

LECTURE 1: SPM CONCEPTS

What is Project?

A temporary endeavor undertaken to create a unique product or service with a definite beginning and end, different from ongoing, repetitive operations and requiring progressive elaboration of characteristics.

These project definitions have a few things in common:

Objective. There must be a clearly defined goal or set of goals for the project. A project must accomplish something. If a project has multiple goals, they should be related to each other, and not conflict with one another.

Start and end points. A project is a temporary endeavor. It must have a clearly defined beginning and ending, usually expressed as dates. Software maintenance is usually an ongoing operation, not a project, but may have well-defined projects that occur within it, such as specific releases.

Uniqueness. A project is a one-time thing, not usually repeated exactly the same way. This does not imply that repeat performance is not a project. Building a house is usually classified as a project, even though contractors have built millions of houses. Although the pattern and process are basically the same (a template), there are enough differences in each house (such as lot and location, varying materials, and code and design changes) to distinguish it from others. Otherwise, it becomes an ongoing production line making identical pieces in exactly the same way. The same is true for software professionals—we never build exactly the same software system, although we may copy it or port it.

Constraints. A project has cost, schedule, and quality performance constraints. These are the "big three" of the PM triangle that must be balanced and managed to achieve success.

What is Program?

A program is a group of related projects managed in a coordinated way. Programs usually include an element of ongoing activity.

Project Management

The definition of PM as it applies to software: Project management is a specialization of general management studies that employs the standard management skills of planning, organizing, staffing, leading or directing, and controlling to achieve defined project objectives.

Task: A generic term for work that is not included in the work breakdown structure, but potentially could be a further decomposition of work by the individuals responsible for that work. Also, the lowest level of effort on a project.

Activity: An element of work performed during the course of a project. An activity normally has an expected duration, an expected cost, and expected resource requirements. Activities can be subdivided into tasks.

Phase: A group of activities/tasks, producing a significant deliverable work product.

Project Processes:

Projects are composed of processes. A process is “a series of actions bringing about a result”. Project processes are performed by people and generally fall into one of two major categories:

Project management processes describe, organize, and complete the work of the project. Product-oriented processes specify and create the project’s product. Project management processes and product-oriented processes overlap and interact throughout the project.

Project management processes can be organized into five groups of one or more processes each:

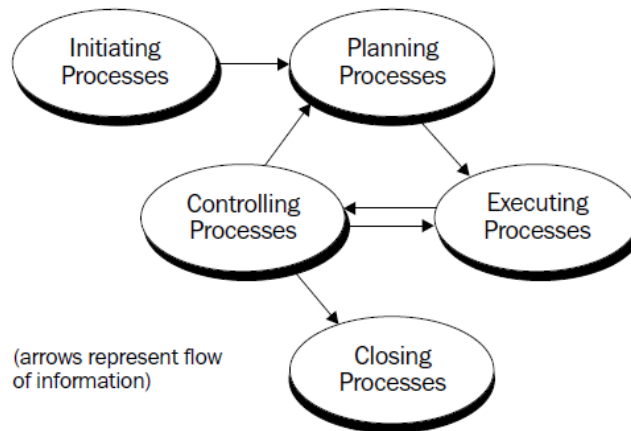
Initiating processes—authorizing the project or phase.

Planning processes—defining and refining objectives and selecting the best of the alternative courses of action to attain the objectives that the project was undertaken to address.

Executing processes—coordinating people and other resources to carry out the plan.

Controlling processes—ensuring that project objectives are met by monitoring and measuring progress regularly to identify variances from plan so that corrective action can be taken when necessary.

Closing processes—formalizing acceptance of the project or phase and bringing it to an orderly end.



Within each process group, the individual processes are linked by their inputs and outputs. By focusing on these links, we can describe each process in terms of its:

Inputs—documents or documentable items that will be acted upon.

Tools and techniques—mechanisms applied to the inputs to create the outputs.

Outputs—documents or documentable items that are a result of the process.

LECTURE 2: KNOWLEDGE AREAS

The Ten Knowledge Areas The ten knowledge areas are the skills a project manager must practice and master to manage a project efficiently.

The ten knowledge areas of project management are given below:

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resources Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management
- Project Stakeholder Management

Project Integration Management: The knowledge area which is devoted to identify and define the work in the project is known as the Integration Management. This knowledge area deals also with efficiently integrating changes into the project. There are six different processes in the integration knowledge area.

Project Scope Management: This knowledge area deals with defining the project scope, project requirement scope, project work, making the work breakdown structure, making the scope baselines and managing the scope of the project. This is one point where you can plan the ways of keeping the project within the established boundaries. There are six processes in the scope management knowledge area.

