Management Project
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Chapter 1
Introduction to Project Management Learning Objectives

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1.2 Project

- What is a project?

Is “a temporary endeavour undertaken to create a unique product, service, or result.

- Operations

Is work done in organisations to sustain the business. It focuses on the ongoing production of goods and services.

- ✓ Projects are different from operations in that they end when their objectives have been reached or the project has been terminated.
- ✓ People focusing on operations and projects must work together for a smooth transition.
- ✓ For example, in software development, DevOps is a fairly new term used to describe a culture of collaboration between software development and operations teams to build, test, and release reliable software more quickly.

Examples of IT 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.
- IT projects involve using hardware, software, and networks to create a product, service, or result.
- Examples of IT projects include the following:
  - ✓ A large network of healthcare providers updates its information systems and procedures to reduce hospital acquired diseases.
  - ✓ A team of students creates a smartphone application and sells it online.
  - ✓ A company develops a driverless car.
  - ✓ A college upgrades its technology infrastructure to provide wireless Internet access across the whole campus as well as online access to all academic and student service information.

- A company implements a new system to increase sales force productivity and customer relationship management that will work on various laptops, smartphones, and tablets.
- A television network implements a system to allow viewers to vote for contestants and provide other feedback on programs via social media sites.
- A government group develops a system to track child immunizations.
- A large group of volunteers from organizations throughout the world develops standards for environmentally friendly or green IT.

- ✓ A global bank acquires other financial institutions and needs to consolidate systems and procedures.
- ✓ Government regulations require monitoring of pollutants in air and water.
- ✓ A multinational firm decides to consolidate its information systems into an integrated enterprise resource management approach.

1.3 Project Attribute

- Project Attribute?

Projects come in all shapes and sizes. The following attributes help define a project further:

- A project has a unique purpose. Every project should have a well-defined objective.
- A project is temporary. A project has a definite beginning and end.
- A project drives change and enables value creation.
- A project is developed using progressive elaboration.

- A project requires resources, often from various areas.

  Resources include people, hardware, software, and other assets. Many projects cross departmental or other boundaries to achieve their unique purposes.

- A project should have a primary customer or sponsor.

  Most projects have many interested parties or stakeholders, but for a project to succeed someone must take the primary role of sponsorship. The project sponsor usually provides the direction and funding for the project.

- A project involves uncertainty.

  Because every project is unique, it is sometimes difficult to define its objectives clearly, estimate 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.

  This uncertainty is one of the main reasons project management is so challenging, especially on projects involving new technologies.

An effective project manager is crucial to a project's success. Project managers work with the project sponsors, team, and the other people involved to achieve project goals.

- Project Constraints?

- Every project is constrained in different ways, often by its scope, time, and cost goals. These limitations are sometimes referred to in project management as the triple constraint .
- To create a successful project, a project manager must consider scope, time, and cost and balance these three often-competing goals:

- 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? How will the scope be verified?

- Time

How long should it take to complete the project? What is the project's schedule? How will the team track actual schedule performance? Who can approve changes to the schedule?

- Cost

What should it cost to complete the project? What is the project's budget? How will costs be tracked? Who can authorise changes to the budget?

