Project Management – Basic Concepts

Topic # 1

Chapter 1 – PMBOK, Schwalbe

Chapter 1, 2 – Reference Material

PM Profession

- Professional Organization
  - PMI (pmi.org) – Project Management Institute
  - SEI – Software Engineering Institute
  - IEEE Software Engineering Group
- Certification
  - PMI PMP
- The "PMBOK" – Project Management Body of Knowledge

PMI

- PMI stands for the Project Management Institute, and is a not-for-profit professional membership association for project managers and program managers.
- PMI was started in 1969, and now has a membership of more than 680,000 and serves more than five million professionals around the globe.
- The Project Management Institute is the organization that gives out the PMP (Project Management Professional) credential, a globally recognized certificate that assures employers that a person is trained and qualified to manage projects.
- PMI is also the organization that oversees the documentation of the Project Management Body of Knowledge (PMBOK) within the PMBOK Guide.

Project Attributes & Project Manager

- Project has a unique purpose
- Project is temporary
- A project is delivered using progressive elaboration
- A project requires resources, often from various areas
- A project should have primary customer or sponsor
- A project involves uncertainty

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

What are Projects?

- A **project** is a temporary endeavor undertaken to create a unique product, service, or result.
- A project can create:
  - A product that can be either a component of another item, an enhancement of an item, or an end item in itself;
  - A service or a capability to perform a service
  - An improvement in the existing product or service lines ; or
  - A result, such as an outcome or document

Project Types

- Software development
- ➢Software integration
- Database deployments
- Product development
- Product Innovation/Specialization
- Acquisitions
- Process Improvement

For Example!

IT Project

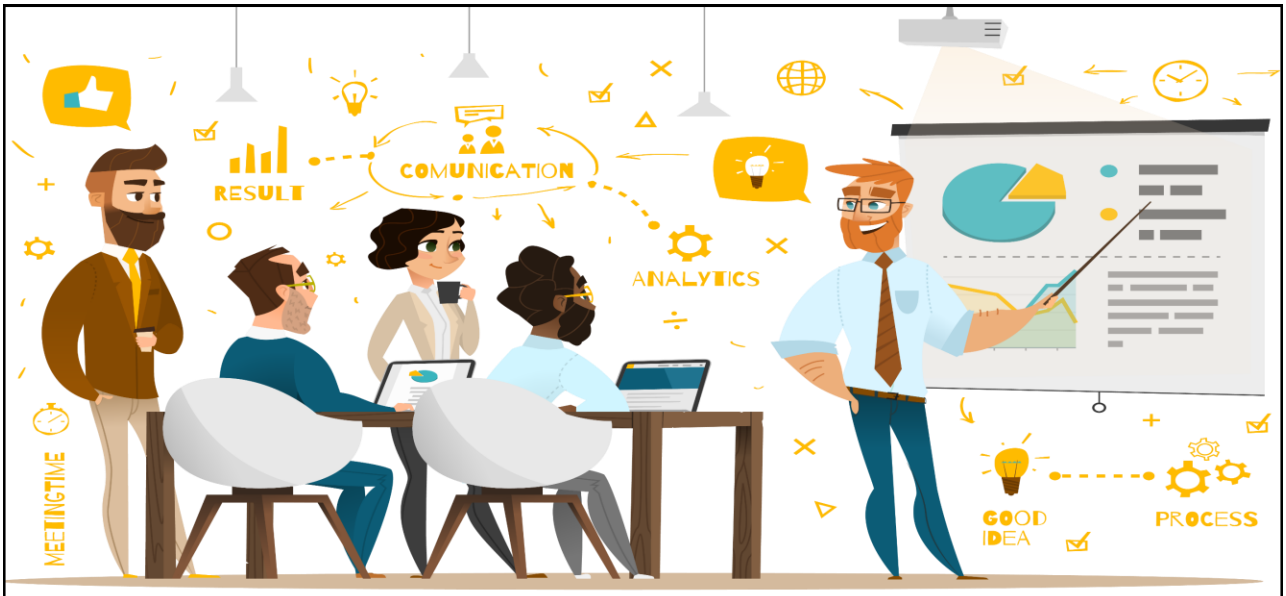
1. A team of students creates a smartphone application and sells it online.
2. A company develops a driverless car.
3. A small software development team adds a new feature to an internal software application for the finance department.
4. A college upgrades its technology infrastructure to provide wireless Internet access across the whole campus.
5. A company develops a new system to increase sales force productivity and customer relationship management that will work on various laptops, smartphones, and tablets.
6. Internet of things: Internet usage will expand as sensors are added to physical items that are connected to the Internet. For example, Near Field Communication allows users to make payments, board airplanes, and perform other tasks by placing their phones in front of a reader
7. A large group of volunteers from organizations throughout the world develops standards for environmentally friendly or green IT.
8. Government regulations require new reporting of commercial business data for a manufacturing company.

