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An Introduction to Project Management, Eighth Edition

Predictive, Agile, and Hybrid Approaches with AI

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Chapter 1

An Introduction to Project, Program, and Portfolio Management

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

- Understand the growing need for better project, program, and portfolio management
- Explain what a project is, provide examples of projects, list various attributes of projects, and describe project constraints
- Define project management and discuss key elements of a project management framework
- Discuss the relationship between project, program, and portfolio management and their contributions to enterprise success
- Understand important agile concepts and explain the differences between predictive, adaptive, and hybrid approaches to project management
- Describe the project management profession, including the role of project managers and suggested skills, the role of professional organizations, the importance of certification and ethics, project management careers, and the growth of project and portfolio management software
- Discuss how artificial intelligence (AI) is changing the field of project management

OPENING CASE

Doug Milis, the Chief Executive Officer (CEO) of Global Construction, Inc., was summarizing annual corporate highlights to the board of directors. Like many other individuals and organizations, they had a very difficult year. Politics, changing technologies, and consumer frustration forced them to deal with many challenges. When one of the board members asked what he was most proud of that year, Doug thought for a few seconds, and then replied,

“Excellent question. Honestly, I think the main reason we survived this year was because we continued to focus on an agile mindset and started embracing various technologies to vastly improve our products and services. We created innovative partnerships to pursue new opportunities. We listened to our customers and focused on better communications, realistic estimates, and on-time deliveries. I'm confident our strong culture and teamwork will drive ongoing success.

INTRODUCTION

Many people and organizations today have a new or renewed interest in project management. In the past, project management primarily focused on providing schedule and resource data to top management in just a few industries, such as the military and construction. Agile project management (versus a predictive or waterfall approach) was used mostly in software development. The advancement and application of technologies, especially artificial intelligence (AI), have sparked new projects and changed the way people work. Today, people in every industry and every country manage projects using predictive, agile, and hybrid approaches and continue to find new uses for technologies. The following facts demonstrate the significance of project management:

- There were about 40 million project managers in 2025 (compared to 30 million nurses), and in 2035 the world is projected to need 30 million more project managers!¹
- Good project management helps the bottom line. Most organizations today have some type of Project Management Office (PMO). High-performing PMOs improve project delivery on budget 83 percent of the time compared to 30 percent for low performing PMOs. They are also far more likely to ensure that projects are aligned to the business strategy.²
- A 2024 global survey on hybrid project management found that 89 percent of respondents reported using a mix of project management methodologies, and nearly half said that doing so increased project success rates by providing greater flexibility and improved resource management.³
- Project management salaries continue to grow. In 2025, the average salary for someone in the project management profession with a Project Management Professional (PMP®) credential in U.S. dollars was \$135,000 per year in the U.S.; (the highest-paid country) and \$11,764 in Egypt (the lowest-paid country). These average salaries do not include bonuses.⁴
- Certification is a good investment. Of the 14,628 salary survey respondents from 21 countries, 86 percent had the Project Management Professional (PMP®) credential, and their salary was 24 percent higher on average than those without it.⁵

- Many project professionals today use AI. It can help in several ways, from automating mundane tasks to acting as a decision-making partner or autonomous agent. The most valuable project managers and team members use AI as an enabler to improve performance.
- Project management is also a vital skill for personal success. Managing a family budget, planning a wedding, remodeling a house, completing a college degree, starting a business, and many other personal projects can benefit from good project management.

WHAT WENT WRONG?

In 1995, the Standish Group published an often quoted study entitled “CHAOS.” This prestigious consulting firm surveyed 365 information technology (IT) executives in the U.S. who managed more than 8,380 IT application projects. As the title of the study suggests, the projects were in a state of chaos with an overall success rate of only 16.2 percent. The surveyors defined success as meeting project goals on time and on budget. The study also found that more than 31 percent of IT projects were canceled before completion, costing U.S. companies and government agencies more than \$81 billion. The authors of this study were adamant about the need for better project management in the IT industry. They explained, “Software development projects are in chaos, and we can no longer imitate the three monkeys—hear no failures, see no failures, speak no failures.”⁶

PMI reported in 2025, “According to a variety of sources, up to 80% or more of AI projects fail. They run into roadblocks, or they don't deliver enough value to justify further investment.”⁷ It seems that many people are back to focusing on the latest and greatest technology instead of using projects to support business strategy!

Although several researchers question the methodology of the CHAOS studies, their popularity prompted organizations throughout the world to examine their practices in managing projects, not only in technology, but in all areas. Managers recognize that to be successful, they need to be conversant with and use modern project management techniques. People from all types of disciplines (science, liberal arts, education, business, etc.) can benefit from basic project management principles. Individuals and organizations are realizing that to remain competitive, they must develop skills to effectively select and manage projects to meet organizational goals. Many of the concepts of project management, especially interpersonal skills and focusing on value, can help people on a day-to-day basis.

Organizations claim that using project management provides advantages, such as:

- Better control of financial, physical, and human resources
- Improved customer relations
- Shorter development times
- Lower costs
- Higher quality and increased reliability
- Higher profit margins
- Improved productivity
- Better internal coordination
- Higher worker morale

In addition to project management, organizations are embracing program and portfolio management to address enterprise-level needs. They are also becoming more agile and using new technologies like AI. This chapter introduces projects and project management (predictive, agile, and hybrid approaches), describes the differences between projects, programs, and portfolio management, discusses the project management profession, and describes how AI is changing the role of the project manager.

WHAT IS A PROJECT?

To discuss project management, it is important to understand the concept of a project. A **project** is “a temporary initiative in a unique context undertaken to create value.”⁸ Operations, on the other hand, is work done in organizations to sustain the business. Projects are different from operations in that they end when their objectives have been reached, or the project has been terminated. It is important to note that although projects are temporary and often produce specific deliverables, the benefits of those deliverables may not be achieved until well after the project is completed. Project teams, therefore, must work with operations to ensure the desired outcomes of their projects provide value to the organization.

Examples of Projects

Projects can be large or small and involve one person or thousands of people. They can be done in one day or take years to complete. They can be done on their own or be part of a program or portfolio, as described later in this chapter. They can develop products, services, or results. Examples of projects include the following:

- A young couple hires a firm to design and build them a new house
- A company uses AI to help consumers “try on” different clothing and accessories virtually before purchasing them
- A school district implements a “no phones” policy
- A medical technology firm develops a device that connects smart phones and watches
- Musicians start a company to help children develop their musical talents, including an event to raise \$100,000
- A pharmaceutical company launches a new drug or vaccine
- A company develops and demonstrates a flying car (Note: This really happened in 2025!)

As you can see, projects come in all shapes and sizes. The following attributes help to further define a project:

- *A project has a unique purpose and context.* Every project should have a well-defined objective. For example, many people hire firms to design and build a new house, but each house, like each person, is unique.
- *A project is temporary.* A project has a definite beginning and a definite end. For a home construction project, owners usually have a date in mind when they’d like to move into their new home.
- *A project drives change and enables value creation.* A project is initiated to bring about a change to meet a need or desire. Its purpose is to achieve a specific objective which changes the

context (a living situation, in this house project example) from a current state to a more desired or valued future state.

- *A project is developed using progressive elaboration or in an iterative fashion.* Projects are often defined broadly when they begin, and as time passes, the specific details of the project become clearer. For example, there are many decisions that must be made in planning and building a new house. It works best to draft preliminary plans for owners to approve before more detailed plans are developed.
- *A project requires resources, often from various areas.* Resources include people, facilities, equipment, hardware, software, intellectual property, and other assets. Many different types of people, skill sets, and resources are needed to build a home.
- *A project should have a primary customer or sponsor.* Most projects have many interested parties or stakeholders, but someone must take the primary role of sponsorship. The **project sponsor** is an individual or group that provides direction and funding for the project and is accountable for enabling project success.
- *A project involves uncertainty.* Because every project is unique, it is sometimes difficult to define the project's objectives clearly, estimate exactly how long it will take to complete, or determine how much it will cost. External factors also cause uncertainty, such as a supplier going out of business or a project team member needing unplanned time off. Uncertainty is one of the main reasons project management is so challenging.

A good project manager contributes to a project's success. **Project managers** work with project sponsors, the project team, and the other people involved in a project to define, communicate, and meet project objectives. Note that some organizations use titles other than project manager, such as project leader, and some organizations spread the duties of project management among different people including functional managers or agile leaders.

Project Constraints

Every project is constrained in different ways. Some project managers focus on scope, schedule, and cost constraints. These limitations are sometimes referred to in project management as the **triple constraint**. To create a successful project, project managers must consider scope, schedule, and cost and balance these three often-competing goals. They must consider the following:

- *Scope:* What work will be done as part of the project? What unique product, service, or result does the customer or sponsor expect from the project?
- *Schedule/Time:* How long should it take to complete the project? What is the timeline?
- *Cost/Budget/Finance:* What should it cost to complete the project? What is the project's budget? What resources are needed?

Other people focus on the quadruple constraint, which adds quality as a fourth constraint.

- *Quality:* How good does the quality of the products or services need to be? What do we need to do to satisfy the customer?

Additional project constraints can include:

- *Compliance/regulatory:* What industry standards, regulations, and laws apply to the project? How can they affect the project schedule, cost, etc.?

- *Resource*: What human and physical resources are required to complete the project? Are they available when needed and within budget? Do you need to procure some resources from external sources?
- *Risk*: What uncertainties relate to the project? Projects involve risk due to their unique circumstances. Some can be known in advance, while many cannot.

Figure 1-1 summarizes typical project constraints. The triple constraint goals—scope, schedule, and cost—often have a specific target at the beginning of the project. For example, a couple might want a new 2,000 square foot home with three bedrooms, three bathrooms, an open-concept kitchen with island seating for four, basic landscaping, etc. (scope) completed within one year (schedule) for no more than \$500,000 (cost). The couple will have to make many decisions along the way that may affect meeting those goals due to the inherent nature of risk in projects. They might need to increase the cost to meet scope and schedule goals or decrease the scope to meet schedule and cost goals. They might originally want quartzite counter tops, hardwood flooring, etc. (quality). Their county might have many building codes, and if they have a homeowner’s association, there would be additional rules to follow (compliance). Skilled workers and specific materials (resources) are required to build the home. Specific resources might not be available or cost more than planned or weather might impact the schedule (risk). As you can see, there are often many interconnected project constraints that affect meeting project goals.

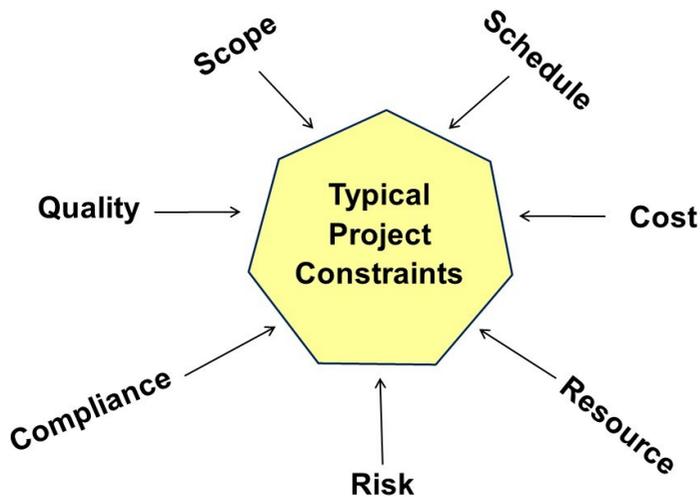


Figure 1-1. Typical project constraints

Projects rarely finish according to the discrete scope, schedule, and cost goals originally planned. Instead of specific target goals for scope, schedule, and cost, it is often more realistic to set a range of goals that allow for uncertainties, such as spending between \$475,000 and \$525,000 and having the home completed within ten to fourteen months. These goals allow for inevitable changes due to quality, compliance, resources, and risk considerations.