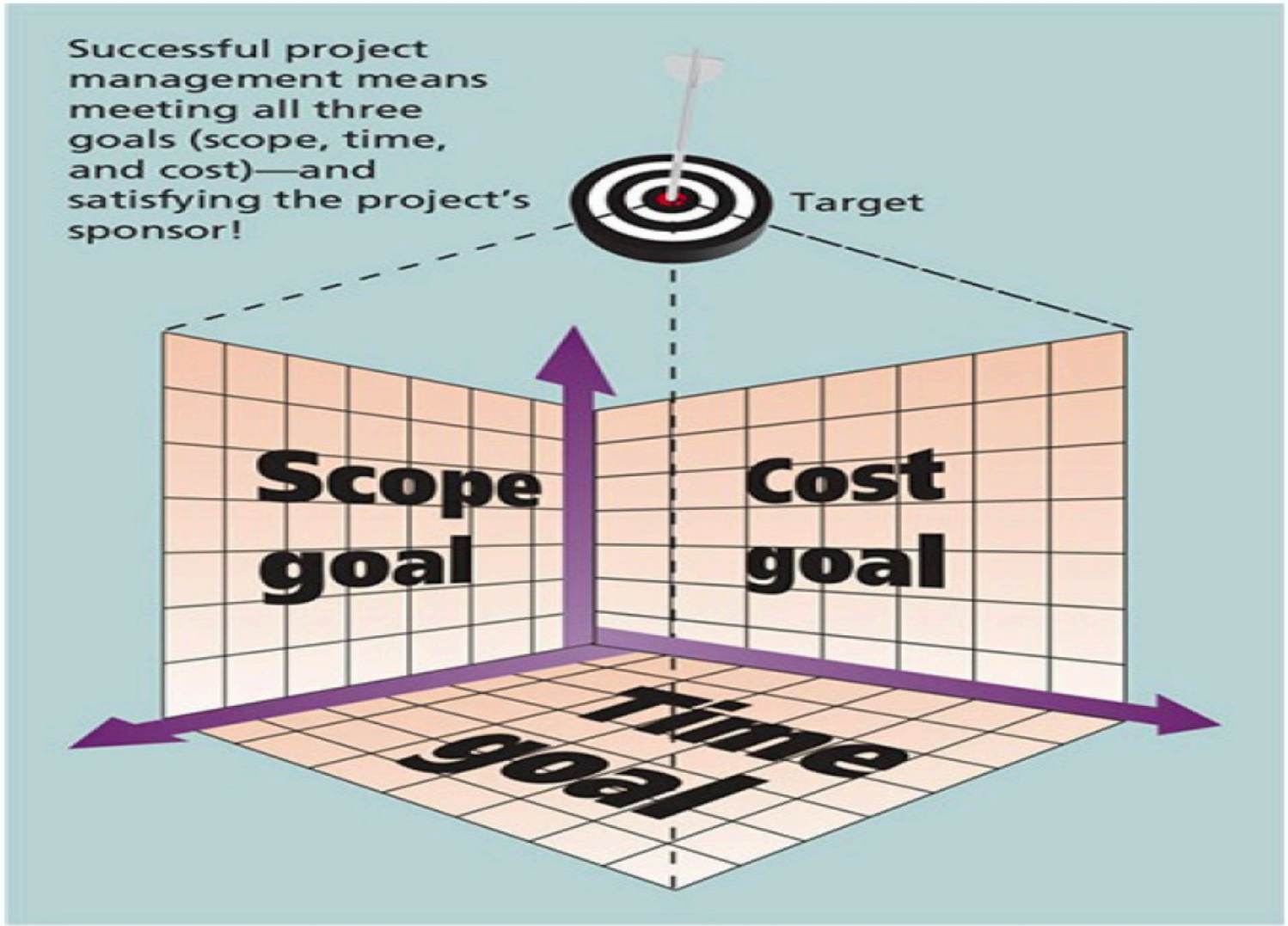

Figure 1.1 Project Constraints

- Managing the triple constraint involves making trade-offs between scope, time, and cost goals for a project.
- For example, you might need to increase the budget for a project to meet scope and time goals.
- Alternatively, you might have to reduce the scope of a project to meet time and cost goals.
- Experienced project managers know that you must decide which aspect of the triple constraint is most important. If time is most important, you must often change the initial scope and cost goals to meet the schedule. If scope goals are most important, you may need to adjust time and cost goals.

- Although the triple constraint describes how the basic elements of a project interrelate, other elements can also play significant roles.
- Quality is often a key factor in projects, as is customer or sponsor satisfaction. Some people, in fact, refer to the quadruple constraint of project management, which includes quality as well as scope, time, and cost.
- A project team may meet scope, time, and cost goals but might fail to meet quality standards and satisfy the sponsor.

- Other factors might also be crucial to a particular project. On some projects, resources are the main concern. For example, the entertainment industry often needs particular actors for movies or television shows. Project goals must be adjusted based on when particular people are available.
- Risk can also affect major project decisions. A company might wait to start a project until the risks are at an acceptable level. The project manager should be communicating with the sponsor throughout the project to make sure it is meeting expectations.

- How can you avoid the problems that occur when you meet scope, time, and cost goals, but lose sight of customer satisfaction?

The answer is good project management, which includes more than managing project constraints.

1.4 Project Management

- What Is Project Management?

Is “the application of knowledge, skills, tools, and techniques to project activities to meet project requirements.