Software Projects v/s Other Projects

- Are Software Projects different??

Not really! …but…

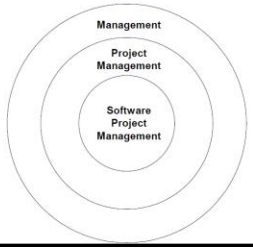
- Invisibility: With software, progress is not immediately visible
- Complexity: Per dollar, software products contain more complexity than other engineered artefacts
- Conformity: Software developers have to conform to the requirements of human clients
- Flexibility: Software systems are particularly subject to change



Project Management

Software Project Management

- **Management** is the organization and coordination of the activities of a business in order to achieve defined objectives.
- **Project management** is the practice of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria at the specified time.
- **Software Project Management** is a sub-discipline of project management in which software projects are planned, implemented, monitored and controlled.



- Managing a project typically includes, but is not limited to:
  - Identifying requirements;
  - Addressing the various needs, concerns, and expectations of the stakeholders in planning and executing the project;
  - Setting up, maintaining, and carrying out communications among stakeholders that are active, effective and collaborative in nature;
  - Managing stakeholders towards meeting project requirements and creating project deliverables;
- Balancing the competing project constraints, which include, but are not limited to:
  1. Scope
  2. Quality
  3. Schedule
  4. Budget
  5. Resources
  6. Risks.

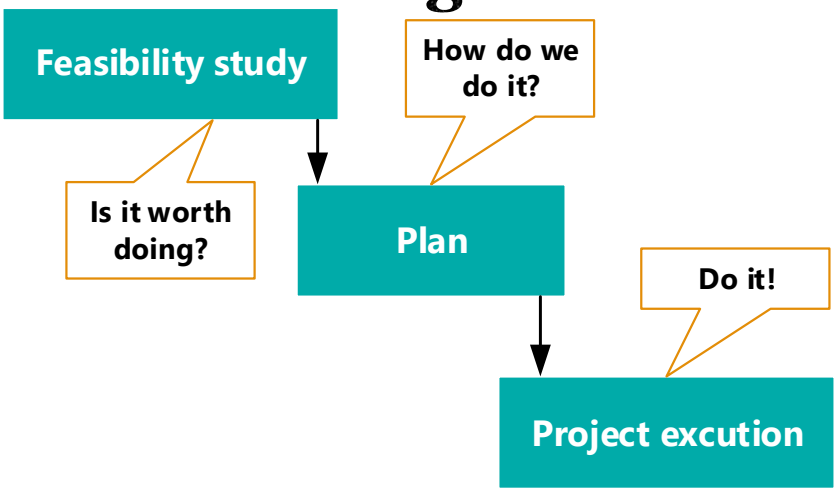
Importance of Project Management

- Question of Money: A lot of money is at stake with ICT projects.
- Unsuccessful Projects: Studies show that only one third of software projects were proved to be successful.
- Reason: Most often – the management of software projects.

What is SPM?

