Project Management Foundations

Course Materials

Projects are the building blocks used to achieve the goals and mission of our organizations. A project is different than day-to-day work. In this course you'll learn what project management is and what a project is. You'll learn how project management helps deliver the right results on time and within budget. Projects follow a set of structured processes that deliver a product, service or result using the resources of the organization. You'll learn how to use these processes to plan, monitor, control, and deliver successful results. You'll also learn how organizations influence the way projects and resources are managed.

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Course Agenda

Day 1		Day2	
8:30 – 9:00	Personal Introductions	8:30 - 9:30	Structuring a Project
9:00 - 10:30	Intro to Project Management	9:30 - 10:15	Project Processes
10:30 - 10:45	BREAK	10:15 - 10:30	BREAK
10:45 - 12:00	Intro to Project Management	10:30 - 11:00	Project Processes
12:00 - 1:00	LUNCH	11:00 - 12:00	PM Knowledge Areas
1:00 - 2:00	Intro to Project Management	12:00 - 1:00	LUNCH
2:00 - 2:30	Structuring a Project	1:00 - 2:30	PM Knowledge Areas
2:30 - 2:45	BREAK	2:30 - 2:45	BREAK
2:45 - 4:00	Structuring a Project	2:45 - 4:00	PM Knowledge Areas

Day 3	
8:30 - 10:15	PM Knowledge Areas
10:15 - 10:30	BREAK
10:30 - 12:00	Project Teams
12:00 - 1:00	LUNCH
1:00 - 2:30	Project Teams
2:30 - 2:45	BREAK
2:45 - 3:30	Project Teams
3:30 - 4:00	Exam and Evaluation

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Lesson 1: Introduction to Project Management

Topic 1: Definition of a Project

Topic 2: What is Project Management?

Topic 3: Project Management in Practice

Topic 4: Project Stakeholders

Topic 5: Project Management Skills

Topic 6: Project Management Knowledge Areas

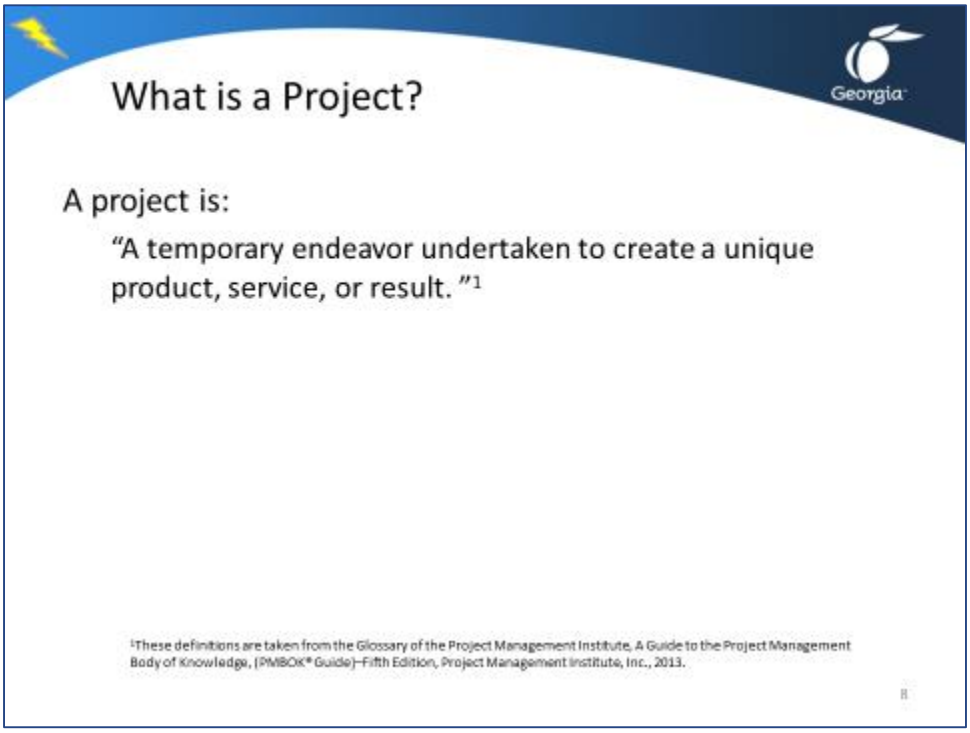
Student Learning Objectives

After completing this lesson you should be able to

- Define a project and explain how it differs from an operation
- Describe the role of project management
- Explain how project management operates in practice
- Identify key project stakeholders
- Describe the key general management skills that also apply to project management
- Identify the different knowledge components of project management

Approximate Presentation time: 3 hours 45 minutes

Topic 1: Definition of a Project



What is a project?

"A temporary endeavor undertaken to create a unique product, service, or result.[1]"

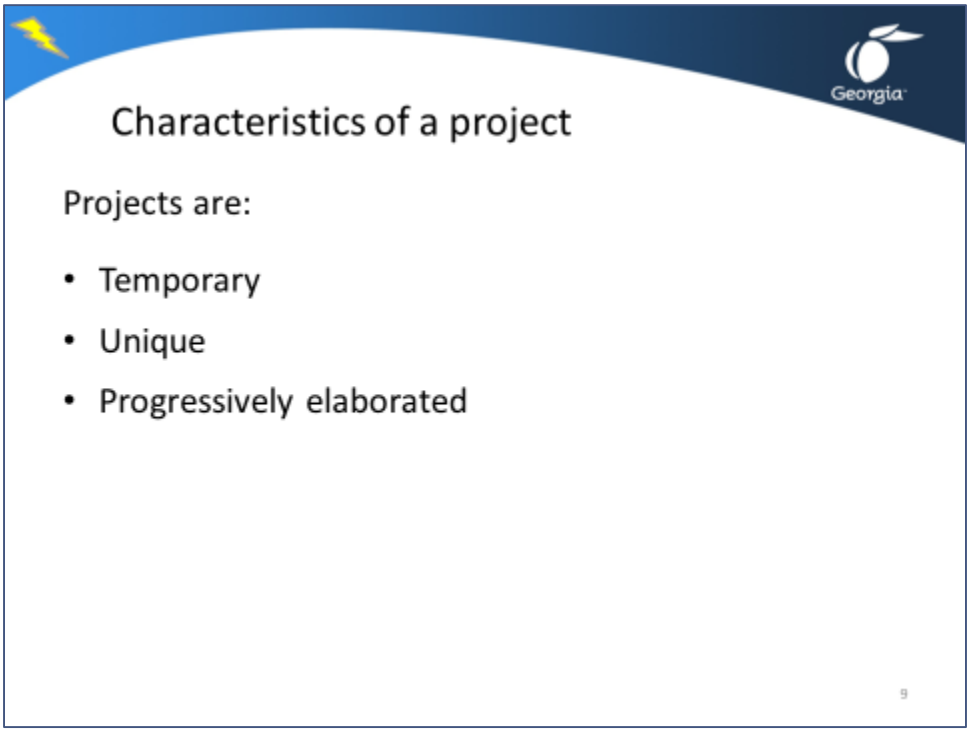
Projects enable organizations to respond to requirements or opportunities that cannot be addressed within normal operational limits.

Projects are undertaken at all levels of an organization. They may involve a single staff member or thousands of employees across different departments. Projects may also cross organizational boundaries – for example, joint ventures and partnering projects.

Projects are critical to the realization of an organization's business strategy because projects are a means by which strategy is implemented. Projects are defined using various measures. One such measure used is hours.

[1] These definitions are taken from the Glossary of the Project Management Institute, A Guide to the Project Management Body of Knowledge, (*PMBOK® Guide*)–Fifth Edition, Project Management Institute, Inc., 2013.

Topic 1: Definition of a Project



Characteristics of Projects

- Projects are **temporary** because they have a definite beginning and end.

Projects are generally initiated in response to a temporary market opportunity, and they have a limited time frame in which to produce their product or service. Most project teams created to perform a project are disbanded when the project is complete – although members of the team may be brought together again for a new project in the future.

A project ends when its objectives have been met, when it becomes clear that the project objectives will not or cannot be met, or when the need for the project no longer exists.

Temporary does not necessarily mean projects are short in duration – projects range in length from a few weeks to several years – but their duration is finite.

In addition, temporary does not generally apply to the product or service created by the project because most projects are undertaken to create a lasting result, such as erecting a national monument.

- Projects are **unique** because their outcome is a unique product, service, or result.

A product or service is unique even if the category to which it belongs is large or elements of the project are repetitive. For example, real estate developments can include several different types of house designs, each of which constitutes a unique design project.

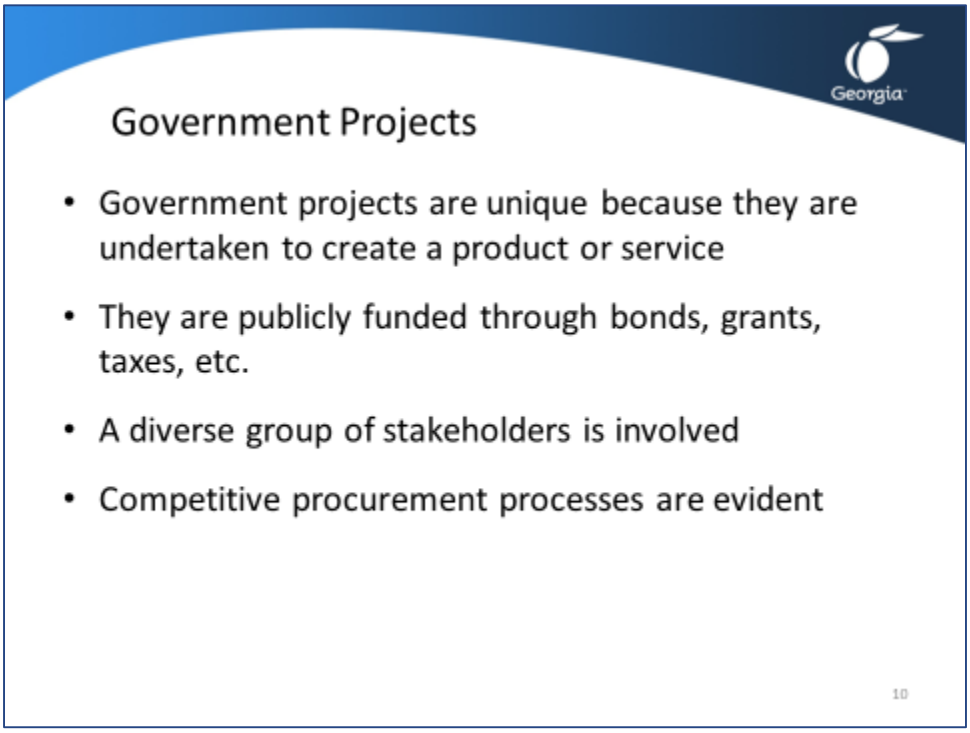
- The characteristics distinguishing the project's product or service are **progressively elaborated** as the project proceeds.

In other words, distinguishing characteristics are broadly defined early in the project but made more explicit and detailed as the project team develops a better and more comprehensive understanding of the product.

For example, the initial definition of the product (result) of an organizational change management project might be “to improve communication systems within the organization.” As the project proceeds, the product is described more specifically as “providing all employees with access to e-mail and an organization intranet.”

Progressive elaboration of product characteristics should be carefully coordinated with appropriate project scope definition, particularly if the project is performed under contract. When properly defined, the scope of the project – the work to be carried out – should remain constant even as the product characteristics are progressively elaborated.

Topic 1: Definition of a Project



Government Projects

Governments spend huge amounts of money on projects, so it is crucial that we understand the factors that make government projects unique (Government Extension to the *PMBOK® Guide*, Third Edition; Chapter 1). Government projects differ from other projects for two principal reasons.

1. **Government projects are often driven by various stakeholders to include elected officials and government bodies.**

Electing multiple representatives serves as a protection against fraud and encourages debate and, ultimately, better decisions.

Because it is not practical for a representative body to provide day-to-day direction to project managers, an executive is generally appointed or elected to carry out the policies and rules set by the representative body. The representative body's key functions include setting the budget for the executive and scrutinizing the work of the executive.

Project managers are generally part of, and report to members of, the executive staff. On large projects, such as projects involving state security, they may report directly to the chief executive (e.g. the state governor of Georgia).

2. **Government projects are funded from mandatory taxes and fees.**

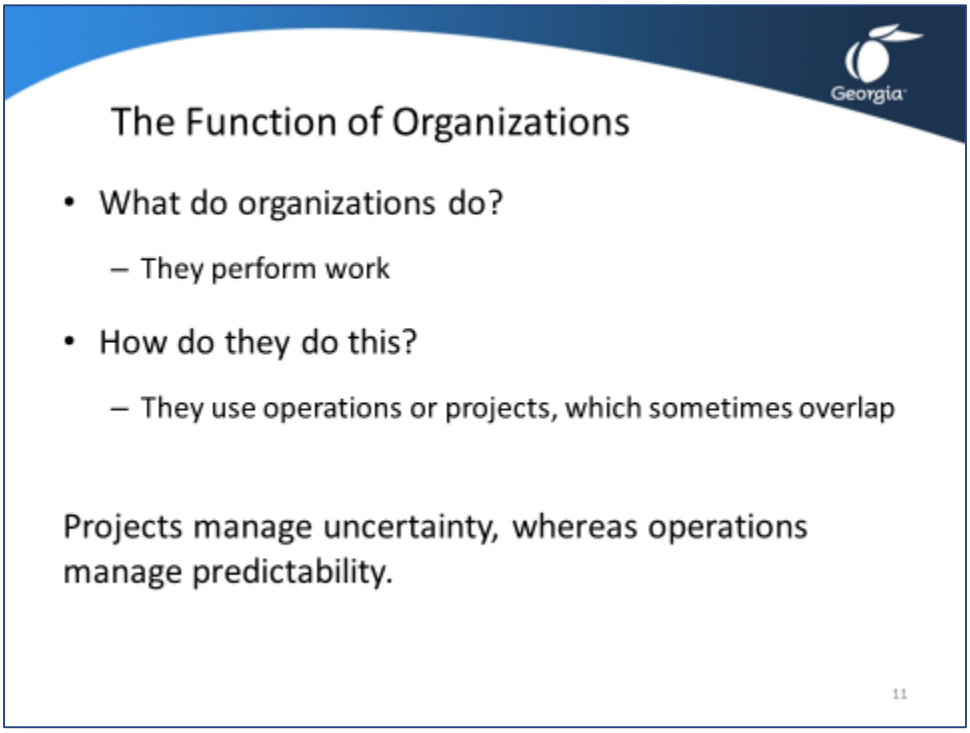
Whether or not they use government services, taxpayers contribute to the funding of these services and the projects that create the services. Taxpayers hold governments – and how they spend tax money on projects – accountable through their elected representatives. In addition, project managers have a responsibility to use taxpayers' funds to meet goals set by elected representatives.

Understanding project management theory and practice is important and applicable to the development of management practices in the state of Georgia.

Examples of such projects include

- implementation of e-voting systems in the state of Georgia
- upgrading of the state employees retirement system
- implementation of a unified state employee email system
- HR facilities application upgrade
- Data Center upgrade
- introduction of web-based systems for payroll systems

Topic 1: Definition of a Project



Organizations

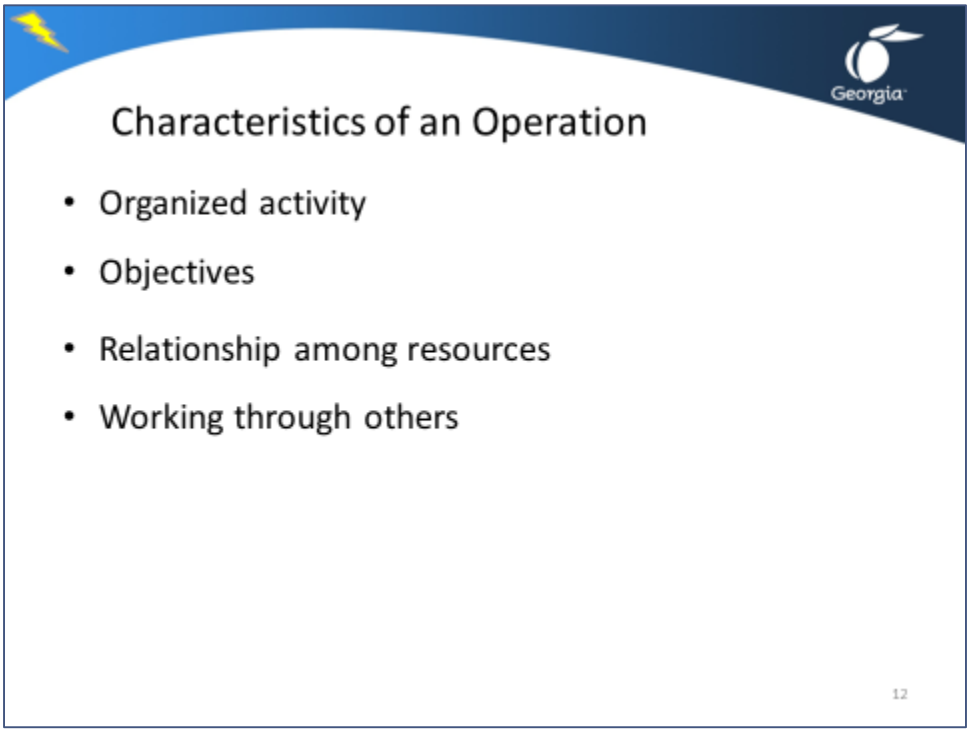
Organizations perform work, which can be divided into two categories: operations and projects. These categories sometimes overlap.

Organizations have traditionally performed work through operations and traditional management.

With the rise of uncertainty and increased pressures from the market, organizations have found that the operation mode is redundant. Projects have replaced operations in organizations where uncertainty, market unpredictability, and increased product turnaround times are the norm.

Projects and operations have overlapped through this transition, as well as through occurrences of uncertainty. **Projects manage uncertainty, whereas operations manage predictability**.

Topic 1: Definition of a Project

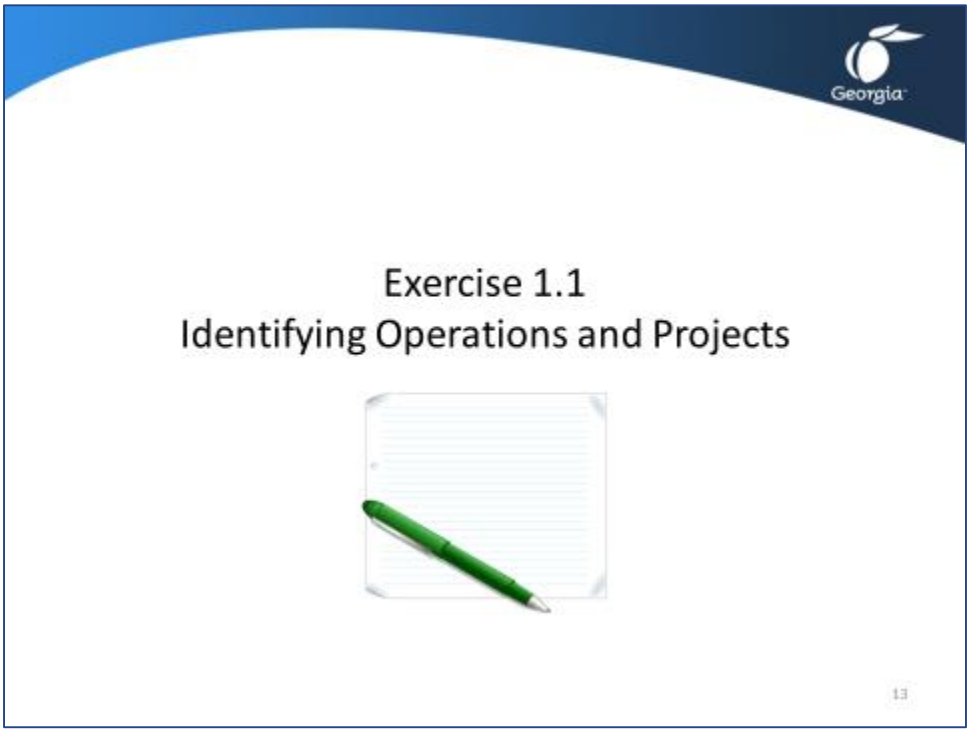


Operations

An operation is an ongoing business process with the following characteristics:

- in an operation, people work toward a common goal in the form of a deliverable or objective
- actions are required to support the goals toward which organized activity is directed
- there is a relationship – generally physical in nature – between material, supplies, equipment, and people in order to get the job done
- responsibility or authority is delegated from one person to another to accomplish goals. Activity is organized in this way so that certain relationships must be created among resources.

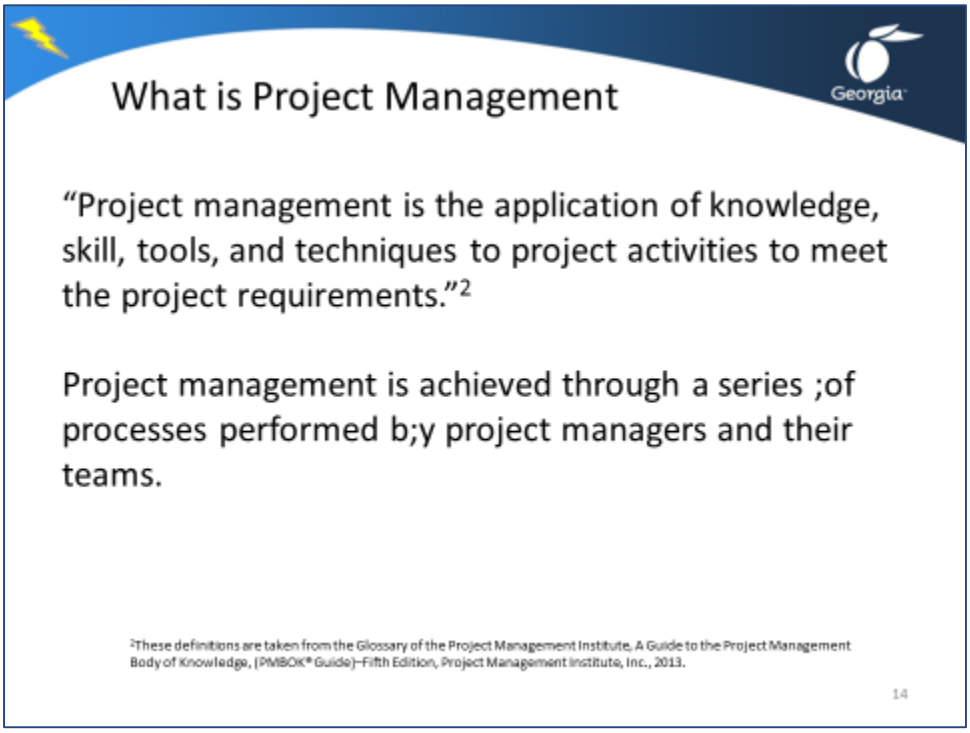
Exercise 1.1 Identifying Operations and Projects



Identify an operation you have been involved in (e.g. the operation of a payroll system) and list the characteristics (list 1). Next identify a project in which you have been part of (e.g. the rollout of a new payroll system) and list the characteristics (list 2). Compare list 1 with list 2. Do the project and operation characteristics overlap?

Operation Characteristics	Project Characteristics

Topic 2: What is Project Management?



What is Project Management?

Project management is the application of knowledge, skill, tools, and techniques to project activities to meet the project requirements.[2]

The requirements of a project relate to, among other things, stakeholder expectations.

Project management is a holistic approach to management dominated by a set of processes and behaviors.

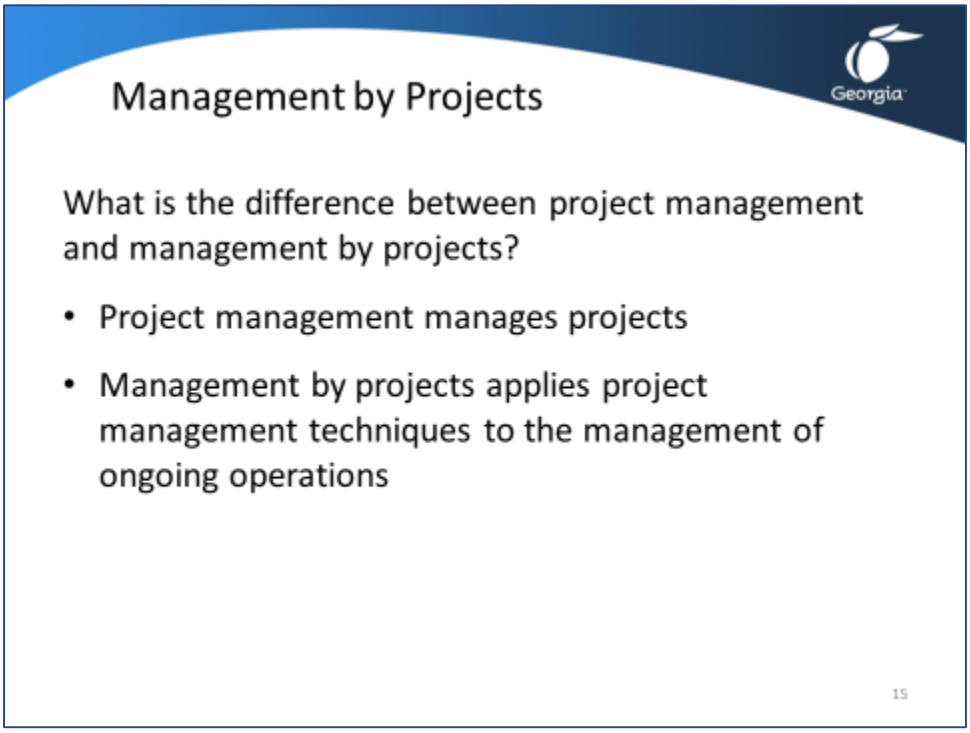
Project management is achieved through the use of logically grouped processes, which are categorized into five process groups; initiating, planning, executing, monitoring and controlling, and closing. Many processes within project management are iterative – they are characterized by incremental evolution and delivery of objectives.

Project teams manage the work of the projects, including

- competing demands regarding scope, time, cost, risk, and quality
- stakeholders with differing needs and expectations
- project requirements

[2] PMBOK® Guide glossary

Topic 2: What is Project Management?

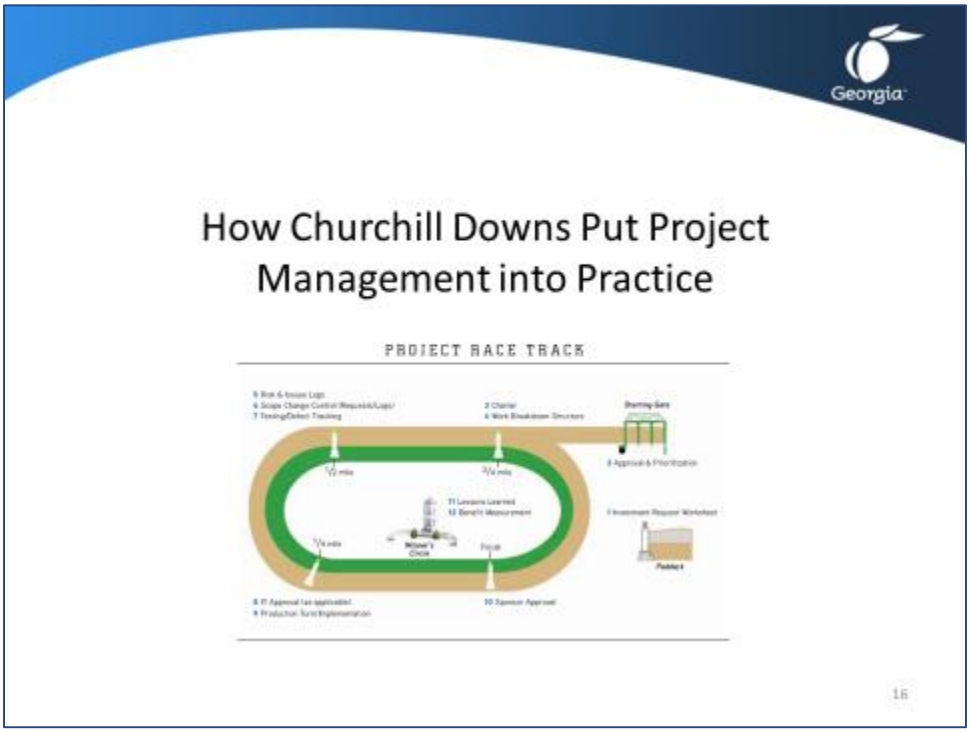


The term **project management** is sometimes used to describe an organizational approach to the management of ongoing operations, in which many aspects of operations are treated as projects to which project management techniques can be applied.

However, this approach is more properly called **management by projects** – it requires an understanding of, but is distinct from, project management.

You'll recall that operations are ongoing and repetitive, whereas projects are temporary and unique. Project management techniques can be applied to the management of operations, but this does not constitute project management.

Topic 3: Project Management in Practice



There are many ways organizations utilize project management processes and techniques.

Let's take a look at a real-world example of how Churchill Downs, home of the Kentucky Derby, used project management processes to contribute to the success of large-scale projects.

Read the article that follows and identify what you think are the key points that illustrate why project management is a critical and popular management technique.

Topic 3: Project Management in Practice

A Closer Look: Churchill Downs, Inc., Louisville, Kentucky, USA
by PMI Staff
July 2009 PM NETWORK, www.pmi.org

THE 134-YEAR-OLD CHURCHILL DOWNS racetrack is world-famous for its annual Kentucky Derby, a thoroughbred horse race dubbed "the most exciting two minutes in sports."

Throughout its storied history, the track and its four other racing facilities have handled projects in the same grand old tradition. Deals were sealed with a handshake and a promise—without much oversight or benchmarking of project results.

As a result, project success was far from a sure bet.

To improve its odds, Churchill Downs Inc. brought in Chuck Millhollan, PMP, PgMP, in 2007 to serve as director of a new project management office (PMO) for the IT department.

"Before the PMO, most projects were managed through Excel spreadsheets," says Ray Pait, senior program manager at Churchill Downs. "The downside was that each project was a specialized effort. There was no leverage of information or learning across the organization."

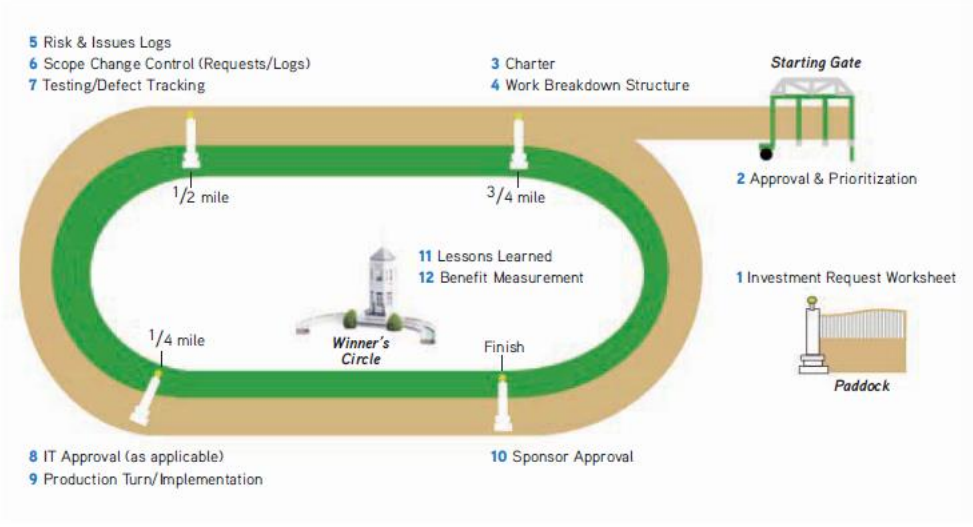
AND THEY'RE OFF
Mr. Millhollan's goal was to develop a lean but comprehensive process for managing the approval, prioritization, oversight and measurement of results for major IT department projects.

It seemed simple enough, but Mr. Millhollan knew he couldn't just rush in.

"Churchill Downs is a smaller organization with a unique culture, and I wanted to be sure not to overwhelm people with added processes and administration," he says. "So I approached it by implementing the minimal amount of process necessary. I knew that later on we'd look for opportunities to enhance it."

To ease project managers into the new format, Mr. Millhollan and Mr. Pait devised the Project Race Track, a life cycle diagram superimposed onto a racetrack image with accompanying metaphors to explain the entire project process.

PROJECT RACE TRACK



In the Race Track, the paddock houses the project business case, where the current and future states are defined; the start gate is the stakeholder approval process; the first turn is the development of the work breakdown structure; and the winner's circle is where results and benefits of finished projects are measured.

"The racetrack image worked very well," says Mr. Pait. "The team here understood what we were trying to do, and instead of feeling like we were being heavy-handed, they worked with us to identify ways that we could improve project processes."

ROUNDING THE FIRST CORNER

Early success with critical IT projects won the PMO attention from across the enterprise, and business leaders quickly began asking for the PMO's help on projects outside the tech realm. By July 2008, the department was restructured to become an enterprise PMO.

Today, projects at all Churchill Downs facilities must follow the structure established by Mr. Millhollan's team. The assigned project manager works with the stakeholders to develop a business case and get it approved by the executive team before moving forward. And no project is considered complete until the business results that were defined during the approval process are measured.

That wasn't an easy sell.

"When we first started the PMO, the concept of project documentation or measuring results was foreign," Mr. Millhollan says. "Getting the company to embrace it was part of the enculturation process."

The first hurdle involved communicating the value that additional processes and results measurement would bring to the project teams.

"We had to explain that we weren't doing this to create repercussions for people or to add administrative work," Mr. Millhollan says. "We were doing it so we could help the enterprise meet and manage project expectations."

And if a project's scope changed, Mr. Millhollan wanted everyone to understand that the PMO was there to help the project team evaluate the impact those shifts would have on the budget, timeline and results.

"Our goal is not to prevent change, it's to help manage change so teams can decide if they are making the right choice," he says.

Once Mr. Millhollan's associates got a few initiatives under their belts using the new approach, they realized that spelling out business benefits at the beginning of the project allowed them to better quantify end results. They could see how the project worked not only in terms of their own budget or timeline goals, but also in terms of actual cash and hours saved for the enterprise.

AND THE WINNER IS?

The results measurement process has two benefits. It helps project teams prove their worth and allows senior management to quantify the benefits each project brings to the organization.

"Benefits realization is not something we were great at in the past," admits Mr. Pait. "But now, being able to identify what we've saved or the cost and value of a project is something the financial folks can really appreciate, and it helps them understand what we've accomplished."

The IT team, for example, launched a project to implement a VoIP (voice over Internet protocol) system to support Churchill Downs' two Kentucky locations. In the end, the team could demonstrate that the project translated to lower operational, maintenance and equipment costs, while also improving productivity and capability due to reduced system downtime.

Not all projects can deliver such easily measured results, so you should define what you're trying to achieve before you begin, Mr. Millhollan says.

"Whether it's a tactical benefit or one that is less tangible, to measure the benefit of a project, you have to define where it's going up front," he says.

THE FINISH LINE

Along with acknowledging individual project results, the PMO helps Churchill Downs more accurately assess and prioritize future projects.

"We use the lessons learned on every project for future decision-making," says Mr. Pait. "It helps us recognize that we may not want to do certain kinds of projects in the future and identify the ones that will have the most value."

It also helps keep project teams focused and prevents resources from getting diverted to other tasks. "I've heard many comments from stakeholders that, if the PMO weren't involved, projects wouldn't get done," says Mr. Pait.

Despite all the glowing reviews, the PMO isn't complacent about its own status. Mr. Millhollan applies the same criteria for benefits realization to his own department that he does to all the projects it oversees.

"We are acutely aware of our status, and we are constantly evolving and scanning our environment to see where the PMO can offer better support," he says. "We would not be good stewards if we weren't always considering risks."

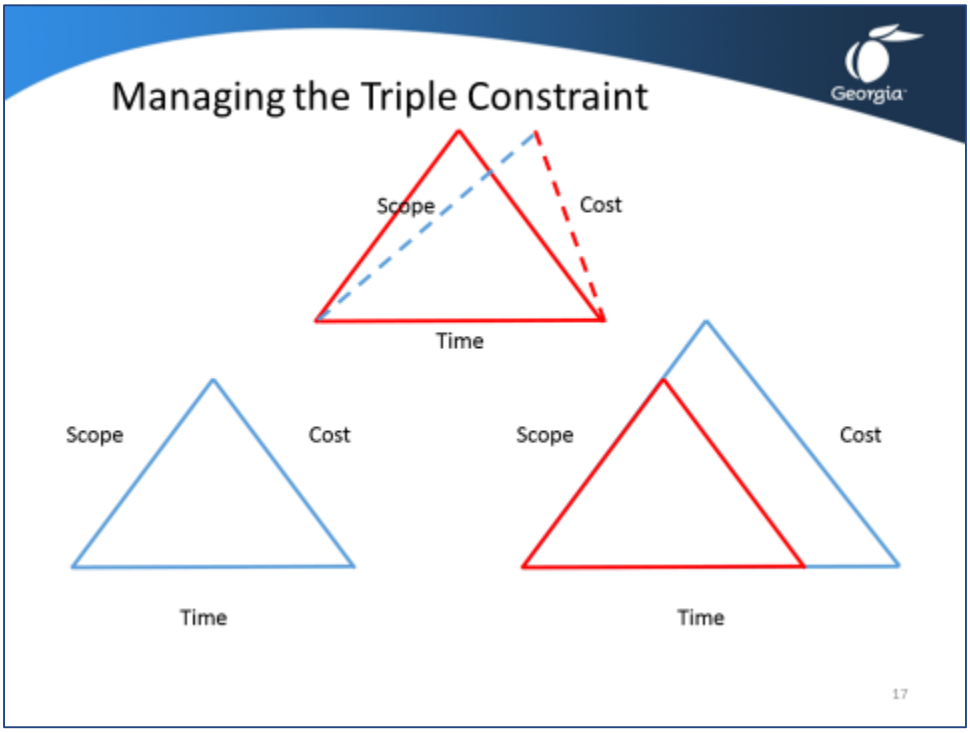
That process includes biweekly reporting to update the executive team on the status of ongoing projects as well as annual meetings to evaluate the PMO's strengths, weaknesses, opportunities and threats. Last year, for example, the team identified a need for formal training in the financial aspects of project management.

"Finance and project processes are intertwined, and in this economy, we want to have that skill set in our project development team," Mr. Millhollan says.

Armed with financial savvy, the PMO team can drive home its message of accountability and business results, cementing its value—and its future—at Churchill Downs.

"The key value of our PMO is that we focus on completion and we built our method to manage projects through benefit realization," he says. "That's how a PMO ensures long-term viability."

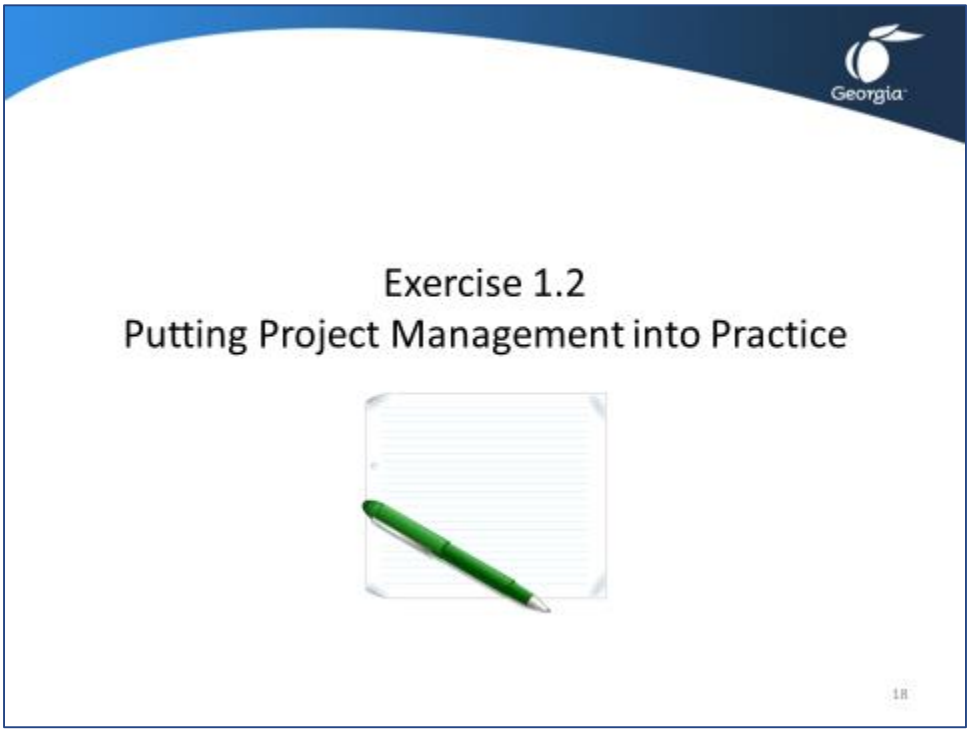
Topic 3: Project Management in Practice



Project managers face a **triple constraint** – project scope, time, and cost – when managing competing project requirements. Project quality depends on the balance among these three constraints, with high quality projects delivering required results within scope, on time, and within budget.

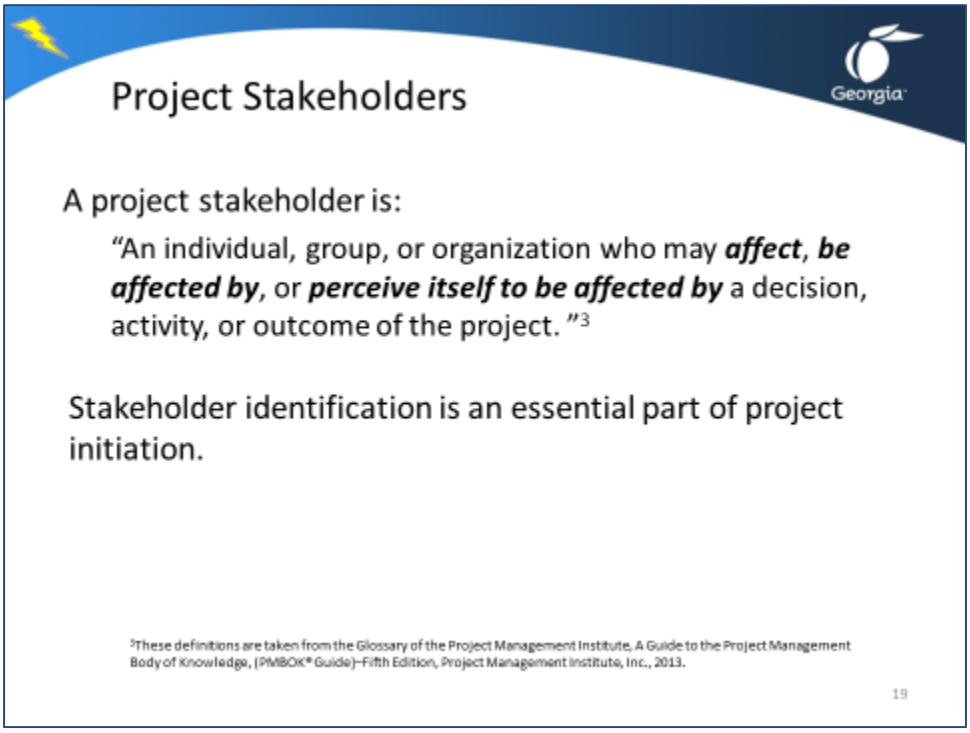
Constraints associated with **value** (e.g. stakeholder perceptions or customer satisfaction) must also be considered when managing project requirements. Without the inclusion of perception and value of product, the project is likely to miss a key element during planning and execution.

Exercise 1.2 Putting Project Management into Practice



Using the article "A Closer Look: Churchill Downs, Inc.," discuss how project management plays a central role in enabling Churchill Downs to reach its business objectives.

Topic 4: Project Stakeholders



Project stakeholders are "an individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of the project."[3]

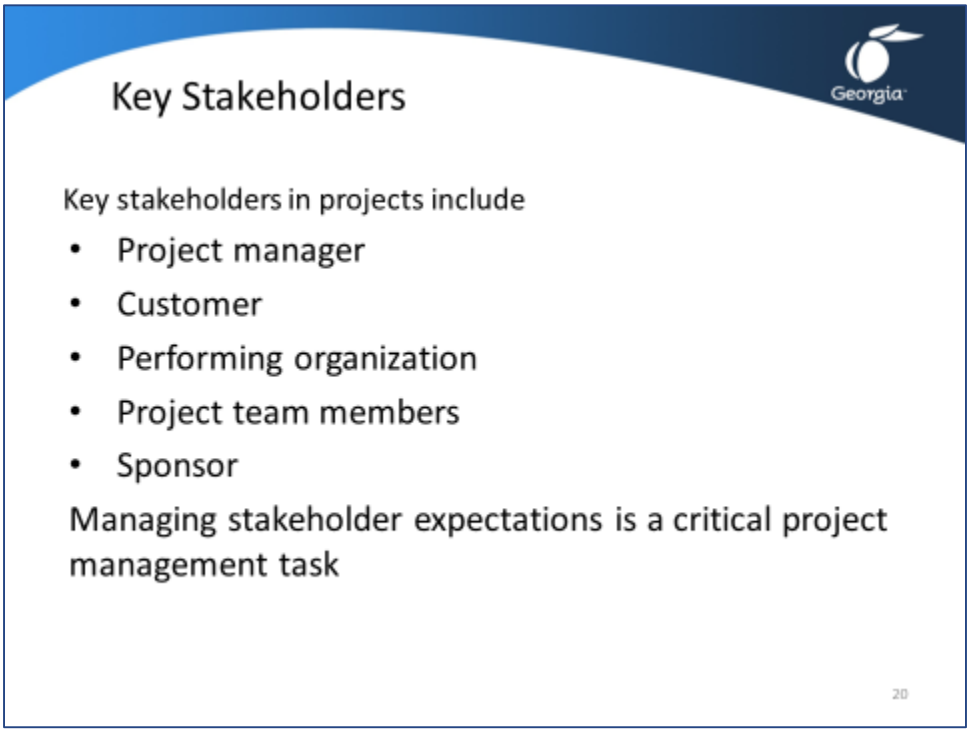
During project initiation and subsequent planning, the project management team must identify the stakeholders, determine their requirements, and then manage and influence those requirements to ensure a successful project.

This is an essential part of the project definition process. It helps the project management team put the project in proper perspective so that the team can plan accordingly, set priorities, and establish effective management procedures.

Stakeholder identification can be difficult. For example, let's say a manufacturing company is developing a new production process to increase efficiency and reduce labor costs. Is a worker whose future employment depends on the outcome of this new project a stakeholder? Is a worker in a competitor company a stakeholder?

[3] These definitions are taken from the Glossary of the Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)–Fifth Edition, Project Management Institute, Inc., 2013.

Topic 4: Project Stakeholders



Key Stakeholders in a Project

The **project manager** is the individual who is directly responsible for managing the project.

The **customer** is the individual or organization that uses the product, service, or result of the project. A project may have several layers of customers. For example, the customers for a project to develop a new parking meter may include the city authorities who buy the parking meters, the drivers who use them, and the city residents who benefit from the money collected.

The **performing organization** is the enterprise whose employees are most directly involved in performing the project tasks.

Project team members are the individuals who together make up the group that is performing the project tasks.

The **sponsor** is the individual or group that provides the resources for the project, in cash or in kind. The sponsor may be an internal stakeholder or, in many cases, external to the performing organization.

Other categories used to identify which individuals and organizations consider themselves to be stakeholders include

- internal and external
- owners and funders
- vendors
- team members and their families
- government agencies

- media outlets
- individual citizens
- temporary or permanent lobbying organizations
- society at large

Stakeholders frequently have very different objectives, so managing stakeholder expectations is a major challenge of project management. Although differences between or among stakeholders should generally be resolved in favor of the customer, the expectations of other stakeholders should not be disregarded.

For example, the manager of a department that needs a new management information system wants a low-cost solution. The system architect emphasizes technical excellence, while the programming contractor wants to maximize its profits.

The challenge is to find a solution that, as far as possible, meets the expectations of all stakeholders – this may prove to be an impossible task.

Topic 4: Project Stakeholders

Key Stakeholders in a Government Project

As well as the key project stakeholders outlined previously, government projects have additional stakeholders who must be considered.

The **public**, including voters and taxpayers, participate in projects either indirectly through electing public representatives or directly through lobbying or attending public hearings.

Regulators approve various aspects of a project and enforce rules and regulations on behalf of the government or a higher governing institution, such as an international regulatory organization.

Advocacy groups are stakeholders who have an interest in the failure of a project – for example, residents who live beside the site of a proposed highway that will replace parkland and substantially increase traffic in the area.

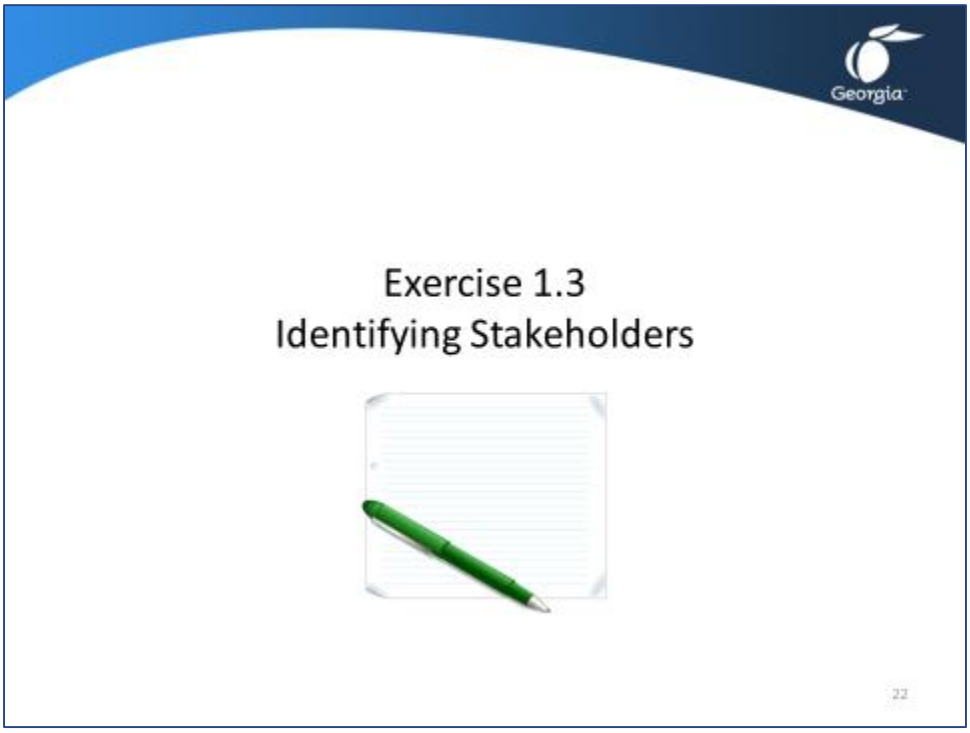
The press has an important role to play in holding governments accountable through reporting on projects that involve large amounts of taxpayers' money.

Vendors are central to government projects that require a substantial amount of procurement or goods and services from external parties.

Future generations are important stakeholders in government projects that will have a long-term impact on such factors as government debt, public infrastructure, and the environment.

Elected officials are central stakeholders and will have an impact on such factors as financial and project objective support.

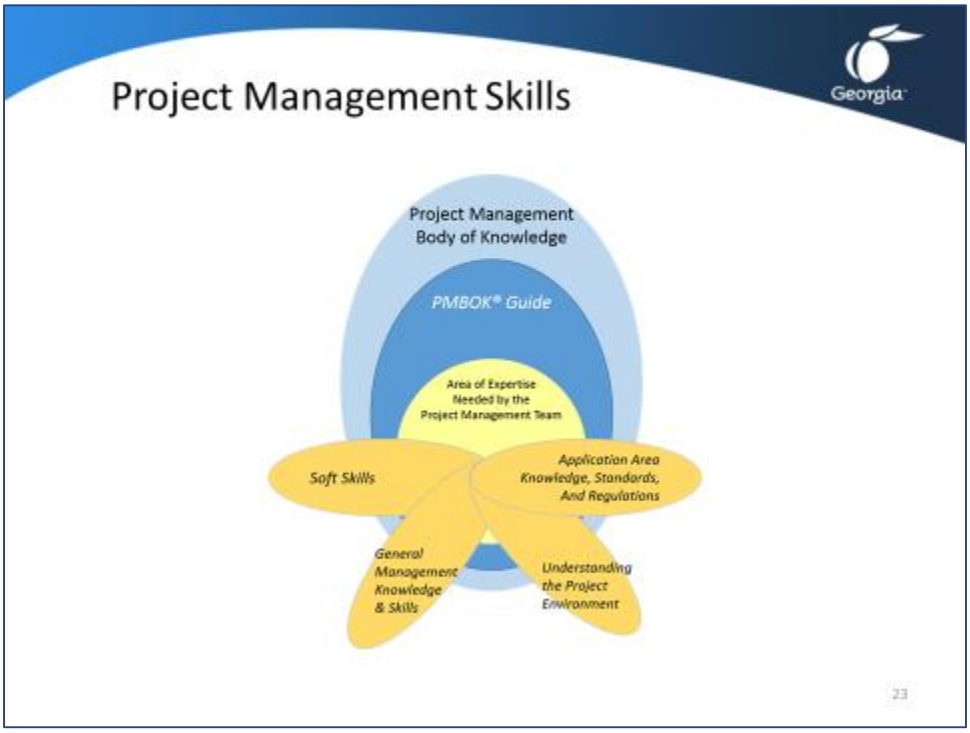
Exercise 1.3 Identifying Stakeholders



Using the article "A Closer Look: Churchill Downs, Inc.," identify stakeholders that may be involved in this project. Categorize the stakeholders as important to the project, somewhat important, and least important.

Stakeholder Name	Importance (Very, Somewhat, Least)

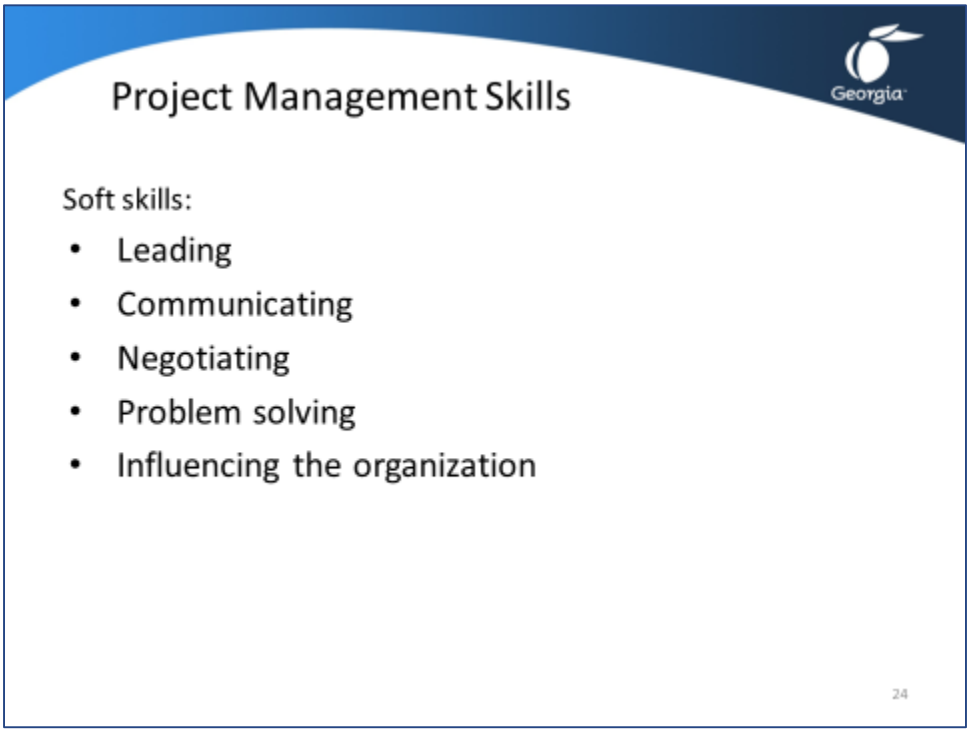
Topic 5: Project Management Skills



Effective project managers require a thorough understanding of project management standards and areas of knowledge – the "hard" project management skills discussed in topics 5 and 6.