Project managers must not only strive to meet specific scope, time, cost, and quality goals of projects, but also facilitate the entire process to meet the needs and expectations of people involved in project activities or affected by them.

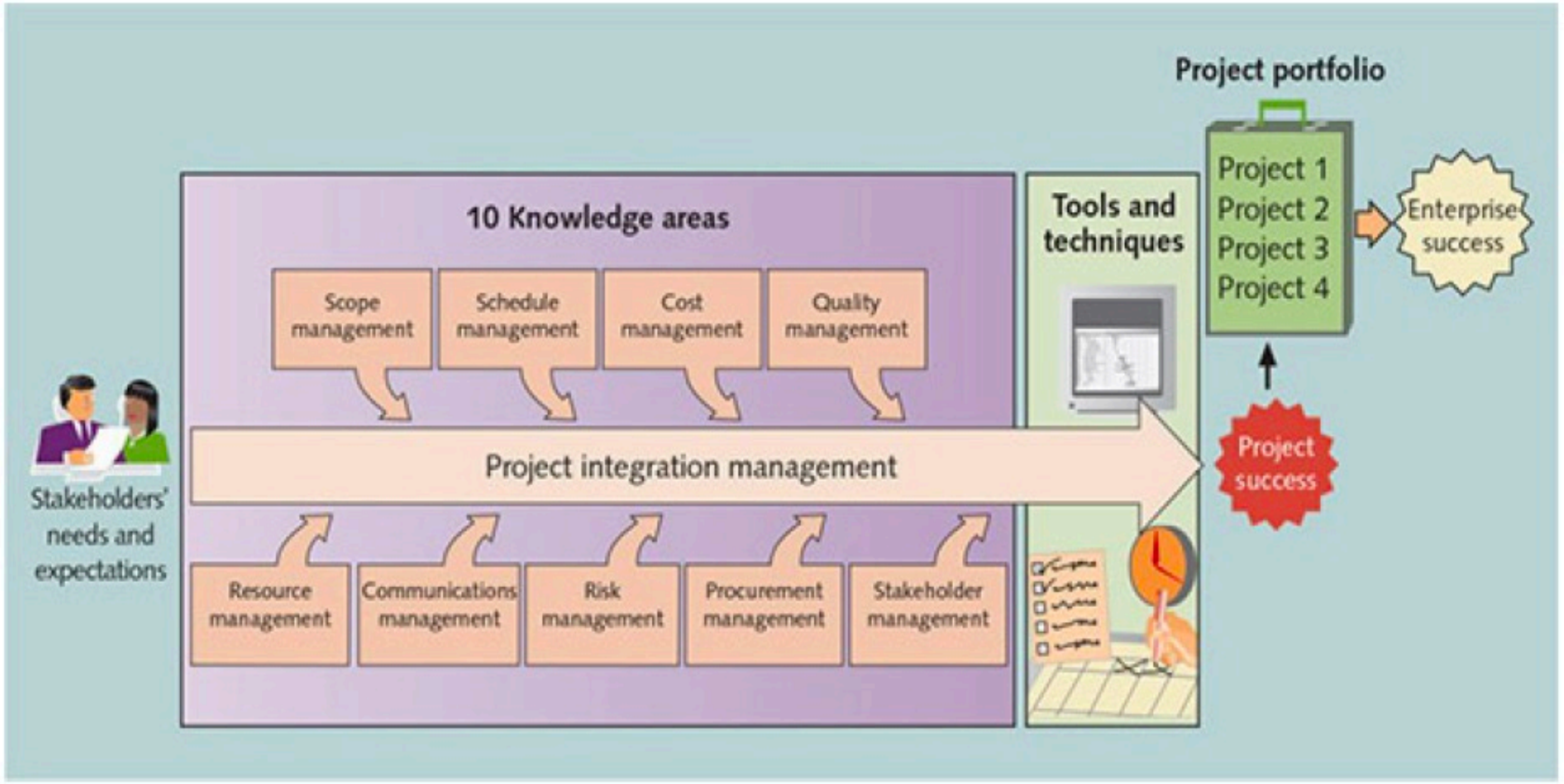

Figure 1.2 Project Management Framework

- 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 of the project.
- These stakeholders often have very different needs and expectations. A familiar example of a project is building a new house.

