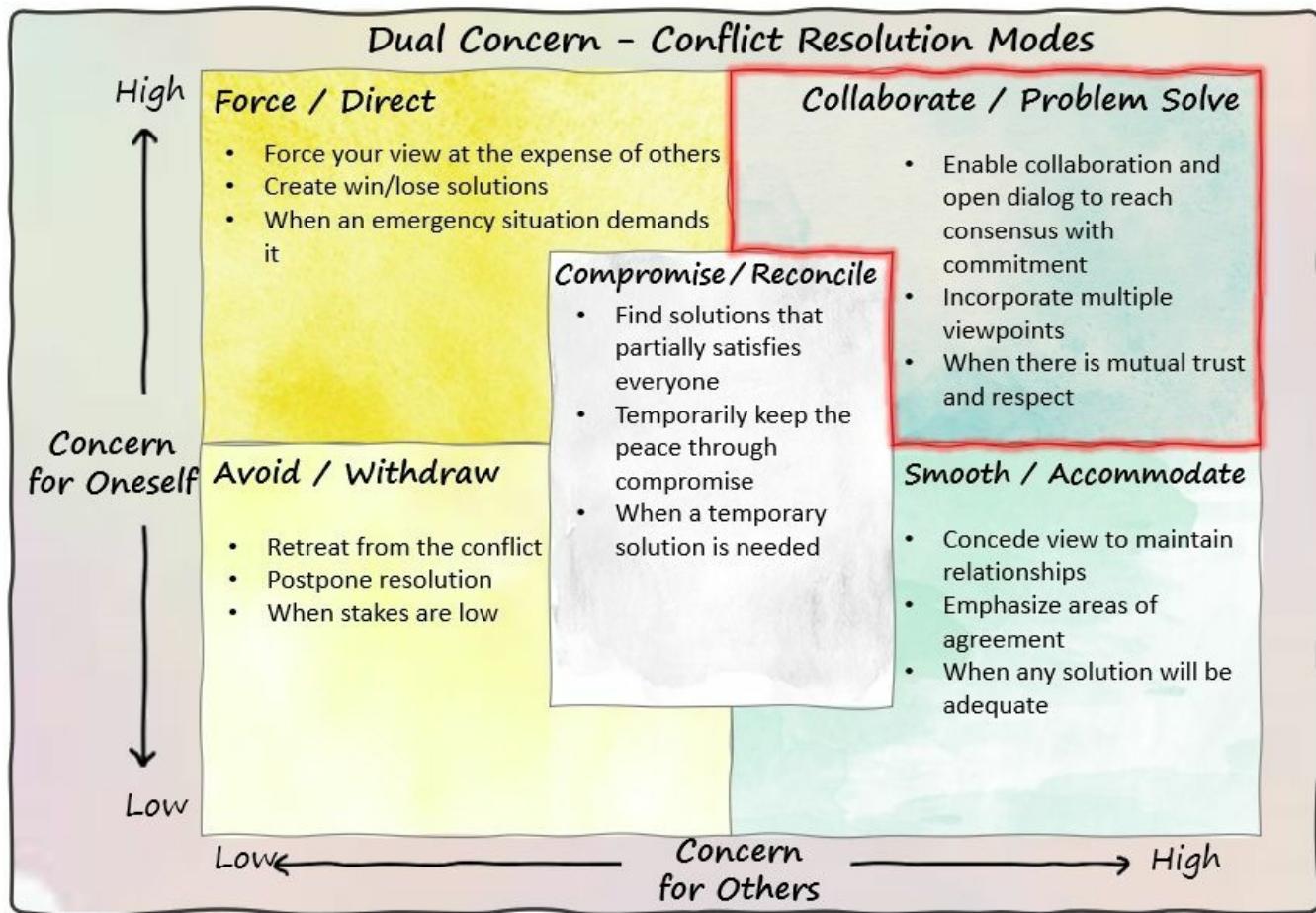
1.1.3 Evaluate / Recommend / Reconcile the Appropriate Conflict Resolution Solution



(Try to resolve the conflict)

When it comes to resolving conflict, a practical model is the Dual-Concern Grid by Langton

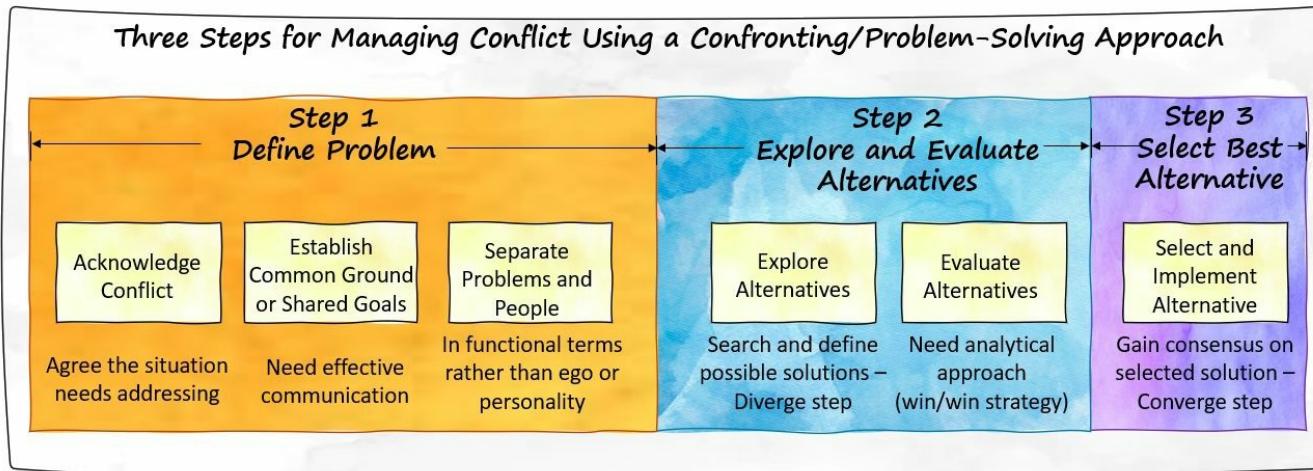
and Sadri. It describes conflict resolution options plotted on an axis that shows Concern for Others (X-axis) and Concern for Ourselves (Y-axis).



There are several ways we can try to resolve conflict. We could use positional power and tell people to stop arguing (graph Top Left – Force / Direct), but this is temporary and futile since it does not solve the problem. Alternatively, we accommodate people by smoothing the problem and do the work ourselves (graph Bottom Right – Smooth / Accommodate). However, neither of these approaches is ideal.

Instead, we should try to be in the upper right quadrant of high concern for others and high concern for oneself. This is the collaborative area of conflict resolution where we confront the issue and hopefully solve it. This all sounds good in theory, but dealing with people when they are angry or upset is never straightforward.

A good approach to try is the Three Steps for Managing Conflict using a Confronting/Problem Solving Approach that combines several conflict resolution models.



The three-step model, starts with Step 1 “Define the Problem.” This involves acknowledging the conflict, establishing common ground or goals, such as ‘we both want what is best for the customer’ and separating the problem from the people. Next, Step 2 ‘Explore and Evaluate Alternatives’ is a “diverge,” brainstorming phase where many different alternatives are investigated and assessed. Lastly, Step 3 “Select Best Alternative,” is the “converge” step where we decide on the best way forward.

These tools are, at best, direction arrows on a tricky journey. They can help us navigate to a solution, but they do not replace the hard work of actively listening to both sides of the conflict and empathizing with different viewpoints. That takes an investment of patience and empathy. So too does the following steps of encouraging people to let go of personal attachment to ideas or feelings.

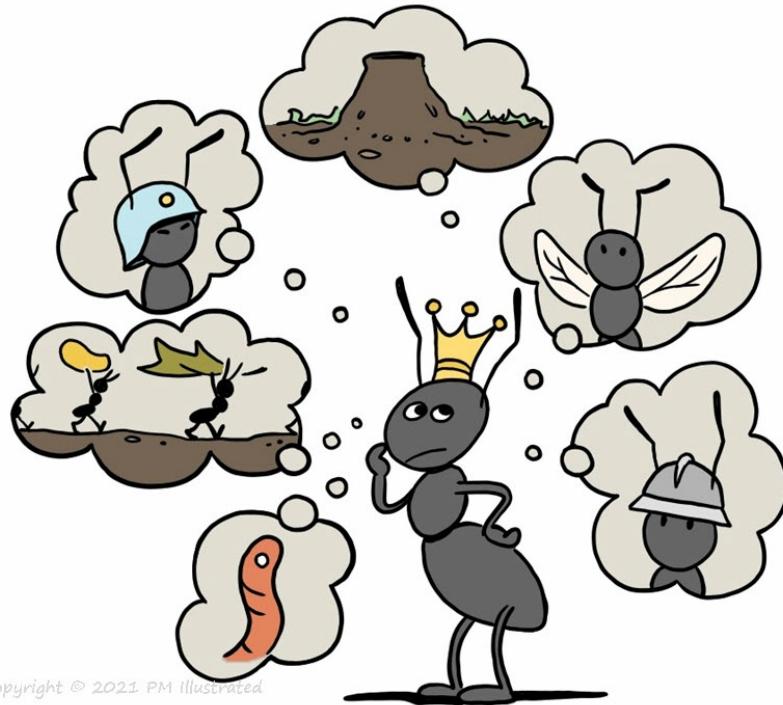
Conflicts are inescapable. At best, they are signs of a vibrant, robust team that is happy to test and improve their ideas and choices. However, if arguments become more personal, they also develop a harmful and counterproductive impact. Team members disengage and distance to protect themselves. Then ideas are not well tested, and blind-spots and problems occur.

The key is to care, to get engaged, listen and try to diagnose the conflicts occurring. Maybe do a reality test by following up individually afterward. Ask, “You and Preeta seemed to be having a heated debate about the design. Did you come to an agreement you are OK with?” Knowing when to let it go and when to step in is half the battle. Using these tools can help and provide some guidance for conflict resolution.

1.9 Collaborate with Stakeholders

1.9.1 Evaluate Engagement Needs

(Full ECO Title: Evaluate the engagement needs for stakeholders)



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(Consider all the group influencing or impacted)

The definition of a stakeholder is expansive. Stakeholders include anyone affected by our project or anyone who can affect it. They can be individuals or groups.

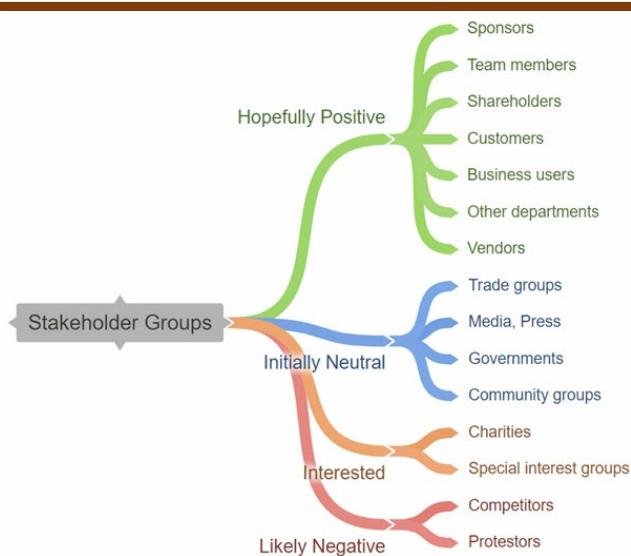
The PMI definition of a stakeholder is “*Any individual, group, or organization that may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio.*”

So, this obviously includes the project sponsors, customers, team roles, and supporting groups. However, it also contains part-time specialist roles, vendors and regulatory bodies. The “perceived to be affected” part of the definition includes competitors, protest groups and even conspiracy theorists. Anyone or any group that is, or believes to be, impacted is a stakeholder.

This might seem extreme, but analysis of project outcomes (especially failed projects) has shown that forgetting or ignoring stakeholders can have severe consequences. So, we need to identify them, understand them and determine how best to collaborate with them.

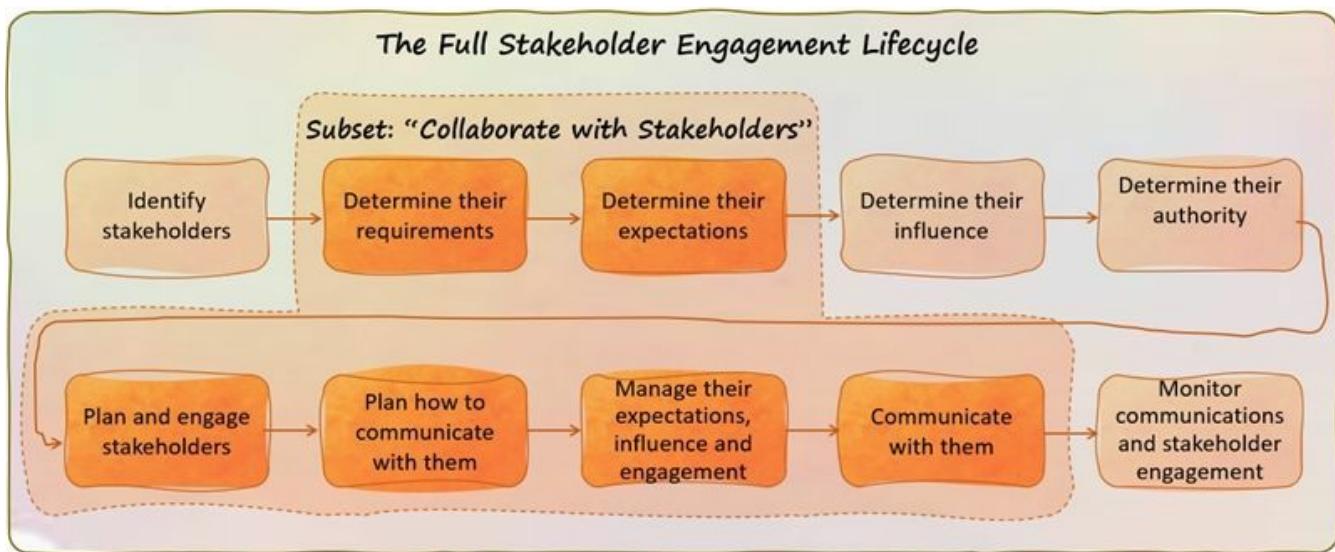
We do not always have to try and satisfy them (remember competitors are stakeholders), and if building a prison, then convicts would also be stakeholders. However, we do need to consider them and have a plan for working with them.

Stakeholders can be supportive, neutral, or negative, and our actions will influence these feelings.



(Stakeholder engagement is usually taught as a complete lifecycle. However, because the PMP® Exam Content Outline separates People related tasks from Process associated tasks, this is one of the topics that has content in two areas.)

See module 2.4 Engage Stakeholders for more on the stakeholder engagement lifecycle. Here, we focus on the subset that deals with collaborating, finding out what they need, and ensuring they get it.



Creating a Stakeholder Register is an activity traditional life cycle projects undertake while initiating the project. It can be completed by creating a document or spreadsheet of all the stakeholders that will be impacted by the project or have the ability to influence it.

Stakeholder Identification

Activities to identify stakeholders include:



The usual suspects – Review each of the common Stakeholder Groups (positive, negative, neutral) categories and list who is impacted or can influence this project.



Ask the team – Take the same questions to the team, ask them to individually, then collectively brainstorm who the project stakeholders are.



Surveys and questionnaires – Ask other stakeholders to tell us who we may have missed. Using surveys and questionnaires, we can canvas relevant stakeholders to their opinions on additional stakeholders or stakeholder groups we should consider.



Document analysis – Look at the other project documentation that might already be available such as the project charter. Anyone or group identified will be a stakeholder. Also, review the risks, assumptions and constraints. Do any point to people or groups we should be considering? Refer to other project documents that share some common characteristics. Review their stakeholder registers, lessons learned, communication plans, risk and issue logs, etc, looking for stakeholders that might be relevant for us.

Stakeholder Register

Stakeholder registers typically contain the following information for each stakeholder or stakeholder group identified:

- Name
- Contact information
- Project role
- Project requirements
- Outcome Expectations
- Impact and influence scores
- Likely attitude about the project
- Stakeholder classification
- Associations

Stakeholder Register

Stakeholder Name	Contact Information	Project Role	Project Requirements	Project Concerns	Impact and Influence Scores
Mary Pulaski	(123) 1234567 mpulaski@hmail.com	Sponsor	Compelling UI, fast and responsive	Delays, cost over runs, poor reacti	●●● ■■■
Libby Kipling	(123) 2345678 lkippling@hmail.com	Project Manager	Completion to scope, schedule, budget & q	Tech viability, Disappointed Sp	●●● ■■□
Jeff Harris	(123) 3456789 jharris@hmail.com	Product Manager	Fully functional app with all high priority	Ready for trade show, slower tha	●●● ■■■
Mitchel O'Keath	(123) 4567890 mokeath@hmail.com	PMO Representative	Alignment with IS strategy, integration	Citizen dev. risks, dependencies on	●○○ ■□□
Sanjiv Patel	(123) 5678901 sapatel@hmail.com	Steering Committee Mbr	Competitive advantage, ROI	Industry reception, costs	●○○ ■■■
Joe Corbitt	(123) 6789012 cuttiepie@hmail.com	Development Team Member	Delight the users, gain team lead exper	Team skills, lack of Xcor experien	●●○ ■□□



Agile projects may not create a formal stakeholder register. Still, they likely have a Who's Who, or contact information document, spreadsheet or Wiki page on the project site to record similar details.

Agile projects often create persona descriptions for essential project stakeholders. These personas describe the stakeholder's characteristics such as typical demographic information, wants, needs, problems to solve and concerns for the project. Persona representations help remind the development team of significant stakeholder requirements and concerns.

1.9.2 Optimize Stakeholder Alignment

(Full ECO Title: Optimize alignment between stakeholder needs, expectations, and project objectives.)



(Ensure stakeholder needs and expectations are aligned with the project objectives)

Once we have a good idea of who the stakeholders are, we can begin to evaluate their needs and plan how best to engage them. Bear in mind new stakeholders may emerge as the project progresses. Like many project management deliverables, the stakeholder register, and any stakeholder engagement plans we create are living documents that will require maintenance throughout the project.

To create a Stakeholder Engagement Plan, we first need to analyze and understand the stakeholder needs.

Stakeholder Analysis

Consider their interests, roles and responsibilities. Assess their potential influence and impact on the project. Stakeholder mapping categorizes stakeholders into groups to be managed in a particular way. Creating a stakeholder map with different categories of stakeholders can help in planning how to prioritize their engagement.

Techniques we can use include:

- The Salience Model – See [1.2 Lead a Team](#)
- Power Interest Grid – See [1.2 Lead a Team](#)
- Categorize Stakeholders – See 2.4 Engage Stakeholders

Engage business to understand needs



Talk to people to understand what they really want and expect from the project.

Often there is a difference between what people initially describe and what they really want. Also, once people see “X,” they often say they need “Y.” So it is vital to explore what they really mean when describing something and check back periodically to see if their needs are still being met.



Hybrid and agile approaches that develop incrementally and hold frequent demonstrations gather a lot of information about business needs. Continuous engagement and validation of business needs reduce the likelihood of receiving rejection or extensive change requests later in the project lifecycle.

Promote dialog with all stakeholders



Encourage all participants to share their thoughts, ideas, and concerns.

Make sure you know who all your customers are. Engage them early and often to keep the dialog going. We want to avoid nasty surprises and disappointments, so keep communicating.

Confirm stakeholder participation



Get agreement on the type and amount of involvement required from the stakeholder for this product/project to be successful.

Discuss what is expected for participation. Agree on how frequently the stakeholder involvement is required, what form it will take, and how the process for evaluating it will operate.

Monitor and adjust stakeholder engagement



Continually check-in with people on how the work is going.

As necessary, change how we are working with stakeholders to better suit the work being done and address identified issues. Look for people who are overloaded with work and creating bottlenecks to the throughput of value delivery. Rebalance workloads if necessary to optimize the flow of value.

Foster group decision making and conflict resolution



Encourage people to make decisions collectively and collaboratively.

Make sure to engage the relevant people and that the process for making decisions taps individual knowledge and the group consensus for the best way forward. Getting ideas for solutions individually first avoids the halo effect (being drawn to a senior person's opinion) and groupthink or social loafing (also called the Ringelmann effect, where people do not try as hard when in a group.) Then as a group, decide on the best options presented.



Team members are important stakeholders. Agile approaches promote collaborative decision making, planning and estimation to gain better insights and generate consensus for the decisions reached.

1.9.3 Use Trust and Influence to Accomplish Objectives

(Full ECO Title: Build trust and influence stakeholders to accomplish project objectives.)



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(Engage stakeholders to accomplish the project objectives)

Building trust is essential for leading any endeavor. As we saw in [1.2 Lead a Team](#), being honest and inspiring are critical for being a competent leader. We need to create a compelling vision, follow-through, do what we commit to, and continuously communicate.

Communication Plans

Communication plans are a core component of consistency, follow-through and maintaining a uniting vision. A communication plan sets out how we will share project information with various stakeholders. It can be a document or table on a website. The main thing is people know where to find it, and it explains how project information will be shared.

Communication Management Plan

Communication Type	Objective of Comm.	Format	Frequency	Audience	Owner	Deliverables
Kick-Off Meeting	Introduce the project, manage expectations, set	Meeting	One-Time	All Core Project Stakeholders	Project Manager	Meeting Minutes, Updated Charter
Status Report	Report of the status of the pro	Document, emailed	Weekly	All Core Project Stakeholders	Project Manager	Status report, issues log, risk log
Steering Committee	Clear issues, review performa	Meeting	Monthly	Steering Comm, PM, others as n	Project Manager	Meeting Minute Action items, up
Task Board	Show work planned, in prog	Information radiator	Real-time	All Core Project Stakeholders	Development Team	Phys task board and electronic ver
Lessons Learned Review	Capture lessons for future projec	Meeting	One-Time	All Core Project Stakeholders	Project Manager	Lessons Learned Report



Hybrid and agile approaches adopt high transparency tools for communicating project status to stakeholders. Instead of sending status reports, meeting minutes and risk logs to stakeholders and hoping they are read, this information is publicly displayed in team spaces and on project websites.

Information radiators are big visible charts that share project information. A task board and impediments board share much of the same information (work done, work in progress, work planned, issues, etc) as a project status report.

There are pros and cons to both sending reports and relying on information radiators. We could try to do both, but this might not be the best use of our organization's time and money. Stakeholder analysis (asking what people want and need), whether conducted formally or informally should inform our decisions.

Create a shared view of the goal



Unite people with a common view of where we are trying to get.

People must understand and share the same vision of “Done” for increments and the final solution. To be effective and work productively without detailed, centralized coordination, we need people moving towards common goals. So, spend time ensuring everyone knows where we are trying to get to. That way, when faced with their own local decision points, or forks in the trail towards project completion, they make decisions aligned with the larger goal.

Maintain the shared vision of success



Frequently remind people about where we are trying to get to and why it is essential that we

get there.

Product and project priorities can change quickly. People come and go from projects, and the market is continuously evolving. With all these changes occurring, we must frequently remind people of where we are trying to get to and why that is important. So, don't let the end goal shift or become fuzzy in people's minds. Align their expectations towards the success criteria to keep the end goal clearly in focus.

Share progress, good and bad



Share information. Make sure people know what is going on, whether this is good news or bad news.

It is crucial to be open and honest about progress, issues, and threats. People are astute and recognize if things are not being discussed, they will begin to withdraw their wholehearted commitment if they feel information is being withheld. So share information, both good and bad, with the team and business representatives often people surprise us with novel solutions to problems.

People want to know what is going on, and we should be able to discuss topics openly. Being honest about progress, good and bad is not only professional, and expected -- but it also builds trust, which pays future dividends in various ways.

Share forecasts to help planning



By sharing accurate updates on progress, we help people plan their work and improve their ability to plan for the future.

When sharing forecasts and plans, we also need to share our levels of uncertainty. Future predictions are more useful when we also know the uncertainty connected to them.

1.13 Mentor Relevant Stakeholders

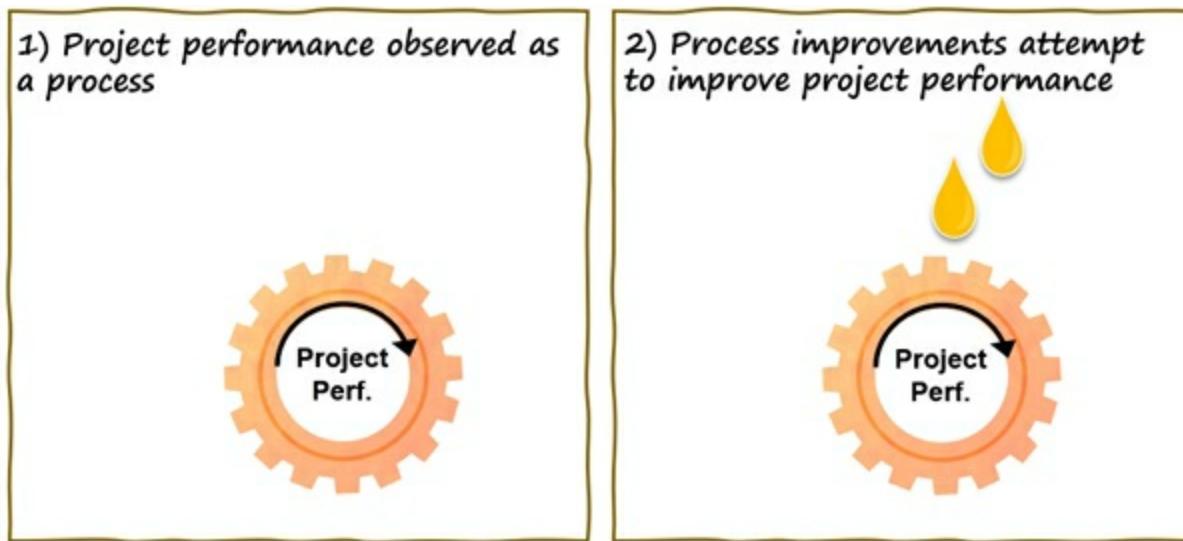


Coaching and mentoring are performed to improve a person's skills, knowledge and capabilities. When we raise team members' and stakeholders' capacities, we improve their output, usefulness, and value. This applies to ourselves too. When thinking about improving, we should start with ourselves and not expect anyone else to do something we would not do. Modeling the desired behavior is essential for anyone in a leadership role.

Production vs Production-Capability

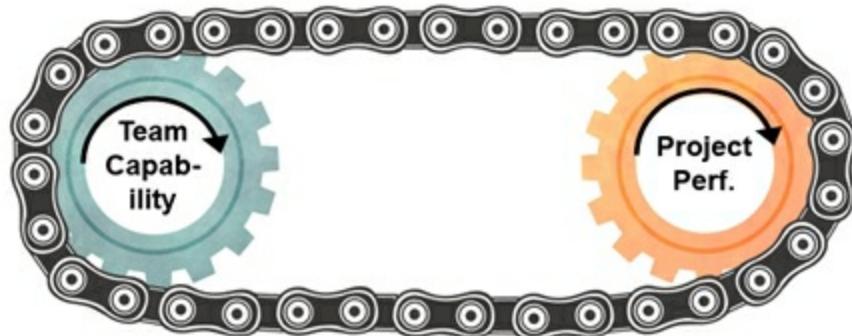
Projects often focus on productivity in terms of outcomes, results and business value generated. However, we also need to pay attention to the production capability, the system that produces these results. Coaching and mentoring improves the production capability of the team and other stakeholders.

One way to visualize this Production vs Production-capability balance is to consider project performance as a process 1). People often try to think of ways to improve the process, like thinking new tools or techniques will work like oil, making it go faster 2).



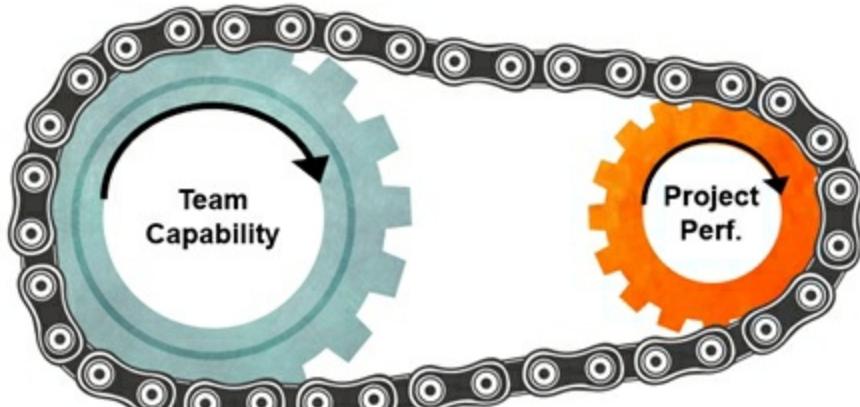
However, we need to remember that people drive the process. Team members and other stakeholders are responsible for delivering results 3.)

3) Project performance is driven by team member and stakeholder capability



Usually, the best way to improve performance is not by oiling the process but by increasing the capabilities of the people driving the process 4.)

4) Increase project performance through increasing capability



Coaching and mentoring help increase team member capability, and in doing so, increase project performance.

1.13.1 Allocate Time to Mentoring



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(Set aside time for mentoring)

Just as we would allocate time for completing work and evaluating results, so we should for mentoring, coaching and other forms of professional development.

Project managers should be taking note of team member performance and interactions. This should be on both technical proficiency (Bob's bananas are frequently bruised after transportation and often get rejected) and human interactions (Carol must stop rolling her eyes when the client asks questions, they notice!)

Then when opportunities arise, go and discuss the issue. Often there is more to the situation than we first realize. Maybe Bob's bananas are bruised because his basket has missing padding. Maybe Carol used to work for the client and knows how they like to stretch scope. This inside knowledge could be helpful, or perhaps Carol is just unaware and needs some coaching about developing a better poker-face.

Either way, to get the best performance out of our teams, we need to allocate time to develop technical and interpersonal skills.



While coaching and mentoring might be fashionable terms these days, the concepts are nothing new. The progression from apprenticeships to journeyman professionals in many trades relies heavily on mentoring as a form of development.