Experienced project managers know that you must decide which constraints are most important on each project and be prepared to make trade-offs. If time is most important, you must often change the initial scope and/or cost goals to meet the schedule. You might have to accept more risk and lower quality expectations. If scope goals are most important, you may need to adjust schedule and/or cost goals, decrease risk, and increase quality expectations. In any case, sponsors must provide some type of target goals for a project's scope, schedule, and cost and define other key constraints for a project. The project manager should be communicating with the sponsor and other stakeholders throughout the project to make sure the project meets expectations.

How can you avoid the problems that occur when you meet scope, schedule, and cost goals, but lose sight of customer satisfaction? The answer is *good project management, which includes more than meeting project constraints*.

WHAT IS PROJECT MANAGEMENT?

Project management is “the application of knowledge, skills, tools and techniques to project activities to meet or exceed the intended value.”⁹ Project managers must not only strive to meet specific scope, schedule, cost, and other requirements of projects, they must also define and understand what the customer means by value and facilitate the entire process to provide it.

Value occurs when a project's benefits exceed its investment.

Project Management Framework

Figure 1-2 illustrates a framework to help you understand project management. Key elements of this framework include project stakeholders, focus areas, performance domains, tools and techniques, and the contribution of projects and portfolios to the success of the entire enterprise. Each of these elements of project management is discussed in more detail in the following sections and throughout this text. Note that this framework is based on the Project Management Body of Knowledge (*PMBOK*[®]) *Guide - Eighth Edition* (published in 2025). To help you understand the flow of projects, this text includes chapters based on the focus areas (initiating, planning, executing, monitoring and controlling, and closing), addressing the performance domains within them. It also includes information on procurement management where appropriate.

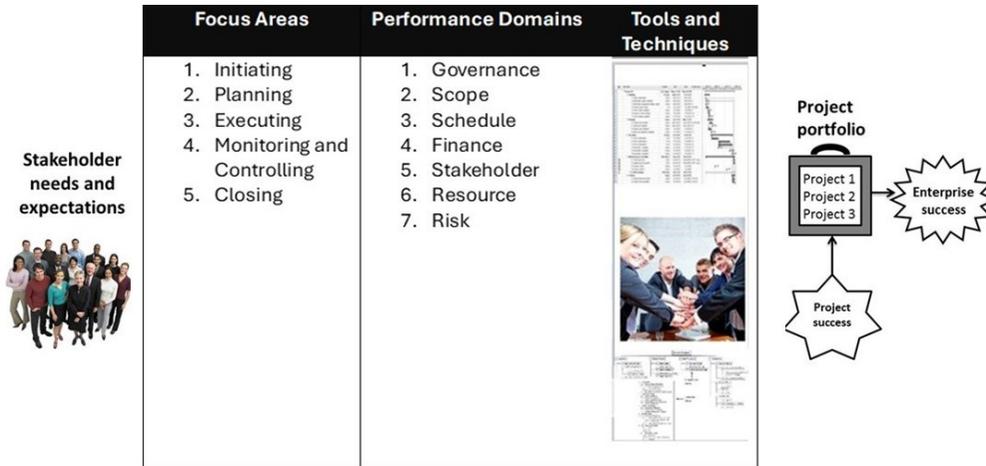


Figure 1-2. Project management framework

Project Stakeholders

Stakeholders are the people involved in or affected by project activities and include the project sponsor, project team, support staff, customers, users, suppliers, and even opponents to the project. They can be anyone positively or negatively affected by the project and its outcomes. Stakeholders often have very different needs and expectations. For example, there are several stakeholders involved in a home construction project.

- The project sponsors would be the potential new homeowners. They would be the people paying for the house and could be on a very tight budget, so they would expect the contractor to provide accurate estimates of the costs involved in building the house. They would also need a realistic idea of when they could move in and what type of house they could afford given their budget constraints.
- The project manager in this example would normally be the general contractor responsible for building the house. He or she needs to work with all the project stakeholders to meet their needs and expectations.
- The project team for building the house would include several construction workers, electricians, carpenters, and so on. These stakeholders need to know exactly what work they must do and when they need to do it. They would need to know if the required materials and equipment will be at the construction site or if they are expected to provide the materials and equipment. Their work would need to be coordinated since there are many interrelated factors involved.
- Support staff might include the employers of the homeowners, the general contractor's administrative assistant, and other people who support other stakeholders. The employers of the homeowners might expect their employees to complete their work but allow some flexibility so they can visit the building site or take phone calls related to building the house. The contractor's administrative assistant would support the project by coordinating meetings between the buyers, the contractor, suppliers, and other stakeholders.

- Building a house requires many suppliers. The suppliers would provide lumber, windows, flooring materials, appliances, and other items. Suppliers would expect exact details on what items they need to provide, where and when to deliver those items, and similar information.
- Additional stakeholders would include several city employees, who would be interested in following city ordinances as well as increasing revenues. They might have certain guidelines for the construction of houses in the area and regulations to ensure the safety of the public near the construction site. The local housing inspector would also be a stakeholder, concerned with ensuring that everything meets specific codes and regulations.
- There may or may not be opponents to a project. In this example, there might be a neighbor who opposes the project because the workers are making so much noise that she cannot concentrate on her work at home, or the noise might awaken her sleeping children. She might interrupt the workers to voice her complaints or even file a formal complaint. Alternatively, the neighborhood might have association rules concerning new home design and construction. If the homeowners did not follow these rules, they might have to halt construction due to legal issues.

As you can see from this example, there are many different stakeholders on projects, and they all have different interests. Stakeholders' needs and expectations are important in the beginning and throughout the life of a project. Successful project managers develop good relationships with project stakeholders to understand and meet their needs and expectations.

Project Management Focus Areas and Performance Domains

The five **project management focus areas** include initiating, planning, executing, monitoring and controlling, and closing activities. Chapter 3 provides more information on the focus areas and how they relate to the performance domains. **Project management performance domains** are a group of interrelated and interdependent processes required to achieve desired project results and value. There are 40 processes in total, and each one has several typical inputs, tools and techniques and outputs. Project managers must have knowledge and skills in all seven performance domains, briefly described as follows:

- The **governance performance domain** involves understanding how an organization is directed and controlled by various stakeholders and regulatory bodies to integrate all aspects of a project to optimize its value and ensure alignment with organizational strategy and goals. It includes processes across all five focus areas. Governance also includes ethical oversight and creating guardrails for new technologies like AI.
- The **scope performance domain** involves working with all appropriate stakeholders to define and manage all and only the work required to complete the project successfully, emphasizing adherence to target quality standards and acceptance criteria for deliverables and processes.
- The **schedule performance domain** involves estimating how long it will take to complete the work, developing an acceptable project schedule given cost-effective use of available resources, and ensuring timely completion of the project.

- The **finance performance domain** involves planning, estimating, budgeting, financing, managing, measuring, and controlling of all internal and external monetary resources to ensure the financial health of the project and optimize its value for the organization.
- The **stakeholder performance domain** involves identifying project stakeholders, understanding their needs and expectations, and communicating with them appropriately throughout the project to foster their support and ensure effective collaboration to maximize value.
- The **resource performance domain** involves making effective use of the human, physical, and virtual resources needed for the project to ensure the team is equipped with the necessary resources at the right time and place to achieve project objectives.
- The **risk performance domain** includes identifying, analyzing, and responding to risks related to the project to ensure project continuity and success under uncertainty.

Project Management Tools and Techniques

Thomas Carlyle, a famous historian and author, stated in his 1834 book, *Sartor Resartus*, “Man is a tool-using animal. . . . Without tools he is nothing, with tools he is all.” As the world continues to become more complex, it is even more important for people to develop and use tools, especially for managing important projects. **Project management tools and techniques** assist project managers and their teams in carrying out work in all seven performance domains. For example, many predictive projects require project charters, scope statements, Gantt charts, kick-off meetings, progress reports, and so on. Agile projects often require product roadmaps, backlogs, burndown charts, retrospectives, etc. You will learn more about these and other tools and techniques throughout this text.

Despite its advantages, project management is not a silver bullet that guarantees success on all projects. Project management is a very broad, often complex discipline. What works on one project may not work on another, so it is essential for project managers to continue to develop their knowledge and skills in managing projects. It is also important to learn from the mistakes and successes of past projects.

Project Success

How do you define the success or failure of a project? There are several ways to define project success. PMI defines **project success** as “the consensus view across intended beneficiaries, other stakeholders, and project participants that a project was perceived to have delivered value that was worth the effort and expense.”¹⁰ It is important to address the success of project outcomes, not just the project management process. For example, many global enablement programs delivered on time and budget, but value was only realized months later when adoption targets or operational readiness metrics were achieved.

As you can imagine, defining, measuring, and evaluating success can be complicated, even in a small, common project like building a house. Tangible, quantifiable outcomes might include providing a good return on investment for the buyers or making a certain amount of

profit for the builder. Intangible or qualitative outcomes might include a good customer satisfaction rating for the builder or the buyers simply being happy in their house in the future.

The list that follows outlines a few common criteria for measuring project success as applied to the project of building a new 2,000 square foot home within one year for \$500,000:

- The project provided value. As defined earlier, value occurs when a project's benefits exceed its investment. Even in this simple example, stakeholders can perceive value in several different ways.
 - One homeowner might define value quantitatively, while another might define it qualitatively. For example, if someone built a home for \$500,000 and sold it one year later for \$600,000, even if they hated the building process and living there for a year, they would consider it to be good value and therefore a success.
 - The homeowner's partner might consider it of low value based on qualitative issues like poor communication with the builder and discovering they did not like having the carpeting in all the bedrooms instead of hardwood floors so they could meet their budget goals.
 - The contractor in charge of the project might consider it a success if their company made a profit of at least ten percent, even if they got a poor rating. A different contractor might consider it a success if they got a high rating even if they lost money because it helped them get future customers.
- The project met scope, schedule, and cost goals (the triple constraint). If the home was 2,000 square feet and met other scope requirements, it was completed in one year as planned, and cost \$500,000 or less, it would be a successful project based on these criteria.
- The project satisfied the customer/sponsor. Even if the project met initial scope, schedule, and cost goals, the couple paying for the house might not be satisfied. Perhaps the contractor never returned their calls and texts or made important decisions without their approval. Perhaps the quality of some of the construction or materials was not what they had hoped for. If the buyers were not happy about important aspects of the project, it would be deemed a failure due to poor customer satisfaction. One method used to measure customer satisfaction is a **net promoter score**, a number that represents the customer's willingness to recommend a product or service to others.

Project managers should work with key stakeholders to define what success means and how they will communicate early in the process. For example, a builder should discuss what homeowners really want. If one person only wants a good return on investment and little communication during the building process and the other wants specific home features regardless of cost, they need to reach an agreement and clarify expectations. If a builder wants to focus on making a profit, the contract should minimize their risk of losing money. (Contract types are discussed in Chapter 4 in planning for the scope performance domain.)

WHAT WENT RIGHT?

A more recent study (2024) challenged the traditional view of project success used by the CHAOS reports. Instead of focusing on project management success, often defined as meeting a project's scope, time, and cost goals, the authors suggested a focus on project success. In other words, did the project add value? Researchers defined project success as delivering value that justifies the effort and expense. Based on this new definition, 48% of projects were successful.¹¹ Having a well-defined performance measurement system, caring for team morale, securing adequate funding, managing resources effectively, and having a sound business case contributed to project success.

The Path to Project Success with M.O.R.E.

The 2024 PMI report “Maximizing Project Success” introduced a new definition of project success based on delivering value that is worth the effort and expense. The report also introduced the concept of M.O.R.E. as a framework grounded in four guiding principles that challenge project professionals to think and act differently:

1. **“Manage perceptions:** For a project to be considered successful, the key stakeholders—customers, executives and others—should perceive that the project's outputs provide sufficient value relative to the perceived investment of resources.
2. **Own success:** Project professionals need to take ownership of the entire breadth of a project, moving beyond mostly execution focus to take accountability for delivering tangible and perceived value while minimizing waste.
3. **Relentlessly reassess:** Project professionals need to recognize the reality of inevitable and ongoing change and, in collaboration with stakeholders, continuously reassess the perception of value and adjust plans.
4. **Expand perspective:** All projects have impacts beyond just the scope of the project itself. We all should consider the broader picture and how the project fits within the larger business goals or objectives of the enterprise, and ultimately our world.”¹²

Project managers need to define project success criteria and value upfront, have a well-established measurement system to align and guide decisions, and measure performance toward intended outcomes throughout the project. As the number of and complexity of projects continue to grow, project managers must do M.O.R.E to increase project success rates.