There are several stakeholders in a home construction project:

- The project sponsors would be the potential new homeowners who would be paying for the house.

  They could be on a very tight budget, so would expect the contractor to provide a realistic idea of what type of home they could afford given their budget constraints. They would also need a realistic idea of when they could move in.

Regardless of budget, they would expect the contractor to provide accurate estimates for the building costs. The new homeowners would have to make important decisions to keep the costs of the house within their budget.

Can they afford to finish the basement right away? If they can afford to finish the basement, will it affect the projected move-in date?

In this example, the project sponsors are also the customers and users of the product, which is the house.

- The house may require financing by a bank or other financial institution like a credit union, which will secure a legal interest (lien) in the property and the finished home. This institution is an example of a legal stakeholder who must be informed of any changes to the plans or schedule because the project is part of a legal contract.
- The project manager in this example would normally be the general contractor responsible for building the house. The project manager 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, and carpenters.

  Those stakeholders would 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 because many interrelated factors are involved. For example, the carpenter cannot put in kitchen cabinets until the walls are completed.

- Support staff might include the buyers' employers, the general contractor's administrative assistant, and people who support other stakeholders.

  The buyers' employers 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 parties.

- Building a house requires many suppliers. The suppliers would provide the wood, windows, flooring, appliances, and other materials. Suppliers would expect exact details on the items they need to provide, and where and when to deliver those items.
- A project might have opponents. In this example, a neighbour might oppose the project because the workers make so much noise that she cannot concentrate on her work at home, or the noise might wake her sleeping children. She might interrupt the workers to voice her complaints or even file a formal complaint. Or, the neighbourhood might have association rules concerning new home design and construction.

1.5 Project Management Knowledge Areas

Those describe the key competencies that project managers must develop.

1. Project scope management involves defining and managing all the work required to complete the project successfully.
2. Project schedule management (formerly called project time management) includes estimating how long it will take to complete the work, developing an acceptable project schedule, and ensuring timely completion of the project.
3. Project cost management consists of preparing and managing the budget for the project.

4. Project quality management ensures that the project will satisfy the stated or implied needs for which it was undertaken.
5. Project resource management is concerned with making effective use of the people and physical resources involved with the project.
6. Project communications management involves generating, collecting, disseminating, and storing project information.
7. Project risk management includes identifying, analysing, and responding to risks related to the project.

8. Project procurement management involves acquiring or procuring goods and services for a project from outside the performing organization.
9. Project stakeholder management includes identifying and analyzing stakeholder needs while managing and controlling their engagement throughout the life of the project.
10. Project integration management is an overarching function that affects and is affected by all of the other knowledge areas.

1.6 Project Management Tools and Techniques

Thomas Carlyle

(a famous historian and author)

"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 project.

Table 1-1 lists some commonly used tools and techniques by knowledge area.

Knowledge Area/Category	Tools and Techniques	Super Tools
Integration management	Project selection methods	Project management software
	Project management methodologies	Change requests
	Stakeholder analyses	Lessons-learned reports
	Work requests	
	Project charters	
	Project management plans	
	Change control boards	
	Project review meetings	

Scope management	Statements of work Scope management plans Scope verification techniques Scope change controls	Scope statements Work breakdown structures Requirements analyses
Schedule management	Project network diagrams Critical path analysis Crashing Fast tracking Schedule performance measurements	Gantt charts

Cost management	Project budgets	
	Net present value	
	Return on investment	
	Payback analysis	
	Earned value management	
	Project portfolio management	
	Cost estimates	
	Cost management plans	
	Cost baselines	

Quality management

Quality metrics

Checklists

Quality control charts

Pareto diagrams

Fishbone diagrams

Maturity models

Statistical methods

Test plans

Resource management	Motivation techniques Empathic listening Responsibility assignment matrices Project organizational charts Resource histograms Team building exercises	
Communications management	Communications management plans Conflict management Communications media selection Status reports Virtual communications Templates Project websites	Kick-off meetings Progress reports

Risk management	Risk management plans Risk registers Probability/impact matrices
	Risk rankings
Procurement management	Make-or-buy analyses Contracts Requests for proposals or quotes Source selections Supplier evaluation matrices

Lists tools and techniques based on their purpose (PMBOK® Guide – Sixth Edition):