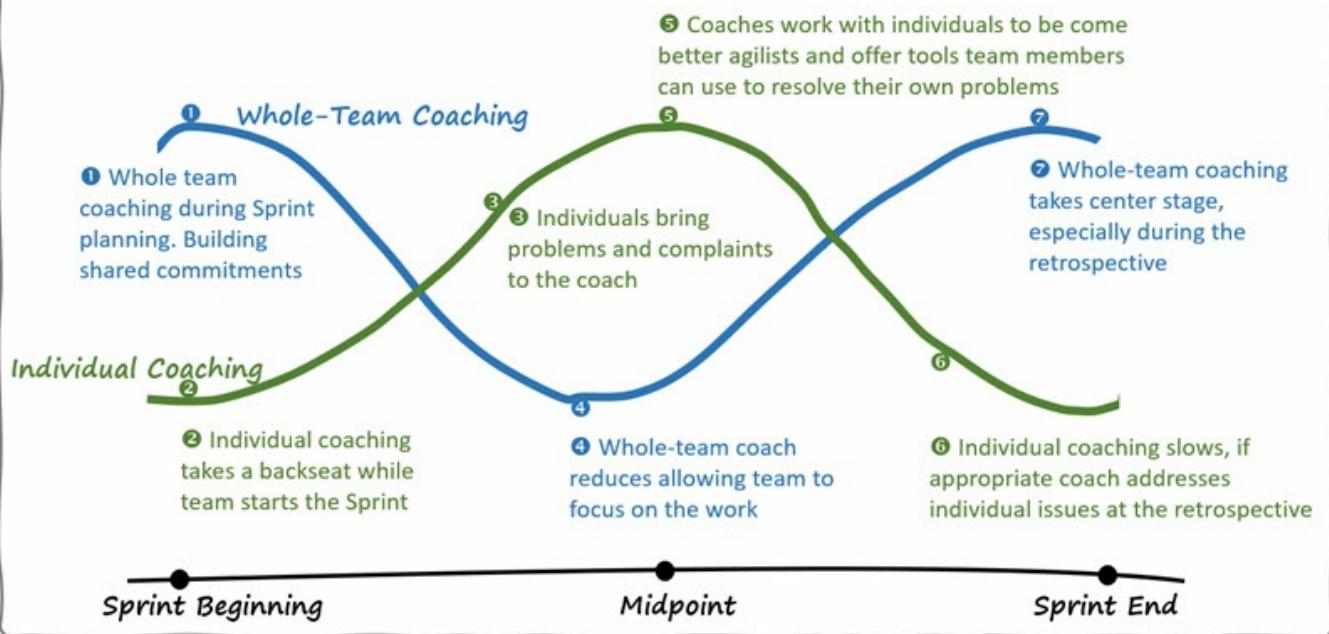
Agile teams often use pairing as a way to mentor junior team members. Pairing means working closely with someone for agreed periods to observe and discuss why and how things are done. Pairing spreads project knowledge, creating resiliency to individual team member loss. It also broadens skills and adds to the set of tasks a team member can complete.



Agile teams often work with a full-time or part-time coach to help them start and improve their agile approaches. The regular cadence of agile planning, execution and review activities, creates a rhythm that supports whole-team and individual coaching activities.

In the book *Coaching Agile Teams*, Lyssa Adkins explains how whole-team coaching occurs at the start of the sprint when the team is gathered around planning activities. During the sprint, whole-team coaching reduces as the team engages with building features, and individual coaching increases as people raise questions and concerns. Then, at the end of the sprint, whole-team coaching increases again, and the team gathers to reflect on delivery.

Whole-team and Individual Coaching during the Sprint



The retrospective is an excellent opportunity to promote intra-team mentoring. When discussing an issue, we can ask the team if anyone knows how we might solve it. Often people have good suggestions. If quick, maybe we share the ideas then. If they will take longer, then we can schedule a follow on session.

Do not assume as the project manager, we need to be the provider of all the coaching and mentoring. Likely, other people know concepts and topics better than we do. By sharing the role of coaching and mentoring, we increase team empowerment and engagement. Also, look outside the team, invite coaches and other stakeholders in to explain topics and answer questions.

1.13.2 Recognize and Act on Mentoring Opportunities



(Be on the lookout for mentoring opportunities)

Both successes and failures are opportunities for learning. When a client is happy, a demo goes well, or an experiment succeeds, take a moment to recognize why and share it if appropriate. Likewise, failed tests, critical reviews, and problems are learning opportunities.

When we encounter a problem, ask: What can we learn from this? It may only be a simple fact like the melting point of steel is 1400 degrees, and the temperature of burning rocket fuel is 1450 degrees, but that could be a critical piece of information for our future success.

"Failure is success in progress." — Albert Einstein

Coaching and mentoring are mindset tools. We often need to follow them up with practice and experience to affect real growth. The short duration of sprints and iterations make ideal test periods to try new skills.

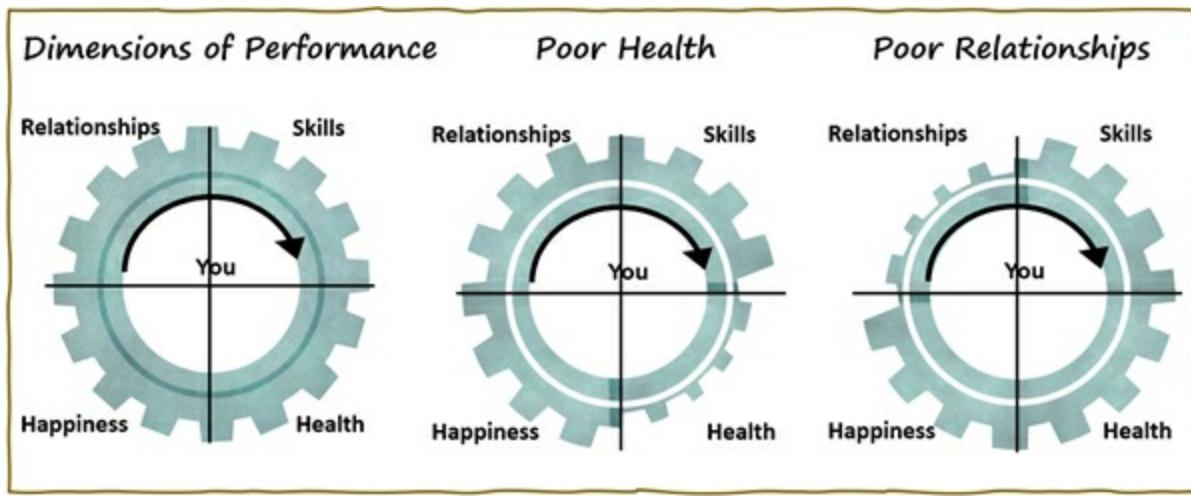
So, after mentoring a team member about a new skill or role, see if there is an opportunity for them to try it for an iteration or two. If appropriate, they can report back at a retrospective. Or if the advice was more personal, such as Carol being nicer to the client, we can follow up after the next demo.

We should ask for feedback too. Ask colleagues to sit in on workshops and team activities. Maybe do a dry run of a client presentation to the team first and ask for feedback. Do not ask questions that are easy to answer with benign platitudes, such as: Was it OK? Do you think they will like it? Ask: How can I improve it? Which were the weakest sections?



Think Beyond Technical Skills

Following the cogwheel driving performance analogy, our capacity is more than just our technical skills. We also need to be healthy, happy and have relationships to be productive over the long term.



Like having a broken or unevenly developed cogwheel, mismatches in these quadrants will eventually limit our work effectiveness. People cannot go on if they are unhappy, unsupported, or sick. Like learning new skills, we need to invest in our well-being and the well-being of those close to us to remain productive.



Remote Mentoring

It is often harder to mentor remote team members. Interacting primarily over video calls, shared documents and task tracking systems, we often miss some of the cues that would usually tell us someone could benefit from coaching or mentoring. Then, when it comes to providing mentoring, a scheduled video call might feel too formal or more challenging to pick up on emotional feedback.

This does not mean we should not try. By establishing regular check-in calls without much more of an agenda than asking how people are, what they are working on, and how can you help? This creates a space to hear about issues and opportunities for mentoring. It also creates a better working relationship beyond one that is purely transactional, making the transition to mentoring easier.



Remote Tips

Make sure you use your webcam. Allow plenty of time for questions and clarifications. Check back to see if you can help. Assume mentoring performed remotely will take more of your effort, to begin with and plan accordingly. Take advantage of online tools and training. Perhaps the technology that sometimes makes communications difficult can help deliver valuable skills and assistance.

Look for online courses, discussion groups, and micro-learning tools to help upskill your team members and other stakeholders. Point people to corporate learning management systems and make sure people are aware of what is available to them.

1.14 Support Team Performance Through the Application of Emotional Intelligence

What is Emotional Intelligence?

Emotional intelligence is the psychology of understanding ourselves and others. It encompasses both recognizing and regulating our feelings and working effectively with others.

Unfortunately, some people are put off the topic by the “emotion” component of the name. Perhaps thinking it soft, fuzzy, and not appropriate for the task of getting serious work done. This is a shame because all leadership is built on emotional intelligence. To help elevate these topics, PMI has recently begun calling soft skills and emotional intelligence “Power Skills” to emphasize their significance.



EI Terminology

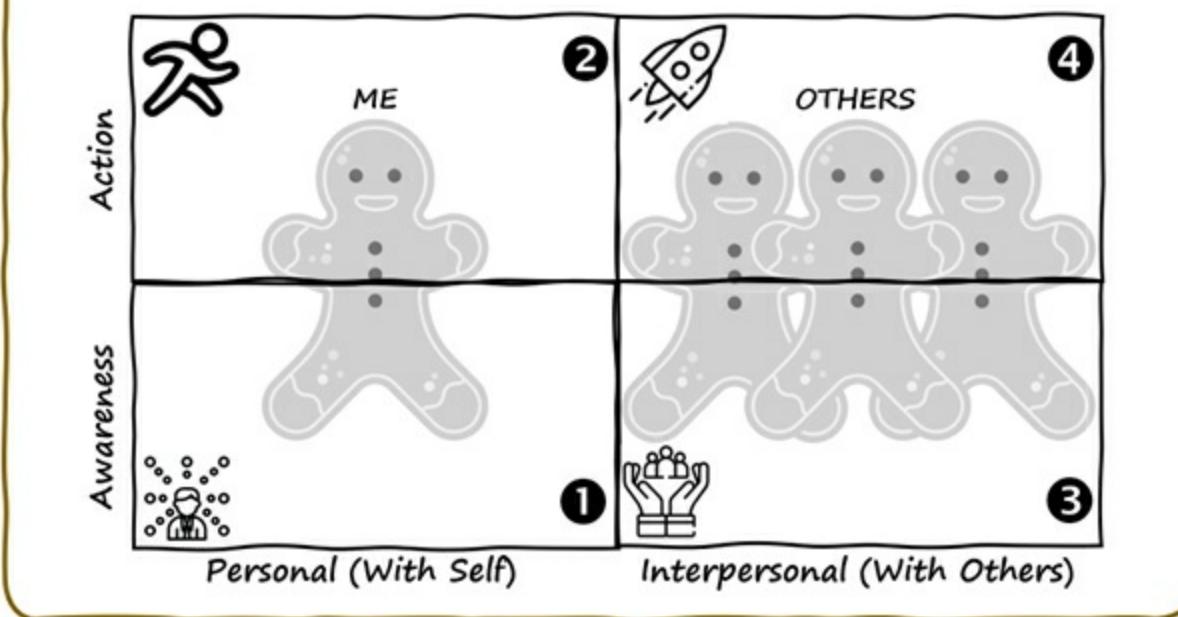
There are several emotional intelligence models in common use. They use slightly different names to describe similar concepts, so the terminology sometimes gets confusing. In this explanation, we will use the common names to explain terms. Instead of ideas such as “self-actualization,” we will talk about “learning what you are good at and developing those skills.” It takes a few more words but is easier to understand and apply. Most approaches label the measure of emotional intelligence as “Emotional Quotient” (EQ).



Core Ideas

The components of Emotional intelligence can be divided into four quadrants, as shown below.

The Four Quadrants of Emotional Intelligence



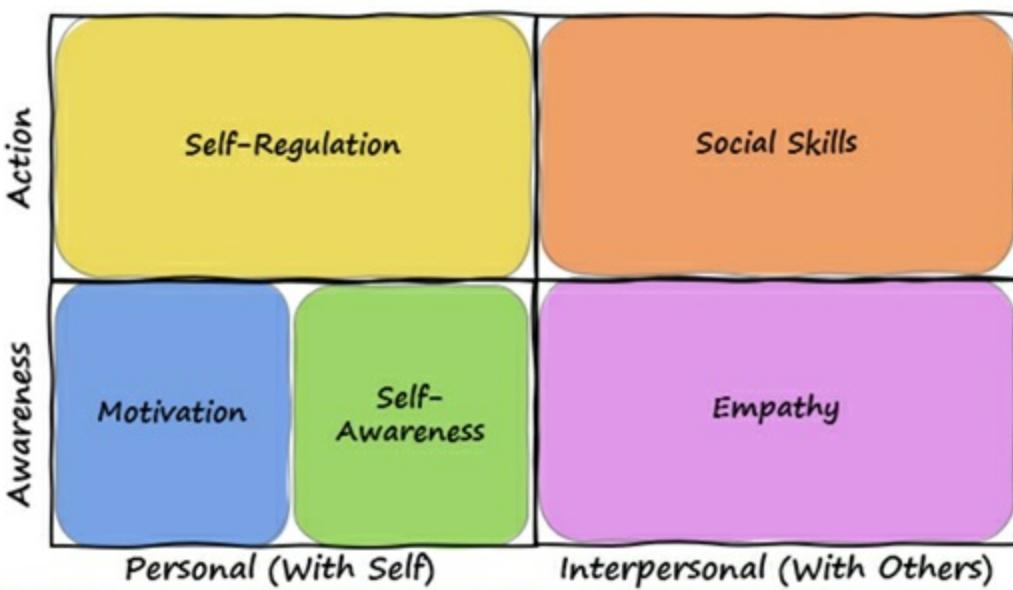
On the left, we have working with ourselves (1) and (2) and on the right, dealing with others (3) and (4). The lower half of the image refers to being aware (of how we feel, and others feel) and the upper half addresses taking action based on this awareness.

Sometimes the left-hand column is referred to as inbound competencies because they look inward. And the With-Others, right-hand column is referred to as outbound skills or competencies because they are outward facing, towards others.

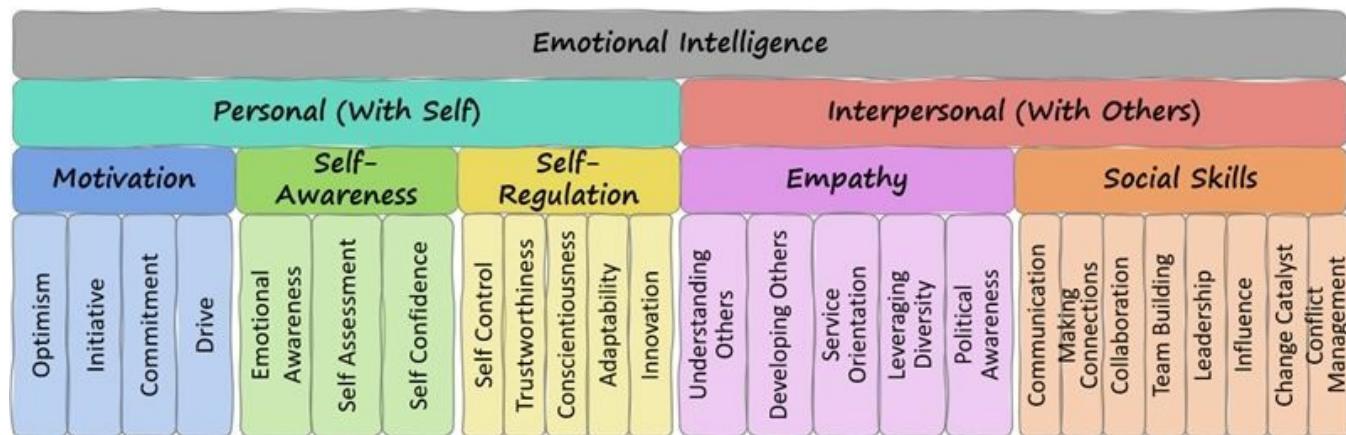
While we use all quadrants simultaneously, we generally develop in the numbered sequence. So, being aware of our emotions (1) allows us to better regulate them (2). Then, once we have our own feelings in check, we are more credible at interacting and influencing others. This starts by being aware of how other people feel (3) and then using the appropriate approach to interact with others (4).

Naming these quadrants gives us a comprehensive framework for discussing and developing our emotional intelligence.

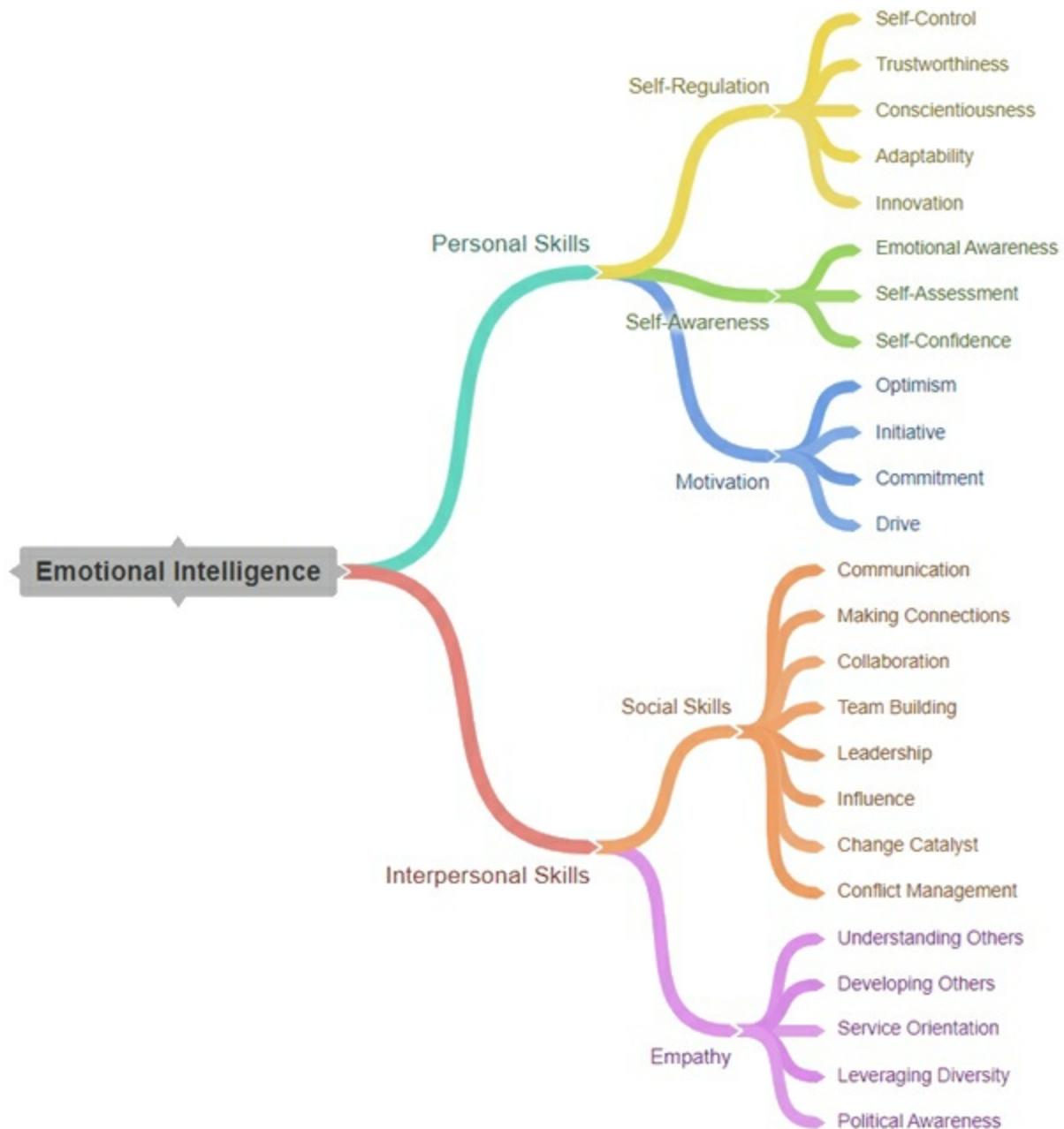
The Four Quadrants of Emotional Intelligence



Each of these colored boxes has a set of tools and techniques behind it. Most people do these things instinctively without labeling them, but it can be helpful for comprehension and revision to see them mapped out.



Or, if you prefer, as a mind-map.



In the exam, you will not be expected to memorize or recall all these categories. However, you might be asked a question that requires you to deduce which quadrant a situation refers to. For instance, recognizing if we are becoming frustrated (self-awareness, lower left, quadrant 1) vs getting people excited about the project vision (influencing others, upper right, quadrant 4).



How Project Managers Employ Emotional Intelligence

As a project manager or Scrum master, much of what we do is based on exercising emotional intelligence. We have the responsibility to inspire, motivate and influence team members and other stakeholders. We use EI first to get our own mental health and outlook in order, then to help

promote collaboration with others.

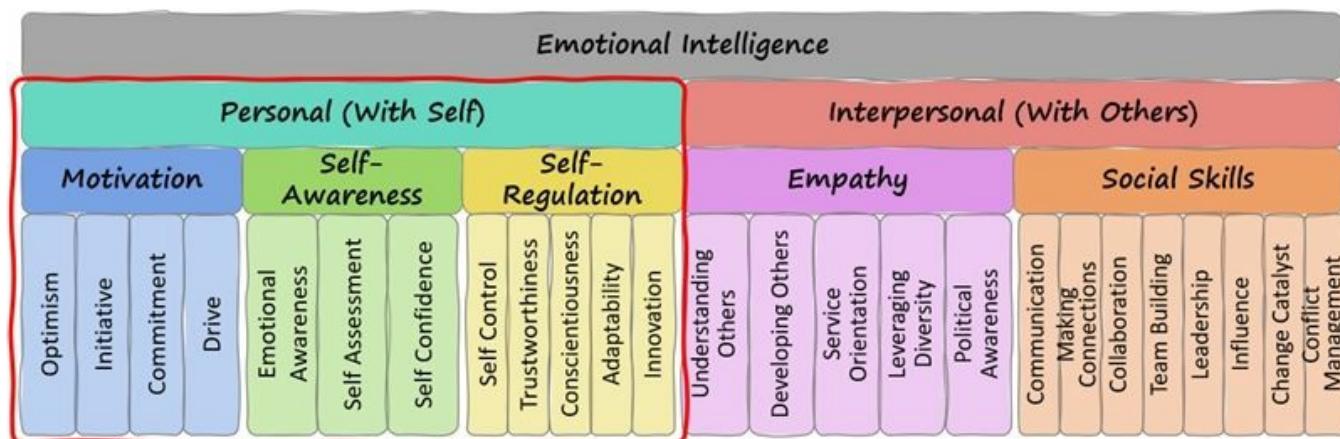
Activities such as evaluating stakeholder engagement needs and conflict resolution are also built on EI concepts of empathy and social skills. Once we understand EI components, we see how leadership and collaboration – huge topics and the focus of thousands of books, are both examples of emotional intelligence at work.

Now we will walk through the model quadrants.



Personal (With Self)

Before we discuss how to understand, assist, and collaborate with others, let's quickly cover the basics of personal (working with ourselves) emotional intelligence. This is important because if we cannot get these elements established, we will not be reliable or credible to others, and our efforts will fail to gain any traction.



Motivation

Motivation covers topics such as optimism, initiative, commitment, and drive. Optimism is centered on believing we can succeed more than fearing failure. It allows us to work towards goals regardless of barriers and setbacks as controllable factors, not fate.

Initiative deals with grabbing opportunities and working above and beyond to get results. It includes cutting through red-tape where necessary to achieve goals. Commitment is making the sacrifice of comfortable things to pursue a goal. It deals with searching for opportunities for accomplishing the mission.

Finally, drive covers working hard on getting results. Setting challenging goals and upgrading capabilities. Anyone seriously studying for their PMP exam understands these concepts of motivation. They explain the mindset of setting your mind to something and then pursuing it

positively, knowing there will be challenges, but you can overcome them.



Self Awareness

Self-awareness is the ability to recognize and name our feelings as they occur. It is a critical step in allowing us to choose how we want to respond to a situation or stimulus.

A difference between the human mind and an animal mind is the pause for choice between stimulus and response. Poke a bear with a stick, and it will get angry. The stimulus (stick poke) prompts an automatic response (get angry.) Poke a person with a stick, and they can choose to respond differently, perhaps pretending to be interested in the stick and asking for a closer look at it, so they can snatch it from you and beat you with it. Self-awareness encompasses recognizing our emotions and how our reactions can impact our behaviors and performance.

For example, if we experience our ideas being ignored in a meeting, we could get frustrated and state them more forcefully, louder. Or recognize our feeling of frustration, link it to the tendency to get agitated and look for other ways to get our points across.

Self-awareness also involves being aware of our blind-spots and weaknesses. Maybe we love big ideas but get frustrated by details and petty procedures. Perhaps we love order and control and are uncomfortable with ambiguity and too many undecided options. Knowing our strengths, weaknesses, and blind spots allows us to partner and collaborate with people to create strong combinations.

Being self-aware allows us to plan our next move better. No longer automatically responding to every stimulus, we can select the best response for our goals. Also, aware of our strengths and weaknesses, we can make sure we are not caught off guard by something that is not our usual focus.



Self-Regulation

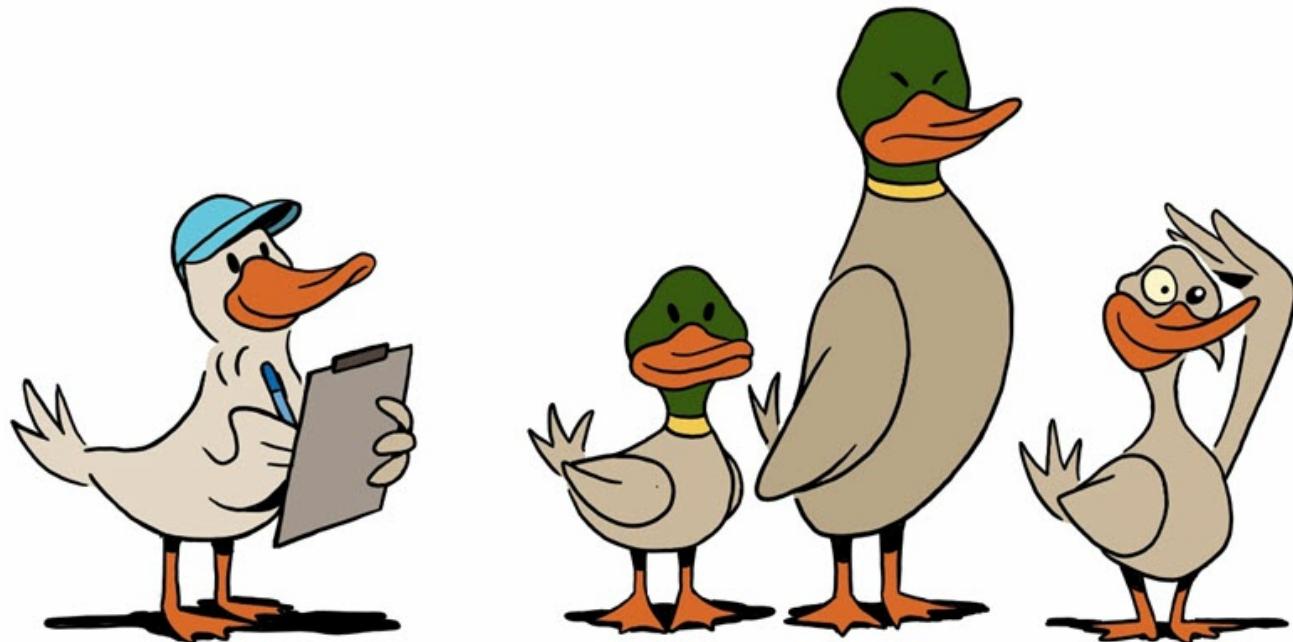
Self-regulation extends self-awareness. It is the ability to remain calm under pressure and stay focused on goals in stressful environments. It also covers adapting to changing events and priorities. Being flexible when faced with numerous demands and creating innovative answers to problems.

There is also a moral compass component that helps guide behavior. This includes acknowledging our errors and establishing a reputation for honesty and credibility. So, we must behave in a morally correct way that is above suspicion and standing by principles.

The personal (with self) components of motivation, self-awareness and self-regulation form

the firm foundation for working with others. To be listened to and taken seriously, we need to be viewed as positive, competent, and trustworthy. Then we can help teams and other stakeholders work together to deliver results. This starts with understanding who we are dealing with.