Project Management Mindset, Dimensions, and Principles

Project managers often face many difficult challenges, and it is important to have the proper mindset and core principles to make good decisions. A mindset is collection of beliefs, attitudes, and assumptions that shape how a person views and interacts with others in various situations. The term growth mindset, coined by Stanford psychologist Carol Dweck, means that you can view failures as learning and growth opportunities and that you continue to pursue goals, even if they are difficult. A fixed mindset, on the other hand, means you believe talent is static, and you avoid challenges. The PMBOK® Guide, Eight Edition, suggests that project managers should have a growth mindset, which includes three dimensions:

1. Be proactive: Anticipate and address challenges and opportunities.
2. Take ownership: Foster a culture of accountability.
3. Drive value: Understand the project's contribution and deliver maximum value.

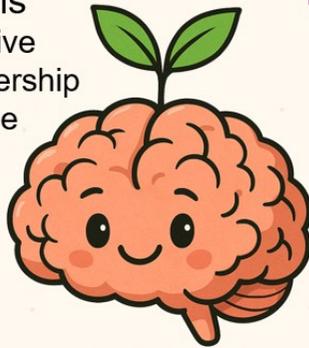
They should also keep in mind key principles of the profession to guide decision-making and problem-solving as follows and as shown in Figure 1-3:

1. Adopt a holistic view: Look at the big picture of how your project fits into your organization and how it affects others outside your organization.
2. Focus on value: Evaluate and adjust how your project adds value
3. Embed quality: Meet or exceed stakeholders' needs and expectations in preparing deliverables and focus on continuously improving processes.
4. Be an accountable leader: Practice honesty and integrity and create a culture of trust and responsibility.
5. Integrate sustainability: Meet project needs without hurting the needs of future generations.
6. Build an empowered culture: Promote collaboration and teamwork among stakeholders.

Project Management Growth Mindset

► Dimensions

- Be proactive
- Take ownership
- Drive value



► Principles

- Adopt a holistic view
- Focus on value
- Embed quality into processes and deliverables
- Be accountable
- Integrate sustainability
- Build an empowered culture

Figure 1-3. Project Management Growth Mindset

PROGRAM AND PROJECT PORTFOLIO MANAGEMENT

Projects make up a significant portion of work in most organizations, and successfully managing those projects is crucial to success. Two important concepts that help projects meet organizational goals are the use of programs and project portfolio management.

Programs

A **program** consists of “a group of related projects and program activities managed in a coordinated manner to obtain benefits not available from managing them individually.”¹³ A **megaproject** is a very large project that typically costs over US \$1 billion, affects over one million people, and lasts several years. Megaprojects normally consist of several programs, as described in following Video Highlights feature.

VIDEO HIGHLIGHTS

You can imagine the challenges megaprojects face. For example, the NEOM project, meaning “new future,” is currently under construction in the northwest of the Kingdom of Saudi Arabia. One part of the project, Sindalah, an island dedicated to luxury tourism, held an opening celebration in October 2024. Another part of the project, Trojena, is a ski resort slated to host the Asian Winter Games in 2029. Oxeon is planned to be a new commercial port with a floating city. In neom.com’s introductory video, NEOM is described as “a place that will change the way we live on this planet.” One part of the project includes building a 170 km (over 105 mile) long city called THE LINE that includes a 500 meter (.3 mile) tall linear structure housing 9 million people. It will be a car-free, carbon-neutral environment powered by 100% renewable energy with all services within a 5-minute walk.

Reality set in quickly as the NEOM project progressed. Although Sindalah was initially estimated to cost \$1.3 billion, it ended up costing over \$4 billion and was three years behind schedule. Trojena started construction in 2022 and was planned to be completed in 2026, but delays may result in relocation of the Asian Winter Games. When it was announced, THE LINE building was scheduled for completion in 2030. Recent plans call for only 2.4 km of the building to be completed by then. The original project estimate of \$500 million made in 2017 increased to \$8.8 trillion in 2025. A Wall Street Journal exclusive article entitled, “The World’s Biggest Construction Project Is a Magnet for Executives Behaving Badly,” describes how the project contends with corruption, worker deaths, racism, and misogyny.¹⁴ You can see several videos about NEOM under the Video Highlights section of this book’s website at <https://intropm.com>, or search online for additional information.

It is often more economical to group projects together to help streamline management, staffing, purchasing, and other work. The following are examples of programs:

- A construction firm has programs for building single-family homes, apartment buildings, and office buildings, as shown in Figure 1-4. Each home, apartment building, and office building is a separate project, but each type of building is part of a program. There would be several benefits to managing these projects under one program. For example, for single-family homes, the program manager could try to get planning approvals for all the homes at once, advertise them together, and purchase common materials in bulk to earn discounts.
- A clothing company has a program to analyze customer-buying patterns. Projects under this program might include one to send out and analyze electronic surveys, one to conduct several focus groups in different geographic locations with different types of buyers, and a project to develop an information system to help collect and analyze current customers’ buying patterns.

- A government agency has a program for children’s services, which includes a project to provide pre-natal care for expectant mothers, a project to immunize newborns and young children, and a project for developmental testing for pre-school children, to name a few.

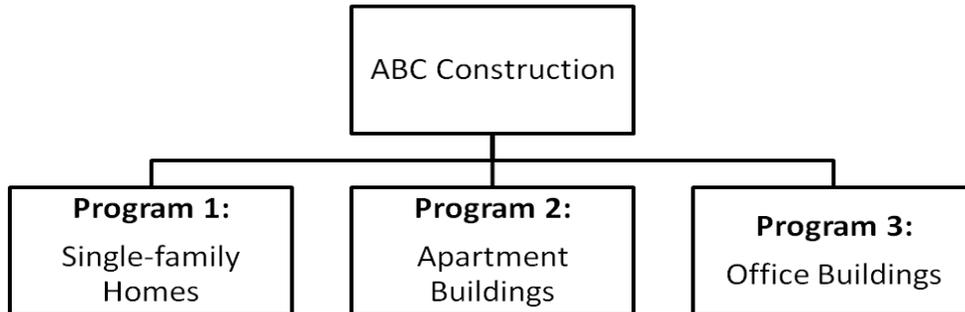


Figure 1-4. Example programs

A **program manager** provides leadership and direction for the project managers heading the projects within the program. Program managers also coordinate the efforts of project teams, functional groups, suppliers, and operations staff supporting the projects to ensure that project products and processes are implemented to maximize benefits. Program managers are responsible for more than the delivery of project results; they are change agents responsible for the success of products and processes produced by those projects. Note that program managers are not the same as product managers. See Chapter 2 for more information on the difference between these roles.

Program managers often have review meetings with all their project managers to share important information and coordinate important aspects of each project. Many program managers worked as project managers earlier in their careers, and they enjoy sharing their wisdom and expertise with their project managers. Effective program managers recognize that managing a program is much more complex than managing a single project. In addition to skills required for project managers, program managers must also possess strong business knowledge, leadership capability, and communication skills.

Project Portfolio Management

A **portfolio** is defined as “a collection of programs, projects, and operations managed as a group to maximize overall value delivery and achieve strategic objectives, meet mandatory obligations, or generate income streams.”¹⁵ Many organizations support an emerging business strategy of **project portfolio management** (also called just portfolio management) by continuously selecting and managing the optimum set of projects and programs to deliver maximum business value.

Portfolio managers need to understand how projects fit into the bigger picture of the organization, especially in terms of corporate strategy, finances, and business risks. They create portfolios based on meeting specific organizational goals, such as maximizing the value of the portfolio or making effective use of limited resources. Portfolio managers help their organizations make wise investment decisions by helping them to select and analyze projects

from a strategic perspective. Portfolio managers may or may not have previous experience as project or program managers. It is most important that they have strong financial and analytical skills and understand how projects and programs can contribute to meeting strategic goals.

The main distinction between project/program management and portfolio management is a focus on meeting tactical or specific, short-term goals versus strategic or long-term goals. Individual projects and programs often address tactical goals, whereas portfolio management addresses strategic goals. Project and program management address questions like:

- Are we carrying out projects well?
- Are projects on time and budget?
- Do project stakeholders know what they should be doing?

Portfolio management addresses questions like:

- Are we working on the right projects?
- Are we investing in the right areas?
- Do we have the right resources to be competitive?

There can be portfolios for all types of projects and programs. For example:

- In a construction firm, strategic goals might include increasing profit margins on large projects, decreasing costs on supplies, and improving skill levels of key workers. Projects and programs could be grouped into these three categories for portfolio management purposes.
- In a clothing firm, strategic goals might include improving the effectiveness of IT and AI, introducing new clothing lines, reducing inventory costs, and increasing customer satisfaction. These might be the main categories for their portfolio.
- A government agency for children's services could group projects into a portfolio based on strategies such as improving health, providing education, and so on to help make optimum decisions on use of available funds and resources.

Organizations group projects into portfolios to help them make better investment decisions, such as increasing, decreasing, discontinuing, or changing specific projects or programs based on their financial performance, risks, resource utilization, and similar factors that affect business value. If a construction firm has much higher profit margins on apartment buildings than single-family homes, for example, it might choose to pursue more apartment building projects. The firm might also create a new project to investigate ways to increase profits for single-family home projects. On the other hand, if the company has too many projects focused on financial performance and not enough focused on improving its work force, the portfolio manager might suggest initiating more projects to support that strategic goal. Just like a personal financial portfolio, a business portfolio should be diversified to account for risk.

AGILE

As mentioned earlier, there is growing interest in organizational agility to respond more quickly and effectively to an ever-changing world. There is an abundance of information, books, videos, podcasts, and courses on agile which address this required responsiveness. The following is just a brief overview. More details and examples are provided throughout the text.

What is Agile?

There are several different definitions of agile. The Agile Alliance (2026) defines **agile** as “the ability to create and respond to change.” Merriam-Webster dictionary (2026) defines agile as “marked by ready ability to move with quick easy grace,” like an agile dancer. Based on these definitions, it seems that every individual and organization would want to be agile. Why wouldn’t you manage all projects this way? Of course, it’s not that simple. There were over 80 different frameworks for agile by 2026! Figure 1-5 pokes fun at this situation.

HOW AGILE FRAMEWORKS PROLIFERATED

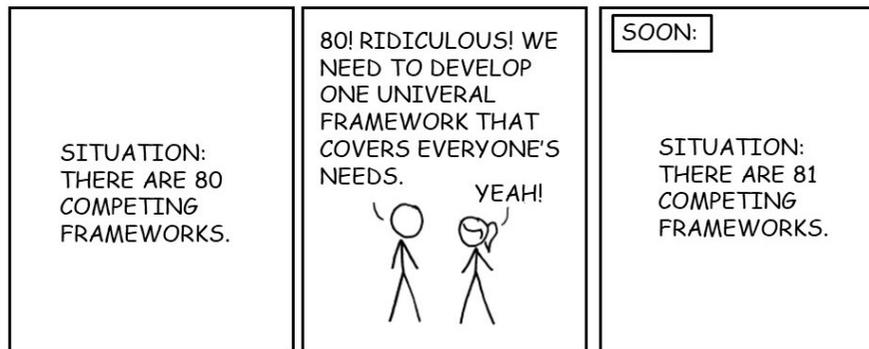


Figure 1-5: How agile frameworks proliferated, adapted from xkcd.com

While some sources suggest agile may be struggling due to framework fatigue or poor leadership, the overarching consensus is that the core principles of adaptability and continuous improvement are vital for modern businesses. The key is shifting from rigid frameworks to fostering an agile mindset, integrating new technologies like AI, and ensuring alignment between strategic goals and daily execution. Early software development projects used what is often called a waterfall or predictive approach, where requirements were defined in detail before any software was written. Many of those projects took years to complete, if completed at all, and often did not produce the desired results. In response to the need to improve the process, a group of 17 people (called the Agile Alliance) developed the Manifesto for Agile Software Development and the 12 principles behind it in 2001, as shown in Figure 1-6.

