LECTURE # 4

1. Introduction & Fundamentals

1.1   PM's nine Knowledge Areas

1. Project Integration Management

Project Integration Management includes the processes required to ensure that the various elements of the project are properly coordinated. It involves making tradeoffs among competing objectives and alternatives to meet or exceed stake-holder needs.

These processes interact with each other and with the processes in the other knowledge areas as well. Each process may involve effort from one or more individuals or groups of individuals, based on the needs of the project. Each process generally occurs at least once in every project phase.

Project integration management comes into play when a cost estimate is needed for a contingency plan, or when risks associated with various staffing alternatives must be identified. However, for a project to be completed successfully, integration must also occur in a number of other areas as well. For example:

- The work of the project must be integrated with the ongoing operations of the performing organization.
- Product scope and project scope must be integrated.

One of the techniques used to both integrate the various processes and to measure the performance of the project as it moves from initiation through to completion is *Earned Value Management (EVM).*

- *Earned value* is the amount of work completed, measured according to the budgeted effort that the work was supposed to consume.
- It is also called the budgeted cost of work performed.
- As each task is completed, the number of person-months originally planned for that task is added to the earned value of the project.

  – **Earned value charts***:* An earned value chart has three curves:

    - The budgeted cost of the work scheduled.
    - The earned value.
    - The actual cost of the work performed so far.

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. It is primarily concerned with defining and controlling what is or is not included in the project.

The processes, tools, and techniques used to manage *product* scope vary by application area and are usually defined as part of the project life cycle

A project generally results in a single product, but that product may include subsidiary components, each with its own separate but interdependent product scopes. For example, a new telephone system would generally include four subsidiary components—hardware, software, training, and implementation.

Completion of the project scope is measured against the project plan, but completion of the product scope is measured against the product requirements. Both types of scope management must be well integrated to ensure that the work of the project will result in delivery of the specified product.

3. Project Time Management

Project Time Management includes the processes required to ensure timely completion of the project. The followings are major processes in developing the project time schedule:

(a) **Activity Definition**—identifying the specific activities that must be performed to produce the various project deliverables.

(b) **Activity Sequencing**—identifying and documenting interactivity dependencies.

(c) **Activity Duration Estimating**—estimating the number of work periods that will be needed to complete individual activities.

(d) **Schedule Development**—analyzing activity sequences, activity durations, and resource requirements to create the project schedule.

(e) **Schedule Control**—controlling changes to the project schedule.

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4. Project Cost Management

Project Cost Management includes the processes required to ensure that the project is completed within the approved budget.

Resource Planning—determining what resources (people, equipment, materials) and what quantities of each should be used to perform project activities.

Cost Estimating—developing an approximation (estimate) of the costs of the resources needed to complete project activities.

Cost Budgeting—allocating the overall cost estimate to individual work activities.

Cost Control—controlling changes to the project budget.

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5. Project Quality Management

Project Quality Management includes the processes required to ensure that the project will satisfy the needs for which it was undertaken. It includes "all activities of the overall management function that determine the quality policy, objectives, and responsibilities and implements them by means such as quality planning, quality assurance, quality control, and quality improvement, within the quality system.

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Project quality management must address both the management of the project and the product of the project. The generic term *product* is occasionally used, in literature regarding quality, to refer to both goods and services.

6. Project Human Resource Management

Project Human Resource Management includes the processes required to make the most effective use of the people involved with the project. It includes all the project stakeholders—sponsors, customers, partners, and individual contributors

Following are some major processes:

- **Organizational Planning**—identifying, documenting, and assigning project roles, responsibilities, and reporting relationships.
- **Staff Acquisition—**getting the human resources needed assigned to and working on the project.
- **Team Development**—developing individual and group competencies to enhance project performance.

These processes interact with each other and with the processes in the other knowledge areas as well. Each process may involve effort from one or more individuals or groups of individuals, based on the needs of the project.

There is a substantial body of literature about dealing with people in an operational, ongoing context. Some of the many topics include:

- Leading, communicating, negotiating, etc.