1.14.1 Assess Behavior

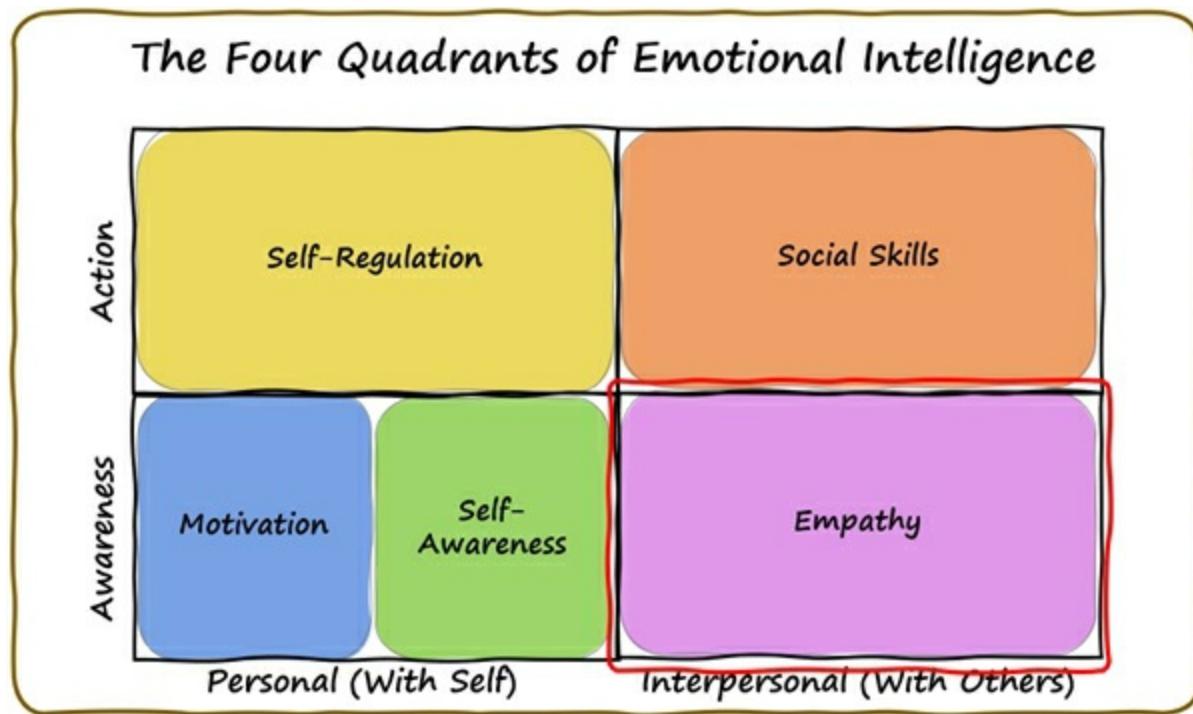


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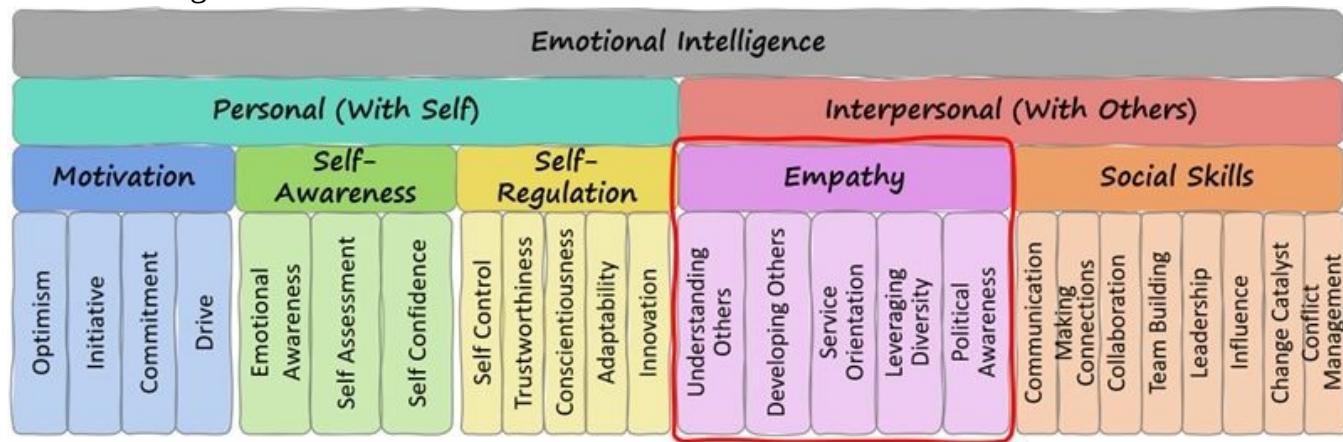
(Review stakeholders and determine who we are dealing with)

This PMP exam content outline task of “Assess behavior through the use of personality indicators” is focused on the lower right, awareness-level elements of the Interpersonal (With Others) EI quadrant of Empathy.

The Four Quadrants of Emotional Intelligence



When we look deeper into the model, we see it is concerned with concepts such as Understanding Others and Political Awareness.



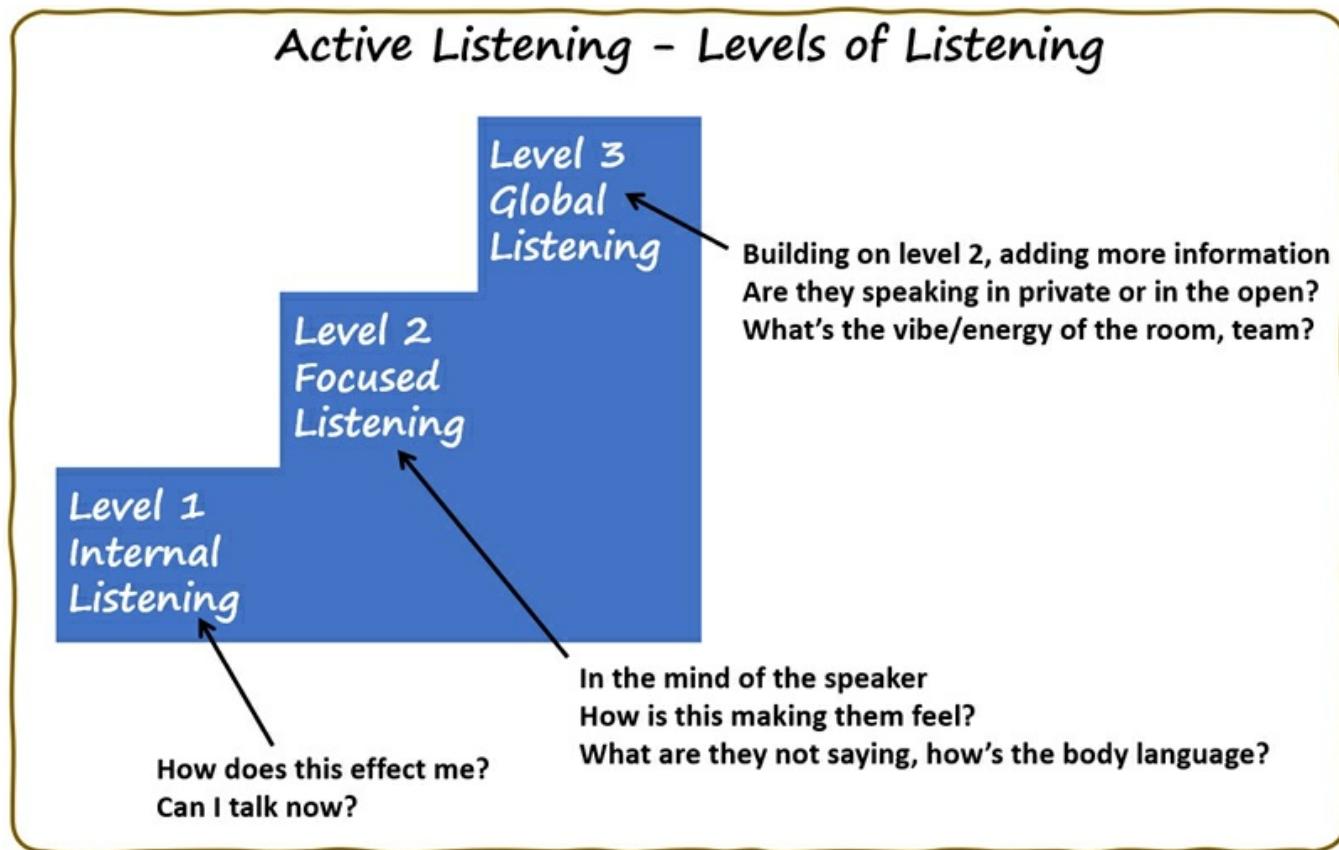
Empathy

Empathy is the capacity to understand and feel what another person is experiencing from within their frame of reference. Beyond just listening to others, empathy involves observing emotional cues and appreciating others' points of view. Truly understanding how others feel is the first step towards developing them.



Active Listening

Empathy starts with properly understanding the situation and person we are speaking to. Active listening is the process of taking to heart the words and emotions being conveyed, and perhaps omitted. It is more than just listening to the words; it also takes note of emotions and the context of the conversation.



It is easy to have superficial conversations where we scan only for impacts to us, and thoughts such as “Is it my turn to speak now?” (Level 1 listening). Instead, we need to get into the mind of the speaker and understand their thoughts and emotions (Level 2 listening). Ideally, we should also take note of the context (private setting, public setting,) and other emotional cues such as other stakeholder reactions (Level 3 Listening).

Once we understand our team members and stakeholders, we can better recognize their achievements, provide helpful feedback and provide the coaching and mentoring as discussed in [1.13 Mentor Relevant Stakeholders](#).

The concept of Service Orientation covers recognizing customer needs and seeing things from a customer’s point of view. It allows us to create customer-focused teams and create strategies to increase customer satisfaction.



Leveraging diversity, as we saw in 1.2.2 Support Diversity and Inclusion, deals with appreciating a variety of viewpoints and ideologies. Showing consideration for diverse stakeholders and creating conditions where people feel welcomed, and they can thrive. It also includes objecting to discrimination and bigotry.

“Diversity is a fact; inclusion is a choice.” - Michael Bach, Founder, Canadian Centre for Diversity & Inclusion



Personality Assessments

We can use personality assessments such as [The Myers Briggs Type Indicator](#), [DiSC](#), Truity, High5, or HEXACO to evaluate behavior and then tune our approach. Understanding where someone is on scales such as introverted to extroverted, data-driven or emotion-driven, etc. can help us choose approaches that appeal.

Being aware of our own personality traits also allows us to make sure we do not choose communication styles, collaboration formats or decision-making approaches that fit our preference, but exclude those of other participants.

1.14.2 Adjust to the Emotional Needs of Key Stakeholders

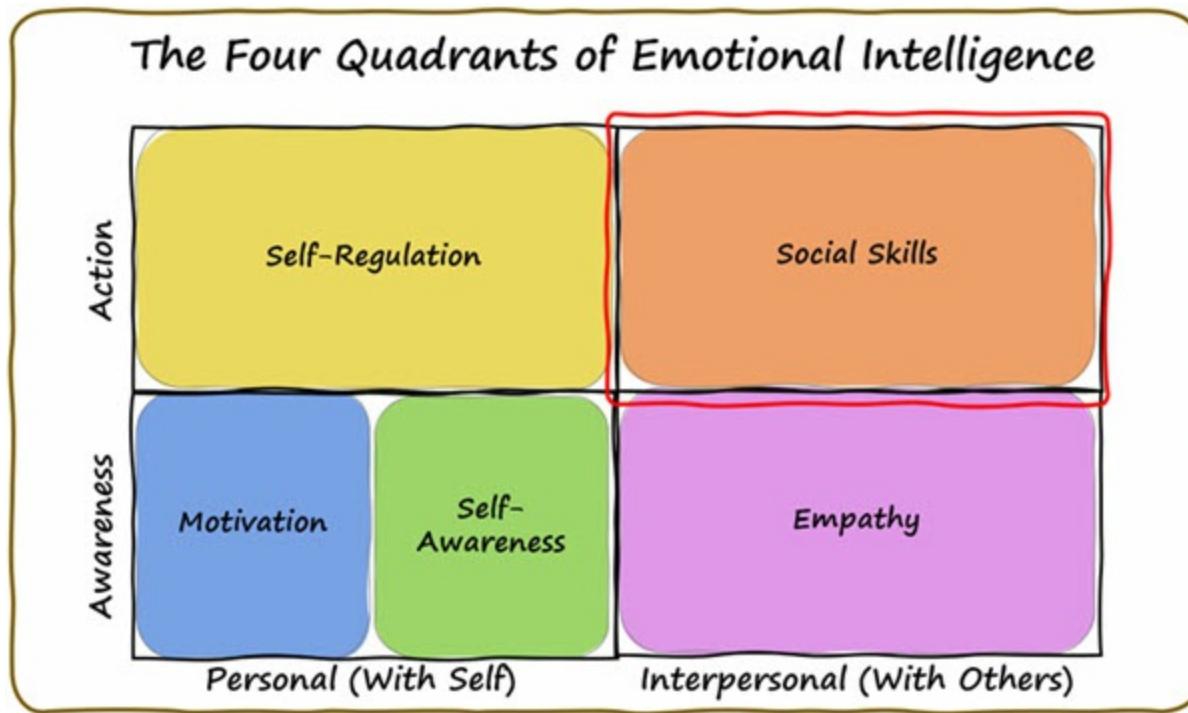
Analyze personality indicators and adjust to the emotional needs of key project stakeholders.



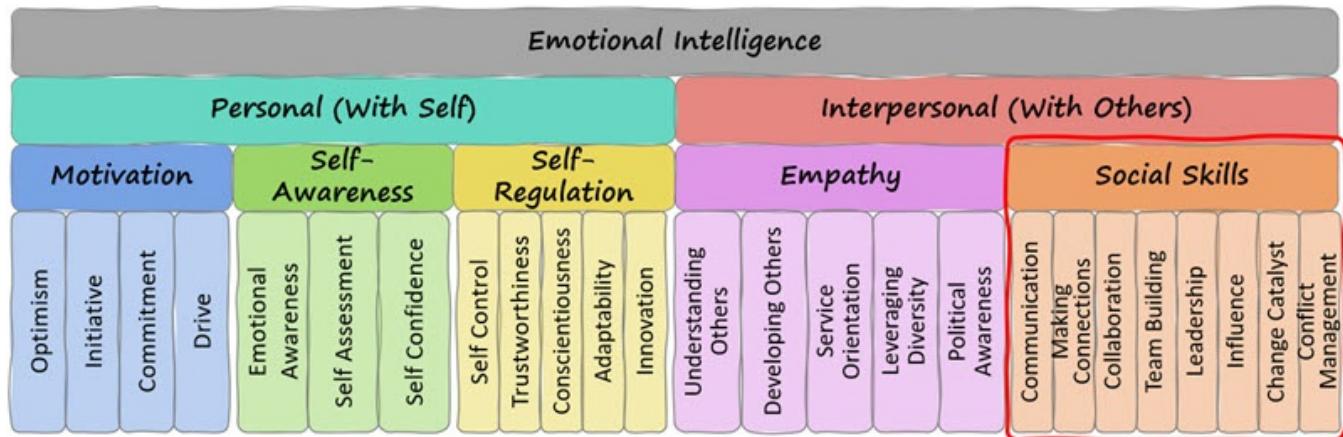
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(Select an approach that best fits the situation and stakeholder)

Once we are aware of other people's needs and preferences, we can use the appropriate social skills to best interact with them. This moves us from the empathy quadrant, up into the social-skills quadrant.



Within this final domain, we find skills such as communication, collaboration, leadership, and conflict management.

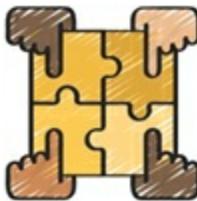


Remember, the list of skills will not be tested in the exam, but you should be able to deduce where in the EI model a skill belongs. Self-control will be in the left (with self) column and in the upper Action related quadrant. Others are more difficult to remember, mentoring is an active role, but it is often grouped in the lower awareness quadrant of empathy.



Communicating and Connecting

A big part of a project manager's role is communicating. This includes exchanging information, creating awareness, and establishing clear communications between stakeholders. Making connections is critical too. Teams are temporary communities, and the sooner people get connected the sooner they can collaborate productively. Project managers play a facilitator role in this, creating casual networks, encouraging interaction, and keeping people informed.



Team Building and Collaboration

We need to go beyond connecting people and encourage team development with collaboration. This involves attracting team members, building team charters and creating an environment of psychological safety. This is so people feel like they belong, are not afraid to ask questions, can share their work, and if necessary, challenge the process.



Leadership and Influence

Domain [1.2 Lead a Team](#) describes some of the leadership roles of a project manager. They include:

Developing and communicating a compelling vision for the project. Modeling the desired behavior and helping others achieve their objectives through support and motivation. Protecting the team from interruptions and clearing the path of obstacles.

The skills linked to Influence involve winning people over through selling ideas and building solidarity for approval. Combined with leadership, influence helps the team continue to move forward, gaining approvals for work done, making responsible decisions, and removing items that might slow or stall the project.



Change Catalyst and Conflict Wrangler

Things rarely go to plan or as smoothly as we hope for. Some people resist change, others are just plain awkward for a good reason, or seemingly no reason at all. To overcome these tendencies, project managers need to advocate for the change being created. They also need to help “grease the tracks” ahead of the change, to help it go smoothly with less resistance.

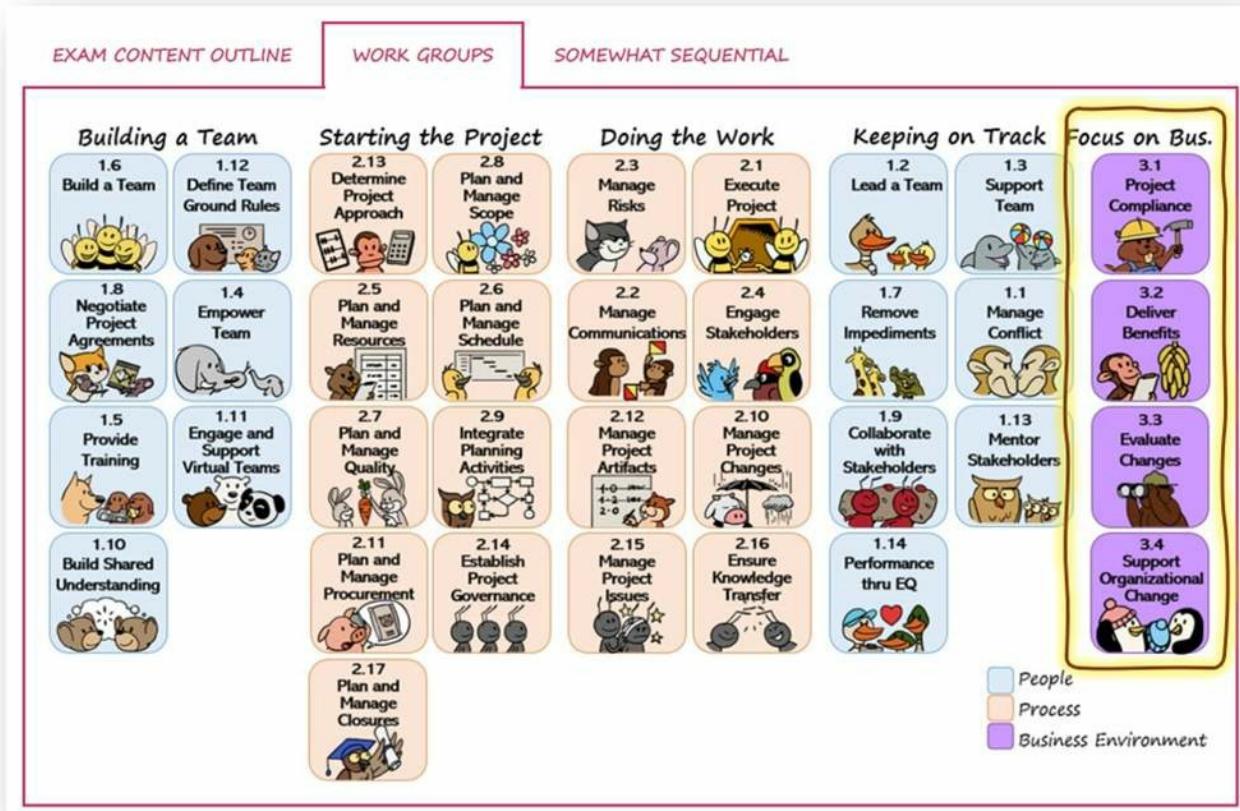
Remember that projects are people-driven. They are thought up by people, undertaken by people, and used or experienced by yet more people. These people do not always agree, have the same views on how things should be done, or what success looks like. So, we cannot just hope everyone gets along and we can focus on our project plan. Conflict management is a critical skill for all project managers.

Domain [1.1 Manage Conflict](#) covers the basic elements. The skills required include detecting potential problems early and determining if we need to intervene or if the issue is best resolved by the concerned parties. Other steps involve separating the issues from the people, evaluating options, and coming to consensus on the way forward.

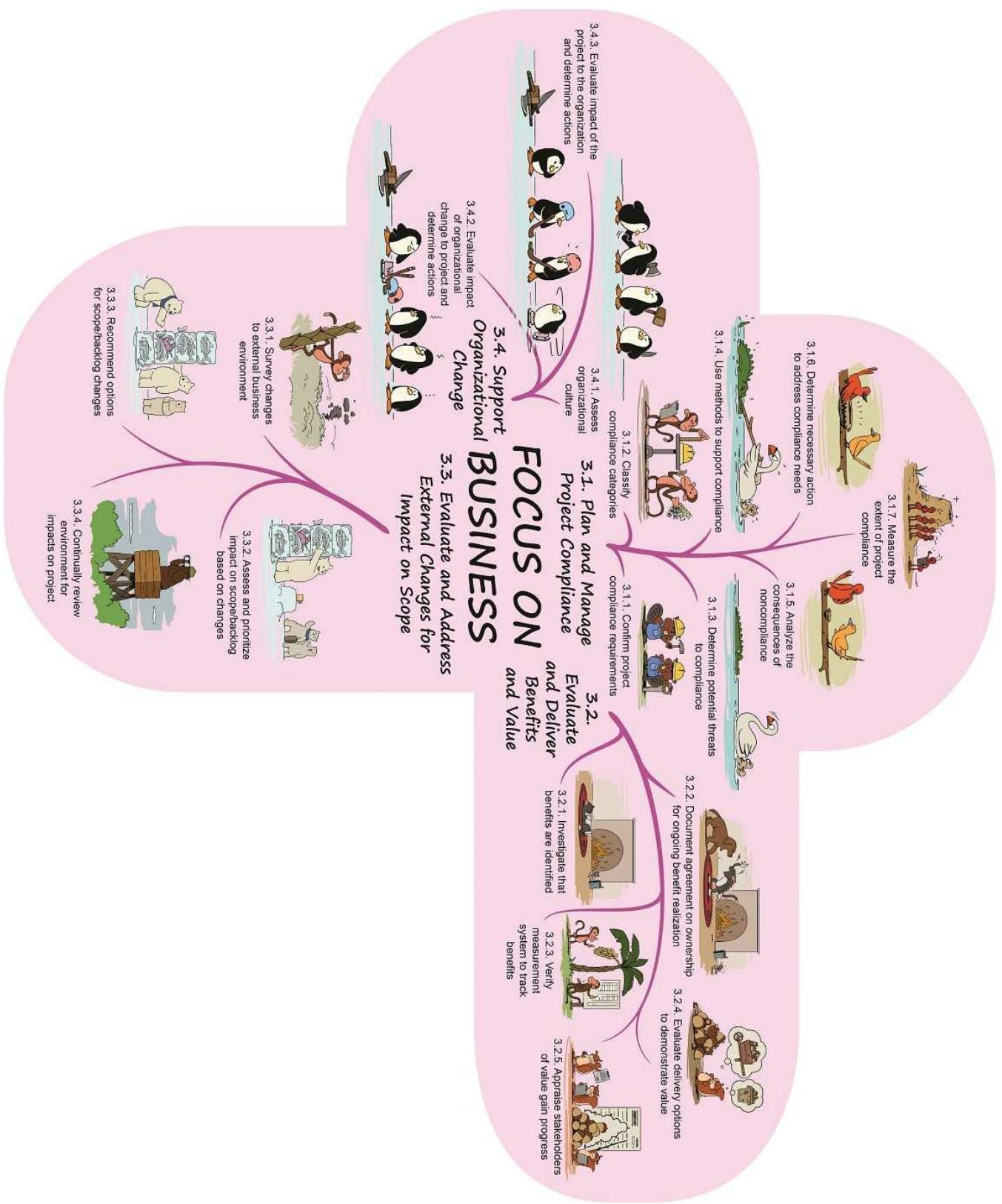
Conflict management is one of the toughest social skills to develop because it exercises every quadrant of the emotional intelligence landscape. We use social skills for mediation, down through empathy for understanding people and into our own self-regulation to stop us from getting too emotional and making things worse. Then, to keep us working through the difficult tasks of conflict resolution, we need to draw on our self-control, motivation, drive and optimism. But, hey, if this job was easy, project management would not be in demand, or we would probably be replaced by robots!

The good news is that unlike IQ, which peaks in our youth, EQ is a skill and ability that we can continue to develop late into our adult lives. Our experiences and reflections increase our repertoire of skills and resilience. Using emotional intelligence is challenging since there is no easily formula to apply to every situation. However, with learning and practice we do improve, and it is a valuable and rewarding field of study.

WORK GROUP 5 – FOCUS ON THE BUSINESS



Focus on the Business – Mindmap



3.1 Plan and Manage Project Compliance

3.1.1 Confirm Project Compliance Requirements

(Full ECO Title: Confirm project compliance requirements (e.g., security, health and safety, regulatory compliance.)

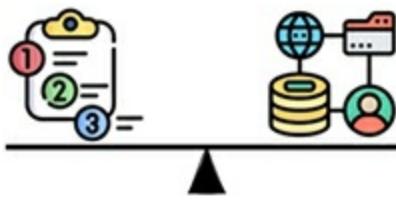


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(Understand the compliance requirements for your project)

Most organizations have some non-negotiable aspects to their projects. These are characteristics, that if not there, or if not up to standard, would mean the project would have to stop or the product or service being worked on would fail critical checks.

As project managers, we need to understand and confirm exactly what is required for our project. There is no point building the world's best mouse trap if we are not allowed to sell it, or selling it would create problems for our organization.

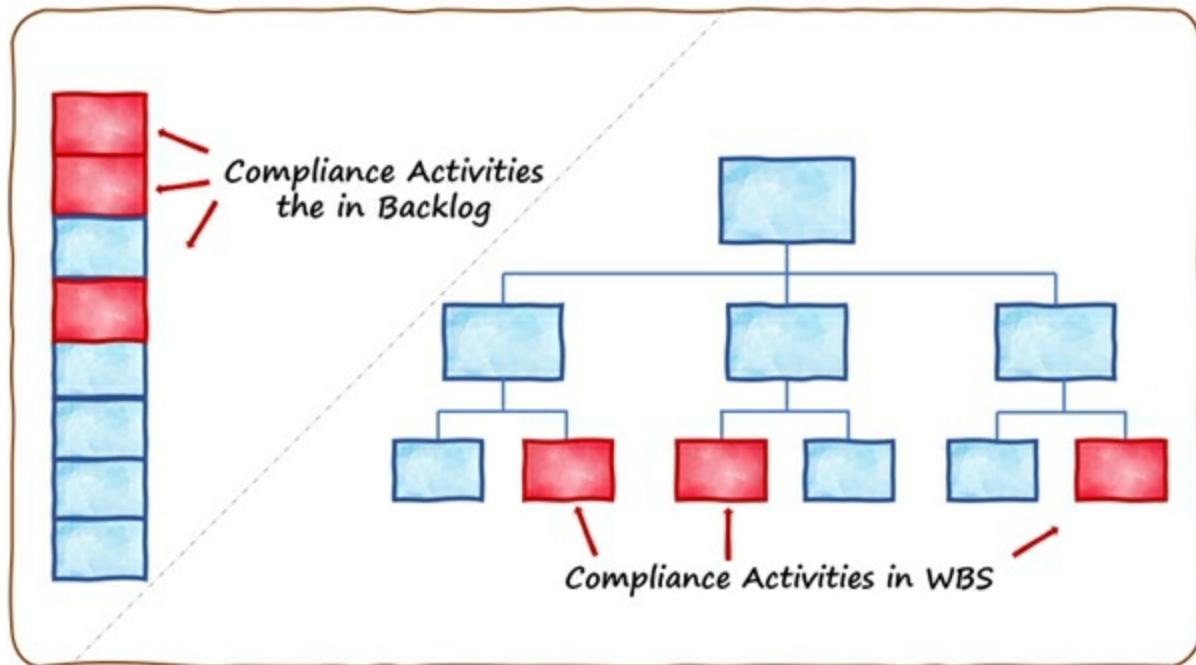


Compliance as Requirements or a Framework?

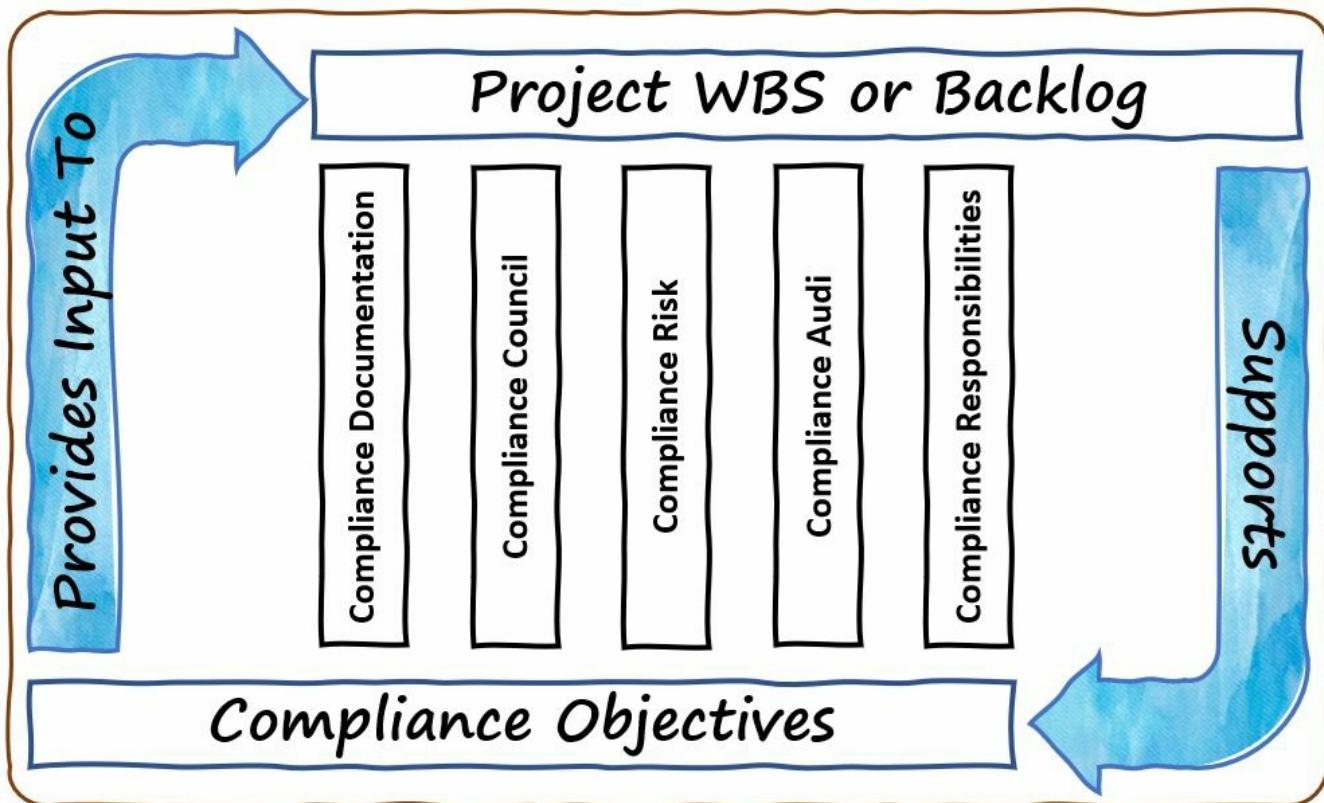
One way to think about compliance constraints is as must-have requirements. They are conditions that must be met for the project to be accepted. Most compliance constraints have severe financial or legal ramifications if they are not met. This “constraints and requirements” view has some advantages and disadvantages.