Most projects are *not* software development projects, but many projects can benefit from the values and principles described in the Agile Manifesto, such as valuing individuals, focusing on delivering useful results versus paperwork, collaborating with customers as well as other people, responding to change, allowing teams to self-organize, reflecting on how to work more effectively, and so on. You can replace the word “software” with “products” or “solutions” so that it applies to all types of projects. Unfortunately, today many people associate agile with scrum, a popular agile framework.

According to “The Scrum Guide,” **scrum** is “a lightweight framework that helps people, teams and organizations generate value through adaptive solutions for complex problems.”¹⁶ Scrum and other agile frameworks are described in more detail in later chapters.

An important concept in truly understanding and successfully implementing agile is having an agile mindset.

Manifesto for Agile Software Development

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

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

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

Principles behind the Agile Manifesto

We follow these principles:

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity--the art of maximizing the amount of work not done--is essential.
11. The best architectures, requirements, and designs emerge from self-organizing teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

Figure 1-6. Manifesto for Agile Software Development and Principles behind the Agile Manifesto (www.agilemanifesto.org (accessed February 10, 2026)).

What is an Agile Mindset?

Gil Broza, author of *The Agile Mind-Set*, emphasizes the need to focus on values, beliefs, and principles before following specific frameworks or processes. He describes how to think and make choices in an agile way by focusing on the *why* before the *how*. Many organizations that

have tried to become agile have failed because they jump to specific frameworks without adopting the proper mindset first. Failure is often due to the organization's culture being at odds with the agile mindset.

One way to describe people or organizations with an agile mindset is to compare them to those with bureaucratic mindsets. Most people understand bureaucracy, where organizations operate in a top-down hierarchy with many layers and divisions. Organizations with a bureaucratic mindset have a goal of making money for their firm and maximizing shareholder value. Individuals report to bosses who define their roles, rules of work, and performance criteria. Organizations with an agile mindset, in contrast, use a network of teams focused on the goal of delivering value to their customers. Work is best accomplished through small, self-organizing teams working in short cycles to deliver something of value to the customer. "Such organizations have been shown to have the capacity to adapt rapidly to a quickly shifting marketplace."¹⁷ Project managers should have both a growth mindset and an agile mindset.

WHAT IS THE DIFFERENCE BETWEEN PREDICTIVE, ADAPTIVE, AND HYBRID PROJECT MANAGEMENT?

Adaptive project management, also called **agile project management**, is used to describe an approach where the project scope cannot be well-defined upfront, incremental deliveries are desired, and changes are expected. Some people describe agile projects as having variable scope constraints and fixed time and cost constraints. To be successful in this scenario, key stakeholders should be continuously involved in the project. For example, if you want a website for your small business, need some features available as soon as possible, are unsure of all the features, and want to be actively involved in its development, an agile approach makes more sense than a predictive one.

Predictive project management, also called **waterfall or traditional project management**, are terms used to describe an approach where most of the project planning is done upfront, there is a single final product, service, or result delivered at the end of the project, change is constrained, costs and risks are controlled, and stakeholders are involved at specific milestones. Many projects or parts of projects are well-suited to this type of approach. For example, if you are remodeling a kitchen on a fairly fixed budget, you should be able to do most of the planning upfront (decide on the layout, pick out the appliances, countertops, cabinets, sink, tiles, etc.), get a good cost and schedule estimate for the work, and check in with the people doing the work periodically. Small changes are to be expected, but you have a good idea of what outcome will be before construction begins.

The term **hybrid project management** is used to describe a mixture or combination of predictive and agile approaches. Some organizations will use predictive project management on some projects and agile project management on others. Some will use a bit of both approaches on the same project. For example, some tools or techniques considered to be predictive (i.e. project charters, milestone reports, Gantt charts, lessons-learned repositories, etc.) or agile (scrums or daily stand-ups, self-organized teams, prioritized backlogs, Kanban boards, etc.) may be useful for many projects. Some projects that produce several different products might use an agile approach for some deliverables and a predictive approach for

others. For example, the design of a house or development of smart technology within the house can be done using an agile approach, and the construction can use a more predictive approach. You might also use a hybrid approach because your customers, suppliers, or other stakeholders prefer to work one way, and you prefer to work another. As mentioned earlier, most organizations today use a hybrid approach to project management.

A 2025 research report based on 349 agile practitioners in various industries found that 74% now use hybrid or homegrown approaches, increasing from 52% in the previous report. “It signals a clear shift away from formal frameworks toward adaptive, fit-for-purpose models that reflect how organizations actually deliver today. This flexibility, mixing what works, discarding what doesn’t, may be the most pragmatic response to the growing pressures shaping how teams operate today.”¹⁸

You will find many different opinions on agile, agile mindsets, and agile project management. As mentioned earlier, project management should be tailored to meet the unique needs of the project. A small project involving new technology should be managed differently than a large project using well-known technology. Projects also exist in unique environments where the organizational culture, team dynamics, and competition play important roles.

Tailoring

Just as you can benefit from tailoring clothing, you can benefit from tailoring how you manage a project. **Tailoring** is “the deliberate adaptation of the project management approach, governance, and processes to align with the project’s environment and objectives.”¹⁹ Every project is unique, as is every project team, every organization, etc., so it is very important to mindfully consider how to manage a project. Factors to consider include the size of the project, complexity, expected duration, industry, organizational culture, and project management maturity. You can tailor which processes you will use, how you will handle stakeholder engagement, which tools, methods, and artifacts you’ll use, and what life cycle and development approach is most appropriate. PMI suggests a 4-step approach to tailoring: select an initial development approach; tailor for the organization; tailor for the project; and implement ongoing improvement. Many of these concepts are described later in this text and will make more sense as you read about them and see examples of when it makes sense to use each approach.

The increased interest in agile is based partly on the hope that it will somehow make project management easier. Many books, courses, and consultants are capitalizing on this “new” approach. Seasoned project managers understand that they have always had the option of tailoring or customizing how they run projects, but that project management is not easy, even when using agile. You cannot just copy what someone else does and expect it to work on your projects. You must continue to try, fail, and learn.

THE PROJECT MANAGEMENT PROFESSION

As you can imagine, good project managers should have a variety of skills. Good program and portfolio managers often need additional skills and experience in managing projects and understanding organizational strategies. This section describes some of the skills that help you manage projects, and you will learn many more throughout this text. If you are serious about considering a career in project management, you should consider earning one or more

certifications. You should also be familiar with some of the project management and AI software products available on the market today. And most importantly, start working on a variety of projects in your personal and professional life to gain experience working with others to add value.

Suggested Skills for Project Managers

Project managers and their teams must develop knowledge and skills in the following areas:

- All project management focus areas and performance domains (as described earlier in this chapter and throughout the text)
- The application area (domain, industry, market, etc.)
- The project environment (politics, culture, change management, etc.)
- General business (financial management, strategic planning, etc.)
- Human relations (leadership, power skills, motivation, communication, etc.)
- Critical thinking (analysis, evaluation, inference, etc.)
- Digital fluency (application software, project management software, AI, etc.)

The application area refers to the application to which project management is applied. For example, a project manager responsible for building houses or apartment buildings should understand the construction industry, including standards and regulations important to that industry and those types of construction projects. A project manager leading a large software development project should know about that application area. A project manager in education, entertainment, the government, and other fields should understand those application areas. The application area is defined by the product, service, or result.

The project environment differs from organization to organization and project to project, but there are some skills that will help in most project environments. These skills include being adaptive to change and understanding how organizations work within their social, political, and physical environments. Project managers must be comfortable handling change because most projects introduce changes in organizations and involve changes within the projects themselves. Project managers need to understand the organizations they work in and how they develop projects and provide services. For example, it takes different skills and behavior to manage a project for a Fortune 100 company in the U.S. than it does to manage a government project for a new business in Poland or India.

Project managers should also possess general business knowledge and skills. They should understand important topics related to financial management, accounting, procurement, sales, marketing, supply chain, compensation, and so on. On some projects, it will be critical for project managers to have substantial experience in one or several of these general business areas. On other projects, project managers can delegate detailed responsibility for some of these areas to a team member, support staff, or even a supplier. Even so, the project managers must be intelligent and experienced enough to know which of these areas are most important and who is qualified to do the work. They must also make and/or take responsibility for all key project decisions.

Achieving high performance on projects requires human relations skills, also known as *soft skills*. Some of these soft skills include leadership, power skills, effective communication, influencing the organization to get things done, motivation, negotiation, conflict management,

and problem solving. Project managers must lead their project teams by providing vision, creating an energetic and positive working environment, and setting an example of appropriate and effective behavior. Project managers must focus on teamwork skills to use their people effectively. They need to be able to motivate different types of people and develop *esprit de corps* within the project team and with other project stakeholders.

Critical thinking skills are required to work in complex situations. Project managers must be able to evaluate facts and information, remain objective, and make sound decisions about how to move forward. They must be open-minded and inquisitive, ask good questions, and search for the best solutions.

Project managers also require digital fluency to make effective use of ever-changing technology. They use various types of application software to write, analyze, and present information. Some use specialized project management software to help organization and track project information. Most project managers today also use various AI tools to streamline their work and assist them in doing more complex functions. Many of those complex functions involve using the skills described earlier, especially human relations and business skills.

The project manager's role will change with advancements in AI. Jeff Chamberlain, a senior project manager with over thirty years of experience, made the following predictions:

- “The project manager’s role will pivot into a more human-centered role. In other words, we no longer manage tasks; we manage the relationships in a project. We also provide oversight to the AI language model output.
- We, as project managers, will need to coach our teams on not just working with each other, but also with AI.
- Project teams will look different. Perhaps we’ll see “Pods” of expertise supplemented by AI tools that allow us to have multiple opinions on best practices and focused decision-making.”²⁰

PMI Talent Triangle® and the Importance of Leadership Skills

PMI developed a talent triangle to emphasize the types of skills project managers need to continuously develop. The updated talent triangle includes:

- **Ways of working:** Previously called technical project management skills, it’s important for project managers to continue to learn various ways of working (predictive, agile, or hybrid) and new practices and technologies (like AI) that help them deliver value by using the best technique at the right time.
- **Business acumen:** Understanding the macro (strategic) and micro (tactical) influences in specific organizations and industries assists project managers in making good decisions. It’s crucial to align projects with organizational strategy. A recent PMI Pulse of the Profession® 2025 report entitled “Boosting Business Acumen: Empowering Project Professionals as Strategic Partners” emphasizes the importance of business acumen in driving project success and a successful career in project management.
- **Power skills:** These interpersonal skills (formerly called just leadership skills) include collaborative leadership, clear communication, results orientation, and empathy, all important skills for engaging and influencing various stakeholders.

The World Economic Forum Future of Jobs Report (2025) reported that analytical thinking remained the most sought skill among employers. In fact, 70% of companies considered it as essential in 2025, followed by resilience, flexibility and agility, leadership, and social influence.²¹ Project managers need to have all these skills, especially leadership.

The terms leadership and management are often used interchangeably, although there are differences. Generally, a **leader** focuses on long-term goals and big-picture objectives, while inspiring people to reach those goals. A **manager** often deals with the day-to-day details of meeting specific goals. Some people say that “Managers do things right, and leaders do the right things.” “Leaders determine the vision, and managers achieve the vision.” “You lead people and manage things.” Project managers take on the role of both leader and manager.

Program managers need the same skills as project managers. They often rely on their past experiences as project managers, strong business knowledge, leadership capability, and communication skills to handle the responsibility of overseeing the multiple projects that make up their programs. Portfolio managers must have strong financial and analytical skills and understand how projects and programs can contribute to meeting strategic goals.

Companies that excel in project, program, and portfolio management grow project leaders, emphasizing development of business and leadership skills. Instead of thinking of leaders and managers as specific people, it is better to think of people as having leadership skills, such as being visionary and inspiring, and management skills, such as being organized and effective. Therefore, the best project, program, and portfolio managers have leadership and management characteristics; they are visionary yet focused on the bottom line. Above all else, they focus on adding value and achieving positive results!