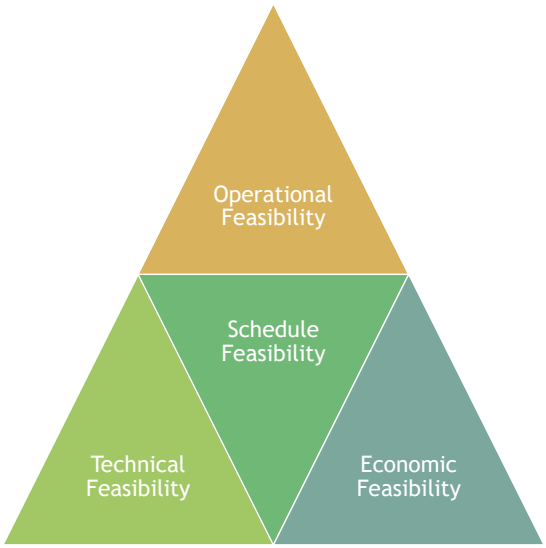
- Maintain flow
- Manage outcomes (Deliverables)
- Use tools and techniques
- Improve operation
- New requirement
- Aim is to achieve all the objectives remaining in its define constraint.

Activities leading success



Three successive processes

Feasibility Study



Feasibility Study

Technical feasibility
- Is the project possible with current technology?
- What technical risk is there?
- Availability of the technology

Schedule feasibility
- Is it possible to build a solution in time to be useful?

Economic feasibility
- Is the project possible, given resource constraints?
- What are the benefits?

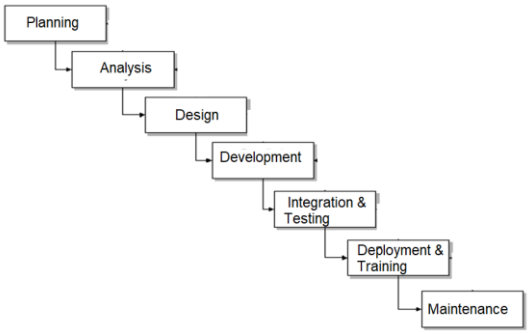
What are developement & operational costs??

Operational feasibility
- If the system is developed, will it be used?
- Human and social issues…

SOFTWARE DEVELOPMENT LIFE CYCLE

SDLC

- Software Development Life Cycle (SDLC) is a process used by the software industry to design, develop and test high quality software.
- It consists of a detailed plan describing how to develop and maintain software.
- SDLC consists of many activities/ phases.
- Following are the major phases of SDLC.
  - Planning
    - System &Feasibility study
    - Planning for new system
  - System analysis
  - System design
  - Implementation
    - Coding & Testing
    - Deployment & Training
  - Maintenance



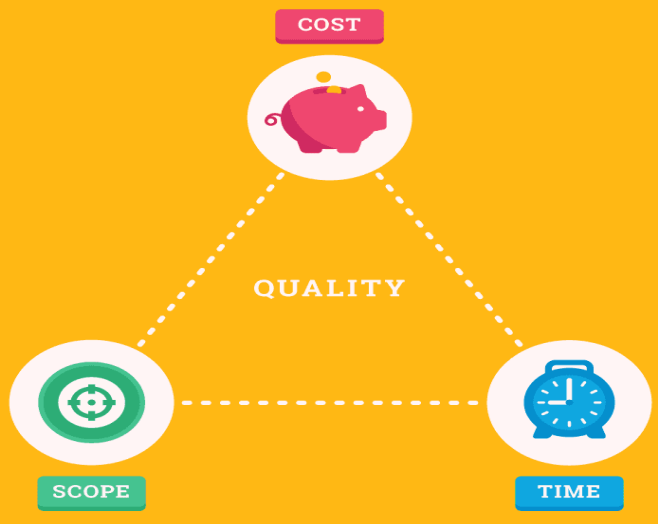
What are guidelines for system development?