On the plus side projects have familiar tools to manage requirements. We can convert them into WBS work packages and product backlogs and track them in tests and traceability matrices. On the downside, the complexity of regulations means a constraint may be fragmented across its technical, legal and control aspects. This makes adherence difficult to tie back to a single WBS or

product backlog item. Plus, some constraints may not be proven satisfied until beyond the duration of the project, which could create challenges in accepting the project.



Another way to consider handling constraints is with a framework. A framework provides a set of guidelines to follow but does not provide a single solution for every project. Also, the framework can be adapted according to the needs of the project team.

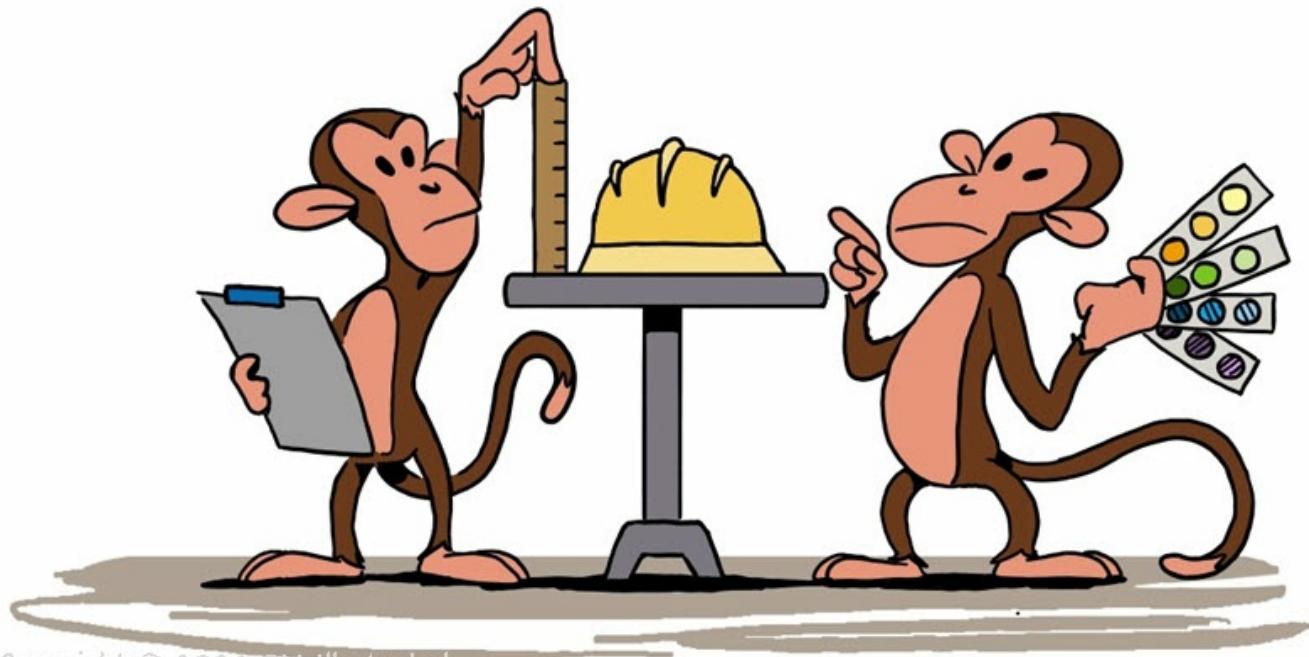


The compliance framework model above shows an outer loop of compliance objectives providing input to WBS or Backlog entries that support the compliance objectives. Within the

model, we see tools and techniques such as compliance-related documentation, council, risks, audits and responsibilities that help monitor and manage compliance work.

However, you think about compliance activities; they need to be performed. They are the price of admission for obtaining acceptance for our projects and staying in business as an organization.

3.1.2 Classify Compliance Categories



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(Understand the classes of compliance required and the details for each)

Compliance constraints can come in many forms. For engineering projects producing or changing physical assets, compliance could be around safety, legal or regulatory constraints. For knowledge work projects creating or updating intangible assets, they could be around security, privacy laws and storing personal information.

Some examples of compliance categories are shown in the mind map below:



Compliance categories will vary depending upon the project type and business we are engaged in. Also, since compliance is often linked to laws that vary by region and country, where our product or service may be offered will impact our compliance rules. For instance, laws around storing customer information vary by country. If we provide digital products globally, we need to be aware of regional variations or risk exclusion and penalties.

Depending on your project, keeping up with all the project compliance categories can be a daunting task. This is why some compliance frameworks feature a compliance council, compliance documentation and compliance audits to help keep items under control.

3.1.3 Determine Potential Threats to Compliance



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(Be on the lookout for compliance risks)

There are many sources of compliance threats. We could build an underperforming product or service; we could miss a new or updated law or regulatory requirement. Some common threat categories are shown below.

Common Sources of Compliance Threats



Product Defects



Errors In Testing



Regulation Changes



Awareness Gaps



New Markets



Product defects refer to errors or bugs in deliverables - the car burst into flames while charging.



Errors in our testing and validation used to confirm compliance - we tested 10,000 charging cycles, but only using our own charging infrastructure.



Changes to regulatory or legal requirements - new legislation makes autonomous vehicle functions illegal to use in school zones.



Awareness gaps - such as not knowing our product emits radio waves that interfere with pacemakers.



New markets - threats associated with new, unknown regulations or laws.

Since these are threats, a form of risk, we can use risk registers and other risk management tools and techniques to identify, track and manage them. As with any risk, we likely want to track information such as:

- The identified risk
- Impact of a realized risk
- Risk owner
- Risk responses – including avoidance, mitigation, transfer/sharing, and acceptance.

3.1.4 Use Methods to Support Compliance



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(Take action to suppress threats and ensure compliance)

While being aware of compliance threats is a necessary first step, the real benefits only come from taking action. We must ensure compliance activities are followed, and the threats acted upon. The tools we have at our disposal to help with this include:



Execution Reports aka Work Performance Reports

Project managers regularly create reports about:

- Overall progress
- Project activities
- Deliverable status
- Risk reports



Tracking Tools and Information Radiators

- Release roadmaps

- Story maps
- Kanban boards
- Cumulative flow diagrams
- Risk burndown charts

In addition to reporting, project managers are responsible for ensuring actions are taken to manage the risks. This includes:



Testing and validation activities

The ongoing running tests to verify project components meet specification and compliance requirements. Testing and validations are often conducted by team members, including quality assurance staff who are part of the project team.

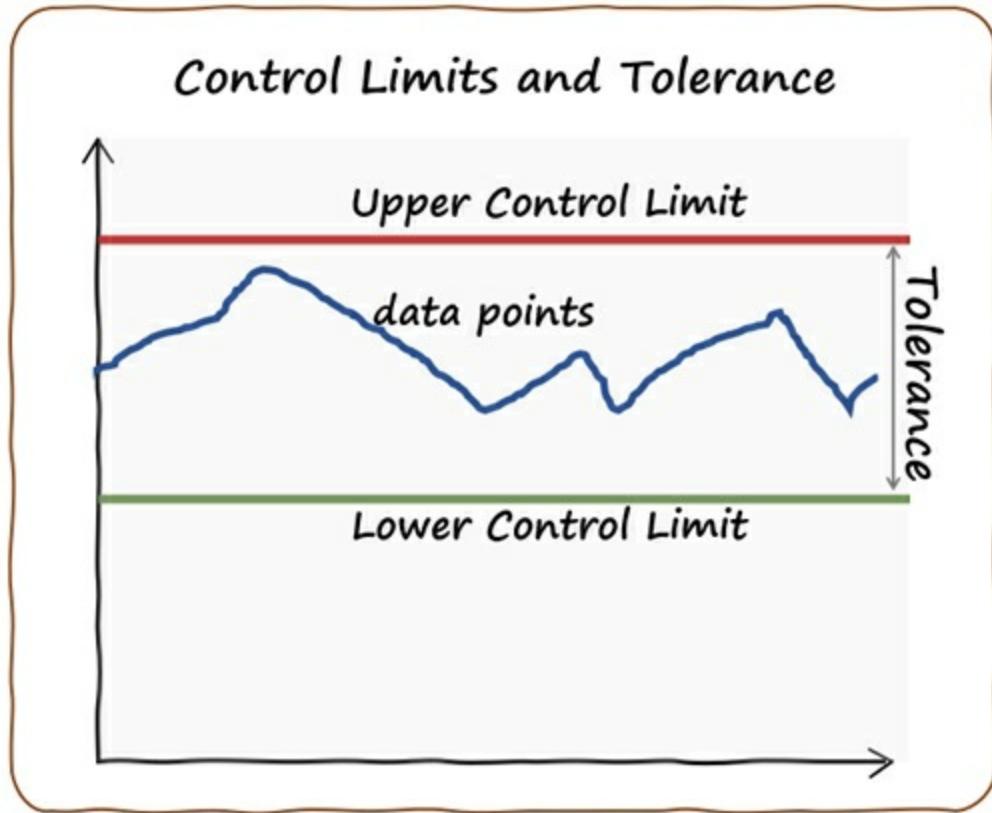


Audits and inspections

Audits are structured, independent reviews to determine if project activities comply with project and organizational procedures, policies and processes. Often audits and inspections are performed by specialists from outside of the project team, such as an internal audit team or PMO. They are designed to identify that good practices are being used and find any nonconformity, gaps, and shortcomings.

When possible, audit teams should proactively offer improvements to improve quality and productivity. They should also share good practices from other projects and highlight contributions to lessons learned and retrospectives.

Control Limits and Tolerances



Control limits are upper and lower bounds that can be established around a project characteristic. Tolerance is the region with these bounds that the project manager is empowered to manage between. Typically, if a tolerance range is breached (or forecast to be breached), the project manager would escalate the issue.

Common control limits and tolerance ranges can be set around any measurable element. Common measures include:

- Budget
- Time
- Quality
- Non-functional requirements

Non-functional requirements describe attributes such as reliability, security, capacity and documentation needs. See [this link](#) for an example of non-functional requirements in a software project.



Sign-offs and Approvals

Gaining approval that the solution and its deliverables meet requirements is another way to help ensure compliance. We must identify the necessary stakeholders who are authorized to sign-

off and then assist by facilitating the process. Sign-off and approval can happen throughout the project as deliverables are produced, or at completion. Agile projects aim for the delivery of completed and accepted deliverables throughout the life cycle. Some environments and products better suit or require a final acceptance.

Frequent review and approvals allow us to gather early warnings of potential issues. They also allow us to take early corrective action reducing scrap and rework. This helps reduce cost overruns, delays and increased risks.

3.1.5 Analyze the Consequences of Noncompliance



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(Understand the impacts of noncompliance and how to spot them)

For project managers to effectively identify and manage legal or regulatory compliance requirements, we need the following items in place:



Lists.

A comprehensive list of the legal, regulatory, and other constraints that apply to the project.



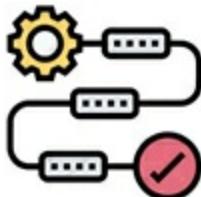
Definitions

Definitions of which parts of the solution are subject to compliance requirements. This includes the scope of the compliance requirement and the stakeholders responsible for managing, approving, and signing-off on the component's compliance.



Business Rules

A set of business rules that constrain the project solution and improve the likelihood of compliance. For example: “To meet the site safety requirements, we will require all employees, contractors and site visitors to wear personal protection equipment at all times and attend training before being allowed on site.”



Methods

Methods to track and manage the review and approval activities related to each compliance item.



Processes

Processes to track and manage the risks and risk responses related to compliance requirements.

Since compliance is a particular form of requirement, we rely on quality management to ensure it is being planned for, tested and tracked. This also includes taking corrective action to fix any problems found and changing our processes to improve quality in the future.



On traditional, plan-driven approaches, the quality management plan describes the activities needed to achieve the necessary quality objectives. It describes the expectations for the project's quality requirements. These will include:

- Quality objectives of the project
- Quality standards to be used
- Quality roles and responsibilities
- Project deliverables and processes subject to quality review
- Quality management activities planned for the project
- Which quality tools will be used?



For agile life cycle projects, much of the quality management plan information is contained in the Definition of Ready, Definition of Done, user story acceptance criteria, non-functional requirements and dedicated compliance activity stories.



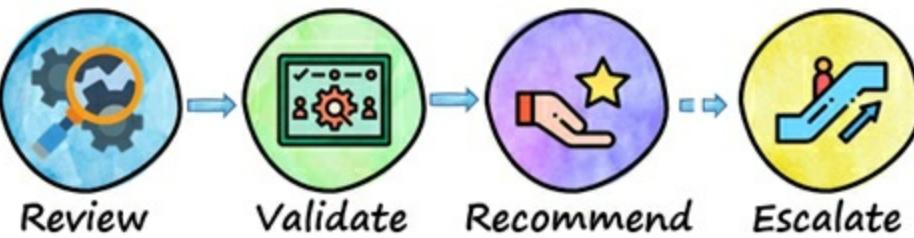
Organizations that operate in highly regulated environments but wish to gain the agile benefits of short iterations with quick feedback loops and reprioritization may choose a hybrid approach. It is possible to encapsulate an agile development process in a more rigorous and documentation focused wrapper of compliance activities.



An example of this is how one of Lockheed Martin's drone software suppliers operates. Just to do business with Lockheed Martin, suppliers must demonstrate thorough security processes and detailed traceability from requirements to documented tests. The supplier wraps an agile core with more traditional process to create a hybrid that supports rapid exploration of new ideas but still satisfies strict compliance requirements.

Regardless of which way quality assurance is embraced with the project life cycle, we need to ensure the appropriate actions are taken based on the outputs of QA activities. These include:

Core Quality Assurance Functions



Review - Deliverables are reviewed to verify they meet both functional and non-functional requirements.



Validate - QA validates whether the deliverables align with compliance requirements and provides details on any variances identified.



Recommend - Where necessary identify and suggest potential improvements to fix any defects or other noncompliance.



Escalate - When noncompliance issues are identified, the project manager should determine if it is within the tolerance level and can be handled within the project or if it needs to be escalated.

Other QA processes project managers need to be aware of include:



Sampling

When it is not viable or cost-prohibitive to inspect every product or deliverable, substituting a sampling of the outputs for review might be appropriate. The goal is to provide similar results in identifying quality issues while reducing the cost of quality.



QA Tools

Data gathering – Using checklists and other sources of acceptance criteria.

Data analysis - Techniques such as process analysis, alternatives analysis, document analysis, and root cause analysis.

Decision making techniques – A group of techniques used to help people reach decisions.

Data presentation techniques – Creating and interpreting charts such as histograms, scatter charts, cause and effect diagrams, flowcharts, affinity diagrams, etc.

Audit reports - documentation from reviews used to determine if activities comply with policies, processes, and procedures.

Design for X - A set of guidelines to optimize for a specific aspect of the design. The X can be reliability, cost, service, usability, safety, quality, or any other variable of interest.

Problem-solving techniques – Tools and steps used in solving problems. Often including: Defining the problem, Identifying the root-cause, Generating possible solutions, Choosing the best solution, Implementing the solution, and Verifying solution effectiveness.

Quality management methods: Six Sigma, Plan-Do-Check-Act

Quality Improvement Methods

Quality movements

- Plan-Do-Check-Act (Shewhart and Deming)
- Juran Trilogy
- Total Quality Management (TQM)
- Kaizen



Agile and Lean Quality Assurance

Agile approaches borrow many ideas from Lean thinking, such as the emphasis on quality and continuous improvement. Both agile and lean approaches aim to make waste visible so it can be reduced or eliminated through activities such as value stream mapping. They also promote frequent reviews to inspect the product or service being created. The plan, build, demo,

retrospective activities of an agile iteration closely mirror Demming's Plan, Do, Check, Act (PDCA) quality cycle.

3.1.6 Determine Approach and Action to Address Compliance Needs

Determine necessary approach and action to address compliance needs (e.g., risk, legal)



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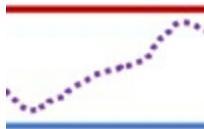
(Resolving problems to satisfy compliance needs)

After ensuring we understand all the compliance requirements and using QA approaches to test them, we need to ensure any issues are addressed. This is essentially the application of the processes already discussed:





Create a Quality Management Plan – Create a suitable Quality Management Plan and educate the team and relevant stakeholders about how it will be executed on an ongoing basis. This will help identify any noncompliance issues as early as possible.



Establish Tolerances - Establish the project tolerances and enable the project manager to either take corrective actions with the team or quickly escalate any noncompliance outside of the tolerances.



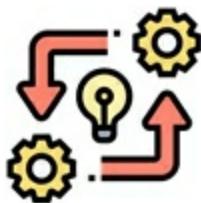
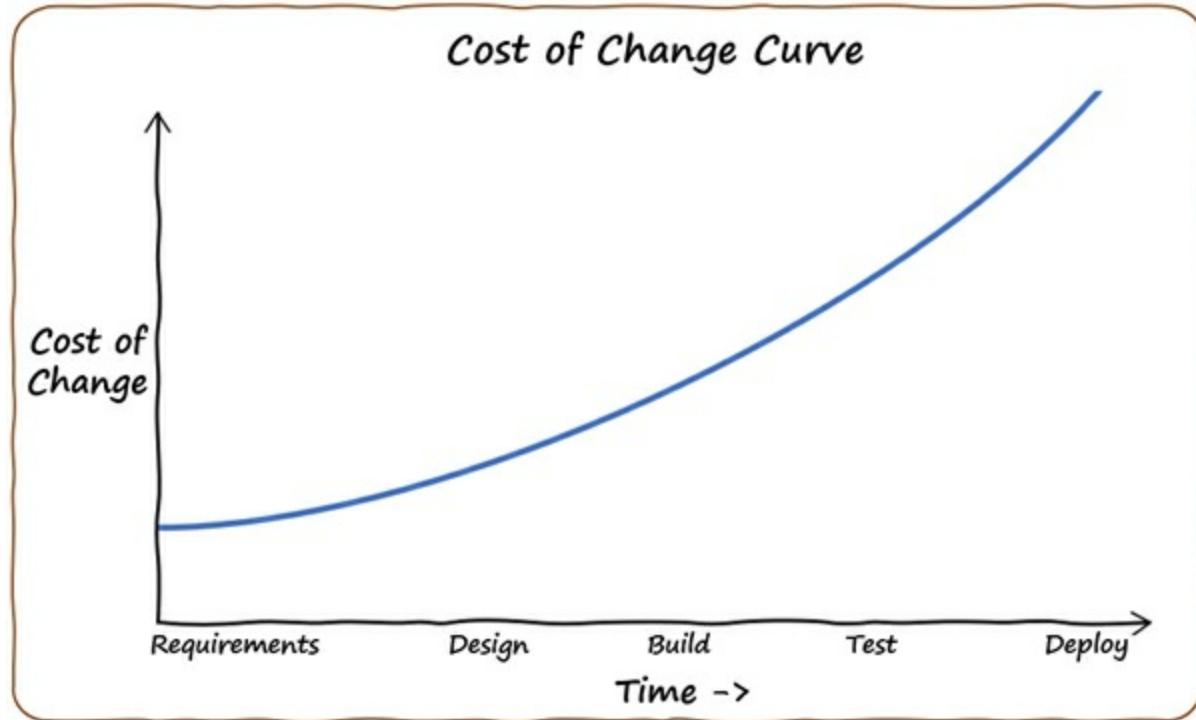
Apply QA Processes - Confirm the outputs and deliverables. Establish how and where external audit teams will validate the use of appropriate processes and procedures. Also, how audit results will enable the team to identify improvements.



Exercise the process - Leverage all the QA tools and techniques to assess quality deliverables and identify improvements, corrective actions, or defect repairs required.

A general theme is to be proactive and catch issues early. This reduces the impact of the problem on downstream activities and minimizes the amount of scrap and remediation. The quicker we catch a problem, typically the less it costs to address it.

Issue remediation costs follow a pattern similar to the cost-of-change curve. The longer things go un-noticed or un-corrected, the more costly they are to fix.



Repeat!

Monitoring compliance is not a once-and-done process. It needs to be an ongoing activity to ensure outputs and deliverables continue to be in compliance. It also needs repeating to keep up with any regulation updates and when we enter new markets.

3.1.7 Measure the Extent to which the Project is in Compliance

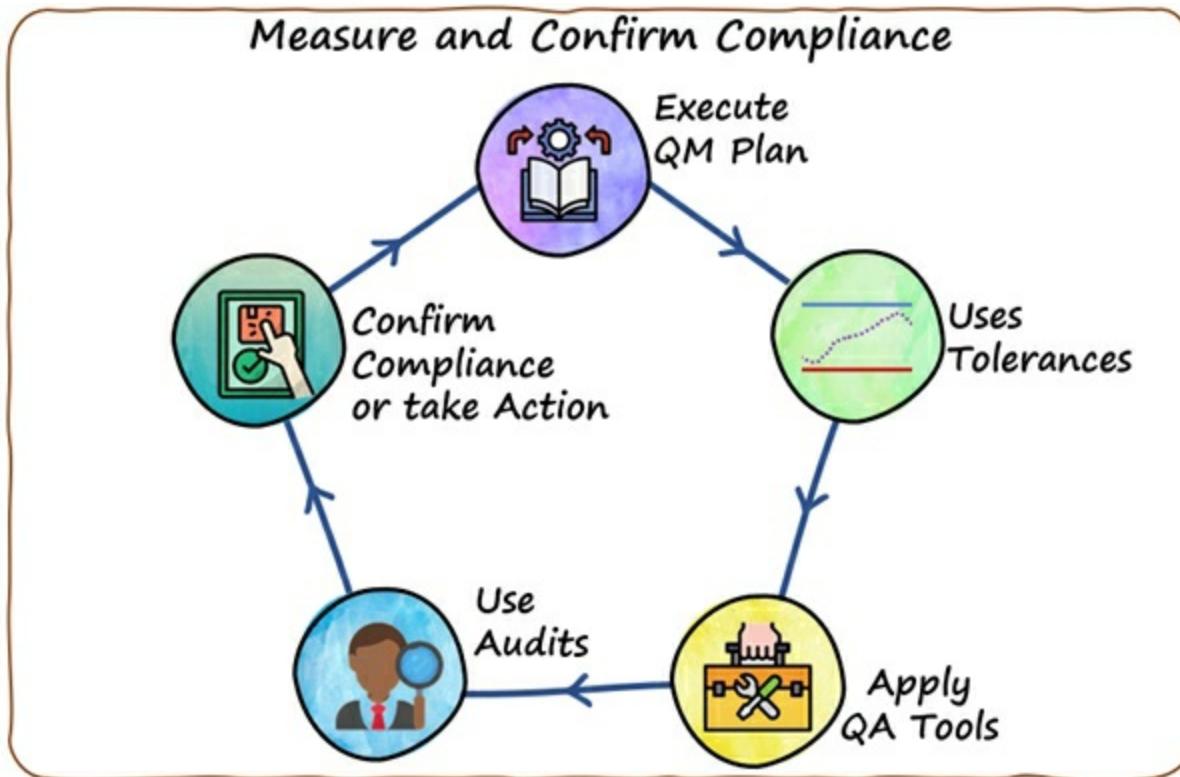


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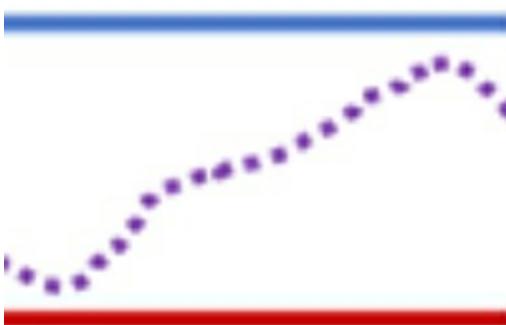
(Measure and confirm the project is in compliance)

The final task we cover in this module is measuring the extent to which the project is in

compliance. It deals with executing the quality management plan, using tolerances, QA tools and audits to see if we are in compliance. Then, if we are not in compliance, taking action to bring the project back or escalate the issue. This process is repeated throughout the project, so it is depicted as a continuous cycle below.



Execute Quality Management Plan – Create a clear Quality Management Plan and execute it on an ongoing basis to find any noncompliance issues as early as possible.



Use Tolerances – Establish project tolerances and enable the project manager to either initiate corrective actions or to quickly escalate any noncompliance.



Apply Quality Assurance Tools – Make use of effective QA tools and techniques to assess deliverables and identify improvements, corrective actions, or defect repairs required.



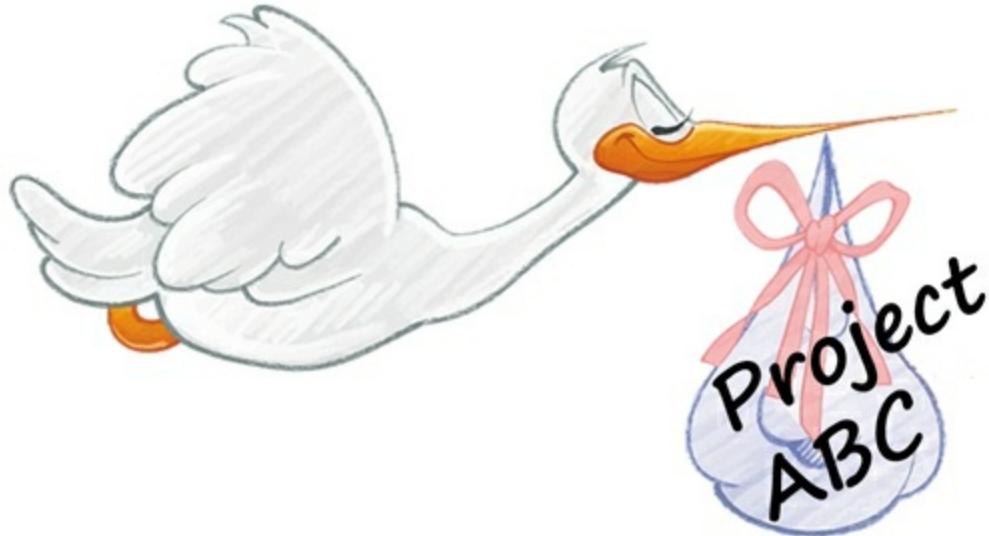
Use Audits – Determine where external audit teams can confirm or validate the use of appropriate processes and procedures. Also, how audit results can enable the team to identify improvements.



Confirm Compliance or Take Action - Use QA outputs to confirm deliverables and process compliance or identify the need for corrective actions. Then determine the issues are within tolerances for the team to remedy or if escalation outside of the project team is needed.

3.2 Evaluate and Deliver Project Benefits and Value

OK, I think it is time to talk about where projects come from...



Projects often come from the desire to gain benefits and value. Some projects are regulatory or non-discretionary, such as addressing a safety risk, but these can be viewed as the desire to avoid financial penalties, business restrictions or reputation damage.



Increasingly we hear about the triple-bottom-line or P.P.P. Both terms refer to People, Profit, and the Planet. So beyond pure profit, organizations are also progressively looking to undertake projects to help people and the planet. Sometimes a fourth P for Purpose is used, but purpose often relates back to helping people or the planet. While this module and the exam focus on financial analysis, it is useful to be aware of these other increasingly significant elements.

3.2.1 Investigate that Benefits are Identified



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(Identify the project benefits both financial and intangible)

Let's start by defining some concepts and terms.



Business Value. This is a non-precise term that contains concepts such as:

- Customer value
- Shareholder value
- Revenue
- Channel partner value
- Employee knowledge
- Organizational intellectual property value

As we see from the list above, business value can be non-financial or difficult to initially quantify such as having a product offering in a new market. Some car manufacturers have spent billions developing electric vehicles, with no positive cash flow yet. However, the shareholder perception of not having products in this space or getting left behind when they become more profitable justifies the expenditure.