In addition, project managers need to understand the "soft" project management skills, many of which overlap with other management disciplines, particularly general management and application areas.

Topic 5: Project Management Skills



There are five major soft project management skills that affect most projects; leading, communicating, negotiating, problem-solving, and influencing the organization.

- **Leading** involves
  - establishing direction – developing a vision of the future and strategies to produce the changes required to achieve the vision
  - aligning people – communicating the vision by words and actions to individuals and groups whose cooperation may be required to achieve the vision
  - motivating and inspiring – encouraging and helping people to energize themselves so they can overcome political, bureaucratic, and resource barriers to change

  Although the project manager is generally a project's principal leader, leadership can and should be demonstrated by many different individuals at many different times during the project.

- **Communicating** involves exchanging information. The sender must ensure that the information is clear, unambiguous, and complete so that the receiver can understand it correctly. The receiver must ensure that the entire information is received and understood correctly.

  People communicate in different ways:
  - written and oral
  - internal (within a project) and external (to the customer, for example)
  - formal (reports, briefings) and informal (memos, ad hoc conversations)
  - vertical (up and down the organization) and horizontal (with peers and partner organization)

  In addition, there are many general communication concepts and techniques that project communications management applies to the specific needs of a project. These include

    - sender-receiver communication models – characterized by feedback loops and barriers to communications
    - choice of media – for example, when to communicate in writing or orally and when to write an informal memo or a formal report
    - writing style – for example, active versus passive voice
    - presentation techniques – the use of body language or visual aids
    - meeting management techniques – how to prepare an agenda or deal with conflict

- **Negotiating** involves conferring with others to reach an agreement or arrangement. Agreements may be negotiated directly or with assistance, such as through mediation or arbitration.

  A project team is likely to negotiate some or all of the following in the course of a typical project:
    - scope, cost, and schedule objectives
    - changes to scope, cost, or schedule
    - contract terms and conditions
    - assignments
    - resources

- **Problem solving** combines problem definition and decision making. Problem definition involves distinguishing between causes and symptoms.

  Problems may be
    - internal – insufficient resources are allocated to the project
    - external – a customer requests a different project end product
    - technical – the wrong project machinery is provided
    - managerial – a functional group is not meeting project targets
    - interpersonal – some project team members do not get along

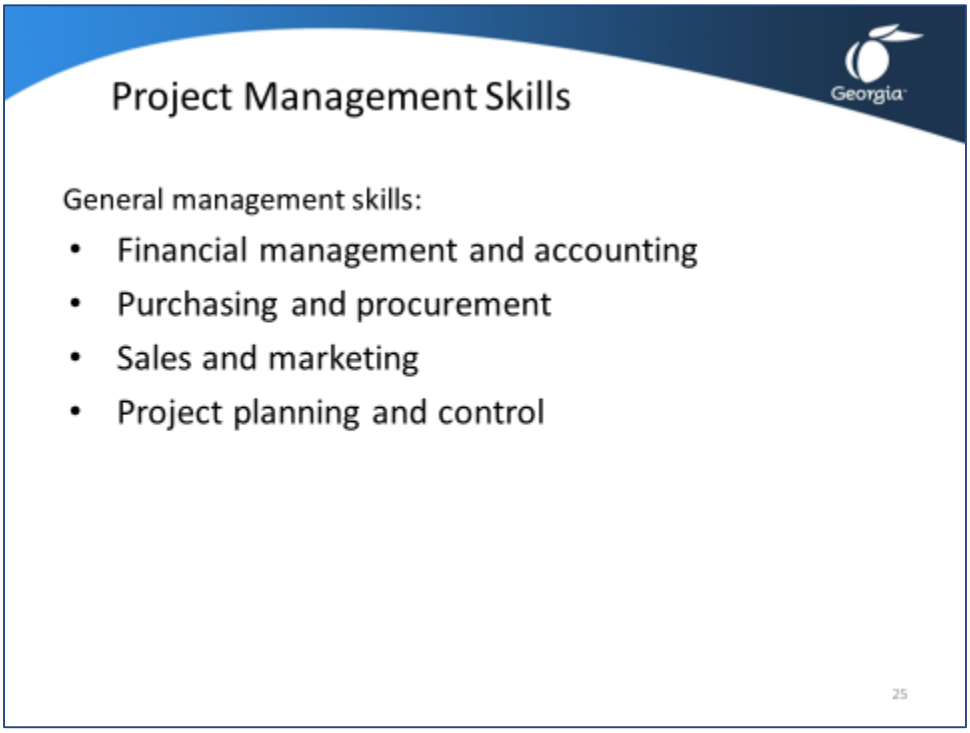
  Decision making involves analyzing a problem to identify viable solutions and choosing the most appropriate solution.

  Decisions can be made or obtained from a stakeholder – for example, the customer, the team, or a functional manager. Once made, decisions need to be implemented. In addition, decisions have a time element because the “right” decision may not be the “best” decision if it is made too early or too late.

- **Influencing the organization** means “getting things done” through persuasion. It requires an understanding of both the formal and informal structures within all stakeholder groups and organizations.

  Influencing the organization also requires an understanding of the mechanics of power and politics in order to, among other things, effect change, overcome resistance to change, and get a group of people with different interests to act collectively.

Topic 5: Project Management Skills

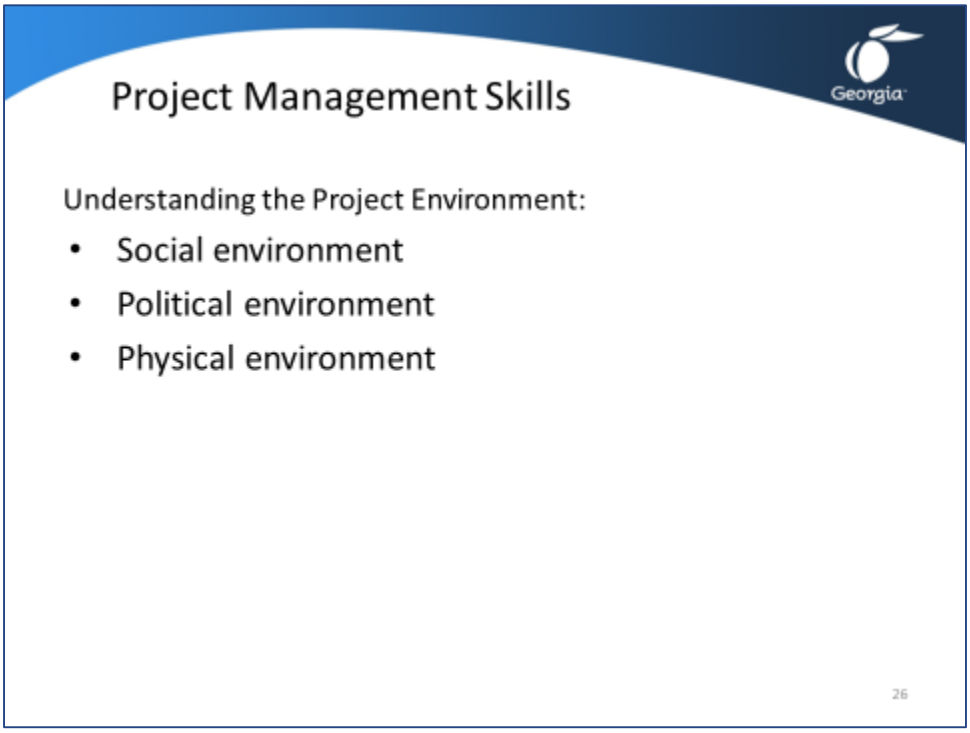


General management covers a wide range of tasks and responsibilities, including planning, organizing, staffing, executing, and controlling the operations of an ongoing business enterprise. General management also includes such supporting disciplines as human resources management, law, logistics, and strategic planning. The specific areas highlighted are:

- **financial management and accounting** – identifying and understanding the flow of funds through an organization. A project will always require financial management in putting aside and managing appropriate funds while ensuring the correct presentation of all financial events as per standard accounting principles.
- **purchasing and procurement** – purchasing, contracting, outsourcing and vendor management are necessary prerequisites of any project manager skills portfolio. As project resources are assigned, there should be a constant evaluation of what skills and materials are available from the external environment.
- **sales and marketing** – the product of the project is sold on many occasions. Initially it is sold to the project sponsor, whereas in the latter stages it is sold to the external environment. Sales and marketing go hand-in-hand to promote and sell the well-being of the project.
- **project planning and control** – the core skills of a project manager are communication and control and to do these well the project must be well planned.

Project management overlaps or modifies general management in many areas – for example, organizational behavior, financial forecasting, or planning techniques.

Topic 5: Project Management Skills



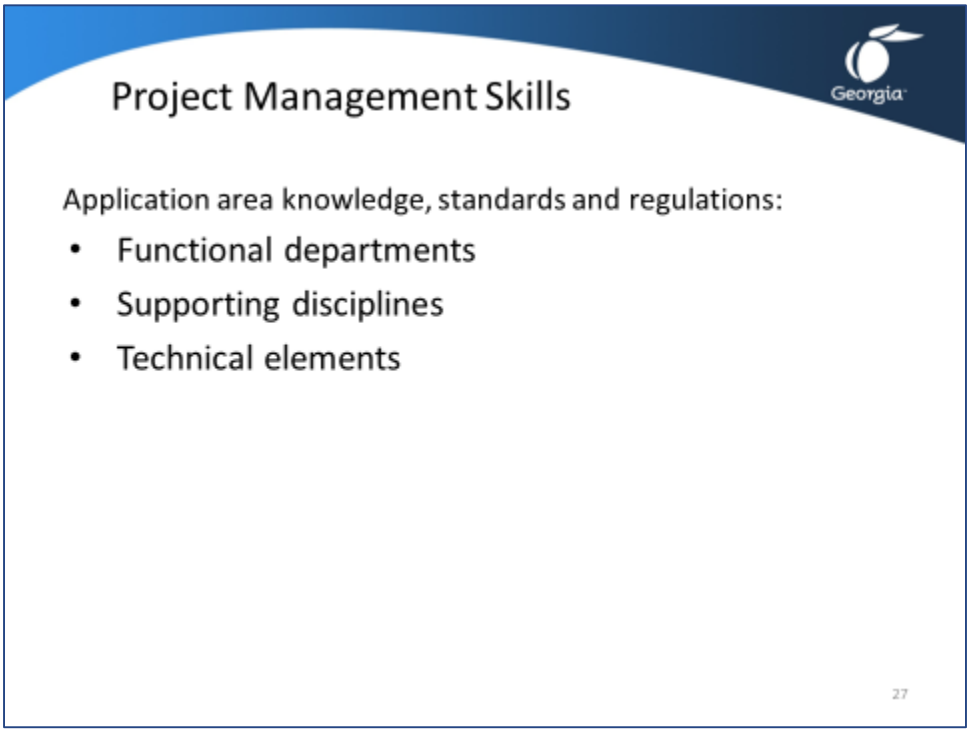
Understanding the Project Environment
The project management team should consider the project in the context of its social, political, and physical environment.

- **Social environment**: The team should have an understanding of how the project affects people and how people affect the project. Economic, demographic, ethical, educational and religious issues should be considered.

- **Political environment**: Some team members may need to be familiar with applicable international, national, regional and local laws, and the political climate that could affect the project.

- **Physical environment**: If the project will impact on the physical environment, some team members should be aware of the local ecology and physical geography that could be affected.

Topic 5: Project Management Skills



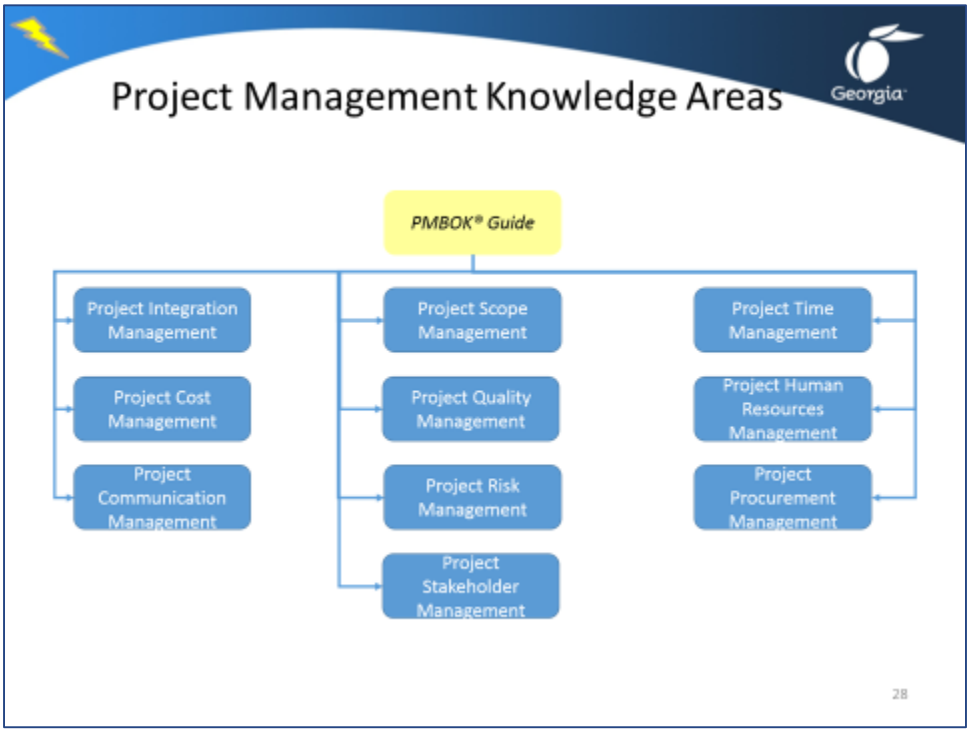
Application Area Knowledge Standards and Regulations

Application areas are categories of projects that have common elements, some of which are important for specific projects but not required or present in all projects.

Examples of application areas include the following:

- functional departments and supporting disciplines, such as legal, production and inventory management, and human resource management
- technical elements, such as software development, pharmaceuticals, and construction engineering

Topic 6: Project Management Knowledge Areas



Project management can be organized into ten key knowledge areas:

- project integration management
- project scope management
- project time management
- project cost management
- project quality management
- project human resource management
- project communications management
- project risk management
- project procurement management
- project stakeholder management

Topic 6: Project Management Knowledge Areas

Project integration management covers the processes that together ensure that the various elements of the project are properly coordinated. These include

- develop project charter
- develop project management plan
- direct and manage project work
- monitor and control project work
- perform integrated change control
- close project or phase

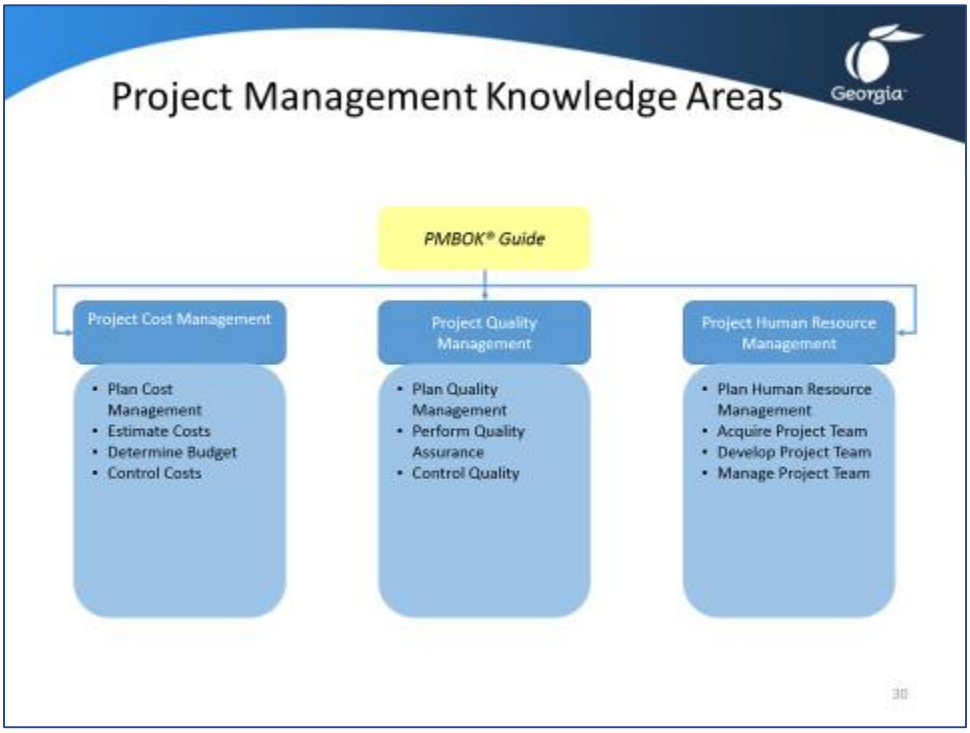
Project scope management covers the processes that ensure that the project includes all the work required, and only the work required, to complete the project successfully. These include

- plan scope management
- collect requirements
- define scope
- create WBS
- validate scope
- control scope

Project time management entails using processes that ensure the project is completed on time. These include

- plan schedule management
- define activities
- sequence activities
- estimate activity resources
- estimate activity durations
- develop schedule
- control schedule

Topic 6: Project Management Knowledge Areas



Project cost management covers the processes that ensure the project is completed within the approved budget. These include

- plan cost management
- estimate costs
- determine budget
- control costs

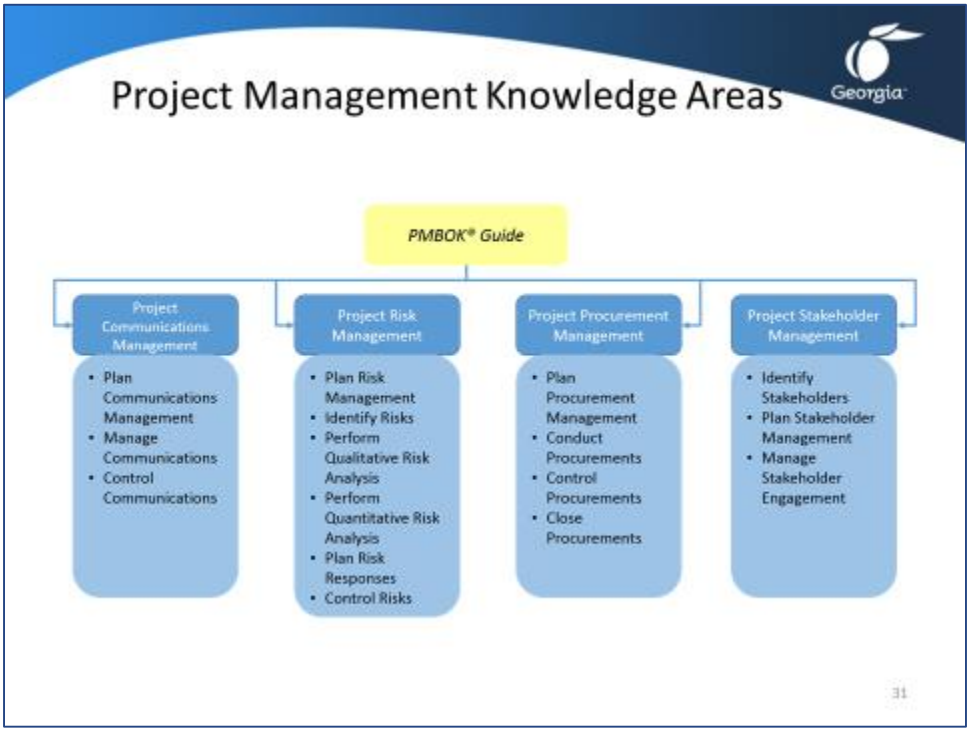
Project quality management entails using processes that ensure the project will satisfy the needs for which it was undertaken. These include

- plan quality management
- perform quality assurance
- control quality

Project human resource management covers the processes that organize, manage, and lead the project team. These include

- plan human resource management
- acquire project team
- develop project team
- manage project team

Topic 6: Project Management Knowledge Areas



Project communications management entails using processes that ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information. These include

- plan communications management
- manage communications
- control communications

Project risk management covers the processes for conducting risk management planning, identifying, analyzing, responding to, and controlling project risk. These include

- plan risk management
- identify risks
- perform qualitative risk analysis
- perform quantitative risk analysis
- plan risk responses
- control risks

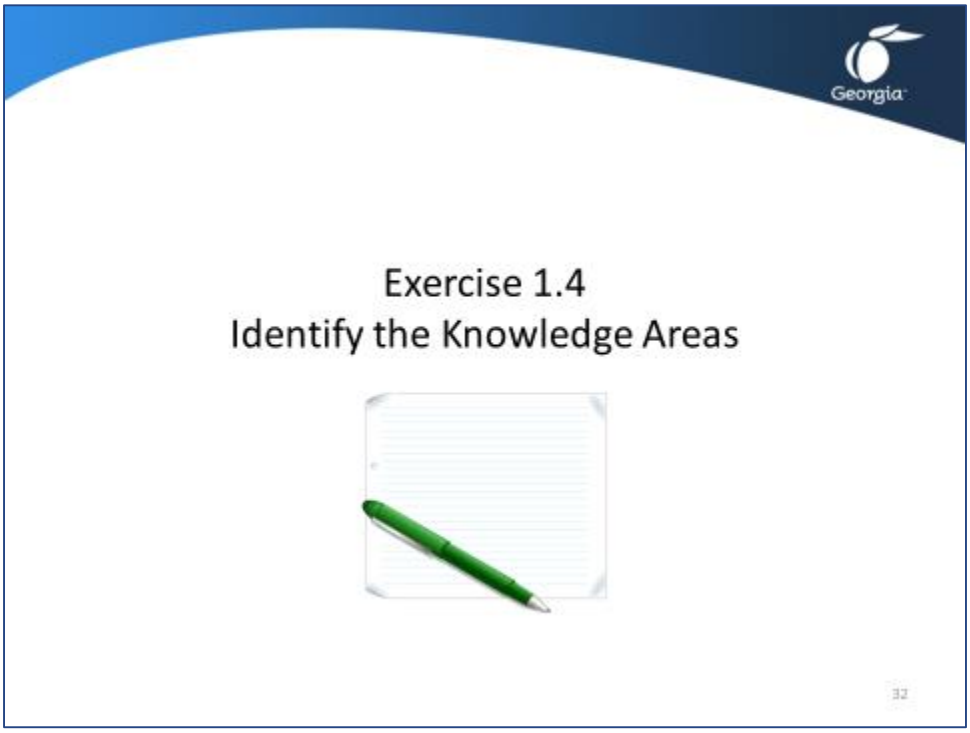
Project procurement management covers the processes for acquiring goods and services from outside the performing organization. These include

- plan procurement management
- conduct procurements
- control procurements
- close procurements

Project stakeholder management covers the processes required to identify the people or groups that could impact or be impacted by the project and effectively engage these groups. These include

- identify stakeholders
- plan stakeholder management
- manage stakeholder engagement
- control stakeholder engagement

Exercise 1.4 Identifying the Knowledge Areas



Consider the Project Management Knowledge Areas that we just discussed and answer the following questions.

1. You are the project manager on the new driver's license upgrade project. You want to create the project's communications plan, which falls in what Knowledge Area? _____
2. If you want to engage individuals or organizations that might be impacted by your project, what Project Management Knowledge Area would you use? _____
3. As the project manager, you have identified several uncertainties about the project. What process have you just completed? _____. This process is also in the Project _____ _____ Knowledge Area.
4. Your project is running well and making progress according to schedule. A major stakeholder comes by your office and asks if it is okay to add 5 pieces of new information to the services request form you are working on. What process should you use to deal with this request? _____. This process is in the Project _____ Management Knowledge Area.

Lesson 1 Summary: Learning Objectives Recap

- **Define a project and explain how it differs from an operation**
  "A temporary endeavor undertaken to create a unique product, service, or result.[4]"

  Projects enable organizations to respond to requirements or opportunities that cannot be addressed within normal operational limits.

  Projects and operations have overlapped through this transition, as well as through occurrences of uncertainty. **Projects manage uncertainty, whereas operations manage predictability**.

- **Describe the role of project management**
  Projects are performed to solve business problems and to meet stakeholder expectations. Project management is a holistic approach to management dominated by a set of processes and behaviors.

  Remember that operations are ongoing and repetitive, whereas projects are temporary and unique. Project management techniques can be applied to the management of operations, but this does not constitute project management

- **Identify key project stakeholders**
  Project stakeholders are individuals or organizations actively involved in a project, positively or negatively affected by project execution or outcome, or influential regarding a project and its results.

  During project initiation and subsequent planning, the project management team must identify the stakeholders, determine their requirements, and then manage and influence those requirements to ensure a successful project.

- **Describe key general management skills that also apply to project management**
  - financial management and accounting
  - purchasing and procurement
  - sales and marketing
  - project planning and control

- **Identify the different knowledge components of project management**
  - project integration management
  - project scope management
  - project time management
  - project cost management
  - project quality management
  - project human resource management
  - project communications management
  - project risk management
  - project procurement management
  - project stakeholder management

[4] These definitions are taken from the Glossary of the Project Management Institute, A Guide to the Project Management Body of Knowledge, (*PMBOK® Guide*)–Fifth Edition, Project Management Institute, Inc., 2013.

Notes

Lesson 2: Structuring a Project

Topic 1: Management by Objectives

Topic 2: Project Phases and Life Cycles

Topic 3: Project Life Cycles in Practice

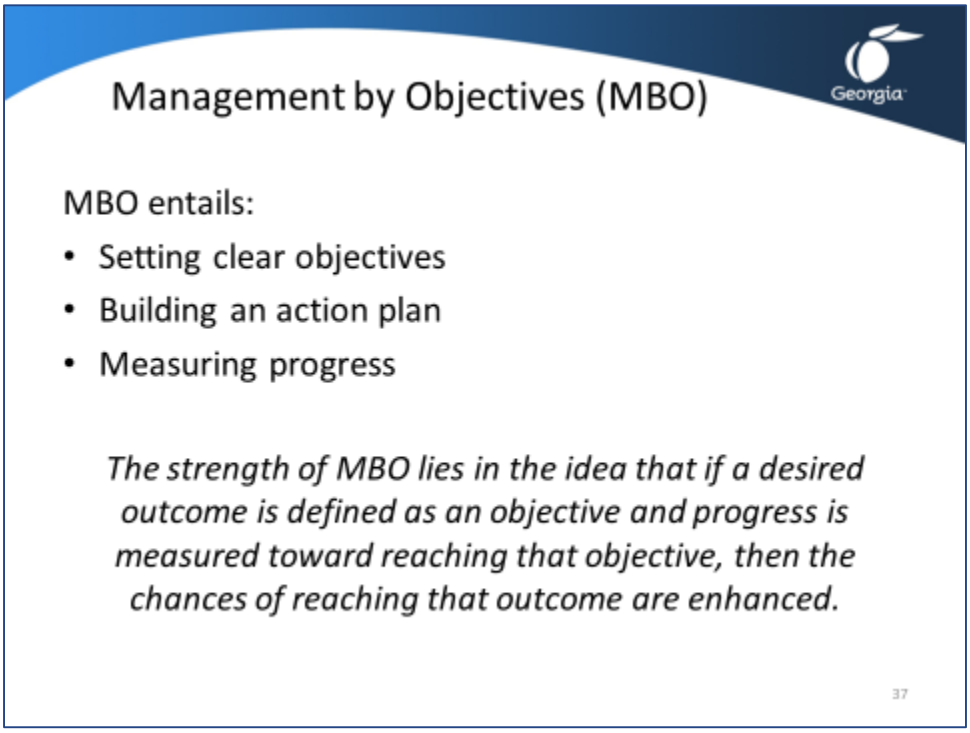
Student Learning Objectives

After completing this lesson you should be able to

- Explain how the concept of objectives has evolved in project management
- Identify and explain the role of project phases and project life cycle
- Describe how a project life cycle contributes to project success

Approximate Presentation time: 2 hours 45 minutes

Topic 1: Management by Objectives



As we'll learn later in this course, the planning process in current project management theory involves defining and refining goals and objectives and selecting the best of alternative courses of action to attain the objectives of the project.

The importance of goals and objectives in business management has its origins in the 1960s and 1970s with the emergence of the concept of management by objectives (MBO).

People appear to need goals and objectives to achieve extraordinary outcomes. In the last 50 years, there have been more than 300 studies repeatedly demonstrating basic truths about humans and goals. These truths include that people

- accomplish beyond their norm when they use goals
- respond positively to stretched goals that they consider to be achievable
- stay attached to goals when leaders support a goal process by both modeling the goal-related behavior and providing feedback relative to goal progress

In the 1960s and 1970s, the idea of managing work efforts by goals and objectives became popular – hence the term MBO. The idea was to improve management and work productivity in general by defining intended outcomes.

MBO principles contain many precursors to the basic building blocks used by current project management theory. The basic MBO principles are setting clear objectives, building an action plan, and measuring progress.

A more detailed set of MBO tenets includes

- establishing a set of **top-level strategic objectives**
- creating a cascade of **organizational objectives** that is supported by lower-level definitive objectives and action plans
- developing an organizational role and **mission statement**, as well as specific objectives and action plans for each member, often in a manner that involves participative decision making
- establishing **key results** or performance standards for each objective
- periodically **measuring/assessing the status** or outcome of the objectives

The strength of the MBO model lies in the idea that if a desired outcome is defined as an objective and progress is measured toward reaching that objective, then the chances of reaching that outcome are enhanced.

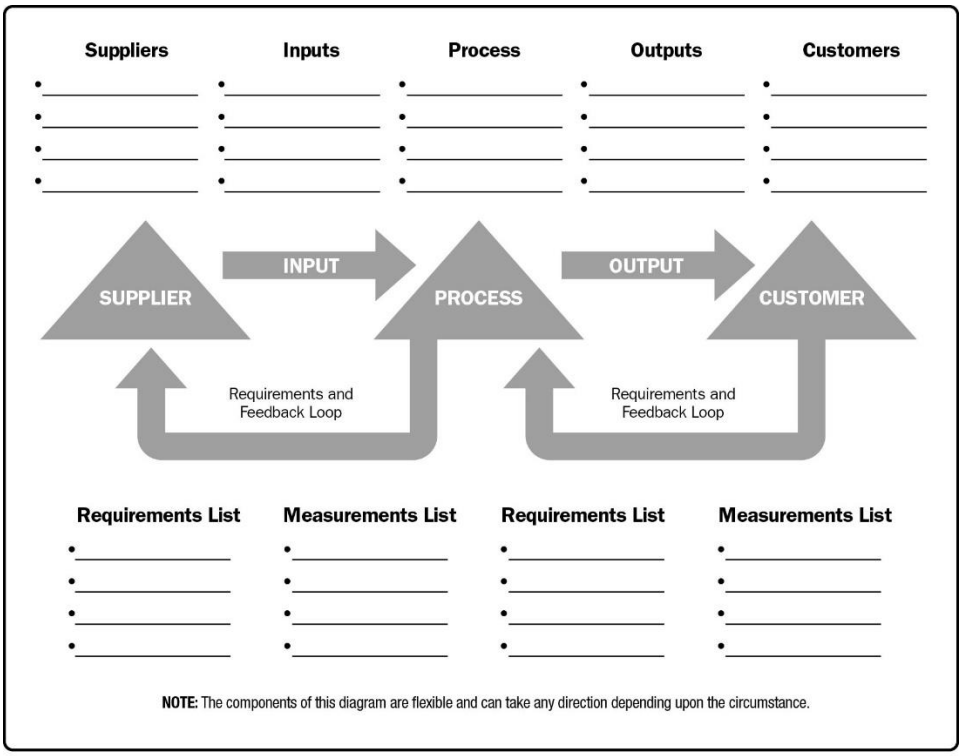
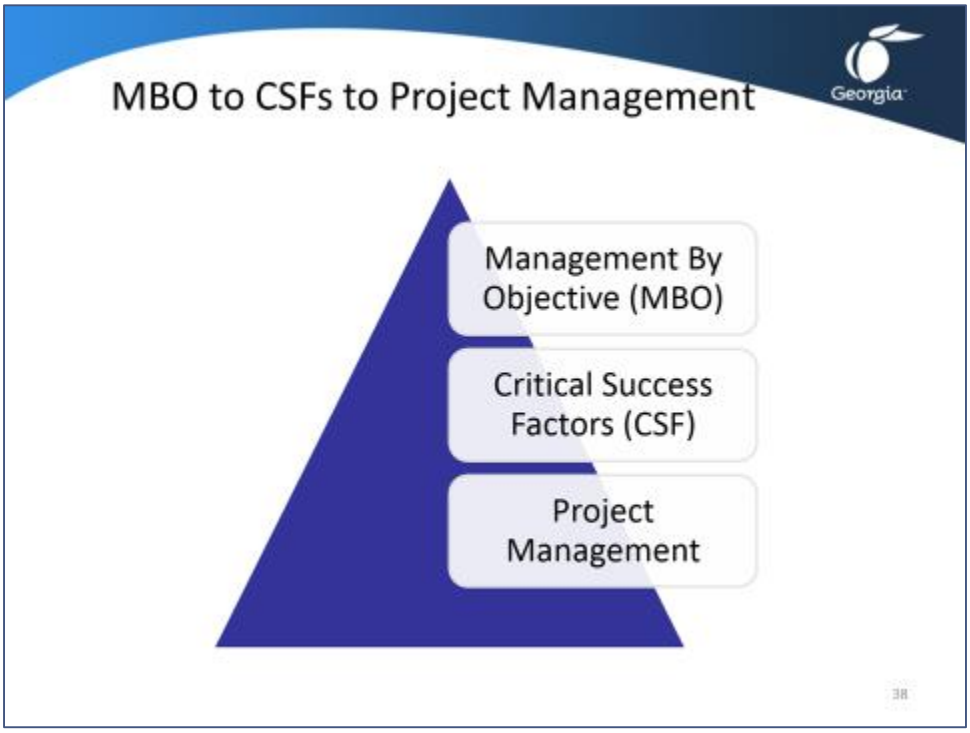


Figure 8-6. The SIPOC Model

A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Fifth Edition. ©2013 Project Management Institute, Inc. All rights reserved.

Topic 1: Management by Objectives



Management by objectives focuses on the importance of the goal definition process, in particular defining critical success factors (CSFs). The CSF goal era of the 1990s provides helpful criteria about what makes objectives effective in shaping behavior. SMART (Specific, Measurable, Actionable, Reasonable, Time-framed) is another method of shaping effective objectives: Each word in the acronym describes a particular aspect of the goal to be achieved:

- **specific –** a goal needs to be exact, distinct and clearly stated
- **measurable –** how do you know when the goal is completed? When specifying the goal you should state how you are going to measure its completion.
- **attainable** – goals should be set in such a way that they can be reached
- **reasonable –** setting a reasonable goal is fundamental
- **time-framed –** you should also allow yourself enough time to succeed

CSF parameters are good predictors of influential or effective goals. Definition of CSFs are

- mirror the objectives of the project
- provide objectives that can be divided into measurable, reasonable, and attainable goals
- are approved by project stakeholders
- are used to measure the success of the project through attaining the goals

Drawing on the influence of MBO and CSF theories, the project management movement emerged, emphasizing project objectives and how to fulfill them:

- **set clear objectives**, get key stakeholder buy-in, and define objectives for the participant through explicit requirement setting
- put together a **series of best practice action steps** in the form of a work breakdown structure

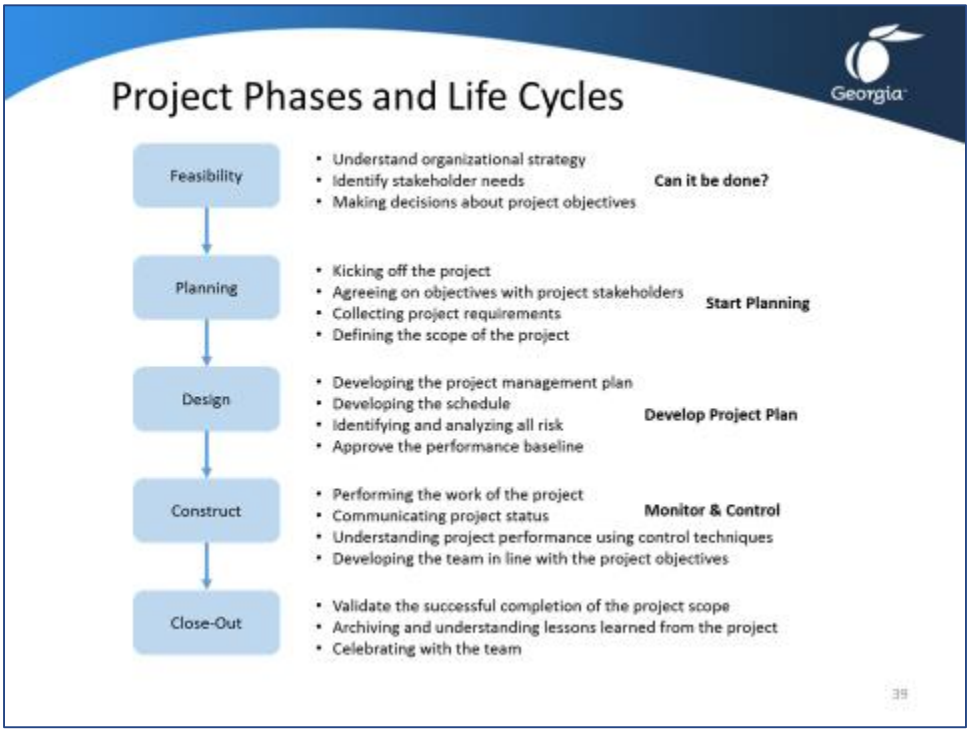
- most important, **help people achieve their objectives** – plan, secure, and schedule deployment of resources and completion of tasks

You can look at the example of baking a cake to understand the evolution from MBO to project management. The MBO and CSF models emphasize setting a goal – baking a cake – with as much specificity as possible regarding the nature of the cake and your action plan for reaching the kitchen and conducting cake baking activities.

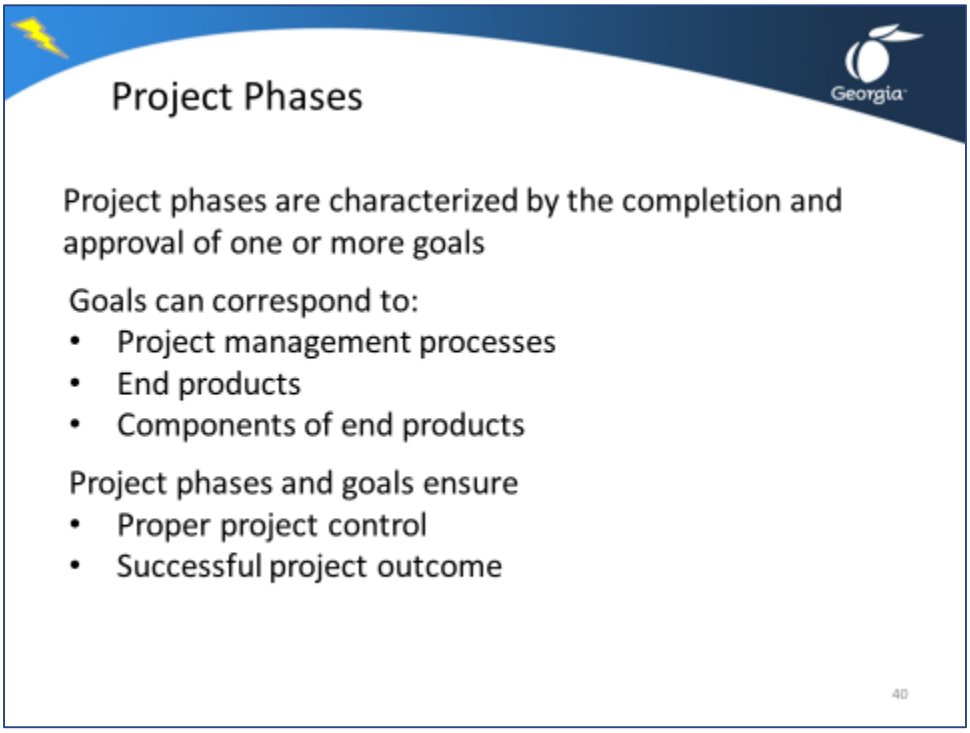
The project management model incorporates elements of the MBO model but adds that the best predictor of baking a cake is your ability to obtain the right ingredients and effectively complete the tasks of measuring, combining, and heating the ingredients as per the recipe.

Take a project example of introducing a new payroll system; where the objective is to introduce a new system for collecting payroll and producing payroll information. The critical success factors in this case might be that the system needs to be available in a certain time frame and the deliverable must meet certain compliance conditions.

Topic 2: Project Phases and Life Cycle



Topic 2: Project Phases and Life Cycle



Project Phases

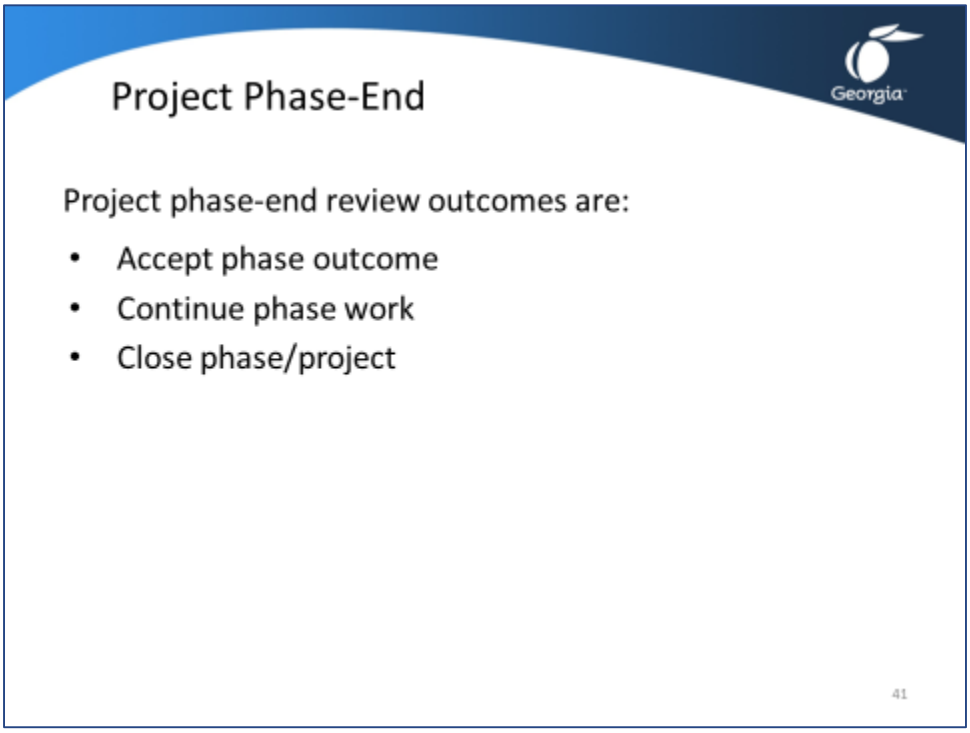
Organizations generally divide projects into project phases to improve management control and to link the project to ongoing organization operations.

Project phases are characterized by the completion and approval of one or more goals. A goal is a tangible, measurable, and verifiable work product that maps directly to a project objective. For a phase to be successful, it must achieve the goal/objective.

Some goals correspond to the project management process, whereas other goals are the end products or components of the end products of a project. Examples of goals include feasibility study reports, detailed design documents, working prototypes, and finished products.

Project phases, and their goals, are part of a sequential process designed to ensure that there is proper control of the project and that the project outcome is achieved. Project phases can be further subdivided into sub-phases, each of which is aligned to one or more specific goals for monitoring and control.

Topic 2: Project Phases and Life Cycle



Project Phase-End Outcomes

At the end of a project phase, a technical or design review of key goals and project performance to date generally takes place. These phase-end reviews – also known as phase exits, kill points, or stage gates – determine whether the project phase outcome is accepted, whether extra work is still required, or whether the phase should be considered accepted.

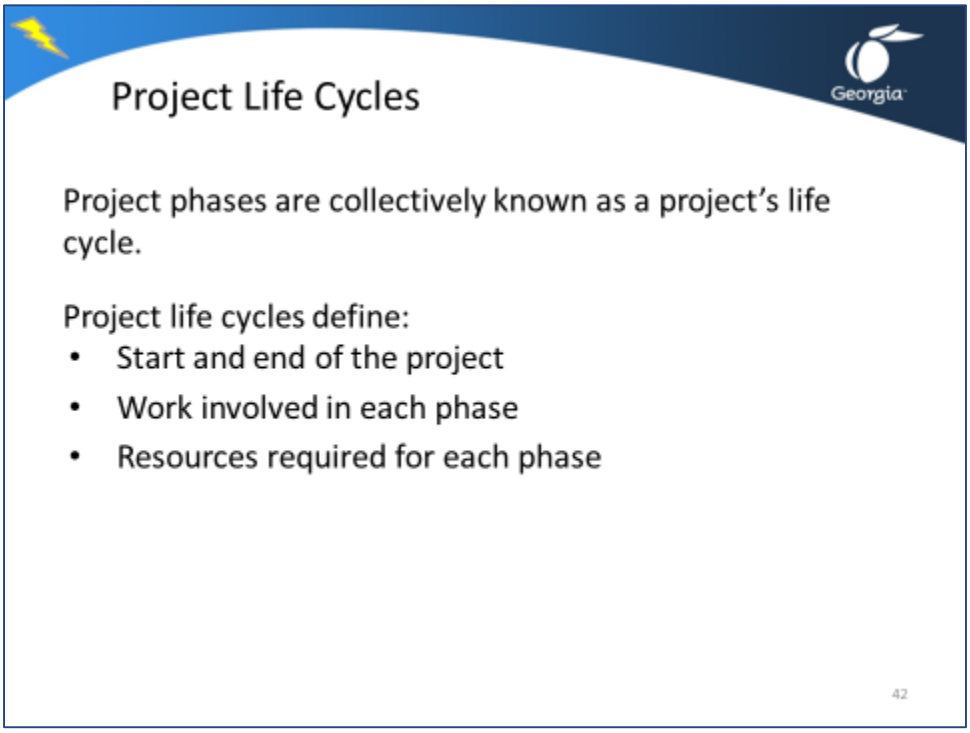
Other phase-end review outcomes include

- a decision to start the activities of the next phase without closing the current phase – for example, when the project manager chooses to accelerate the course of action

- a decision to close a phase without initiating any other phases – for example, when the project ends or when the risk is considered too great for the project to be allowed to continue

Formal phase completion does not include authorizing the subsequent phase because each phase is initiated to produce a phase-dependent output, specifying what is allowed and expected for that phase. However, a phase-end review can be held with the explicit goal of obtaining authorization to close the current phase and to initiate the subsequent one.

Topic 2: Project Phases and Life Cycle



A project's phases are collectively known as the project's life cycle.

The project life cycle defines the start and end of a project. For example, when an organization identifies a business opportunity, it generally undertakes a needs assessment or a feasibility study to decide whether it should proceed with a project to realize the opportunity. The project life cycle definition determines whether the feasibility study constitutes the first project phase or is a separate, standalone project.

The project life cycle definition also determines which transitional actions at the beginning and the end of the project are included in the project and which are not. In this way, the project life cycle definition is used to link the project to the organization's ongoing operations.

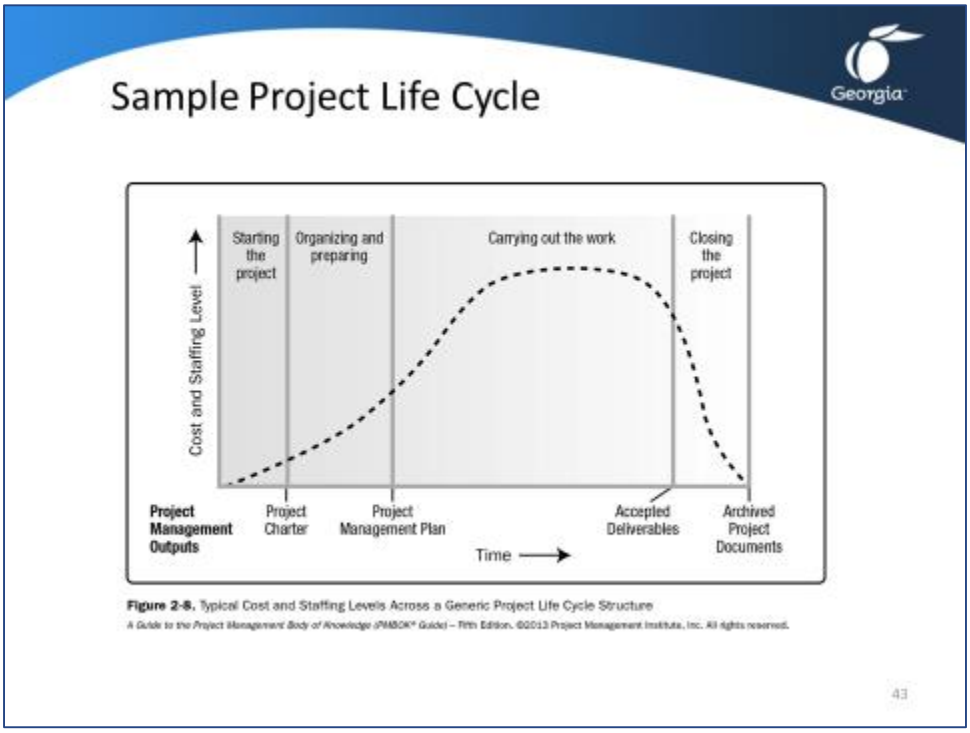
Within a project life cycle, deliverables from the preceding project phase are usually approved before work starts on the next phase. However, a new project phase sometimes starts before the previous phase deliverables are approved when the risks involved are deemed acceptable – this practice of overlapping phases is called fast tracking.

Project life cycles generally define

- the start and end of the project
- what technical work is required in each phase
- who should be involved in each phase

Project life cycle descriptions can be very general or highly detailed. Highly detailed project life cycle descriptions have numerous forms, charts, and checklists to provide structure and consistency – such detailed approaches are called project management methodologies.

Topic 2: Project Phases and Life Cycle



Project life cycle descriptions generally share a number of common characteristics.

- **Cost and staffing levels** are initially low, higher toward the end, and fall rapidly as the project draws to a conclusion (illustrated on slide).

- The **probability of successfully completing the project** is progressively higher as the project continues – risk and uncertainty are highest at the start of the project.

- **Stakeholders' ability to influence** a project's outcome and final cost is highest at the start and gets progressively lower as the project continues – the cost of changes and error correction increases as the project continues.

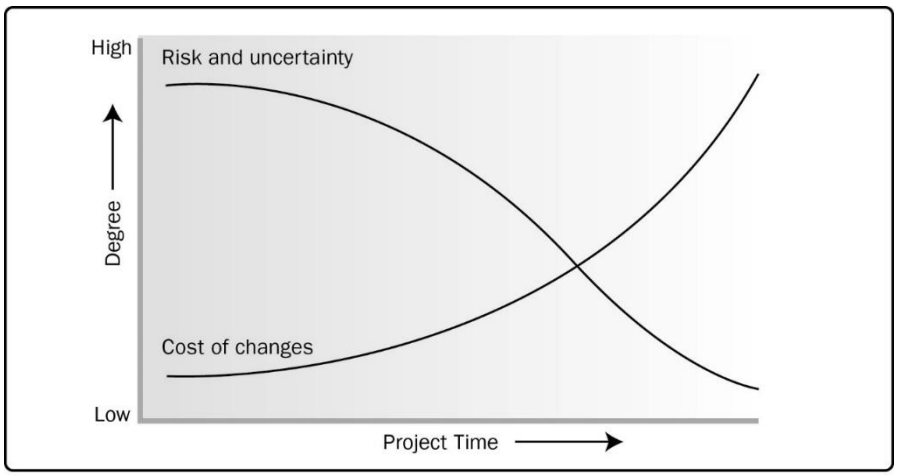


Figure 2-9. Impact of Variable Based on Project Time
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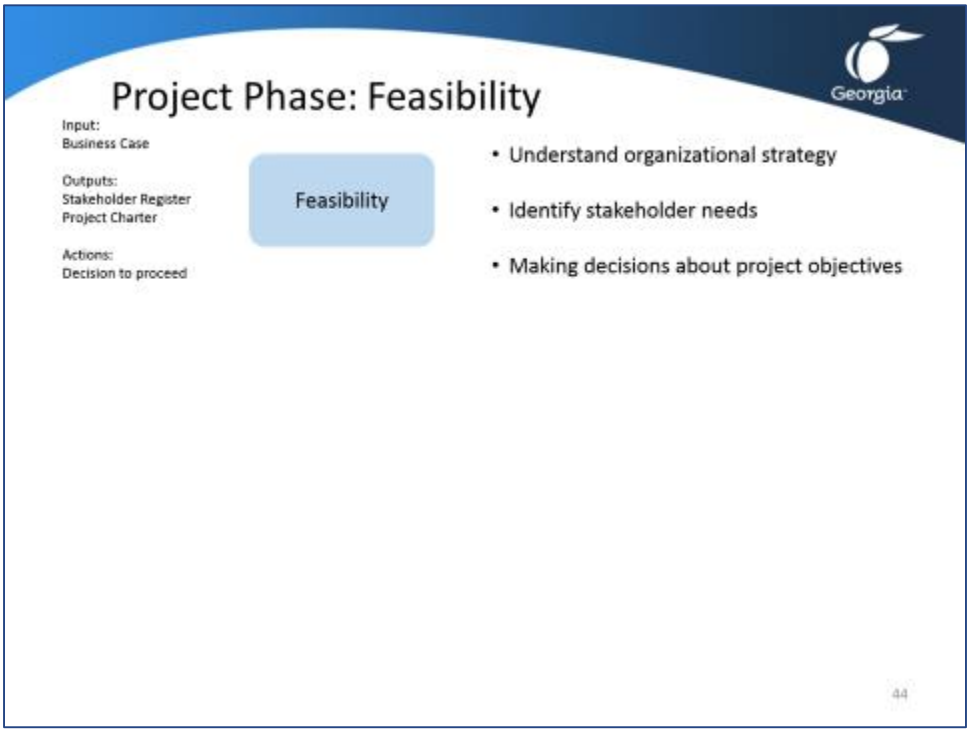
The project life cycle must be differentiated from the product life cycle. For example, a project undertaken to bring a new prescription drug to market is just one phase or stage of the product life cycle.