Arrange tasks into phases (groups of activities)

Involve users (anyone for whom system is being built)

Develop clearly defined standards (procedures company expects employees to follow)

Project	Operations
Performed by people	Performed by people
Constraint by limited resources	Constraint by limited resources
Planned, executed, and controlled	Planned, executed, and controlled
Projects are temporary and unique	***Operations are ongoing and repetitive***
Projects are different from operations in that they end when their objectives have been reached or the project has been terminated	***Ongoing operations have the opposite characteristics of projects. It is the work done in the organization to sustain the business***



Project Triple Constraints

Constraint Change	Required Adjustment Alternatives (One or Combination of Both)	
Shorter Time	Higher Cost	Reduced Quality or Narrowed Scope
Reduced Cost	More Time	Reduced Quality or Narrowed Scope
Higher Quality or Increased Scope	More Time	Higher Cost

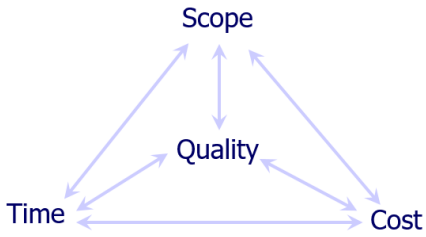
Increased **Scope** = increased time + increased cost

- Tight **Time**= increased costs + reduced scope
- Tight **Budget**= increased time + reduced scope.

Traditional Project Management Constraints

- **Every project has 3 constrains**
  Scope goals: What work will be done?
  Time goals: How long should it take to complete?
  Cost goals: What should it cost?

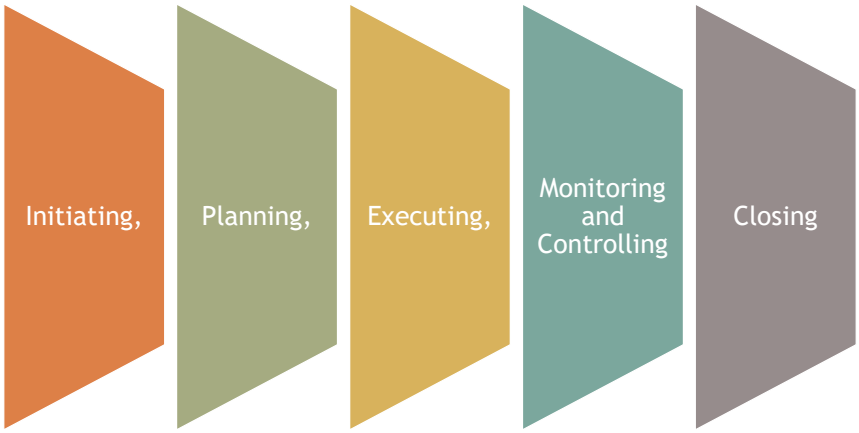
- We may add Quality as a 4th constraint:
  The **Quadruple** constraint **=**The **Triple** constraint **+Quality** constraint – Quality is the key factor for project success.