Project Time Management: The project managers estimate the duration of the tasks in this knowledge area. This is where he/she sequences the tasks and chooses the number of resources required to achieve the objective of the project. Schedule is monitored and managed here in this area to keep the project on the track. Seven processes are present in this knowledge area of project management.

Project Cost Management: Budget baseline is established and costs are estimated in this knowledge area. The plan to manage the costs is categorized in the cost management knowledge area too. This knowledge area consists of four processes.

Project Quality Management There are three processes in Project Quality Management, the knowledge area where the quality requirements for project deliverables are planned and tracked. In this area, all the quality issues are monitored and fixed.

Project Human Resources Management This knowledge area, which is the HR management of the project, comprises of the processes very essential to define the ways human resources will be utilized, developed, acquired and managed. Project Human Resources Management has four processes in it.

Project Communications Management Communications management is the knowledge area that defines how communications within the project will work. In these processes, the project manager makes the communication management plan, ensures the plan is followed, and controls information flow within the project. The communications management knowledge area has three processes.

Project Stakeholder Management: Project Stakeholder Management area encompasses all the processes which is used by a project manager for recognizing and satisfying the ones who are affected by the project. The

affected party can either be internal or external, in nature. You can pay close attention to those stakeholders who can have a powerful positive or negative impact on the project. There are four processes in stakeholder management.

Project Risk Management Project Risk Management consists of identifying risks, planning risk management, conducting risk assessments, and controlling risks. This knowledge area has six processes in it. The area concentrates on identifying, analyzing, planning responses to both ‘threat risks’ (negative) and ‘opportunity risks’ (positive).

Project Procurement Management (some changes) This knowledge area deals with the processes which project managers usually follow to acquire required material for the successful completion of the project. In this knowledge area, project managers come up with the plan for conducting procurements, controlling the procurements and closing out the procurements. 4 processes are there in this knowledge area.

LECTURE 3: PROJECT MANAGEMENT KNOWLEDGE AREAS AND THE RELATED PROCESS GROUPS

Knowledge Area	Project Management Process Groups				
	Initiating	Planning	Executing	Monitoring and Controlling	Closing
<i>Project Time Management (continued)</i>		Estimate activity resources, Estimate activity durations, Develop schedule			
<i>Project Cost Management</i>		Estimate costs, Determine budget		Control costs	
<i>Project Quality Management</i>		Plan quality	Perform quality assurance	Perform quality control	
<i>Project Human Resource Management</i>		Develop human resource plan	Acquire project team, Develop project team, Manage project team		
<i>Project Communications Management</i>	Identify stakeholders	Plan communications	Distribute information, Manage stakeholders expectations	Report performance	
<i>Project Risk Management</i>		Plan risk management, Identify risks, Perform qualitative risk analysis, Perform quantitative risk analysis, Plan risk responses		Monitor and control risks	
<i>Project Procurement Management</i>		Plan procurements	Conduct procurements	Administer procurements	Close procurements
<i>Project Integration Management</i>	Develop project charter	Develop project management plan	Direct and manage project execution	Monitor and control project work, Perform integrated change control	Close project or phase
<i>Project Scope Management</i>		Collect requirements, Define scope, Create WBS		Verify scope, Control scope	
<i>Project Time Management</i>		Define activities, Sequence activities,		Control schedule	

PROCESS GROUPS

Develop Project Charter—Overview: This is the process of developing a document that formally authorizes a project or a phase and documents initial requirements that satisfy the stakeholder's needs and expectations.

Identify Stakeholders—Overview: Identify Stakeholders is the process of identifying all people or organizations impacted by the project, and documenting relevant information regarding their interests, involvement, and impact on project success.

The Project Management Plan: The project management plan is the major output from this process. Developing it is the process of documenting the actions necessary to define, prepare, integrate, and coordinate all subsidiary plans. It represents the primary source of information for how the project will be planned, executed, monitored and controlled, and closed.

Collect Requirements—This process is essential for clarifying and managing expectations as adjustments are made throughout the project. Your project requirements document and management plan, plus the requirements traceability matrix are outputs of this process.

Define Scope—This process produces a detailed description of the project and its product that ensures the confidence and trust of the stakeholders. Your project scope statement and project document updates are the outputs of this process.

Create Work Breakdown Structure (WBS)—This is the process where you break down the project elements into manageable work packages producing your WBS and associated dictionary. The WBS Dictionary describes each

component of the WBS with milestones, deliverables, activities, scope, and sometimes dates, resources, costs, quality. If the WBS element names are ambiguous, a WBS dictionary can help clarify the distinctions between WBS elements. Other outputs include the scope baseline that enables stakeholders and the project manager to assess ongoing progress and the impact of necessary adjustments.