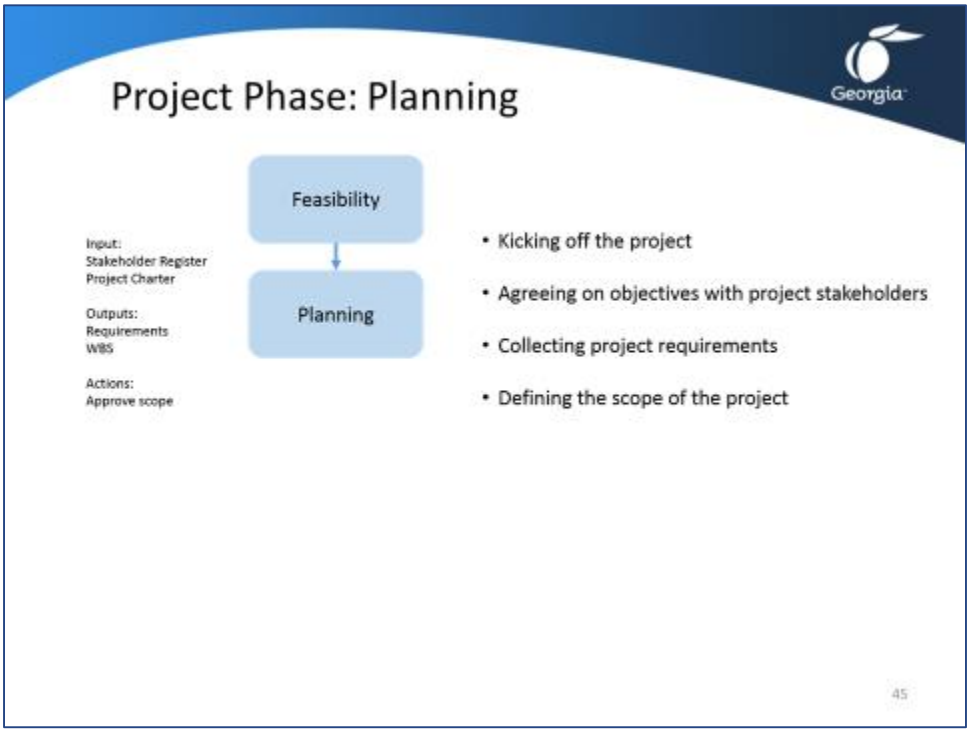
The project life cycle provides the basic framework for managing the project, regardless of the specific work involved. This allows the organization to determine checkpoints to assess project health and progress toward project objectives and ultimately organizational objectives.

Topic 2: Project Phases and Life Cycle



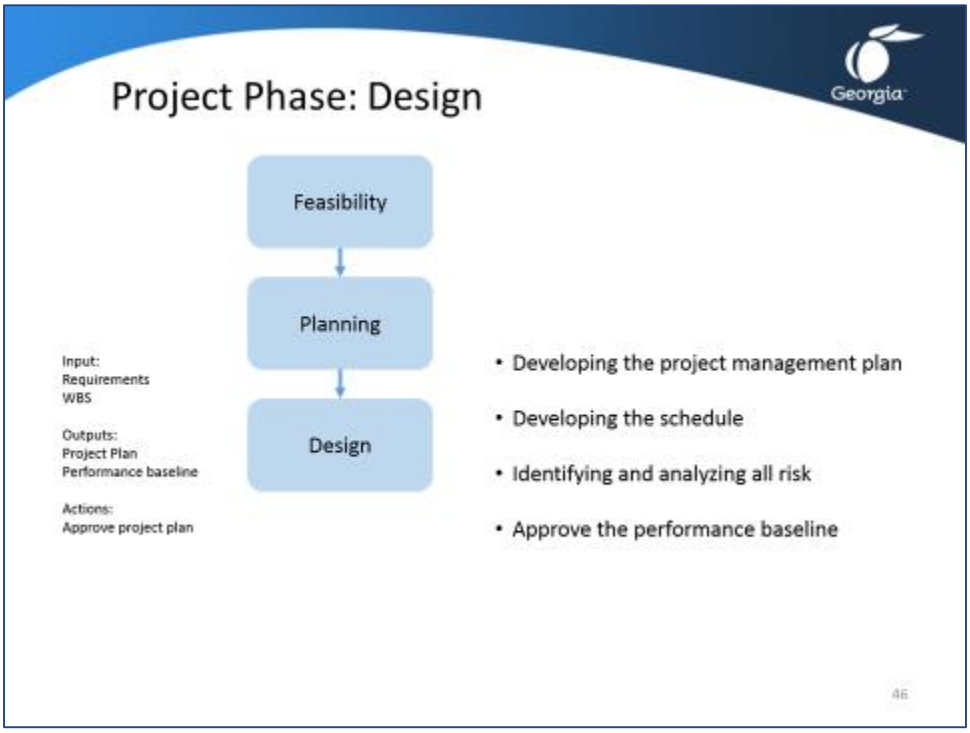
Feasibility is the first phase in the project life cycle. During the feasibility phase, a study is conducted to identify and analyze a problem and its potential solutions in order to determine their viability.

Topic 2: Project Phases and Life Cycle



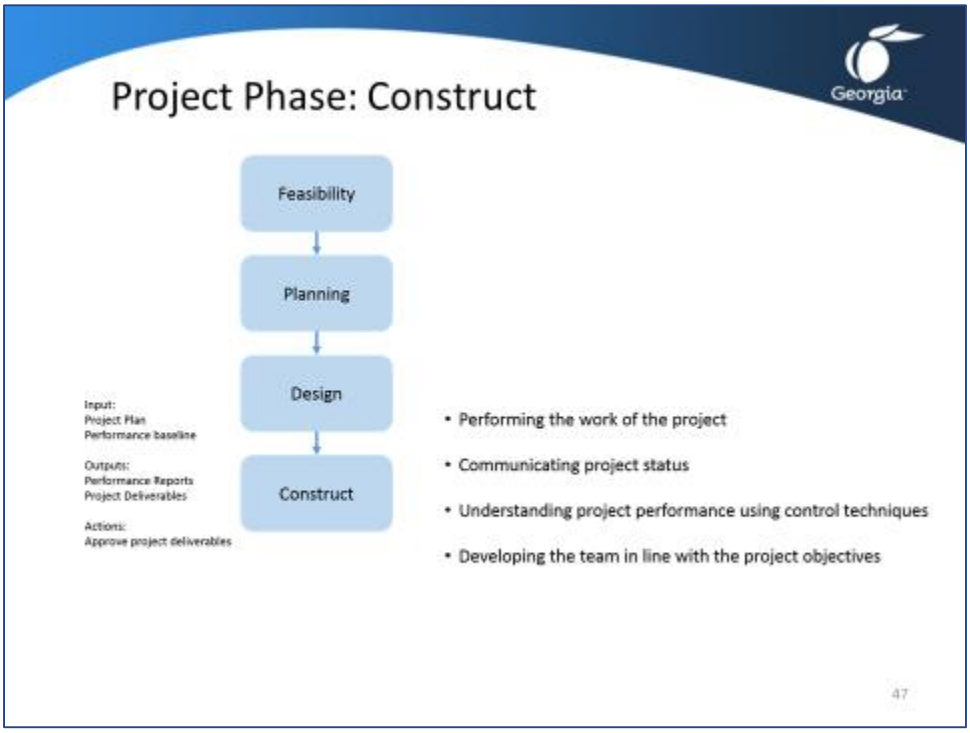
The **planning** phase is the second phase of the project life cycle. During this phase, objectives are agreed upon, the project requirements are collected and documented, and the scope of work is defined, including projected time, cost and performance requirements, together with the potential impact on organizational resources.

Topic 2: Project Phases and Life Cycle



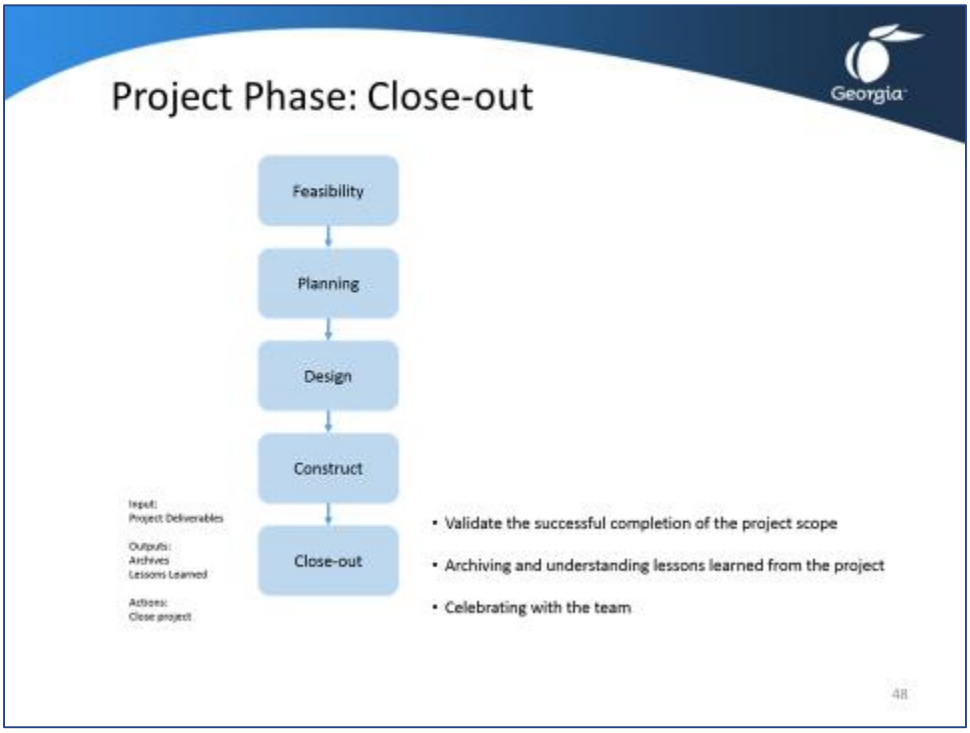
During the **design** phase, the preparation of all documentation necessary to support the project takes place, the resources for the project are firmly identified and specific time, cost, and performance parameters are set.

Topic 2: Project Phases and Life Cycle



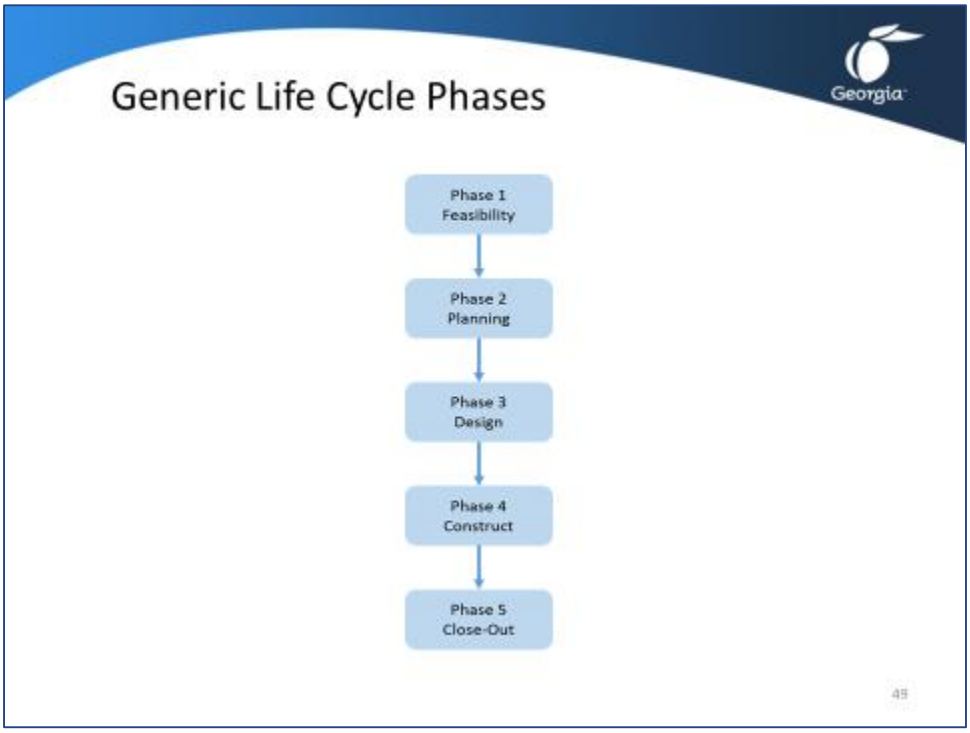
The fourth phase is the **construct** phase, during which the work of the project takes place. The project is tasked with the controlling of product deliverables as well as the communication of project performance and status.

Topic 2: Project Phases and Life Cycle



During the **close-out** phase the efforts and results of the project are evaluated and analyzed. They are also recorded as lessons learned, to serve as input to the feasibility and planning phases of new projects.

Topic 2: Project Phases and Life Cycle



Using the evaluation of project phases, project management theory provides a generic life cycle, which consists of five distinct phases:

- **feasibility phase –** the initial phase concerned with understanding the viability of a project

  The decision whether to proceed with a project is often based on the following criteria:

  - alignment with strategic objectives – Does the project align with the strategic direction of the business?
  - product analysis – Can the product contribute to the business? What is the demand for the product likely to be?
  - stakeholder commitment – Are the stakeholders (including the organization) willing to support and commit to the project?

These factors combine to provide the project's management team with an understanding of the feasibility of the project. This phase provides a series of product guidelines and, more important, an objective to kick off the project.

The **outputs** from the feasibility phase is a project charter and the stakeholder register. The charter includes objectives, justification, and intent. This charter is committed to by all stakeholders. The stakeholder register documents all identified stakeholders, their expectations of the project, requirements, influence over the project, and level of interest they have in project outcomes.

- **planning phase** – the initial evaluation of the project objective and the associated requirements

  This phase includes a preliminary analysis of risk and the resulting impact on time, cost, and performance requirements.

Activities in the conceptual phase include

- determining the requirements needs and wants
- conducting technical and economic studies
- carrying out cost-benefit analysis
- conducting environmental studies
- obtaining approval to move to the design stage of the project

The activities concentrate on deciding, from a range of options, what is likely to be the best solution to satisfy requirements. This planning phase must be completed before the project is definitively identified. Prior to this, the project is a series of schemes or alternatives under consideration.

The **output** from the planning phase is a definition of the project, generated using a scope statement that contains project requirements, critical success factors, constraints, and assumptions. An initial definition of the project should be present using a work breakdown structure.

- **design phase –** a refinement of the requirements that are described at the planning phase

  Activities in this phase include

  - establishing the project goals and objectives in terms of time, cost, and performance
  - defining the work that is required in order to complete the project with respect to the proposed objectives and constraints
  - scheduling and budgeting the project work
  - developing and scheduling the project resources, including the project team
  - obtaining approval for the transition to the construct phase with the proposed master project plan
  - producing all documentation required to support the project (e.g. project management plan and associated project documents)

The design phase begins with a partially defined project that depends on the outcome and success of the planning phase. Two distinct elements of this phase are

- design – the what and how of the project
- procurement – who, how long, and how much

The deliverable at the end of this phase becomes the starting position for the construct phase.

The **output** from the design phase is a project management plan that includes all schedules, budgets, quality plans, procurement plans, risk management plans, and any plan that relates to the project activities.

- **construct phase –** when the project's product or service is built and integrated into the organization

  Actions, plans, and documentation produced in previous phases are adhered to in order to implement the project product. At the same time, the project is monitored and controlled with respect to risks and constraints.

  Activities in the construct phase include

  - tracking project accomplishment
  - analyzing project quality
  - detecting project changes
  - initiating corrective action and re-planning of project objectives and constraints as required

- approving staged payments to participating entities in projects that require services to be procured from outside the organization
- performing the work as detailed by the master project plan
- obtaining approval for the transition to the close-out phase

The **output** from the construct phase is the delivery of a product that meets the customer specifications

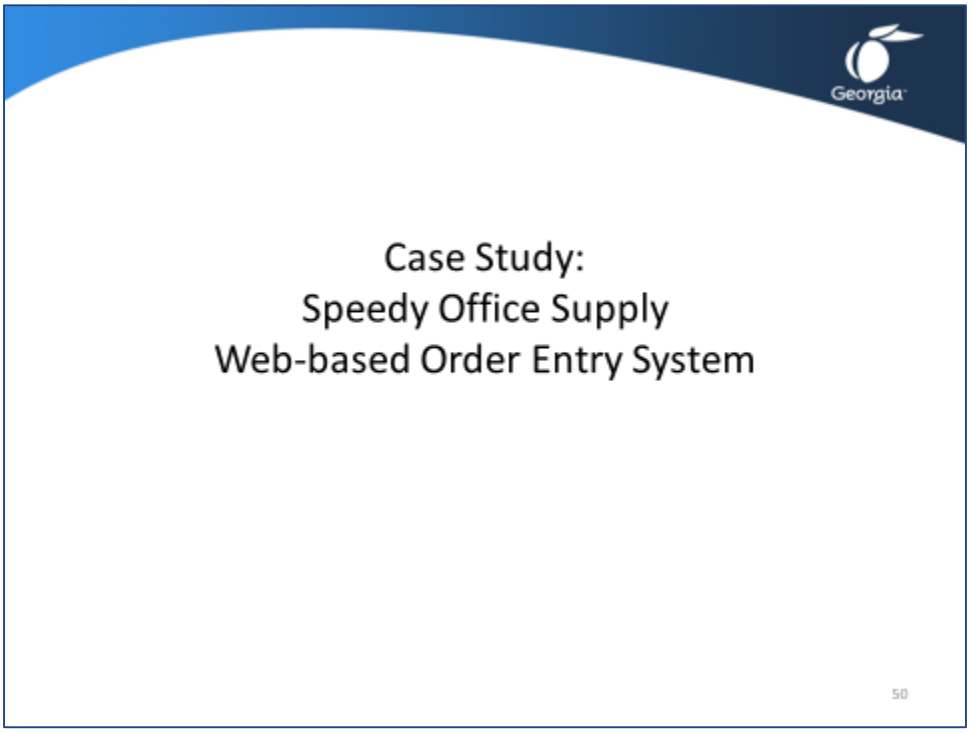
- **close-out phase –** evaluation of the efforts and results of the project, which serves as input for the planning phase of future projects

  Activities in this phase include

  - delivering the product or service to the customer
  - acceptance from the customer
  - releasing personnel and equipment to other projects
  - closing and archiving project records, which act as historical material for future projects
  - writing “lessons-learned” reports

The **output** of this phase is the formal closing of the project with confirmation by the project manager and project stakeholders that the scope of the project has been satisfied.

Topic 3: Project Life Cycles in Practice



The following case study illustrates how in major business projects distinct project phases and life cycles must be completed before a project proceeds.

Read the case study and then complete the exercise that follows it.

Speedy Office Supplies Web Expansion Project

Company Overview

Speedy Office Supplies, led by founder and CEO Sam Speedy, has been in business for 30 years and is recognized as the leader in discount office supplies. We have a reputation of providing high quality products at reasonable prices and offering superior customer service. We are selling to corporate clients, governmental agencies, and individuals nationwide. Our customers are served by over 40,000 employees through direct sales, catalogs, e-commerce and more than 2,000 stores. Eighty percent of our business is currently done in our 2,000 retail stores with total annual sales of 700 million dollars.

Business Objectives

Objective Number	Business Objective	Strategic Objective
1	Increase sales by 30% over the next 5 years	Increase sales
2	Reduce overhead costs by 40% over the next 5 years	Reduce cost
3	Expand customer base by 25% over the next 5 years	Increase market share
4	Innovate internal systems and processes within 2 years	Increase effectiveness

Problem Definition

Over the past five years the Retail Store Division has shown a steady decline in sales from 900 million dollars to the current 700 million dollars, a 22% decline; energy costs have increased by 30% for our fleet vehicles and retail stores; employee health care costs have increased by 75% and continue to rise due to federal regulations.

Market trends and customer preferences are indicating that customers desire the ability to order their products on-line at times convenient to them. The SOS management team believes if we phase-out or reduce the number of stores in the Retail Store Division and implement a web-based ordering system and consolidation of our distribution network, we anticipate a savings of nearly 10 million dollars per year. This system would also need to integrate into the existing legacy supply chain systems. Customer satisfaction surveys also indicate a favorable reaction to the concept of web-based sales, which could increase our current sales by at least 30% over the next 5 years, which will put SOS back on track to reach financial goals.

Current State

Currently orders for products are received via in-store requests, phone calls, or catalog mail-in from customers. We access our online system to check inventory, prices, and estimated shipping dates. If the order total is over $10,000 we turn it over to a supervisor. We then call the Credit Card Authorization Company to check the customer's credit card account. If the credit card charge is authorized we enter the order into the system. The current system is an old mainframe application and is very cumbersome.

There are purchasing agreements, special discounts, and payment terms for our clients purchasing over $50,000 per year. In the past, we have billed these customers on a monthly basis, providing them with a detailed listing by location of their purchases. We want to make it easier for them to pay via credit card each time they place an order to increase our cash flow and lower our Accounts Receivable. If possible, we still want to provide select customers the same reporting on a monthly basis for their purchases by location.

Federal Express and UPS are currently bidding on the exclusive rights for delivery of all customer office supplies. Each company is proposing an online interface to track shipments, including the name of the person who signs for the delivery. The shipment will need to have a label and detailed purchase order slip with the package. The cost of shipping is determined by the size of the package, weight, location, insurance, and timeliness of delivery. The customer will need an accurate shipping cost at the time of purchase.

Project Proposal

Based on this information SOS management is considering a decision to close or reduce the number of the brick and mortar stores within 18 months. We believe this decision will significantly cut costs and that we can be just as successful selling our products on our website.

Our main focus for this project is to create the shopping experience for our retail customer on the website and to place product orders on the Internet. We want to have real time information regarding product description; quantities; pricing; availability; payment processing; shipping method options with associated costs; delivery date; and order tracking. All information currently available at the retail stores and in the catalogs should be available and consistent with the Internet.

It would be nice if there were a place on the Internet for the customer to build a profile and store frequently purchased items in a list to use for future purchases. This would be very beneficial for large organizations that purchase the same products frequently.

We envision using our existing customer number and allowing each customer to create a password to ensure security. Anyone could look at the products online, but only registered customers would be allowed to place orders. The web site should have search ability by several options: product item number (from the catalog), product type, color, and size.

Hopefully when a customer places an order the software would quickly calculate a shipping charge and present the order total to the customer. We would not allow orders totaling more than $1,000 to be placed on the web. The software should also email a confirmation to the customer if requested.

Project Objectives

Project Objective	Project Objective Description	Business Objective
1	Provide a web-based order entry system	1, 2, 3, 4
2	Close or reduce retail stores	2, 4
3	Create distribution centers from some existing stores	2, 4
4	Provide superior shopping experience on web site	3

A feasibility team was formed and evaluated the business and project objectives to establish detailed specifications around the structural aspects of the project. The company also allocated a budget to invest in highly capable individuals who could provide a complete structural solution.

Project Implementation

Specialists recruited by the feasibility team subsequently presented a work breakdown structure (WBS) for the project as seen below, which subdivides the project work into the major elements and then their sub-elements. For example, a major element of work is the web-based order entry system work, which is subdivided into five sections. These sections include customer profile, search and scan products, ordering products, order billing and shipping, and integration to legacy system.

- WBS level 1 – Program/Phase: vision of the end product
- WBS level 2 – Project: the project's major deliverables
- WBS level 3 – Project units: the main work packages associated with each deliverable
- WBS level 4 – Further decomposition of Project units

The specialist team proposed that once the contracts are identified, the project could then be outsourced to different contractors.

Project Management

The feasibility team has proposed that a dedicated project management team be established within Speedy Office Supplies. The team would have total control over budgets and schedules and would report directly to the CEO.

The control, planning, and management of the project present complex logistical issues. The scheme may entail numerous individual contract packages, which will require coordination.

At a very early stage, the feasibility team settled the key project management objectives as

- effective and efficient communication of information
- utilization of thorough project control techniques
- efficient and widely understood procurement and contractor processes

This standardization is necessary to ensure that all contractors are working in unison. To furnish timely and accurate cost reports, the project control team needs a comprehensive system that integrates cost and schedule, provides reporting capabilities consistent with the project requirements, and improves operating efficiency.

The system has to be capable of processing and analyzing a vast amount of incoming monthly cost data quickly and accurately. Also, the team could use integrated systems to perform risk and schedule simulation analysis where the relationship between the schedule and cost is not always clear.

Although technology has simplified data collection and scheduling, the feasibility team has identified that professionals must carefully study and analyze the system output to provide a logical, meaningful explanation of the causes of any cost and schedule variances. In this way, sound project control methodologies reduce cost overruns, control cost growth, help meet project schedule objectives, and ultimately satisfy the client's expectations.

Feasibility Report

The feasibility team completed their study on schedule with an outline of strategy, detailed recommendations, and a list of preferred suppliers.

The main outcomes from the team are the following:

- The web-based order entry system should be piloted in one region. Based on the relative success of the pilot and after a period of “customization”, the initiative can be deployed in other areas.
- Contractor participation is a key aspect to the success of the project, and Speedy Office Supplies should establish and work with a set of preferred suppliers.
- Speedy Office Supplies should establish a detailed project management office that has the authority to manage and control the project and report to senior management.

The feasibility team gave the green light for the project, based on these recommendations.

Internal Stakeholders

The **Marketing Department** is responsible for customer reporting and the negotiations for preferred customer status including volume discounts. Our largest customers receive one monthly bill for all their departments’ purchases and a report showing the detailed purchases. Additionally, marketing maintains the customer profiles, which are used to process orders, verify billing information, discounts, and reduce redundancy by eliminating the need for the customer to always enter their company information.

The **Customer Service Department** will need access to all information regarding customer orders to assist with the web site usage and handle any possible complaints.

Accounts Receivable is responsible for processing and sending bills to our preferred customers. The web ordering system will need to notify accounts receivable when one of our preferred customers request their order to be direct billed. Some customers have negotiated payment terms and discount rates based on volumes. They work with the Collections Department for any

outstanding receivables beyond 90 days. On a monthly basis Accounts Receivable produces an aging report.

Inventory Management is impacted by a reduction in inventory from placed orders and an increase in inventory from cancellations and returns. They are responsible for managing the inventory and placing orders with vendors. Inventory Management is also responsible for handling returns, including items that have to be returned to the suppliers as defective.

Order Fulfillment receives an order notification from the order processing system containing all necessary information required to assemble the order. They are responsible for producing the packaging slips, retrieving the supplies, assembling the order into a bin or crate, and delivering the order to the Shipping Department.

The **Shipping Department** receives the order from fulfillment and prepares the order for shipment. The packing slip contains the shipping method requested by the customer and the estimated shipping timeframe. The Shipping Department is responsible for notifying the shipping company and updating the order status.

The **IT Department** manages and maintains a legacy supply chain system on mainframes at the corporate offices. Each retail store maintains its own sales and inventory on local servers that are integrated to the mainframe via communications lines. Sales and inventory data are downloaded nightly in batches to update corporate databases on the mainframe.

The **Employees** working in the retail stores. These may include stock clerks, cashiers, customer support, back office warehouse, drivers, and store managers. These employees will be directly impacted by a decision to close retail stores or consolidate them into distribution centers.

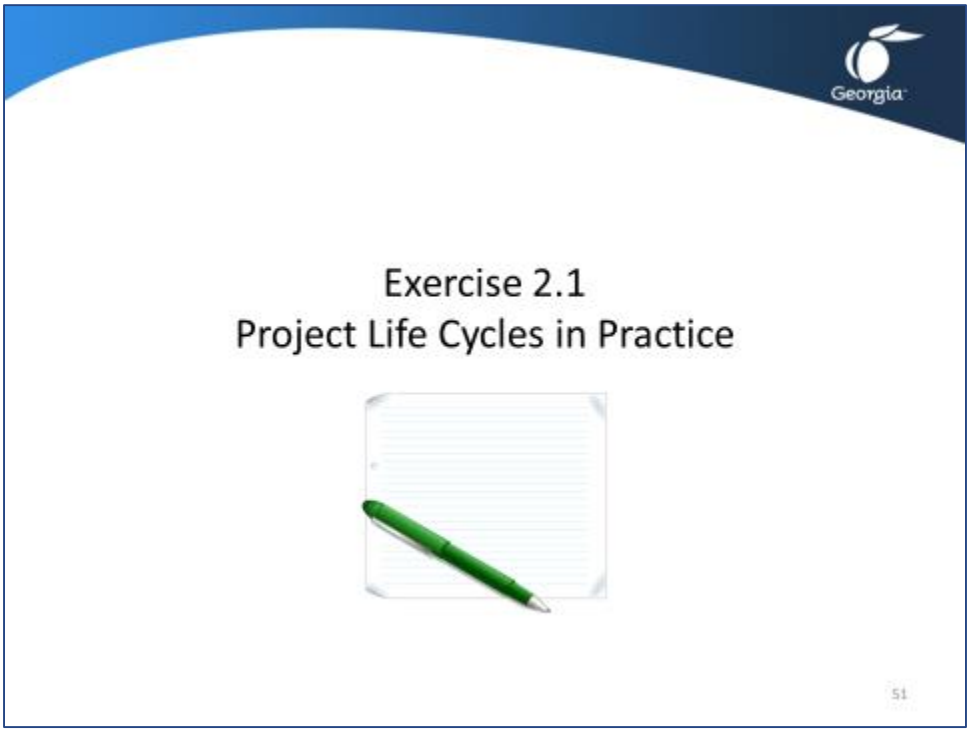
External Stakeholders

The **Shipping Company** currently has an online tracking system. Our web ordering system will have a direct link to the shipping company's web site for the customer to track packages using the tracking number provided by the Shipping Department to the order status system.

The **Credit Card Processor** currently authorizes customer purchases made in the stores, over the phone, or via fax. An additional interface will need to be established between the web application to receive the customer and order information and to return an authorization code.

The **Customers** ordering from the retail stores and from the web site. These customers will be directly impacted by a decision to close or limit the number of retail stores and purchasing goods via the web site.

Exercise 2.1 Project Life Cycles in Practice



Assume that the Speedy Office Supply management has sanctioned the web-based order entry project. You are part of the assembled dedicated project management team. You need to perform the following initial tasks:

1. re-establish the project objectives
2. identify a set of critical success factors that will guide the project
3. evaluate a high-level project structure

Project Objectives

Project Objective	Project Objective Description
1	
2	
3	
4	
5	
6	

Critical Success Factors

Critical Success Factors

Project Structure

WBS Level	Description

Lesson 2 Summary: Learning Objectives Recap

- **Explain how the concept of objectives has evolved in project management**

  Drawing on the influence of Management by Objectives and Critical Success Factors theories, the project management movement emerged, emphasizing project objectives and how to fulfill them:

  - **set clear objectives**, get key stakeholder buy-in, and define objectives for the participant through explicit requirement setting
  - put together a **series of best practice action steps** in the form of a work breakdown structure
  - most important, **help people achieve their objectives** – plan, secure, and schedule deployment of resources and completion of tasks.

- **Identify and explain the role of project phases and project life cycle**

  Organizations generally divide projects into project phases to improve management control and to link the project to ongoing organization operations.

  Project phases, and their goals, are part of a sequential process designed to ensure that there is proper control of the project and that the project outcome is achieved.

  A project's phases are collectively known as the project's life cycle. The project life cycle defines the start and end of a project. Within a project life cycle, deliverables from the preceding project phase are usually approved before work starts on the next phase.

- **Describe how a project life cycle contributes to project success**
  The project life cycle provides the basic framework for managing the project, regardless of the specific work involved. This allows the organization to determine checkpoints to assess project health and progress toward project objectives and ultimately organizational objectives.

Notes

LESSON 3: PROJECT PROCESSES

Topic 1: Definition of Project Management Processes

Topic 2: Project Process Interactions

Topic 3: Mapping the Project Processes to the Knowledge Areas

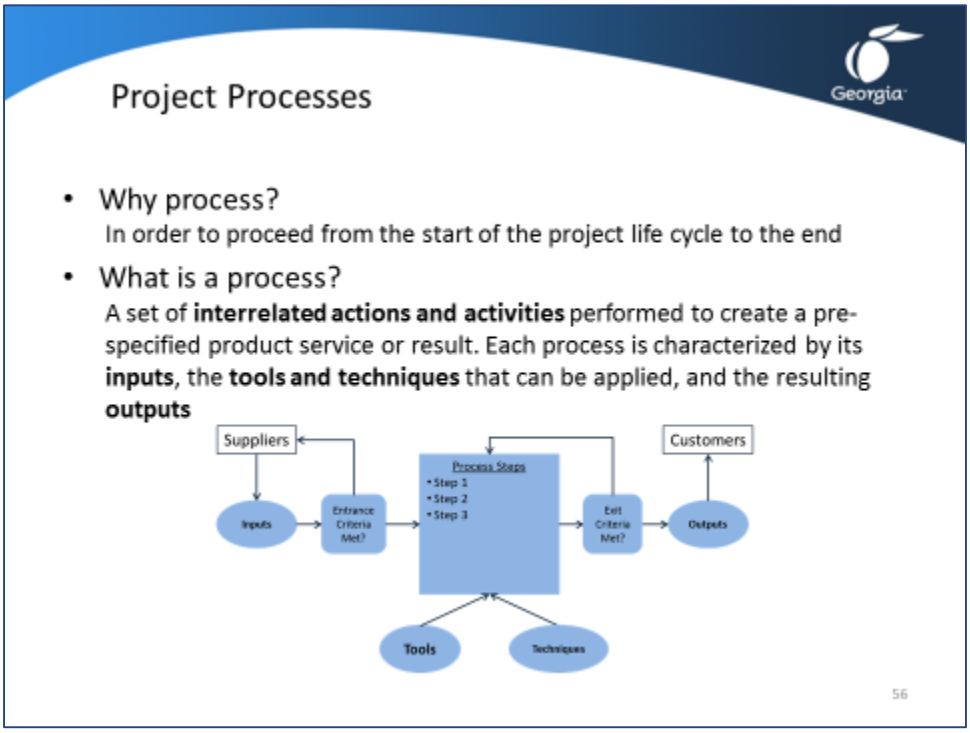
Student Learning Objectives

After completing this lesson you should be able to

- Identify what project processes are and explain why they are used
- Identify various components within a project process group
- Describe the interaction between project process groups and project management knowledge areas

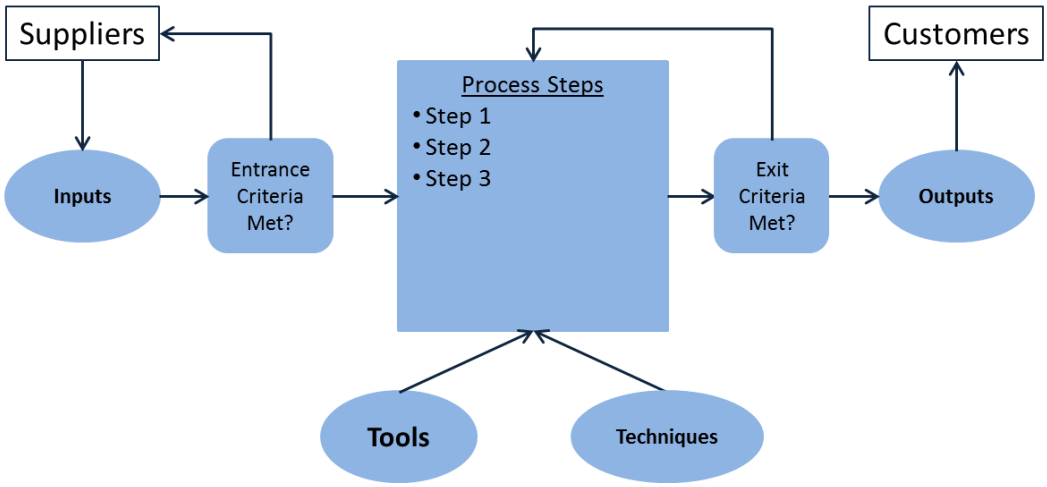
Approximate Presentation time: 1 hour 15 minutes

Topic 1: Definition of Project Management Processes



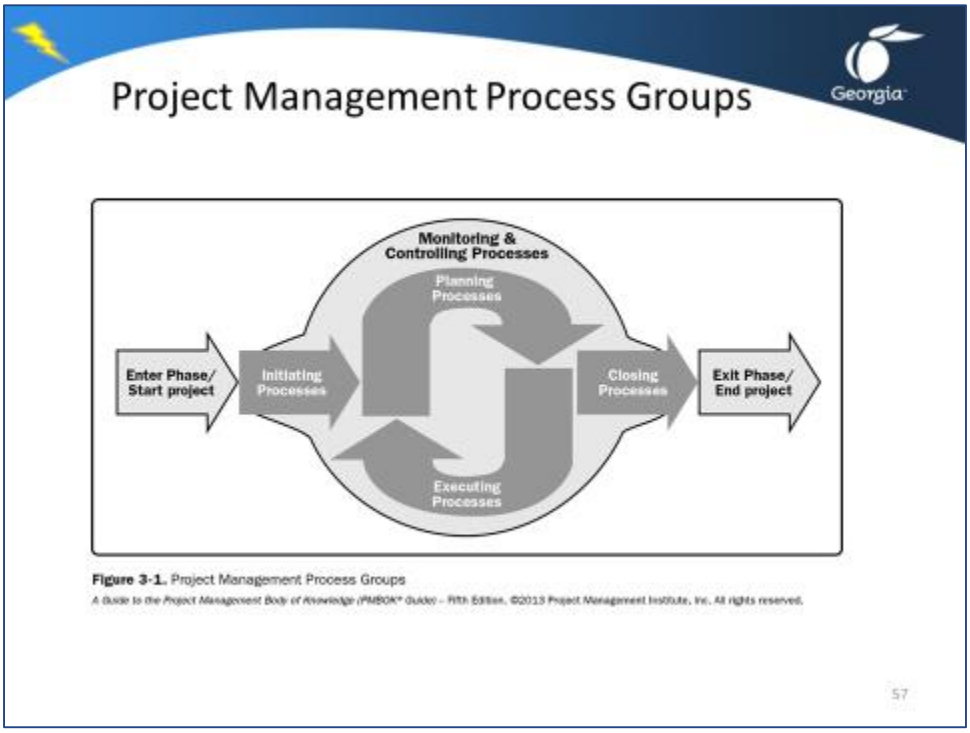
This topic introduces the concept of project management processes. In an ideal situation, these are discrete elements with well-defined interfaces. In reality, however, they overlap and interact in several ways.

The *PMBOK® Guide* defines a process as "a set of interrelated actions and activities performed to create a pre-specified product service or result. Each process is characterized by its inputs, the tools and techniques that can be applied, and the resulting outputs… project management processes ensure the effective flow of the project throughout its life cycle."[5]



[5] *PMBOK® Guide* p 47

Topic 1: Definition of Project Management Processes



The *PMBOK® Guide* identifies project management processes and has grouped them into five categories known as Process Groups:

Initiating Process Group. Those processes performed to define a new project or phase by obtaining authorization to start the project or phase.

Planning Process Group. Those processes required to establish the scope of the project, refine the objectives, and define the course of action to attain the project objectives.

Executing Process Group. Those processes performed to complete the work defined in the project management plan.

Monitoring and Controlling Process Group. Those processes required to track, review, and regulate the progress and performance of the project.

Closing Process Group. Those processes performed to finalize all activities across all Process Groups to formally close the project or phase.[6]

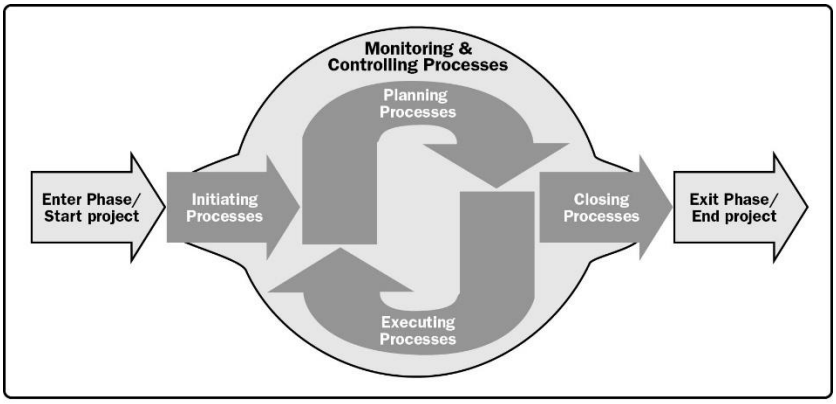
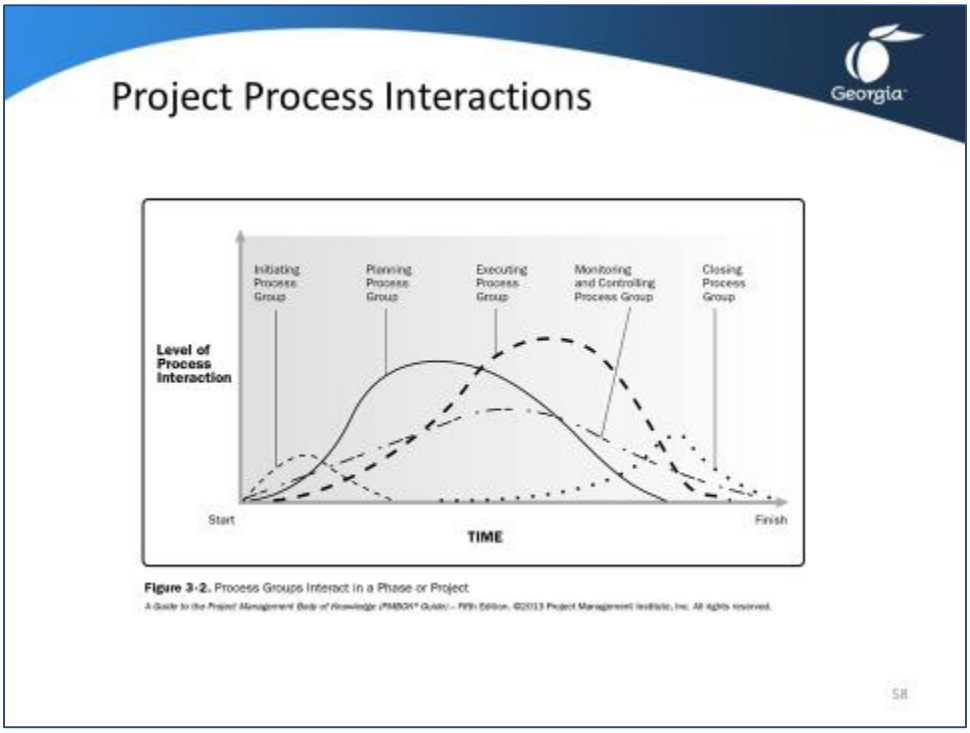


Figure 3-1. Project Management Process Groups

A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Fifth Edition. ©2013 Project Management Institute, Inc. All rights reserved.

[6] *PMBOK® Guide* p 49

Topic 2: Project Process Interactions



In order to proceed from the start of a project life cycle to the end, project processes are required. They allow activities to be undertaken in a sequence that enables project phases to deliver on their goals.

Project Management Process Groups are linked by the outputs which are produced. The output of one process generally becomes the input to another process or is a deliverable of the project. The figure below illustrates how the Process Groups interact and shows the level of overlap at various times. If the project is divided into phases, the Process Groups interact with each phase.[7]

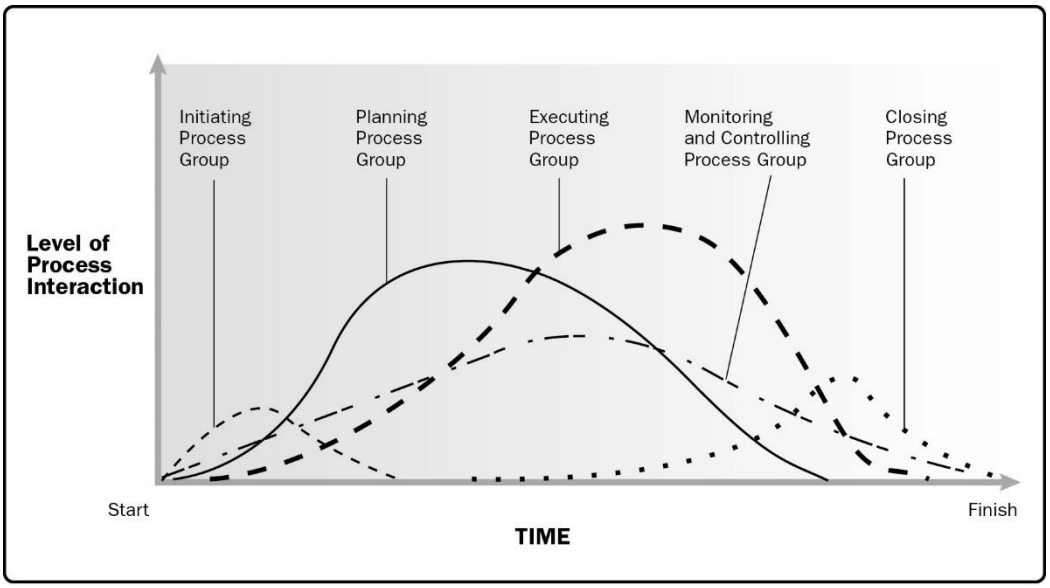
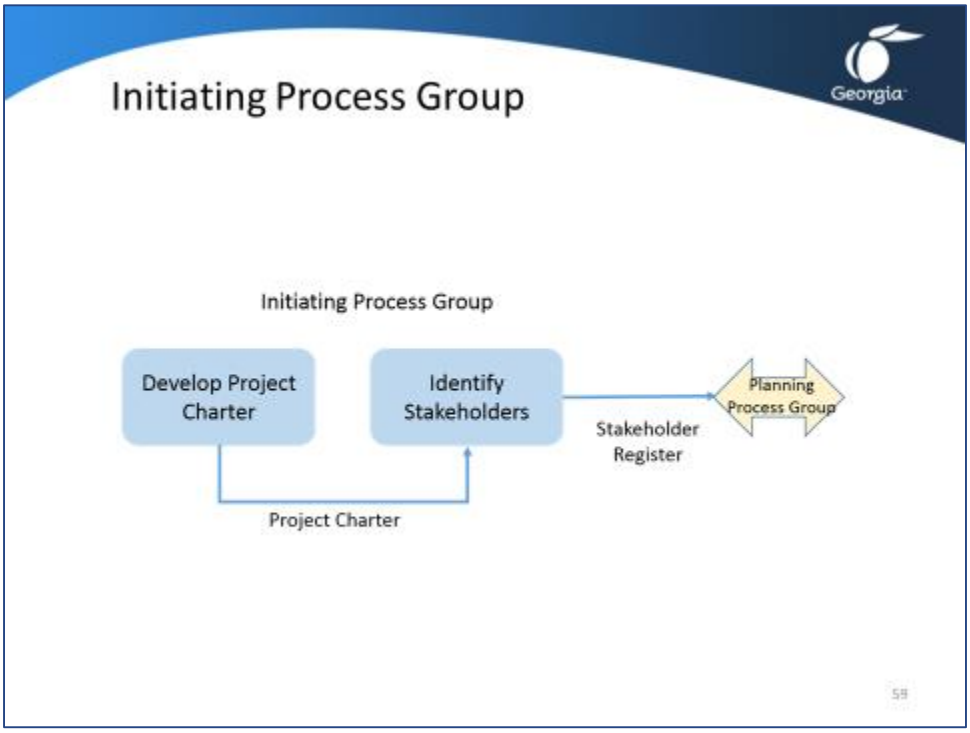


Figure 3-2. Process Groups Interact in a Phase or Project

A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Fifth Edition. ©2013 Project Management Institute, Inc. All rights reserved.

[7] *PMBOK® Guide* p51

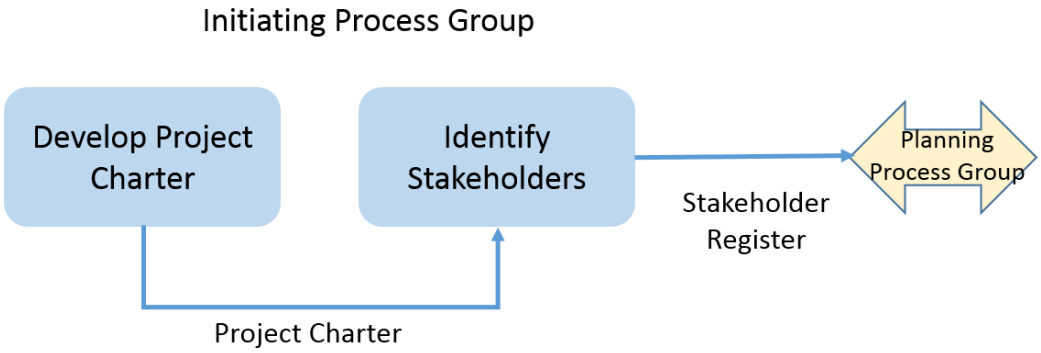
Topic 2: Project Process Interactions



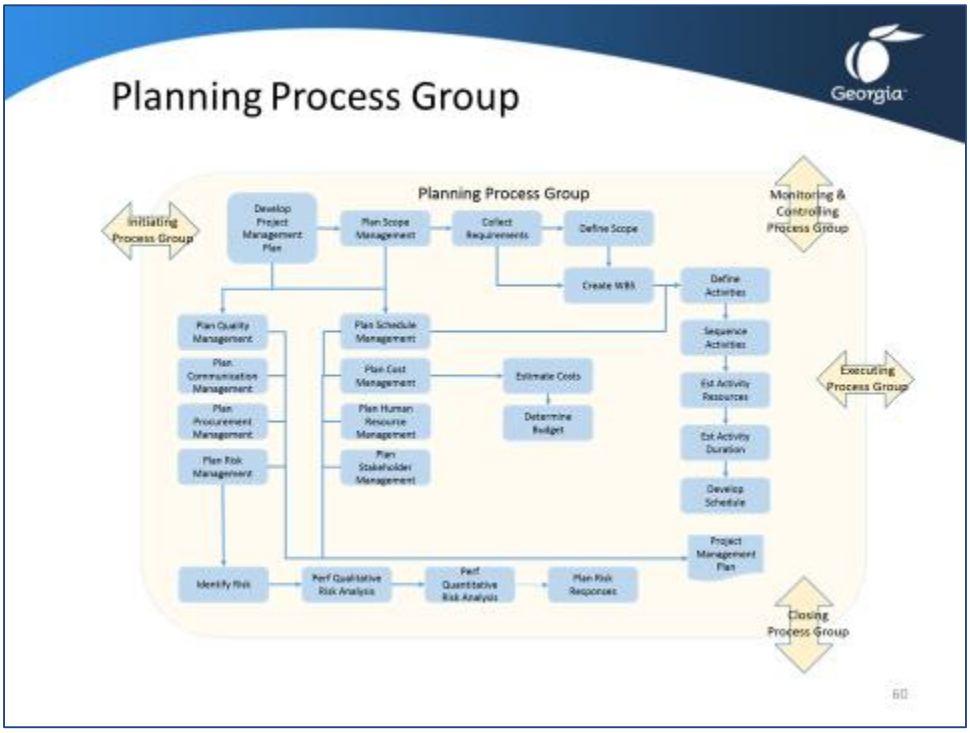
The **initiating process** comprises the processes required to authorize the start of a new project. It entails formally authorizing a new project or authorizing that an existing project should continue into its next phase. The key purpose of this process group is to align the stakeholders' expectations with the project's purpose. These processes help set the vision of the project.

The output from this group is the **project charter**, which defines of the project's purpose, the identification of its objectives, and the authorization for the project manager to begin.

The other output from this group is the **stakeholder register** which documents the identified stakeholders and their expectations.



Topic 2: Project Process Interactions

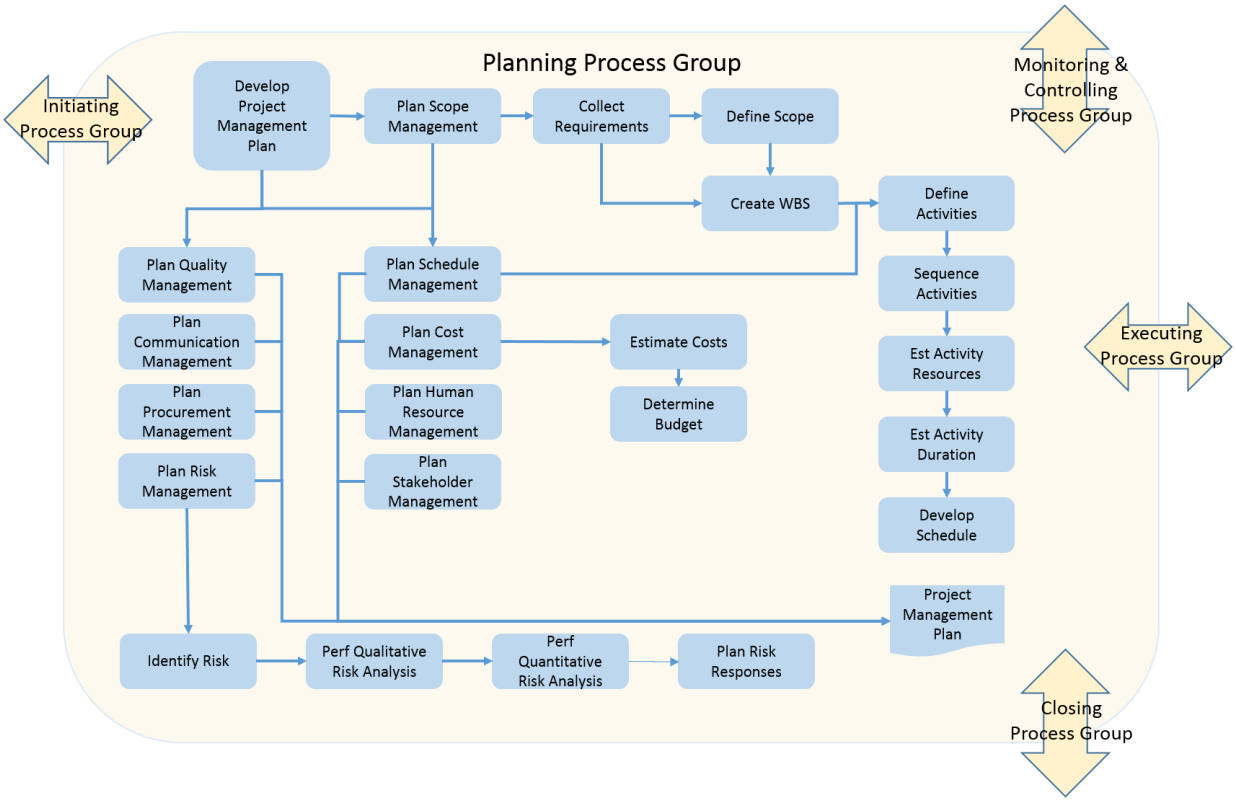


Planning is of major importance because a project typically involves doing something that has not been done before. For this reason, there are more processes in this group than in the other process groups.

The number of processes does not necessarily mean that project management is primarily planning. The amount of planning performed should be in keeping with the scope of the project and the usefulness of the information developed.