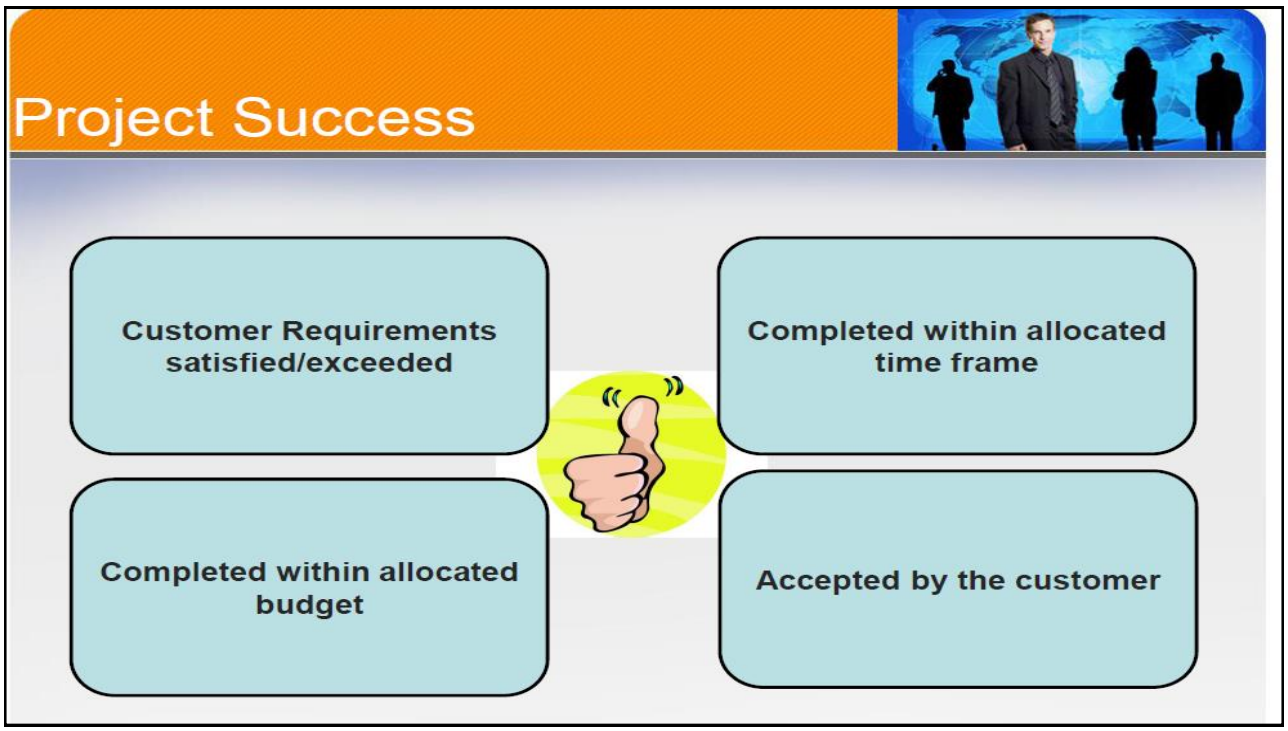


Triple Constraints … Quadruple Constraints

- Time constraint may lead to **less quality** because of:
  - Less time for analysis, planning, reviewing, checking, monitoring, control
- Cost constraint may lead to less quality because of:
  - Hiring less skilled people,
  - Getting less quality resources
  - Ignoring some customer requirements
- Scope constraint may lead to less quality because of:
  - Scope limitations may lead to ignore some customer requirement shortcuts

- Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.
- These five Process Groups are integrated and applied by PM:





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Project Failure

- Scope Creep
- Poor Requirements Gathering

- Unrealistic planning and scheduling
- Lack of resources

Project Failure Causes

Failure to establish upper-management commitment to the project	Lack of organization's commitment to the system development methodology	Taking shortcuts through or around the system development methodology	Poor expectations management
Premature commitment to a fixed budget and schedule	Poor estimating techniques	Over-optimism	Inadequate people management skills
Failure to adapt to business change	Insufficient resources	Failure to "manage to the plan"	Communication Gaps

Project Stakeholders

- Project stakeholders are individuals and organizations that are actively involved in the project or whose interest May be affected as a result of project execution or project completion
- Important to identify the stakeholders:
  - Who the stakeholders are
  - What role they will play
- **Two groups of stakeholders**
  - **Internal stakeholders:** Company owner, shareholders, project managers, technical managers, team leaders,developers, and other employees.
  - **External stakeholders**: Government, military, customers, suppliers, competitors etc.

The Players of the System – Stakeholders

System owners	• An information system's sponsor and executive advocate, usually responsible for funding the project of developing, operating, and maintaining the information system
System User	• A "customer" who will use or is affected by an information system on a regular basis - capturing, validating, entering, responding to, storing, and exchanging data and information • Internal users • External users • Direct users & Indirect users • Non human users
System Designer	• A technical specialist who translates system users' business requirements and constraints into technical solution. She or he designs the computer databases, inputs, outputs, screens, networks, and software that will meet the system users' requirements
System Builder	• A technical specialist who constructs information systems and components based on the design specifications generated by the system designers
Software Quality Assurance People	
Project Manager	• An experienced professional who accepts responsibility for planning, monitoring, and controlling projects with respect to schedule, budget, deliverables, customer satisfaction, technical standards, and system quality.
External Service Provider (ESP)	• A systems analyst, system designer, or system builder who sells his or her expertise and experience to other businesses to help those businesses purchase, develop, or integrate their information systems solutions; may be affiliated with a consulting or services organization.
System Analyst	• A specialist who studies the problems and needs of an organization to determine how people, data, processes, and information technology can best accomplish improvements for the business.