Define Activities, 3.4.6 Sequence Activities, 3.4.7 Estimate Activity Resources, 3.4.8 Estimate Activity Durations—These four processes create the list of activities and their attributes that are required for the project. These activities are then scheduled into network diagrams along with estimates of the resources needed and how long it will take to complete. These outputs enable benchmark goals to be set so that teams with the right resources can be created.

Develop Schedule—This process produces the schedule baseline and data needed to complete the work. This is a complex process and often requires a great deal of coordination with many project constituents.

Estimate Costs—This part of the planning process produces the cost estimates for each activity and phase. The expertise of your project manager will have a significant impact on their accuracy and attention to detail.

Determine Budget—This brings together all activity and work package cost estimates into a complete project budget. This forms the documentation for the project funding that includes contingency for potential issues that may arise and produces the cost performance baseline. To ensure smooth authorization by stakeholders these details must be presented logically and clearly.

Plan Quality—The quality management plan this process produces must define the quality metrics and checklists that take into account potential risks, cost performance baseline, and organizational and environmental factors.

Develop Human Resource Plan—Each phase of the project plan must have the correct resources and skills in the staff assigned to it. These individuals will form teams to produce work packages or for phases. The resulting management plan details the skills, roles, responsibilities, and reporting relationships that support the schedule of work and project objectives.

Plan Communications—Communicating the correct level of information in a timely manner to all parties is essential for your success. This management plan enables you to set and manage stakeholder expectations through your regular updates on progress and project changes. It also helps to create good working relationships within the project team, gaining their support and cooperation.

Plan Risk Management, 3.4.16 Identify Risks, 3.4.17 Perform Qualitative Risk analysis 3.4.18 Perform Quantitative Risk Analysis, 3.4.19 Plan Risk Responses—The importance of assessing and planning for potential risks is paramount if your project is to be completed on time and to budget. Your resulting risk register enables your communication with stakeholders to be informed and practical.

Plan Procurements—This management plan will define the approach your project adopts towards procurement and identify potential suppliers you want to approach. There will be detailed reports outlining procurement statements of work and decision-making throughout the project life cycle.

Direct and Manage Project Execution—This process is concerned with performing and delivering the work as defined in the project management plan so that its objectives can be attained. Project managers will spend the majority of the project budget during the execution process so scheduling and phasing details must be as accurate as possible. This includes the complete management of the change request procedure.

Perform Quality Assurance—A key aspect of any project is ensuring that the quality of products and deliverables meets the criteria set. Performing regular quality assurance checks has several purposes:

- Ensures any necessary amendments can be incorporated in plan to maintain quality.
- Assures stakeholders that the project is staying within its budget, and time-scales.

Any quality issues highlighted can be incorporated into your organization's processes as required.

Acquire Project Team—This process is simply concerned with ensuring the composition of people and skills matches the project's needs. It also ensures the availability of the required individuals by clearly communicating project expectations and timelines.

Develop Project Team—This process enables the project manager to ensure that the interactions and competencies within the team match the required level of performance. It is also the process responsible for building a cohesive team and conducting regular team assessments.

Manage Project Team—This process involves managing and monitoring team members' performance. The project manager will give constructive feedback to individuals or groups to ensure that issues and conflicts are avoided. It also manages project changes to maintain performance. This process provides a means for concerns to be fed back to the project management team.

Distribute Information—A major contributor to a project's success is how well pertinent information is routinely communicated to the relevant parties. Selecting the best means of communicating plays a key role in this process. Knowing what issues warrant a call to a stakeholder (e.g. delay of a timeline) and those that don't helps to create a positive working environment.

Manage Stakeholder Expectations—Since your stakeholders are a significant party in any project, communicating appropriately with them is an essential skill to acquire. Such communications need to assure them that their needs are being met, their concerns are heard, and that issues that occur are being properly addressed.

Conduct Procurements—All projects need to acquire certain resources from external suppliers and having the necessary procurement processes in place ensures the correct distribution of resources. Regular reports set suppliers' expectations and provide a structured process to voice and address their responses. This process is also responsible for the timely awarding of and managing of any contracts required for the project.