The planning process group comprises the processes that define and develop the scope of the project, develop the project management plan, and identify and schedule the project activities that occur within the project.

It paves the way for the project team's documentation of the processes and interactions that the project management team decides are needed to plan and manage a successful project for the organization.

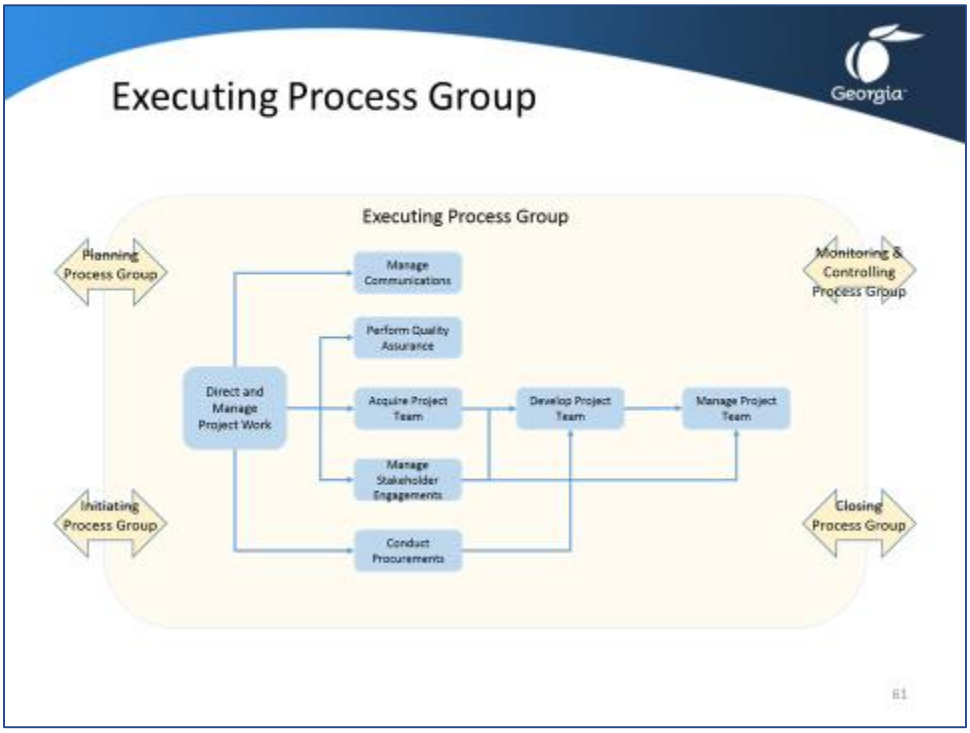


The sub-processes for the key areas of scope, time, cost, risk, and quality are as follows:

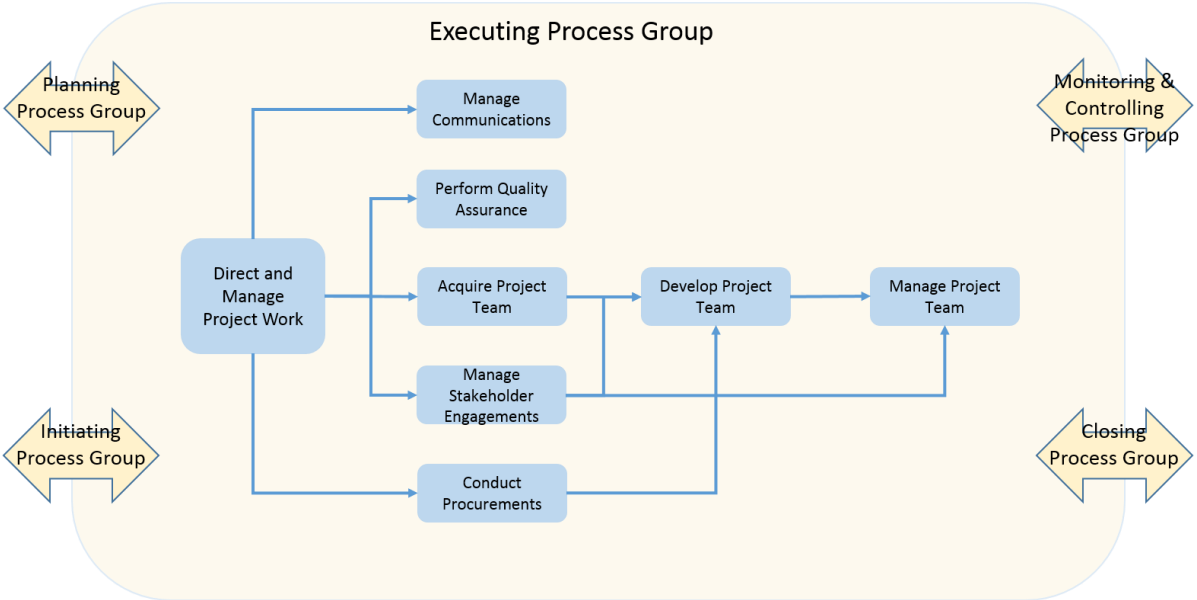
- **scope**
  - Plan Scope Management
  - Collect Requirements
  - Define Scope
  - Create WBS (work breakdown structure)
- **time**
  - Define Activities
  - Sequence Activities
  - Estimate Activity Resources
  - Estimate Activity Duration
  - Develop Schedule
- **cost**
  - Estimate Costs
  - Determine Budget
- **risk**
  - Plan Risk Management
  - Identify Risk
  - Perform Qualitative & Quantitative Risk Analysis
  - Plan Risk Responses
- **quality**
  - Plan Quality Management

The end result of the planning process group is the **project management plan**.

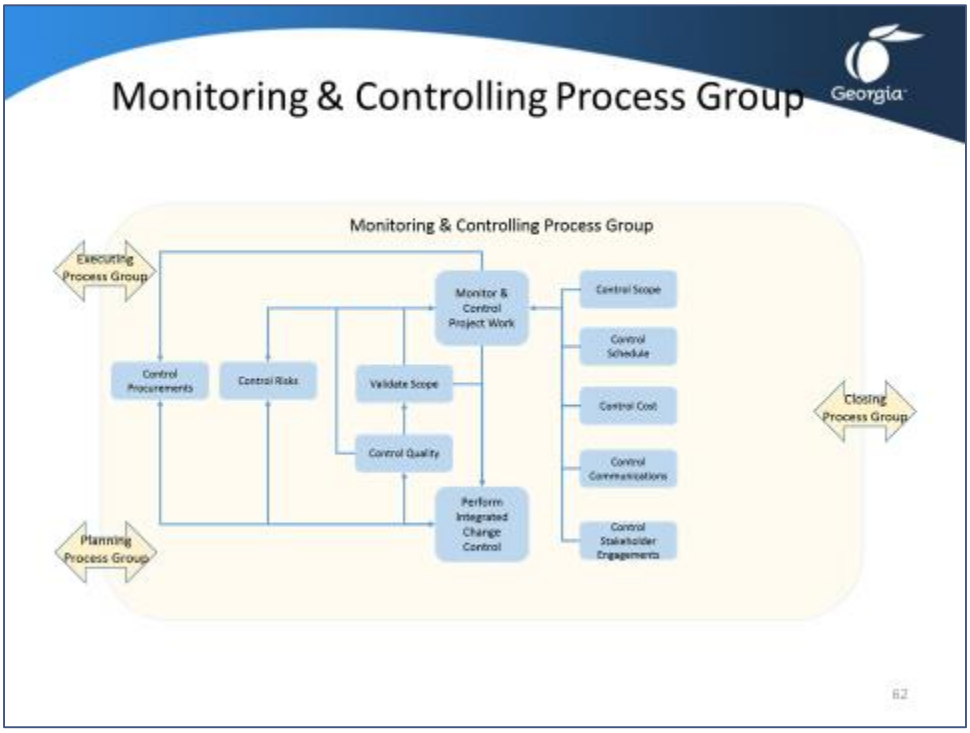
Topic 2: Project Process Interactions



The executing process group comprises the processes required to complete the work defined in the project management plan. This group coordinates people and resources, as well as the integration and performance of the project or phase, in line with the project management plan. In addition, the group addresses the scope defined in the project scope statement and implements approved changes. Usually, there will be some variance from the plan at the executing phase in the project and some re-planning will be required.

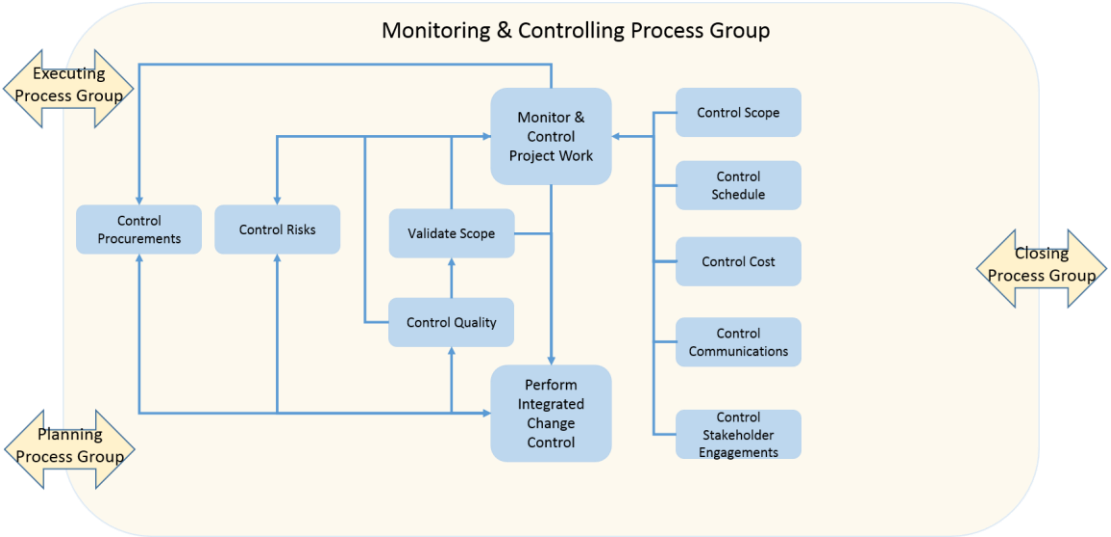


Topic 2: Project Process Interactions

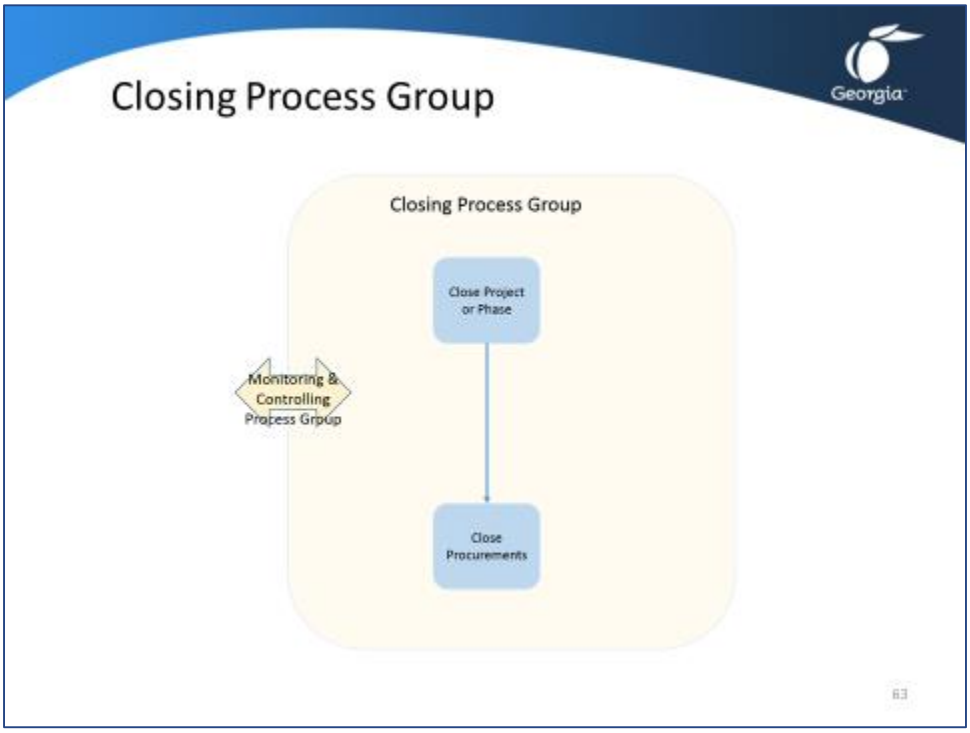


Monitoring and controlling is concerned with communication and control of project progress. Project performance must be monitored and measured to identify variances from the plan. Any identified variances are fed into the control processes in the various knowledge areas. Any variances that endanger the project objectives must be taken into account by adjusting the plan through repeating the appropriate project planning processes.

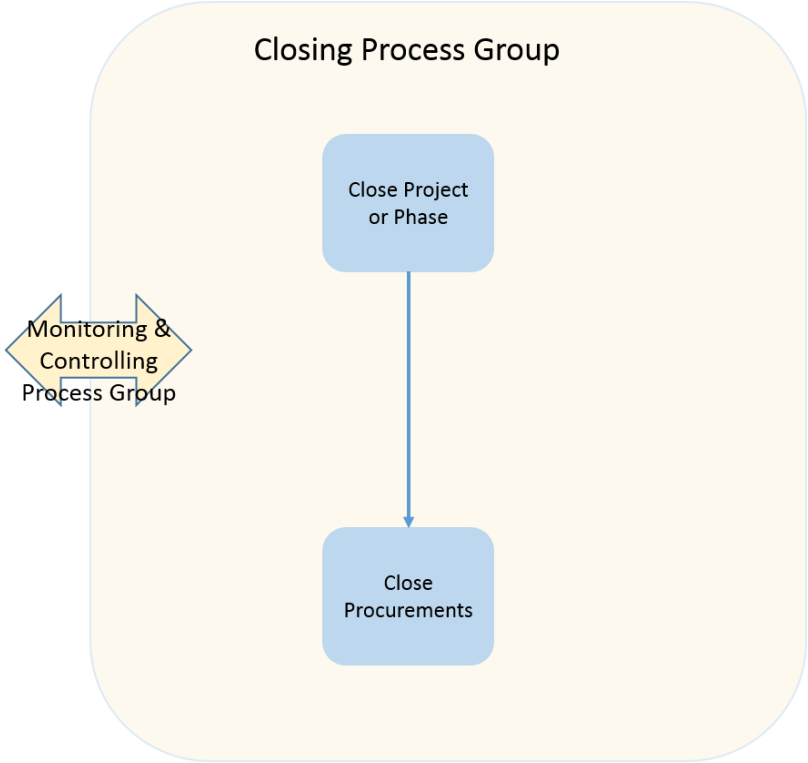
Controlling also includes preventive action taken in anticipation of possible problems. The main benefit of the monitoring and controlling group is that project performance is monitored and measured regularly to identify variances from the project management plan.



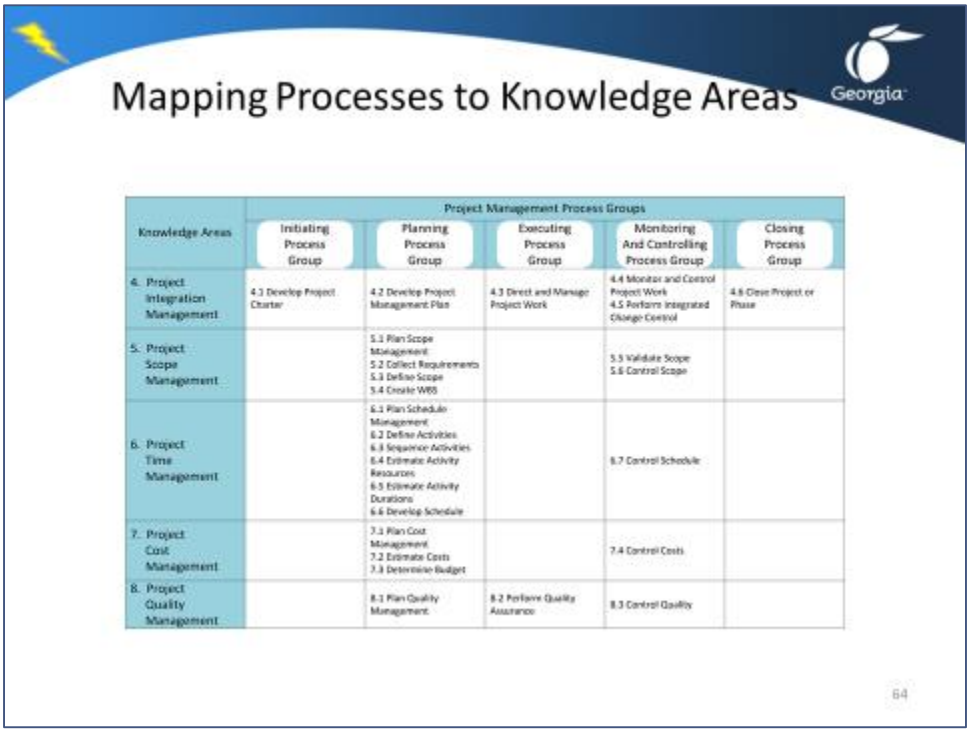
Topic 2: Project Process Interactions



Closing processes include the core processes of contract closeout and administrative closure.



Topic 3: Mapping the Project Processes to the Knowledge Areas



Mapping Processes to Knowledge Areas

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring And Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	

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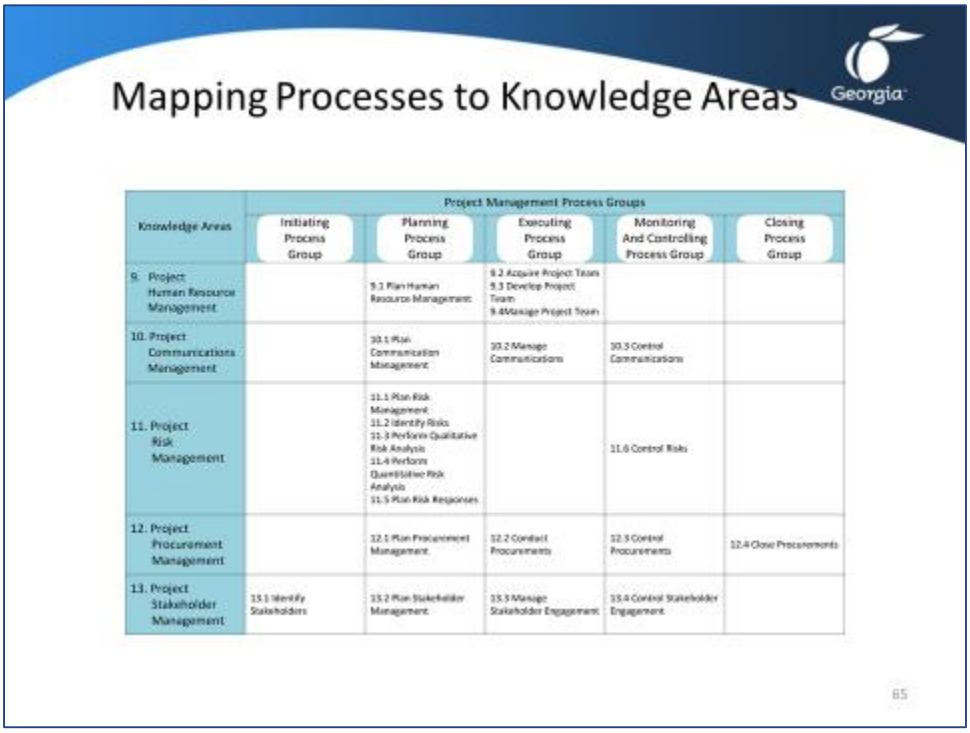
The processes and interactions discussed so far meet the test of general acceptance – this means that they apply to most projects most of the time.

This is not always the case – not all of the processes will be needed on all projects, and not all of the interactions will apply to all projects. The processes and interactions can be customized to the specific requirements of the project.

For example, a larger project may require more detail. It may be necessary to subdivide risk identification in order to focus separately on identifying cost risks, schedule risks, technical risks, and quality risks.

Topic 3: Mapping the Project Process to the Knowledge Areas



Mapping Processes to Knowledge Areas

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring And Controlling Process Group	Closing Process Group
9. Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4Manage Project Team		
10. Project Communications Management		10.1 Plan Communication Management	10.2 Manage Communications	10.3 Control Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses		11.6 Control Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

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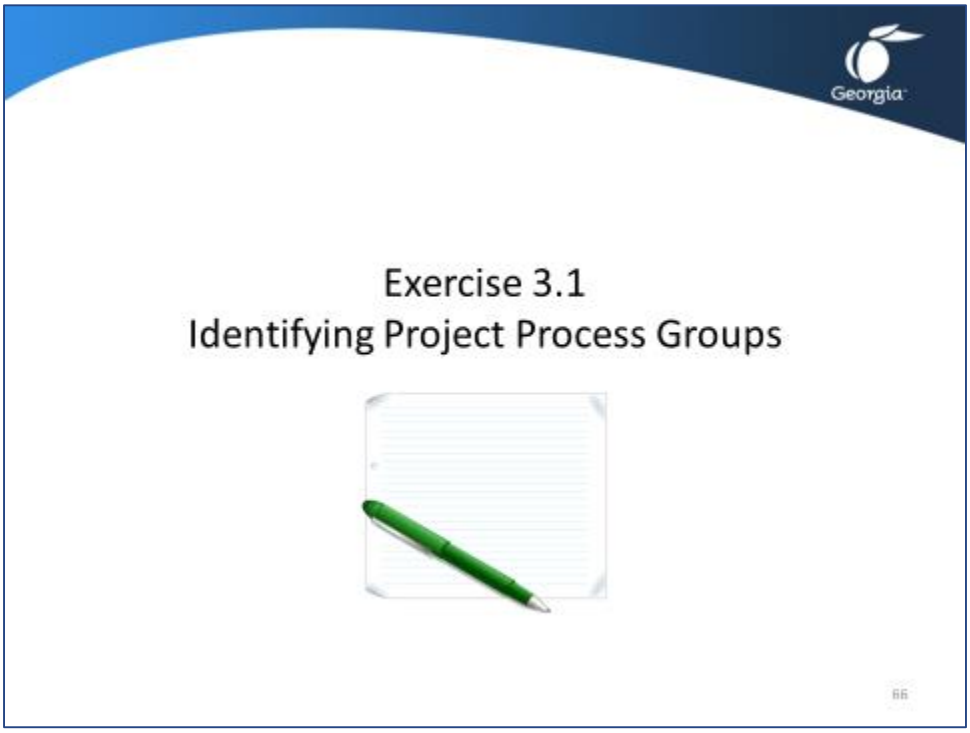
In the table below, 47 project management processes are mapped across the five project management process groups and the ten project management knowledge areas as outlined:

- project integration management
- project scope management
- project time management
- project cost management
- project quality management
- project human resource management
- project communications management
- project risk management
- project procurement management
- project stakeholder management

The diagram illustrates where the project management processes fit into both the project management process groups and the project management knowledge areas.

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring And Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	
9. Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4Manage Project Team		
10. Project Communications Management		10.1 Plan Communication Management	10.2 Manage Communications	10.3 Control Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses		11.6 Control Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

Exercise 3.1 Identifying Project Process Groups



Review the matrix above and the Process Group diagrams in this lesson to answer the following questions.

Number	Question	Answer
1	If you want to begin to “Collect Requirements”, which process or processes should you complete before doing that?	
2	“Validate Scope” is part of what Process Group?	
3	I am starting “Estimate Activity Durations”. What process should I have completed?	
4	The “Direct and Manage Project Work” process is in what Knowledge Area?	
5	After completing the “Identify Risks” process, which process should follow?	
6	In what Process Group would you perform the “Conduct Procurement” process	

Lesson 3 Summary: Learning Objectives Recap

- **Identify what project processes are and explain why they are used**
  A process is a set of interrelated actions and activities performed to create a pre-specified product service or result. Each process is characterized by its inputs, the tools and techniques that can be applied, and the resulting outputs.

  Project management processes ensure the effective flow of the project throughout its life cycle.

- **Identify various components within a project process group**
  Review the matrix on page 78.

- **Describe the interactions between project process groups and project management knowledge areas**
  The project management processes interact with both the Process Groups and the Knowledge Areas. This acts as a type of roadmap to guide the project manager through the Process Groups while performing all of the necessary activities in a Knowledge Area.

Notes

Lesson 4: Project Management Knowledge Areas

Topic 1: Project Integration Management

Topic 2: Project Scope Management

Topic 3: Project Time Management

Topic 4: Project Cost Management

Topic 5: Project Quality Management

Topic 6: Project Human Resource Management

Topic 7: Project Communications Management

Topic 8: Project Risk Management

Topic 9: Project Procurement Management

Topic 10: Project Stakeholder Management

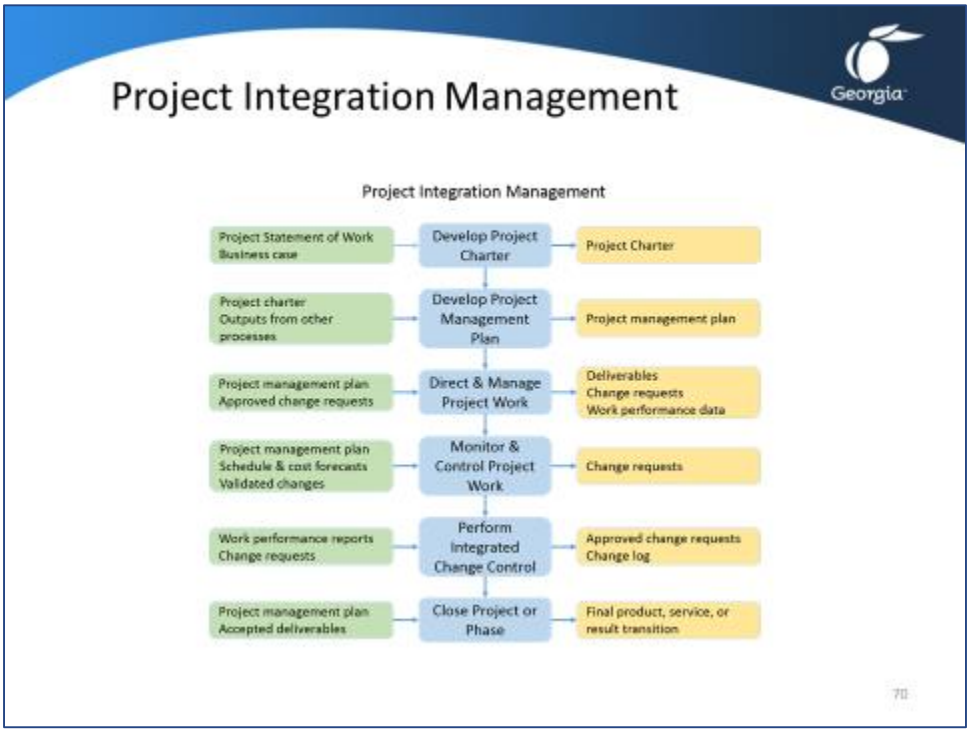
Student Learning Objectives

After completing this lesson you should be able to

- Define what scope management is and identify how to use a work breakdown structure (WBS)
- Demonstrate what is required to develop a schedule
- Define what cost management is
- Identify the components of risk management
- Outline the importance of project communication
- Define quality management
- Outline the procurement management cycle
- Define human resource management
- Define stakeholder management

Approximate Presentation time: 5 hours 30 minutes

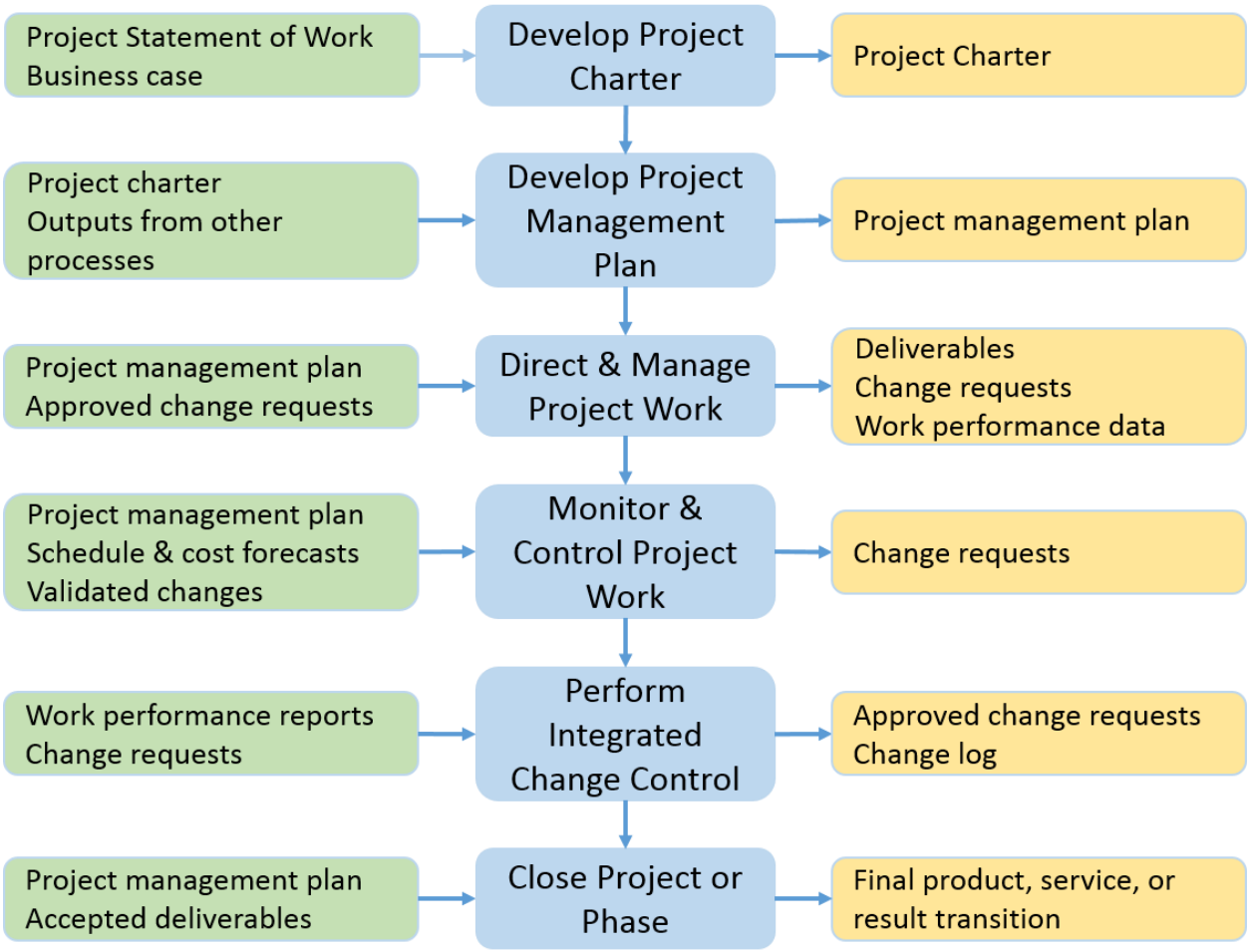
Topic 1: Project Integration Management



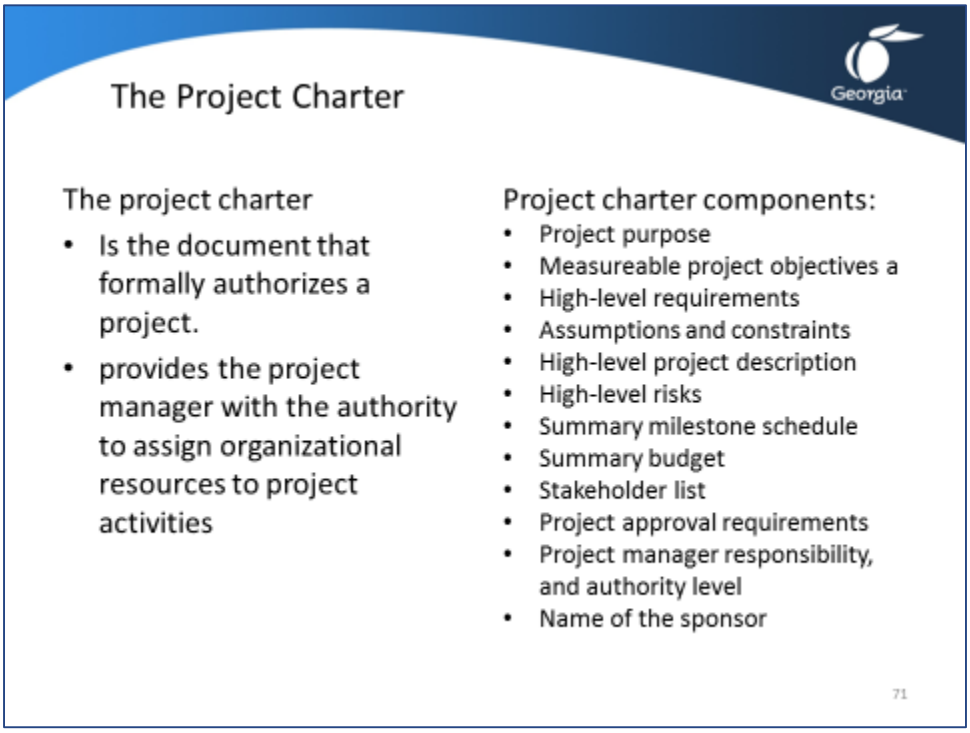
Project Integration Management is primarily concerned with integrating the processes that are required to accomplish project objectives. These processes are as follows:

- **Develop Project Charter** – developing the document that formally authorizes the existence of the project and provides the project manager with the authority to apply organizational resources to project activities
- **Develop Project Management Plan** – the process of defining, preparing, and coordinating all subsidiary plans into a project management plan
- **Direct and Manage Project Work** – the process of leading the work defined in the project management plan to achieve the project's objectives
- **Monitor and Control Project Work** – the process of tracking, reviewing, and reporting project progress against the performance objectives defined in the project management plan
- **Perform Integrated Change Control** – reviewing all change requests, approving changes, and managing changes to the deliverables and organizational process assets
- **Close Project or Phase** – finalizing all activities across all of the project process groups to formally complete the project or phase

Project Integration Management



Topic 1: Project Integration Management



The project charter is the document that formally authorizes a project. It is issued by a project initiator or sponsor external to the project organization. It must be carried out at a level, within the organization authorizing the project, which is appropriate to funding project needs.

The project charter provides the project manager with the authority to assign organizational resources to project activities. As part of the process, a project manager is identified and assigned as early in the project as is feasible. Project managers should be assigned prior to the start of the planning – preferably while the project charter is being developed.

Chartering a project links the project to the ongoing work of the performing organization. In some organizations, the project is not formally chartered and initiated until some form of analysis is carried out – for example, a needs assessment, feasibility study, or preliminary plan.

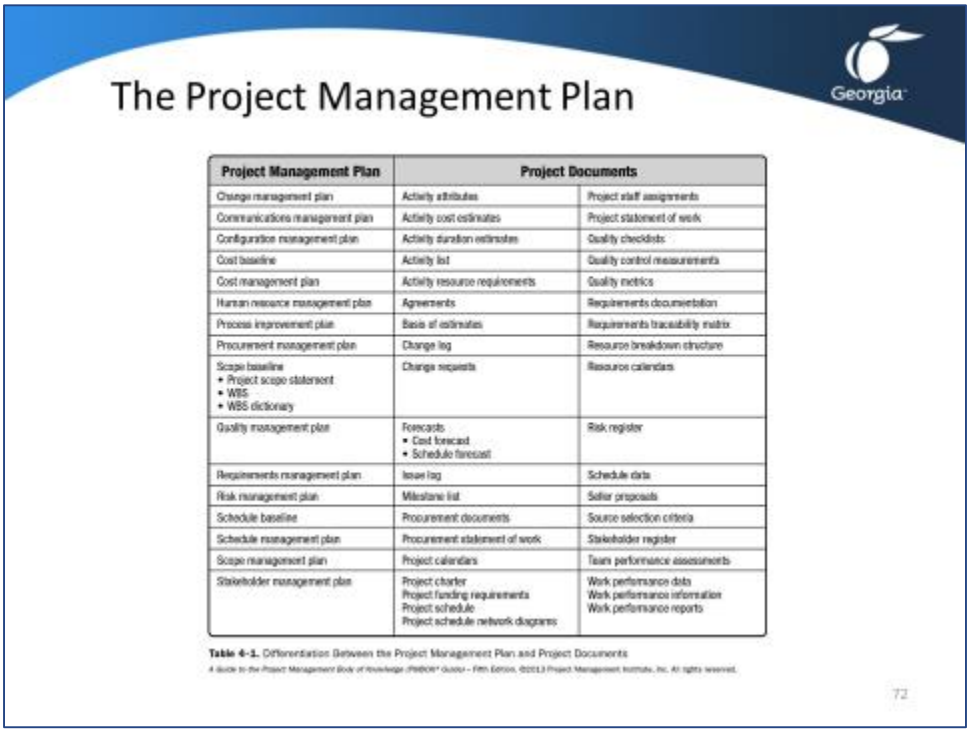
Projects are usually chartered and authorized outside of the project organization by the enterprise, a government agency, a company, a program organization, or a portfolio organization.

The project charter documents the business needs, assumptions, constraints, the understanding of the customer's needs and high-level requirements, and the new product, service, or result that is intended to satisfy. Components of a project charter include the following items:

- Project purpose or justification
- Measureable project objectives and related success criteria
- High-level requirements
- Assumptions and constraints
- High-level project description and boundaries
- High-level risks

- Summary milestone schedule
- Summary budget
- Stakeholder list
- Project approval requirements (what constitutes project success, who decides the project is successful, and who signs off on the project)
- Assigned project manager, responsibility, and authority level
- Name and authority of the sponsor or other person(s) authorizing the project charter

Topic 1: Project Integration Management



The Project Management Plan

Project Management Plan	Project Documents	
Change management plan	Activity attributes	Project staff assignments
Communications management plan	Activity cost estimates	Project statement of work
Configuration management plan	Activity duration estimates	Quality checklists
Cost baseline	Activity list	Quality control measurements
Cost management plan	Activity resource requirements	Quality metrics
Human resource management plan	Agreements	Requirements documentation
Process improvement plan	Basis of estimates	Requirements traceability matrix
Procurement management plan	Change log	Resource breakdown structure
Scope baseline • Project scope statement • WBS • WBS dictionary	Change requests	Resource calendars
Quality management plan	Forecasts • Cost forecast • Schedule forecast	Risk register
Requirements management plan	Issue log	Schedule data
Risk management plan	Milestone list	Seller proposals
Schedule baseline	Procurement documents	Source selection criteria
Schedule management plan	Procurement statement of work	Stakeholder register
Scope management plan	Project calendars	Team performance assessments
Stakeholder management plan	Project charter Project funding requirements Project schedule Project schedule network diagrams	Work performance data Work performance information Work performance reports

Table 4-1. Differentiation Between the Project Management Plan and Project Documents

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The project management plan is the document that describes how the project will be executed, monitored, and controlled. It integrates and consolidates all of the subsidiary plans and baselines from the planning processes.

The diagram on the following page helps you understand the components of the project management plan and contrasts it with other project documents.

Project Management Plan	Project Documents	
Change management plan	Activity attributes	Project staff assignments
Communications management plan	Activity cost estimates	Project statement of work
Configuration management plan	Activity duration estimates	Quality checklists
Cost baseline	Activity list	Quality control measurements
Cost management plan	Activity resource requirements	Quality metrics
Human resource management plan	Agreements	Requirements documentation
Process improvement plan	Basis of estimates	Requirements traceability matrix
Procurement management plan	Change log	Resource breakdown structure
Scope baseline • Project scope statement • WBS • WBS dictionary	Change requests	Resource calendars
Quality management plan	Forecasts • Cost forecast • Schedule forecast	Risk register
Requirements management plan	Issue log	Schedule data
Risk management plan	Milestone list	Seller proposals
Schedule baseline	Procurement documents	Source selection criteria
Schedule management plan	Procurement statement of work	Stakeholder register
Scope management plan	Project calendars	Team performance assessments
Stakeholder management plan	Project charter Project funding requirements Project schedule Project schedule network diagrams	Work performance data Work performance information Work performance reports

Table 4-1. Differentiation Between the Project Management Plan and Project Documents

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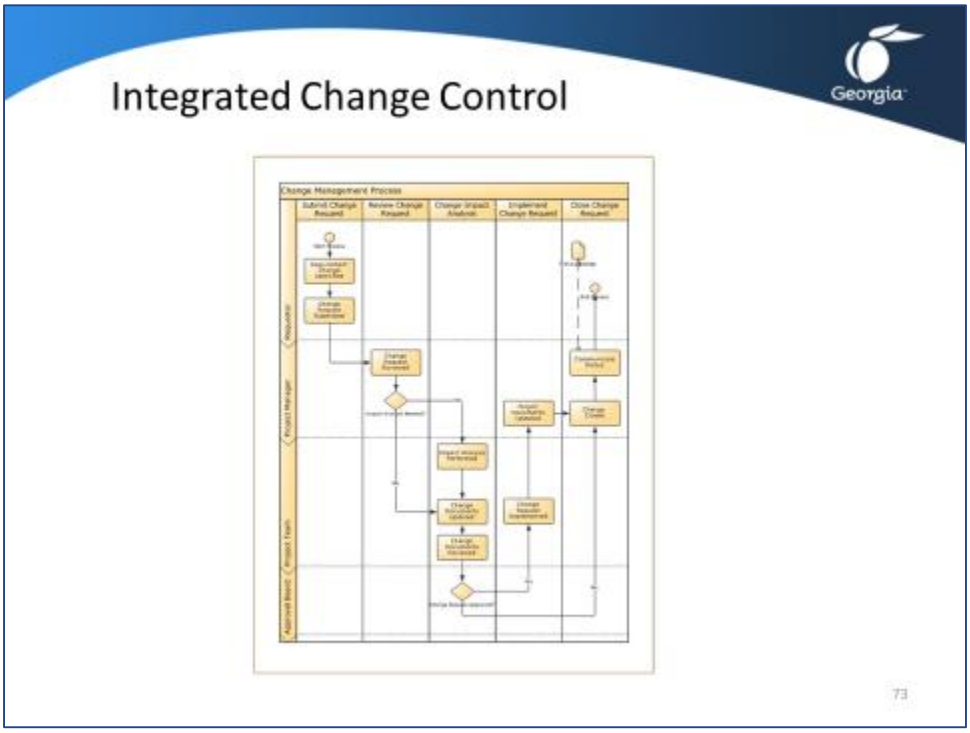
Topic 1: Project Integration Management



A key aspect of integration is project control, which ensures that the various elements of a project are properly coordinated. It generally comes into play when plans are established – that is, when scope requirements, definitions, schedules, and budgets are in place.

One of the major processes used to achieve project coordination is integrated change control, which coordinates changes across the entire project.

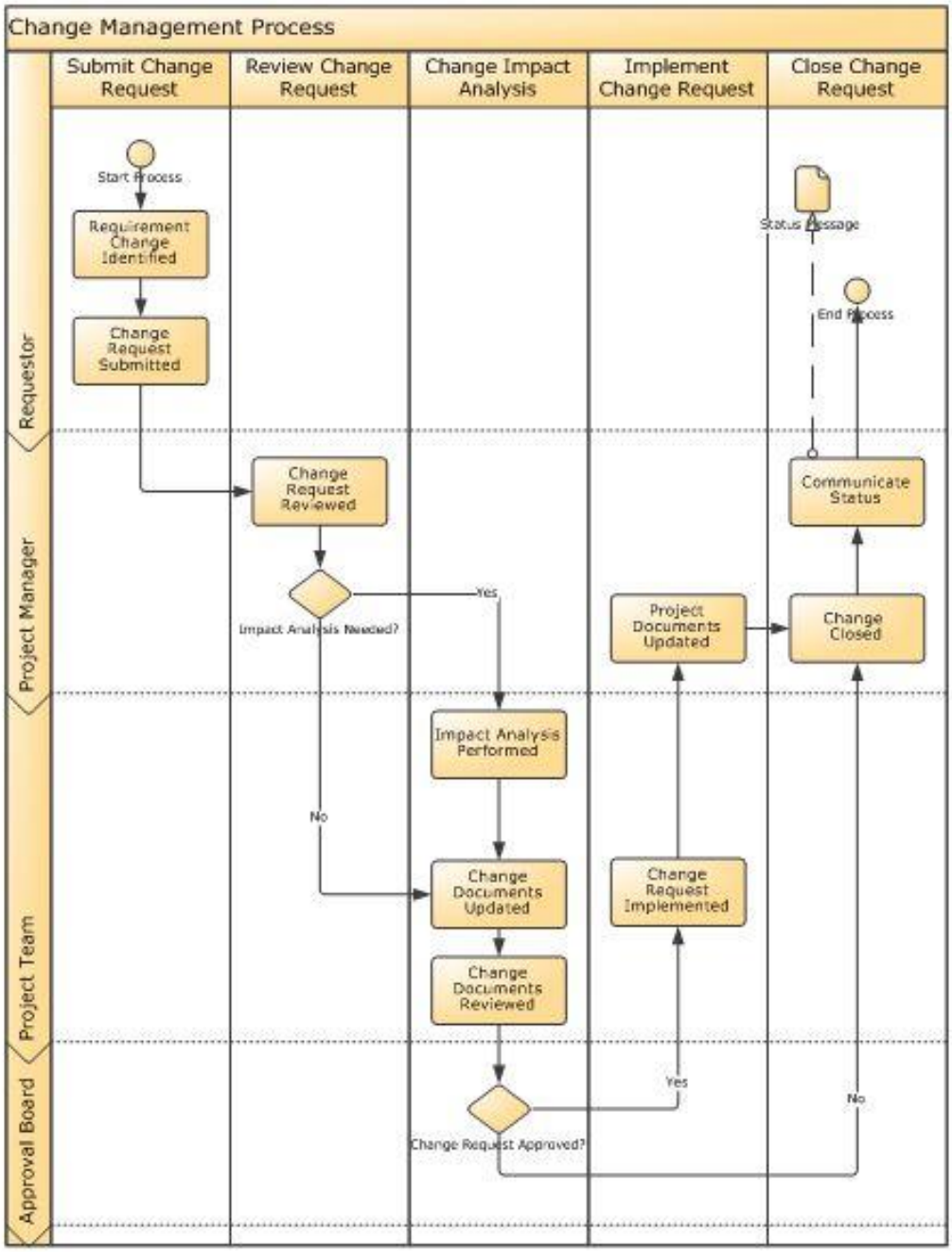
It is concerned with

- agreeing on change factors
- identifying when changes occur
- managing the actual changes as they occur

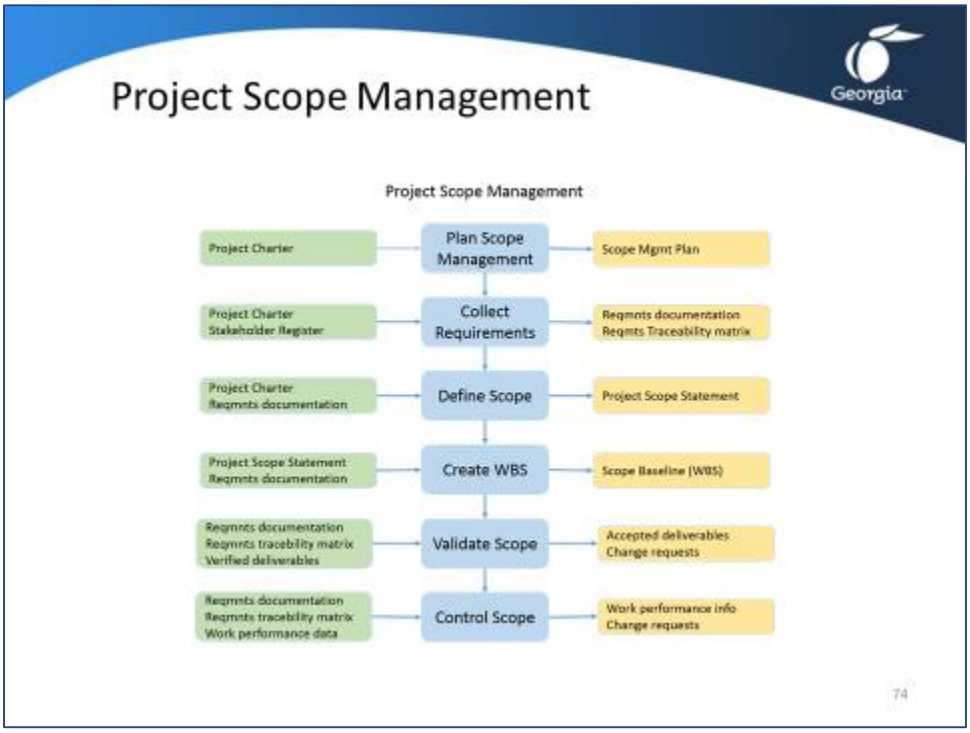
When changes occur, the project scope definition and the integrated performance baseline must be updated. Integrated change control requires

- maintaining the integrity of the performance measurement baselines
- amending the project scope's definition to ensure that changes to the product scope are accounted for
- coordinating changes across knowledge areas – for example, a change in a schedule can affect cost, risk, quality, and staffing

One of the tools and techniques used in integrated change control is the change control system.


Change Management Process
Submit Change Request
Review Change Request
Change Impact Analysis
Implement Change Request
Close Change Request
Requestor
Project Manager
Project Team
Approval Board
Start Process
Requirement Change Identified
Change Request Submitted
Change Request Reviewed
Impact Analysis Needed?
Yes
No
Impact Analysis Performed
Change Documents Updated
Change Documents Reviewed
Change Request Approved?
Yes
No
Change Request Implemented
Project Documents Updated
Change Closed
Communicate Status
End Process

Topic 2: Project Scope Management



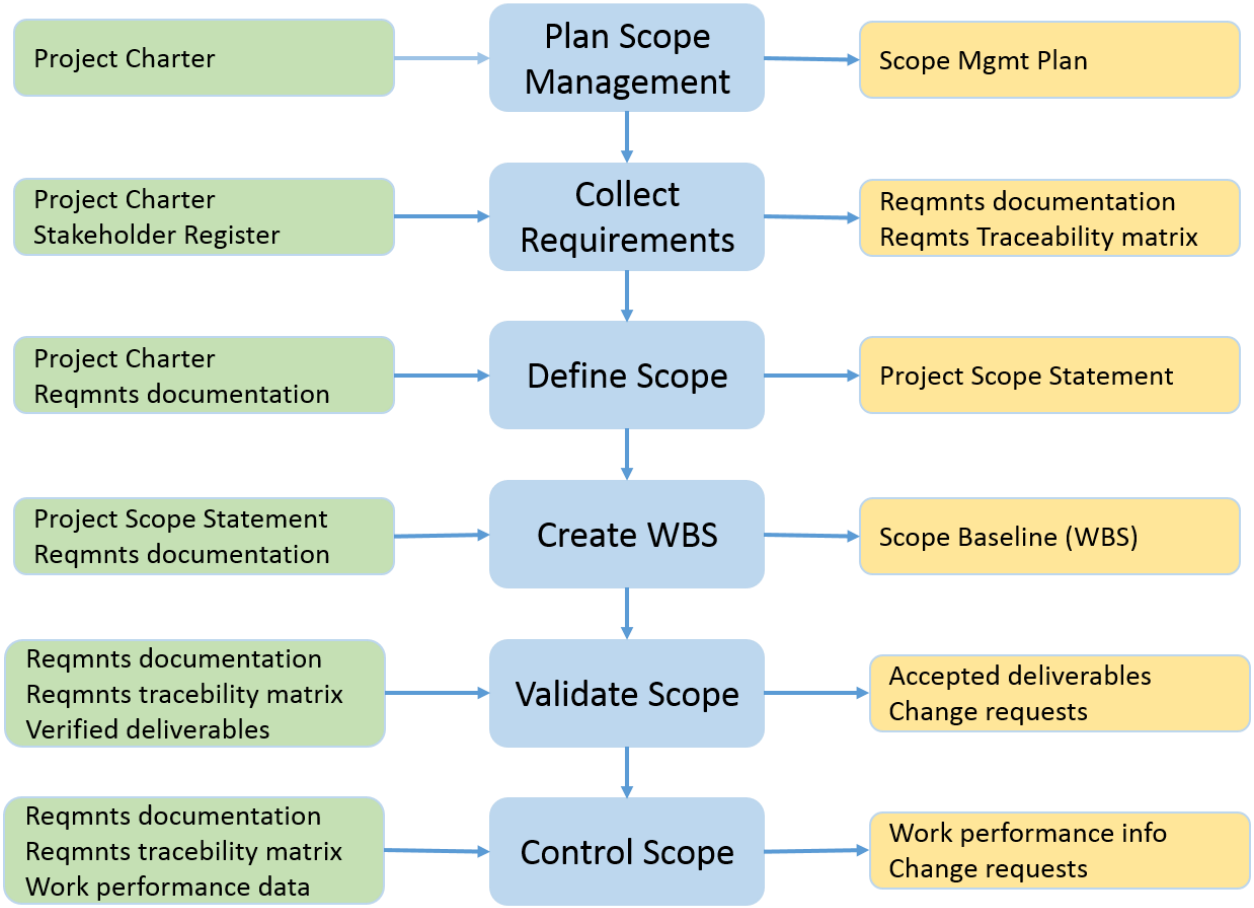
Project scope management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. These processes include the following:

- **Plan Scope Management** is the process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled
- **Collect Requirements** determines, documents, and manages stakeholder needs and requirements to meet project objectives
- **Define Scope** develops a detailed description of the project and product
- **Create WBS** subdivides the project deliverables and project work into smaller, more manageable components
- **Validate Scope** is the process of obtaining formal acceptance of the completed project deliverables
- **Control Scope** monitors the status of the project and product scope and manages changes to the scope baseline

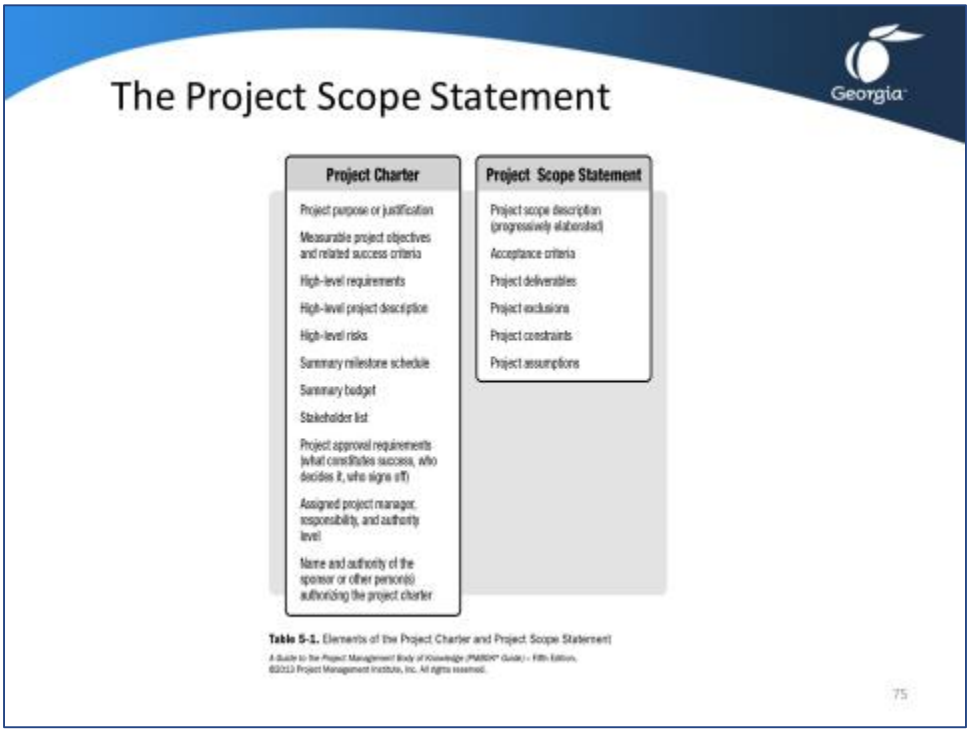
The term scope may refer to:

- **Product scope** which includes the features and functions that characterize a product, service, or result
- **Project scope** which is the work performed to deliver a product, service, or result. The term project scope is sometimes viewed as including product scope

Project Scope Management



Topic 2: Project Scope Management



Define Scope – Project Scope Statement

Defining the scope of the project is essential in order to understand what it is the project team will accomplish. It establishes the boundaries for the product, service, or result by defining which of the collected requirements will be included and excluded from the project scope.