1. Data gathering: benchmarking, brainstorming, check sheets, checklists, focus groups, interviews, market research, questionnaires and surveys, and statistical sampling
2. Data analysis: alternatives analysis, assessment of other risk parameters, assumption and constraint analysis, cost of quality, cost-benefit analysis, decision tree analysis, document analysis, earned value analysis, and several other tools fit in this category
3. Data representation: affinity diagrams, cause-and-effect diagrams, control charts, flow charts, hierarchical charts, histograms, logical data models, matrix diagrams, matrix based charts, mind mapping, probability and impact matrix, scatter diagrams, stakeholder engagement assessment matrix, stakeholder mapping/representation, and text-oriented formats

4. Decision making: multi-criteria decision analysis and voting
5. Communication: feedback and presentations
6. Interpersonal and team skills: active listening, communication styles assessment, conflict management, cultural awareness, decision making, emotional intelligence, facilitation, influencing, leadership, meeting management, motivation, negotiation, networking, nominal group, observation/conversation, political awareness, team building
7. Ungrouped: several other tools fit in this category

- NOTES:

Despite its advantages, project management is not a silver bullet that guarantees success on all projects. Some projects, such as those involving new technologies, have a higher degree of uncertainty, so it is more difficult to meet their scope, schedule, and cost goals. 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.

1.6 Project Success

How to define the success or failure of a project?

The list that follows outlines a few common criteria for measuring the success of a project:

1. The project met scope, time, and cost goals.
2. The project satisfied the customer/sponsor.
3. The results of the project met its main objective, such as making or saving a certain amount of money, providing a good return on investment, or simply making the sponsors happy.

It is interesting to compare success factors for IT projects in the United States with those in other countries.

A survey of 247 information systems project practitioners in mainland found that relationship management is viewed as a top success factor for information systems in China, while it is not mentioned in U.S. studies.

The study also suggested that having competent team members is less important in China than in the United States.

The Chinese, like the Americans, included top management support, user involvement, and a competent project manager as vital to project success.

- It is also important to look beyond individual project success rates and focus on how organisations as a whole can improve project performance.
- Research comparing companies that excel in project delivery—the “winners”—with those that do not found four significant best practices:

1. Use an integrated toolbox. Companies that consistently succeed in managing projects clearly define what needs to be done in a project, by whom, when, and how. They use an integrated toolbox, including project management tools, methods, and techniques. They carefully select tools, align them with project and business goals, link them to metrics, and provide them to project managers to deliver positive results.

2. Grow project leaders. The winners know that strong project managers—referred to as project leaders—are crucial to project success. They also know that a good project leader needs to be a business leader as well, with strong interpersonal and intrapersonal skills. Companies that excel in project management often grow or develop their project leaders internally, providing them with career opportunities, training, and mentoring.
3. Develop a streamlined project delivery process. Winning companies have examined every step in the project delivery process, analysed fluctuations in workloads, searched for ways to reduce variation, and eliminated bottlenecks to create a repeatable delivery process.

All projects go through clear stages and clearly define key milestones. All project leaders use a shared road map, focusing on key business aspects of their projects while integrating goals across all parts of the organization.

4. Measure project health using metrics. Companies that excel in project delivery use performance metrics to quantify progress. They focus on a handful of important measurements and apply them to all projects. Metrics often include customer satisfaction, return on investment, and percentage of schedule buffer consumed.

1.7 Program and Project Portfolio Management

- About one-quarter of the world's gross domestic product (GDP) is spent on projects.
- Projects make up a significant portion of work in most business organisations or enterprises, and managing those projects successfully is crucial to enterprise success.
- Two important concepts that help projects meet enterprise goals are the use of programs and project portfolio management.

1.7.1 Program

- A program is “a group of related projects, subsidiary programs, and program activities managed in a coordinated manner to obtain benefits and control not available from managing them individually.
- Programs are not large projects; a megaproject is a very large project that typically costs over US$1 billion, affects over one million people, and lasts several years. For examples, the Panama Canal Expansion Project was a megaproject that took 11 years and $5.25 billion to complete.

The following are examples of common programs in the IT field:

- Infrastructure

An IT department often has a program for IT infrastructure projects. This program could encompass several projects, such as providing more wireless Internet access, upgrading hardware and software, enhancing computer security, and developing and maintaining corporate standards for IT.