Project & Process Management

Project

- a [temporary] sequence of unique, complex, and connected activities having one goal or purpose and that must be completed by specific time, within budget, and according to specification

Project management

- The process of scoping, planning, staffing, organizing, directing, and controlling the development of an acceptable system at a minimum cost within a specified time frame

Process management

- the activity of documenting, managing, and continually improving the process of systems development.

Role of Project Managers

The project manager is the person assigned by the performing organization to lead the team that is responsible for achieving the project objectives.

In general, project managers have the responsibility to satisfy the needs: task needs, team needs, and individual needs.

Build customer-company alliance.

Link between company strategy- project.

Project Manager Competencies

- Effective project management requires that the project manager possess the following competencies:

Knowledge	Performance	Personal
• Refers to what the project manager knows about project management	• Refers to what the project manager is able to do or accomplish while applying his or her project management knowledge	• Refers to how the project manager behaves when performing the project or related activity. Personal effectiveness encompasses attitudes, core personality characteristics, and leadership, which provides the ability to guide the project team while achieving project objectives and balancing the project constraints.

Project Manager – Interpersonal Skills

- Project managers accomplish work through the project team and other stakeholders. A proper balance of ethical, interpersonal & conceptual skills is needed.

Leadership,
Team building,
Motivation,
Communication,
Influencing,
Decision making,
Political and cultural awareness,
Negotiation,
Trust building,
Conflict management, and
Coaching

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resource Management
- Project Communication Management
- Project Risk Management
- Project Procurement Management
- Project Stakeholder Management

Project Integration Management

This knowledge area focuses on project plan develop and execution

•It includes:

- -Creation and approval of project plan
- -Executing the project plan
- -Managing , controlling and documenting changes to the project plan

Project Scope Management

Primarily it is the definition and control of what ***IS*** and ***IS NOT*** included in the project.

•Project Scope Management is the process to ensure that the project is inclusive of all the work required, and only the work required, for successful completion.

•Project Scope Management plan includes:

- •collect requirements
- •Planning the project scope
- •Defining the exact project scope
- •Create WBS
- •Verifying the project scope
- •Controlling the project scope

Project Time Management

- This knowledge area cover activities their characteristics and how they fit into the project schedule

•It includes:

-Scheduling Activities

-Sequence Activities

-Estimate Activity Resources

-Estimate Activity Duration

-Develop Schedule

-Control Schedule

Project Cost Management

- This process is required to ensure the project is completed within the approved budget
  - **Resources**
  - people equipment
  - materials
  - **Quantities**
- This knowledge area is concerns with planning, estimating, budgeting and control of cost.

•It includes

-Estimate Cost

-Creating the project budget using project management cost controlled techniques

Control cost

Project Quality Management

1. **User-Based:** Fitness for use, meeting customer expectations.
2. **Manufacturing-Based: Conforming** to design, specifications, or requirements. Having no defects. Quality means conformance to process standards.
3. **Product-Based:** Quality can be appreciated by measuring the inherent characteristics of the product which will result in improved external product behavior
4. **Value-Based:** The product is the best combination of price and features.
5. **Transcendent:** It is generally associated with some intangible properties that delight users.

Project Quality Management

- Quality Management is the process that ensure the project will meet the needs
- "conformance to requirements" -**Crosby**

  "fitness for use" -**Juran**
- "the totality of characteristics of an entity that bear on its ability to satisfy stated and implied need' **-ISO 8402:1994**
- It deals with the quality planning, assurance and control.
- It includes:
  -Planning for project quality
  -adhere to quality assurance
  -Enforcing set quality control systems

Project Human Resource Management

- It focuses on organizational planning, staff acquisition and team development
- It includes:
  - Developing a project organizational structure or HR Plan
  - Acquire project team
  - Developing the project team
  - Manage team
  - Resolve Conflicts (force, compromise, smooth, confront, withdraw, collaborate)

Project Communication Management

- This process is necessary to ensure timely and appropriate generation, collection, dissemination, and storage of project information
- **Communications planning:** Determining the needs (who needs what information, when they need it, and how it will be delivered)
- **Information Distribution:** Defining who and how information will flow to the project stakeholders and the frequency
- **Performance Reporting:** Providing project performance updates via status reporting.