The project scope statement is the description of the project scope, major deliverables, assumptions, and constraints. It documents the entire scope, including project and product scope. The project scope statement includes the following items:

- **Product scope description** – the characteristics of the product, service, or result described in the project charter and requirements documentation
- **Acceptance criteria** – conditions that are required to be met before deliverables are accepted
- **Deliverable** – Any unique and verifiable product, service, or result or capability to perform a service that is required to be produced to complete a process, phase, or project. These can include project management reports and documentation.
- **Project exclusion** – Generally identifies what is excluded from the project. Explicitly stating what is out of scope for the project helps manage stakeholder expectations.
- **Constraints** – a limiting factor that affects the execution of a project or process. Constraints identified with the project scope statement list and describe the specific internal and external restrictions or limitations associated with project scope.
- **Assumptions** – a factor in the planning process that is considered to be true, real, or certain, without proof.

The table on the following page describes the difference between the Project Charter and the Project Scope Statement.

Project Charter	Project Scope Statement
Project purpose or justification	Project scope description (progressively elaborated)
Measurable project objectives and related success criteria	Acceptance criteria
High-level requirements	Project deliverables
High-level project description	Project exclusions
High-level risks	Project constraints
Summary milestone schedule	Project assumptions
Summary budget	
Stakeholder list	
Project approval requirements (what constitutes success, who decides it, who signs off)	
Assigned project manager, responsibility, and authority level	
Name and authority of the sponsor or other person(s) authorizing the project charter	

Table 5-1. Elements of the Project Charter and Project Scope Statement

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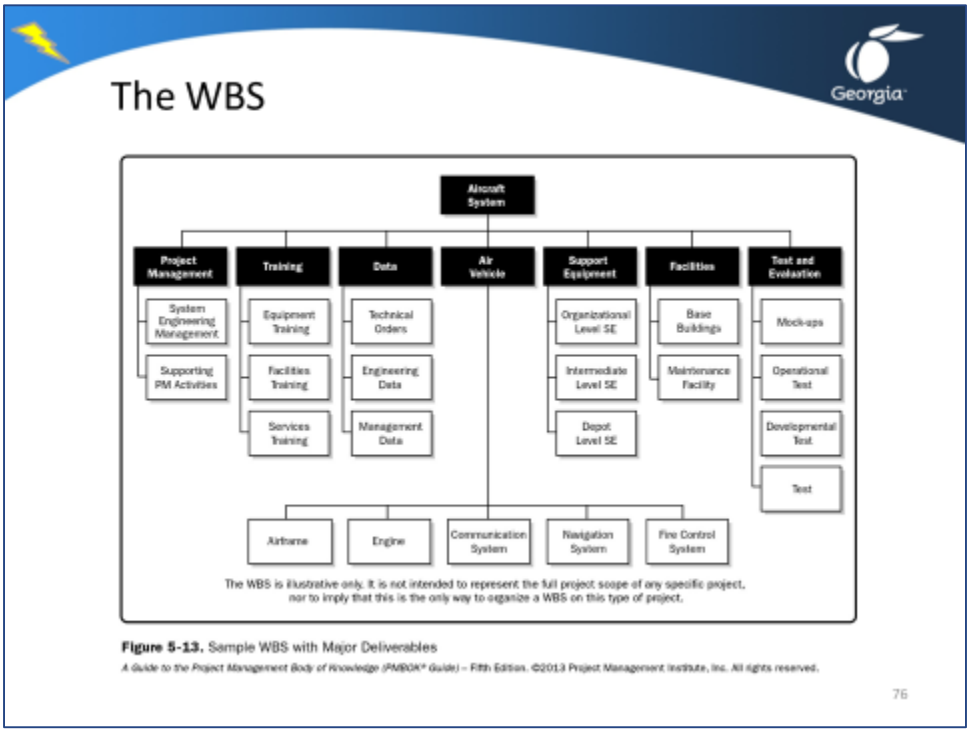
Topic 2: Project Scope Management



Create WBS

A WBS is a hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

Any work not in the WBS is considered to be outside the scope of the project. It is the role of the project manager to get the project team to deliver the content of the WBS. As with the scope statement, the WBS is often used to develop or confirm that everyone has a common understanding of project scope. Each descending level represents an increasingly detailed description of the project deliverables.

A WBS is normally presented in chart form, and each item in the WBS is generally assigned a unique identifier, which provides a structure for a hierarchical summation of costs and resources. The project manager normally uses this type of approach when assigning a scope of work to another organization and where this organization must plan and manage the scope of work at a more detailed level than the project manager.

A WBS from a previous project can be used as a template for a new project. This is possible because projects resemble other projects to some extent. For example, projects within an organization will have the same or similar project life cycles, so each phase will have the same or similar deliverables.

A work package is a deliverable at the lowest level of the WBS, when that deliverable may be assigned to the project to plan and execute. To identify a work package, the 80-hour rule can be used. The duration of a work package should be between 8 and 80 hours. Anything that exceeds this is not classed as a single work package.

The **benefits** of doing this include

- improving the accuracy of cost, duration, and resource estimates
- defining a baseline for performance measurement and control
- facilitating clear responsibility assignments

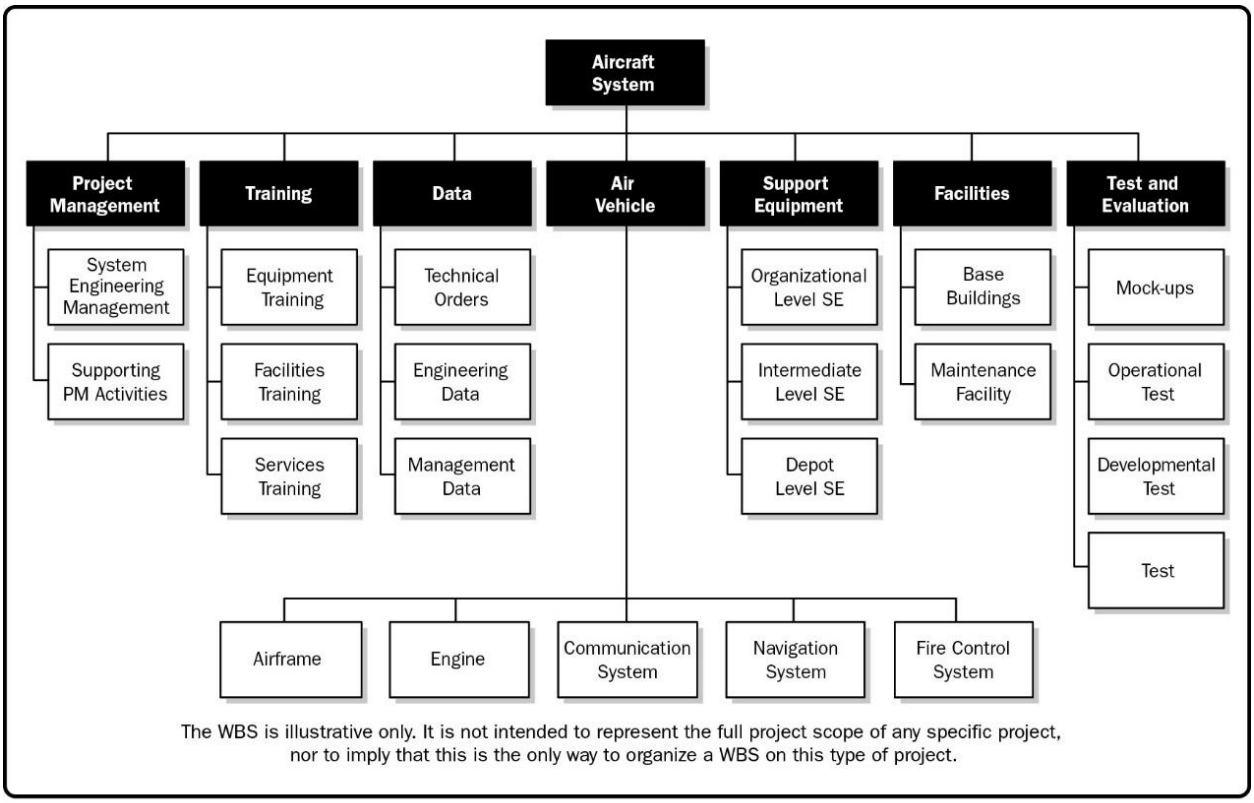


Figure 5-13. Sample WBS with Major Deliverables

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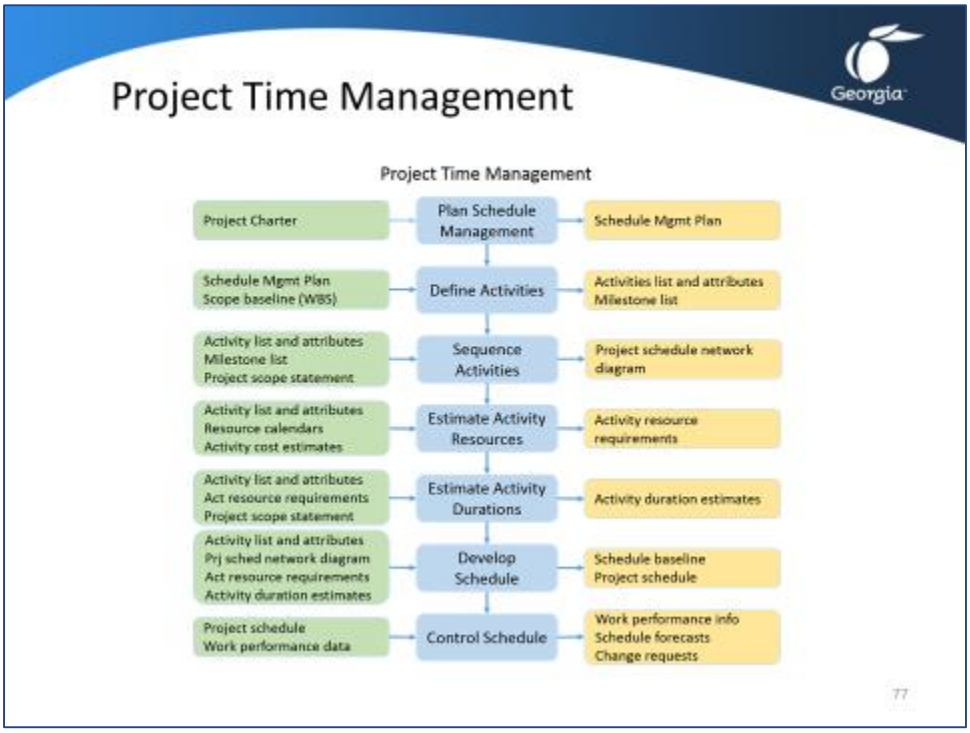
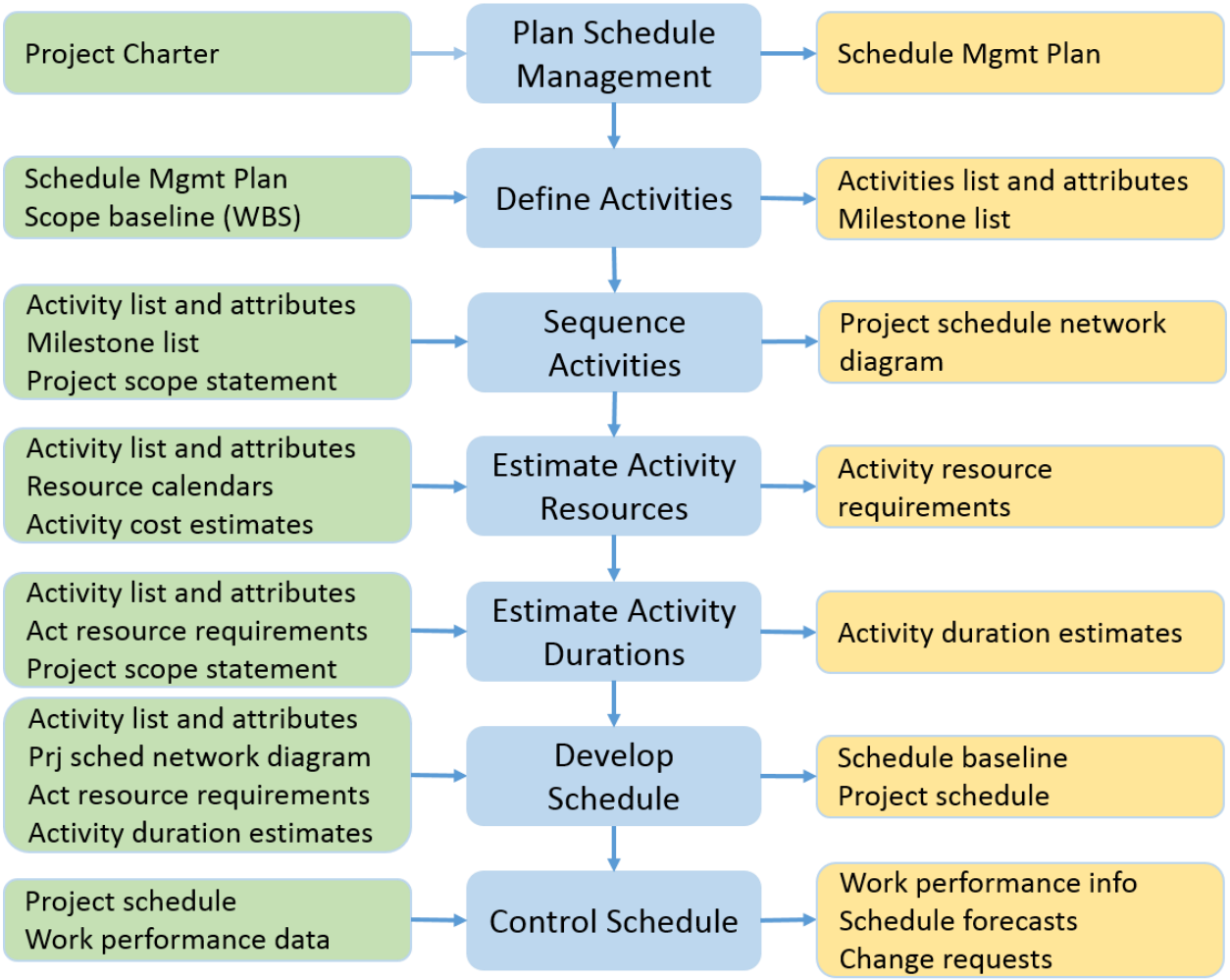
Topic 3: Project Time Management



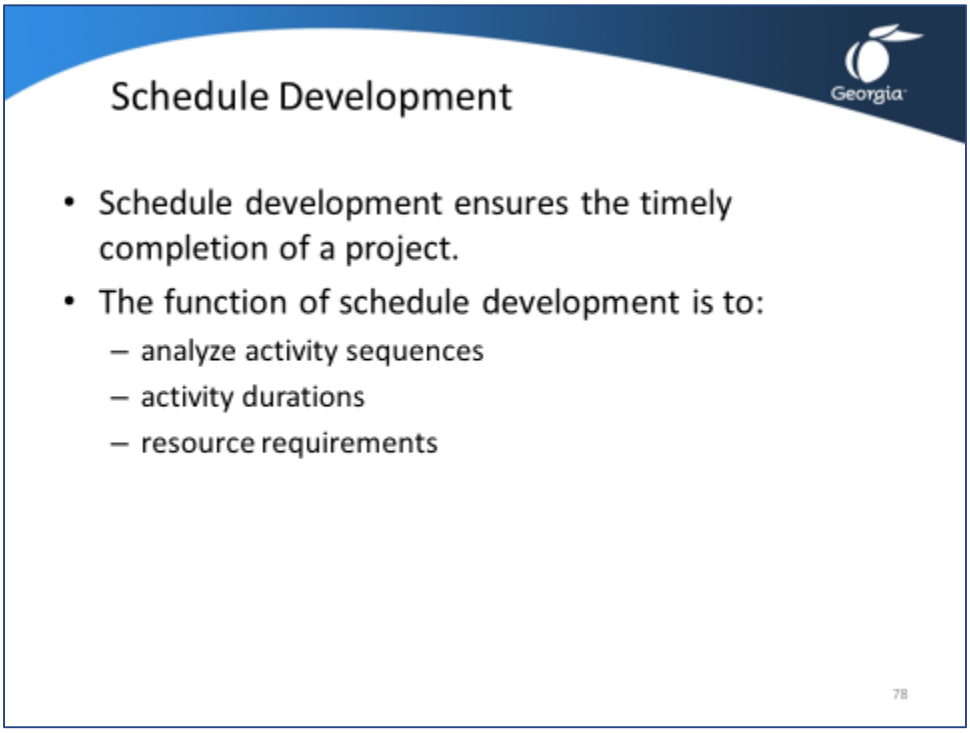
Project time management includes the processes required to manage the timely completion of the project. These processes include the following:

- **Plan Schedule Management** - is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule
- **Define Activities -** is the process of identifying and documenting the specific actions to be performed to produce the project deliverables
- **Sequence Activities -** is the process of identifying and documenting relationships among the project activities
- **Estimate Activity Resources –** is the process of estimating the type and quantity of material, human resources, equipment, or supplies required to perform each activity
- **Estimate Activity Durations -** is the process of estimating the number of work periods needed to complete individual activities with estimated resources
- **Develop Schedule -** is the process of analysing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model
- **Control Schedule** – is the process of monitoring the status of the project activities to update project progress and manage changes to the schedule baseline to achieve the plan

Project Time Management



Topic 3: Project Time Management



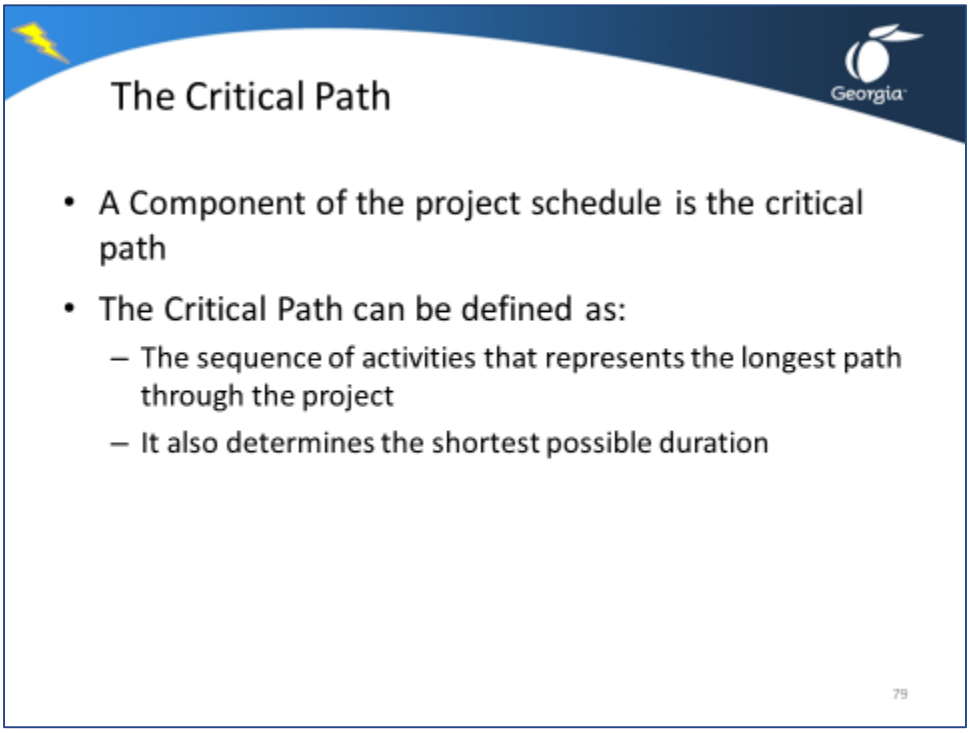
Develop Schedule

Schedule development is one of the processes used in project time management, which ensures the timely completion of a project. The function of schedule development is to analyze activity sequences, activity durations, and resource requirements in order to create the project schedule.

The project schedule provides the basis for measuring and reporting schedule performance. It includes at least planned start and expected finish dates for each activity. It may be presented in summary form (the *master schedule*) or in detail. Normally, it is presented graphically using project network diagrams (with date information added), bar charts (Gantt charts), or milestone charts.

On small projects, schedule development and the other processes in project time management are so closely linked that they are viewed as a single process – they may be performed by a single individual over a relatively short period of time.

Topic 3: Project Time Management



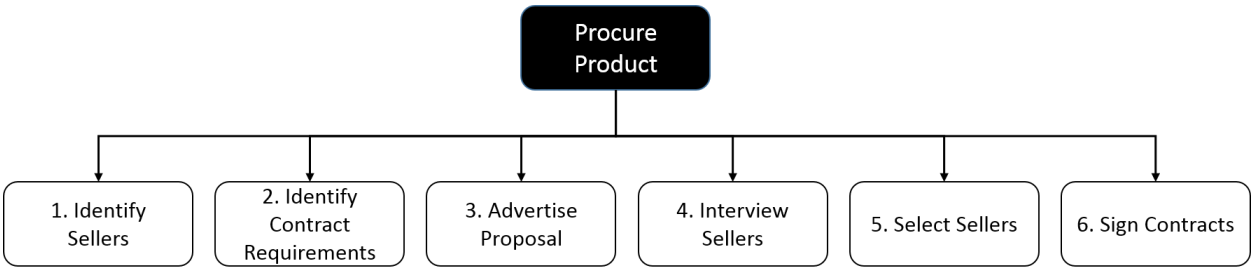
Critical Path

The **critical path** is the sequence of activities that represents the longest path through a project, which determines the shortest possible project duration.

A WBS provides a series of work deliverables that can be converted into work packages. A work package is a deliverable at the lowest level of the WBS, when that deliverable may be assigned to the project to plan and execute. A work package is identifiable as a piece of work that can be planned within a schedule (i.e. time), allocated a cost, and reported on.

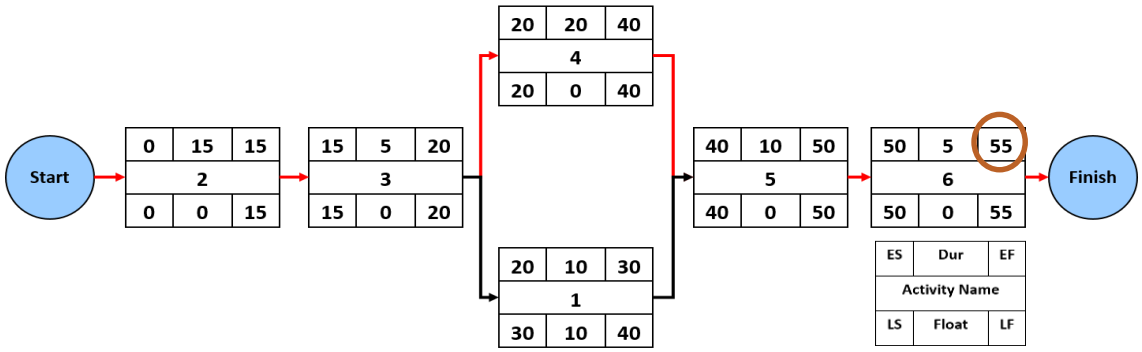
Identified work packages yield a set of project activities. These can be linked together to give a sequence of activities. The sequence, with time applied, produces a project network or schedule.

The following example presents a WBS and a list of government procurement activities that create the schedule, represented in a network diagram:



Activity Number	Activity	Activity Predecessor	Duration
1	Identify Sellers	3	10
2	Identify Contract Requirements	-	15
3	Advertise Proposal	2	5
4	Interview Sellers	3	20
5	Select Sellers	1,4	10
6	Sign Contracts	5	5

Scheduling the activities, with time, yields the following project network or schedule:



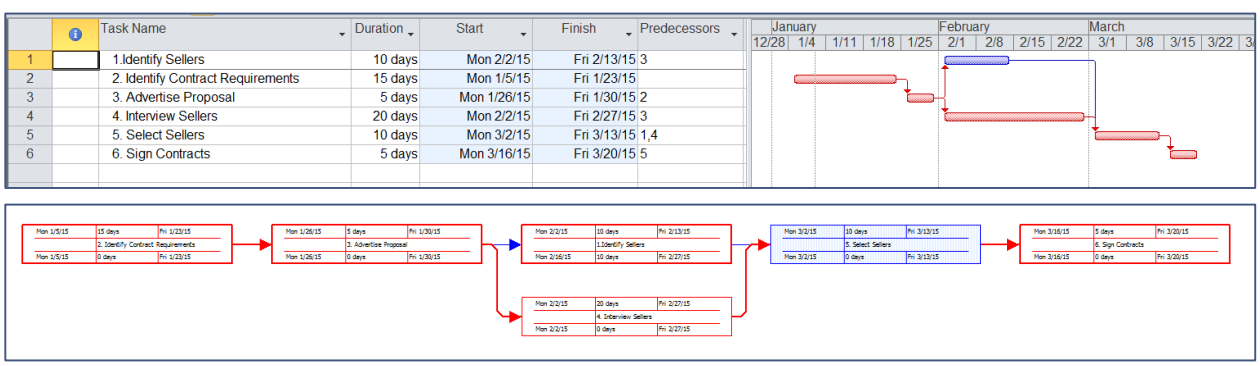
Path A: 2-3-4-5-6 = 55 days (longest path -> critical path and duration of the project)
Path B: 2-3-1-5-6 = 45 days

Note that the project duration is taken from the critical path of activities. The duration is 55 days.

A **critical path is defined as a series of activities that determines the duration of the project** and is a path of activities from project-start to project-finish that have zero float (or flexibility). It is the longest path through the project.

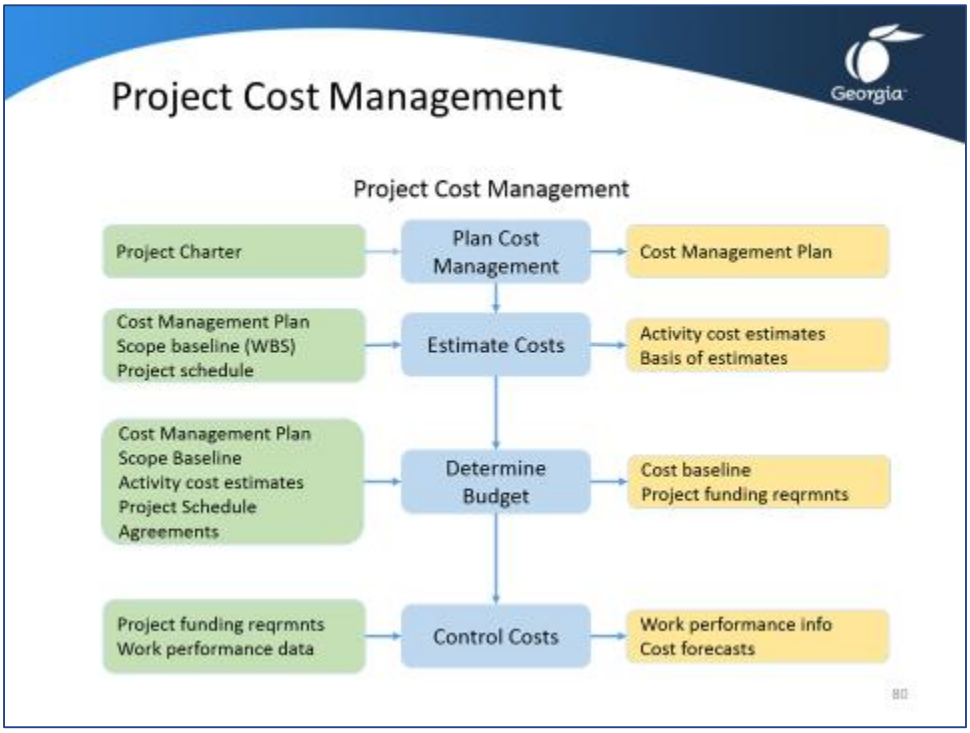
The critical path of activities is to **identify contract requirements**, **advertise proposal**, and then **interview sellers**, **select sellers,** and finally **sign contracts**. If any of these activities is delayed, the overall project duration is delayed.

The resulting activities produce the project schedule as depicted in the MS Project illustration below.



	Task Name	Duration	Start	Finish	Predecessors
1	1.Identify Sellers	10 days	Mon 2/2/15	Fri 2/13/15	3
2	2. Identify Contract Requirements	15 days	Mon 1/5/15	Fri 1/23/15	
3	3. Advertise Proposal	5 days	Mon 1/26/15	Fri 1/30/15	2
4	4. Interview Sellers	20 days	Mon 2/2/15	Fri 2/27/15	3
5	5. Select Sellers	10 days	Mon 3/2/15	Fri 3/13/15	1,4
6	6. Sign Contracts	5 days	Mon 3/16/15	Fri 3/20/15	5

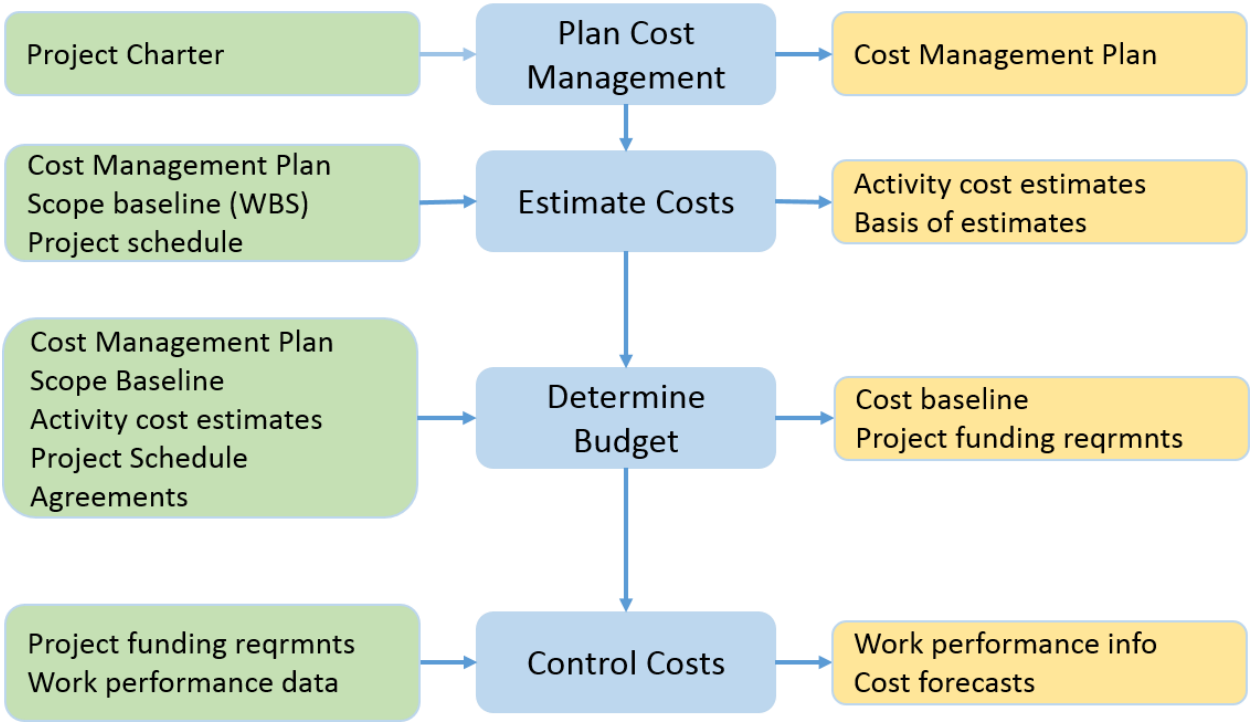
Topic 4: Project Cost Management

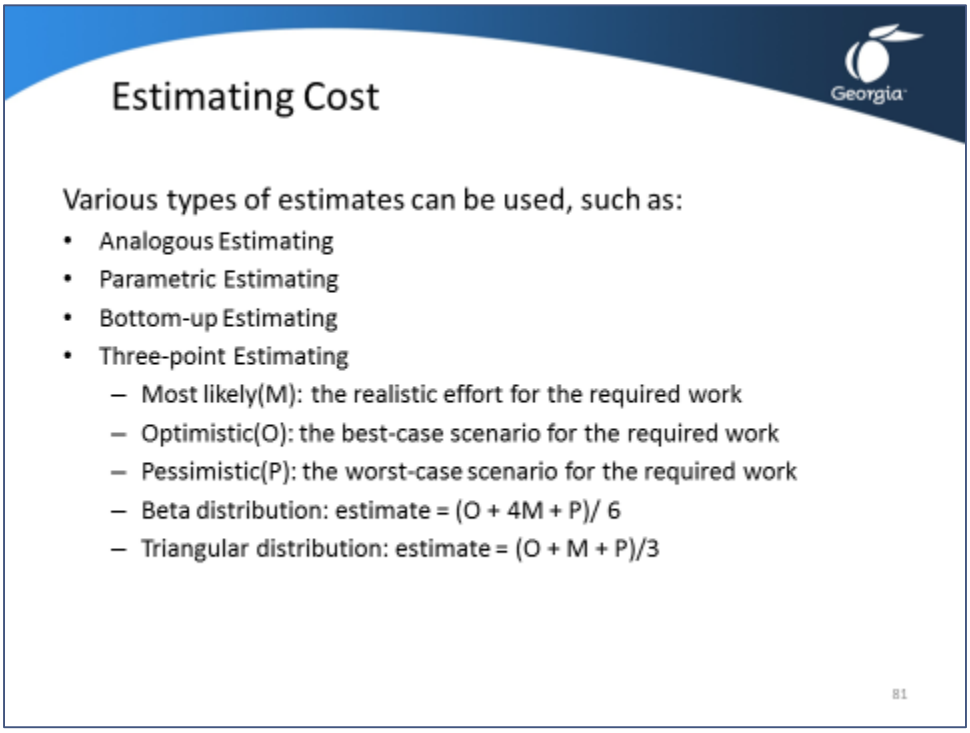


Project cost management includes the processes involved in planning, estimating, budgeting, managing, and controlling costs so that the project can be completed within the approved budget. Project Cost Management is primarily concerned with the cost of resources needed to complete the project activities and should also consider the effect of project decisions on the recurring costs of using, maintaining, and supporting the product, service, or result. For example, cutting back on the number of design reviews may reduce the cost of the project but could increase the operating cost of the product. The Project Cost Management processes include the following:

- **Plan Cost Management** - the process that establishes the policies, procedures, and documentation for planning, managing, expending, and controlling project costs
- **Estimate Costs -** the process of developing an approximation of the monetary resources needed to complete project activities
- **Determine Budget -** the process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline
- **Control Costs** – the process of monitoring the status of the project to update project costs and managing changes to the cost baseline

Project Cost Management





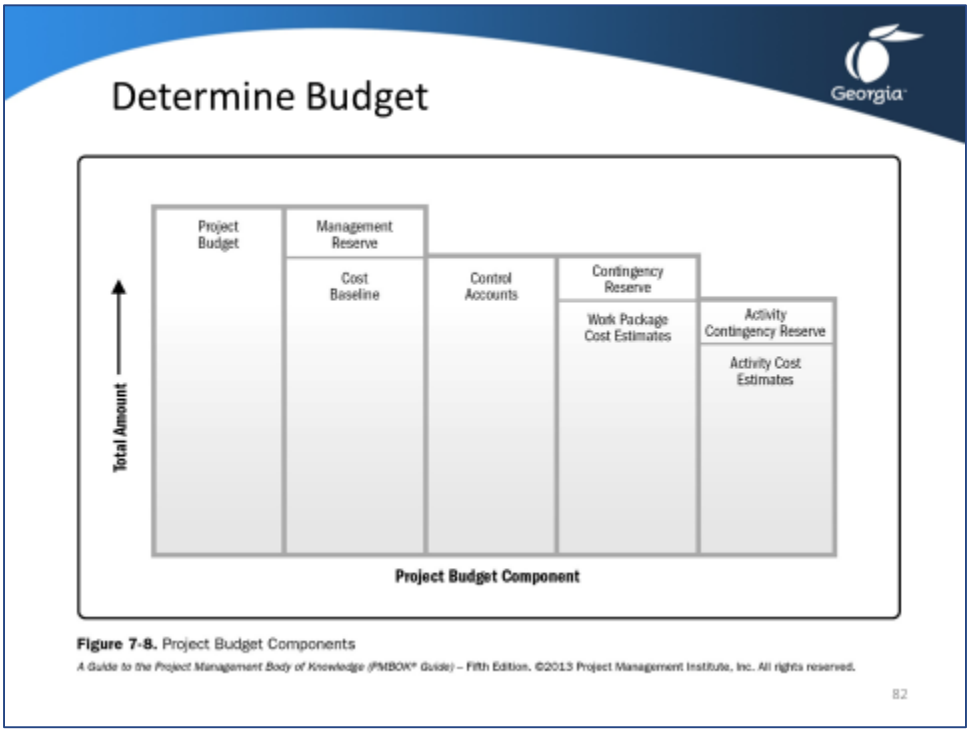
Estimate Cost

Cost estimates are a prediction that is based on the information known at a given point in time. Estimates should be reviewed and refined during the course of the project to reflect additional detail as it becomes available and assumptions are tested. The accuracy of the estimate will increase as the progresses through its life cycle. For example, at project initiation a rough order of magnitude (ROM) in the range of -25% to +75% might be used. Later, when more information is known, a definitive estimate marrows the range to -5% to +10%.

Various types of estimates can be used, such as:

- Analogous Estimating – this uses values from a previous similar project as the basis for estimates. It is used when there is limited information about the project
- Parametric Estimating – uses statistical data to calculate a cost estimate for project work. It produces higher levels of accuracy.
- Bottom-up Estimating – a method used to estimate a component of work. Individual work package costs are rolled up to higher levels.
- Three-point Estimating – this method considers estimating the uncertainty in a work package and uses three estimates to define an approximate range for an activities cost.
    - Most likely(M): the realistic effort for the required work
    - Optimistic(O): the best-case scenario for the required work
    - Pessimistic(P): the worst-case scenario for the required work
    - Beta distribution: estimate = (O + 4M + P)/ 6
    - Triangular distribution: estimate = (O + M + P)/3

Topic 4: Project Cost Management

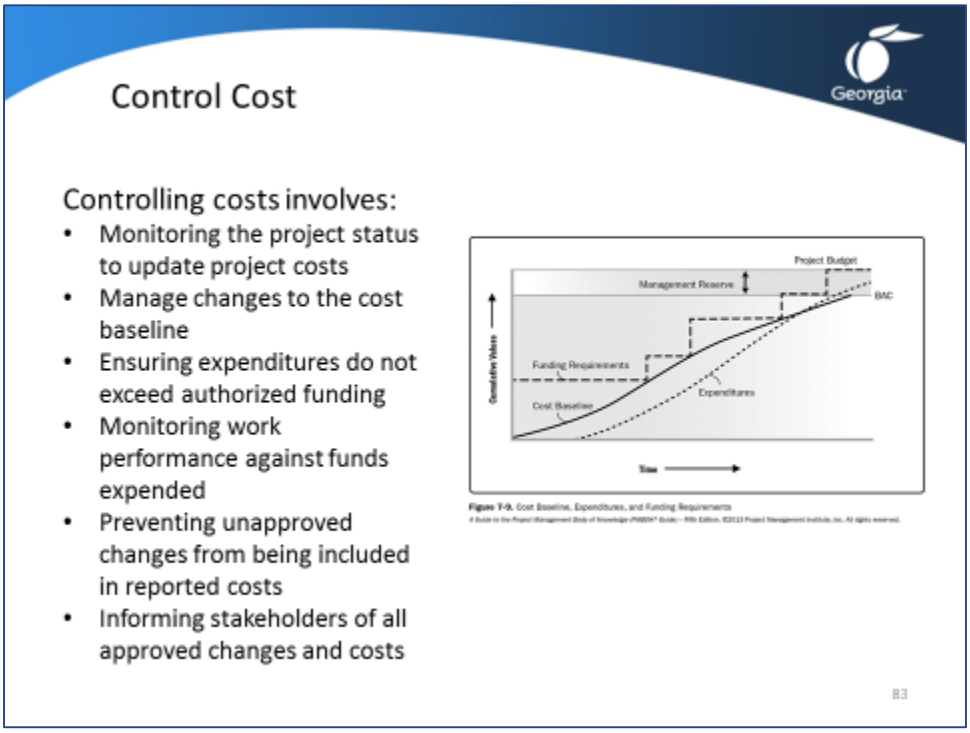


Determine Budget

The project budget is determined by aggregating the estimated costs of individual work activities to establish the cost baseline. Once the cost baseline is established project performance related to cost can be monitored and controlled.

The **cost baseline** is the approved version of the time-phased project budget, excluding and management reserves. It is an **agreement with all stakeholders about the project budget**, and it is generally used to gauge or measure a project's progress. It can be thought of as a time-phased project budget that is usually displayed as an S-curve and is created by adding estimated costs for each period.

Topic 4: Project Cost Management



Control Cost

Controlling costs involves monitoring the project status to update project costs and manage changes to the cost baseline. The key benefit is that variances from the plan can be recognized so that corrective actions can be taken to minimize risk.

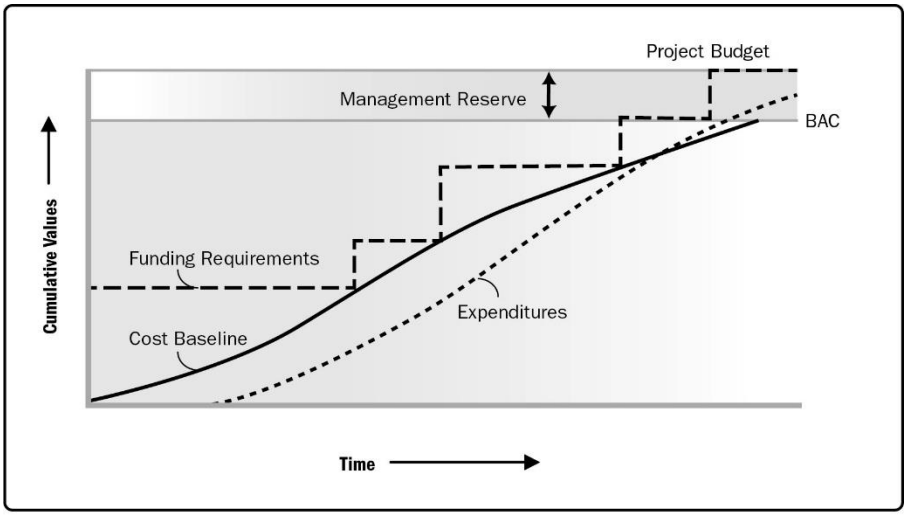


Figure 7-9. Cost Baseline, Expenditures, and Funding Requirements

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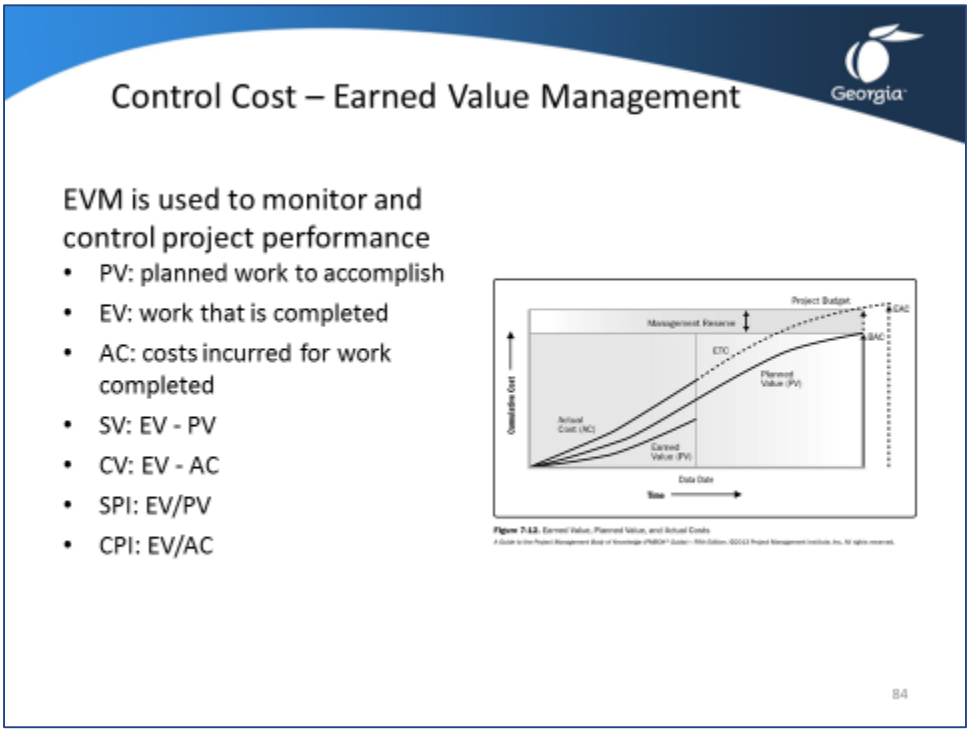
Project cost control includes:

- Ensuring that all change requests are acted upon in a timely manner
- Managing the actual changes when they occur
- Ensuring that cost expenditures do not exceed the authorized funding by period
- Monitoring work performance against funds expended
- Preventing unapproved changes from being included in the reported cost
- Informing appropriate stakeholders of all approved changes and associated costs
- Bringing expected cost overruns within acceptable limits

Topic 4: Project Cost Management



Control Cost – Earned Value Management

Earned Value Management is a tool used by project managers to monitor and control the project performance. It integrates the scope, cost, and schedule baselines to form the performance baseline. The three primary measurements used in EVM are:

- Planned Value (PV): the authorized budget assigned to scheduled work. It reflects the planned work to be accomplished at any given time in the project life cycle. The total planned value is referred to as Budget at Completion (BAC).
- Earned Value (EV): the authorized work that has been completed up to a point in time in the project life cycle.
- Actual Cost (AC): the realized cost incurred for the work performed during a specific time period. It is the total cost incurred in accomplishing the work that the Earned Value measured.
- Metrics derived from these measurements:
    - Schedule Variance (SV): SV = EV – PV
    - Cost Variance (CV): CV = EV – AC
    - Schedule performance index (SPI): SPI = EV/PV
    - Cost performance index: CPI = EV/AC
    - Estimate at Completion (budgeted rate): EAC = AC + (BAC – EV)
    - Estimate at Completion (CPI rate): EAC = BAC/CPI

The diagram below depicts a typical Earned Value Management graphic.

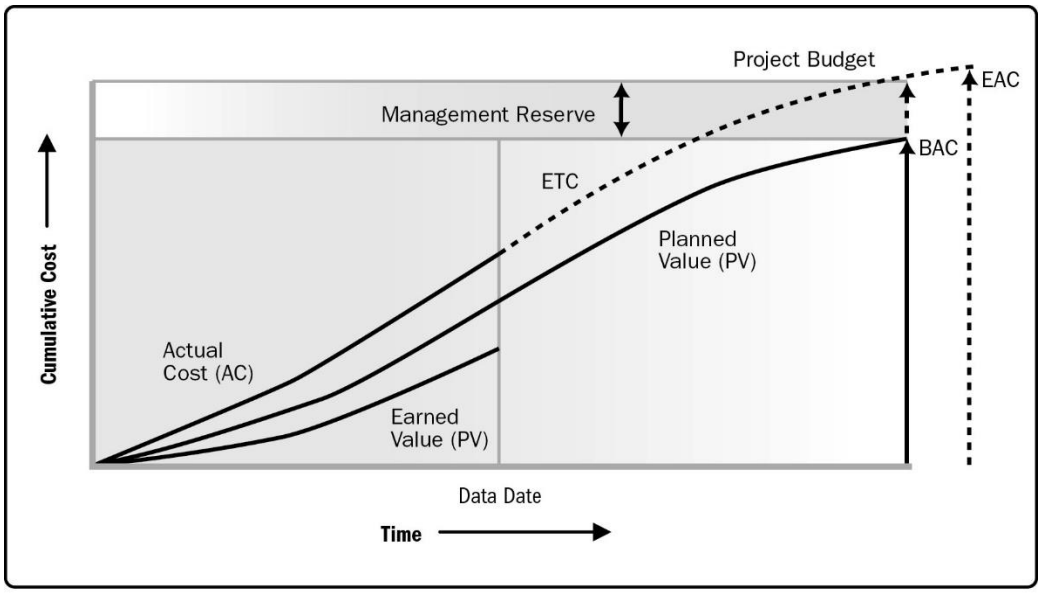


Figure 7-12. Earned Value, Planned Value, and Actual Costs

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Earned Value Equations Table

Earned Value Analysis					
Abbreviation	**Name**	**Lexicon Definition**	**How Used**	**Equation**	**Interpretation of Result**
PV	Planned Value	The authorized budget assigned to scheduled work.	The value of the work planned to be completed to a point in time, usually the data date, or project completion.		
EV	Earned Value	The measure of work performed expressed in terms of the budget authorized for that work.	The planned value of all the work completed (earned) to a point in time, usually the data date, without reference to actual costs.	EV = sum of the planned value of completed work	
AC	Actual Cost	The realized cost incurred for the work performed on an activity during a specific time period.	The actual cost of all the work completed to a point in time, usually the data date.		
BAC	Budget at Completion	The sum of all budgets established for the work to be performed.	The value of total planned work, the project cost baseline.		
CV	Cost Variance	The amount of budget deficit or surplus at a given point in time, expressed as the difference between the earned value and the actual cost.	The difference between the value of work completed to a point in time, usually the data date, and the actual costs to the same point in time.	CV = EV – AC	Positive = Under planned cost Neutral = On planned cost Negative = Over planned cost
SV	Schedule Variance	The amount by which the project is ahead or behind the planned delivery date, at a given point in time, expressed as the difference between the earned value and the planned value.	The difference between the work completed to a point in time, usually the data date, and the work planned to be completed to the same point in time.	SV = EV – PV	Positive = Ahead of Schedule Neutral = On schedule Negative = Behind Schedule
VAC	Variance at Completion	A projection of the amount of budget deficit or surplus, expressed as the difference between the budget at completion and the estimate at completion.	The estimated difference in cost at the completion of the project.	VAC = BAC – EAC	Positive = Under planned cost Neutral = On planned cost Negative = Over planned cost
CPI	Cost Performance Index	A measure of the cost efficiency of budgeted resources expressed as the ratio of earned value to actual cost.	A CPI of 1.0 means the project is exactly on budget, that the work actually done so far is exactly the same as the cost so far. Other values show the percentage of how much costs are over or under the budgeted amount for work accomplished.	CPI = EV/AC	Greater than 1.0 = Under planned cost Exactly 1.0 = On planned cost Less than 1.0 = Over planned cost
SPI	Schedule Performance Index	A measure of schedule efficiency expressed as the ratio of earned value to planned value.	An SPI of 1.0 means that the project is exactly on schedule, that the work actually done so far is exactly the same as the work planned to be done so far. Other values show the percentage of how much costs are over or under the budgeted amount for work planned.	SPI = EV/PV	Greater than 1.0 = Ahead of schedule Exactly 1.0 = On schedule Less than 1.0 = Behind schedule
EAC	Estimate At Completion	The expected total cost of completing all work expressed as the sum of the actual cost to date and the estimate to complete.	If the CPI is expected to be the same for the remainder of the project, EAC can be calculated using: If future work will be accomplished at the planned rate, use: If the initial plan is no longer valid, use: If both the CPI and SPI influence the remaining work, use:	EAC = BAC/CPI EAC = AC + BAC – EV EAC = AC + Bottom-up ETC EAC = AC + [(BAC – EV)/(CPI x SPI)]	
ETC	Estimate to Complete	The expected cost to finish all the remaining project work.	Assuming work is proceeding on plan, the cost of completing the remaining authorized work can be calculated using: Reestimate the remaining work from the bottom up.	ETC = EAC – AC ETC = Reestimate	
TCPI	To Complete Performance Index	A measure of the cost performance that must be achieved with the remaining resources in order to meet a specified management goal, expressed as the ratio of the cost to finish the outstanding work to the budget available.	The efficiency that must be maintained in order to complete on plan. The efficiency that must be maintained in order to complete the current EAC.	TCPI = (BAC–EV)/(BAC – AC) TCPI = (BAC – EV)/(EAC – AC)	Greater than 1.0 = Harder to complete Exactly 1.0 = Same to complete Less than 1.0 = Easier to complete Greater than 1.0 = Harder to complete Exactly 1.0 = Same to complete Less than 1.0 = Easier to complete

Table 7-1. Earned Value Calculations Summary Table

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Topic 5: Project Quality Management

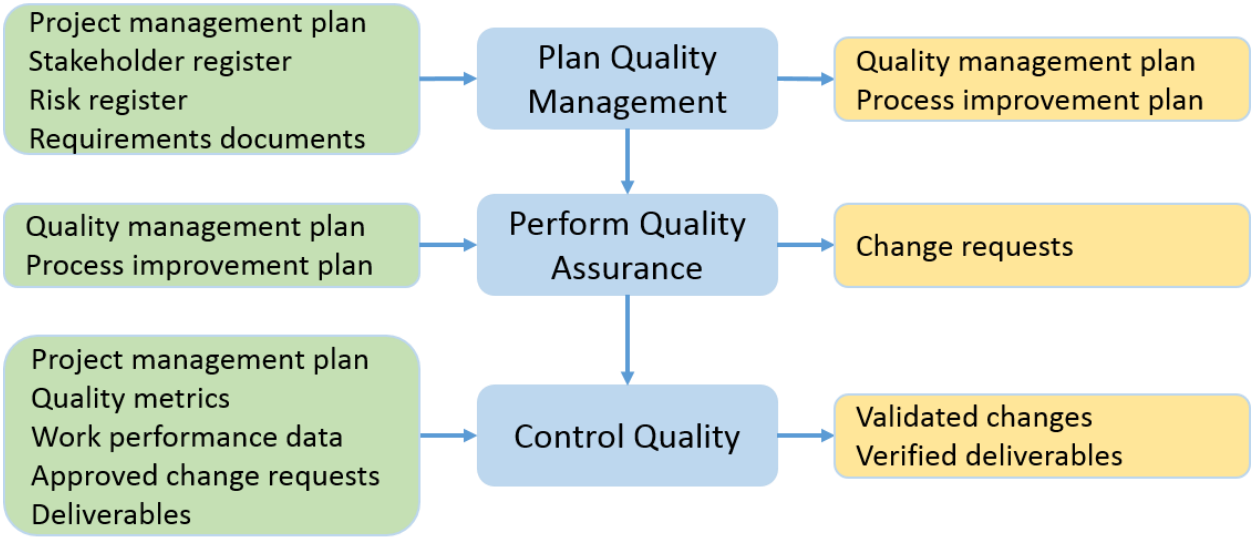
Project quality management includes the processes and activities of the organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken. The Project Quality Management processes include the following:

- **Plan Quality Management** - the process of identifying quality requirements and/or standards for the project and its deliverables and documenting how the project will demonstrate compliance with quality requirements
- **Perform Quality Assurance -** the process of auditing the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used
- **Control Quality** – the process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes

Terms to know:

- Quality: the degree to which a set of inherent characteristics fulfill requirements
- Grade: a category assigned to a deliverable having the same functional use but different technical characteristics.
- Precision: a measure of exactness
- Accuracy: an assessment of correctness

Project Quality Management



Project quality management must address both the management of the project and the outcome of the project – the quality of the goods or services produced. If the quality requirements of either of these are not met, it can have serious negative consequences for the project stakeholders. It is also important that the right approach is taken when meeting the requirements.