Value Analysis. The process of examining each element of business value to

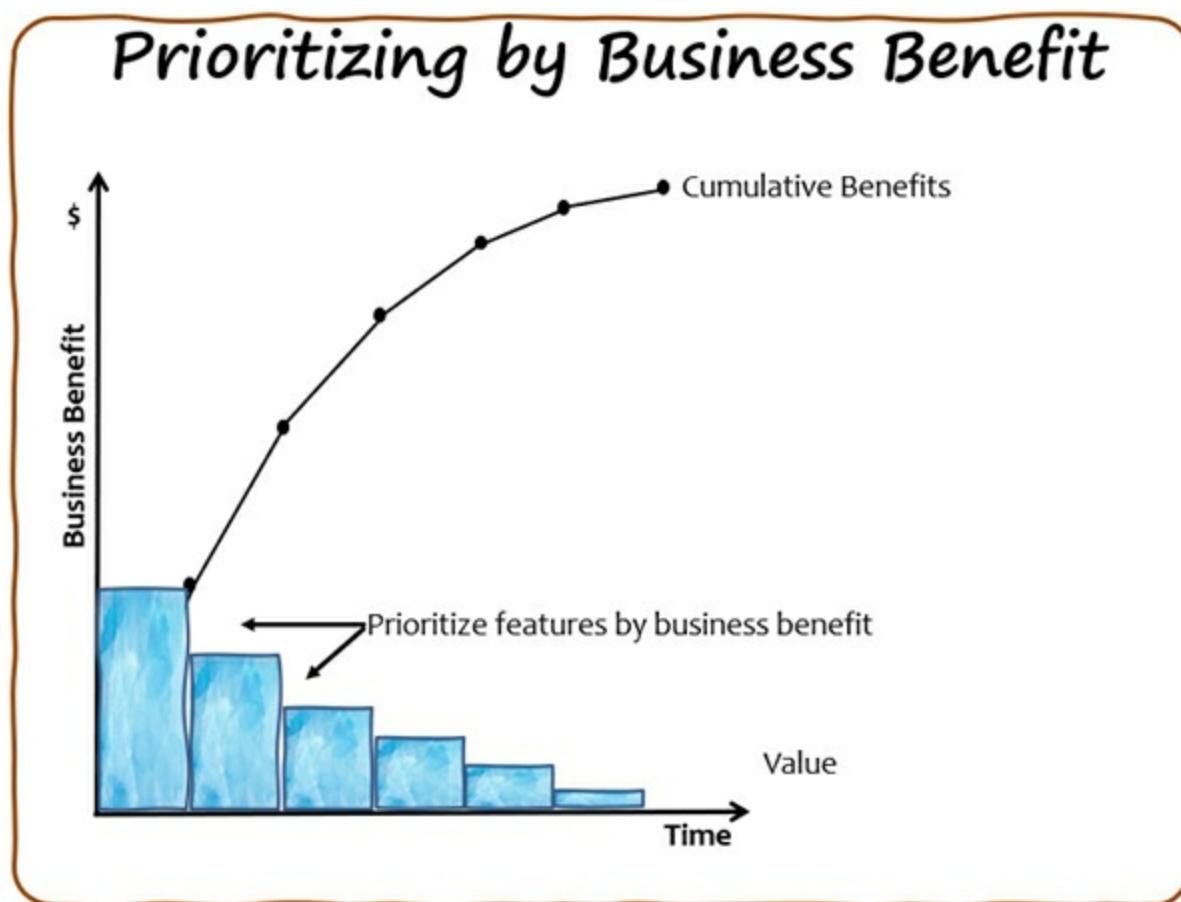
understand the cost and benefit. The goal is to optimize (increase the benefits and reduce the costs) the overall business value.



Traditional projects may also identify in which project phase the benefits will be delivered.



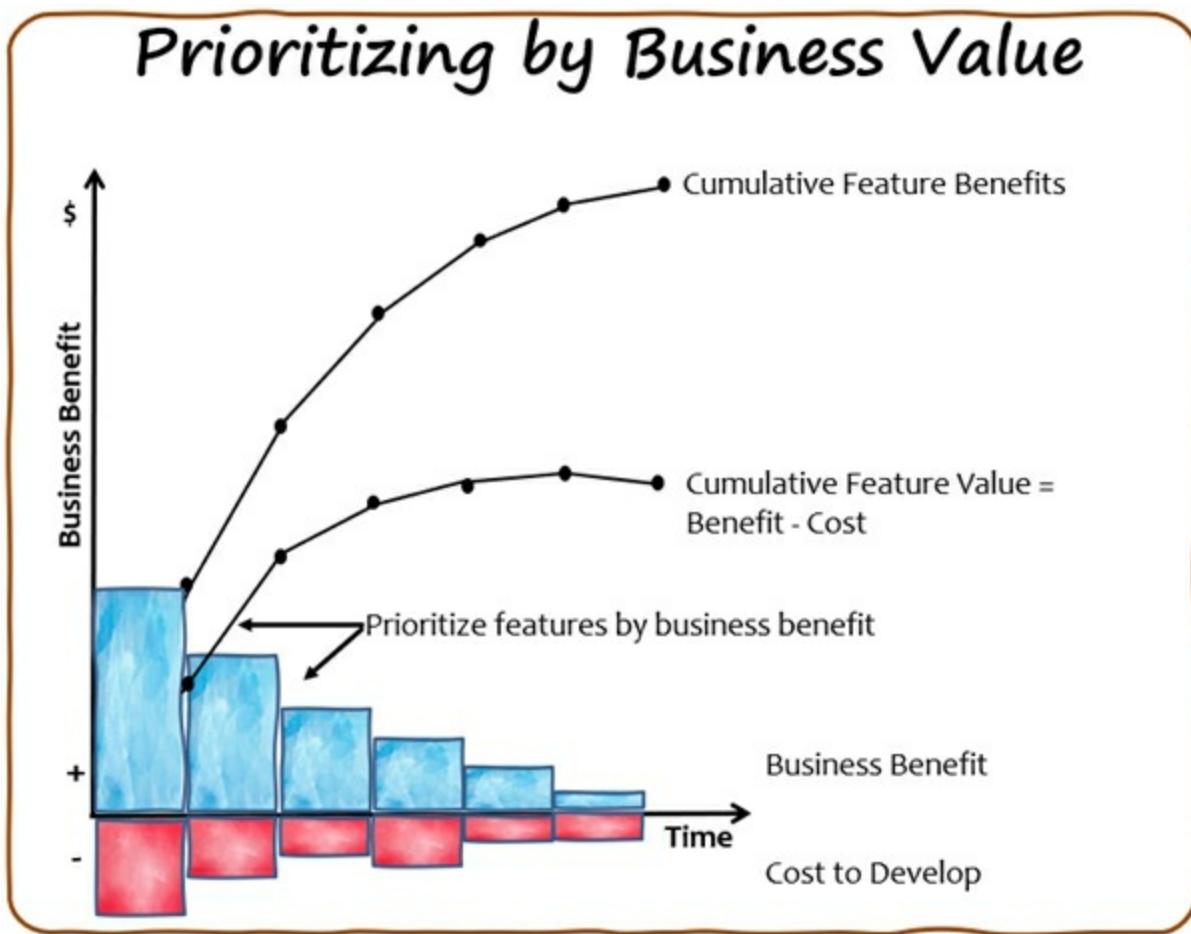
Agile projects often prioritize their product backlog based on business benefits, so they deliver the highest value items first.



However, as we saw with the discussion of value analysis, the business benefit is only part of the complete picture. We also need to factor in the cost to develop those features. Value is often expressed as

$$\text{Value} = \text{Benefit} - \text{Cost}$$

So, a more accurate way to depict the agile prioritization would be net of costs.



In the graph above, the last feature costs more to develop than it delivers in value. So, this should probably be cut from scope unless it has some non-financial benefit. This introduces another topic we need to be aware of, Benefit-Cost Analysis



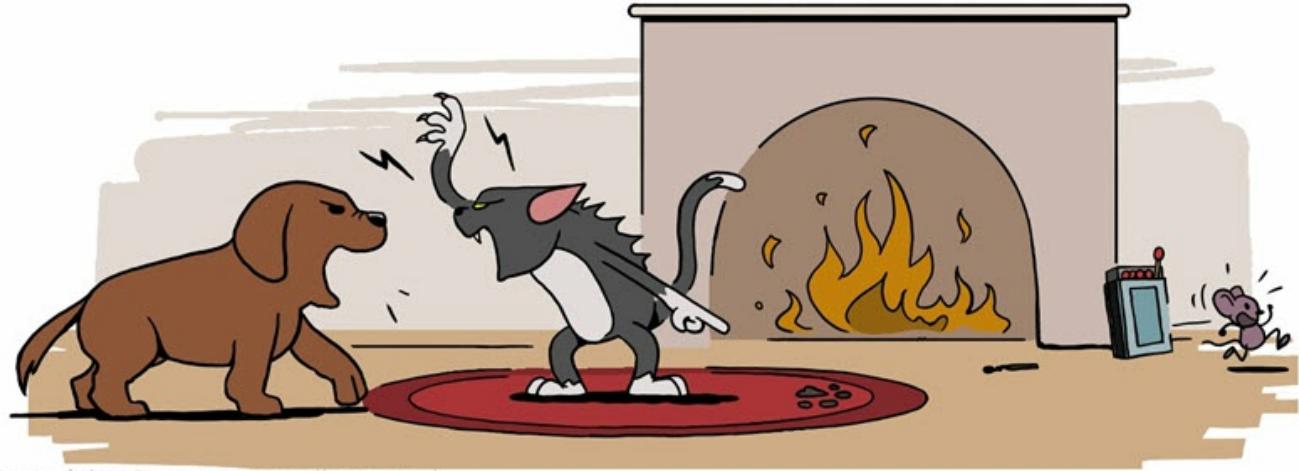
Benefit-Cost Analysis

Also called Cost-Benefit Analysis, this is the process of examining the pros and cons, strengths and weaknesses of alternatives to find the best approach for achieving benefits while preserving savings. It helps us compare several potential projects and choose the best one or ones to authorize.

Of course, the accuracy of the analysis depends upon the quality of the input data. If groups artificially inflate the business case of their initiative so it looks more attractive and wins funding this will likely cause problems when the project benefits fail to be delivered. Value Performance Analysis feeds back the actual business benefits into strategic planning.

3.2.2 Document Agreement on Ownership for Ongoing Benefit

Realization



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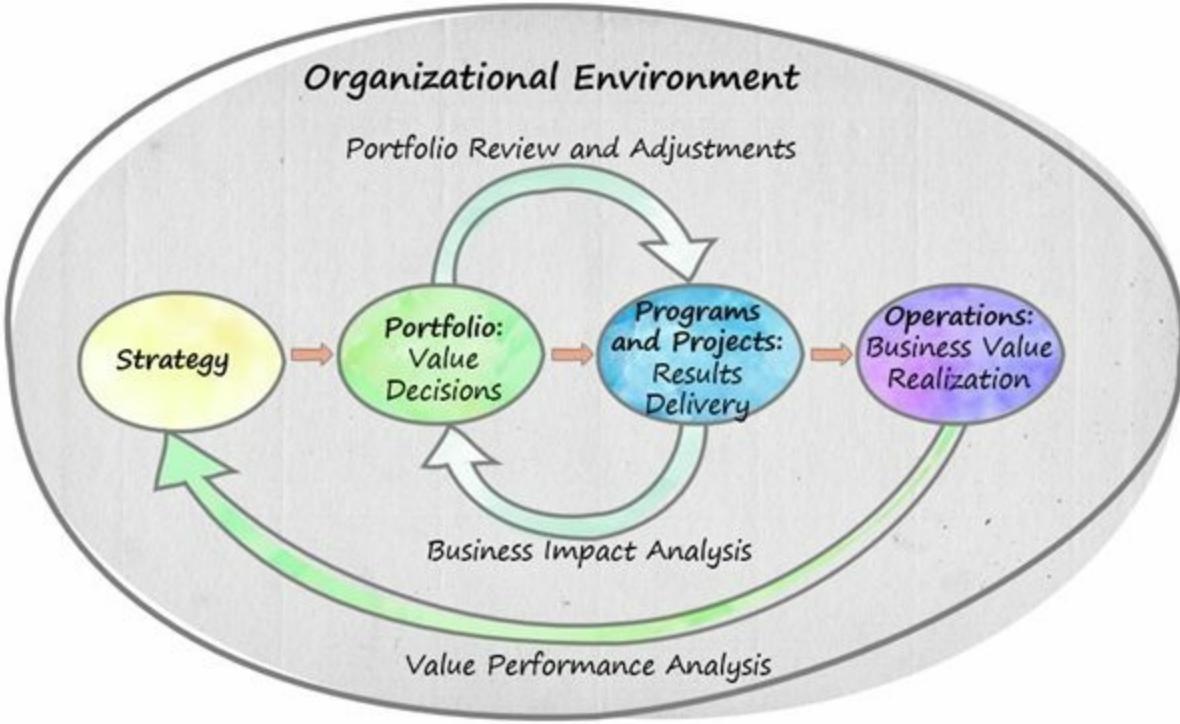
(Understand the benefits and their ownership)

Since benefits and value drive so much project effort and expenditure, it is important to have a firm handle on understanding what is expected, who owns it, and how we will measure it. That way, we will know when we are done and if it was successful.

Identifying and attempting to quantify the project benefits and value may highlight gaps or flaws in the business justification. It is much better to find out about deficiencies early to divert funds elsewhere rather than go through the trouble of making something only to discover this later.

Of course, some benefits are intangible or based on speculative information. Spending \$10 million to develop a language learning application is great if it becomes more popular than, say, DuoLingo, but not so good if only a couple of thousand people download it. Project managers need to understand the basics of estimating the return on investment, decision tree analysis, risk and uncertainty.

Projects typically form part of a larger system called “Organizational Project Management (OPM) and Strategies”. In this larger ecosystem, organizations use portfolios, programs, and projects to deliver strategic objectives. Or in other words, companies determine what they want to achieve (strategies) and use portfolios, programs and projects to make those things happen.



Here we see Strategy feeding into a Portfolio where decisions about what to fund are made based on maximizing the likely value. These value decisions result in Programs and Projects that (hopefully) deliver the anticipated benefits. Nothing is guaranteed though and so there is an inner cycle of feeding business impacts back into the value decision process and making adjustments to programs and projects.

When projects complete, they typically hand over their new product or service to Operations, where the bulk of the business value realization occurs. Finally, value performance analysis feeds actual results of achieved value back to the Strategy process.

The main components are:



Strategy – Deciding what to work on. This includes creating strategies to maximize value.



Portfolio Management - Aligning work streams (portfolios) with the organizational strategies by selecting the right programs or projects, prioritizing this work, and providing the needed funding and support.



Program management - harmonizes its program components and manages interdependencies between initiatives to realize the specified benefits.



Project management – enabling the achievement of organizational goals and objectives.

As project managers, we get involved at the last step, turning the hopes, dreams and aspirations of strategy into real results and outcomes. However, it is important that we understand the language and definitions of many of these pre-project planning activities.

Who owns the benefits delivered by the project is typically part of the Business Management Plan. The Business Management Plan, along with the Business Case, are inputs to the Project Charter.



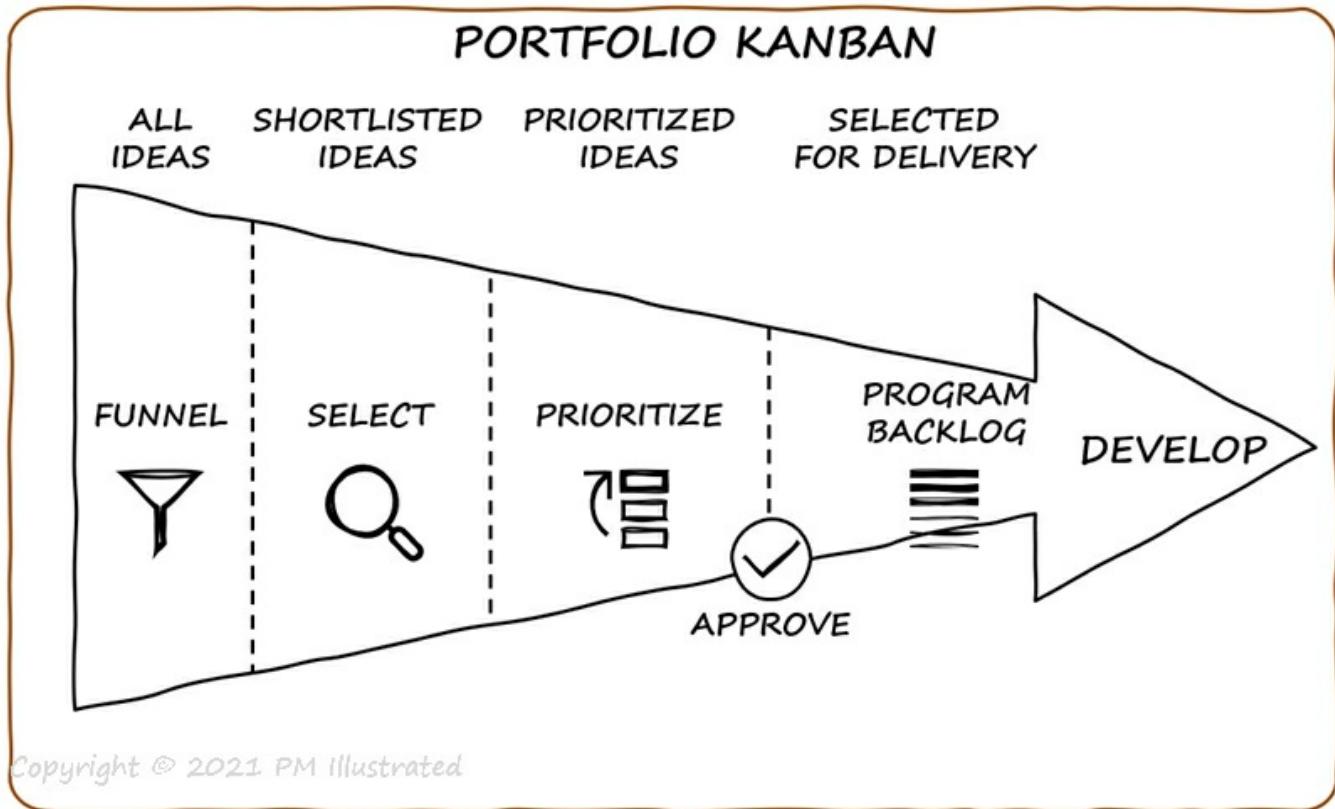
Benefits Management Plan. A description of how and when the projects' benefits will be obtained and measured. It typically contains sections including:

- **Strategic alignment** - How the project and its benefits align with the strategies of the organization and which group owns the benefits.
- **Target benefit** - The expected tangible and intangible business value to be achieved by the project.
- **Timeframe** – When the benefits will be delivered (short-term and long-term)
- **Metrics** – How the benefits will be measured. Both direct and indirect measures.
- **Risks** – Any risks associated with achieving the identified benefits.
- **Assumptions** – Any underlying assumptions the benefits management plan rely on.



Portfolio Kanban

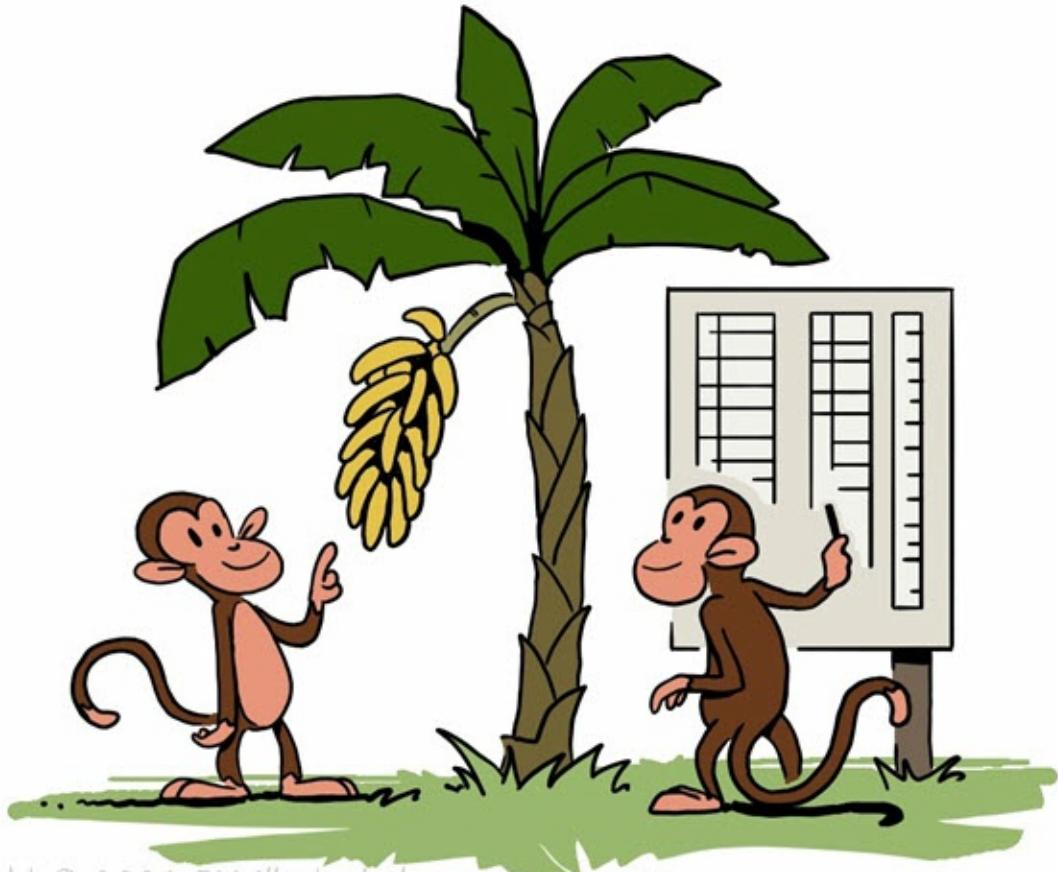
Organizations using agile or hybrid approaches may use a portfolio Kanban system to manage ideas through the stages: capture, evaluation, selection, sequencing, and delivery system.



Using portfolio kanban system, all ideas are welcome into the input funnel and there is no limit on the number of ideas that can be submitted. A high-level feasibility evaluation is performed, and a Go/No Go decision is made moving approved candidates into the Shortlisted Ideas category. Here a value statement is created and the understanding refined. The number of items is limited to keep workloads manageable and flowing quickly.

The next stage, Prioritize Ideas, sorts them by business value and then, based on capacity, the highest business value ideas are selected for delivery. They are placed in the program backlog and moved into the development stage when teams become available.

3.2.3 Verify a Measurement System is in Place to Track Benefits



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(Measure the project benefits)

Projects use many tools and techniques to measure and track benefits. Listed below are the popular ones we need to know about.



Return on Investment (ROI)

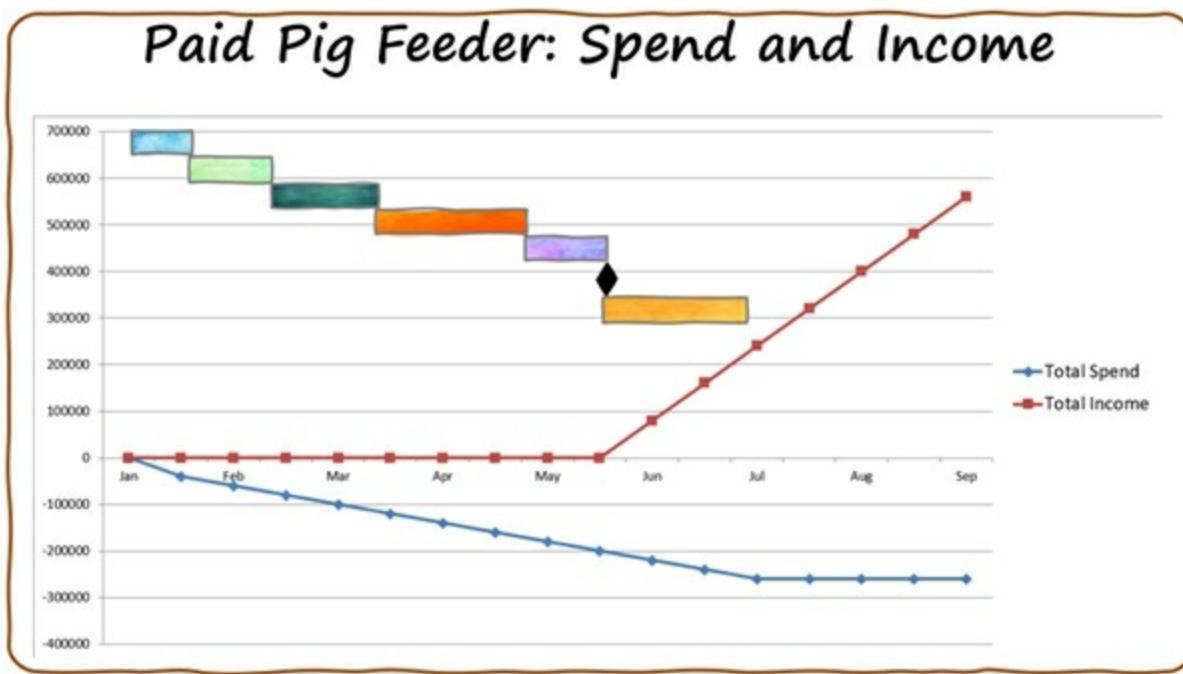
The return on investment is a financial measure of the gain (or loss) from an investment compared to the amount of money invested. Also known as the rate of return and usually expressed as a percentage. A high, positive ROI rate is a good investment, and a low or negative ROI is a lousy investment.

A practical way to understand the variety of financial tools used to evaluate value is with a mini-case study and plenty of pictures.



Paid Pig Feeder Project

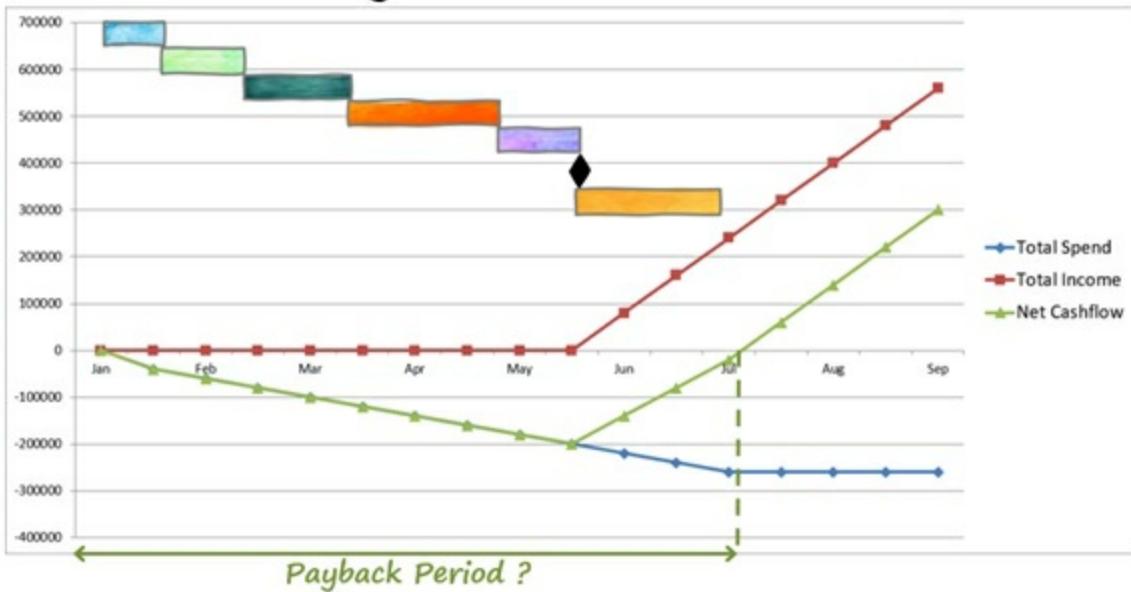
Suppose we were developing a project to select, install, test and deploy a new pig food vending machine at a petting zoo. The idea is that people can pay by coins or credit card and get a cup of food to go feed the pigs. We need to feed the pigs anyway, but this way we can get other people to do it and charge them for the process. The basic schedule and estimated financial data are shown below.



The colored bars at the top of the graph depict the tasks of starting the project, gathering requirements, evaluating machines, purchasing, installing and testing in mid-May (shown by the black diamond.) The orange task after deployment shows the first 45 days of use during which time, we are responsible for supervising its use and the pig's health.

The blue line shows the total cumulative spend over the length of the project. The red line shows the total income gained from the pig feeder that starts immediately after deployment.

Paid Pig Feeder: Net Cashflow



In the image above, the added green data series shows Net Cashflow (Total Spend – Total Income). We can see this line passes through zero indicating we have paid back the project expenditure and have broken even around the start of July. (This is a very short payback period, but perhaps we have very hungry pigs and very expensive pig food!)

It would seem like the payback period ends in July, but because of inflation, the future value of money is not as valuable as having that same money today. We measure the impacts of time and inflation on future values using the concept of Present Value.



Present Value

The current value of a future amount of money. The formula for Present Value (PV) is

$$PV = \frac{FV}{(1 + r)^n}$$

FV = Future Value
 r = Interest Rate
 n = number of time periods

So, the present value of \$50,000 received in 5 years time with an inflation rate of 7% would be

$$PV = \frac{\$50,000}{(1 + 0.07)^5}$$

$$PV = \$35,649$$

This means given the choice of receiving \$36,000 today or \$50,000 in 5 years, we should opt for \$36,000 if we believe the inflation rate will be 7%.

When we want to evaluate an income stream, we use a string of these Present Value calculations in a technique called Net Present Value.



Net Present Value

Net Present Value is the sum of the outputs and inputs, all adjusted for todays value using the Present Value formula we just looked at.

Net Present Value

Net Present Value = The total benefits (income less the costs) for a revenue stream

I = Income for each year

r = Discount Rate

n = number of time periods

$$NPV = I_0 + \frac{I_1}{(1+r)^1} + \frac{I_2}{(1+r)^2} \dots + \frac{I_n}{(1+r)^n}$$

As an example, let's assume we have a project that costs \$150,000 in the first year and then returns \$40,000 for the next 4 years, with a discount rate (inflation/interest rate) of 5%.

Here the $NPV = -\$150,000 + \$40,000/(1+0.05) + \$40,000/(1+0.05)^2 + \$40,000/(1+0.05)^3 + \$40,000/(1+0.05)^4 = -\$8,162$

We might have thought it should have broken even since $4 \text{ years} \times \$40K = \$160K$ and it only costs us \$150K but because those future \$40,000 payments get discounted, it does not and after 4 years we are still down \$8,162.

NPV can be especially helpful when comparing projects with different timeframes or deliver value at different times. For example, what if we are trying to choose between a project that we expect will deliver a 10%ROI in 12 months and one that we expect will deliver a 17% ROI in 36

months? Does inflation and interest over the longer period cancel the higher ROI of the second project? To find out, we would calculate the NPV of the two projects, and see which one has more value in today's money.