BEST PRACTICE

A **best practice** is “an optimal way recognized by industry to achieve a stated goal or objective.”²² Robert Butrick, author of *The Project Workout*, wrote an article on best practices in project management for the Ultimate Business Library’s Best Practice book. Although this article was written over 20 years ago, it has stood the test of time. He suggests that organizations need to follow basic principles of project management, including these two mentioned earlier in this chapter:

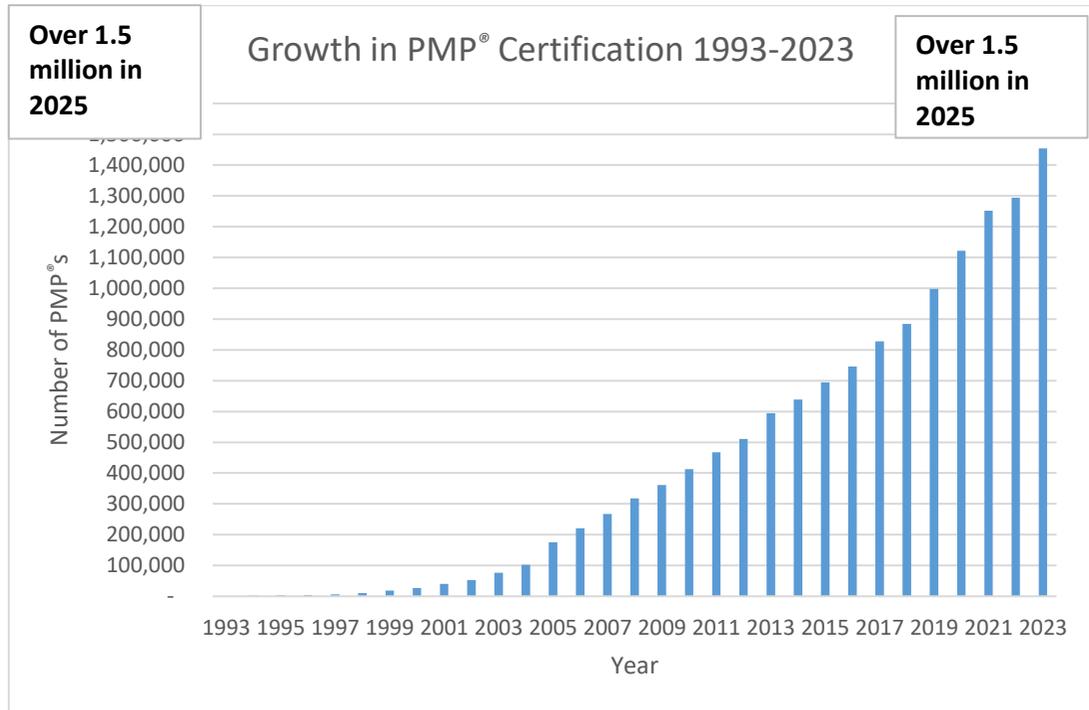
- Make sure your projects are driven by your strategy. Demonstrate how each project you undertake fits your business strategy, and screen out unwanted projects as soon as possible.
- Engage your stakeholders. Ignoring stakeholders often leads to project failure. Be sure to engage stakeholders at all stages of a project and always encourage teamwork and commitment. Use leadership and open communications to make things happen.

Project Management Certifications

Professional certification is an important factor in recognizing and ensuring quality in a profession. The **Project Management Institute (PMI)** is a global professional society for project and program managers. PMI provides several certifications, including their most popular one for a **Project Management Professional (PMP®)**—someone who has documented sufficient project experience, agreed to follow the PMI code of professional conduct, and demonstrated knowledge of the field of project management by passing a comprehensive examination.

The number of people earning PMP® certification continues to increase. In 1993, there were about 1,000 certified project management professionals. By the end of September 2025 there were over 1.5 million active PMP®s, according to PMI's official website. PMI and other organizations also offer additional certifications. See Appendix B for more information on certifications.

Figure 1-7 shows the rapid growth in the number of people earning project management professional certification from 1993 through December 31, 2023, the last time the PMI Fact File was available. Although most PMP®s are in the U.S. and Canada, the PMP® credential is growing in popularity in several countries, such as Japan, China, and India. There are also requirements to maintain active certification status by continuing to develop expertise in the field. Consult PMI's website and Appendix B of this text for more details.



*Source: Various issues of PMI Today® and the PMI Fact File.

Figure 1-7. Growth in PMP® certification

PMI provides over a dozen certifications related to the field of project management, including one launched in late 2025 called PMI Certified Professional in Managing AI (PMI-CPMAI)™. Other certifications provided by different organizations are summarized below:

- In 2021, Google launched a project management certification as part of their “Grow with Google” program. (Other Google certifications include cybersecurity, data analytics, digital marketing and ecommerce, and IT support.) Google’s project management certificate program is geared toward people looking for an entry-level job in project management and requires no prior experience. It includes over 100

hours of online education provided through the Coursera platform. They suggest completing the program in under six months with 5-10 hours of study a week, but you can work at your own pace, often finishing much faster. Over 2.2 million people enrolled in this program by September 2025, and Google often runs promotions where you could enroll for free!

- PRINCE2, or Projects in Controlled Environments, is a process-based method for effective project management known across the world. There are over one million certified PRINCE2 professionals.
- In 2026 Scrum.org announced that there were over 1.1 million professional scrum certifications held throughout the world.
- Scaled Agile Framework (SAFe) is a popular framework for scaling Agile. There are several different certifications including SAFe Agilest, Scrum Master, and Product Owner/Product Manager. Estimates of the number of certified professionals vary from 1-2 million.
- The International Project Management Association (IPMA) provides several levels of certification based on successful experience in managing projects. There are over 320,000 certified project professionals.
- CompTIA offers the Project+ focused on business professionals managing small-to medium-sized projects.

The goal of this book is to help you understand many important project management concepts. It will help you pass a project management certification test, but more importantly, it will help you understand and apply good project management.

PMI Student Membership and Certification Information

As a student, you can join PMI for a reduced fee (\$32 vs. \$164 in 2026 in the U.S.). Consult PMI's website (www.pmi.org) for more information and costs for other countries. PMI also announced a new Group Student Membership and Student Bundle in 2026. Students should consider earning the Certified Associate in Project Management (CAPM®) credential from PMI. If you complete a bachelor's degree, you do not need any work experience to earn the CAPM®. However, if you have enough work experience, the PMP® is more marketable. See the companion website (<https://intropm.com>) for more information on certification and several other topics.

Ethics in Project Management

Ethics, loosely defined, is a set of principles that guide our decision making based on personal values of what is “right” and “wrong.” Making ethical decisions is an important part of our personal and professional lives because it generates trust and respect with other people. Project managers often face ethical dilemmas. For example, several projects involve different payment methods. If a project manager can make more money by doing a job poorly, should he or she do the job poorly? No! If a project manager is personally opposed to the development of nuclear weapons, should he or she refuse to manage a project that helps produce them? Yes! Ethics guide us in making these types of decisions.

PMI has a Code of Ethics and Professional Conduct which applies not only to PMI certification holders but to all PMI members, applicants starting a PMI certification process, and PMI volunteers. It is vital for project management practitioners to conduct their work in an ethical manner. Even if you are not affiliated with PMI, these guidelines can help you conduct your work in an ethical manner, which helps the profession earn the confidence of the public, employers, employees, and all project stakeholders. The 2025 PMI Code of Ethics and Professional Conduct includes short chapters addressing vision and applicability, responsibility, respect, fairness, and honesty.

Advancements in AI have created the need to evaluate ethical issues like bias, privacy, copyright, accountability, and impacts on society. There are many examples where the lack of ethics in AI has caused harm. Grieving parents sue AI companies for goading their children into committing suicide. AI errors cause medical malpractice and wrongly deny insurance. Artists, musicians, and authors sue companies for copyright infringement. There are several databases and trackers that focus on the growing number of AI-focused lawsuits. As people use AI in their professional and personal lives, it is crucial to keep ethics in mind.

Project Management Careers

How does one become a project manager? In the past, many people became project managers by accident. They had never heard of the job title, and their organizations did not have a real career path for project managers. They may have led a small project part-time and then been thrown into the role of project manager on a larger project. Today, individuals and organizations often take a more proactive approach. Some people study project management in college and enter the field upon graduation. Others gain expertise in a certain industry and/or application area in a more technical capacity and then move into project management when they believe (or their bosses believe) they can lead a team.

The need for project managers is evident in recent studies and job postings.

- As mentioned earlier, there were about 40 million project managers globally in 2025, and projected demand by 2035 is for an additional 30 million.
- In September 2025, LinkedIn listed project management jobs as #4 in the top 10 jobs identified as being most in demand.
- The need for change is everywhere—technology, healthcare, construction, etc., and change happens through projects.

What is a typical career path for project managers? Being a project manager is a demanding yet rewarding profession, for the right person. Many people start off leading a small

project related to their current job, part-time, to make sure they are cut-out for and enjoy the work. Some organizations require their people to have a few years of experience before they let them lead any projects. Others hire entry-level people with the title of project coordinator or project assistant. With increased use of generative AI and agents, however, there aren't as many project coordinator positions available as described in the following Media Snapshot.

MEDIA SNAPSHOT

A 2025 podcast entitled “How to start a PM career when generative AI is replacing entry-level roles” addressed the problem many young people are facing in finding their first professional jobs out of college. In this episode, Galen Low, the co-founder of The Digital Project Manager (DPM) and host of The DPM Podcast has a lively discussion with Benjamin Chan, Founder of CLYMB Consulting. A few questions and answers are quoted below:

Galen Low: How can aspiring project managers break into the world of project management when there's no ground floor and no stairs until they get to the second level?

Ben Chan: For those that are trying to go into that project management area, start looking and building up those skills as soon as possible wherever you are.

Galen Low: What are the skills and traits that a hiring manager could be looking for with the backdrop of like AI tools, doing all the traditional project coordinator stuff?

Ben Chan: Quickness to learn, adaptability, being able to manage conflict. Those are things that drive success.

Galen Low: Is AI literally taking entry level jobs or is it redefining what an entry level job is?

Ben Chan: It's probably the latter. It might be a redefinition of what does that role exactly look like? You need to see new jobs that have never been thought of. Network. Go and talk to people. In the end, an AI is not gonna hire you. People are gonna hire you.²³

You can listen to this podcast or read the entire transcript from www.thedigitalprojectmanager.com.

Many organizations realize that they need to provide a structured career path to develop and maintain their talent pipeline for project managers. After leading a small project, many people go on to lead multiple small projects, larger projects, or become program managers. Some organizations have different levels of project managers, often based on knowledge and experience. What if you do not want to stay in a project management career path? You can often go back to your former, more technical position, and move along that career path. Or, many ex-project managers move into higher level management positions, such as director, vice president, or even CEO. Some become consultants, educators, or entrepreneurs. Their experience leading projects makes them marketable in several different careers.

PERSONAL EXAMPLE

I completed my bachelor's degree on a U.S. Reserve Officers' Training Corps (ROTC) scholarship in 1981, and my first assignment as a 2nd Lieutenant was at Hanscom Air Force Base. I worked off base at a company and was initially in charge of a \$250K project to study the interoperability of various satellite and communications systems under development. I knew nothing about those systems or formal project management, but I had taken a couple of management courses, had some part-time work experience from summer jobs, and had some leadership experience after being the captain of several sports teams. I was a quiet person and often the only woman in meetings.

How did I manage a project when I knew little about it and had little experience? I was the third of seven children growing up, so I knew how to work with other people, negotiate, and focus on what was important. My organization also assigned us mentors, and mine was a captain with experience working in that environment. I spent the first few months just listening and asking a lot of questions, and I soon became comfortable making decisions and leading our team. I then led a bigger project and became better at public speaking, an important skill for being seen, heard, and moving ahead. I even joined the base briefing team to enhance my speaking skills. I was also never afraid to ask questions, and one manager said I was very astute. (I had to look up the meaning of that word! It means being good at understanding complex situations, spotting opportunities, and making smart choices.) I earned my PMP® certification in 1998 before I started writing textbooks. I continued to gain more skills and confidence that led me to eventually fulfilling my dream of being my own boss while educating future leaders.

