# LECTURE # 3

# 1. Introduction & Fundamentals

## 1.1 Costs and 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.

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.

Although the processes are presented here as discrete elements with well-defined interfaces, in practice they may overlap and interact in ways not detailed here.

Project cost management is primarily concerned with the cost of the resources needed to complete project activities.

However, project cost management should also consider the effect of project decisions on the cost of using the project's product.

For example, limiting the number of design reviews may reduce the cost of the project at the expense of an increase in the customer's operating costs. This broader view of project cost management is often called life-cycle costing. Life-cycle costing together with Value Engineering techniques are used to reduce cost and time, improve quality and performance, and optimize the decision-making.

In many application areas, predicting and analyzing the prospective financial performance of the project's product is done outside the project.

In others (e.g., capital facilities projects), project cost management also includes this work. When such predictions and analyses are included, project cost management will include additional processes and numerous general management techniques such as return on investment, discounted cash flow, payback analysis, and others.

Project cost management should consider the information needs of the project stakeholders—different stakeholders may measure project costs in different ways and at different times. For example, the cost of a procurement item may be measured when committed, ordered, delivered, incurred, or recorded for accounting purposes.

## 1.2 Project vs. Program Management

⇒ **What is a Program?**

"A coordinated portfolio of projects that change organizations to achieve benefits of strategic importance"

Program management is the process of managing multiple on going projects. An example would be that of designing, manufacturing and providing support infrastructure for an automobile make.

It can be argued that Program Management has evolved from the complexities of the more intricate aspects of Project Management.

As projects became larger; more interrelated; complex and multidimensional, the need arose to have an approach that controlled Project Management whilst remaining focused on the strategic objectives of the business. Whilst Project Management focused on technical delivery, Program Management engaged on relating design concepts to the business strategic vision of the future.

It is very important that you understand the concept of Program Management as a method. Approaches may vary but definitions are relatively common. It is appropriate to understand the 'mission, goals and objectives' of Program Management and then relate these to the Program you propose to develop. Definitions will fall within each of these headings and it is possible to develop your own template which fits your organizational program. For example:

- **Mission:**

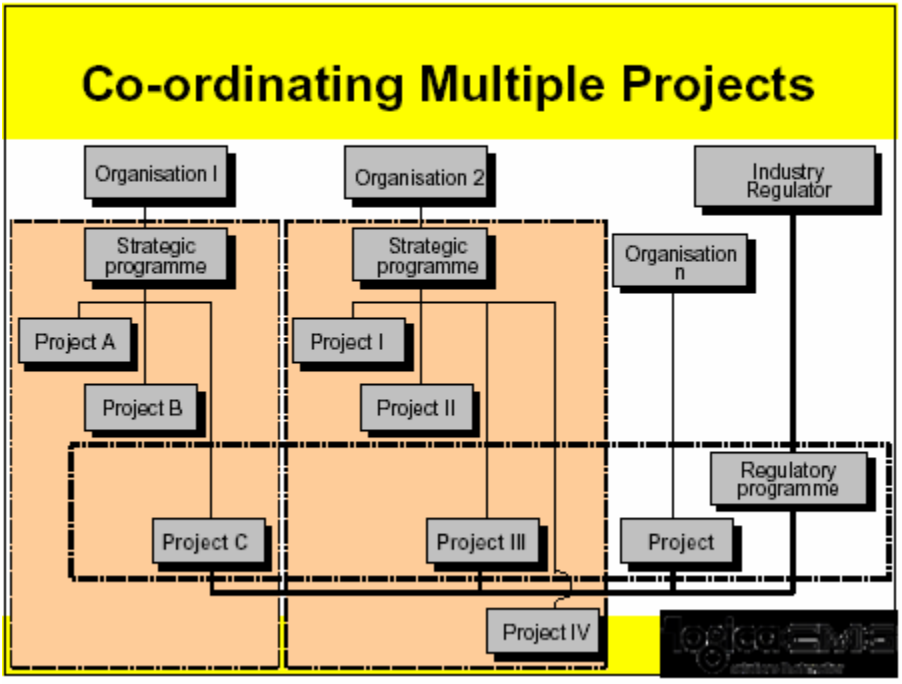
  To co-ordinate a portfolio of projects to harmonize communications in order to achieve a set of stated business objectives: *Provision of strategy alignment, with design objectives, in order to maintain control over a*