Internal Rate of Return (IRR)

This one might sound complex to begin with, but it is quite simple. It is the interest rate that would be required to plug into the NPV formula to make the payback period the end of your project. Or make the net present value of all cash flow equal to zero by the end of your project.

It gives us a single figure for comparing the financial return of projects. If project A has an IRR of 20% and project B has an IRR of 25% then we should invest in project B (all other factors being equal).

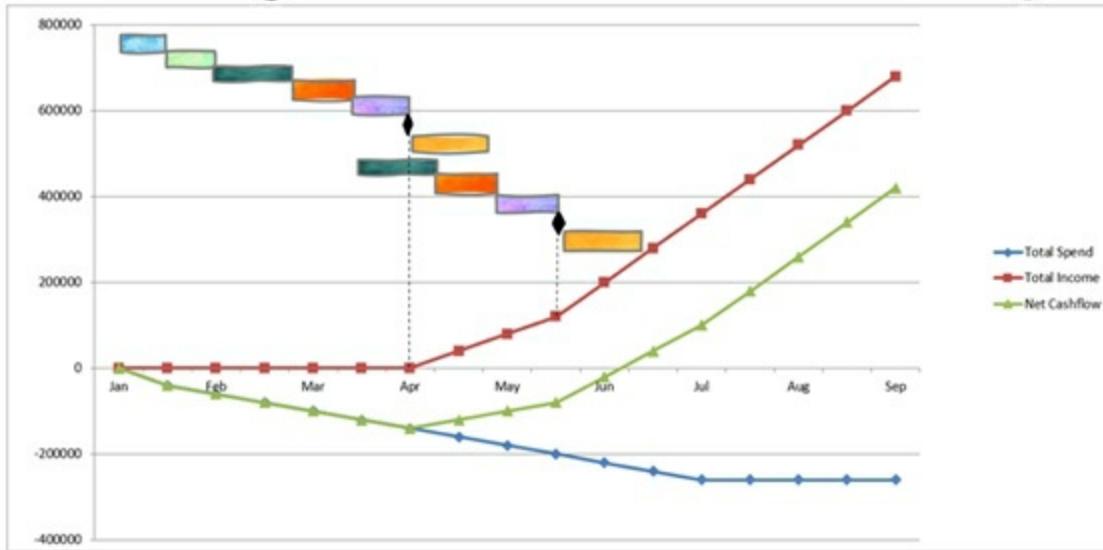


Incremental Delivery

Hybrid and Agile often try to deliver value as early as possible. For our Pig Feeder project, if it were handling the payments that was dictating the completion date, maybe we can get one of the payment methods (coins or credit card) completed sooner. It would not provide all the business benefits but would allow for some income to be achieved while work continued on adding the other payment method. (Or sell pig food first and also add goat food later.)

This incremental delivery schedule with initially reduced earnings is shown below.

Paid Pig Feeder: Incremental Delivery



In this scenario, we have an initial delivery in April that starts to generate a small income followed by the second delivery in mid-May that delivers the remaining benefits. This shortens the payback period even more.



The exam assumes projects are selected based on sound economic reasons or benefits, not on the whims and ideas of senior executives. So if you work in an organization where the business rational for projects is rarely communicated, assume you are working where it is clearly articulated.

3.2.4 Evaluate Delivery Options to Demonstrate Value



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(Investigate options to show value delivery)

Often the project benefits are not delivered until the end of the project. Occasionally it can be long after the project has finished that the benefits are seen. That can be too long for sponsors and senior stakeholders to wait and so we often want interim measures and demonstrations of value.



Agile Demos

Agile projects demonstrate new features at the end of every Sprint or iteration (typically every 1-2 weeks). This demonstration of functionality shows what the project team has been working on, the elements that have been completed, and can discuss priorities for upcoming work.

Demonstrations provide an opportunity for obtaining feedback from interested stakeholders. This includes validation of suitability (we hear things are going well) or potential issues (people report things are not looking so good). Both types of feedback are valuable. If changes need to be made, it is better to learn about them as early as possible.



Net Promoter Score (NPS)

Net Promoter Score is a measure of a customer's willingness to recommend a product or service to a friend or colleague. NPS has been widely adopted by Fortune 500 companies and many other organizations. It is a good proxy for overall satisfaction because the person being questioned needs to consider the whole picture then decide if they would recommend it. The “...to a friend or colleague” component may also help bring in core subjective qualities that a purely analytical assessment might miss.

NPS is calculated by calculating based on responses to a single question: “**How likely is it that you would recommend our company/product/service to a friend or colleague?**” The scoring for this answer is usually based on a 0 to 10 scale. Where 0 = “No-way/never” and 10 = “Absolutely/every-time.” Using the scores, people are divided into the following categories:

0-6 Distractors

7-8 Passives

9-10 Promoters

The final NPS Score = % of Promoters - % of Detractors

So, if we asked 5 people at our Sprint Demo “How likely is it that you would recommend our pig food vending machine at the petting zoo to a friend or colleague?” and received the following scores:

Stakeholder 1 = “4”

Stakeholder 2 = “7”

Stakeholder 3 = “9”

Stakeholder 4 = “10”

Stakeholder 5 = “8”

We would have 1 Distractor, 2 Promoters (and 2 Passives). Our NPS Score would be:

NPS = % of Promoters - % of Detractors

NPS = (2 out of 5 = 40%) – (1 out of 5 = 20%)

NPS = 40% - 20%

NPS = 20

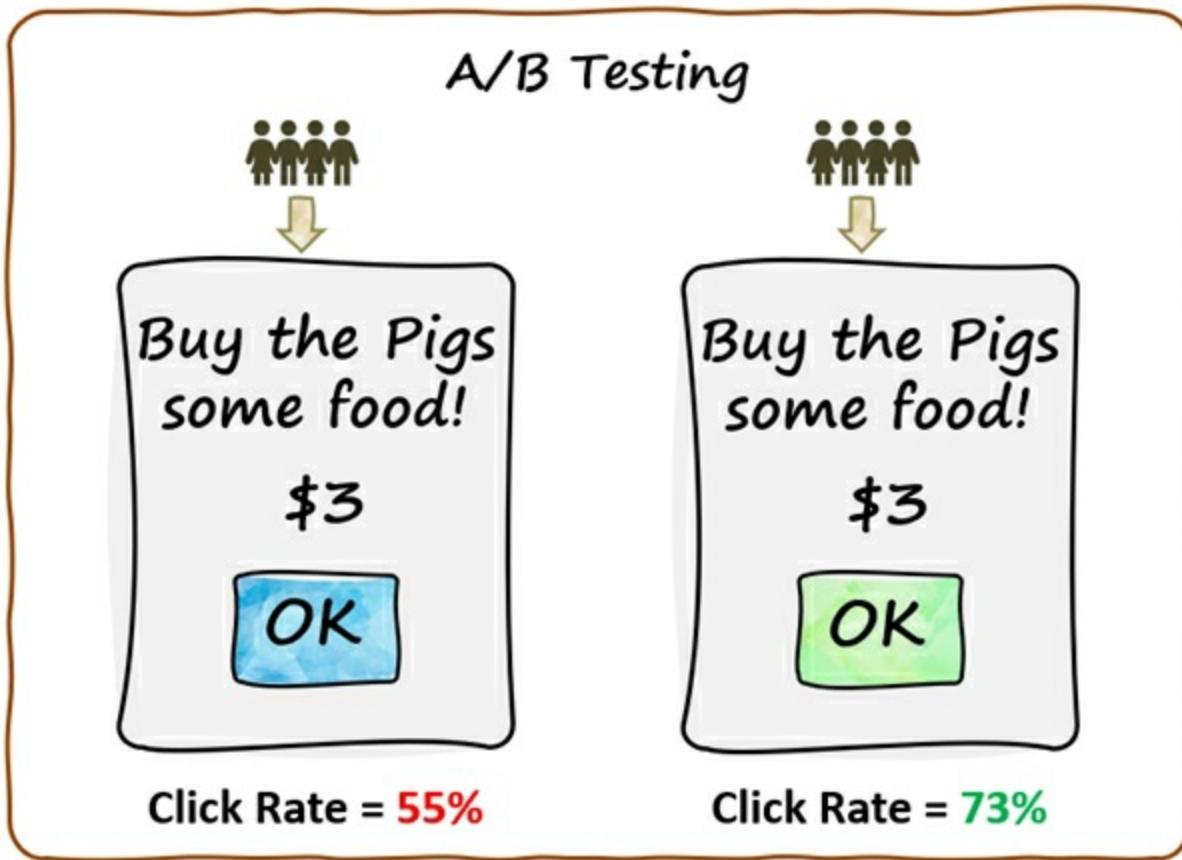
Note: NPS is usually displayed as number, not a percentage. So, in the example, above the NPS score is 20.

So, is this a good score or a poor one? It depends and is more useful as a trend metric. NPS ranges between -100 (all respondents are "Detractors") and +100 (all respondents are "Promoters"). A good score is simply one whose trend is better than how we were doing before. Or we can see if we are scoring better than our competitors in the same industry, by measuring in a double-blind survey.



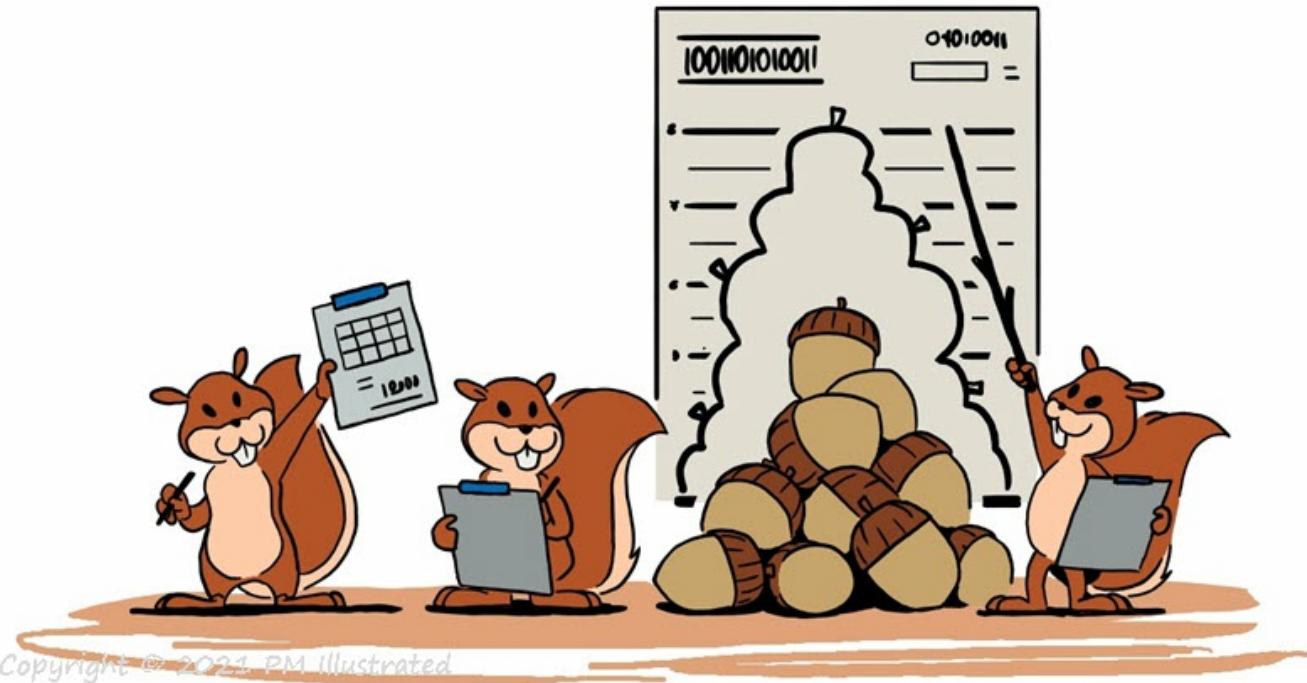
A/B Testing

A/B testing, also known as split-run testing, is a way of comparing two design choices. A/B tests consist of a randomized experiment with two variations of the design being tested, design A and design B. For instance, our “A” design could be a screen with a blue button, and our “B” design the same screen but with a green button.



We present one sample of a randomized audience with design “A” and the other sample with design “B”. Whichever design gets the most clicks is deemed the more successful design. In the example above, the green button received more clicks so would be regarded as the preferred design. Companies such as Facebook, Amazon and Google run thousands of A/B tests daily to optimize engagement.

3.2.5 Appraise Stakeholders of Value Gain Progress



(Apply techniques to help show value and evaluate options)

Some more techniques we need to understand for assessing value and options include:

- Expected Monetary Values (EMV)
- Decision Tree Analysis
- Simulations



Expected Monetary Value (EMV)

Expected monetary value calculates the average financial outcome for future scenarios based on likelihood and estimated value. EMV is calculated by multiplying the monetary value of an outcome by the probability of its occurrence. So, if we think an opportunity may return \$2 million dollars if it is realized and there is a 50% likelihood of it occurring then the expected monetary value (EMV) would be:

$$\text{EMV} = \$2,000,000 \times 50\% = \$1,000,000$$

EMV can be used for opportunities that have positive values and threats that have negative values. So, if we thought the threat of a project delay for the vending machine delivery would cost us \$4,000 and the probability of the delay is 75%, then:

$$\text{EMV} = -\$4,000 \times 0.75 = -\$3,000$$

EMV is often used for quantitative risk analysis and for evaluating project options or decisions in the next process discussed, Decision Tree Analysis.

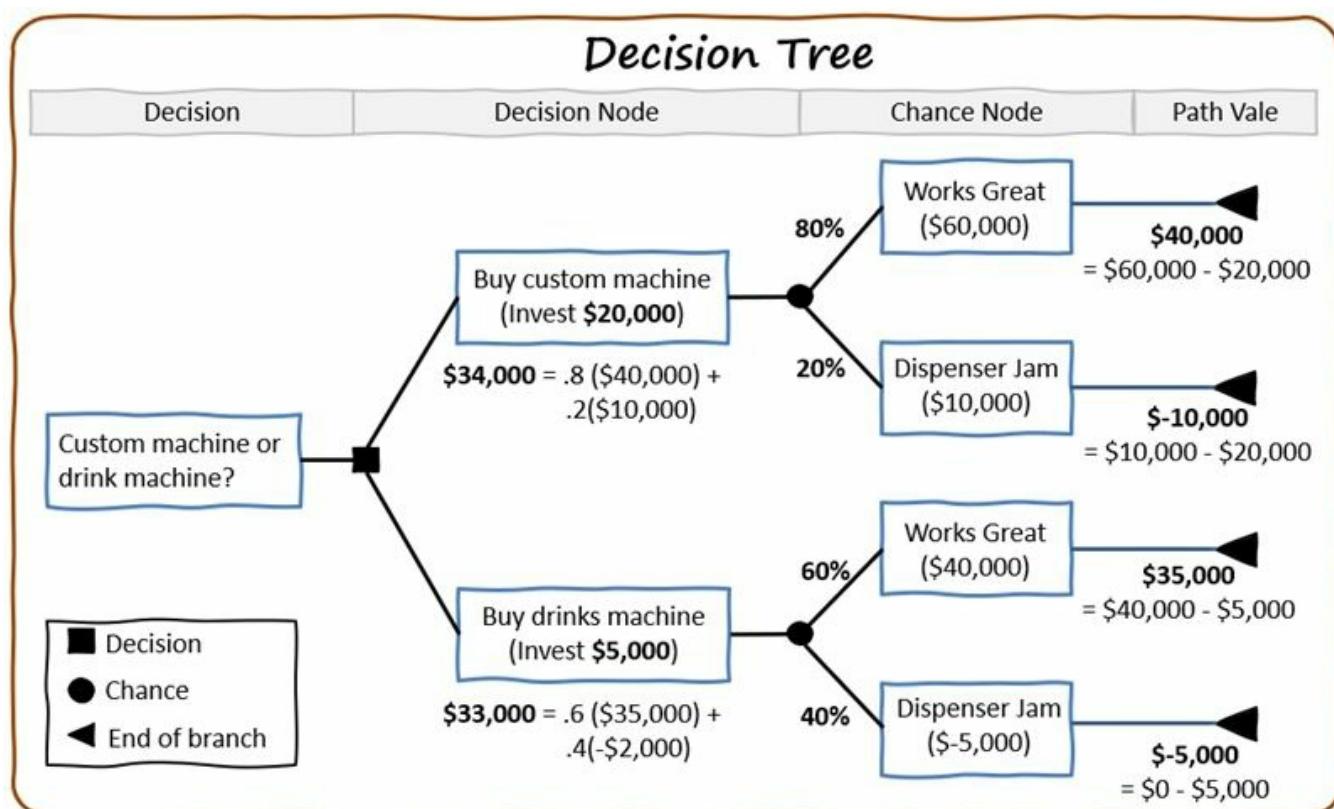


Decision Tree Analysis

A decision tree is a branching model showing decisions and their possible outcomes. It includes the chance of event outcomes, costs, and value. Decision Tree Analysis is the process of using a decision tree to analyze one or many decisions. It can be used to evaluate project options and decisions.

Consider for the Pig Feeder project; we have a choice to buy a fancy new specialized vending machine that will be branded with custom signage or use an old drink vending machine. The custom machine is designed to handle various package sizes but is not guaranteed for sticky products. If we use the bottle-vending machine, we will package the pig food in bottle shaped containers.

A new vending machine with custom graphics costs \$20,000 and is guaranteed to operate or the manufacturer will issue a refund minus a restocking fee and graphics fee of \$10,000. We project \$60,000 of sales with a custom machine and are 80% confident it will work. Without custom graphics, we expect \$40,000 in sales using the drinks vending machine and are 60% confident it will work. If it fails, we cannot return it after it has been tested with pig food. These options are shown below.



The decision tree shows the two choices, “Buy custom machine”, and “Buy drinks machine” along with the chances of success and final node values. The top node showing \$40,000 is calculated from revenue \$40,000 – cost of machine \$20,000. The two machine options are

assessed using Expected Monetary Value (outcome x probability.) Using EMV we calculate the value of the custom vending machine option at +\$34,000 and the value of the vending machine option as +\$33,000.

So, it would seem (from a bunch of guesses multiplied together) that buying a custom vending machine is slightly better. However, what if our 80% / 20% likelihood of success for the custom vending machine was more like 90% / 10%? We would have to redo the calculations to see what impact it had. As we would with every other variation we want to evaluate. This is where simulations are powerful.



Simulations

Simulation is an analysis technique where a computer model is run many times varying the input data based on input ranges, probability distributions and even probabilistic branches. A popular form of simulation is a Monte Carlo Simulation which uses random values between input ranges and re-runs a set of calculations to model many possible outcomes.

Using Monte Carlo simulation, we could run 1,000 experiments where the probability of success for our custom vending machine varied between 65% and 95% with a strong preference (probability distribution) for values in the 75% - 85% range. We could also vary the projected revenue figures for both custom and drinks vending machines.

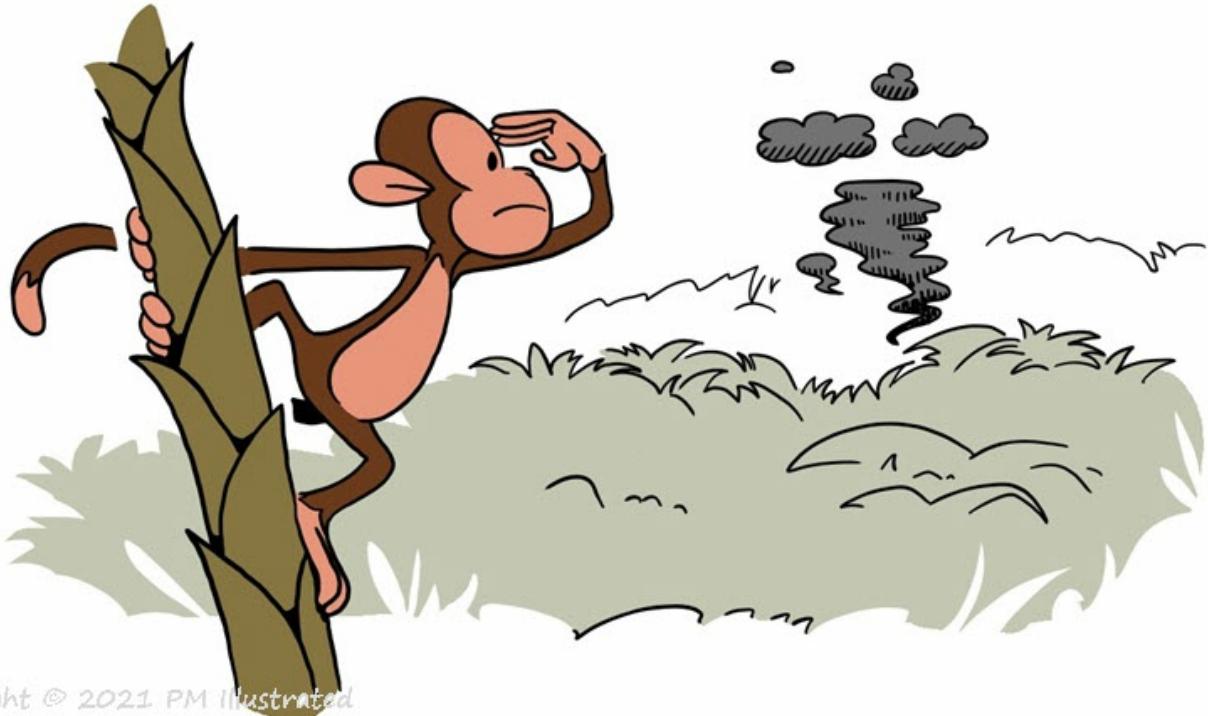
Varying all the input values at random between our likely ranges, Monte Carlo simulation analysis in a project management tool or simple Excel spreadsheet could quickly model 50,000 different scenarios and average EVM figures for both options. This weighted average may be quite different from the single path through the decision tree we calculated by hand.

3.3 Evaluate & Address External Business Environment Changes for Impact on Scope

“Change is inevitable – except from a vending machine” - Robert C. Gallagher

3.3.1 Survey Changes to External Business Environment

Look for changes to factors such as regulations, technology, geopolitical, market, etc.



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(Be on the lookout for signs of changes)

Changes to our projects come from inside our organization (Internal Business Environment) and from outside the organization (External Business Environment.) We need to be alert and ready to consider all forms of change. This does not necessarily mean accept the change but evaluate its impacts, costs and merits.

Project managers are usually the custodians of approved changes, meaning we must accommodate them, but we are generally not the people to approve them. That is typically a change control board, steering committee, project sponsor or product owner.



Internal Changes

MORTAR is an acronym to help remember internal business factors that can affect the value and desired outcomes of a project, leading to changes.



M - Maturation of ideas. As we start to flesh out what is required, we realize there is a lot more needed than initially stated. This is especially true of digital products where we may not have built anything like it before.

O - Organization changes. Sponsors, product owners and business representatives come and go. People get promoted or reassigned, and the replacement people often have different goals that bring about project changes.

R - Reprioritization. Strategies and organizational priorities change. Sometimes the reprioritization of projects or goals within projects will cause us to make changes.

T - Taking away deliverables. Sometimes things are not required anymore, perhaps we missed an opportunity, or it turns out not to be worth the effort once we investigate it.

A - Adding scope. More often, things get added. "While painting the exterior, can you fit new lights?" these changes all sound reasonable individually but can add up to large amounts of scope creep.

R - Rethink and pivot. Initiatives with high rates of uncertainty or complexity may not go as expected. Perhaps after investigating building a website to rent garden tools locally, we switch to creating a hub for exchanging them.



External Changes

PESTLE is an acronym to identify the external business environment factors that can affect the value and desired outcomes.



P - Political. Any way a government intervenes in the economy or a certain industry. This can include government policy, labor law, environmental law, trade restrictions, foreign trade policy, tax policy, etc. Also, governments may have an impact on the education system or infrastructure which may impact the viability of a project or create changes.

E - Economic. Events that affect the economic environment. It includes the financial models and accounting techniques used during the evaluation of the project. Factors include taxes, interest rates, inflation rate, exchange rate, wage rates, economic growth, recession, unemployment, credit availability, and financing availability.

S - Social. Social events that affect the project through market and community changes. These include shifts to remote work, cultural changes, population changes, health consciousness, global pandemics, career attitudes, global warming, etc.

T - Technical. Any and all technology related factors, including new tools, materials, platforms and environments. New technologies such as software as a service, platform as a service. New technology-based competition such as Airbnb disrupting hotel businesses. New advertising and distribution channels. New pricing structures such as eBay auctions, etc.

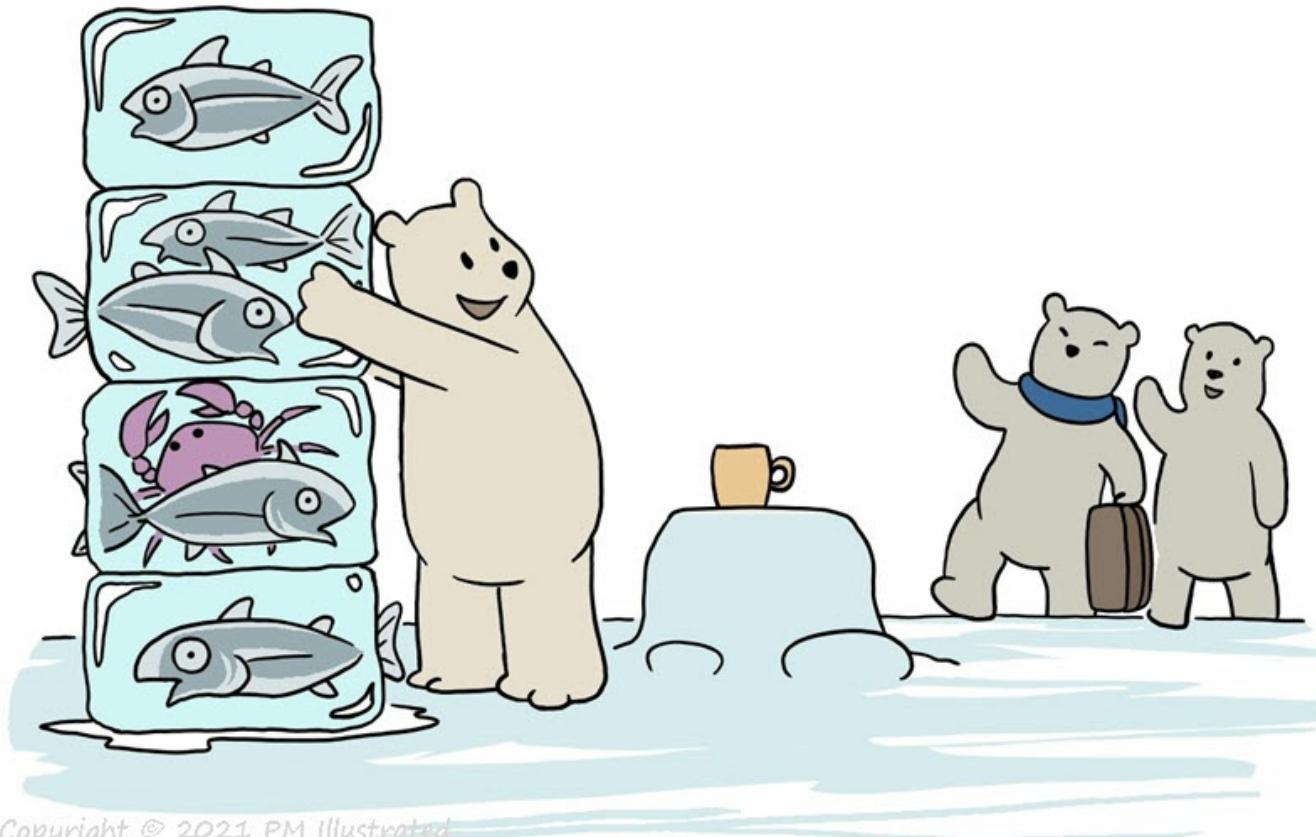
L - Legal. Legal factors including changes to laws impacting employment, imports/exports, quotas, taxation, access to materials and resources.

E - Environmental. Consideration of the ecological and environmental aspects of the project that could impact economic or social aspects. These include CO₂ emissions, ground contamination, water contamination, endangered species and habitats, global temperature, natural calamities, access by rail, air, and road, ground conditions, proximity to water sources, and heritage sites, etc.

MORTAR and PESTLE can be helpful tools to identify common factors that could impact our project. They can also be helpful in a team workshop environment to prompt discussions and to brainstorm about potential threats and opportunities. However, they are at best simplifications and do not replace consulting with subject matter experts. Also, in many business domains (biotech, AI) technology is outpacing legislation and reminder acronyms, so it is best to not rely on these mnemonics alone.

3.3.2 Assess and Prioritize Impact on Project Scope/Backlog

Assess and prioritize the impacts to project scope / the backlog based on changes in the external business environment.



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(When changes occur, adapt)

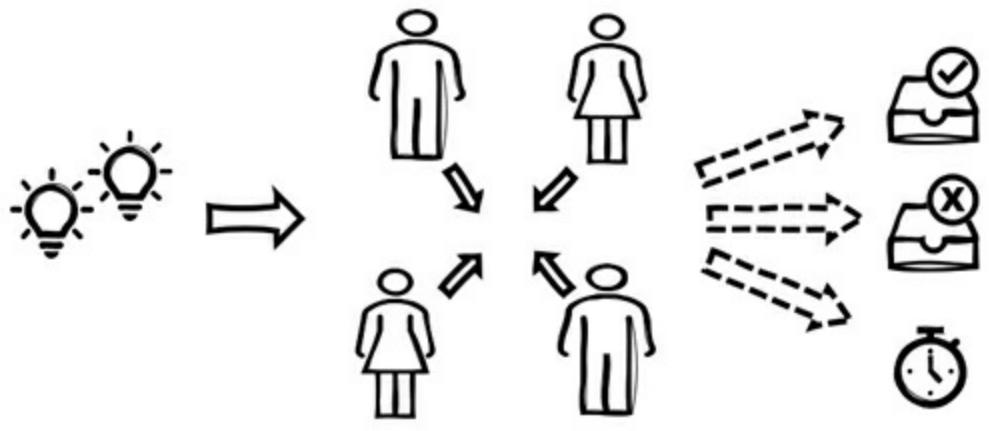


Change Control Boards

A Change Control Board (CCB) is a formally chartered group responsible for reviewing, evaluating, approving, deferring, or rejecting changes to the project. The board represents key stakeholders for the project and is tasked with assessing changes in terms of cost, schedule, risk, and value impact. They are created to manage all project change requests fairly.