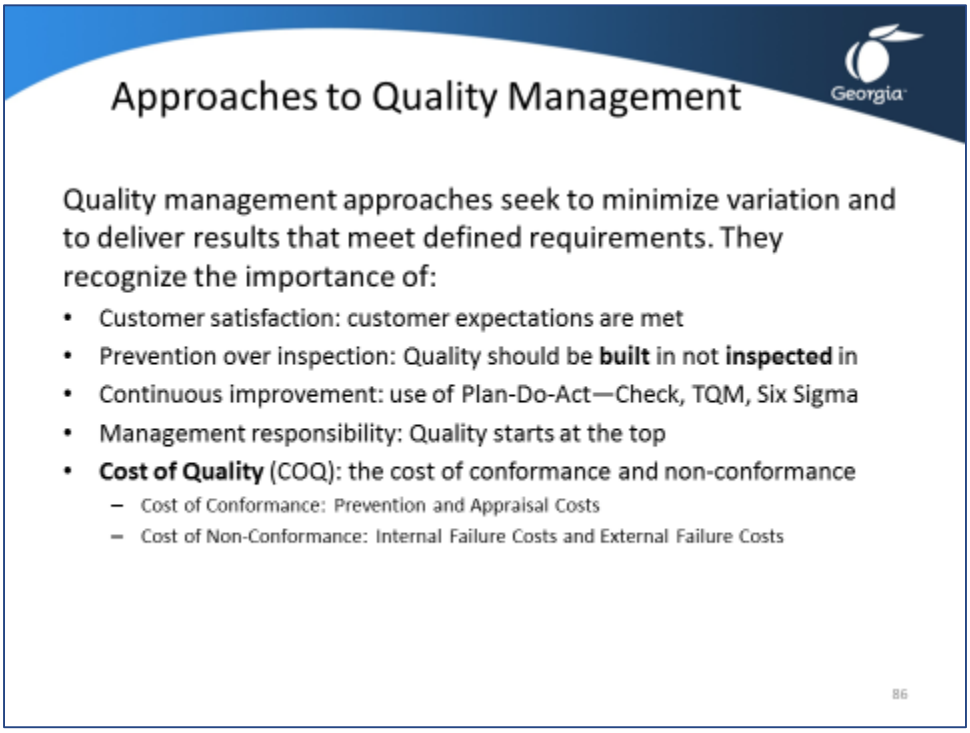
Quality has different meanings. Generally, quality can be defined as meeting customer needs (both stated and implied) and providing value to them as well. It is these stated and implied needs that are used to develop the project requirements, which are achieved by project scope management.

It is important that the project management team does not confuse quality with grade. Grade is a characteristic of the product or service, in that the product or service can have the same functional use but different technical characteristics.

Low grade is not necessarily a problem, but low quality is. For example, a low quality software product – one that has many bugs and an unreadable user manual – will be of little use to anyone, even if it is of high grade (loads of features).

It is the project manager's (and project team's) responsibility to determine and deliver the appropriate level of quality and grade.

Topic 5: Project Quality Management



Approaches to Quality Management

Modern quality management approaches seek to minimize variation and to deliver results that meet defined requirements. These approaches recognize the importance of:

- Customer satisfaction – managing requirements so that customer expectations are met.
- Prevention over inspection – Quality should be planned and built into – not inspected into the project's deliverables.
- Continuous improvement – use of the *Plan-Do-Act-Check* model, Total Quality Management (TQM), Six Sigma, and Lean Six Sigma could improve the quality of the project's management and product.
- Management Responsibility – management retains within its responsibility for quality a related responsibility to provide suitable resources at adequate capabilities.
- Cost of Quality (COQ) – the total cost of the conformance work and the nonconformance work that should be done as a compensatory effort.

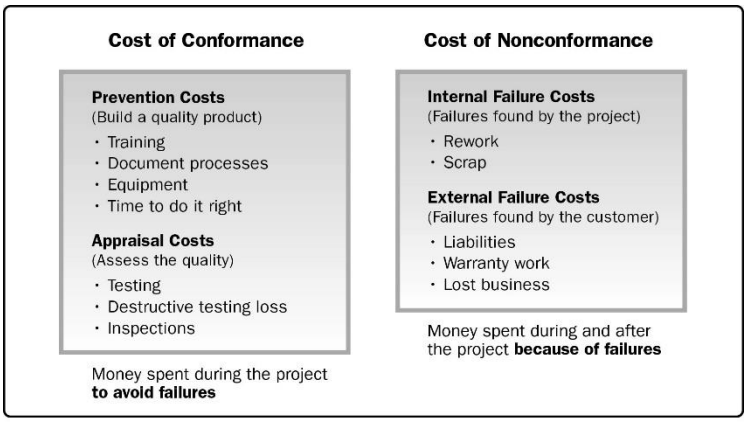


Figure 8-5. Cost of Quality

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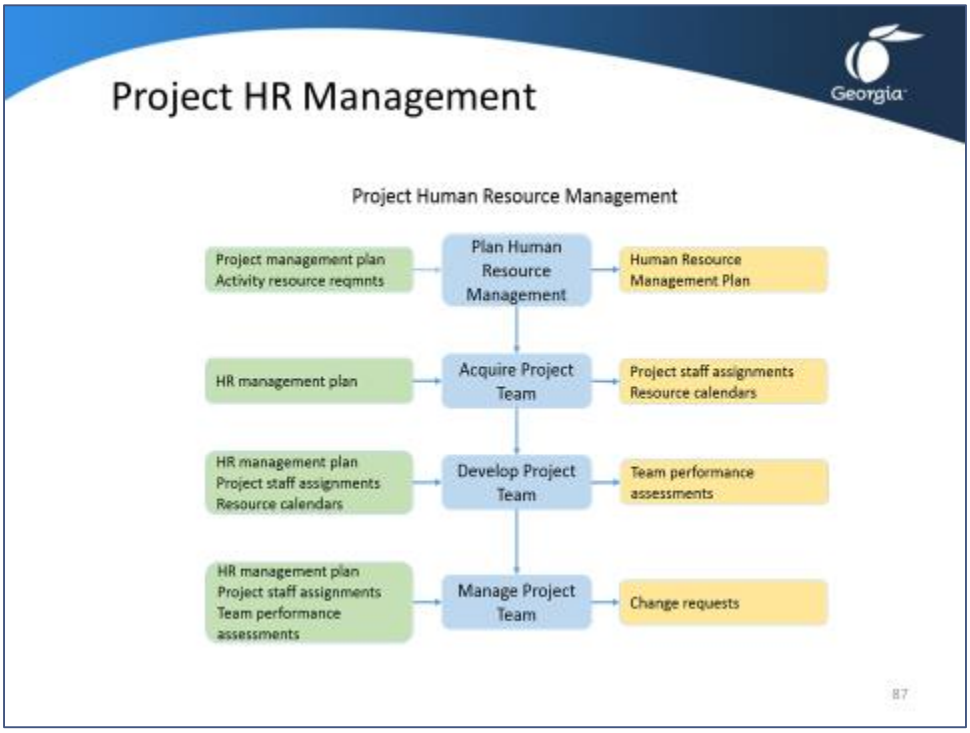
Topic 6: Project Human Resource Management

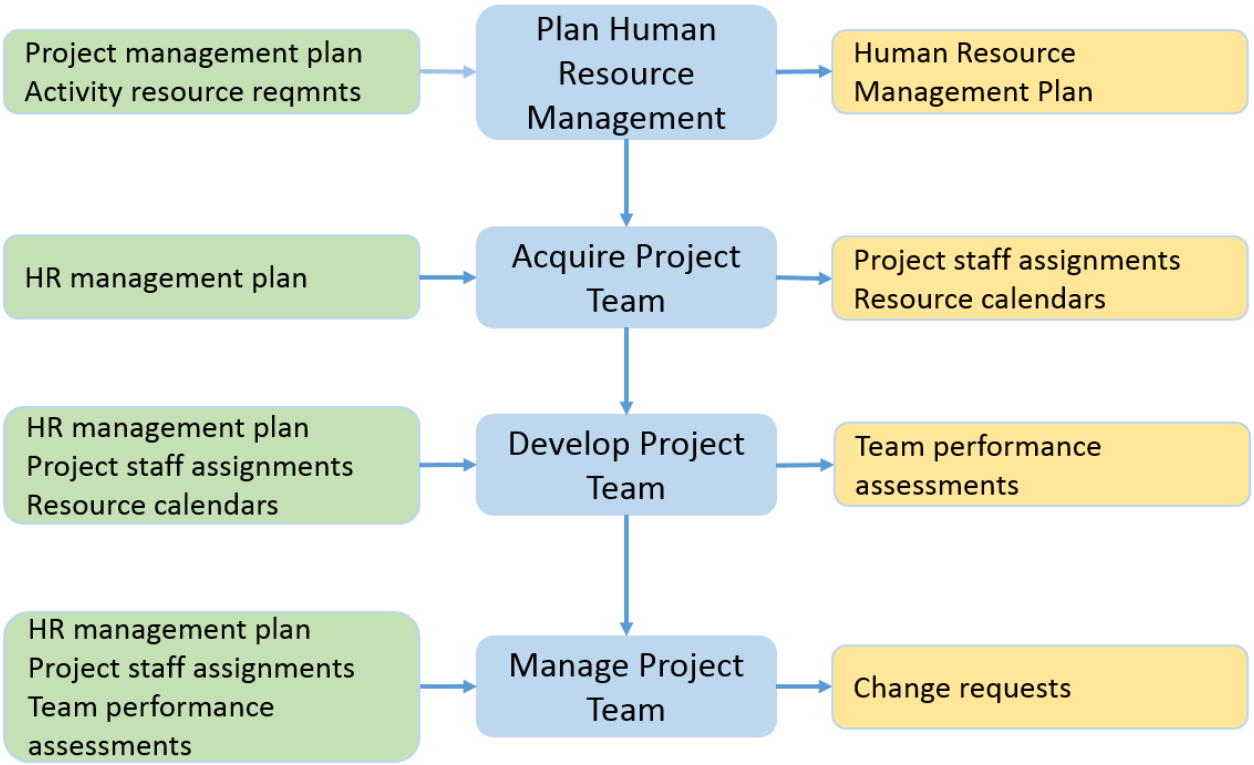


Project human resource management includes the processes that organize, manage, and lead the project team. The Project Human Resource Management processes include the following:

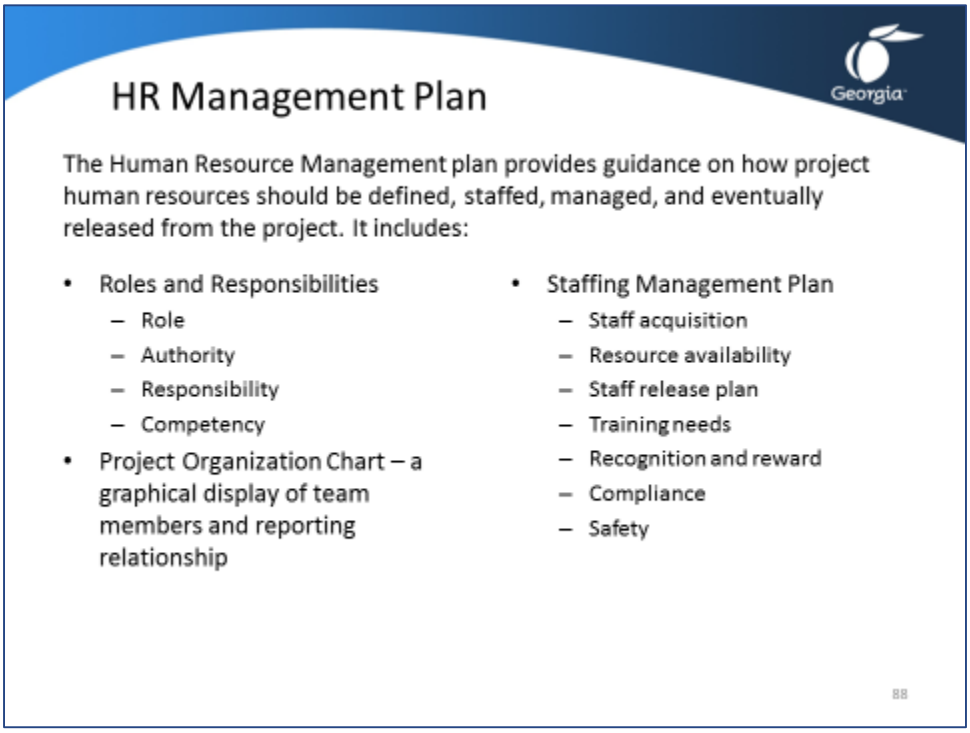
- **Plan Human Resource Management** - the process of identifying and documenting project roles, responsibilities, required skills, reporting relationships, and creating a staffing management plan
- **Acquire Project Team -** the process of confirming human resource availability and obtaining the team necessary to complete project work
- **Develop Project Team -** the process of improving competencies, team member interaction, and overall team environment to enhance project performance
- **Manage Project Team** – the process of tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance

The project manager and management team need to aware that the selection and application of appropriate skills for the management of human resources on projects are slightly different when compared to normal day-to-day operations. For example, the temporary nature of projects means that the personal and organizational relationships will be transient, whereas in day-to-day operations, the relationships are more established. In addition, the nature and number of project stakeholders differ at each stage, so techniques need to be appropriate to the current needs of the project. General management and project team skills are dealt with in Lesson 5.

Project Human Resource Management



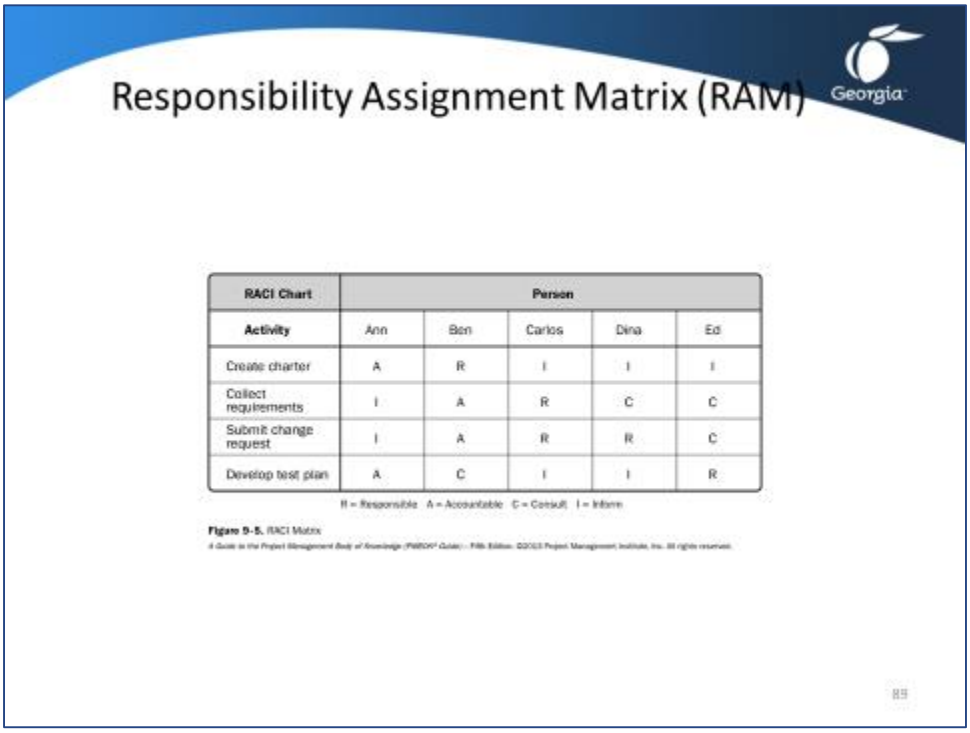
Topic 6: Project Human Resource Management



Human Resource Management Plan

The human resource management plan is a part of the project management plan and provides guidance on how project human resources should be defined, staffed, managed, and eventually released from the project. The human resource management plan contains the following items:

- Roles and responsibilities – the following should be addressed;
    - Role – the function assumed by a person on the project
    - Authority – the right to apply project resources, make decisions, sign approvals, accept deliverables, and influence others
    - Responsibility – the assigned duties and work that a team member is expected to perform
    - Competency – the skill and capacity required to complete assigned work
- Project organization charts – a graphical display of team members and their reporting relationships
- Staffing management plan – describes when and how team members will be acquired and how long they will be needed
    - Staff acquisition: internal/external
    - Resource calendars: resource availability
    - Staff release plan: method and timing of releasing team members
    - Training needs: team members may need additional competencies and a plan to train them should be developed
    - Recognition and reward: Criteria for rewards and a planned system to use them as a means to reinforce desired behaviors
    - Compliance: strategies for complying with applicable regulations
    - Safety: procedures that protect team members from safety hazards



Responsibility Assignment Matrix (RAM)

One example of a RAM is a RACI (responsibility, accountable, consult, inform) chart shown below. The chart shows the work to be done in the left column as activities. The assigned resources can be shown as individuals or groups. A RACI chart is a useful tool to use when the team consists of internal and external resources in order to ensure clear divisions of roles and responsibilities.

RACI Chart	Person				
Activity	Ann	Ben	Carlos	Dina	Ed
Create charter	A	R	I	I	I
Collect requirements	I	A	R	C	C
Submit change request	I	A	R	R	C
Develop test plan	A	C	I	I	R

R = Responsible A = Accountable C = Consult I = Inform

Figure 9-5. RACI Matrix

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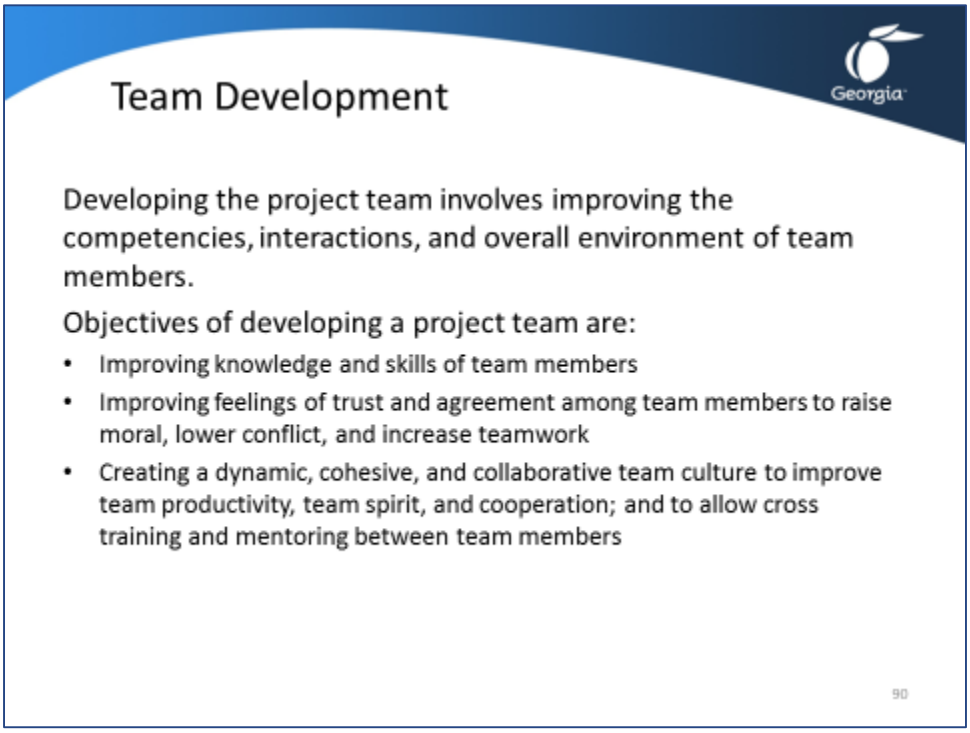


Develop Project Team

Developing the project team involves improving the competencies, interactions, and overall environment of team members. The key benefit of developing the project team is that it results in improved teamwork, enhanced skills and competencies, motivated employees, reduced turnover, and improved overall project performance.

Objectives of developing a project team are:

1. Improving knowledge and skills of team members
2. Improving feelings of trust and agreement among team members to raise moral, lower conflict, and increase teamwork
3. Creating a dynamic, cohesive, and collaborative team culture to improve team productivity, team spirit, and cooperation; and to allow cross training and mentoring between team members

Topic 7: Project Communications Management

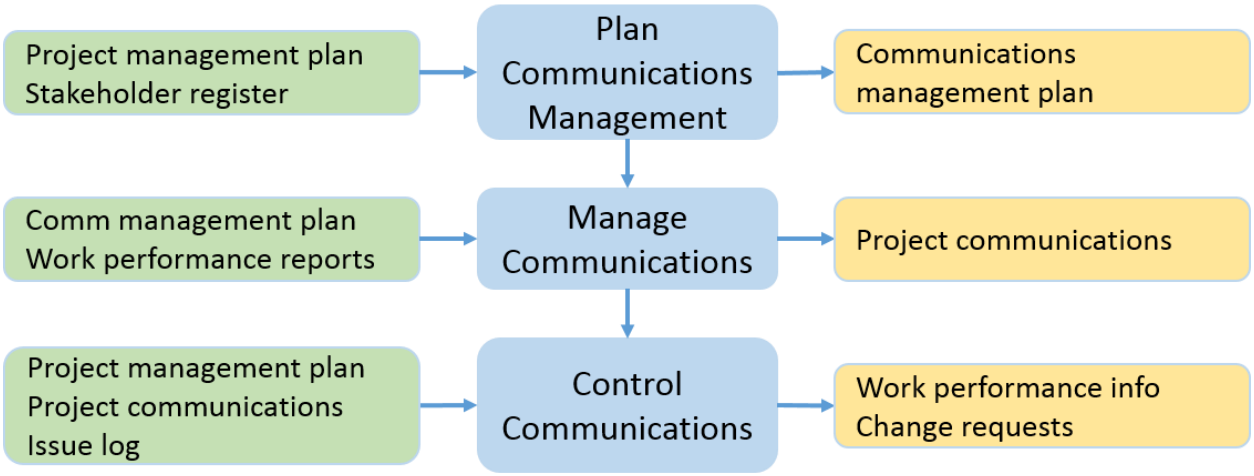
Project communications management includes the processes that are required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and disposition of project information. The Project Human Resource Management processes include the following:

- **Plan Communications Management** - the process of developing an appropriate approach and plan for project communications based on stakeholder's information needs and requirements
- **Manage Communications -** the process of creating, collecting, distributing, storing, retrieving and disposition of project information
- **Control Communications** – the process of monitoring and controlling communications throughout the project life cycle

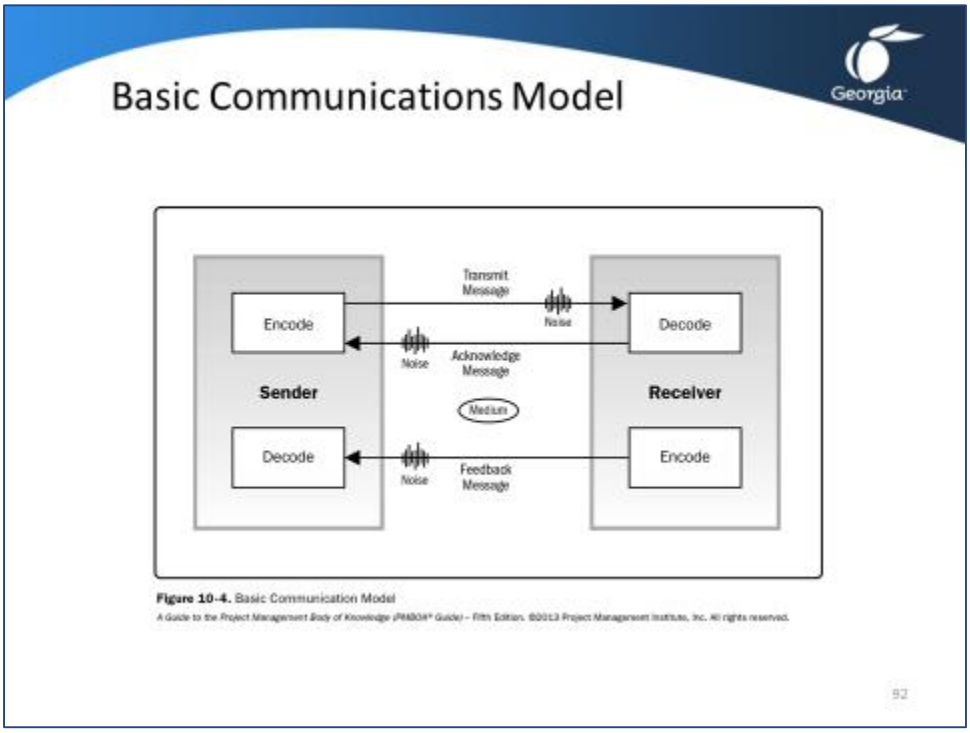
Communications activities often have many potential dimensions that need to be considered, including:

- Internal (within the project) and external (customer, vendor, other projects, the public)
- Formal (reports, minutes, briefings) and informal (emails, memos, ad-hoc discussions)
- Vertical (up and down the organization) and horizontal (with peers)
- Official (newsletters, annual report) and unofficial (off the record communications)
- Written and oral, and verbal 9voice inflections) and nonverbal (body language)

Project Communications Management



Topic 7: Project Communications Management



Basic Communications Model

A basic communication model shown below consist of two parties, defined as the sender and receiver. Medium includes the mode of communication while noise includes any interference or barriers the might compromise the delivery of the message. The sequence in the basic communication model are:

- Encode: Thoughts or ideas are translated (encoded) into language by the sender
- Transmit Message: Information sent by the sender using a communication channel
- Decode: Message is translated by the receiver back into a meaningful thought or idea
- Acknowledge: The receiver may signal receipt of the message but does not mean agreement
- Feedback/Response: Receiver encodes thoughts or ideas into a message and transmits to sender

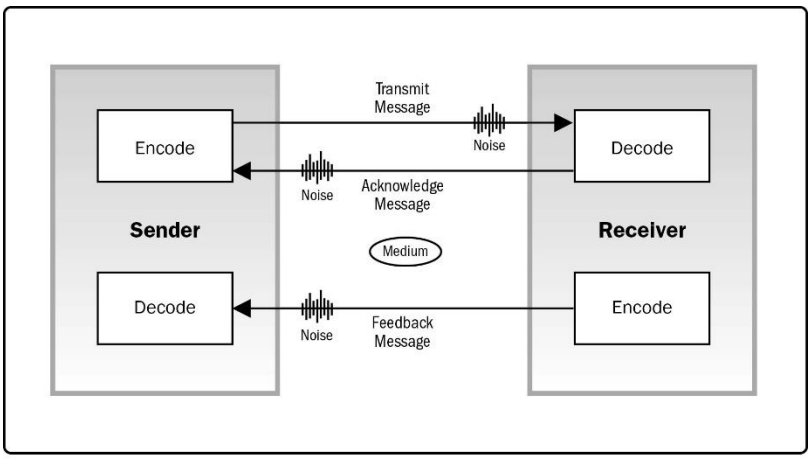


Figure 10-4. Basic Communication Model

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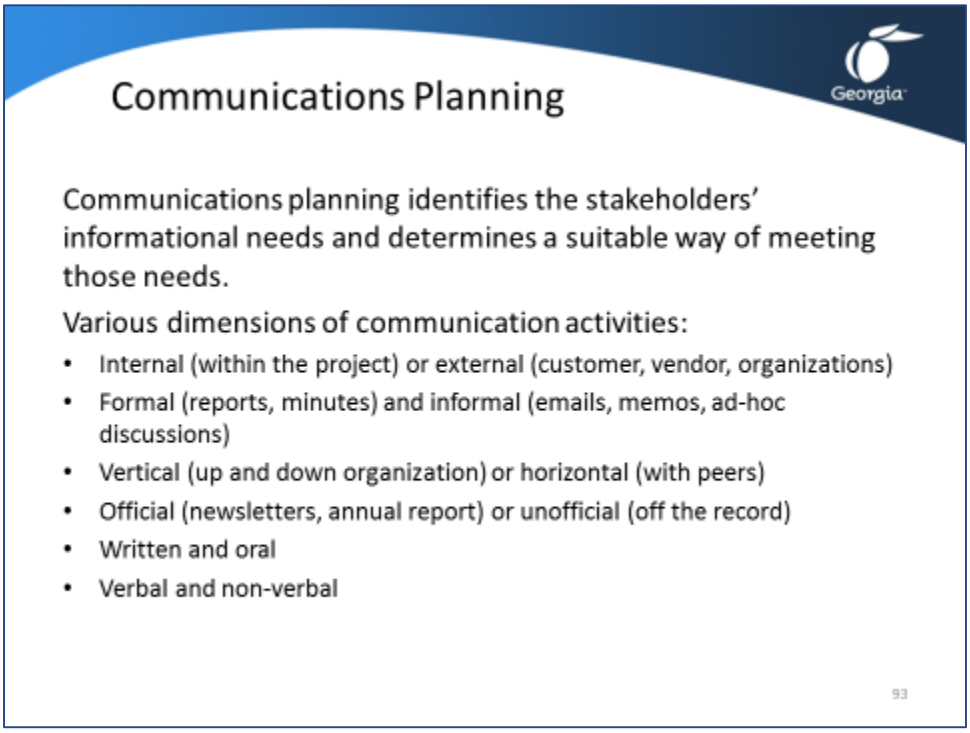
Topic 7: Project Communications Management



Communications Management Plan

The communications management plan is a part of the project management plan that describes how project communications will be planned, structured, monitored, and controlled. The communications management plan contains the following items:

- Stakeholder communications requirements
- Information to be communicated, including language, format, content, and level of detail
- Reason for the distribution of the information
- Time frame and frequency for the distribution of the information
- Person responsible for communicating the information
- Person responsible for authorizing release of confidential information
- Person or groups who will receive the information
- Methods or technologies used to convey the information, such as memos, email, and/or press release
- Resources allocated for communications activities, including time and budget
- Escalation process identifying timeframes and management chain for resolution
- Method for updating and refining communications management plan as project progresses
- Glossary of common terminology
- Flow charts of the information flow in the project
- Communications constraints usually derived from a specific legislation or regulation, technology, and organizational policies

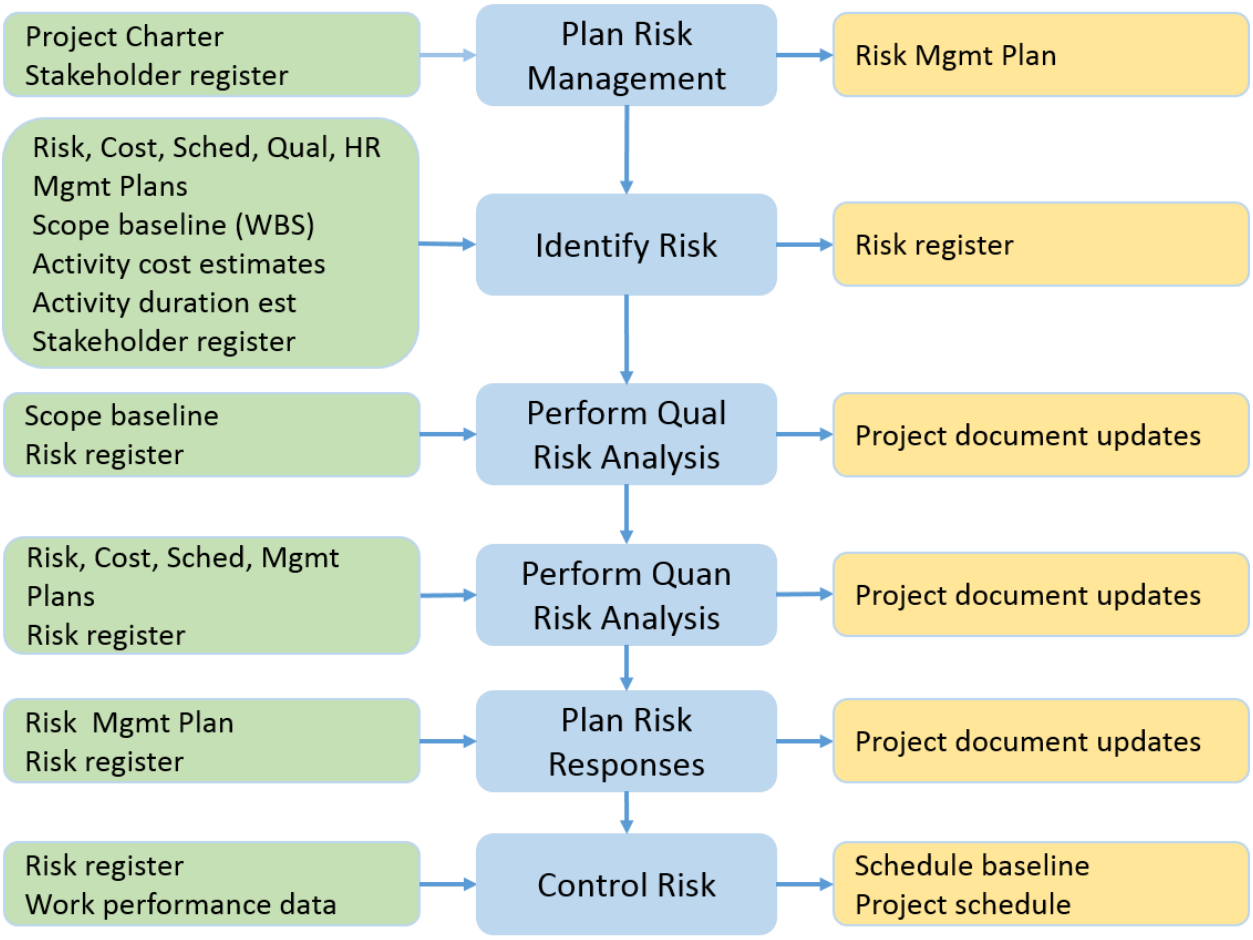
Topic 8: Project Risk Management

Project risk management includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project. The objective of project risk management is to increase the likelihood and impact of positive events while decreasing the likelihood and impact of negative events in the project. The Project Risk Management processes include the following:

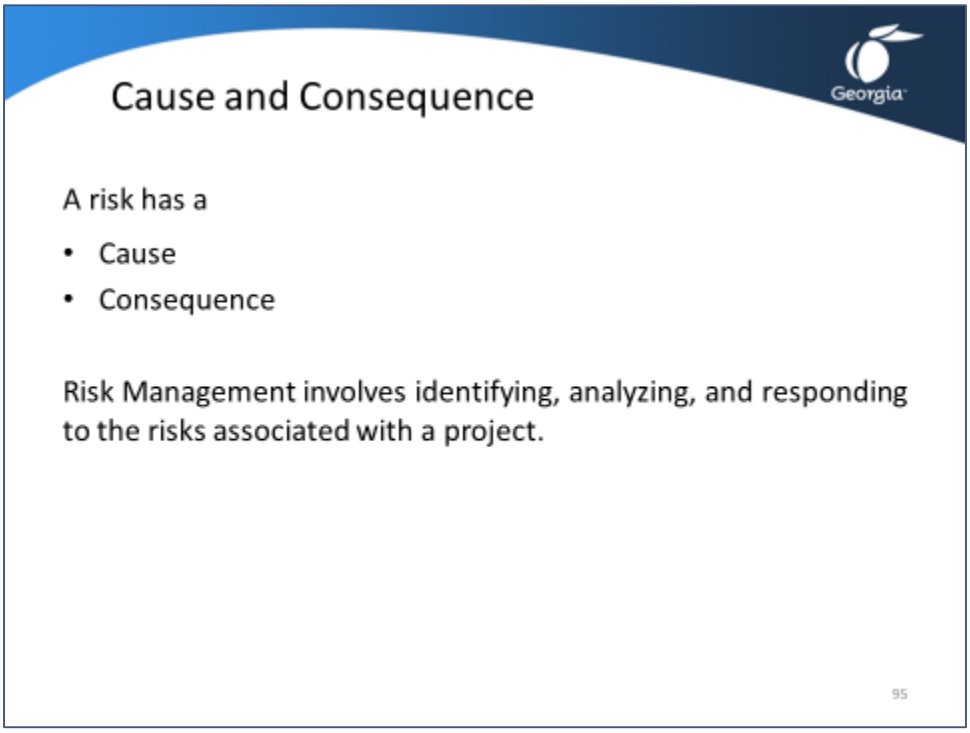
- **Plan Risk Management** - the process of defining how to conduct risk management activities for a project
- **Identify Risks -** the process of determining which risks may affect the project and documenting their characteristics
- **Perform Qualitative Risk Analysis -** the process of prioritizing risks for further analysis by assessing and combining their probability of occurrence and impact
- **Perform Quantitative Risk Analysis -** the process of numerically analyzing the effect of identified risks on overall project objectives
- **Plan Risk Responses** – the process of developing options and actions to enhance opportunities and to reduce threats to project objectives
- **Control Risks** – the process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness

Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives. A risk may have one or more causes and may have one or more impacts.

Project Risk Management



Topic 8: Project Risk Management



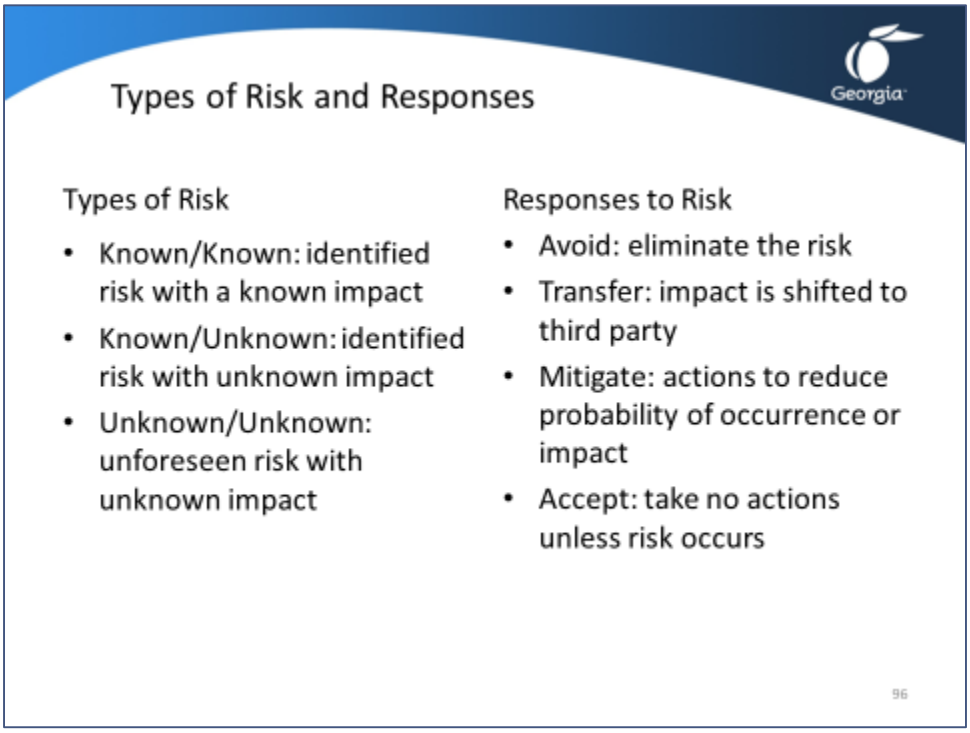
Cause and Consequence

A risk has a cause and a consequence (if it occurs):

- **cause** – for example, new employees may need a work permit or there may be a limited number of people assigned to a project
- **consequence** – for example, if the project cannot start on time because the work permits take longer than planned, or the quality of work is below standard because the personnel are unsuitable for the task, the project cost, schedule, and quality are affected

Risk management attempts to increase the chances and consequences of positive events occurring, while reducing the chances and consequences of adverse events affecting the project. These uncertain events or conditions can have a positive or a negative effect on a project objective.

Topic 8: Project Risk Management



Types of Risks

Project risk has its origins in the uncertainty of all projects and can be viewed through the following three types:

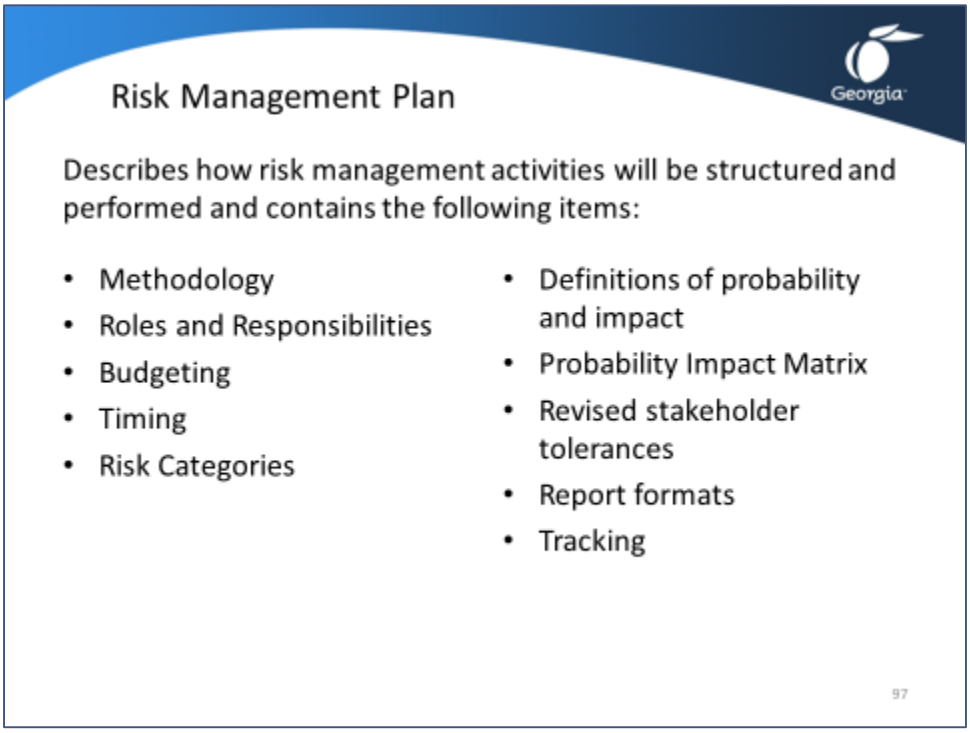
- Known risk with Known impact: Risks that have been identified and analyzed making it possible to plan responses for these risks
- Known risk with Unknown impact: Risks that have been identified where the impact can not be analyzed thouroghly enough to manage. These risks should be assigned a contingency reserve
- Unknown risk with Unknown impact: Risks that are unforeseen and therefore not planned for. These risks are assigned a management reserve

A negative project risk that has occurred can be considered an issue.

Negative project risks can be responded to in four ways:

- Avoid – actions are taken to eliminate the risk or protect the project from the impact
- Transfer – the impact of the risk is shifted to a third party
- Mitigate – actions are taken to reduce the probability of occurrence or the impact of the risk
- Accept – take no actions unless the risk occurs

Topic 8: Project Risk Management



Risk Management Plan

The risk management plan is a part of the project management plan that describes how risk management activities will be structured and performed. The risk management plan contains the following items:

- **Methodology** – The approaches, tools and data that will be used to perform risk management
- **Roles and Responsibilities** – Defines the lead, support, and risk management team members
- **Budgeting** – Estimates the funds needed for inclusion in the cost baseline and establishes procedures for application of contingency and management reserves
- **Timing** – Defines when and how often risk management processes will be performed
- **Risk Categories** – **Provides a means for grouping potential causes of risk**
- **Definitions of risk probability and impact** – General definitions of probability levels and impact levels are tailored to the individual project (see the table below)
- **Probability and Impact matrix** – a grid for mapping the probability of each risk occurrence and its impact
- **Revised stakeholder tolerances** – the stakeholder tolerance levels may need revision during the project life cycle
- **Report formats** – how the outcomes of risk management will be documented, analyzed, and communicated. It describes the content and format of the risk register as well as other reports
- **Tracking** – how risk activities will be recorded and how the process will be audited

Definitions of risk probability and impact

Defined Conditions for Impact Scales of a Risk on Major Project Objectives
(Examples are shown for negative impacts only)

Project Objective	Relative or numerical scales are shown				
	Very low /0.05	Low /0.10	Moderate /0.20	High /0.40	Very high /0.80
Cost	Insignificant cost increase	< 10% cost increase	10 – 20% cost increase	20 – 40% cost increase	> 40% cost increase
Time	Insignificant time increase	< 5% time increase	5 – 10% time increase	10 – 20% time increase	> 20% time increase
Scope	Scope decrease barely noticeable	Minor areas of scope affected	Major areas of scope affected	Scope reduction unacceptable to sponsor	Project end item is effectively useless
Quality	Quality degradation barely noticeable	Only very demanding applications are affected	Quality reduction requires sponsor approval	Quality reduction unacceptable to sponsor	Project end item is effectively useless

This table presents examples of risk impact definitions for four different project objectives. They should be tailored in the Risk Management Planning process to the individual project and to the organization's risk thresholds. Impact definitions can be developed for opportunities in a similar way.

Table 11-1. Definition of Impact Scales for Four Project Objectives

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Probability and Impact Matrix

Probability and Impact Matrix

Probability	Threats					Opportunities				
0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
	0.05/ Very Low	0.10/ Low	0.20/ Moderate	0.40/ High	0.80/ Very High	0.80/ Very High	0.40/ High	0.20/ Moderate	0.10/ Low	0.05/ Very Low

Impact (numerical scale) on an objective (e.g., cost, time, scope or quality)

Each risk is rated on its probability of occurring and impact on an objective if it does occur. The organization's thresholds for low, moderate or high risks are shown in the matrix and determine whether the risk is scored as high, moderate or low for that objective.

Figure 11-10. Probability and Impact Matrix

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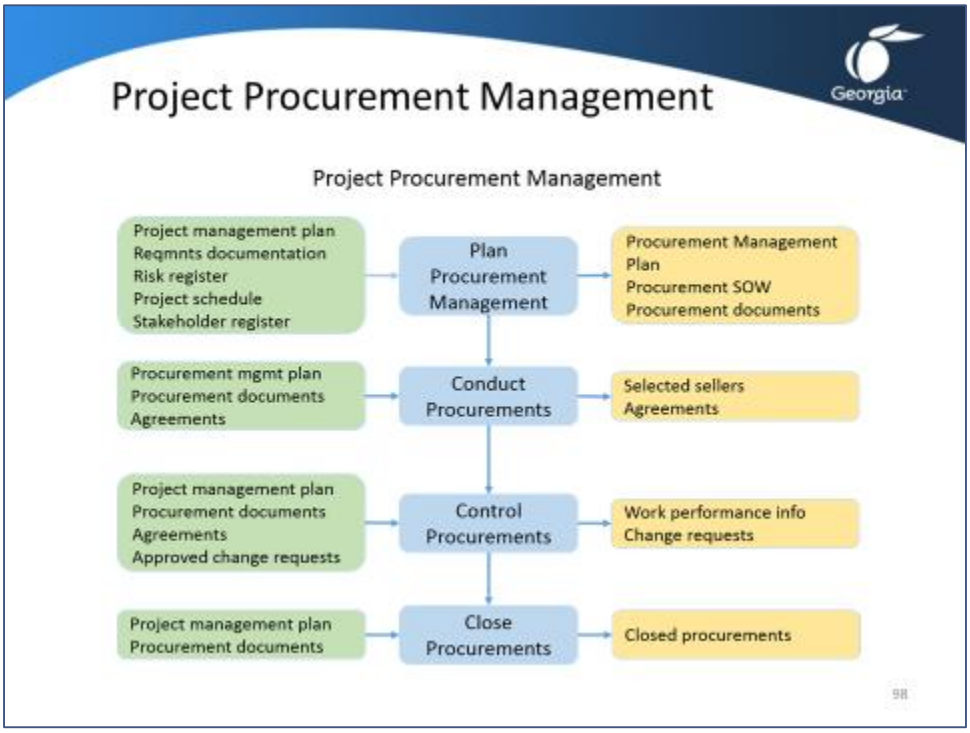
Topic 9: Project Procurement Management



Project procurement management includes the processes required to acquire goods and services from outside the organization. The objective of project risk management is to increase the likelihood and impact of positive events while decreasing the likelihood and impact of negative events in the project. The Project Procurement Management processes include the following:

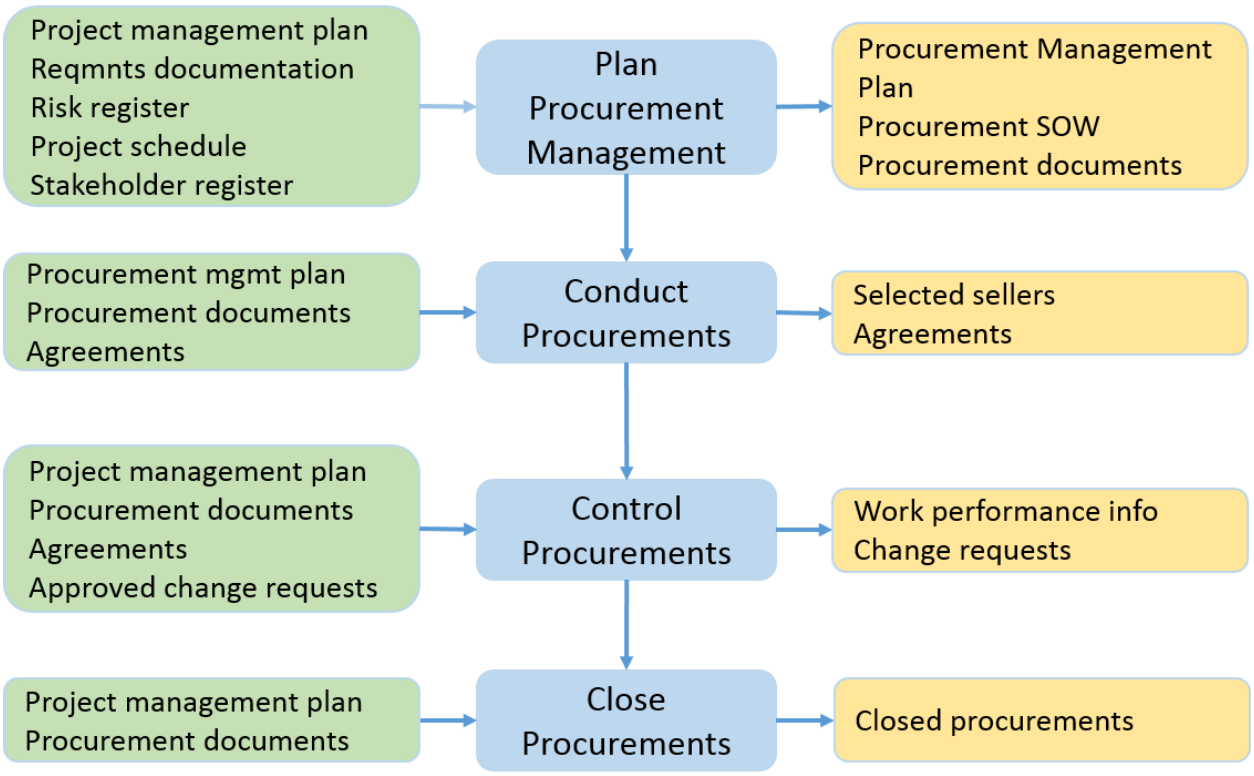
- **Plan Procurement Management** - the process of documenting project procurement decisions, specifying the approach, and identifying potential sellers
- **Conduct Procurements -** the process of obtaining seller responses,, selecting a seller, and awarding a contract
- **Control Procurements** – the process of managing procurement relationships, monitoring contract performance, and making changes and corrections as appropriate
- **Close Procurements** – the process of completing each project procurement

Project procurement management involves considering the various aspects of procurement – whether to procure, how to procure, what to procure, how much to procure, and when to procure. This process should be accomplished when defining the scope of the project.

The number of processes performed in project procurement management depends on whether the products and services are obtained from outside. If they're not, only the procurement planning process is performed. Otherwise, all the processes are performed for each product or service item.

The project management team may, when needed, avail of the help of specialists in the areas of contracting and procurement. The specialists should be considered members of the project team and be involved early in the process.

Project Procurement Management



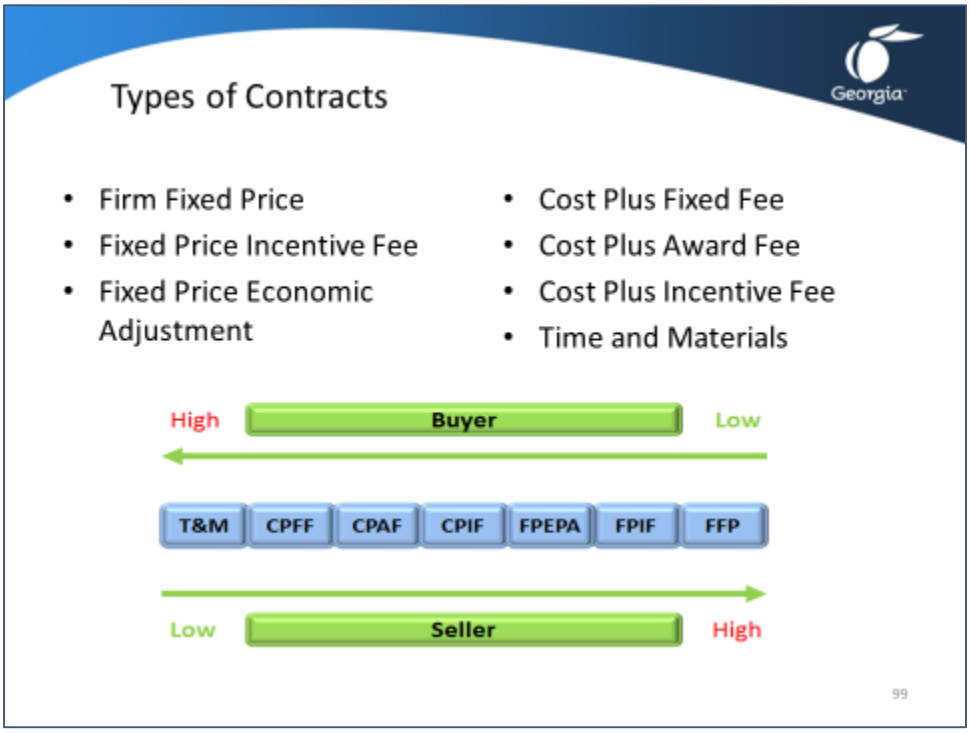
The buyer-vendor relationship is a central part of project procurement management and can exist at many levels in a project. In this topic, project procurement management is discussed from the perspective of the buyer.