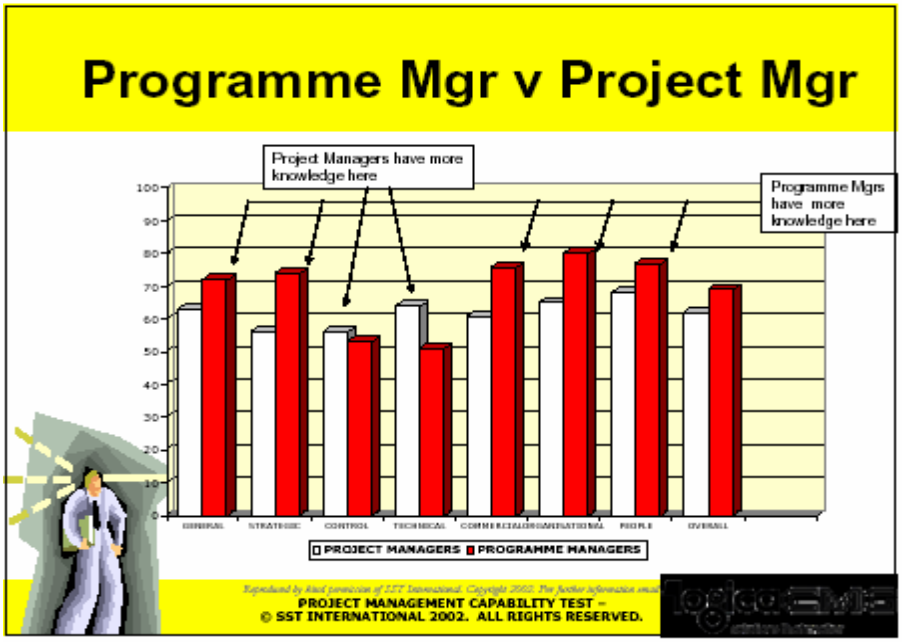
*multiple project environment; ensuring quality end deliverables which meet business operational needs.*

The above is a fairly complex mission statement but provides a framework to develop an intricate set of goals in order to utilize Program Management. It is possible to develop an extensive list of goals, depending upon the level of detail you wish to acquire. The following are offered as suggestions:

– **Goals:**

1. Clearly defined roles and responsibilities
2. Established baselines and Terms of Reference statement
3. Type of program defined
4. Future business blueprint
5. Recognition of business transformation procedures
6. Defined structure of the Program
7. Route Map
8. Visible end deliverables — vision of the future
9. Identification of future benefits
10. Risk
11. Contingency planning






Each of the goals would then be analyzed for providing objectives. For example:

- Managing a program embraces functions, risks and strategies outside of what a project manager does.
- A program has goals beyond those of a project or group of projects. Program outcomes are usually service delivery focused whereas a project is more likely to be focused on the delivery of a 'product'.
- A program is more than a grouping of projects (that's just a program of works).
- The coordinated management of a portfolio of projects to achieve a set of business objectives
- There are many more meanings of the term program management. Here are the more common meanings:

  – **The Multi-Project Organization:**

  Program Management is the directing of a portfolio of projects that benefit from a consolidated approach.

  Jobbing engineering companies; software houses contracting for work; and many other types of organization; run many simultaneous projects each of which may or not contribute towards the corporate goals.

  Typically the result of such a project is a deliverable which is eventually delivered to a client for payment. After many delays the payment arrives and

gets paid into the company's bank account thereby increasing cash flow which is achieving one of the company's objectives.

Sometimes the projects are much more directly aimed at corporate goals - opening a new factory or launching a new product - spring to mind.

The common elements of the projects are that they run simultaneously or at least overlap with each other, they share resources and are supposed to generate some income. One project being cancelled does not necessarily change the organization's general direction. These types of programs run for ever and need have no end date. The projects are separate in that there need not be logical links between projects. Whilst they share the same resources, delays in one project need not cause delays in others.

- **The Mega Project**

The management of a portfolio of projects towards one specific objective; Program management can also mean one very large project.