Project Management Software

The project management and software development communities continue to respond to the need for more software to assist in managing projects. There are hundreds of products available, ranging from free online or smart phone apps to enterprise software with high monthly fees per user. Deciding which project management software to use has become a project itself. International Data Corporation (IDC) reports the worldwide project and portfolio management (PPM) software market to be \$7.46 billion in 2024, with growth to \$13.6 billion in 2029. “We see uptake and rapidly evolving adoption of AI and ML, including AI agents, and significant uptake of PPM in the cloud, which will continue throughout the forecast period.”²⁴

The top companies in the PPM market include:

- Oracle (US)
- Smartsheet (US)
- Microsoft (US)
- Asana (US)
- ServiceNow (US)
- Planview (US)
- SAP (Germany)
- Atlassian (Australia)
- Wrike (US)
- Monday.com (Israel) and many more.²⁵

In the past, Microsoft Project dominated the project management software market, releasing its first version in 1984. Today, there are hundreds of tools available, and even Microsoft provides several options based on user needs and budgets. As agile and AI became more popular, companies included capabilities to manage agile projects and to use AI to assist customers in using their software. Key features that distinguish project and portfolio management software include the ability to do the following:

- Enter detailed task information required to complete a project
- Create Gantt charts to display project timelines, showing task dependencies, milestones, and assignments as well as project network diagrams to show critical path information (more details on these concepts later in this text)
- Perform resource management to allocate and track resources
- Assign, track, and forecast costs for project tasks
- Provide various reports and graphics to track and summarize project status
- Manage multiple projects and assist in project portfolio management

Many students like to use free software with no time restrictions when learning about project management. Figure 1-8 displays a screenshot from the free desktop version of ProjectLibre, showing a simple project schedule in Gantt chart format. Notice that dependencies between tasks are displayed on the calendar. The desktop version is designed for single users and single projects and runs on both Windows and Macintosh computers.

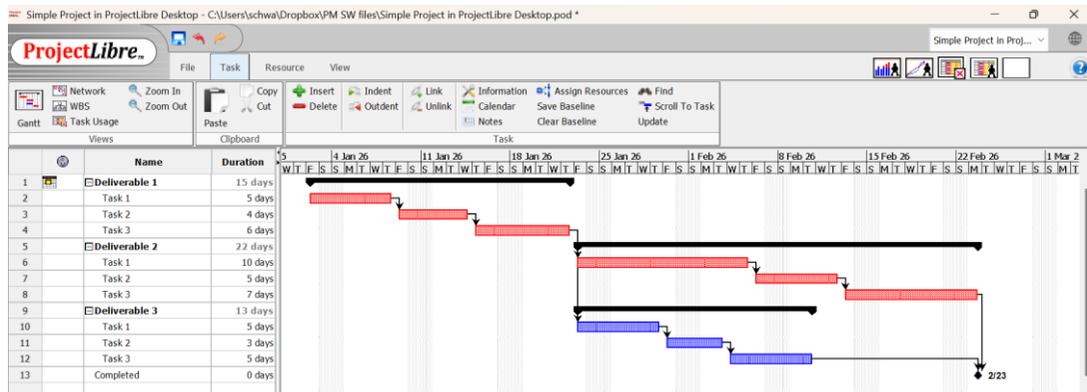


Figure 1-8. Sample Gantt chart in free ProjectLibra Desktop

ProjectLibre also has a more robust cloud version. According to ProjectLibre's website, their desktop version has had over 7.7 million downloads across 193 countries and is used in over 1,700 universities. Their desktop and cloud versions are the #1 alternative to Microsoft Project.²⁶ The cloud version of ProjectLibra allows organizations to manage multiple projects and perform more complex project portfolio management. Many organizations like to forecast resource needs and see various charts or dashboards showing the status of multiple project costs and risks. Figure 1-9 provides an example of a dashboard from ProjectLibre Cloud version.

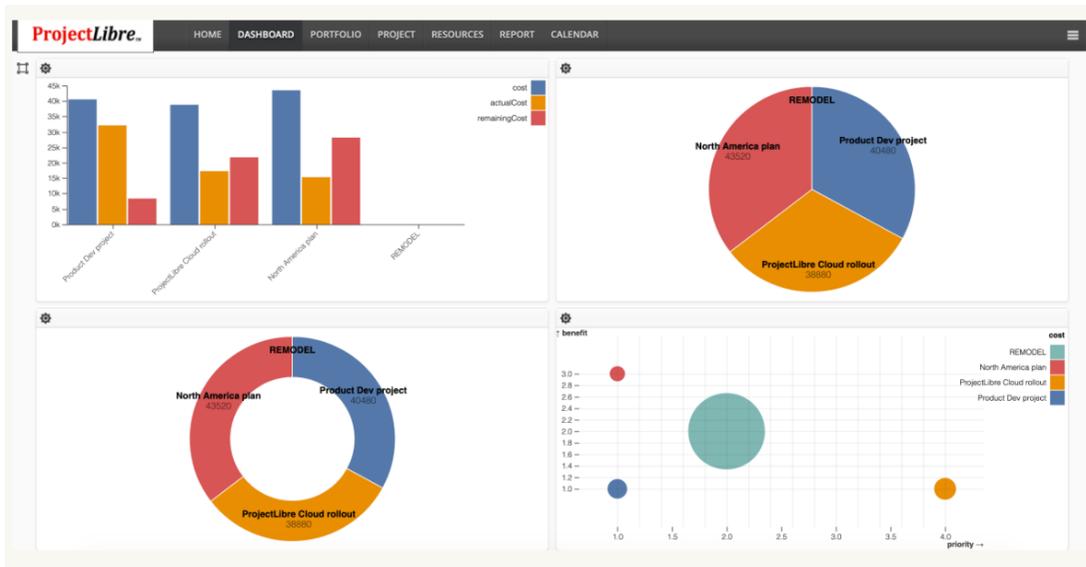


Figure 1-9. Sample multiple project dashboard in ProjectLibra Cloud version

Atlassian Jira, according to their website, is the #1 software development tool used by agile teams. Figure 1-10 shows a screenshot from a Jira template file for creating Kanban boards. (You'll learn more about Kanban boards in a later chapter.) Note that many project management products are cloud-based, with new features added often. Most products now also include AI features to help teams create, plan, collaborate, execute, and manage projects consistently and efficiently. As products change quickly, screenshots may look different than those shown in this text.

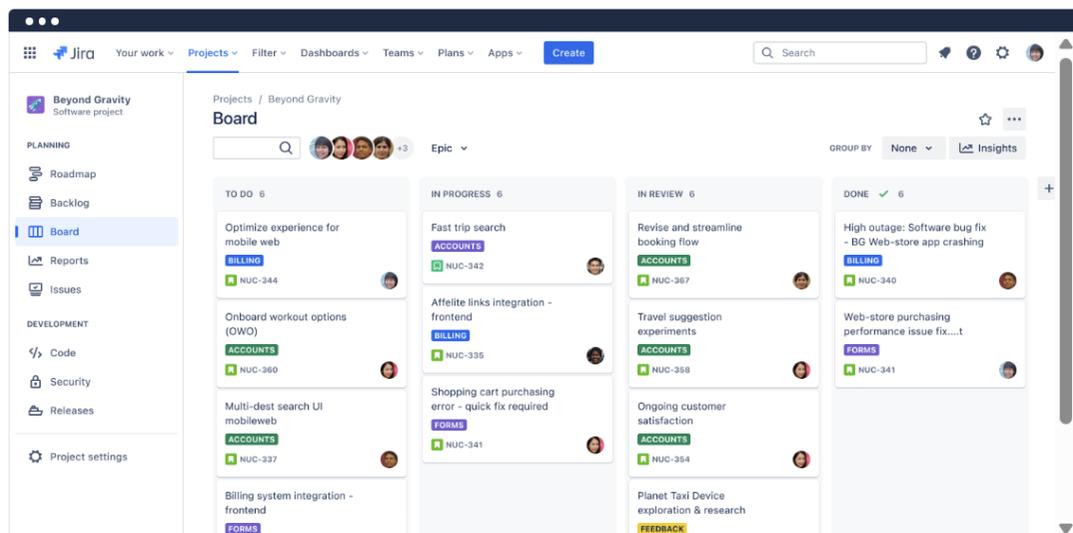


Figure 1-10. Sample Kanban board in Jira

Free Trials and Information on Project Management Software

Evaluation copies of many tools, such as ProjectLibra, Jira, Microsoft Project, etc. are available from their company websites. Products change often. See this book's companion website (<https://intropm.com>) for links to information on project management software and other topics. Instructors using this book in a class can create an assignment for students to find the best tools available to meet their needs, as described in Exercise 3 at the end of this chapter.

ARTIFICIAL INTELLIGENCE TOOLS AND PROJECT MANAGEMENT

One of the biggest changes in the past few years has been the advancements in AI. This textbook now includes a section at the end of each chapter on AI as it relates to content in that chapter. There is also a new chapter, Chapter 10, called AI and Project Management. The companion website will include links to updated information as things change quickly.

As defined here and further in Chapter 10, “**Artificial intelligence (AI)** is technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy.”²⁷ Consider the following estimates:

- The World Economic Forum's Future of Jobs Report (2025) forecasts that AI and other information processing technologies will spark the creation of 170 million new roles worldwide while making 92 million jobs redundant.²⁸
- Gartner estimated that global spending on AI was over \$1.7 trillion in 2025. They also predict that spending will be over \$2.5 trillion in 2026 and over \$3.3 in 2027.²⁹
- LinkedIn listed AI literacy as the top skill companies are looking for so workers can understand and use new tools for business purposes.³⁰

Many project managers report that using AI can free up some of their time by automating administrative work. For example, Nilotpal Ray, PMP®, PRINCE2 Practitioner®, shared his experience with using various AI tools to help manage projects. He shared the following: “Let me be very clear. AI didn't make me a better project manager over the last 30 days just because I was using it...What it did do was free up nearly 11 hours per week of administrative work out of my standard 40-hour work week. So that's a flat 25% and above productivity, allowing me to focus on what truly matters as a project manager... leading people, building relationships and navigating human complexities.”³¹ His main findings include the following benefits and drawback of using AI:

- Capturing, summarizing, and analyzing meeting transcripts to provide a consolidated list of prioritized action items with deadlines saved about four hours per week.
- Quickly reporting project status by analyzing categorized emails to provide an executive summary with key decisions, budget impacts, risks, etc. saved about three hours per week
- Creating a draft risk register by analyzing detailed project information to review with various stakeholders saved about four hours per week.

- Trying to use AI to assist with a performance review of a troubled team member wasted time due to the tool's inability to dynamically handle human interactions.

AI can also be used to improve scheduling and resource allocation, forecast financial information, enhance creativity with brainstorming, and create charts and videos, among other things. Several experts suggest that the real value of AI is not in simply automating simple tasks to free up some time, but in using it to augment experts so they can create more valuable products and services.

Many project management software products are using AI. For example, Figure 1-11 shows an early demonstration of how you can copy a description of a project (opening a flagship store in this example) into ProjectLibra's Cloud/AI version, and it will use its library of data and Language Learning Model (LLM) to generate a draft schedule. It can also provide text in 28 different languages.

AI Project Generation
Retail Industry: Opening a Flagship Store
Description: Phases include site selection, interior design, staffing, and marketing campaigns. Return 50 tasks.
Parallel Phases: Marketing campaigns can run parallel to staff hiring and training.
Why waterfall: Each phase builds on the previous one to ensure a smooth opening.