Project Risk Management

- Find Potential Negative Impact on the project
- This knowledge area focuses on risk planning, analysis, monitoring and control.
- Risk is an art and science of identifying, analyzing responding to risk throughout the life of project.
- Risk is an uncertainty that can have a negative or positive effect on meeting project objectives
- It includes:
  - Planning for risk management
  - Identifying risk
  - Using qualitative risk analysis
  - Using quantitative risk analysis
  - Creating project risk plans
  - Actively monitoring and reacting to project risk

Project Procurement Management

- This knowledge area involve solicitation , contract administration and contract closeout
- It includes :
  - Planning for project procurement
  - Planning for solicitation
  - Management Project solicitation
  - Selecting vendors
  - Managing and creating procurement documents
  - Administrating and closing project documents

Project Stakeholder Management

- **Stakeholder management:**
  - Includes identifying and analyzing stakeholder needs while managing and controlling their engagement throughout the life of the project.

The triggering of Systems Development Projects

- **Planned Projects:**
  - **Information Systems Strategy Plan:** It examines the business as a whole to identify those system development projects that will return the greatest strategic (long-term) value to the business
  - **Business Process Redesign :** It has thoroughly analyzed a series of business processes to eliminate redundancy and bureaucracy and to improve efficiency and value added. Not it is time to redesign the supporting information system for those redesigned business processes

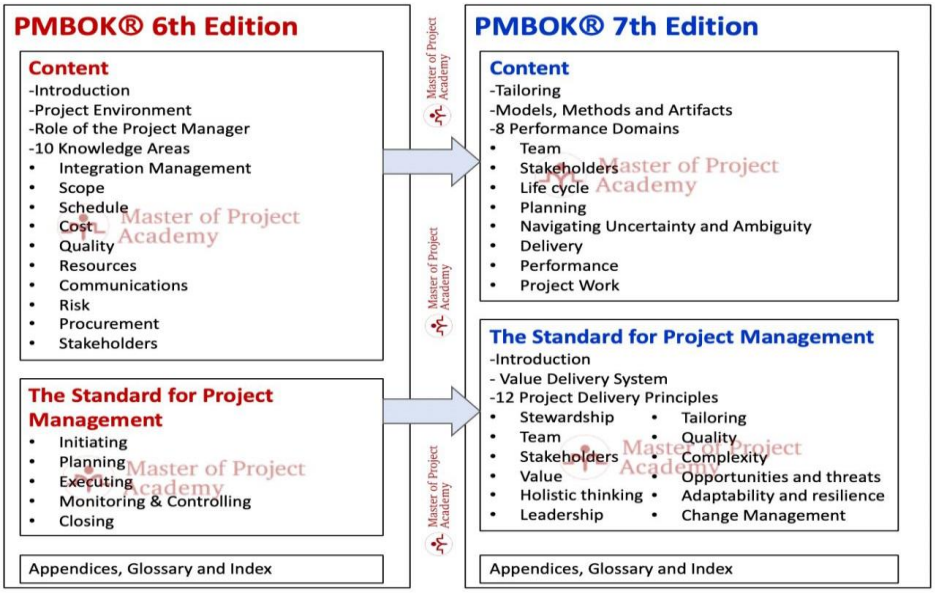
The triggering of Systems Development Projects

- Unplanned Projects can b triggered by some specific problem, opportunity or directive that occurs in the course of doing business
- **Steering Committee:** An administrative body of system owners and information technology executives that prioritizes and approves candidate system development projects.
- **Backlog:** A repository of project proposals that cannot be funded or staffed because they are a lower priority than those that have been approved for system development.

The triggering of Systems Development Projects

- **PIECES – The Problem solving Framework**

P	the need to improve performance
I	the need to improve information (and data)
E	the need to improve economics, control costs, or increase profits
C	the need to improve control or security
E	the need to improve efficiency of people and processes
S	the need to improve service to customers, suppliers, partners, employees, etc.



END OF TOPIC 1

- **COMING UP!!!!!!**
- **Project Lifecycle**
- **Project Teams**
- **Project Initiation & Integration**