A Change Control Board (CCB) may meet on-demand for high-priority requests or on a regular schedule, such as once a week or once a month. In addition to deciding on project changes, they are also responsible for recording and communicating such decisions.

Change Control Board



1) Change requests are batched for review

2) CCB convenes and reviews requests

3) Requests are approved, declined or deferred

Once a decision has been made by the CCB, the scope of the change is compared to the established tolerance thresholds. Changes within thresholds can be approved and initiated by the project manager. Changes outside of tolerance thresholds usually require the project sponsor to approve the change.



Product Owner as a Change Control Board

Agile approaches are often used in high change environments where many scope and trade-off decisions need to be made daily. In these situations, getting the change control board together, bringing them up to speed about the issue or request and letting them discuss and debate the pros, cons and various options would just take too long.

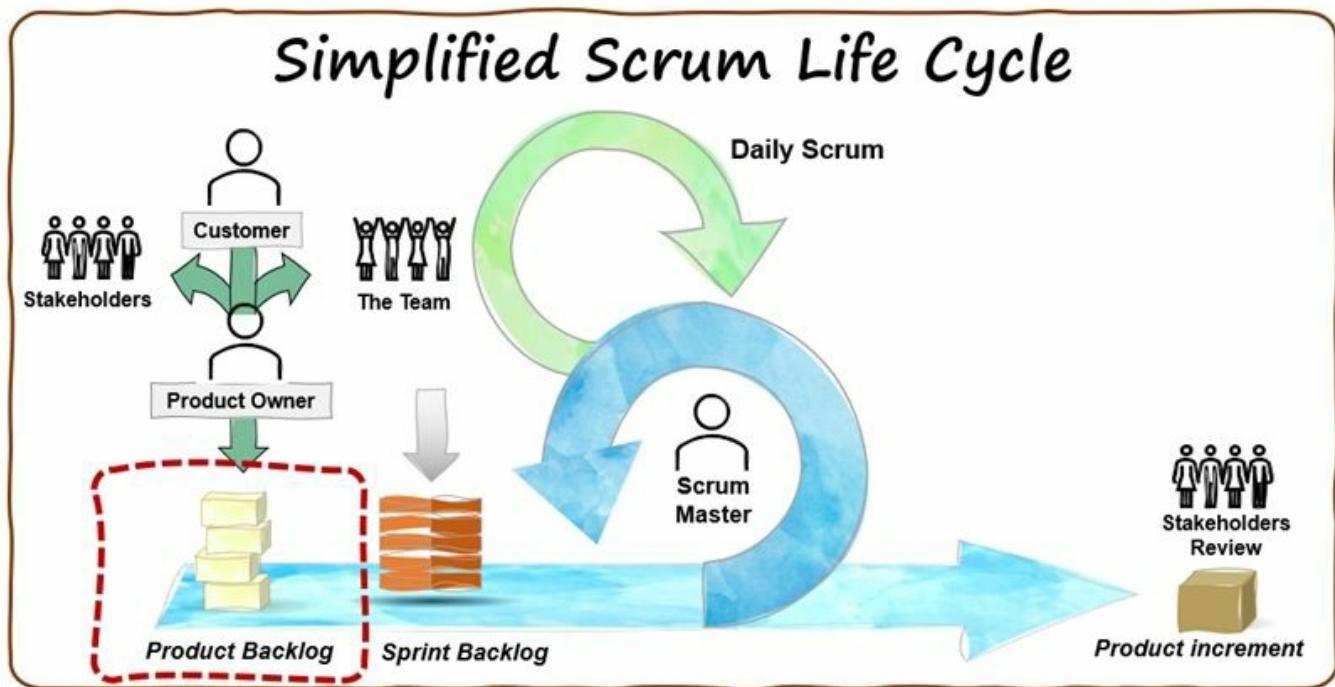
Instead, the Product Owner is empowered by the business to make scope, priority and change decisions on behalf of the sponsor. They are trusted to do the right thing, act on behalf of the business and customers and manage the bulk of all change decisions themselves. Unless a change would materially impact the outcome of the project, the Product Owner approves, rejects and defers changes daily.

Product Owners often consult with the Scrum Master / team lead and members of the team to get information about estimates, dependencies and risks but otherwise have the autonomy to make project decisions.

As a <Role> I want <Functionality> So that <Benefit>
As a <Role> I want <Functionality> So that <Benefit>
As a <Role> I want <Functionality> So that <Benefit>
As a <Role> I want <Functionality> So that <Benefit>
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Backlogs

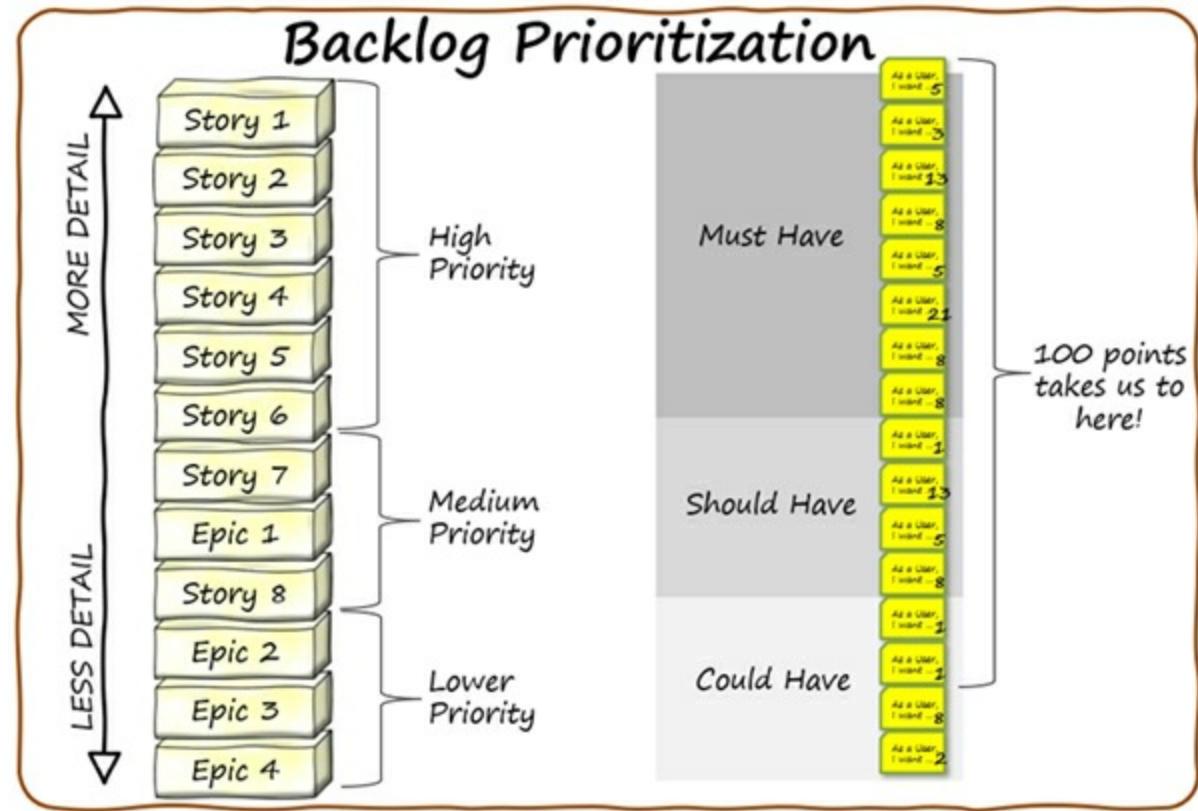
Agile projects use a Product Backlog to store and collaborate on upcoming work items. The backlog is prioritized so the next items to be worked on are at the top of the backlog. In the simplified Scrum life cycle diagram below, the product backlog is highlighted in the red dotted square.



The Product Owner takes input from customers, the team and other stakeholders, then makes their decision on the priority of items in the backlog, the highest priority at the top. During sprint planning, the team and product owner take the top priority backlog items and break them down into more detail to form the sprint backlog that gets worked on in the next sprint.

The product backlog contains the project's high priority, medium, and low priority work items. Items near the top of the list will be more detailed and broken down into well-understood user stories. Items further down the backlog might be larger, placeholder epics or features that have been analyzed in less detail (but will be progressively elaborated as they move up the backlog.)

Backlog Prioritization



The column on the right in the image above shows how the team's capacity is used to gauge progress and check completion targets. By estimating stories in points and tracking how many points get delivered per sprint, coarse-grained predictions are possible.



Update Baselines

With traditional life cycle projects, after the initial plan is created, it is saved as a baseline. This baseline plan acts as a reference point for comparison and tracking progress. As changes are approved, the baseline is updated to reflect any new requirements or deliverables so that progress is being tracked against the new updated baseline plan.

The project management plan includes scope, schedule and cost baselines. Together these baselines form an overall performance measurement baseline. When changes occur, potential impacts to the performance management baseline are examined to understand the likely impacts of the change.

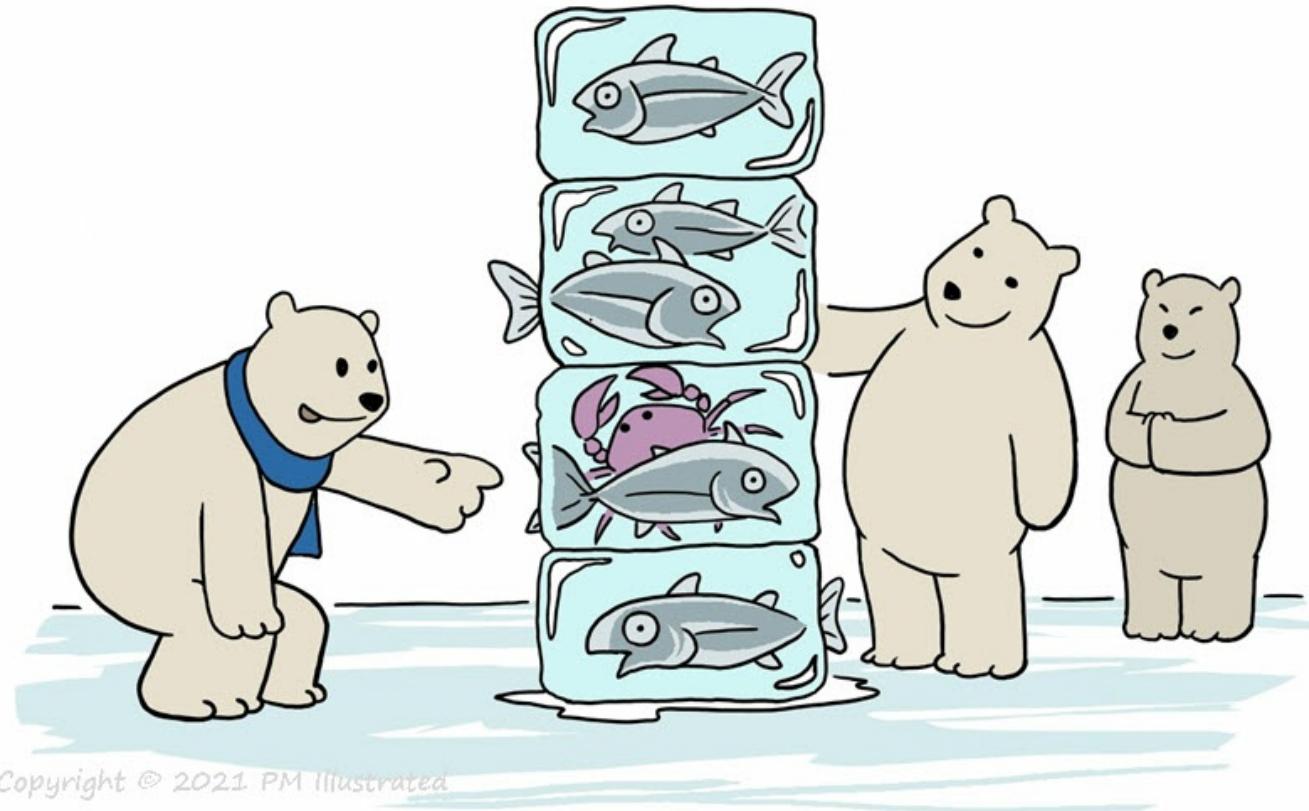


Configuration Management System

A Configuration Management System (CMS) is a collection of procedures used to track project artifacts. These days, CMSs are usually computerized content management systems that allow monitoring and reporting on project artifacts. When a change occurs on the project, any associated configuration items should also be updated. The CMS maintains the change history of all components tracking what changed and who changed it to effectively control the versions of all the project components.

3.3.3 Recommend Options for Scope/Backlog Changes

(Full EDO Title: Recommend options for scope or backlog changes such as updating schedule, budget.)



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(When changes occur, manage the implications)

“The only constant in life is change” – Heraclitus 500, BCE.

A project manager's life would be much simpler if changes did not occur, but like schoolteachers not having to deal with naughty children, that is not going to happen. We are much better served with learning how to deal with changes effectively. Also, sometimes change can bring a competitive advantage.

Being the first organization to respond to a market shift can bring huge economic returns, often referred to as “first-mover advantage”. So, what are our options for responding to change?



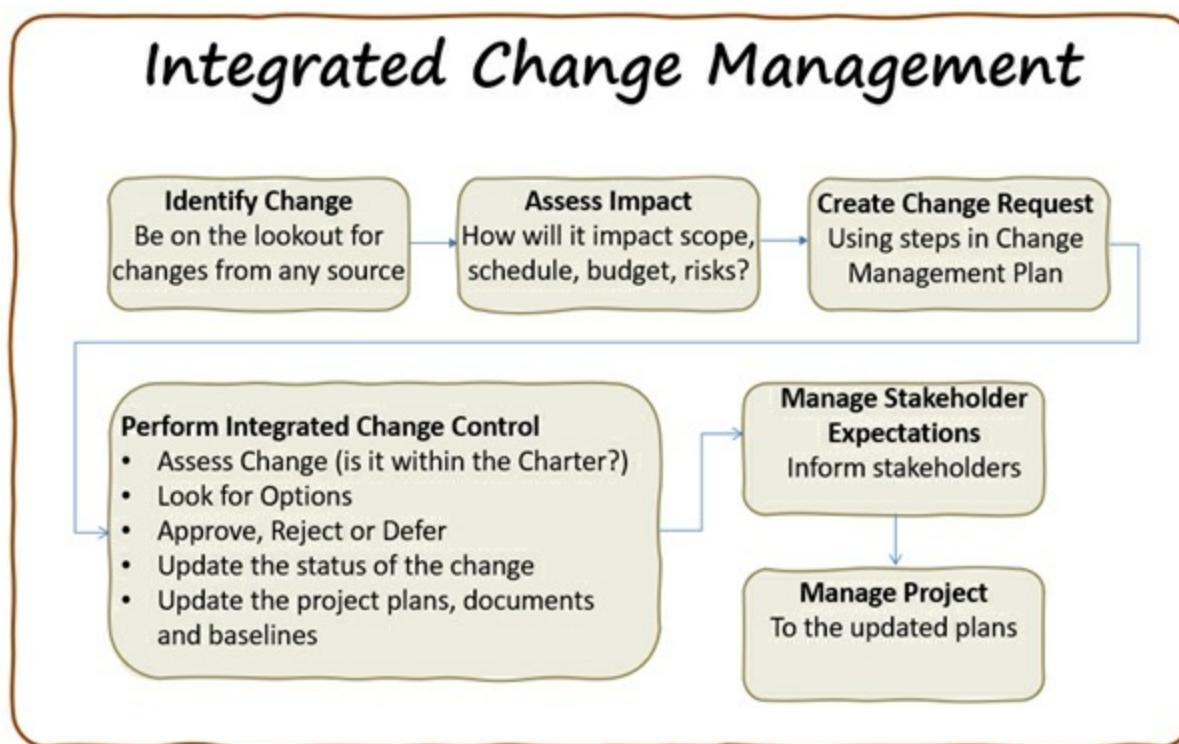
Integrated Change Management

Traditional projects have a comprehensive system for managing change. We have already discussed the Change Control Board, Baselined Plans and Configuration Management System. However, most projects also have a Change Management Plan that outlines who will be on the change control board, how it will operate and what to do with emergency changes.

There will also likely be a Change Control System to gather and track change requests in a standardized way. Plus, a Configuration Management Plan that explains the naming conventions, document management system and version control tools used.

When a potential change is identified, it is sent to the change control board who evaluates it. They will assess the change to see if it is in scope as defined by the charter and evaluate the options available. The CCB will make a decision, update the status of the change request and communicate their decision to the relevant stakeholders.

If the change was approved, the project manager can start updating and re-baselining the plans. The change is then will be actioned through the execution of the updated plans. The main components of this process, sometimes called Integrated Change Management, are shown below.

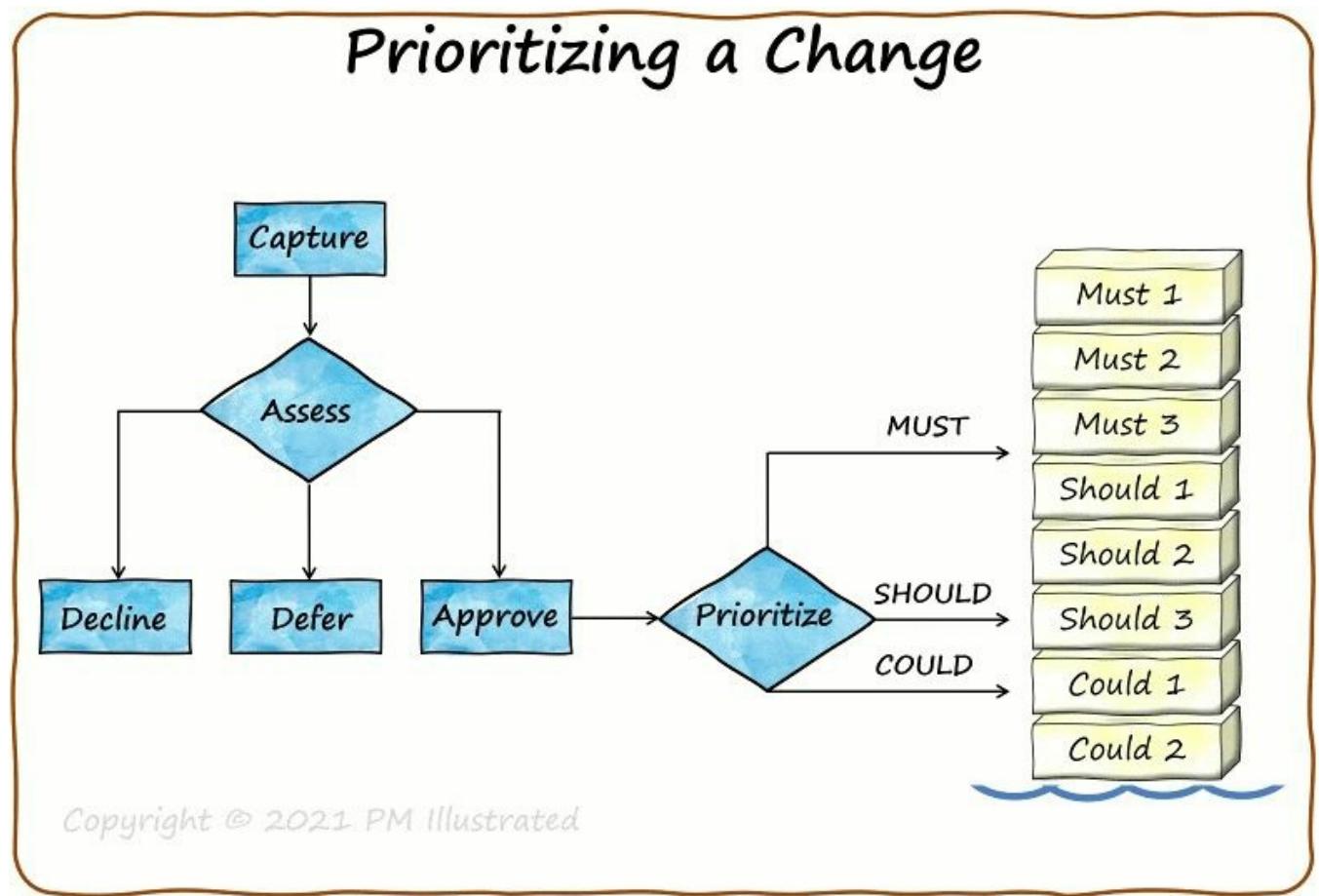




Changes and the Backlog

Using agile approaches, the Product Owner is responsible for conducting similar steps as identified in the Integrated Change Management approach shown above, just by themselves and with less documentation. The Product Owner monitors the internal and external business environment, looking out for opportunities, threats and change requests that might impact the project.

When a potential change is identified, they evaluate it, consulting with other stakeholders such as customers and team members to gather the required information. Then decide whether to decline, defer or approve the change. If approved, they assign a priority and put it in the backlog displacing items of lower priority down the backlog. This process is depicted in the image below.



The diagram shows a “water-line” of agreed to work below the original backlog. If we accept a change the Product Owner and other stakeholders must accept that it displaces a similar sized piece of work with a lower priority.

We can accept changes, even late in the life cycle sometimes, but we cannot defy the laws of time and space. An important note about agile projects is that all work goes in the backlog. We do not maintain a separate list of change requests or defect fixes. Everything lives in the backlog, so

priorities and remaining work is visible to everyone.



Backlog Reprioritization

In addition to new requests or changes being introduced into the product backlog, Product Owners also reprioritize items in the backlog as priorities change.

Reprioritizing the Backlog



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Other Responsibilities of the Product Owner

As well as maintaining and prioritizing the product backlog, the Product Owner ensures that the product backlog is transparent, visible and understood, i.e., everyone on the project understands what it contains and represents. Product Owners also perform several other critical responsibilities:

- **Creates and shares the product vision** - Developing and explicitly communicating

the product goal.

- **Coordinates business and customer engagement** – acts as the main contact with other stakeholders to gather and distribute product information.
- **Provides story input** – Creating and clearly communicating product backlog items. Ensuring the stories are “ready” for development and have acceptance criteria.
- *Oversees product development* – in collaboration with the team, they create release roadmaps, release plans
- **Collaborates with the development team** - Answers team questions about the solution, engage in team work sessions, provides timely feedback on demos and reviews, etc.



Minimums

Some commonly used agile terms relating to releases include Minimum Marketable Feature (MMF), Minimum Viable Product (MVP) and Minimum Business Increment (MBI). While they share the first word “Minimum” and all relate to the smallest increment of something, that something varies and so we should understand the definitions.

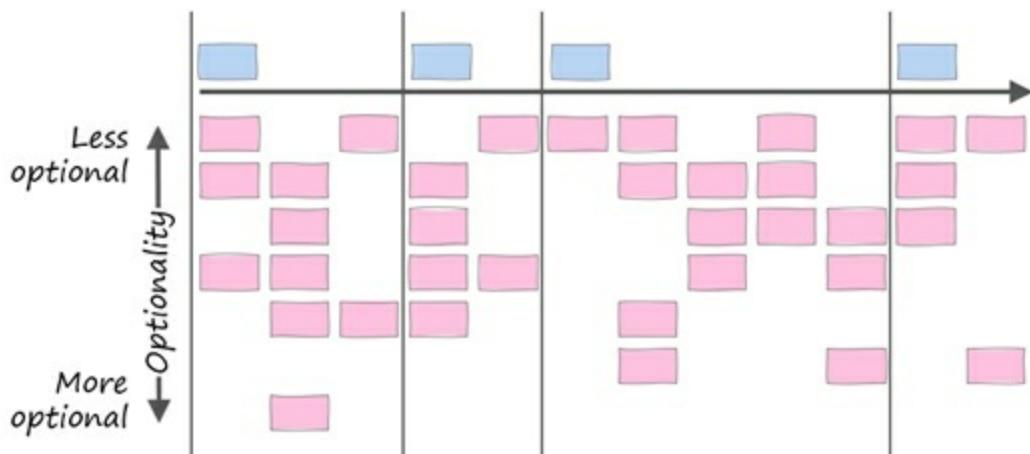
- **MMF – Minimum Marketable Feature** – A small, self-contained feature that can be developed quickly and that delivers significant value to the user.
- **MVP – Minimum Viable Product** - MVP is about learning more about the ultimate product. An MVP could range anywhere from not having any MMFs, to having a single MMF, to having several MMFs.
- **MBI – Minimum Business Increment** – A MBI is a description of the minimum amount of business value that can be realized from a business perspective. MBI is more related to MMF than MVP and was developed because some organizations objected to the term “marketable” since they did not sell products.



Updated Roadmaps

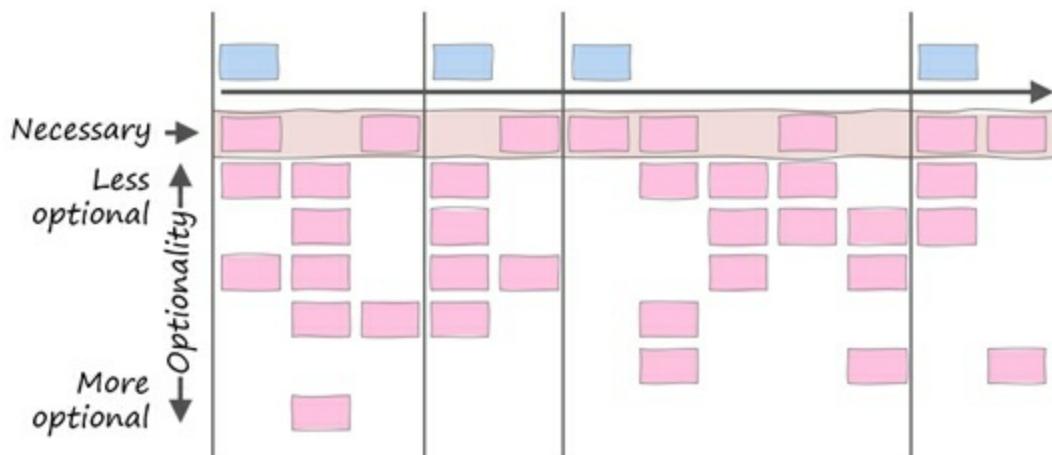
An output of evaluating project changes may include updated roadmaps. Roadmaps are high-level planning tools used to show chunks of functionality and their release targets. A Story Map is an example of a roadmap used to plan releases. In the image below, stories that represent functionality have been mapped out in functional areas by their Optionality – i.e. how critical they are.

1) Story Map - Release Roadmap



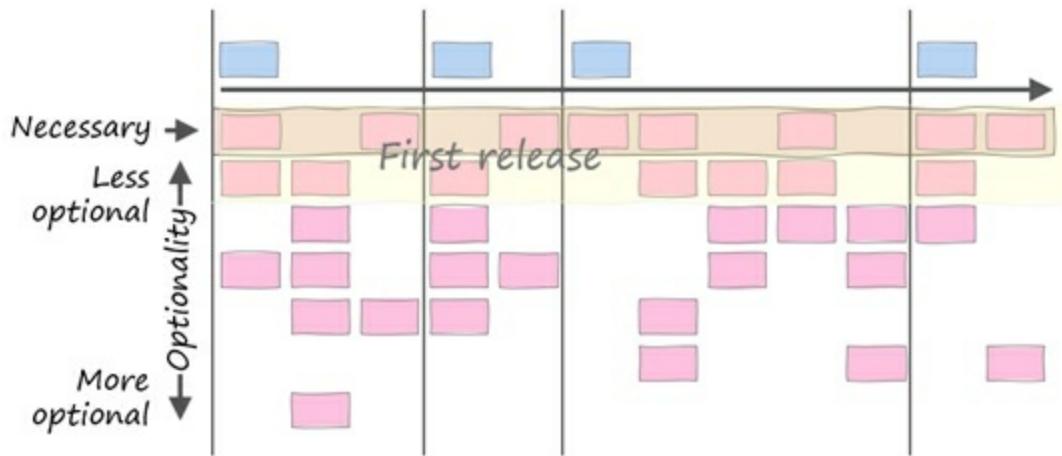
In pic 1) above, stories are arranged vertically based on how critical they are. The four vertical columns could represent different functional areas. If this were a Netflix-type video website, these areas could represent creating a database of movies, membership logon, browsing movies, and payments.

2) Story Map - Release Roadmap



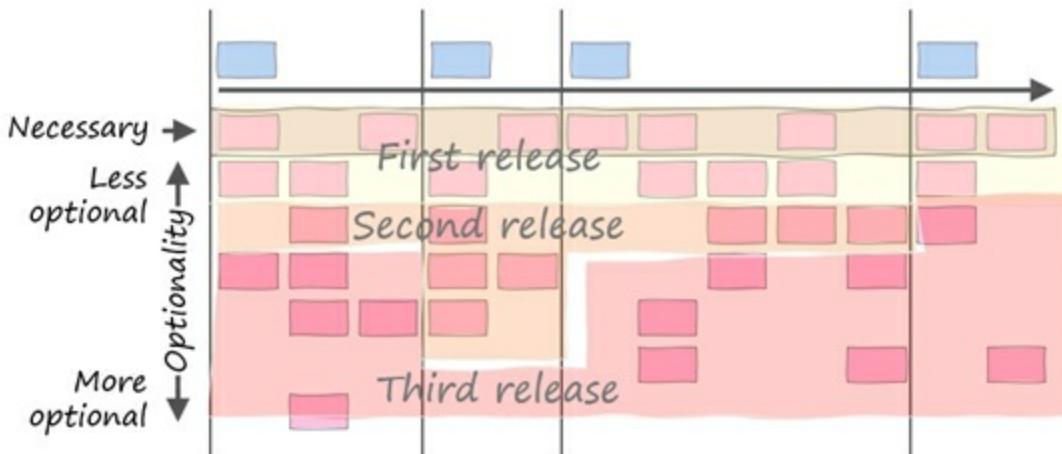
Pic 2) shows the most critical stories that represent the walking skeleton of necessary functionality. These items are enablers for subsequent features to be built on. They represent a pre-MVP infrastructure.