Monitor and Control Project Work—This process is concerned with tracking the progress of the performance objectives as they have been defined in the project management plan. Another aspect of this process is the reviewing, regulating, and forecasting of these objectives. The performance reports generated by this process feed into other processes to monitor and control cost, resources, risk, scope, schedule, quality, benchmark goals, and timelines. The project status report is a key method of keeping your project stakeholders informed about project progress and performance. These documents provide a trail and history that can be used to aid future projects.

Perform Integrated Change Control—Changes are inevitable in any project and it is this process that manages the reviewing, approving, documenting and then execution of the proposed changes. The larger the project the greater the number of change requests. These changes are most likely to alter the project deliverables and plan. It is essential the project manager documents and assesses each change against its impact on timescales and budget.

Verify Scope—This process formally accepts project deliverables as being complete. To attain this completed status all documentation relating to that phase or work package must be included to be accepted as complete. This includes documenting any follow-through that is required as the project progresses.

Control Scope—Any changes to the scope baseline must be closely monitored and, once accepted, reflected in the project scope and relevant work packages. These adjustments must be communicated to the project stakeholders so that implications for the budget and timeframes can be understood and agreed to.

Control Schedule—The project schedule baseline is a critical document and it is essential that any changes or adjustments that result from monitoring are properly incorporated and communicated to all necessary parties. Careful and thorough monitoring will reduce instances of major setbacks due to scheduling issues that have been poorly reported.

Control Costs—Monitoring and controlling the costs of any project are critical aspects of its success. It is essential that project status reports accurately report current expenditure and forecasted spend, and highlight any variances from the cost baseline.

Perform Quality Control—Managing and controlling the quality of what is produced during a project are vital to its success. This process monitors the quality of the executed activities, assesses how well it matches the required quality metrics and checklist, and recommends any necessary changes.

Report Performance—This is the process that defines and monitors the production of performance status reports, measurements, and forecasts. These reports form a key aspect of the communication within the project team and stakeholders on how well progress maps the project benchmark goals.

Monitor and Control Risks—This process plays a key role in project management and performance because it documents identified risks, and monitors and evaluates any changes or responses to this initial assessment. It also identifies, evaluates, and reports new risks, updating the risk register as appropriate.

3.6.10 Administer Procurements—All projects require the procurement of some resources so that their performance matches project timelines and budget. This process manages, monitors, and documents the performance of suppliers against the contracted requirements. It also manages these working relationships to ensure that any changes that occur during the contract period are properly incorporated and delivered.

Close Project or Phase: This is the process of finalizing all activities across all of the Project Management Process Groups to formally complete the project or phase. When closing the project, the project manager will review all prior information from the previous phase closures to ensure that all project work is complete and that the project has met its objectives. Since project scope is measured against the project management plan, the project manager will review that document to ensure completion before considering the project closed. This process also establishes the procedures to investigate and document the reasons for actions taken if a project is terminated before completion.

Close Procurements: This is the process of formally closing any contracts set up by the project and involves verification that all work and deliverables were acceptable. It also involves administrative activities such as finalizing open claims, updating records to reflect final results, and archiving such information for future use.

LECTURE 4: SPM TEAM BUILDING

Individual Personality Type

Starting with the individual, several personality models have been derived from Carl Jung's theory of "psychological types." The Myers-Briggs Type Indicator (MBTI), the Fundamental Interpersonal Relations Orientation—Behavior (FIRO-B) model, the Keirsey Temperament Sorter, the Kahler Process Communication Model (PCM), and the WorkStyle Patterns™ Inventory from the McFletcher Corporation, represent a few. There are more than 150 models published, but we will discuss seven that are readily implementable.

Myers-Briggs Type Indicator

The Myers-Briggs Personality Type Indicator may be the most popular and widespread, having been in use for more than 40 years. With millions of people assessed all over the world, its validity is continually updated and debated. It is usually administered and interpreted by professionals formally trained in its use. MBTI identifies four bipolar dimensions of behavior, measuring self-reported preferences on each one, which allows for 16 different personality descriptions, identified by 4-letter codes. The type dimensions are illustrated in [Table](#).

Much can be found on the Web about MBTI, including an abbreviated version of the test instrument and a discussion that relates the model to leadership. For the technical disciplines, many personality types (about 60%) fall into the ISTJ type. Regional or national culture can provide a modifying context for expressing type, as discussed in a later section.