*The USA's Man on the Moon Project was such a program. In this sense the term program indicates one very large project which is made up from a number of components. Within the Apollo program there were many projects: the Lunar Lander, the Orbiter, the Launcher and the Control Systems were all projects which were large, complex and interesting. Polaris and the Manhattan project (which resulted in the nuclear bomb) are other famous projects large enough to be called programs. Therefore, particularly in USA, the word program refers to a series of projects which make up one large project.*

The program is usually reflected in the management structure as there will be a program manager to whom the project managers will report. Said program manager or sometimes program director will concern himself with recruiting and maintaining his project management teams and on integrating the deliverables of each project into one overall program. In this meaning of program management there is likely to be one physical deliverable.

These sorts of programs end. There will be a time when the overall objective has been achieved and the program and all of its constituent projects are over.

The projects within this type of program are often linked. Delays with one project often cause knock on effects with others due to logical links between tasks in both projects.

For example if the moon rocket launch pad project was delayed, it would delay the testing of the moon rocket itself. The Beirut Shopping Mall will be of little use without the water treatment plant and the new sewer scheme. Such

projects may not share the same resources but there are almost certain to be linked through their logic.

## 1.3 Project Success

**Project success is correlated with thorough analyses of the need for project deliverables**. Our research has shown that when a project results in deliverables that are designed to meet a thoroughly documented need, then there is a greater likelihood of project success. So managers should insist that there is a documented business need for the project before they agree to consume organizational resources in completing it.

We conduct planned and controlled software projects for one primary reason - it is the only known way to manage complexity. And yet, we still struggle. In 1998, industry data indicated that 26 percent of software projects failed outright and 46 percent experienced cost and schedule overruns [REE99].

Although the success rate for software projects has improved somewhat, our project failure rate remains higher than it should be.

In order to avoid project failure, a software project manager and the software engineers who build the product must avoid a set of common warning signs, understand the critical success factors that lead to good project management, and develop a common sense approach for planning, monitoring and controlling the project.

In order to manage a successful software project, we must understand what can go wrong (so that problems can be avoided) and how to do it right. In an excellent paper on software projects, John Reel [REE99] defines ten signs that indicate that an information systems project is in jeopardy:

1. Software people don't understand their customer's needs.
2. The product scope is poorly defined.
3. Changes are managed poorly.
4. The chosen technology changes.
5. Business needs change (or are ill-defined)
6. Deadlines are unrealistic.
7. Users are resistant.
8. Sponsorship is lost [or was never properly obtained).
9. The project team lacks people with appropriate skills.
10. Managers [and practitioners) avoid best practices and lessons learned.

Jaded industry professionals often refer to the 90-90 rule when discussing particularly difficult software projects: The first 90 percent of a system absorbs 90 percent of the allotted effort and time. The last 10 percent takes the other 90

percent of the allotted effort and time [ZAH94]. The seeds that lead to the 90-90 rule are contained in the signs noted in the preceding list.

But enough negativity! How does a manager act to avoid the problems just noted? Reel [REE99] suggests a five-part commonsense approach to software projects:

1. **Start on the right foot**. This is accomplished by working hard (very hard) to understand the problem that is to be solved and then setting realistic objects and expectations for everyone who will be involved in the project. It is reinforced by building the right team (Section 3.2.3) and giving the team the autonomy, authority, and technology needed to do the job.
2. **Maintain momentum**. Many projects get off to a good start and then slowly disintegrate. To maintain momentum, the project manager must provide incentives to keep turnover of personnel to an absolute minimum, the team should emphasize quality in every task it performs, and senior management should do everything possible to stay out of (the team's way.
3. **Track progress.** For a software project, progress is tracked as work products (e.g., specifications, source code, sets of test cases) are produced and approved (using formal technical reviews) as part of a quality assurance activation, software process and project measures can be collected and used to assess progress against averages developed for the software development organization.
4. **Make smart decisions**. In essence, the decisions *of* the project manager and the software team should be to "keep it simple." Whenever possible, decide to use commercial off-the-shelf software or existing software components, decide to avoid custom interfaces when standard approaches are available, decide to identify and then avoid obvious risks, and decide to allocate more time than you think is needed to complex or risky tasks (you'll need every minute).
5. **Conduct a postmortem analysis.** Establish a consistent mechanism for extracting lessons learned for each project. Evaluate the planned and actual schedules, collect and analyze software project metrics, get feedback from team members and customers, and record findings in written form.

– **Projects and Strategy**

Projects are a means of organizing activities that cannot be addressed within the organization’s normal operational limits.