3) Story Map - Release Roadmap



3) Shows the stories select for the first release. They include all the necessary stories and others most critical for the first release. This might constitute a MVP if it contains enough functionality to be useful or might be for internal review to assess technical capabilities and gather initial feedback.

4) Story Map - Release Roadmap



4) Shows the Second release and Third release planned stories. They add additional functionality in coherent groups of features that consider the span of business functionality and user activities. Each release adds more functionality until all the planned stories are delivered.



Release Planning

Traditional projects usually have a single release at the end of the project. Increasingly organizations are using hybrid approaches to deliver some functionality early for feedback then the remainder of functionality later.

Agile projects typically have multiple releases of different increments of the solution as they are available. Releasing early has a number of benefits, including:

- Validate approaches, technologies and materials to mitigate project risks
- Start to gain value from the solution early
- Generate real feedback from users allowing lower-cost adjustments if necessary

3.3.4 Continually be on the Lookout for Changes

(Full ECO Title: Continually review external business environment for impacts on project scope/backlog.)



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(Be on the lookout for changes and their impacts)

Projects need to continually review the business environment for items or issues that could impact the project scope. This applies equally to whether that scope is managed in work packages and statements of work or in backlogs and user stories. Some tips include:



Governance Steering Committee

The overall governance or steering committee that coordinates the project might be called the Project Board or Steering Committee. These groups might include the project sponsor, a senior user, and PMO resources. They have responsibilities that include:

- Clarifying the project charter and objectives.
- Allocating the resources to the project.
- Providing direction when challenges or changes are encountered.

A clear governance structure becomes critical when project changes are caused by variations in the internal or external business environments.



When kicking off and chartering a project, it is a good idea to politely reiterate the steering committee's role in providing direction in the event of business environment changes. That way it should come as no surprise that their timely guidance will be sought should major changes occur. Likewise priming and convening the change control board ahead of their first real need can be useful to dry-run to a hypothetical change.

We create fire escape plans ahead of fires, so we do not need to be creating them on the fly. Having clear expectations and practiced processes for handling major project changes can save confusion and valuable time.



Agile Tips

Get the best Product Owner you can. Ideally, they are well connected within the organization and fully aware of market changes and the competition. Educate and invite the team and other stakeholders to take part in risk management, demos and planning activities.

When identifying risks, it is good practice to assign a risk owner, someone responsible for monitoring the risk and alerting the project manager should it occur. Extend the concept to consider related business environment changes. Ask to be informed if they hear about anything that might impact the project.

At demos and retrospectives ask open ending questions such as: "Is anyone aware of any market changes that might impact our business case or planned work? Get people used to scanning for changes and sharing information. Create a culture of inquiry and information sharing, so we can hopefully be forewarned of events before we are forced to react to them.

3.4 Support Organizational Change

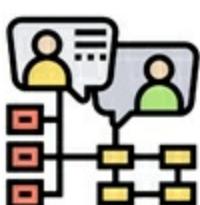
Supporting organizational change requires an understanding of the groups, culture and willingness to adapt. In fact, for each group in an organization, there are many factors to consider, including:

- Motivation and reward systems
- Regulations, policies and procedures
- Risk tolerance
- Operating environment
- Shared vision, beliefs and expectations
- Code of conduct
- Information sharing norms
- Promotion and disciplinary processes

3.4.1 Assess Organizational Culture



(Learn how the organization acts and behaves)



Organizational Structures

Project managers need to navigate various work cultures, norms, management practices, and organizational structures. Often, the structure of an organization affects access to people and how they interact with one another. This, in turn, affects how projects operate. Some organizational structures we need to be aware of are:

- **Functional** – People report to particular departments like marketing or engineering. As a PM, if you need someone to do some work on your project, you typically have to go to the department head to ask for that person's time.
- **Projectized** – People get seconded to projects, and while on the project, they report to

the project manager.

- **Matrix** – This is somewhere between Functional and Projectized where people report into a functional area but also to a project manager. We can have a Weak Matrix that is closer to Functional structure and the PM's authority with team members is limited. Or a Balanced Matrix where authority is split, all the way to a Strong Matrix that is closer to a Projectized environment and the PM's authority is High.

The table below summarizes other project characteristics, including who typically controls budgets and common part-time and full-time roles.

Project Characteristics \ Organization Structure	Functional	Matrix			Projectized
		Weak Matrix	Balanced Matrix	Strong Matrix	
Project Manager's Authority	Little or None	Limited	Low to Medium	Medium to High	High to Almost Total
Who Controls the project budget?	Functional Manager	Functional Manager	Mixed	Project Manager	Project Manager
Project Manager's Role	Part-Time	Part-Time	Full-Time	Full-Time	Full-Time
Project Management Admin Staff	Part-Time	Part-Time	Part-Time	Full-Time	Full-Time
Resource (People) Availability	Little or None	Limited	Low to Medium	Medium to High	High to Almost Total

Beyond Functional, Matrix and Projectized, there is a fourth type called a **Composite Organization**. This is an organization that uses a mixture of the functional, matrix, and projectized approaches either consistently or on a project-by-project basis.

Composite organizations may change their project structure (just from a staffing, reporting, project authority and budgeting perspective) to suit a particular project. For instance, they may deliver one project using a Matrix approach, while another is undertaken using a Projectized approach. They may also have a third project being handled more in a Functional way.



Project Management Offices (PMOs)

A Project Management Office (PMO) is a group in an organization that provides or ensures compliance to project governance. The PMO may oversee or assist with the execution of projects. Similar to organization structures, there are several types of PMO, each with varying authority

levels.

Types of PMOs include:



- **Supportive PMOs** – Exercise a low level of control over a project and instead provide tools, templates, methodology guidance, policy guidelines and support.



- **Controlling PMOs** – Exercise a moderate level of control over a project and provide guidance on how to manage projects. They may also provide training and ensure project management approach compliance.



- **Directive PMOs** – Have a high level of control over projects. They may provide the project managers for projects and be responsible for the project's success.

Types of PMO



Supportive
Provides general help and assistance



Controlling
Provides guidance on how to run projects



Directive
Controls project execution and governance

←
LOW

PMO AUTHORITY

HIGH→



Increasingly, organizations are creating or converting PMOs to **Value Delivery Offices (VDO)** or **Value Management Offices (VMO)** that focus on value. The deliberate name change to reference "Value" emphasizes the shift to concentrating on value and assisting with its delivery.



On the exam, assume there is a functioning PMO that provides the expected services and support described here. In practice this is often not the case, but if a question mentions a PMO assume it is comprehensive and effective.

3.4.2 Evaluate Impact of Organizational Change

Evaluate the impact of the organizational change and determine the required actions.



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(Understand how change is viewed and handled)

PMOs are often custodians of the processes, procedures and document templates we use to execute projects along with lessons learned repositories. These procedures and knowledge stores form part of what traditional project management calls OPAs.



Organizational Process Assets (OPAs)

Organizational Process Assets or OPAs is the collective name for all the procedures, processes, policies, documentation, and knowledge bases used by an organization. Project managers and teams may recommend changes to OPAs to improve how projects operate, but they are usually owned and updated by the Project Management Office (PMO).

OPA examples include:

- Standard templates for project work
- Specific organizational standards
- Guidelines and criteria for aligning project work
- Organizational communications requirements
- Standardized guidelines, work instructions, proposal evaluation criteria, and performance measurement criteria
- Procedures for officially opening and closing a project
- Corporate knowledge bases – repositories for storing project information, including:
- Project files
- Policies, procedures, and guidelines
- Human resources documentation
- Lessons-learned and retrospective findings



Enterprise Environmental Factors (EEFs)

EEFs are conditions that are outside the control of the team or project manager to influence. They can be external or internal. External examples include:

- Government regulations
- Laws
- Industry standards
- Market conditions.

Internal EEFs include:

- Organizational culture
- Type of organizational structure
- Internal political conditions
- Infrastructure
- Geographic locations
- Available resources

Since EEFs are factors that a project manager or team would likely struggle to change, they represent things that are considered a given, and we have to be aware of them when planning.

OPAs and EEFs describe the environment our projects operate in. Some settings are formal, strict and slow to change. Others are more adaptive, constantly evolving and easier to make changes within. These organizational and environmental realities influence how change is viewed and handled in projects. They influence our change management processes and how project outcomes will be rolled out.



Change

Sometimes our project delivers change to an organization. Sometimes changes impact our project. When this occurs, we need to handle the change and, if necessary, update our plans.



Change Management Plan

Organizational culture directly influences how an organization manages changes to a project.

An organization in a highly regulated environment tends to have a cautious, formal, and rigid culture. This leads to rigorous change management procedures, perhaps with multiple levels of approval. Organizations operating in new or rapidly evolving environments tend to have a lighter-touch approach to change.

The change management plan describes how changes will be managed and may include:

- Approval levels for changes
- The structure of the Change Control Board, if one is used
- The change control process
- The tools used to track and communicate change decisions
- The emergency change process



Project Management Plan Updates

Based on the scope of changes, the project management plan may need minor to substantial updates.

These updates might include:

- Scope
- Timelines/Release plans
- Work packages / Backlog items
- Team member assignments



In agile projects, it might be necessary to move lower-value deliverables out of scope to make room for the adopted change. See [3.3 Evaluate and address changes](#) for an explanation of reprioritizing the backlog and what happens to items at the bottom of the backlog.

3.4.3 Evaluate Impact of Project to the Organization

Evaluate the impact of the project to the organization and determine the required actions.



(Check to see if the desired project changes have been achieved)

Once we know what we want to change, we need a plan to communicate the approach and coordinate the necessary steps. What we need is a roll out plan!



Roll Out Plan

Roll out plans explain how the project's new product or service will be implemented after it is approved.

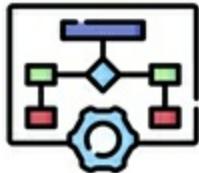
Roll out plans enable the project manager to define the preparation, training, and knowledge transfer activities required to implement the change.

Delivering a new solution and expecting customers or clients to accept and welcome it is unrealistic. During a project's development, the project manager and team become deeply invested in the endeavor and the perceived benefits.

It is understandable to expect the product or service consumers to feel the same way too, but this is rarely the case. Often customers do not care much or consider it an inconvenience to change how they currently work. Project managers need to "grease the tracks" ahead of the change to ensure it goes smoothly.

Depending on the size, scope, and nature of the change, the roll out plan details might include:
Information about the affected customer and user stakeholders

- Prerequisite work
- Training plans
- Support activities
- Transition support
- Troubleshooting and escalation procedures
- Post-implementation review



Training Plan

The training plan can be a section of the Roll Out Plan or its own document. Training plans outline the following information:

- Who will be trained – by name and role for future new hires
- What training they will receive
- When the training will occur
- How the training will be conducted and evaluated

If our project is impacted by change or makes significant adjustments to its planned deliverables, we will need to change the training plan or some training artifacts.



Training Artifacts

Training artifacts are simply components of the training program. They can be learning objectives, courseware, labs, or assessments. Changes to our project plan and deliverable set sometimes require changes to the training artifacts, including:

- Changes to the training courseware modules
- Changes to lab configurations and exercises
- Changes to knowledge requirements and credentials if certification of skills is expected
- Training updates for the trainers to learn the changes to the topics in the updated training



Demos

Changes to procedures or software solutions often benefit from demonstrating the changed processes, workflows, and roles and responsibilities. Demonstrations should be provided to the key customer and user stakeholders for feedback to ensure the changed elements work as intended and do not otherwise impact the solution's workflow.

Gaining early feedback allows for adaptation while the feedback is immediately relevant. Timely feedback also reduces the overall cost and risk of making any required changes. This is because there is less to rework and fewer elements built on the components that need to change.



Guidelines to Recommend, Plan, and Facilitate Change

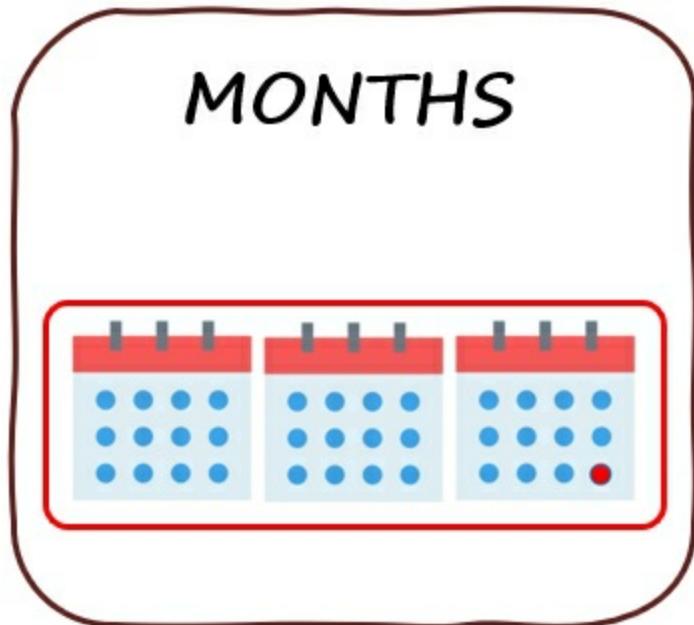
When dealing with change, whether it is happening to our project or we are introducing it to others, the following guidelines are helpful:

- For handling changes to traditional, plan-driven projects, establish a single way changes are requested. Ensure it captures the proposed change, the business value of the change, any risk and risk mitigation recommendations, and the likely cost of the change.
- Ensure that a Change Control Board (CCB) can assess the change cost, risk, value, other potential impacts on the project and make recommendations.
- Use the magnitude of the change and the project's tolerances to determine if the project manager can approve the change. If the change is very large or outside of the project tolerances, it should be escalated for review and approval to the project's governing board or steering committee.
- Follow your organizational change management best practices. This includes building a compelling case for the change and getting buy-in and commitment from key stakeholders. Then communicate the change vision and benefits to encourage other stakeholders to engage and support the change.
- Ensure changes are appropriately aligned and updates to other project artifacts, such as the project plan, training plans, training artifacts, and software configurations or demonstrations.

PMP Exam Taking Tips



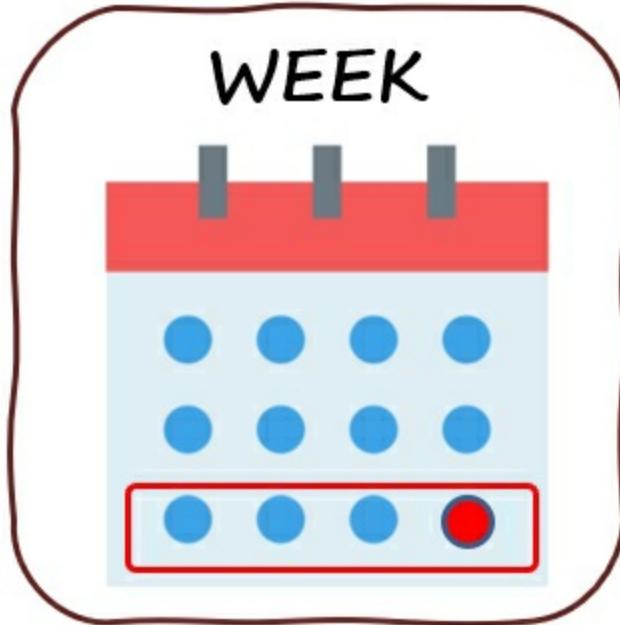
Finally, here are some suggestions for scheduling and being best prepared for your PMP exam.



More Than a Month Before Your Exam

- Book your exam date well in advance. It will help with your motivation to study and provide a mental push to complete your studies. (Note – If you need to, you can reschedule your exam at no charge, up to 30 days in advance of the date you selected. However, once the window is 30 days or less, there is a fee for any change. Also, you cannot change the date of the exam within 48-hours of the exam. At that point, you must either take the test as planned, or forfeit your exam fee.)
- Beware of out-of-date online advice based on the old PMP® exam format. For instance, anything recommending you memorize the ITTOs (Inputs, Tools, Techniques, and Outputs), knowledge areas, or expecting several EVM calculation questions. Or an over-emphasize on the PMBOK® Guide as a main source for the test questions. The exam changed significantly on January 2, 2021; study the new Exam Content Outline (ECO) topics instead.

- One more key point about the PMBOK – Version 6 is one of the 20 publications PMI uses to fact-check PMP test questions. Version 7 was released in August 2021, but as of now, it is NOT yet one of the books PMI references for the PMP Exam.
- Use trustworthy exam simulation questions to assess your readiness for the exam. Aim to be consistently scoring over 75% to be confident.
- To get the most out of your Simulator:
 - Keep track of your scoring on the quizzes
 - Study the explanations/rationales provided - good simulators provide well-researched justifications for the answers to their practice questions including why the distractors are incorrect.
 - Take notes (“Lessons Learned”) after you go over the answers from each quiz, and study them later as your test date gets closer.
- Make sure you do not over-use your simulations and attain high scores only because you are accustomed to the questions. Re-taking the same quizzes will give you a false sense of security about your chances for passing.
- Try a couple of full mock exams where you answer 180 questions in 3 hours 50 minutes to practice the volume, endurance and concentration required for the exam.
- Also, try to complete least 500 to 600 questions. Doing them in short bursts of 10 or 20 questions at a time is a good strategy. The key is to study the answers after each quiz and take lessons from each question.



- **In The Last Week**

- Try to relax as much as possible. Exams can be stressful, so some anxiety is natural and to be expected. If you experience it, try deep breathing and relaxation techniques to bring it under control.
- If you are taking the exam at a test center, drive there ahead of your test day. Find out where you will park/arrive, where to go once inside the building, etc. Removing uncertainty will help with your nerves on the day.
- Get to the test center with plenty of time before your exam; you do not want to be stressed about being late on the exam day.
- If you are using an online proctored exam at home, run the systems compatibility check well ahead of your exam day. This will let you know about any firewall or problematic software installed on your machine with plenty of time to fix it or find an alternative machine.
- Run the compatibility check at the location you will be taking your exam. You do not want different network or Wi-Fi speeds being an issue on exam day.

- Make sure you have the most stable internet connection you can. A wired connection to your router is usually more reliable than wireless if you can arrange it.
- The online test has a whiteboard facility to allow you to make notes. You can practice using the whiteboard application ahead of the exam, so it is not new to you on exam day, by accessing the practice link from the Pearson Vue website:



On The Day

- Bring / have on hand your authorization letter and two forms of identification.
- Wear comfortable clothes and have snacks and drinks available if you will need them.
- Plugin your laptop if testing at home, running low or out of battery capacity, would not be fun.
- Find a quiet, uncluttered room to take your exam. The online proctor will ask you to show them your room via the webcam. You cannot have any study materials present or things that look like they could be study materials such as Post-it notes, papers, books, posters, etc. If you have a messy home office, consider taking the exam in a clearer space.
- The exam proctor needs to be confident you are not cheating or getting help from anyone else. So, you will need to remain in your webcam's video camera view while taking the exam. Do not move out frame. Do not read questions out loud, talk to yourself, or do anything that looks like you might be communicating with other people.
- There are two optional 10-minute breaks. One after 60 questions and one after 120 questions. During these breaks, you can move out of view, go to the bathroom, etc.

After you return from a break, you cannot go back to questions you answered before you break, just in case you had a cheat sheet in your bathroom. So, you will need to review questions 1-60 before you first break and 61-120 before the second break.

- Write down anything you are having trouble remembering using the Whiteboard App.
- Read each question carefully. Look for modifier words that may change the answer, such as which statement is FALSE or which one of these is NOT an approach, etc.
- You will see one question on the screen at a time. You can answer a question and/or mark it to return to it later.
- Remember that the exam does not adapt to any of your answers. Nor does it give partial credit for answers that are mostly correct, but partly incorrect.
- Use all the exam time. Do not finish early unless you have reviewed each question twice.
- Find the key part of the question in the question text, then read the rest of the text. Determine what your answer should be, and then look at the answer options shown.
- Eliminate answers that are highly implausible.
- There may be more than one “correct” answer to each question, but only one “BEST” answer.
- Watch out for choices that are true statements, but do not answer the question.
- Be aware that the PMP Exam for many years was all multiple choice, A, B, C, D, pick one.

But this is another thing that changed on January 2021. There are still many of those, but there are also now:

- Select All That Apply
- Mix & Match
- Hot Spot (move your cursor to the appropriate part of the diagram for the answer)
- Limited Fill-In-The-Blanks (filling in short answers, like numbers or letters)

- Do your best, remember everyone must go through the same process. Few people enjoy it, but everyone survives, have faith, you can do this!

Additional Resources and Other Products

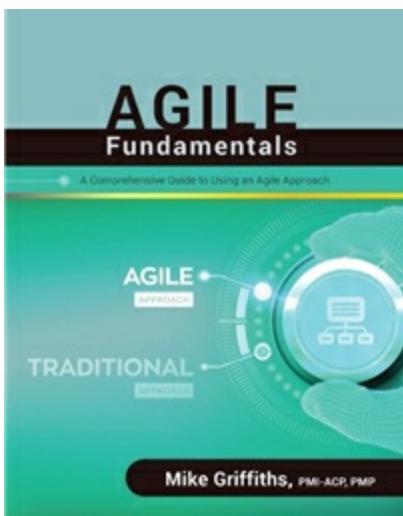
I hope you found this book useful. Other books and products I have developed include:



Big-Picture Mind Map Poster – The Big Picture poster shows the full scope of the PMP® exam on an extra-large (36 x 24 inch, 91 x 61 cm) poster.

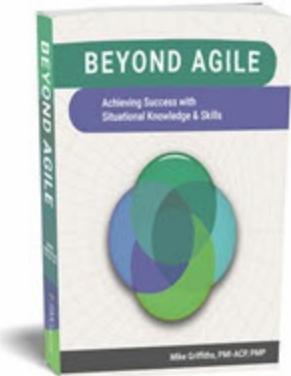
Organized by Work Groups and featuring all the cartoons from the PM Illustrated website and book. It shows each task and enabler activity as an interconnected mind map.

If you are a visual thinker looking for the big picture view of the PMP® exam, this is the perfect poster. Available on the PM Illustrated website.



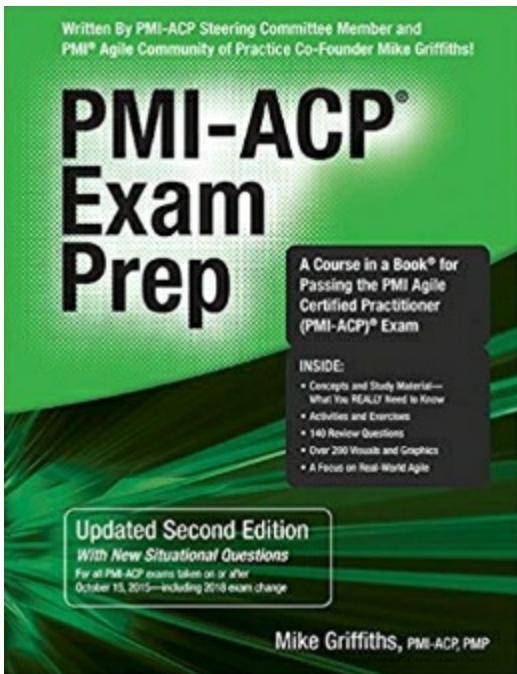
Agile Fundamentals – Many people reported that my PMP-ACP Exam Prep book was an excellent resource to learn about agile approaches even if they were not interested in taking the PMI-ACP exam. So, we took all the practice questions and quiz activities out of PMI-ACP Exam Prep to create Agile Fundamentals.

This book is useful for anyone looking to gain a deeper understanding of the agile approaches reviewed in the PM Illustrated. It provides comprehensive coverage of the basics of lean, agile and servant leadership used on today's high change projects.



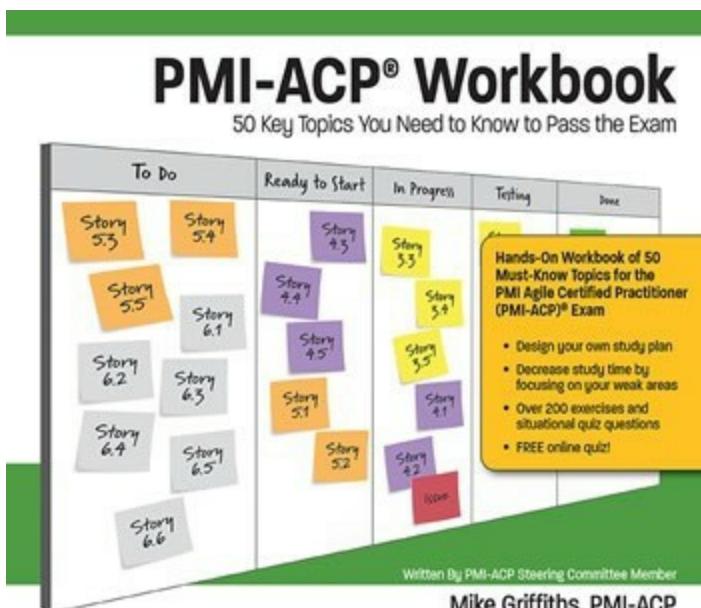
Advanced Agile Guidance. Beyond Agile is for project practitioners, PMOs, and business representatives who want new, high-value delivery guidance.

The book presents a model that provides a context-specific approach from a full spectrum of project disciplines including lean/agile, leadership/EI, plan-driven, and industry-specific approaches. Unlike scaling models such as SAFe, LeSS, and Nexus, the Beyond Agile Model avoids agile-myopia (believing everything can be solved best by agile approaches) and buffet-syndrome (taking on too much process) by being simultaneously broader but ruthlessly selective in its recommendations.



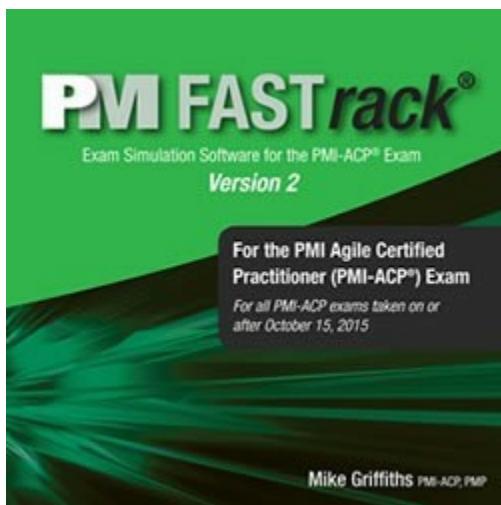
PMI-ACP Exam Study Guide – The full text explanation of the agile mindset, values and principles tested in the exam. Along with the Kanban, Lean, Leadership and Emotional Intelligence topics also covered. All accompanied by review questions, exercises and sample exam questions.

I wrote this book to help people prepare for and pass their PMI-ACP® certification. Having worked on the design of the PMI-ACP® credential I knew the exam tested a multitude of concepts drawn from domains such as leadership, lean, Kanban and agile approaches. So, I wanted to create a source that explains all the ideas in a single consistent voice.



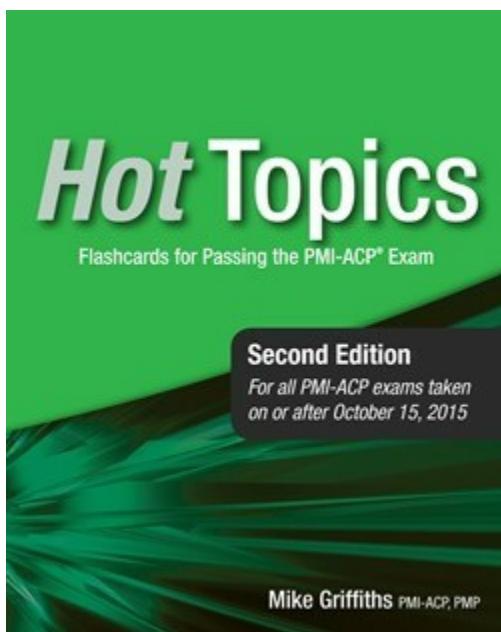
PMI-ACP Workbook – A summary of the core topics tested in the PMI-ACP® exam with exercises and practice questions.

Arranged alphabetically by topic, this book covers the top concepts in the PMI-ACP® exam with no additional fluff. Great for creating your own prioritized study plan, complete with Kanban board for tracking progress, this is for topic-based learners.



PMI-ACP FASTrack – Exam Simulator, know what to expect before you step into the exam room.

With 500+ questions the program allows you to filter questions by domain and keyword—and practice with randomized, timed 120 question tests with the same balance of questions from each domain as the real exam! All questions are also cross-referenced to the exam guide, so you may quickly and easily return to the book and work on your weak areas.



PMI-ACP Hot Topics - Spiral bound flashcards to help you study for the exam.

If you are looking for a way to prepare for the PMI-ACP® exam that fits into your busy schedule, these flashcards are it. Now you can study anywhere with RMC's portable and extremely valuable Hot Topics PMI-ACP® Exam Flashcards. This flip book offers over 175+ of the most important and difficult to recall PMI-ACP® exam-related terms and concepts—in portable format!

About the Author



Mike lives with his wife and son in Canmore, Alberta, Canada. He is an experienced agile practitioner and project manager with a long history of contributions to the agile community. Mike helped create the agile approach DSDM in 1994 and has been using agile approaches ever since. He served on the board of the Agile Alliance and remains active in the agile community.

Mike is a frequent contributor to the project management community. He was on the steering committee that created the Agile Certified Practitioner (PMI-ACP) credential, was chair of the author group for the PMI Agile Practice Guide, co-developed with the Agile Alliance. Mike was co-chair of the development team for the PMBOK® Guide 7th Edition and participates in the PMI Mentor program.

Mike trains and consults on effective project and product development. Combining elements of agile, leadership, and emotional intelligence, Mike tries to use the right tools for the job at hand.



Mike maintains the blog Leading Answers at www.LeadingAnswers.com. Check it for his most recent work and announcements.