The vendor is referred to by different terms, depending on the application area – for example, the vendor may be a called a subcontractor, a seller (vendor), or a supplier.

The vendor will generally manage its work as a project. In these cases, the buyer becomes the customer and is thus a key stakeholder for the vendor. The vendor needs to pay attention to all the processes involved in project management and not just focus on the processes in their knowledge area. Key inputs to many of the vendor's processes are the terms and conditions of the contract. This may contain the actual inputs – for example, the major deliverables, key milestones, and cost objectives – or it may reduce the options that the project team makes – for example, staffing decisions generally require the buyer's approval on design projects.

This topic assumes that the vendor is external to the performing organization, but the vendor can be applied to other units of the performing organization where formal agreements exist between them. In such cases, the processes used in project human resource management and project communications management are more likely to be applied.

Topic 9: Project Procurement Management

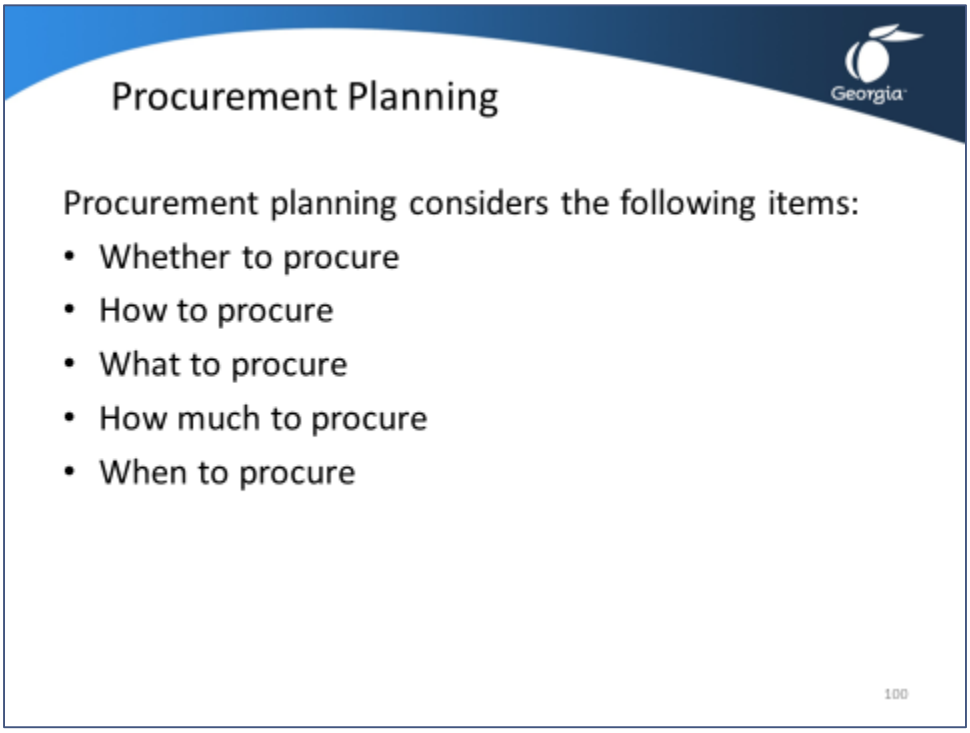


Types of Contracts

All legal contractual relationships generally fall into one of two broad families: either fixed-price or cost-reimbursable. There is a third hybrid type in used called time and material. The most common are listed below:

- Fixed-price contracts – this type sets a total fixed price for the project work. These may also include incentives for exceeding or achieving project objectives. Sellers are obligate to complete the contract at the agreed price. Buyers need to be specific about the product being procured.
    - Firm Fixed Price – cost is set at the outset
    - Fixed Price Incentive Fee – flexibility that allows for deviation from performance
    - Fixed Price with Economic Price adjustment – adjustment made based on economic conditions
- Cost-reimbursable contracts - involves payments to the seller for all legitimate actual costs incurred for completed work. Used when the scope of the work cannot be clearly defined
    - Cost Plus Fixed Fee – seller is reimbursed for all costs and receives a fixed-fee amount calculated as a percentage of the initial estimated costs
    - Cost Plus Incentive Fee – seller is reimbursed all costs and receives a predetermined incentive fee based upon achieving certain performance objectives
    - Cost Plus Award Fee – seller reimbursed all costs but majority of the fee is earned only based on the satisfaction of certain performance criteria
- Time and Materials – Often used for staff augmentation, acquisition of experts.

Topic 9: Project Procurement Management



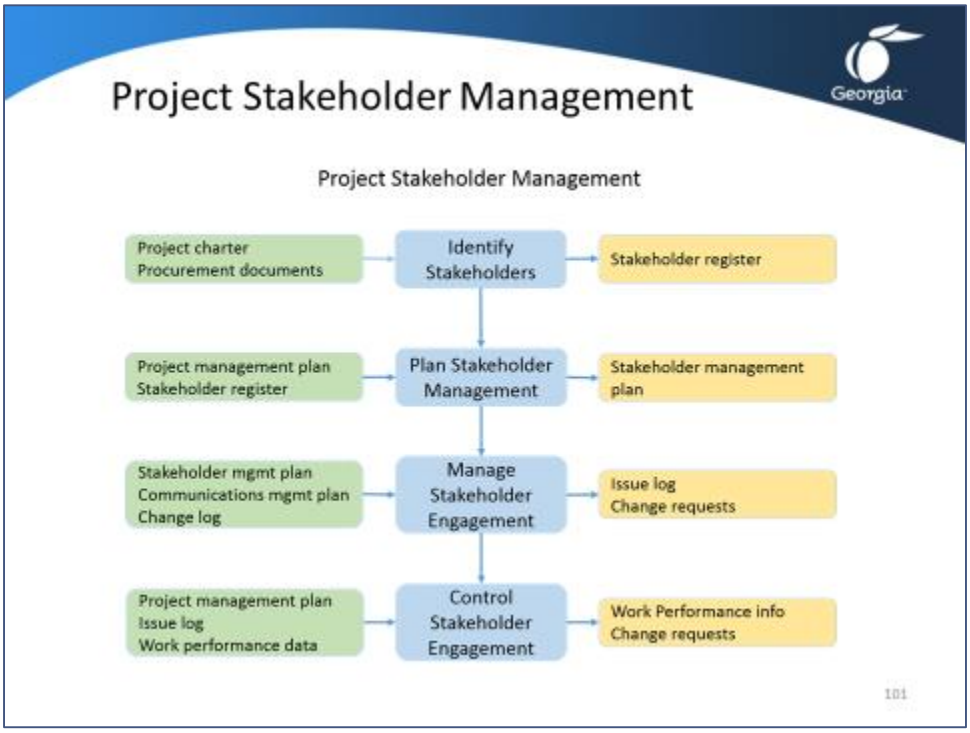
Plan Procurement Management

Plan Procurement Management is the process of identifying the project needs that can be best met by procuring products or services from outside the organization. It involves considering the various aspects of procurement – whether to procure, how to procure, what to procure, how much to procure, and when to procure. This process should be accomplished when performing the Define Scope process.

The number of processes performed in procurement management depends on whether the products and services are obtained from outside. If they're not, only the procurement planning process is performed. Otherwise, all the processes are performed for each product or service item.

The project management team may, when needed, avail of the help of specialists in the areas of contracting and procurement. The specialists should be considered members of the project team and be involved early in the process.

Topic 10: Project Stakeholder Management

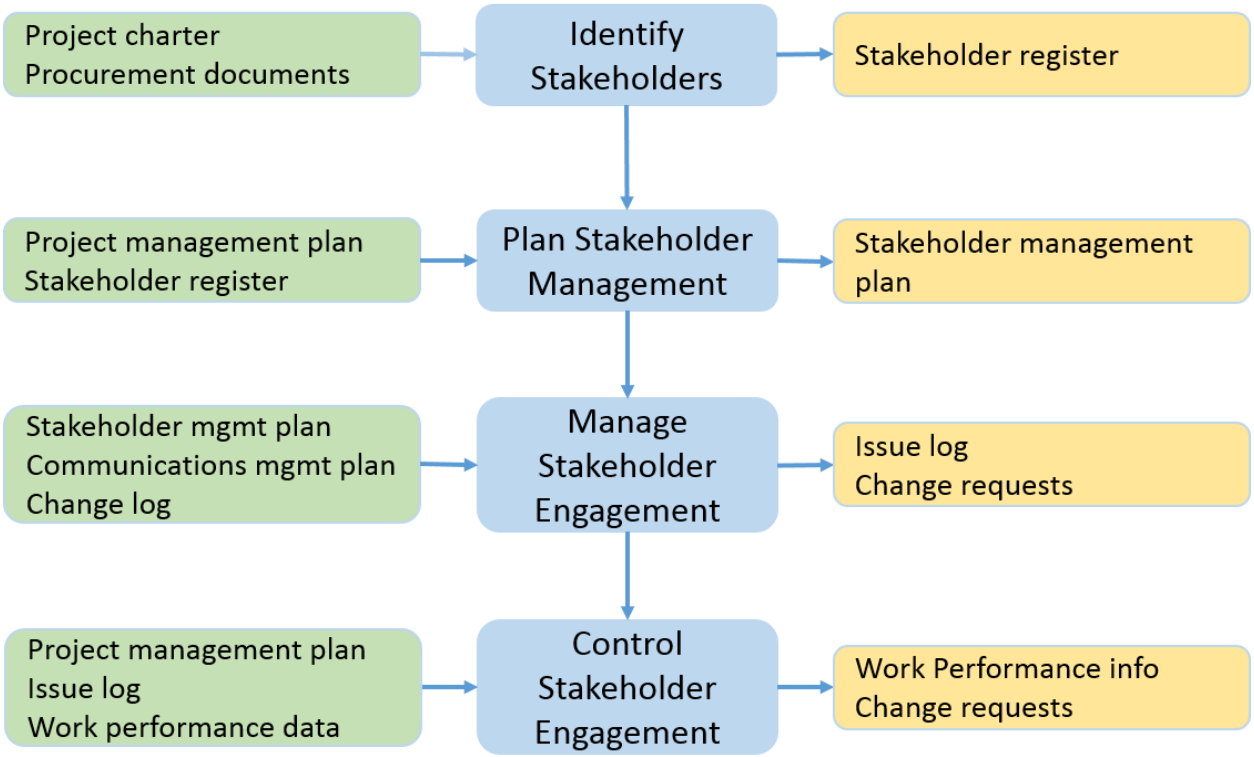


Project stakeholder management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations, and to develop management strategies for effectively engaging stakeholders. The Project Stakeholder Management processes include the following:

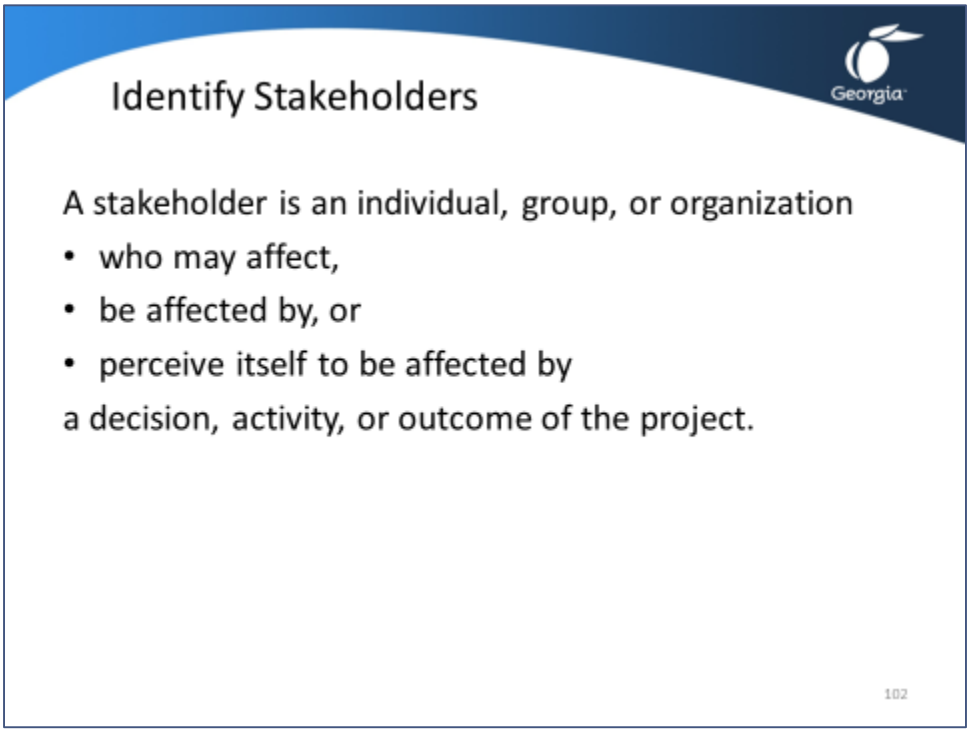
- **Identify Stakeholders -** the process of identifying the stakeholders; analysing and documenting relevant information regarding their interest, involvement, influence, and impact on project success
- **Plan Stakeholder Management** – the process of developing appropriate management strategies to effectively engage stakeholders throughout the project life cycle
- **Manage Stakeholder Engagement** – the process of communicating and working with stakeholders to meet their needs/expectations
- **Control Stakeholder Engagement** – the process of monitoring overall project stakeholder relationships and adjusting strategies for engaging stakeholders

It is important to manage stakeholder expectations because it allows the project manager to increase support and minimize resistance from stakeholders.

Project Stakeholder Management



Topic 10: Project Stakeholder Management



Identify Stakeholders

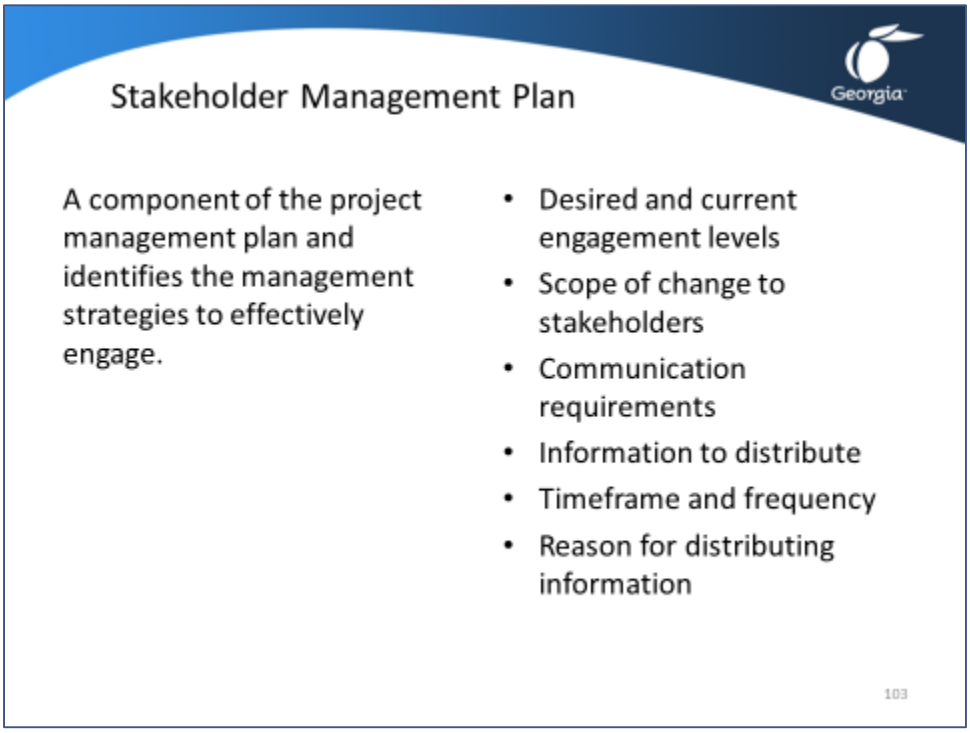
A stakeholder is an individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of the project. Stakeholders might include the following:

- Customers
- Sponsors
- The performing organization
- The public

Stakeholders should be identified early in the project with an analysis done of their levels of interest, expectations, importance, and influence to the project. Stakeholder analysis is a technique to gather and analyze both quantitative and qualitative information. This information is placed into the **Stakeholder Register** which contains the following information:

- **Identification information:** name, organizational position, location, role in the project, contact information
- **Assessment information:** major requirements, main expectations, potential influence, phase or life cycle of project with most interest
- **Stakeholder classification:** internal/external, supporter/neutral/resistor

Topic 10: Project Stakeholder Management



Plan Stakeholder Management

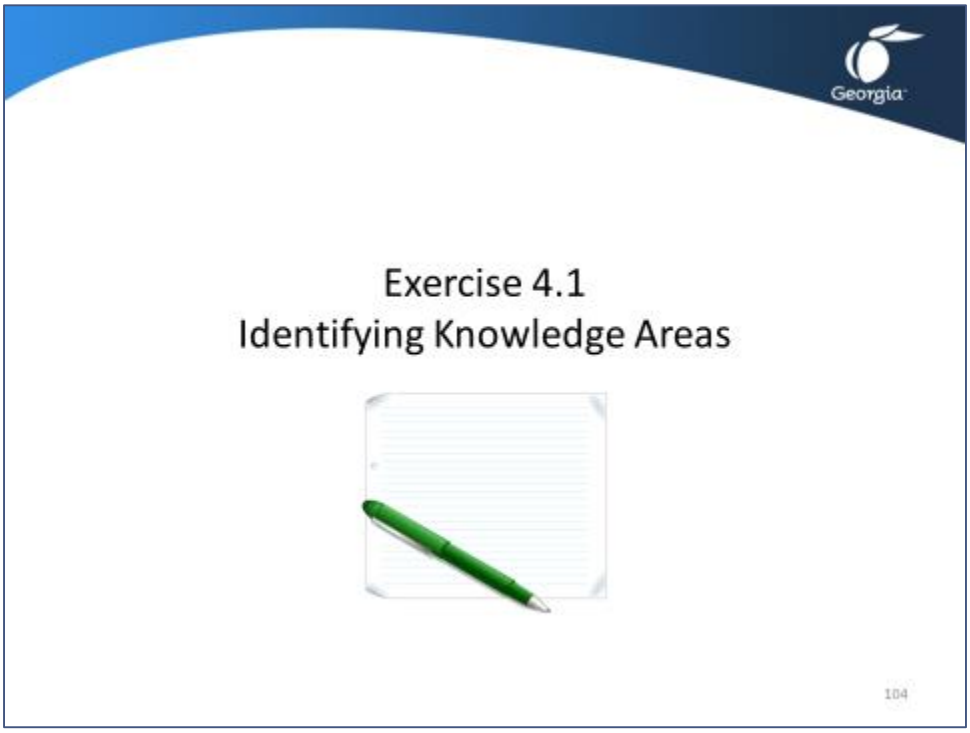
The **stakeholder management plan** is a component of the project management plan and identifies the management strategies to effectively engage stakeholders.

In addition to the data gathered in the stakeholder register, the stakeholder management plan often provides:

- Desired and current engagement levels
- Scope and impact of change to stakeholders
- Identified interrelationships and potential overlap between stakeholders
- Stakeholder communication requirements
- Information to be distributed to stakeholders including language, format, content, and level of detail
- Reason for the distribution of that information and the expect impact to stakeholder engagement
- Time frame and frequency for the distribution of information
- Method for updating and refining the stakeholder management plan

Project managers should be aware of the sensitive nature of the stakeholder management plan and take appropriate precatuions.

Exercise 4.1 Identifying Knowledge Areas



Using the information provided in the Case Study and the table on the following page create a high-level Work Breakdown Structure.

Exercise 4.1 Identifying Knowledge Areas

Exercise Worksheet

WBS Level	Description	Inputs	Outputs (goals)
1	Web-based order entry system		

Lesson 4 Summary: Learning Objectives Recap

- **Define what scope management is and identify how to use a work breakdown structure (WBS)**
  - Project Scope Management is the process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled.
  - A WBS is a hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

- **Demonstrate what is required to develop a schedule and outline the components of a project plan**
  When all activities have been identified they are then sequenced in a logical order dependent upon relationships between the activities. This will result in the network diagram where estimates for activity duration can be documented. The project schedule can now be developed and the critical path determined for the project.

Project Management Plan
Change management plan
Communications management plan
Configuration management plan
Cost baseline
Cost management plan
Human resource management plan
Process improvement plan
Procurement management plan
Scope baseline • Project scope statement • WBS • WBS dictionary
Quality management plan
Requirements management plan
Risk management plan
Schedule baseline
Schedule management plan
Scope management plan
Stakeholder management plan

- **Define what cost management is**
  Project Cost Management is primarily concerned with the cost of resources needed to complete the project activities and should also consider the effect of project decisions on the recurring costs of using, maintaining, and supporting the product, service, or result.

- **Identify what risk management is and state the value of a risk management process**
  Project risk management is a set of processes that increase the likelihood and impact of positive events while decreasing the likelihood and impact of negative events in the project. A risk management process ensures that the uncertainty in the project is being identified, analyzed, managed, and controlled.

- **Outline the importance of project communication and identify the various facets of the discipline**
  Project communications allows the team and stakeholders to be totally informed regarding the status and progress of the project.

- **Point to what quality management is and demonstrate how it is influenced by organization practices**
  Project quality management includes the processes and activities of the organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken.

  Quality management is influenced by these organizational practices:
  - Customer satisfaction
  - Prevention over inspection
  - Continuous improvement

- Management Responsibility
- Cost of Quality

- **Outline the procurement management cycle**
  - Plan Procurement Management
  - Conduct Procurements
  - Control Procurements
  - Close Procurements

- **Define human resource management**
  Project human resource management includes the processes that organize, manage, and lead the project team

- **Define stakeholder management and explain the importance of managing stakeholder expectations**
  Project stakeholder management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations, and to develop management strategies for effectively engaging stakeholders.

  It is important to manage stakeholder expectations because it allows the project manager to increase support and minimize resistance from stakeholders.

Notes

LESSON 5: PROJECT TEAMS

Topic 1: Organizational Influences

Topic 2: Project Management Office

Topic 3: Effective Project Teams

Topic 4: Project Leadership

Topic 5: Project Management Skills

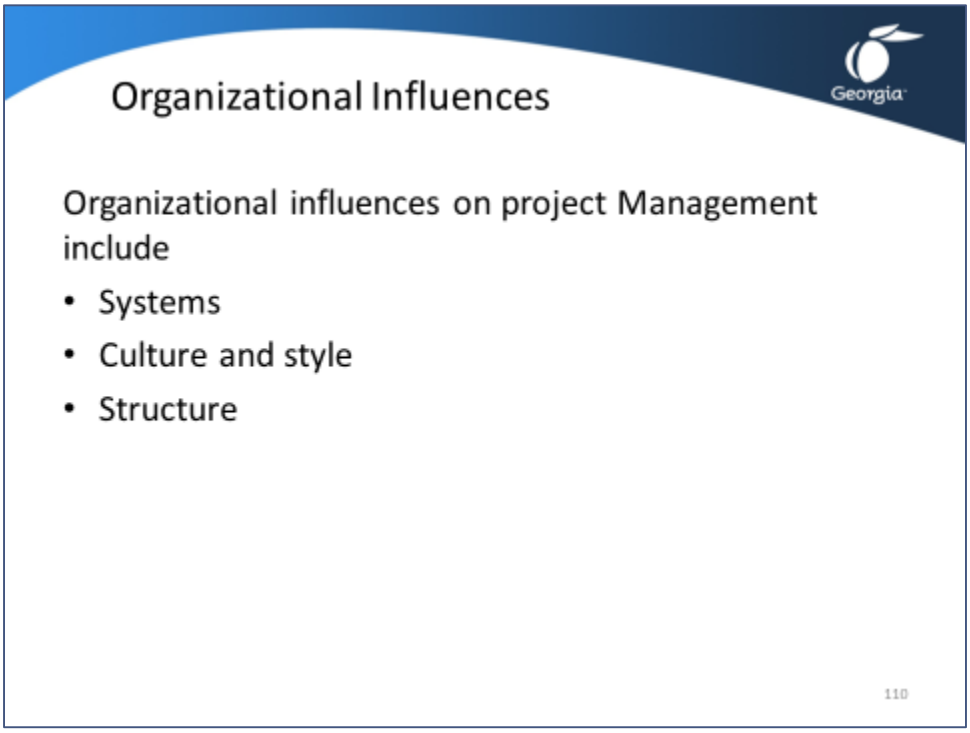
Student Learning Objectives

After completing this lesson you should be able to

- Delineate the organizational influences that impact projects
- Identify the characteristics of effective project teams and barriers to building effective project teams
- Describe the leadership qualities necessary for project success
- Outline the skills that a project manager requires in a team environment

Approximate Presentation time: 3 hours 45 minutes

Topic 1: Organizational Influences



A project does not take place in isolation but rather is generally part of an organization larger than the project – for example, business corporations, government agencies, or professional associations.

Even when the project is the organization – for example, a project to set up a joint venture – the parent organization or organizations, as well as other external factors, influence how the project proceeds.

Factors that can influence a project include the nature and level of development of an organization's

- **systems**
- **culture and style**
- **structure**

Let's take a look at key aspects of these organizational influences on a project.

Organizational Systems

Project-based organizations' operations consist mainly of projects, and such organizations fall into two categories:

- organizations that carry out projects for others – for example, management consultants, construction companies, or engineering firms
- organizations that employ the management by projects approach to operations

Such organizations generally have management systems that facilitate project management – for example, their financial systems are designed for accounting, tracking, and reporting on multiple simultaneous projects.

A project management team needs to know how the organization's systems affect the project. If, for example, an organization rewards managers for charging staff time to projects, the project management team may need to implement controls to ensure that assigned staff members are being used effectively on the project.

Organizational Culture and Style

An organization develops its own unique culture and style, which is reflected in, among other things, shared values, norms, beliefs, and expectations; policies and procedures; and authority relationships.

Organizational culture and style can have a direct impact on a project. For example,

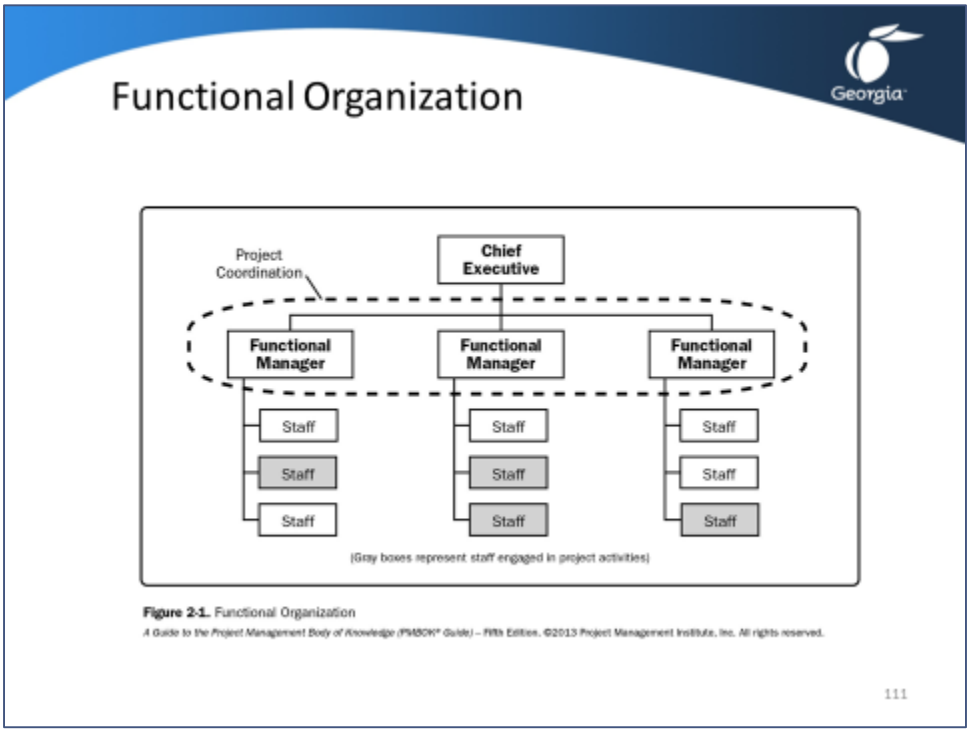
- a team proposing an unusual or high-risk project is less likely to secure approval in an organization with a conservative or cautious culture
- a project manager with a highly participative style is likely to face problems in a rigidly hierarchical organization

Organizational Structure

An organization's structure has a critical influence on the use and availability of project resources and on how a project is carried out.

Organizational structures span a spectrum from functional to projectized, with several matrix structures in between.

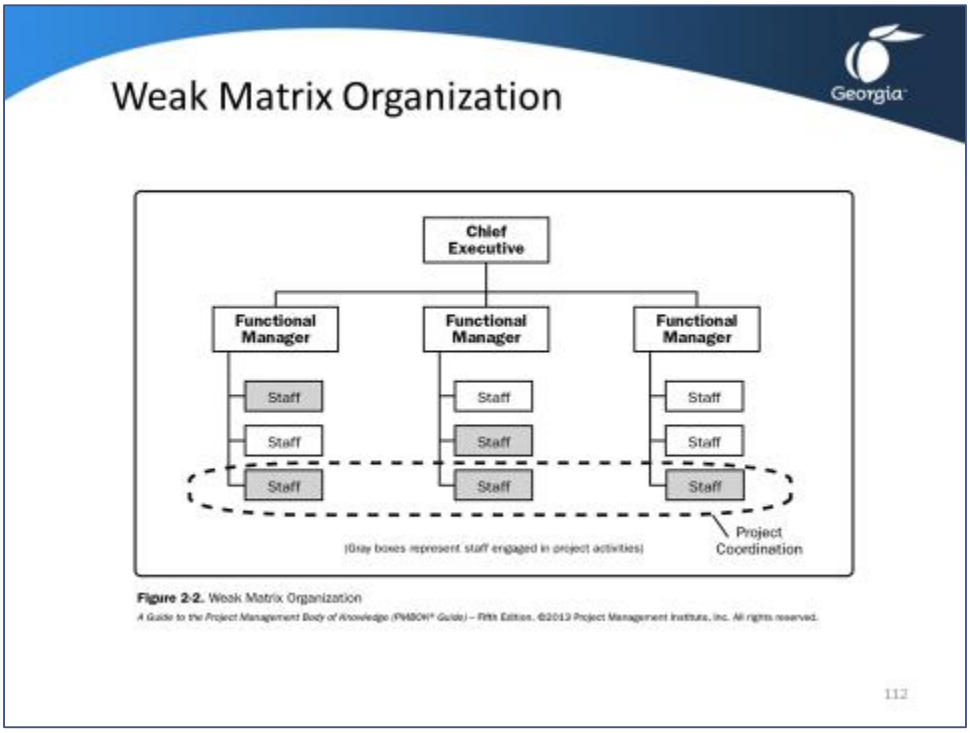
Topic 1: Organizational Influences



The classic functional organization is a hierarchy in which each staff member has one direct superior. Staff members are grouped by function, such as production, marketing, engineering, and accounting.

Functional organizations conduct projects, but the perceived scope of the project is limited to the boundaries of the function. For example, the engineering department in a functional organization conducts projects independent of the manufacturing department. If questions about manufacturing arise, they are passed up the hierarchy to the head of engineering, who consults with the head of manufacturing. The head of engineering then passes the answer back down the hierarchy to the relevant engineering project manager.

Topic 1: Organizational Influences



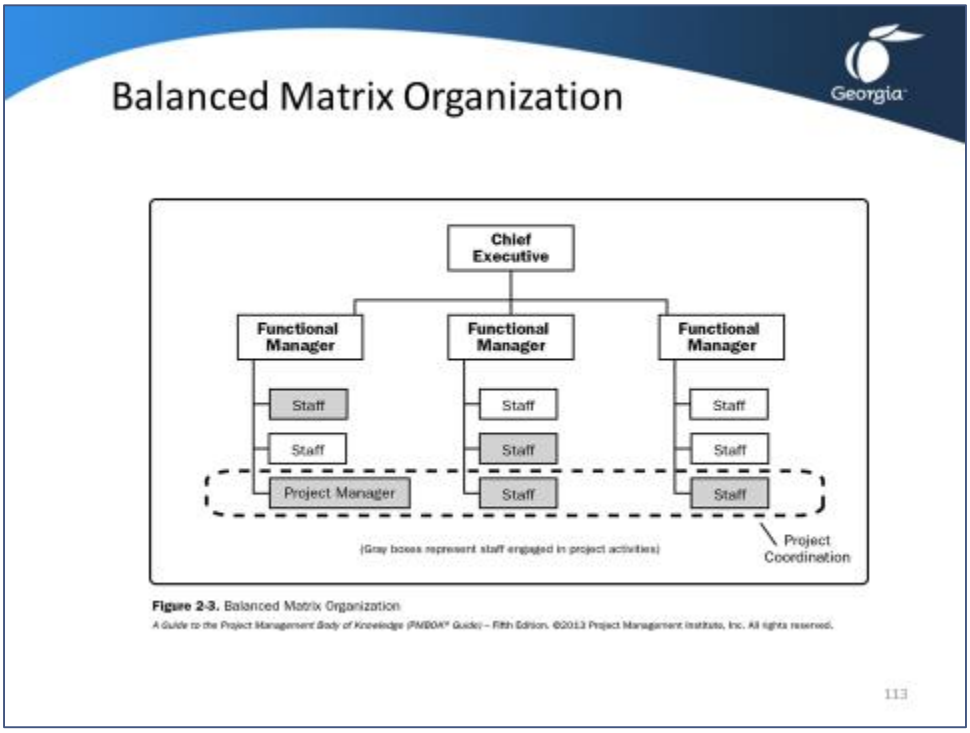
Matrix organizations combine the characteristics of functional and projectized organizations.

The weak matrix organization maintains and emphasizes characteristics of a functional organization but with a limited role for a project manager – often known as a project coordinator or leader in a weak matrix organization.

In weak matrix organizations,

- the project staff members have limited authority and the role of project manager is part-time. A staff member is a project coordinator in that the correct project management skills may not be present and there is limited authority on the project
- less than 25% of personnel are assigned full-time to project work
- project management administrative staff are part-time

Topic 1: Organizational Influences

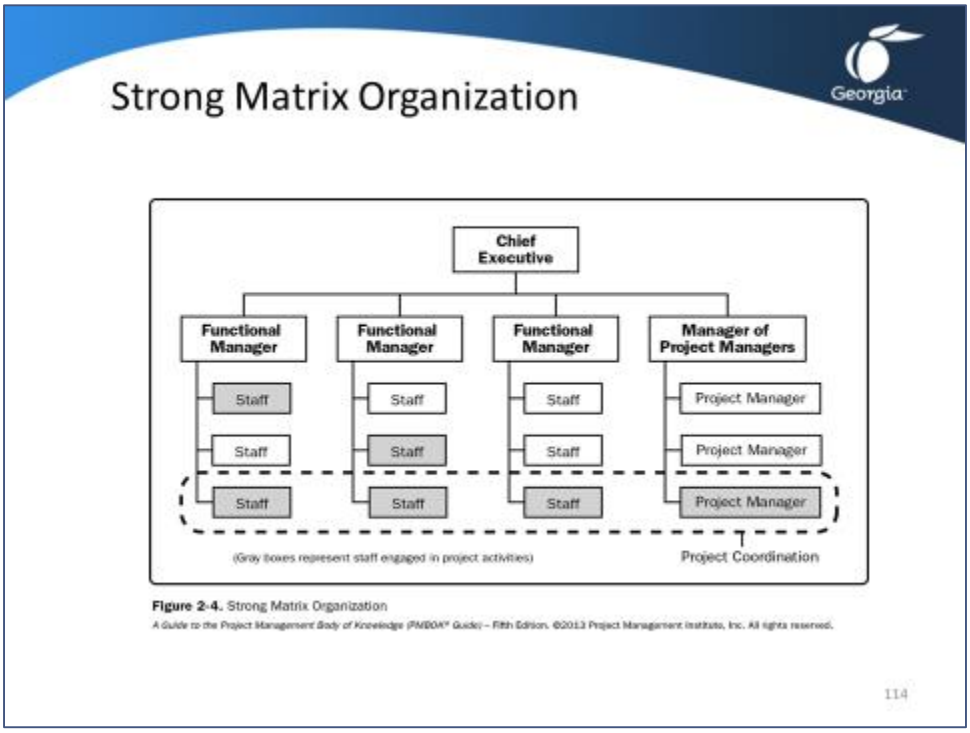


The balanced matrix organization maintains characteristics of a functional organization, but the project manager (also known as project officer) has a coordinating role across functions – there is a balance between functional and project management priorities.

In balanced matrix organizations,

- the project manager has low to moderate authority and the role is full-time
- 15% to 60% of personnel are assigned full-time to project work
- project management administrative staff are part-time

Topic 1: Organizational Influences

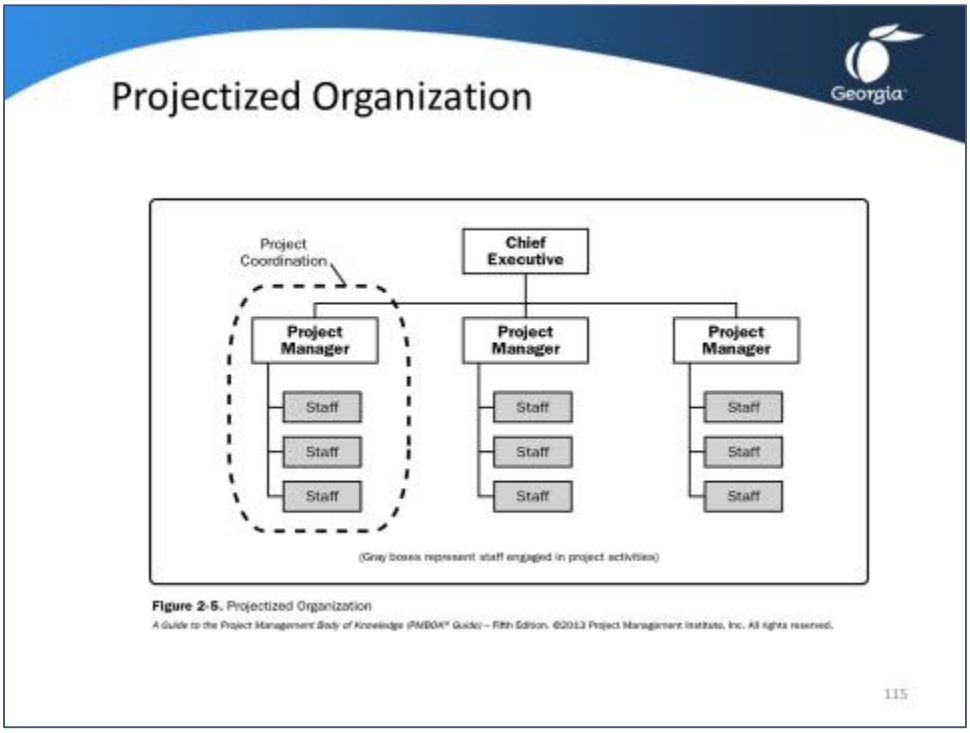


The strong matrix organization prioritizes project management by maintaining the characteristics of the projectized organization – full-time project or program managers with a great deal of authority and full-time project administrative staff.

In strong matrix organizations,

- the project manager has moderate to high authority and the role is full-time
- 50% to 95% of personnel are assigned full-time to project work
- project management administrative staff are full-time

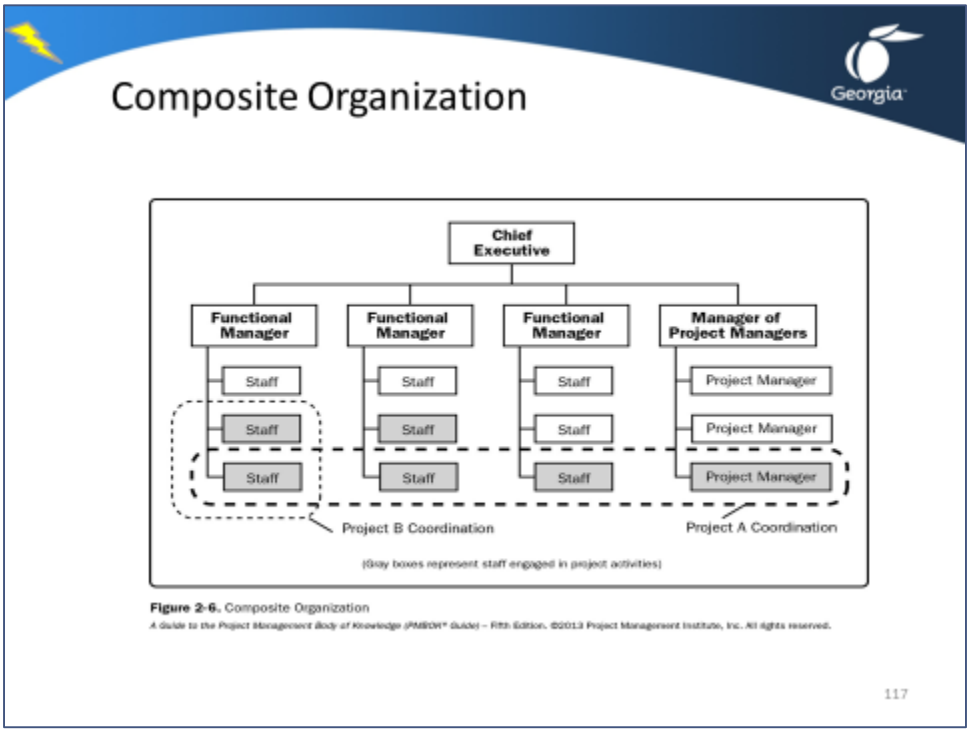
Topic 1: Organizational Influences



In a projectized organization, project managers have a lot of independence and authority. In addition, most of the organization's resources are involved in project work.

Projectized organizations often have organizational units called departments, which report directly to the project manager or provide support services to the various projects.

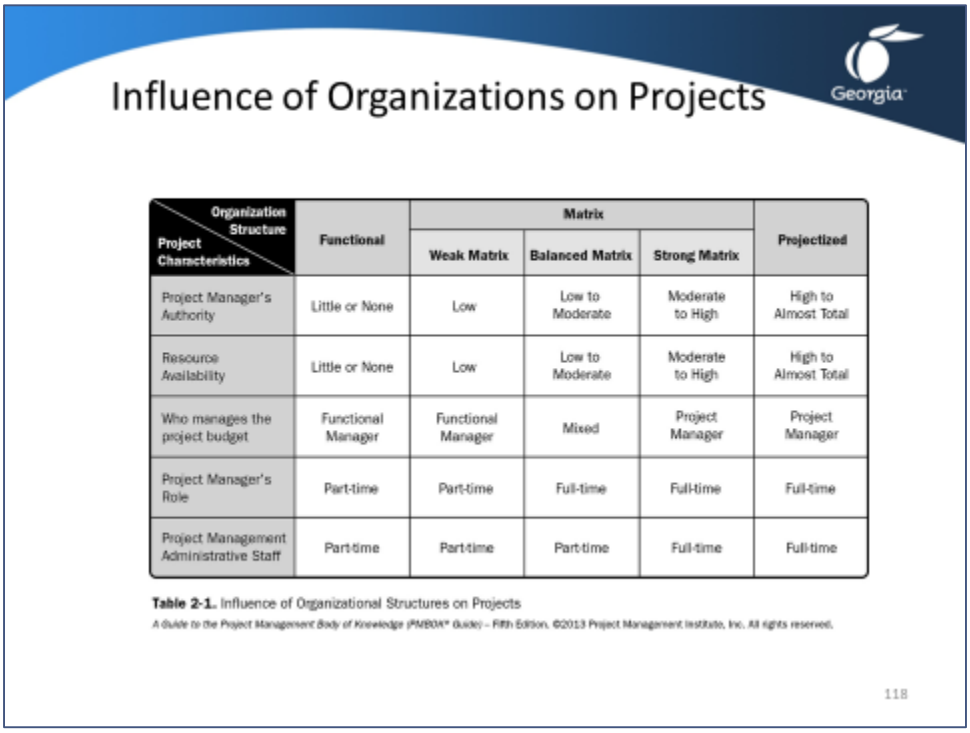
Topic 1: Organizational Influences



Most modern organizations combine elements of the different structures at various levels in the organization. In fact, the composite organization is the most prominent structure in organizations because it is an acceptable balance between function and project. The project management office is usually formed as a part of a composite structure and consists of individual project managers engaged in specific project activity, as well as an overall manager of the project managers.

For example, a functional organization embarking on a critical project may create a special project team that has many of the characteristics of a project in a projectized organization. The team may include full-time staff from different functional departments, it may develop new operating procedures, and it may operate outside the existing reporting structure.

Topic 1: Organizational Influences



Influence of Organizations on Projects

Organization Structure / Project Characteristics	Functional	Matrix			Projectized
		Weak Matrix	Balanced Matrix	Strong Matrix	
Project Manager's Authority	Little or None	Low	Low to Moderate	Moderate to High	High to Almost Total
Resource Availability	Little or None	Low	Low to Moderate	Moderate to High	High to Almost Total
Who manages the project budget	Functional Manager	Functional Manager	Mixed	Project Manager	Project Manager
Project Manager's Role	Part-time	Part-time	Full-time	Full-time	Full-time
Project Management Administrative Staff	Part-time	Part-time	Part-time	Full-time	Full-time

Table 2-1. Influence of Organizational Structures on Projects

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The influence of organizational structures can be significant on project management and project managers. These structures can also play a pivotal role in the success of large complex projects. The matrix below can be used to determine the approach project managers will want to consider as they identify the organizational environment they are working in. For example, if your organization is highly functional, the project manager will need to understand how to lead the project effort with little to no authority, limited resources, and possibly only working part-time on the project. If the project is not very large or complex, this structure might work well, although it will have great challenges.

They key for the project manager is to first understand the organizational environment and its influence on how the project can be managed. Secondly, the project manager will have to develop flexible leadership styles to perform well in any given organizational structure.

Topic 2: Project Management Office

Project management involves related activities that apply the same basic skills as managing a project but are performed on different levels. Examples of these related activities include programs and program management, portfolios and portfolio management, and the activities of a project management office.

Programs and Program Management

A program is a group of related projects managed collectively in order to obtain greater benefits and control than would be obtained by managing the projects individually.

Programs may include work activities – for example, ongoing operations – that do not fall within the scope of specific projects within the program. Programs may also involve a series of repetitive or cyclical activities.

Examples of programs are

- **a new car model program** – made up of projects for the design of each major component, as well as ongoing manufacturing on the assembly line
- **a fundraising program** – an ongoing effort by a nonprofit organization to win financial support through a series of discrete projects, such as a membership drive

Program management involves the centralized coordinated management of a program to achieve strategic objectives and benefits.

Government Programs or Projects

Programs are more common in the public than in the private sector (see Government Extension to A Guide to the Project Management Body of Knowledge © 2000, section 1.5). Representative bodies, such

as state legislatures, generally assign funding to programs rather than projects because they do not have time or resources to consider individual projects. However, representative bodies should have procedures in place to delegate funding decisions for individual projects to such bodies as commissions, lower government authorities (for example, city councils), or the executive.

Government programs of projects require similar program management skills and activities to those that apply to programs in the private sector, with a particular emphasis on accountability to principal stakeholders, such as representative bodies and, ultimately, the public.

Portfolios and Portfolio Management

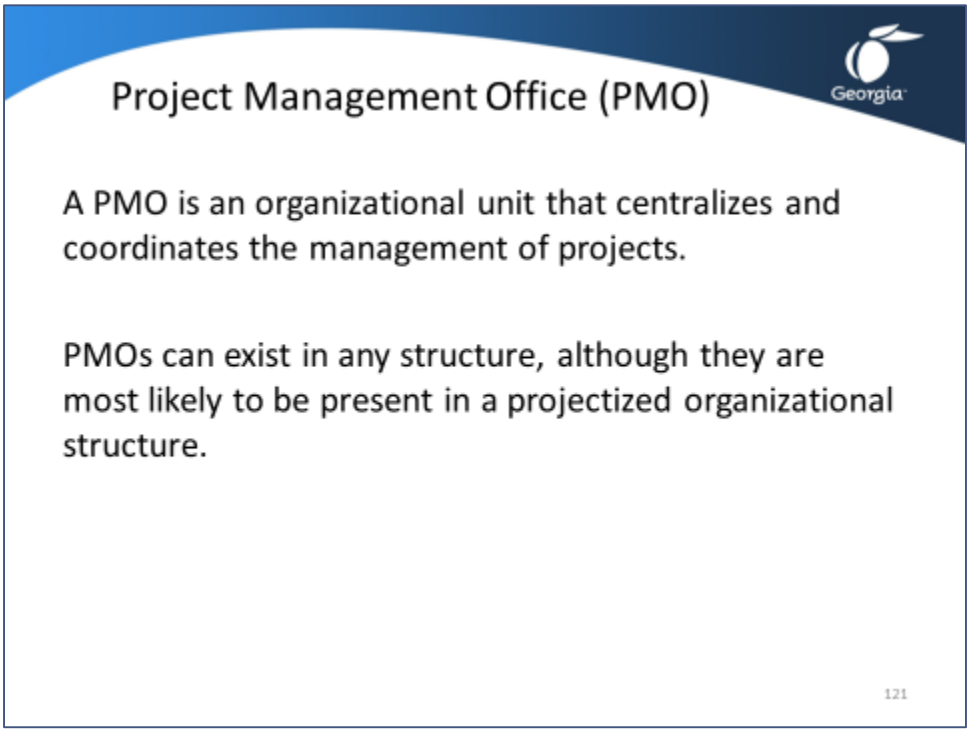
A portfolio is a collection of projects or programs and other work that are grouped together to enable effective management of that work in order to fulfill strategic business objectives. These projects or programs are not necessarily interdependent or directly related.

Organizations manage portfolios based on specific goals, such as

- maximizing the value of the portfolio – by careful examination of candidate projects and programs for inclusion into the portfolio
- balancing the portfolio among incremental and radical investments
- ensuring efficient use of resources

Portfolio management activities are generally the responsibility of senior managers or senior management teams.

Topic 2: Project Management Office



Project Management Office Activities

A project management office (PMO) is an organizational unit that centralizes and coordinates the management of projects. The PMO coordinates the planning, prioritization, and execution of projects linked to overall business objectives.

The structure, function, and use of an organization's PMO vary depending on the application areas involved and the organization's portfolios, programs, or projects. As a result, there is no generally accepted single construct of a PMO within project management theory.

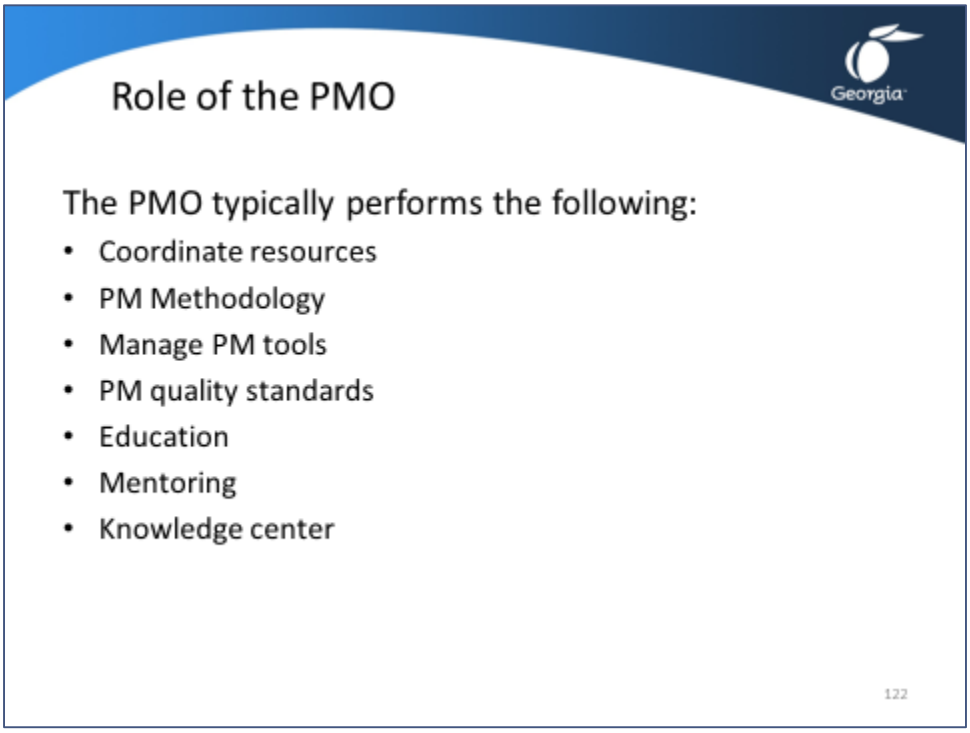
The activities of a PMO can range from providing project management support functions to direct management of projects and their results. A PMO may act as an integral stakeholder and a key decision maker with the authority to make recommendations. A PMO can also be involved in the selection, management, and redeployment of project personnel.

Some of the key features of a PMO are

- **shared and coordinated** resources across all PMO projects
- **identification and development of project management methodology**, best practices, and standards
- **central office for operation and management of project tools**, such as enterprise-wide project software
- central coordination of **communication management** across projects
- central **monitoring** of PMO project timelines and budgets
- coordination of **project quality standards** between the project manager and any internal or external quality personnel or standards organization
- **education** and promotion on project management methodologies

- **mentoring** staff and project team members on project management disciplines
- to be positioned as a **knowledge center** within the organization on project management guidelines and methodologies

Topic 2: Project Management Office



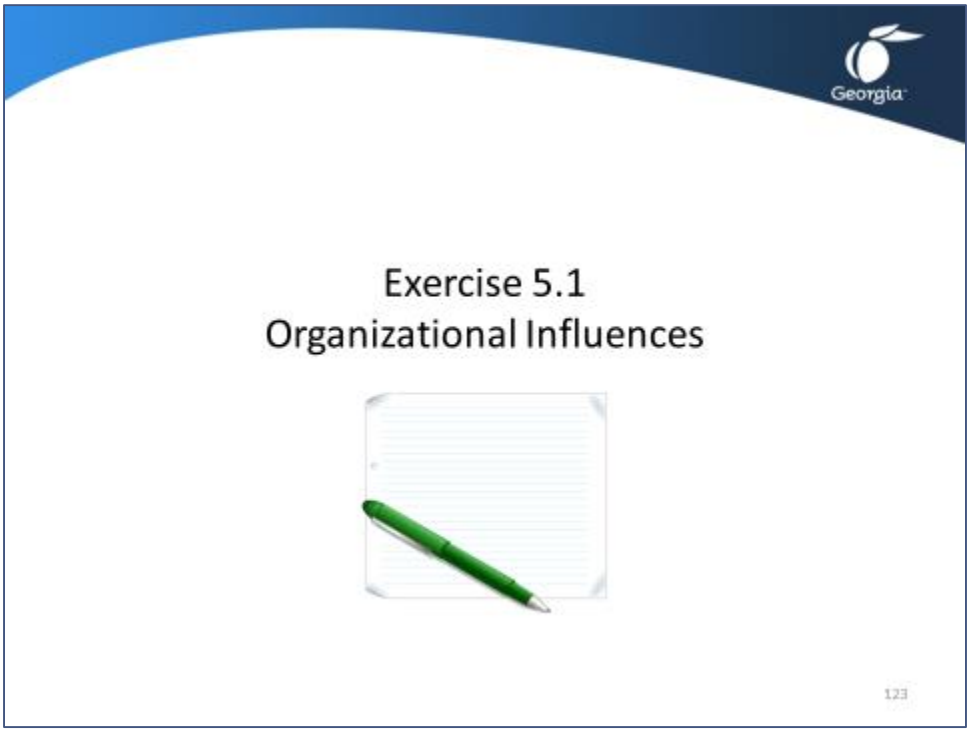
The Role of the PMO in Organizational Structure

Remember that organizational structures span a spectrum from functional to projectized, with several matrix structures in between. PMOs can exist in any of these structures, although they are most likely to be present in a projectized organizational structure, particularly when the parent organization simultaneously manages multiple and sequential projects.