- Applications development

This program could include several projects, such as updating an enterprise resource planning (ERP) system, purchasing a new off-the-shelf billing system, or developing a new capability for a customer relationship management system.

- User support

In addition to the many operational tasks related to user support, many IT departments have several projects to support users. For example, a project might provide a better e-mail system or develop technical training for users.

A program manager provides leadership and direction for the project managers heading the projects within a program. Program managers also coordinate the efforts of project teams, functional groups, suppliers, and operations staff supporting the projects to ensure that products and processes are implemented to maximize benefits.

1.7.2 Project Portfolio Management

- Project managers also support an emerging business strategy of project portfolio management or portfolio management, in which organisations group and manage projects and programs as a portfolio of investments that contribute to the entire enterprise's success.
- Portfolio managers help their organisations make wise investment decisions by helping to select and analyse 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.

- Figure 1-3 illustrates the differences between project management and project portfolio management.
- The main distinction is a focus on meeting tactical or strategic goals.
- Tactical goals are generally more specific and short term than strategic goals, which emphasise long-term goals for an organisation.
- Individual projects often address tactical goals, whereas portfolio management addresses strategic goals.

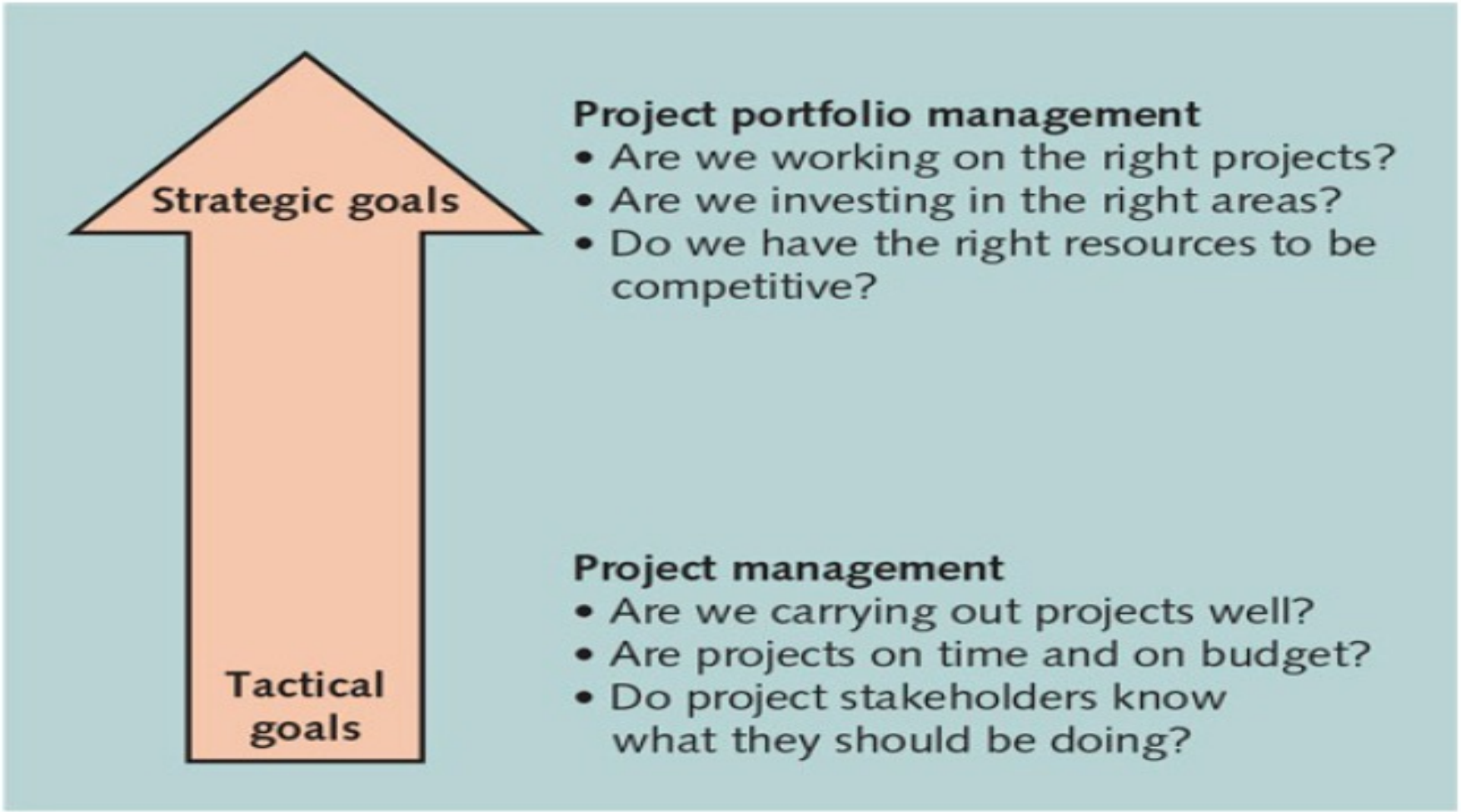

Figure 1. 3 Project management compared to project portfolio management

- Portfolio management addresses questions like “Are we working on the right projects?”, “Are we investing in the right areas?”, and “Do we have the right resources to be competitive?”
- PMI defines a portfolio as “projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives.

- Table 1-3 provides a comparative overview of project, program, and portfolio management.
- Organisational project management is a “framework in which portfolio, program, and project management are integrated with organizational enablers in order to achieve strategic objectives

Table 1.3 Comparative Overview of Portfolios, Programs, and Projects

	Projects	Programs	Portfolios
Definition	A project is a temporary endeavor undertaken to create a unique product, service, or result.	A program is a group of related projects, subsidiary programs, and program activities that are managed in a coordinated way to obtain benefits not available from managing them individually.	A portfolio is a collection of projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives.