Key General Management Skills:

- Delegating, motivating, coaching, mentoring, and other subjects related to dealing with individuals.
- Team building, dealing with conflict, and other subjects related to dealing with groups.
- Performance appraisal, recruitment, retention, labor relations, health and safety regulations, and other subjects related to administering the human resource function.

Most of this material is directly applicable to leading and managing people on projects, and the project manager and project management team should be familiar with it. However, they must also be sensitive as to how this knowledge is applied on the project. For example:

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7. Project Communications Management

Project Communications Management includes the processes required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information. It provides the critical links among people, ideas, and information that are necessary for success. Everyone involved in the project must be prepared to send and receive communications, and must understand how the communications in which they are involved as individuals affect the project as a whole.

Major processes include:

- **Communications Planning**—determining the information and communications needs of the stakeholders: who needs what information, when they will need it, and how it will be given to them.
- **Information Distribution**—making needed information available to project stakeholders in a timely manner.
- **Performance Reporting**—collecting and disseminating performance information. This includes status reporting, progress measurement, and forecasting.
- **Administrative Closure**—generating, gathering, and disseminating information to formalize a phase or project completion.

These processes interact with each other and with the processes in the other knowledge areas as well. Each process may involve effort from one or more individuals or groups of individuals, based on the needs of the project. Each process generally occurs at least once in every project phase.

Communicating is a broader subject and involves a substantial body of knowledge that is not unique to the project context. For example:

- **Sender-receiver models**—feedback loops, barriers to communications, etc.
- **Choice of media**—when to communicate in writing versus when to communicate orally, when to write an informal memo versus when to write a formal report, etc.
- **Writing style**—active versus passive voice, sentence structure, word choice, etc.
- **Presentation techniques**—body language, design of visual aids, etc.
- **Meeting management techniques**—preparing an agenda, dealing with conflict, etc.

8. Project Risk management

Project Risk management is the systematic process of identifying, analyzing, and responding to project risk. It includes maximizing the probability and consequences of positive events and minimizing the probability and consequences of adverse events to project objectives.

- **Risk Management Planning**—deciding how to approach and plan the risk management activities for a project.
- **Risk Identification**—determining which risks might affect the project and documenting their characteristics.
- **Qualitative Risk Analysis**—performing a qualitative analysis of risks and conditions to prioritize their effects on project objectives.
- **Quantitative Risk Analysis**—measuring the probability and consequences of risks and estimating their implications for project objectives.
- **Risk Response Planning**—developing procedures and techniques to enhance opportunities and reduce threats to the project's objectives.
- **Risk Monitoring and Control**—monitoring residual risks, identifying new risks, executing risk reduction plans, and evaluating their effectiveness throughout the project life cycle.

These processes interact with each other and with the processes in the other knowledge areas. Each process generally occurs at least once in every project.

9. Project Procurement Management

Project Procurement Management includes the processes required to acquire goods and services, to attain project scope, from outside the performing organization. For simplicity, goods and services, whether one or many, will generally be referred to as a *product*.

An overview of the major processes includes:

- **Procurement Planning**—determining what to procure and when.
- **Solicitation Planning**—documenting product requirements and identifying potential sources.
- **Solicitation**—obtaining quotations, bids, offers, or proposals, as appropriate.
- **Source Selection**—choosing from among potential sellers.
- **Contract Administration**—managing the relationship with the seller.
- **Contract Closeout**—completion and settlement of the contract, including resolution of any open items.

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*Project Procurement Management is discussed from the perspective of the buyer in the buyer-seller relationshi*p. The buyer-seller relationship can exist at many levels on one project. Depending on the application area, the seller may be called a *subcontracto*r, a *vendo*r, or a *supplie*r.

The *seller* will typically manage its work as a project. In such cases:

- The *buyer* becomes the customer, and is thus a key stakeholder for the seller.
- The seller's project management team must be concerned with all the processes of project management, not just with those of this knowledge area.
- The terms and conditions of the contract become a key input to many of the seller's processes. The contract may actually contain the input (e.g., major deliverables, key milestones, cost objectives), or it may limit the project team's options (e.g., buyer approval of staffing decisions is often required on design projects).