Where a PMO has substantial authority from executive management to manage programs or projects, the PMO may, in turn, delegate its authority to the individual project manager. The project manager, who reports directly to the PMO, will generally receive administrative support from the PMO either through dedicated staff or through a shared staff member.

The project team members might be dedicated to the project or might also work on other projects. Project team members report directly to the project manager or, if shared with other projects, to the PMO.

Exercise 5.1 Organizational Influences

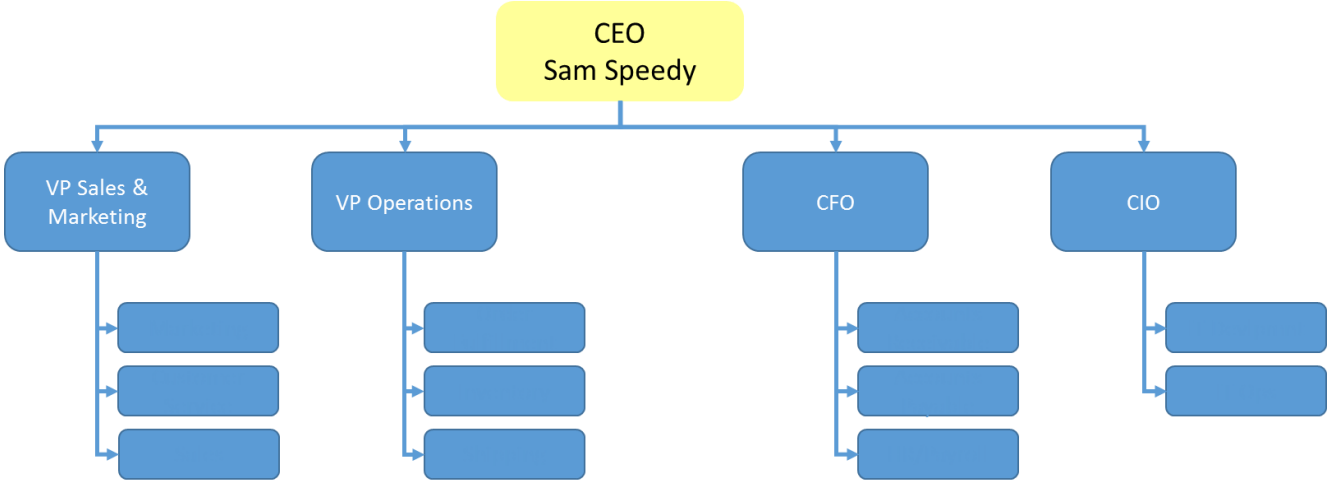


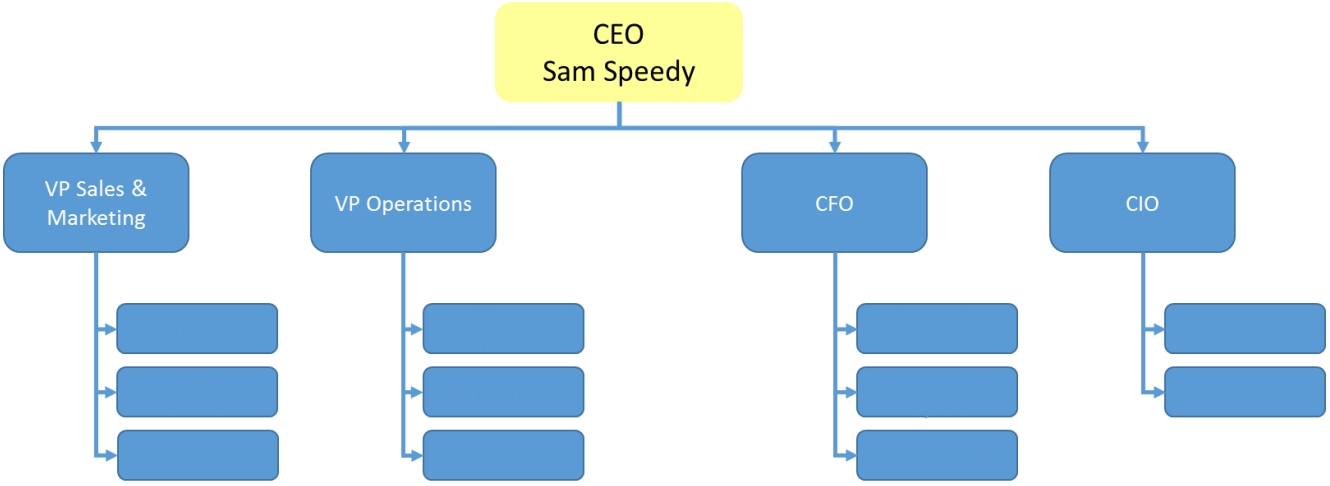
Exercise Instructions

Review the Case Study and depict the organizational structure of Speedy Office Supply, Inc. Also recommend how Speedy Office Supply could implement a PMO and where in the organization it might reside.

Exercise 5.1 Organizational Influences

Exercise Worksheet





Topic 3: Effective Project Teams

Characteristics of an Effective Project Team

Effective project teams have a variety of characteristics, for example:

- team members have **high levels of commitment** to the project goals
- the project team can be classified as **innovative and creative** from a behavioral viewpoint
- team members **are highly innovative** and interface effectively
- a capacity for **conflict resolution** exists. Conflict is encouraged when it can lead to beneficial results.
- **effective communication** systems are established within the project team
- high levels of trust and a **cooperative spirit** exist within the project team
- team members are willing to **make decisions** and lead on behalf of the project
- projects can **empower team members** by giving them the power to use their initiative and make their own decisions on how project goals can be attained

These characteristics take a considerable amount of time and energy to develop.

Barriers to Effective Project Teams

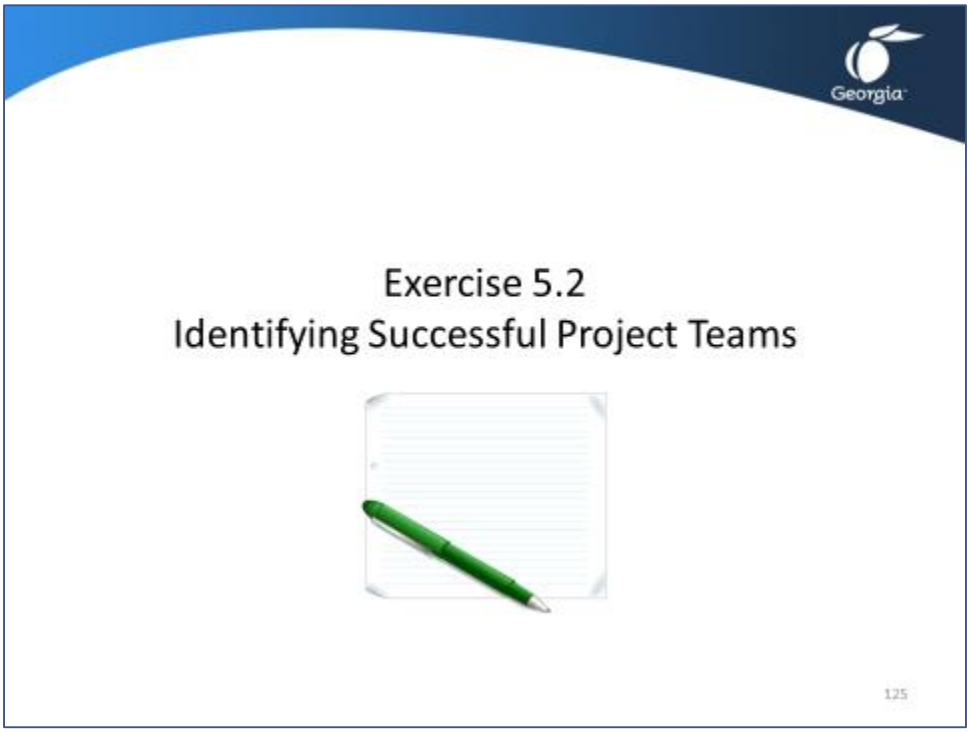
The process of building an effective team is a difficult one because many barriers can arise from many different sources. An understanding of these barriers can help in preempting the problems, while also developing an environment suitable to effective project team building.

Barriers can include the following:

- **divergent outlooks –** team members may have professional objectives and interests that differ significantly from the project objectives.

- **lack of clarity on project objectives –** project teams with unclear objectives or outcomes produce a number of dysfunctional consequences, such as power struggles and destructive conflict between team members
- **team leadership structure –** leadership needs to be clearly defined and structured so that one formal leader exists. This minimizes conflict between informal and formal leaders and reinstates credibility within the team.
- **communication problems –** communication significantly influences effective team development. The following are four levels of communication that need to be maintained:
    - among team members
    - between the project manager and team members
    - between the project team and top management
    - between project manager and client
- **lack of proper support from management –** this might, for example, include lack of resources, unrealistic time constraints, and lack of responsiveness to team issues

Exercise 5.2 Identifying Successful Teams



Exercise Introduction

R. M. Belbin (1981) suggests that teams with high scores on mental ability tests do not perform well in group tasks. He found that they tended to be argumentative, difficult to manage, and destructive in debate. He also found that these teams had difficulty making decisions.
In addition, Belbin found that teams with similar personalities did not perform well. Belbin's work identified eight key roles – listed on the slide – which successful teams need to fill.
More recently, he has added a ninth role: specialist.

Belbin's Self-Perception Inventory

Belbin's inventory was developed as a means of giving group members a simple way of assessing their best team roles. The inventory is set out as an activity – devised by Sullivan, Rice, Rogerson and Saunders (1996) – to help you find out which role would suit any individual.

Activity (to be completed individually at any time)
For each of the questions that follow, distribute a total of 10 points among the sentences that you think best describe your behavior. These points may be distributed among several sentences. You may use all the sentences, or you may give 10 points to a single sentence.

Exercise 5.2 Identifying Successful Teams

Question 1: What can I contribute to a team?		
No	**Option**	**Points**
a.	I think I can quickly see and take advantage of new opportunities.	
b.	I can work well with a very wide range of people.	
c.	Producing ideas is one of my natural assets.	
d.	My ability rests in being able to draw people out whenever I detect they have something of value to contribute to group objectives.	
e.	My capacity to follow through has much to do with my personal effectiveness.	
f.	I am ready to face temporary unpopularity if it leads to worthwhile results at the end.	
g.	I am quick to sense what is likely to work in a situation with which I am familiar.	
h.	I can offer a reasonable case for alternative courses of action without introducing bias or prejudice.	

Question 2: What are some possible shortcomings I have when working on a team?		
No	**Option**	**Points**
a.	I am not at ease unless meetings are well structured and controlled and generally well conducted.	
b.	I am inclined to be too generous toward others who have a valid viewpoint that has not been given a proper airing.	
c.	I have a tendency to talk a lot once the group gets on to new ideas.	
d.	My objective outlook makes it difficult for me to join in readily and enthusiastically with colleagues.	
e.	I am sometimes seen as forceful and authoritarian if there is need to get something done.	
f.	I find it difficult to lead from the front perhaps because I am over responsive to group atmosphere.	
g.	I am apt to get too caught up in ideas that occur to me and so lose track of what is happening.	
h.	My colleagues tend to see me as worrying unnecessarily over detail and the things that may go wrong.	

Exercise 5.2 Identifying Successful Teams

Question 3: How do I get involved in a project with other people?		
No	**Option**	**Points**
a.	I have aptitude for influencing people without pressuring them.	
b.	My general vigilance prevents careless mistakes and omissions being made.	
c.	I am ready to press for action to make sure that the meeting does not waste time or lose sight of the main objective.	
d.	I can be counted on to contribute something original.	
e.	I am always ready to back a good suggestion in the common interest.	
f.	I am keen to look at the latest ideas and developments.	
g.	I believe my capacity for cool judgment is appreciated by others.	
h.	I can be relied upon to see that all essential work is organized.	

Question 4: What is my characteristic approach to group work?		
No	**Option**	**Points**
a.	I have a quiet interest in getting to know colleagues better.	
b.	I am not reluctant to challenge the views of others or to hold a minority view.	
c.	I can usually find a line of argument to refute unsound propositions.	
d.	I think I have a talent for making a plan work once it has been put into operation.	
e.	I have a tendency to avoid the obvious and to come out with the unexpected.	
f.	I bring a touch of perfectionism to any team job I undertake.	
g.	I am ready to make use of contacts outside the group itself.	
h.	While I am interested in all views, I have no hesitation in making up my mind once a decision has to be made.	

Exercise 5.2 Identifying Successful Teams

Question 5: How do I gain satisfaction in a job?		
No	**Option**	**Points**
a.	I enjoy analyzing situations and weighing up all the possible choices.	
b.	I am interested in finding practical solutions to problems.	
c.	I like to feel I am fostering good working relationships.	
d.	I can have a strong influence on decisions.	
e.	I can meet people who may have something new to offer.	
f.	I can get people to agree on a necessary course of action.	
g.	I feel in my element when I can give a task my full attention.	
h.	I like to find a field that stretches my imagination.	

Question 6: How do I respond when I am given a difficult task suddenly, have limited time, and need to work with unfamiliar people?		
No	**Option**	**Points**
a.	I would feel like retiring to a corner to devise a way out of the impasse before developing a line.	
b.	I would be ready to work with the person who showed the most positive approach – however difficult they might be.	
c.	I would find some way of reducing the size of the task by establishing what different individuals might best contribute.	
d.	My natural sense of urgency would help to ensure that we did not fall behind schedule.	
e.	I believe I would keep cool and maintain my capacity to think straight.	
f.	I would retain a steadiness of purpose in spite of the pressure.	
g.	I would be prepared to take a positive lead if I felt the group was not making any progress.	
h.	I would open up discussions with a view to stimulating new thoughts and getting something moving.	

Exercise 5.2 Identifying Successful Teams

Question 7: How do I deal with problems that arise when I am working in groups?		
No	**Option**	**Points**
a.	I am apt to show my impatience with those who are obstructing progress.	
b.	Others may criticize me for being too analytical and insufficiently intuitive.	
c.	My desire to ensure work is done properly can hold up proceedings.	
d.	I tend to get bored rather easily and rely on one or two stimulating members to spark me off.	
e.	I find it difficult to get started unless the goals are clear.	
f.	I am sometimes poor at explaining and clarifying complex points that occur to me.	
g.	I am conscious of demanding from others what I cannot do myself.	
h.	I hesitate to get my points across when I run up against real opposition.	

Interpretation of Questions

To interpret the questions, you should look at the following analysis table. Enter the scores from the points table into the analysis table. Then add up the points in each column to give a total team role distribution score.

Analysis Table

Question		Impl		Chair		Shaper		Plant		Research		Monitor		Team		Finish
1	g		d		f		c		a		h		b		e	
2	a		b		e		g		c		d		f		h	
3	h		a		c		d		f		g		e		b	
4	d		h		b		e		g		c		a		f	
5	b		f		d		h		e		a		c		g	
6	f		c		g		a		h		e		b		d	
7	e		g		a		f		d		b		h		c	
Total																

Exercise 5.2 Identifying Successful Teams

Interpretation of Total Scores

The highest score on team role indicates how best the respondent can make a mark in a project team. The next highest scores denote back-up team roles toward which the individual should shift if for some reason there is less group need for a primary team role. The two lowest scores indicate possible areas of weakness. Rather than attempting to reform in this area, the member might be better advised to seek a colleague with complementary strengths.

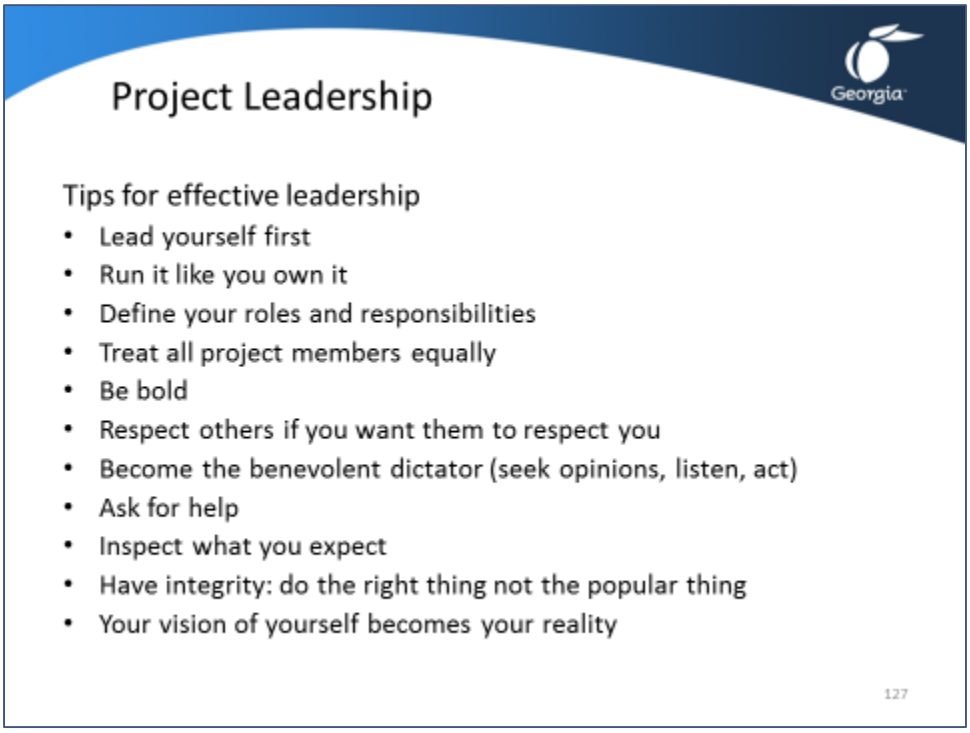
Type	Symbol	Typical features	Positive qualities	Allowable weaknesses
Worker/implementer	Impl	Conservative, dutiful, predictable	Organizing ability, practical common sense, hardworking, self-disciplined	Finds it hard to be flexible and is unresponsive to unproven ideas
Chair/facilitator	Chair	Calm, self-confident, controlled	A capacity for treating and welcoming all potential contributors on their merits and without prejudice	Considers self as "average"
Shaper	Shaper	Outgoing, dynamic	Drive and a readiness to challenge inertia, ineffectiveness, complacency, or self-deception	Prone to provocation, irritation, and impatience
Eccentric/plant	Plant	Individualistic, serious-minded, unorthodox	Genius, imagination, intellect, knowledge	“Up in the clouds”, inclined to disregard practical details or protocol
Researcher/resource investigator	Research	Extroverted, enthusiastic, curious, communicative	A capacity for contacting people and exploring anything new. An ability to respond to challenge	Liable to lose interest once the initial fascination has passed
Monitor-evaluator	Monitor	Pedantic, prudent, objective	Judgment, discretion, hard-headedness	May find it hard to participate fully
Team worker	Team	Socially-oriented, rather mild, sensitive	An ability to respond to people in all situations, and to promote team spirit	Indecisive at moments of crisis
Completer-finisher	Finish	Painstaking, orderly, conscientious, anxious	A capacity for follow through, perfectionism	A tendency to worry about small details. A reluctance to "let go"

Topic 4: Project Leadership

What makes a good leader?

Write down your ideas in the space below.

Topic 4: Project Leadership

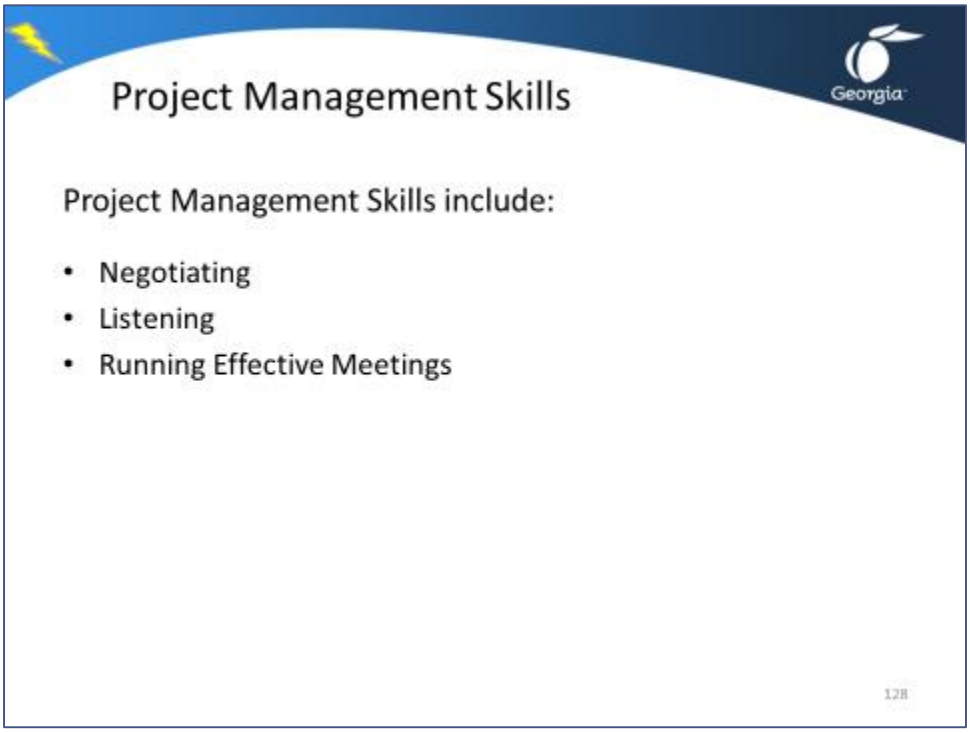


Leadership Tips for Promoting Project Success

- It's not about the ability of those around you to lead; it's about your ability to lead, in spite of what is happening around you.
- Mind your own business first. Behave as if you own the business and your business is defined by your domain of responsibility. This not only serves to strengthen your behavior and effectiveness, but, if everyone behaves similarly, your company greatly benefits as well.
- Define your roles and responsibilities and obtain agreement from your boss. You are far more likely to rise to expectations when those expectations are clearly defined. We achieve according to that which we are measured.
- Treat all project members equally. A project suffers when preferential treatment is given to any group or person – whether they are clients, vendors, contractors, or company employees.
- Boldness. You cannot be a consistently effective leader if you don't have it. The person who consistently displays bold behavior will far out-perform the person with similar knowledge and experience who does not. Bold behavior includes doing what is necessary, within legal and ethical parameters, to accomplish your job.
- Become a benevolent dictator. A benevolent dictator leads, first, by actively soliciting information and opinions from team members and others; second, by listening; and third, by demonstrating the leadership, courage, and boldness to personally make the right decision and then standing accountable for that decision.
- Practice the Golden Rule. Doing unto others as you would have them do unto you is the best time-tested behavior to adopt while performing on projects.
- Perform post-project reviews and ensure that resulting lessons are applied to new projects. Lessons cannot be considered "learned" until they have been appropriately adopted.

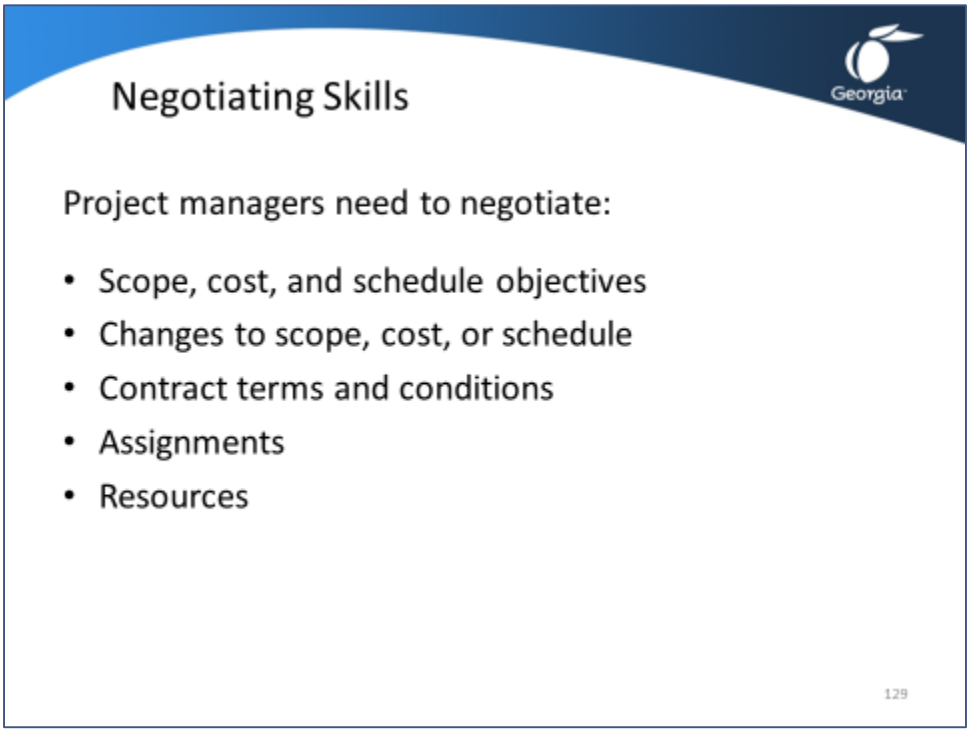
- Seek out a mentor. There is no better way to learn than by having a mentor who has been there, done that, messed up, and learned from it. A mentor's advice can positively impact your career and help protect your projects.
- Ask for help or become part of the problem. Asking for and obtaining help is a sign of professional maturity, not weakness. It sends the signal that you take pride in your work and care about the success of the project.
- For consistent success, focus on your top three priorities each day rather than your bottom 30. The top problems of a project are the areas that can cause the most harm. They must be effectively dealt with according to the urgency they require.
- Inspect what you expect. Don't "trust" that things are progressing smoothly or will work out okay on their own. Plan, measure and, if necessary, mitigate it.
- Don't delay or avoid escalating issues that are at an apparent impasse; escalations are a healthy and essential part of business. If you and another project member are unable to see eye-to-eye, then after an earnest attempt to negotiate a resolution without success, you must call on higher levels of project leadership for help.
- The No. 1 reason why leaders fail is that they are too soft. If you are too soft, your stakeholders will not learn effective behavior. Nor will they respect you. Projects fail because their leaders fail.
- It's not about being liked but rather about doing the right thing. It’s called integrity.
- You are what you perceive yourself to be. Your vision of yourself becomes your reality.

Topic 5: Project Management Skills



You'll recall from Lesson 1 that there are certain general management skills – "soft" project management skills – which project managers require, including the ability to negotiate, listen, and run effective meetings.

Topic 5: Project Management Skills



Negotiating

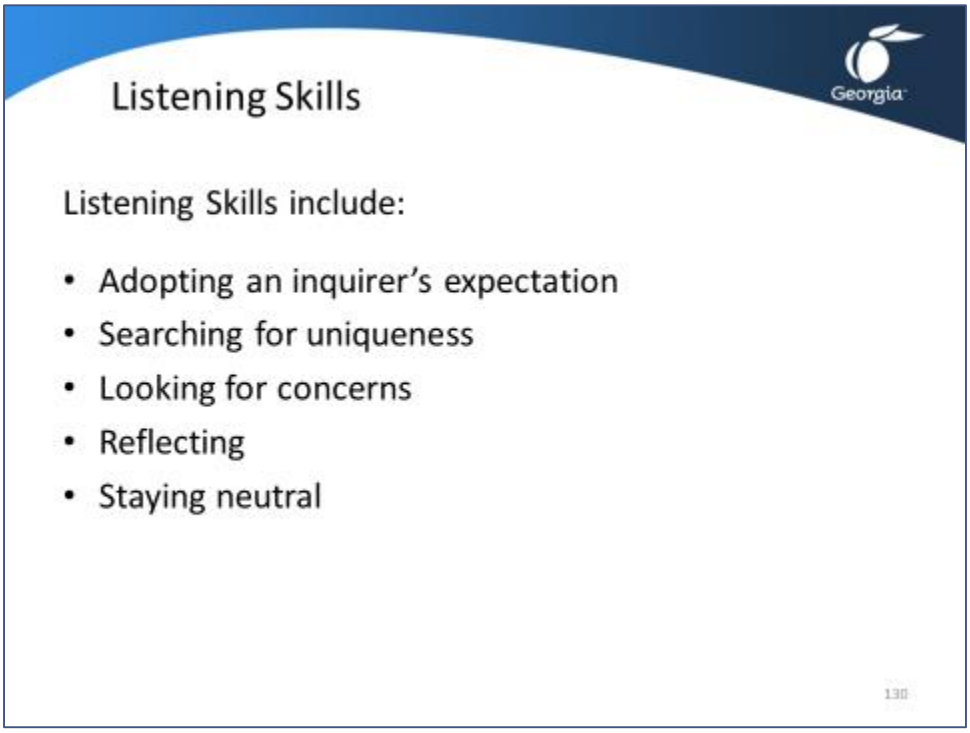
Remember that negotiating involves conferring with others to reach an agreement or arrangement. Agreements may be negotiated directly or with assistance, such as through mediation or arbitration.

A project team is likely to negotiate some or all of the following in the course of a typical project:

- scope, cost, and schedule objectives
- changes to scope, cost, or schedule
- contract terms and conditions
- assignments
- resources

Remember also that project managers face a triple constraint – project scope, time, and cost – when trying to negotiate about competing project requirements. Project quality depends on the balance between these three constraints. High quality projects deliver required results within scope, on time, and within budget.

Topic 5: Project Management Skills



Listening

Listening is both the most important and the most neglected part of communication. It is important because without it, communication does not happen. The most articulate speaker can run aground trying to deal with someone who does not listen, and the good listener will extract meaning from incoherence. Although communication depends on both parties, only the listener can evaluate whether it has worked.

Good listeners have acquired a set of behaviors that they can carry with them into any situation to improve the quality of their listening:

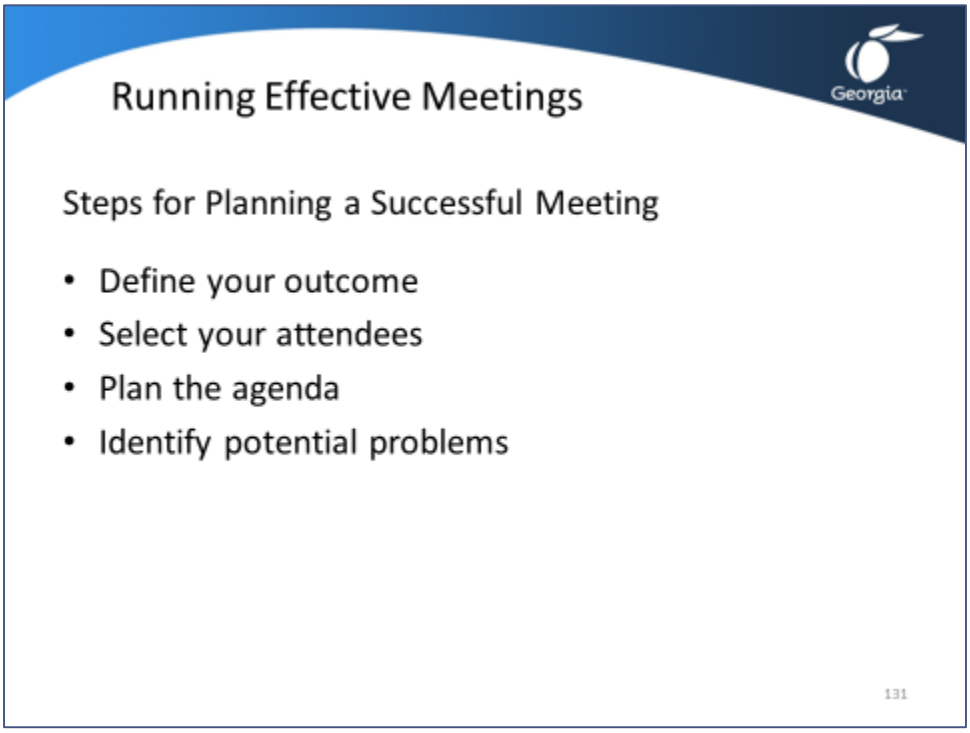
- **Adopt an inquirer's expectation: You take many expectations with you when you meet someone. For example, you might expect to be bored because you have heard this problem before and understand it already. In this case, the only reason you meet might be political. Or you might expect the other person to be defensive about your proposal or attempt to impose a solution that you already know will not work.**

- **Search for uniqueness: We are a species of classifiers. We look for, and usually find, similarities in all situations that confront us. This is one of our strengths – we call it learning. However, there is a risk that we will decide too quickly that "we have seen this before" and begin to act without recognizing where the situation is different.**

- **Look for concerns: Everybody you speak to has concerns. If you do not hear them and respond to them, people will repeat them in different ways until you, and they, are exasperated.**

- Reflect: Listening is an active process (hence, the redundant term "active listening") because it requires you to extract meaning from someone else. The most effective listening behavior is to “reflect back” to the speaker what you think you have heard.

- Stay neutral: We value involvement and the sense that there is another person hearing us and responding, and we tend to adapt our behavior to the feedback we get. When we see a frown or a tightened face, we back off. When we receive a smile or a bright expression, we push forward. We have learned to become sensitive to nonverbal signals and to direct our conversation accordingly.



Running Effective Meetings

One of your goals as a project manager should be to conduct meetings that your people will await with expectation, join with enthusiasm, and leave with satisfaction.

Three types of meetings are

- presentations to disseminate information
- information-gathering meetings that seek answers to specific questions
- problem-solving meetings that attempt to solve a problem or address an opportunity

Of these three types, problem-solving meetings are the most complex to run because they require attendees to present opinions and defend positions. Problem-solving meetings can be either closed or open.

In a closed meeting, the leader presents the problem or opportunity, gives alternatives and their advantages and disadvantages, and makes a recommendation. The job of the attendees is to pick one of the solutions. Sometimes, the recommendation is a so-called “straw man” that the attendees are expected to challenge and reconstruct.

In an open meeting, the leader presents the problem or opportunity and leaves it to the attendees to define the alternatives and craft a solution.

Holding open meetings – with their apparent virtues of democracy, participation, and creativity – has become the “correct” way to conduct meetings. However, the often-reviled closed approach is, in fact, more effective in solving most of the problems you will encounter on a project.

Open problem solving is suited to larger issues, such as corporate mission or strategy, or for problems that appear unique and intractable. Closed problem solving is better for operational problems where there are a few well-understood alternatives.

Before you agree to lead or participate in an open problem-solving meeting, ask yourself the following questions: Has this problem been dealt with before? Are there reasonably well-defined solutions to the problem? Could I come up with a satisfactory answer by meeting with one or two people privately?

If the answer to all three questions is yes, you don't need a meeting. Above all, you should not let team members avoid their responsibilities for solving problems by suggesting that they get together to brainstorm a creative solution.

The following are four possible steps to planning a successful meeting:

1. Define your outcome: What do you want the meeting to achieve, and what will constitute success? If you cannot state clearly why you are there, nobody else will be able to. When people do not understand the purpose of a meeting, they do not quietly await clarity – they impose their own purposes. The outcome of a meeting should be properly framed. That is, it should be specific, measurable, achievable, respective of values, and timely.

2. Select your attendees: Who needs to be there? You should make sure that you invite only those who, by virtue of their knowledge or position, can contribute to the outcome. You need to invite the 20 percent of the people who can handle 80 percent of the issues and then fill in the missing 20 percent later. If you think you may need detailed information or a quick decision from people who are not major participants, you should have them on standby, but respect their time.

3. Plan the agenda: Meetings in which the leader starts by requesting agenda items from the audience are doomed to failure. You should start the meeting with a clear agenda, which you can hand out or write on a board or flip chart. The agenda is open for discussion, and some people may request that items be added, but it is rare that attendees reject an agenda.

   Three items that must accompany each agenda are introductions, objectives, and other issues:

   - Introductions are made so that the attendees will know one another, as well as to provide the rationale for each person's presence.
   - The objectives of the meeting are as important for the attendees as for the leader. Everyone must know what is necessary for success and must be committed to working for it. Therefore, your second agenda item is to present the objective and to get agreement on it.
   - A planned discussion period at the end lets people know that there will be time for them to present any other issues that are relevant. In practice, most of the discussion will have taken place before the end of the meeting, but the presence of "other issues" on the agenda reassures the participants that there wil1 be an opportunity for a complete discussion.

   When you are planning an agenda, you should time it. If the meeting includes some presentations, you should make sure that the presenters know what their time limits are and that you will enforce them. You need to know, throughout the meeting, whether you are proceeding on time.

4. Identify potential problems: Where is the meeting likely to flounder? Are there contentious issues that wil1 spark prolonged debate? Are there personalities that wil1 clash or people who will try to dominate the meeting? If you can identify these problems in advance, you can minimize the chances that you will be blindsided in the meeting itself.

Lesson 5 Summary: Learning Objectives Recap

- **Delineate the organizational influences that impact projects**
  Organizational structures span a spectrum from functional to projectized, with several matrix structures in between.

- **Identify the characteristics of effective project teams and barriers to building effective project teams**
  Effective team characteristics:
  - high levels of commitment
  - innovative and creative
  - conflict resolution
  - effective communication
  - cooperative spirit
  - make decisions
  - empower team members

  Barriers:
  - divergent outlooks
  - lack of clarity on project objectives
  - team leadership structure
  - communication problems
  - lack of proper support from management

- **Describe the leadership qualities necessary for project success**
  - Your ability to lead, in spite of what is happening around you.
  - Mind your own business first.
  - Define your roles and responsibilities and obtain agreement from your boss.
  - Treat all project members equally.
  - Boldness.
  - Become a benevolent dictator.
  - Practice the Golden Rule.
  - Perform post-project reviews and ensure that resulting lessons are applied to new projects.
  - Seek out a mentor.
  - Ask for help or become part of the problem.
  - For consistent success, focus on your top three priorities each day rather than your bottom 30..
  - Inspect what you expect.
  - Don't delay or avoid escalating issues that are at an apparent impasse; escalations are a healthy and essential part of business.
  - The No. 1 reason why leaders fail is that they are too soft.
  - It's not about being liked but rather about doing the right thing. It’s called integrity.
  - You are what you perceive yourself to be. Your vision of yourself becomes your reality.

- **Outline the skills that a project manager requires in a team environment**
  negotiate, listen, and run effective meetings.

Notes

Case Study – Speedy Office Supplies Web Expansion Project

Company Overview

Speedy Office Supplies, led by founder and CEO Sam Speedy, has been in business for 30 years and is recognized as the leader in discount office supplies. We have a reputation of providing high quality products at reasonable prices and offering superior customer service. We are selling to corporate clients, governmental agencies, and individuals nationwide. Our customers are served by over 40,000 employees through direct sales, catalogs, e-commerce and more than 2,000 stores. Eighty percent of our business is currently done in our 2,000 retail stores with total annual sales of 700 million dollars.

Business Objectives

Objective Number	Business Objective	Strategic Objective
1	Increase sales by 30% over the next 5 years	Increase sales
2	Reduce overhead costs by 40% over the next 5 years	Reduce cost
3	Expand customer base by 25% over the next 5 years	Increase market share
4	Innovate internal systems and processes within 2 years	Increase effectiveness

Problem Definition

Over the past five years the Retail Store Division has shown a steady decline in sales from 900 million dollars to the current 700 million dollars, a 22% decline; energy costs have increased by 30% for our fleet vehicles and retail stores; employee health care costs have increased by 75% and continue to rise due to federal regulations.

Market trends and customer preferences are indicating that customers desire the ability to order their products on-line at times convenient to them. The SOS management team believes if we phase-out or reduce the number of stores in the Retail Store Division and implement a web-based ordering system and consolidation of our distribution network, we anticipate a savings of nearly 10 million dollars per year. This system would also need to integrate into the existing legacy supply chain systems. Customer satisfaction surveys also indicate a favorable reaction to the concept of web-based sales, which could increase our current sales by at least 30% over the next 5 years, which will put SOS back on track to reach financial goals.

Current State

Currently orders for products are received via in-store requests, phone calls, or catalog mail-in from customers. We access our online system to check inventory, prices, and estimated shipping dates. If the order total is over $10,000 we turn it over to a supervisor. We then call the Credit Card Authorization Company to check the customer's credit card account. If the credit card charge is authorized we enter the order into the system. The current system is an old mainframe application and is very cumbersome.

There are purchasing agreements, special discounts, and payment terms for our clients purchasing over $50,000 per year. In the past, we have billed these customers on a monthly basis, providing them with a detailed listing by location of their purchases. We want to make it easier for them to pay via credit card each time they place an order to increase our cash flow and lower our Accounts Receivable. If possible, we still want to provide select customers the same reporting on a monthly basis for their purchases by location.

Federal Express and UPS are currently bidding on the exclusive rights for delivery of all customer office supplies. Each company is proposing an online interface to track shipments, including the name of the person who signs for the delivery. The shipment will need to have a label and detailed purchase order slip with the package. The cost of shipping is determined by the size of the package, weight, location, insurance, and timeliness of delivery. The customer will need an accurate shipping cost at the time of purchase.

Project Proposal

Based on this information SOS management is considering a decision to close or reduce the number of the brick and mortar stores within 18 months. We believe this decision will significantly cut costs and that we can be just as successful selling our products on our website.

Our main focus for this project is to create the shopping experience for our retail customer on the website and to place product orders on the Internet. We want to have real time information regarding product description; quantities; pricing; availability; payment processing; shipping method options with associated costs; delivery date; and order tracking. All information currently available at the retail stores and in the catalogs should be available and consistent with the Internet.

It would be nice if there were a place on the Internet for the customer to build a profile and store frequently purchased items in a list to use for future purchases. This would be very beneficial for large organizations that purchase the same products frequently.

We envision using our existing customer number and allowing each customer to create a password to ensure security. Anyone could look at the products online, but only registered customers would be allowed to place orders. The web site should have search ability by several options: product item number (from the catalog), product type, color, and size.

Hopefully when a customer places an order the software would quickly calculate a shipping charge and present the order total to the customer. We would not allow orders totaling more than $1,000 to be placed on the web. The software should also email a confirmation to the customer if requested.

Project Objectives

Project Objective	Project Objective Description	Business Objective
1	Provide a web-based order entry system	1, 2, 3, 4
2	Close or reduce retail stores	2, 4
3	Create distribution centers from some existing stores	2, 4
4	Provide superior shopping experience on web site	3

A feasibility team was formed and evaluated the business and project objectives to establish detailed specifications around the structural aspects of the project. The company also allocated a budget to invest in highly capable individuals who could provide a complete structural solution.

Project Implementation

Specialists recruited by the feasibility team subsequently presented a work breakdown structure (WBS) for the project as seen below, which subdivides the project work into the major elements and then their sub-elements. For example, a major element of work is the web-based order entry system work, which is subdivided into five sections. These sections include customer profile, search and scan products, ordering products, order billing and shipping, and integration to legacy system.

- WBS level 1 – Program/Phase: vision of the end product
- WBS level 2 – Project: the project's major deliverables
- WBS level 3 – Project units: the main work packages associated with each deliverable
- WBS level 4 – Further decomposition of Project units

The specialist team proposed that once the contracts are identified, the project could then be outsourced to different contractors.

Project Management

The feasibility team has proposed that a dedicated project management team be established within Speedy Office Supplies. The team would have total control over budgets and schedules and would report directly to the CEO.

The control, planning, and management of the project present complex logistical issues. The scheme may entail numerous individual contract packages, which will require coordination.

At a very early stage, the feasibility team settled the key project management objectives as

- effective and efficient communication of information
- utilization of thorough project control techniques
- efficient and widely understood procurement and contractor processes

This standardization is necessary to ensure that all contractors are working in unison. To furnish timely and accurate cost reports, the project control team needs a comprehensive system that integrates cost and schedule, provides reporting capabilities consistent with the project requirements, and improves operating efficiency.

The system has to be capable of processing and analyzing a vast amount of incoming monthly cost data quickly and accurately. Also, the team could use integrated systems to perform risk and schedule simulation analysis where the relationship between the schedule and cost is not always clear.

Although technology has simplified data collection and scheduling, the feasibility team has identified that professionals must carefully study and analyze the system output to provide a logical, meaningful explanation of the causes of any cost and schedule variances. In this way, sound project control methodologies reduce cost overruns, control cost growth, help meet project schedule objectives, and ultimately satisfy the client's expectations.

Feasibility Report

The feasibility team completed their study on schedule with an outline of strategy, detailed recommendations, and a list of preferred suppliers.

The main outcomes from the team are the following:

- The web-based order entry system should be piloted in one region. Based on the relative success of the pilot and after a period of "customization", the initiative can be deployed in other areas.
- Contractor participation is a key aspect to the success of the project, and Speedy Office Supplies should establish and work with a set of preferred suppliers.
- Speedy Office Supplies should establish a detailed project management office that has the authority to manage and control the project and report to senior management.

The feasibility team gave the green light for the project, based on these recommendations.

Internal Stakeholders

The **Marketing Department** is responsible for customer reporting and the negotiations for preferred customer status including volume discounts. Our largest customers receive one monthly bill for all their departments' purchases and a report showing the detailed purchases. Additionally, marketing maintains the customer profiles, which are used to process orders, verify billing information, discounts, and reduce redundancy by eliminating the need for the customer to always enter their company information.

The **Customer Service Department** will need access to all information regarding customer orders to assist with the web site usage and handle any possible complaints.

Accounts Receivable is responsible for processing and sending bills to our preferred customers. The web ordering system will need to notify accounts receivable when one of our preferred customers request their order to be direct billed. Some customers have negotiated payment terms and discount rates based on volumes. They work with the Collections Department for any outstanding receivables beyond 90 days. On a monthly basis Accounts Receivable produces an aging report.

Inventory Management is impacted by a reduction in inventory from placed orders and an increase in inventory from cancellations and returns. They are responsible for managing the inventory and placing orders with vendors. Inventory Management is also responsible for handling returns, including items that have to be returned to the suppliers as defective.

Order Fulfillment receives an order notification from the order processing system containing all necessary information required to assemble the order. They are responsible for producing the packaging slips, retrieving the supplies, assembling the order into a bin or crate, and delivering the order to the Shipping Department.

The **Shipping Department** receives the order from fulfillment and prepares the order for shipment. The packing slip contains the shipping method requested by the customer and the estimated shipping timeframe. The Shipping Department is responsible for notifying the shipping company and updating the order status.

The **IT Department** manages and maintains a legacy supply chain system on mainframes at the corporate offices. Each retail store maintains its own sales and inventory on local servers that are integrated to the mainframe via communications lines. Sales and inventory data are downloaded nightly in batches to update corporate databases on the mainframe.

The **Employees** working in the retail stores. These may include stock clerks, cashiers, customer support, back office warehouse, drivers, and store managers. These employees will be directly impacted by a decision to close retail stores or consolidate them into distribution centers.

External Stakeholders

The **Shipping Company** currently has an online tracking system. Our web ordering system will have a direct link to the shipping company's web site for the customer to track packages using the tracking number provided by the Shipping Department to the order status system.

The **Credit Card Processor** currently authorizes customer purchases made in the stores, over the phone, or via fax. An additional interface will need to be established between the web application to receive the customer and order information and to return an authorization code.

The **Customers** ordering from the retail stores and from the web site. These customers will be directly impacted by a decision to close or limit the number of retail stores and purchasing goods via the web site.

APPENDIX I - EXERCISE ANSWERS

Exercise 1.4 Identifying the Knowledge Areas

Consider the Project Management Knowledge Areas that we just discussed and answer the following questions.

1. You are the project manager on the new driver's license upgrade project. You want to create the project's communications plan, which falls in what Knowledge Area? Project Communications Management
2. If you want to engage individuals or organizations that might be impacted by your project, what Project Management Knowledge are would you use? Project Stakeholder Management
3. As the project manager, you have identified several uncertainties about the project. What process have you just completed? Identify Risks. This process is also in the Project Risk Management Knowledge Area.
4. Your project is running well and making progress according to schedule. A major stakeholder comes by your office and asks if it is okay to add 5 pieces of new information to the services request form you are working on. What process should you use to deal with this request? Perform Integrated Change Control. This process is in the Project Integration Management Knowledge Area.

Exercise 2.1 Project Life Cycles in Practice

Assume that the Speedy Office Supply management has sanctioned the web-based order entry project. You are part of the assembled dedicated project management team. You need to perform the following initial tasks:

1. re-establish the project objectives
2. identify a set of critical success factors that will guide the project
3. evaluate a high-level project structure

Project Objectives

Project Objective	Project Objective Description
1	Implement a web-based order entry system to one pilot region
2	Phase-in the closing of 90% of the retail stores
3	Create distribution centers from some existing stores
4	Provide superior shopping experience on web site
5	Establish enterprise level PMO to coordinate project activities
6	Establish preferred list of suppliers and contractors

Critical Success Factors

Critical Success Factors
Identify detailed customer requirements
Procure qualified suppliers for application and infrastructure
Internal stakeholders must be supportive of project objectives
Open and honest communication regarding store closings to employees
Identify all data interface points from new system to legacy systems

Project Structure

WBS Level	Description
1	Web-based order entry system
1.1	Planning
1.2	Design
1.3	Construct
1.4	Test
1.5	Implement System
1.6	Close phase
2	Close or reduce retail stores
3	Remodel selected stores into distribution centers
4	Provide superior shopping experience on web site

Exercise 3.1 Identifying Project Process Groups

Review the matrix above and the Process Group diagrams in this lesson to answer the following questions.

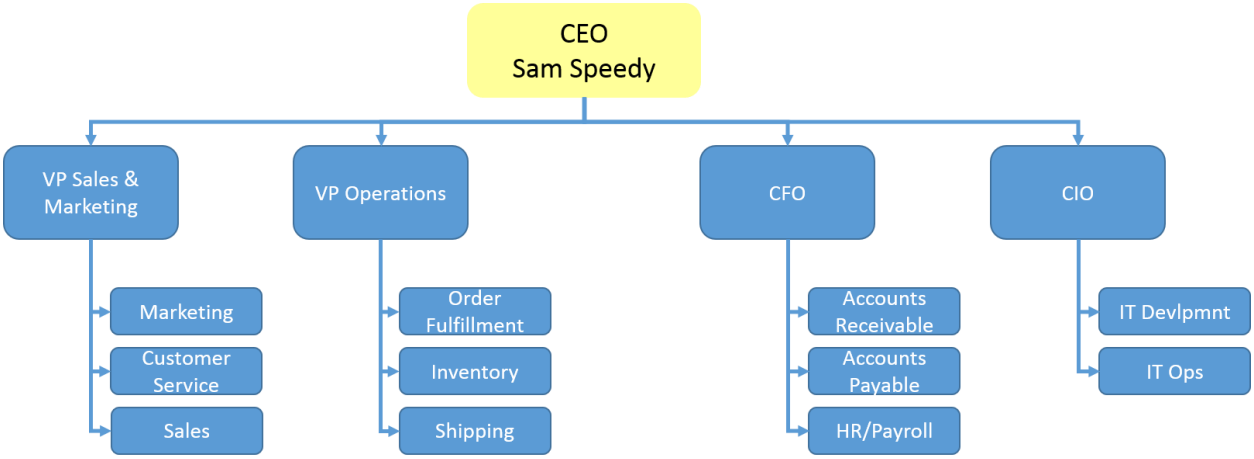
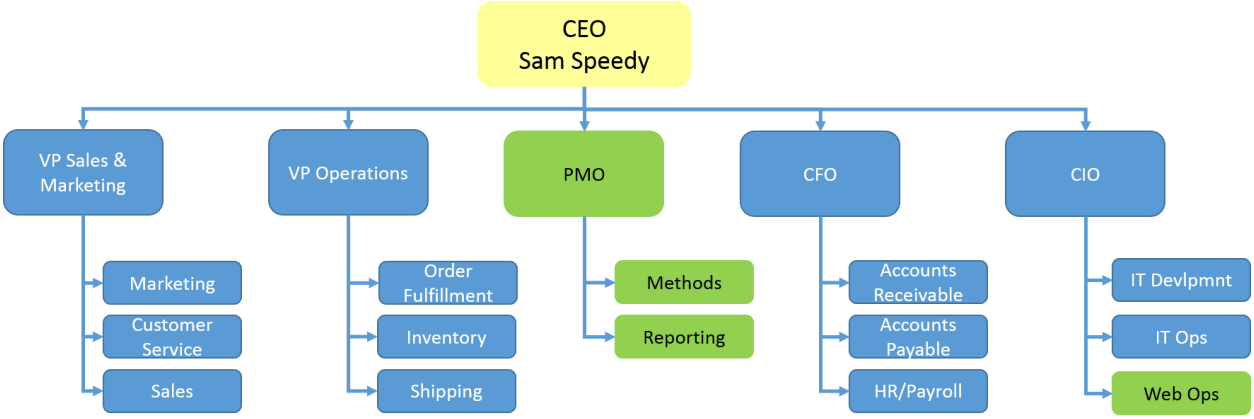
Number	Question	Answer
1	If you want to begin to “Collect Requirements”, which process or processes should you complete before doing that?	Develop Project Charter Identify Stakeholders
2	“Validate Scope” is part of what Process Group?	Monitoring and Controlling
3	I am starting “Estimate Activity Durations”. What process should I have completed?	Estimate Activity Resources
4	The “Direct and Manage Project Work” process is in what Knowledge Area?	Project Integration Management
5	After completing the “Identify Risks” process, which process should follow?	Perform Qualitative Risk Analysis
6	In what Process Group would you perform the “Conduct Procurement” process	Executing Process Group

Exercise 4.1 Identifying Knowledge Areas

Using the information provided in the Case Study and the table on the following page create a high-level Work Breakdown Structure.

WBS Level	Description	Inputs	Outputs (goals)
1	Web-based order entry system		
1.1	Planning	Stakeholder Register Project Charter	Requirements documents WBS
1.2	Design	Requirements documents WBS	Project plan and Schedule Performance baseline
1.3	Construct	Project plan and Schedule Performance baseline	Performance Reports Project Deliverables
1.4	Test	Requirements documents	Validated deliverables
1.5	Implement System	Validated deliverables	Delivered system
1.6	Close phase	Project documentation	Archives Lessons Learned

Exercise 5.1 Organizational Influences

Exercise Instructions

Review the Case Study and depict the organizational structure of Speedy Office Supply, Inc. Also recommend how Speedy Office Supply could implement a PMO and where in the organization it might reside.