Management	Project managers manage the project team to meet the project objectives.	Programs are managed by program managers who ensure that program benefits are delivered as expected, by coordinating the activities of a program's components.	Portfolio managers may manage or coordinate portfolio management staff, or program and project staff that may have reporting responsibilities into the aggregate portfolio.
Monitoring	Project managers monitor and control the work of producing the products, services, or results that the project was undertaken to produce.	Program managers monitor the progress of program components to ensure that the overall goals, schedules, budget, and benefits of the program are met.	Portfolio managers monitor strategic changes and aggregate resource allocation, performance results, and risk of the portfolio.
Success	Success is measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction.	A program's success is measured by the program's ability to deliver its intended benefits to an organization, and by the program' efficiency and effectiveness in delivering those benefits.	Success is measured in terms of the aggregate investment performance and benefit realization of the portfolio.

Source: Project Management Institute, Inc., A Guide to the Project Management Body of Knowledge (PMBOK ® Guide) – Sixth Edition (2017).

1.8 Organisational Project Management

- Organisations 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 utilisation, and similar factors that affect business value.
- 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's portfolio should be diversified to account for risk.

- Example:

There are three basic IT project portfolio categories:

- Venture: Projects in this category help transform the business. For example, the large retail chain described in the opening case might have an IT project to provide kiosks in stores and similar functionality on the Internet where customers and suppliers could quickly provide feedback on products or services. This project could help transform the business by developing closer partnerships with customers and suppliers

- Growth: Projects in this category would help the company increase its revenues. For example, a company might have an IT project to provide information on its corporate website in a new language, such as Chinese or Japanese. This capability could help the company grow its business in those countries.
- Core: Projects in this category must be accomplished to run the business. For example, an IT project to provide computers for new employees would fall under this category.