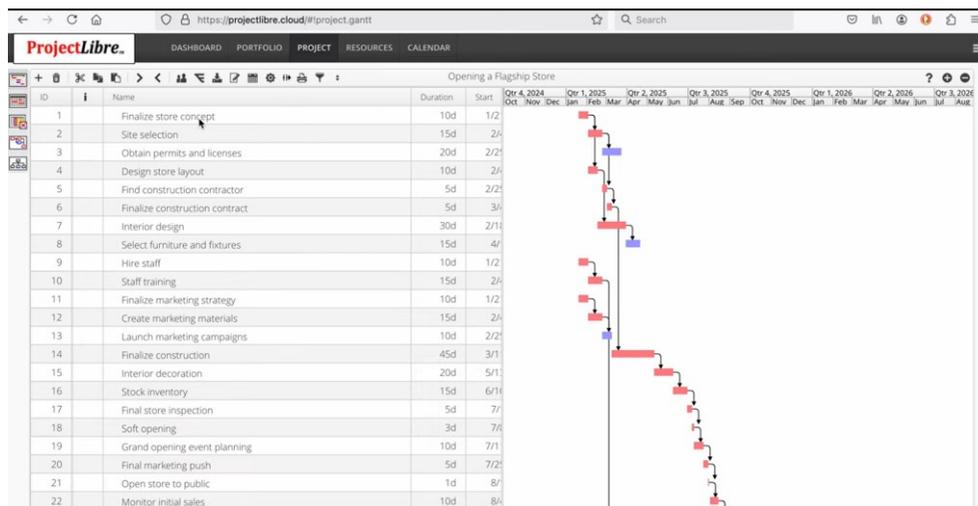


Figure 1-11. AI generated draft schedule in ProjectLibre

You can use generative AI tools like ChatGPT, Claude, Gemini, Copilot, etc. to assist in many aspects of project management. This text includes several prompts and their results, all from free versions of these tools. You can also control what sources are used in tools like

Google’s NotebookLM. For example, I uploaded a draft of this chapter and created an infographic summarizing the chapter, as shown in Figure 1-12.

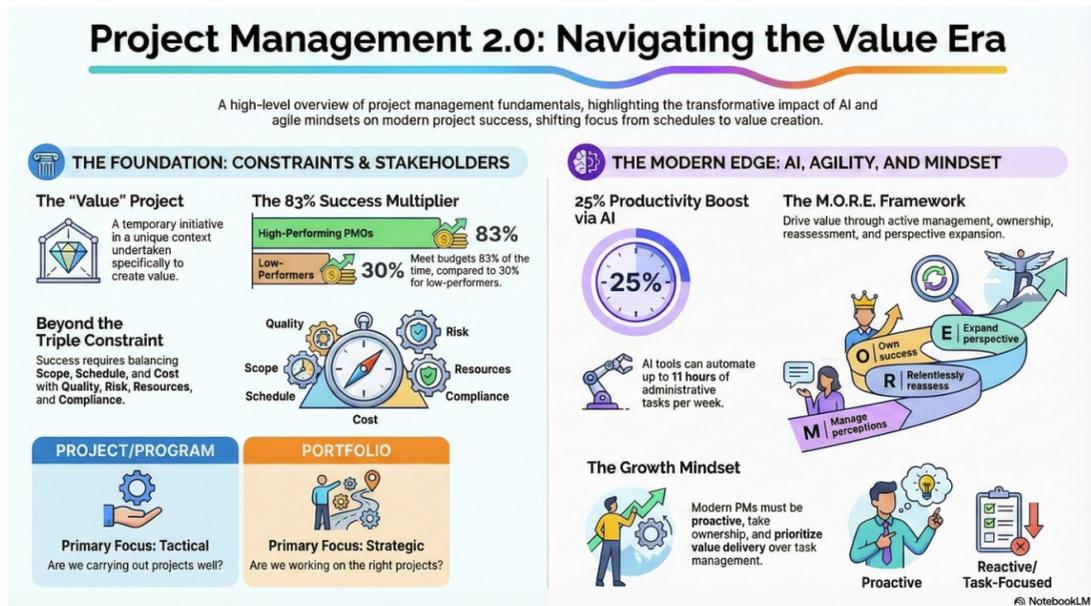


Figure 1-12. Infographic of this chapter created with Google NotebookLM (February 3, 2026)

While AI can be very beneficial, it can also cause major problems. A 2026 study published in *Harvard Business Review* suggests that AI does not always reduce work, as described earlier. It can intensify work and lead to burnout if not managed well.

In the study, employees worked at a faster pace, took on a broader scope of tasks, and extended work into more hours of the day, often without being asked to do so. That may sound like a win, but it’s not quite so simple. These changes can be unsustainable, leading to workload creep, cognitive fatigue, burnout, and weakened decision-making. The productivity surge enjoyed at the beginning can give way to lower quality work, turnover, and other problems. To correct for this, companies need to adopt an “AI practice,” or a set of norms and standards around AI use that can include intentional pauses, sequencing work, and adding more human grounding.³²

Another problem with AI is that results can be inaccurate (or totally false hallucinations), and you can spend a lot of time and money experimenting with ever-changing tools. Think about why you want to use AI and what it can do for you. It’s very important to remember the old saying, “A fool with a tool is still just a fool.” People will always try to exploit “new” ideas—AI, project management software, agile, fad diets, you name it—to make money. Before investing time or money in any tool, learn the fundamental concepts and decide what is most appropriate for you and your organization. Also remember that AI adds the most

value by enhancing human capacity, not by replacing humans. See Chapter 10 for more information on AI and project management, including benefits and cautions.

Today, people in virtually every industry around the globe apply different aspects of project, program, and portfolio management using predictive, agile, and hybrid approaches. The sophistication and effectiveness with which organizations use these concepts and tools today is influencing the way companies do business and respond to market needs with speed and accuracy. There are many reasons to study project, program, and portfolio management. The number of projects continues to grow, the complexity of these projects continues to increase, and the profession of project management continues to expand and mature. Many colleges, universities, and companies now offer courses related to various aspects of project, program, and portfolio management. The growing number of projects and the evidence that good project management really can make a difference continue to contribute to the growth of this field.

CASE WRAP-UP

Another board member asked Doug Milis, the CEO, to describe more about specific projects that helped them succeed and how they developed such a strong culture of teamwork. He explained how Marie Scott, the Director of their Project Management Office (PMO) worked with him and other senior managers to quickly prioritize needs and define specific projects. For example, one project addressed how employees could effectively use various forms of AI within the organization while protecting corporate data. Part of this project focused on communicating “quick hits” or successful uses of AI within the organization. Fortunately, Marie had also overseen a program to train all employees on agile to help the organization become more flexible and responsive. A key part of that training was getting people to work in self-managed teams, focusing on being creative and professional in completing prioritized tasks. They had successfully completed a Just-In-Time Training project several years ago, and they were about to start a new project to address new training and human capital needs. The board and the company’s shareholders were very pleased with the results of these efforts and the company’s continued success. (Note: This company and sample projects will be described in detail in the following chapters.)

CHAPTER SUMMARY

There is a new or renewed interest in project management today as the number of projects continues to grow and their complexity continues to increase. Most projects fail to meet scope, schedule, and cost goals, costing organizations millions of dollars. Using a more disciplined approach to managing all types of projects can help organizations succeed.

A project is a temporary initiative in a unique context undertaken to create value. Projects are developed incrementally; they require resources, have a sponsor, and involve uncertainty. The triple constraint of project management refers to managing the scope, schedule, and cost dimensions of a project. There are other constraints as well.

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet or exceed intended value. Stakeholders are the people involved in or affected by project activities. A framework for project management based on the *PMBOK® Guide - Eighth Edition*, includes the project stakeholders, project management focus areas, performance domains, and project management tools and techniques.

A program is a group of related projects and program activities managed in a coordinated manner to obtain benefits not available from managing them individually. Project portfolio management involves organizing and managing a collection of projects, programs, subsidiary portfolios, and operations as a group to achieve strategic objectives. Portfolio management emphasizes meeting strategic goals.

Many organizations today use agile or hybrid approaches to manage projects. It is important to use an agile mindset first to help agile projects succeed. The terms agile or adaptive project management describes an approach where the project scope cannot be well-defined upfront, incremental releases are desired, and changes are expected. Predictive, waterfall, or traditional project management describes an approach where most of the project planning is done upfront, there is a single final product, service, or result delivered at the end of the project, change is constrained, costs and risks are controlled, and stakeholders are involved at specific milestones. A hybrid approach uses combination of these two approaches.

The profession of project management continues to grow and mature. Project, program, and portfolio managers play key roles in helping projects and organizations succeed. They must perform various duties, possess many skills, and continue to develop skills in project management, general management, and their application area, such as IT, healthcare, or construction. Soft skills, especially leadership, are particularly important for project managers. The Project Management Institute (PMI) is an international professional society that provides several certifications and upholds a code of ethics. The number of people earning PMP® certification continues to grow, and several other organizations provide certifications, including Google. Demand for project managers is high, and several organizations provide defined career paths. Hundreds of project management software products and AI tools are available to assist people in managing projects.

Most project managers and teams today use AI to enhance their performance. They can save time by using AI to automate administrative work, giving them more time to focus on more challenging tasks. Organizations use AI to improve scheduling and resource allocation, forecast financial information, enhance creativity, etc. AI can also cause problems, so you need to make sure to use it effectively.

USE OF AI FOR ASSIGNMENTS

Note: Instructors should discuss their policies on the use of AI for quizzes, exams, discussion questions, exercises, and team projects. Some people suggest using the “traffic light framework,” as summarized in Figure 1-13.

The Traffic Light Framework

This model categorizes assignments into three levels of AI integration:

- **Red (No AI):** Used for foundational skill-building (e.g., in-class exams, handwritten reflections, or core logic exercises). The goal here is to ensure the student can perform the task unassisted.
- **Yellow (AI-Assisted):** AI can be used for brainstorming, outlining, or debugging code, but the final output must be the student’s original work. This is the “study buddy” phase.
- **Green (AI-Integrated):** Students are encouraged—or even required—to use AI to generate content, analyze massive datasets, or iterate on complex designs. The focus shifts to **prompt engineering** and **critical verification**.

Figure 1-13. Traffic light framework for use of AI (Google Gemini, February 2, 2026)

QUICK QUIZ

1. Which of the following statements is false?
 - A. Demand for project managers continues to increase.
 - B. Agile organizations respond better to change.
 - C. According to PMI’s 2024 survey, over half of projects were successful.
 - D. A company demonstrated flying cars in 2025.

2. A predictive approach to project management is also called _____.
 - A. adaptive
 - B. agile
 - C. iterative
 - D. waterfall

3. A _____ is a temporary initiative in a unique context undertaken to create value
 - A. program
 - B. process
 - C. project
 - D. portfolio

4. Which of the following statements are true?
 - A. Not all projects are unique.
 - B. It is not easy to define and measure project success.
 - C. Projects must end.
 - D. Not all projects involve uncertainty.

5. Which of the following is not part of the triple constraint of project management?
 - A. meeting value goals
 - B. meeting schedule goals
 - C. meeting scope goals
 - D. meeting cost goals

6. _____ is not a performance domain.
 - A. Governance
 - B. Finance
 - C. Risk
 - D. Communication

7. Which of the following is not a project management principle according to the *PMBOK® Guide - Eighth Edition*?
 - A. Integrate sustainability
 - B. Be accountable
 - C. Focus on leadership
 - D. Adopt a holistic view

8. Project portfolio management addresses _____ goals of an organization, while project management addresses _____ goals.
 - A. strategic, tactical
 - B. tactical, strategic
 - C. internal, external
 - D. external, internal

9. Which of the following statements is true concerning agile project management?
 - A. You should use a tool like Jira and not Microsoft Project on agile projects.
 - B. All projects should be run using an agile framework.
 - C. You cannot use both agile and predictive project management tools on the same project.
 - D. You should first understand and use an agile mindset before trying to implement agile project management.

10. Which of the following statements is true concerning the project management profession?
 - A. Project managers, program managers, and portfolio managers require the same skillset.
 - B. The number of people earning Project Management Professional (PMP®) certification has decreased in recent years.
 - C. People in virtually every industry around the globe can benefit from good project management.
 - D. It is too early to see benefits of using AI in project management.