Table Myers-Briggs Type Indicator (MBTI)	
MBTI Type Dimension	Characteristics
Introvert (I, E)	Source and Direction of Energy: I: From internal concentration (is drained of energy by being around others)
Extrovert	E: From external contact ("plugs into" the energy of others)
Sensing (S, N)	Preferred Method of Information Reception: S: Prefers empirical, sensory data
iNtuitive	N: Prefers meaningful patterns and abstractions
Thinking (T, F)	Way of Information Processing: T: Makes decisions according to their impersonal logic (Thinkers decide based primarily on logic, and when they do so, they consider a decision to be made.
Feeling	They tend to see the world in black and white and dislike fuzziness. Perhaps because people are so variable, they focus on tangible things, seeking truth and

Table Myers-Briggs Type Indicator (MBTI)	
MBTI Type Dimension	Characteristics
	<p>use of clear rules. At work, they are task-oriented, seek to create clear value. Interacting with them tends to be brief and business-like. They may be seen as cold and heartless by Feelers.)</p> <p>F: Makes a decision according to their personal values (Feelers decide based primarily through social considerations, listening to their heart and considering the feelings of others. They see life as a human existence and material things as being subservient to this. They value harmony and use tact in their interactions with others. At work, they are sociable and people-oriented and make many decisions based on values (more than value). They may be seen as unreliable and emotional by Thinkers.)</p>
Judging (J, P) Perceiving	<p>Way of Living Out Processed Information:</p> <p>J: Organizes all life events and acts strictly according to their plans (Judgers approach life in a structured way, creating plans and organizing their world to achieve their goals and desired results in a predictable way. They get their sense of control by taking charge of their environment and making choices early. They are self-disciplined and decisive, and seek closure in decisions. When they ask for things they are specific and expect others to do as they say. They enjoy being experts. At work, they decide quickly and clearly and work to get the job done. Perceivers may see them as rigid and opinionated.)</p> <p>P: Inclined to improvisation and seeking different alternatives (Perceivers perceive structure as being more limiting than enabling. They prefer to keep their choices open so they can cope with many problems that the know life will put in their way. They get their sense of control by keeping their options open and making choices only when they are necessary. They are generally curious and like to expand their knowledge, which they will freely acknowledge as being incomplete. They are tolerant of other people's differences and will adapt to fit into whatever the situation requires. At work, they tend to avoid or put off decisions and like most the exploration of problems and situations. Judgers may see them as aimless drifters.)</p>

Keirsey Temperament Sorter

Closely related to MBTI is the Keirsey Temperament Sorter, derived from the work of David Keirsey in his book *Please Understand Me*. It is accessible via the Internet, does not require professional administration, and offers the personality test instrument in four languages (Spanish, Portuguese, German, and Norwegian). Keirsey's model identifies four temperament types, with variants as described in [Table](#).

Kahler Process Communication Model

The Kahler Process Communication Model (PCM) is a six-part description based on transactional analysis, which analyzes personalities by observing how one conducts transactions with others (their "miniscripts"). It is administered and interpreted by formally trained professionals enabling you to understand, motivate, and communicate more effectively with others on a project team. PCM has profiled more than a half-million people in 20 different countries, and is used by NASA to evaluate astronaut candidates. The six personality types identified in PCM are described in Table.

Table. Keirsey Temperament Sorter	
Keirsey's Type (with MBTI Labels)	Characteristics
Guardians, SJs Supervisors (ESTJ) Inspectors (ISTJ) Providers (ESFJ) Protectors (ISFJ)	Concrete in communicating Cooperative in implementing goals; can become highly skilled in logistics
Artisans, SPs Promoters (ESTP) Crafters (ISTP) Performers (ESFP) Composers (ISFP)	Concrete in communicating Utilitarian in implementing goals; can become highly skilled in tactical variation
Idealists, NFs Teachers (ENFJ) Counselors (INFJ) Champions (ENFP) Healers (INFP)	Abstract in communicating Cooperative in implementing goals; can become highly skilled in diplomatic integration
Rationals, NTs Field Marshals (ENTJ)	Abstract in communicating Utilitarian in implementing goals;

Table. Keirsey Temperament Sorter	
Keirsey's Type (with MBTI Labels)	Characteristics
Masterminds (INTJ)	can become highly skilled in strategic analysis
Inventors (ENTP)	
Architects (INTP)	

Table Kahler Process Communication Model (PCM)	
PCM Type	Characteristics
Dreamer	Imaginative, reflective, calm, introspective, directable Motivated into action by things and people
Workaholic	Logical, responsible, organized, time-oriented Perceptions through logic, things
Reactor	Warm, sensitive, compassionate, kind, empathetic, nurturing Perceptions through feelings and emotions
Rebel	Spontaneous, creative, playful, expressive, energetic Reactions through likes and dislikes
Persister	Dedicated, observant, conscientious, tenacious Evaluates through opinions
Promoter	Adaptable, persuasive, charming, resourceful Action-oriented