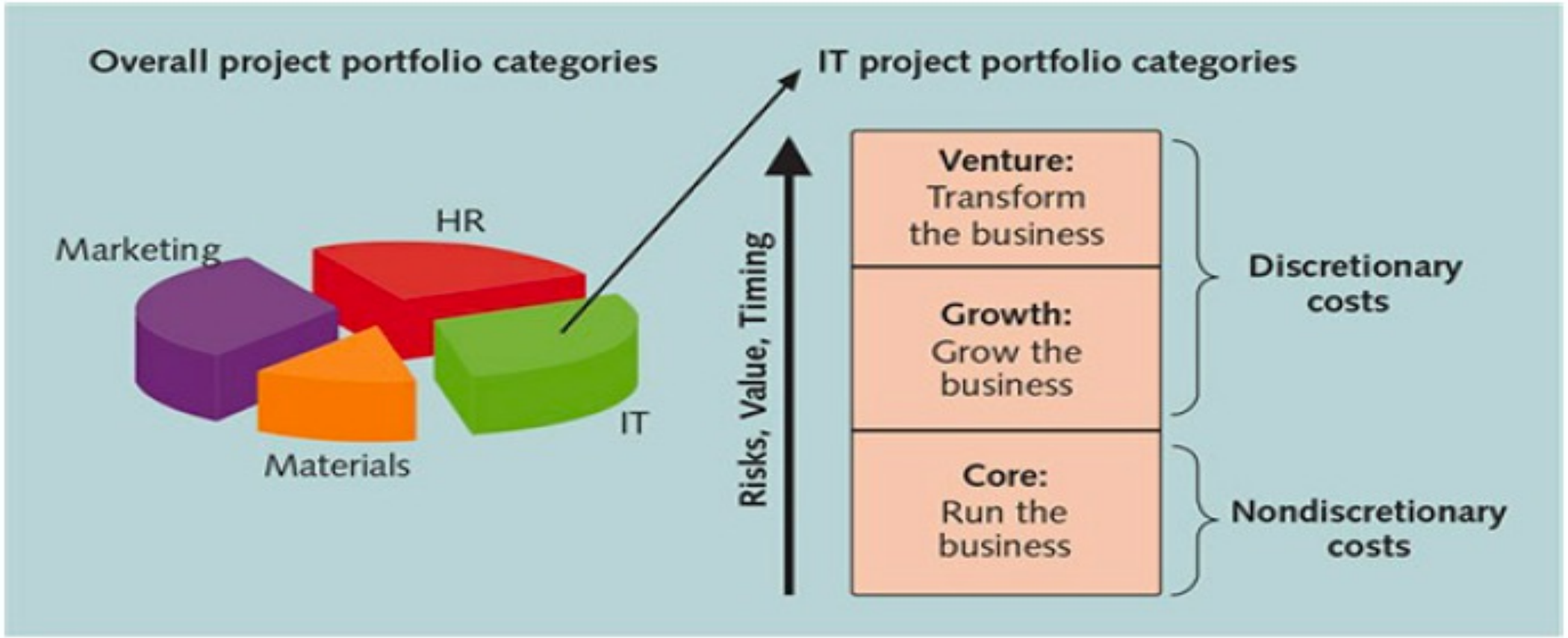

Figure 1.4 Sample project portfolio approach

- Figure 1-4 illustrates one approach for project portfolio management in which one large portfolio exists for the entire organisation.
- The main portfolio categories shown :
  - ✓ The left part of Figure 1-4—marketing, materials, IT, and human resources (HR)— and divide each of those categories further to address its unique concerns.
  - ✓ The right part of this figure shows how the IT projects could be categorised in more detail to assist in their management.

- In Figure 1-4, the costs of Core IT projects are nondiscretionary, which means that the company has no choice in whether to fund them.
- Core IT Projects must be funded for the company to stay in business. Projects in the Venture or Growth category are discretionary costs because the company can use its own discretion or judgment in deciding whether to fund them; these projects are not critical to the company fulfilling its mission.
- The arrow in the centre of Figure 1-4 indicates that the risks and value of projects normally increase as you move from Core to Growth to Venture projects.

- In addition, timeliness becomes increasingly important; growth and venture projects, more than core projects, must be done within a certain time frame to be effective. However, some core projects can also be high risk, have high value, and require good timing. As you can see, many factors are involved in portfolio management.

1.9 Project Manager Job Description

A project manager can have many different job descriptions, which can vary tremendously based on the organisation and the project.

- Project manager for a consulting firm: Plans, schedules, and controls activities to fulfil identified objectives applying technical, theoretical, and managerial skills to satisfy project requirements. Coordinates and integrates team and individual efforts and builds positive professional relationships with clients and associates.

- Project manager for a computer systems firm: Works independently within established practices to assist in the development and implementation process of projects involving departmental, vendor relationships, and/or cross-functional teams. Coordinates with internal/external clients to gather business requirements and coordinate project plans. Monitor projects from initiation through delivery ensuring completion of the project on schedule.

- IT project manager for a non-profit consulting firm: Responsibilities include business analysis, requirements gathering, project planning, budget estimating, development, testing, and implementation. Responsible for working with various resource providers to ensure that development is completed in a timely, high-quality, and cost-effective manner.