Quick Quiz Answers

1. C, 2. D 3. C, 4. B, 5. A, 6. D, 7. C, 8. A, 9. D, 10. C.

DISCUSSION QUESTIONS

1. Why is there a new or renewed interest in the field of project management? What statistics presented would motivate someone to begin a career in project management?
2. What is a project, and what are its main attributes? How is a project different from what most people do in their day-to-day jobs? What is the triple constraint? What are other project constraints? Provide examples of projects and their constraints.
3. What is project management? Briefly describe the project management framework based on the *PMBOK® Guide - Eight Edition*, providing examples of stakeholders, focus areas, performance domains, tools and techniques, and project success factors.
4. What is agile? What is an agile mindset? What are the main differences between predictive, agile, and hybrid approaches to project management?
5. Discuss the relationship between project, program, and portfolio management and their contribution to enterprise success.
6. What are suggested skills for project managers? Why should project managers have a growth mindset?
7. What types of certifications are available in project management? Why do you think the number of people earning project management certification keeps increasing?
8. What types of software can assist in project management? What unique functions can you perform with these tools?
9. How is AI changing the field of project management? What are some of the more mundane tasks that AI can do? What are some of the more complex tasks it can do? What are some of the dangers of using AI in project management? Do you think AI will take over most project management jobs?
10. How should you use AI for your class?

EXERCISES

Note: These exercises can be done individually or in teams, in class, as homework, or in a virtual environment. Learners can either write their results in a paper (on or two pages is usually sufficient) or prepare a short video, podcast, or presentation (5-10 minutes) to show their results. Feel free to modify the exercises to meet your students' needs or interests.

1. Review PMI's website (www.pmi.org) and summarize two articles or reports published in the past year. Summarize key information and your opinion of the articles. How can you use what you learned in your job or personal life?
2. Find an example of a real project with a real project manager that was completed in the past year. Feel free to use projects mentioned in the media related to sporting events, entertainment, business, healthcare, etc. or a project from your work, if applicable. Describe the project in terms of its scope, schedule, and cost goals. Was it managed using a predictive, agile, or hybrid approach? Describe at least one example of what went right and wrong on the project. Also, describe whether you consider the project to be a success or not and why. Include at least one reference and proper citations.

3. Review information about various project management software tools. Try using ProjectLibre. Try free trials of at least two other products. What tool(s) do you plan to use to help manage projects for your class, job, or personal life? Why did you select them over others?
4. Watch at least three videos about the NEOM megaproject. Summarize key points from at least two of the videos. What surprised you most about the project? Describe two specific challenges the project team faced and how they addressed them. Cite your references.
5. Research recent studies about project success, especially those that focus on value or benefits realization. Summarize your findings, citing at least two references from the past year.
6. Research information about earning and maintaining PMP® and CAPM® certifications. How long do you think most people studied before taking the PMP® exam? Review Google's project management certification. Do you think it is valuable? Do you think that having a certification makes you a more successful project manager? Summarize your findings and opinions.
7. Go to www.indeed.com or another job search site and search for jobs as a "project manager" or "program manager" in three geographic regions of your choice. Summarize your findings, including the number of positions, qualifications, salary, and other information of interest to you.
8. Find two recent articles about using AI to assist in managing projects and two other articles that describe project problems produced by AI. Summarize your findings.

TEAM PROJECTS

Note: Team projects can be done in class, as homework, or in a virtual environment. Learners can either write their results in a paper (three or four pages is usually sufficient) or prepare a short video, podcast, or presentation (15-20 minutes) to show their results.

1. Project ideas: As a team, discuss projects that you are currently working on or would like to work on to benefit yourself, your employer, your family, or the broader community. Try to think of projects that would take at least 40 hours to complete. Come up with at least ten projects. Summarize the purpose of the projects, estimate the time and money needed to complete them, and document how you would measure if they were successful or not. If you had to select one to work on as a class project, which would it be and why? Who on your team would want to lead the project and why? How would you select your project manager?
2. Certifications: Summarize requirements for earning at least four different project management certifications. Which ones do you think are most valuable and why? Select one that at least one of your team members would want to pursue. Summarize your findings and opinions.
3. AI: Research how to write a good prompt. As a team, develop an initial prompt and follow-up prompts related to how organizations successfully use AI in project management. Compare results from three different sources, focusing on what made their use of AI successful. Also discuss how each of your team members is currently using AI successfully or unsuccessfully. Summarize your opinions and results.

KEY TERMS

agile — The ability to create and respond to change.

agile or adaptive project management — An approach where the project scope cannot be defined upfront, incremental deliveries are desired, and changes are expected.

artificial intelligence — Technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy.

best practice — An optimal way recognized by industry to achieve a stated goal or objective.

ethics — A set of principles that guide our decision making based on personal values of what is “right” and “wrong.”

finance performance domain — Planning, estimating, budgeting, financing, managing, measuring, and controlling of all internal and external monetary resources to ensure the financial health of the project and optimize its value for the organization.

fixed mindset — When you believe talent is static, and you avoid challenges.

governance performance domain — Understanding how an organization is directed and controlled by various stakeholders and regulatory bodies to integrate all aspects of a project to optimize its value and ensure alignment with organizational strategy and goals. It includes processes across all five focus areas.

growth mindset — When you can view failures as learning and growth opportunities and that you continue to pursue goals, even if they are difficult.

hybrid project management — A mixture or combination of predictive and agile approaches to managing projects.

leader — A person who focuses on long-term goals and big-picture objectives, while inspiring people to reach those goals.

manager — A person who deals with the day-to-day details of meeting specific goals.

megaproject — A very large project that typically costs over US \$1 billion, affects over one million people, and lasts several years.

mindset — a collection of beliefs, attitudes, and assumptions that shape how a person views and interacts with others in various situations.

net promoter score — A number that represents the customer’s willingness to recommend a product or service to others.

principles — Foundational guidelines for strategy, decision making, and problem solving.

portfolio — A collection of projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives.

program — A group of related projects, subsidiary programs, and program activities managed in a coordinated manner to obtain benefits not available from managing them individually.

program manager — A person who provides leadership and direction for the project managers heading the projects within the program.

project — A temporary initiative in a unique context undertaken to create value.

project management — The application of knowledge, skills, tools, and techniques to project activities to meet or exceed intended value.

project management focus areas — Initiating, planning, executing, monitoring and controlling, and closing.

project manager — The person responsible for working with the project sponsor, the project team, and the other people involved in a project to meet project objectives.

Project Management Institute (PMI) — International professional society for project managers.

Project Management Professional (PMP®) — Certification provided by PMI that requires documenting project experience, agreeing to follow the PMI code of ethics, and passing a comprehensive exam.

project management tools and techniques — Methods available to assist project managers and their teams; some popular tools in the time management knowledge area include Gantt charts, network diagrams, critical path analysis, and project management software.

project performance domains — A group of interrelated and interdependent processes required to achieve desired project results and value.

project portfolio management — The grouping and managing of projects and programs as a portfolio of investments.

project sponsor — An individual or group that provides direction and funding for the project and is accountable for enabling project success.

project success — the consensus view across intended beneficiaries, other stakeholders, and project participants that a project was perceived to have delivered value that was worth the effort and expense.

resource performance domain — Making effective use of the human, physical, and virtual resources needed for the project to ensure the team is equipped with the necessary resources at the right time and place to achieve project objectives

risk performance domain — Identifying, analyzing, and responding to risks related to the project to ensure project continuity and success under uncertainty.

scrum — A lightweight framework that helps people, teams and organizations generate value through adaptive solutions for complex problems.

schedule performance domain — Estimating how long it will take to complete the work, developing an acceptable project schedule given cost-effective use of available resources, and ensuring timely completion of the project.

scope performance domain — Working with all appropriate stakeholders to define and manage all and only the work required to complete the project successfully, emphasizing adherence to target quality standards and acceptance criteria for deliverables and processes.

stakeholder performance domain — Identifying project stakeholders, understanding their needs and expectations, and communicating with them appropriately throughout the project to foster their support and ensure effective collaboration to maximize value.

stakeholders — People involved in or affected by project activities.

triple constraint — Balancing scope, schedule, and cost goals.

value — When a project's benefits exceed its investment.

waterfall, predictive, or traditional project management — Terms used to describe an approach where most of the project planning is done upfront, there is a single final product, service, or result delivered at the end of the project, change is constrained, costs and risks are controlled, and stakeholders are involved at specific milestones.

ENDNOTES

- Project Management Institute, “Global Project Management Talent Gap” (2025).
- ² PM Solutions, “The 2025 State of the Project Management Office (PMO) (2025).
- ³ Antonio Nieto-Rodrigues, “Hybrid Project Management: First Global Survey” (2024).
- ⁴ Project Management Institute, “Earning Power: Project Management Salary Survey – Fourteenth Edition” (2025).
- ⁵ Ibid.
- ⁶ Standish Group, “The CHAOS Report” (www.standishgroup.com) (1995).
- ⁷ Project Management Institute, “Free Introduction: PMI Certified Professional in Managing AI (PMI-CPMAI)[™] (2025).
- ⁸ Project Management Institute, Inc., *The Standard for Project Management, Eighth Edition* (2025), p. 5.
- ⁹ Project Management Institute, Inc., *The Standard for Project Management, Eighth Edition* (2025), p. 5.
- ¹⁰ Project Management Institute, Inc., *The Standard for Project Management, Eighth Edition* (2025), p. 6.
- ¹¹ Project Management Institute, Inc. “Project Management Institute Champions a New Era of Project Success” (September 19, 2024).
- ¹² Project Management Institute, “Project Success: Step Up: Redefining the Path to Project Success with M.O.R.E.,” (2025), p. 6.
- ¹³ Project Management Institute, Inc., *The Standard for Project Management, Eighth Edition* (2025), p. 5.
- ¹⁴ Wall Street Journal, “The World’s Biggest Construction Project Is a Magnet for Executives Behaving Badly” (September 11, 2024).
- ¹⁵ Project Management Institute, Inc., *The Standard for Project Management, Eighth Edition* (2025), p. 5.
- ¹⁶ Ken Schwaber and Jeff Sutherland, “The Scrum Guide” (November 2020).
- ¹⁷ Steve Denning, “Understanding the Agile Mindset,” *Forbes* (August 13, 2019).
- ¹⁸ Digitalai, *The 18th Edition State of Agile Report* (2025).
- ¹⁹ Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge* (2025), p. 103.
- ²⁰ Faye Wai, “Project Manager With 30+ Years of Experience Shares How He’s Deploying Microsoft’s AI Copilot Across His Organization, *Digital Project Manager* (October 15, 2025).
- ²¹ World Economic Forum, “Future of Jobs Report,” (2025).
- ²² Ultimate Business Library, *Best Practice: Ideas and Insights from the World’s Foremost Business Thinkers* (New York: Perseus 2003), p. 1.
- ²³ The Digital Project Manager, “How to start a PM career when generative AI is replacing entry-level roles,” Podcast (September 23, 2025).
- ²⁴ Melinda-Carol Ballou, “Worldwide Project and Portfolio Management Software Forecast, 2025–2029: Optimizing Businesses with Collaboration, Strategic Execution, and AI to Grow PPM Market,” IDC Research (June 2025).

²⁵ Marketsandmarketsresearch Pvt. Ltd., “Project Portfolio Management Market Surges to \$13.7 billion by 2029 - Dominated by Oracle (US), Smartsheet (US), Microsoft (US) (August 13, 2025).

²⁶ ProjectLibre, “About Us,” <https://www.projectlibre.com/about-us/> (accessed October 30, 2025).

²⁷ Cole Stryker and Eda Kavlakoglu, “What is artificial intelligence (AI)?” IBM Think (accessed January 13, 2026).

²⁸ Jasmin Jessen, “WEF: AI Will Create and Displace Millions of Jobs,” Sustainability Magazine (January 17, 2025)

²⁹ Gartner, “Gartner Says Worldwide AI Spending Will Total \$2.5 Trillion in 2026” (January 15, 2026).

³⁰ LinkedIn News, “LinkedIn Skills on the Rise 2025: The 15 fastest-growing skills in the U.S.” (March 19, 2025).

³¹ Nilotpal Ray, “I used AI to manage my projects for 30 days - Here's what happened,” PMP® With Ray YouTube video (September 5, 2025).

³² Aruna Ranganathan and Xingqi Maggie Ye, “AI Doesn’t Reduce Work—It Intensifies It,” Harvard Business Review (February 9, 2026).