Projects are therefore often utilized as a means of achieving an organization’s strategic plan, whether the project team is employed by the organization or is a contracted service provider**.**

Projects are typically authorized as a result of one or more of the following strategic considerations:

- A market demand (e.g., an oil company authorizes a project to build a new refinery in response to chronic gasoline shortages)
- A business need (e.g., a training company authorizes a project to create a new course in order to increase its revenues)
- A customer request (e.g., an electric utility authorizes a project to build a new substation to serve a new industrial park)
- A technological advance (e.g., an electronics firm authorizes a new project to develop a new generation of video game player after the introduction of the corresponding new game format)
- A legal requirement (e.g., a paint manufacturer authorizes a project to establish guidelines for the handling of a new toxic material).

No project ever goes 100% as planned, so project managers must learn to adapt to change. There are many things that can go wrong with project management. These are commonly called barriers. **Here are some possible barriers**:

1. **Poor Communication**

   - Many times a project may fail because the project team does not know exactly what to get done or what's already been done.

2. **Disagreement**

   - Project must meet all elements in a contract.
   - Customer and project manager must agree on numerous elements.
   - Failure to comply with standards and regulations.
   - Inclement weather.
   - Union strikes.
   - Personality conflicts.
   - Poor management

3. **Poorly defined project goals**

## 1.4 Trade-Off Triangle

Good project management deals with three factors: time, cost and performance.

Projects are successful if they are completed on time, within budget, and to performance requirements. In order to bring the many components of a large project into control there is a large toolkit of techniques, methodologies, and tools.

These techniques provide the tools for managing different components involved in a project: planning and scheduling, developing a product; managing financial and capital resources, and monitoring progress. However the success of a project will always rest on the abilities of a project manager and the team members.

In managing competing project requirements Project managers often talk of a triple constraint:

- Project scope
- Time and
- Cost

Project quality is affected by balancing these three factors.

High quality projects deliver the required product or service within scope, on time and within budget.

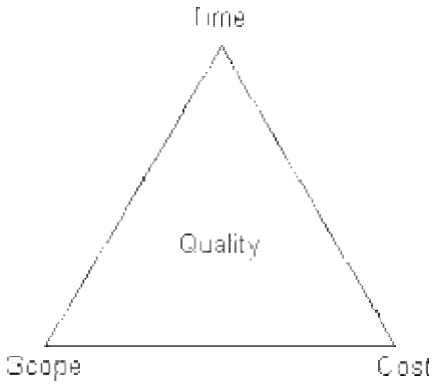
The relationship among these factors is such that if any one of the three factors changes, at least one other factor must change.

Simply put: project success means completing all project deliverables on *time,* within *budget,* and to a level of *quality* that is acceptable to sponsors and stakeholders.

The project manager must keep the team's attention focused on achieving these broad goals. Most people still want their projects to be on time, meet quality objectives, and not cost more than the budget. These form the classic time, quality, cost triangle.

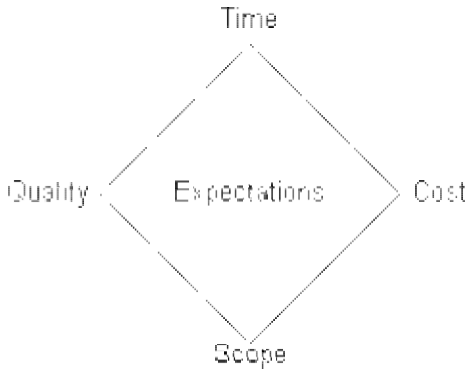
In fact if you have an unlimited budget and unlimited time, project management becomes rather easy. For most people, however, time and money are critical and that is what makes project management so important today.

Project management is often summarized in a triangle. The three most important factors are time, cost and scope. These form the vertices with quality as a central theme.




1. Projects must be delivered on time.
2. Projects must be within cost
3. Projects must be within scope
4. Projects must meet customer quality requirements

More recently, this has given way to a project management diamond, with time, cost, scope and quality the four vertices and customer expectations as a central theme. No two customers' expectations are the same so you must ask what their expectations are.




A project goes through four phases during its life:

1. Project Definition: Defining the goals, objectives and critical success factors for the project
2. Project Initiation: Everything that is needed to set-up the project before work can start
3. Project Control: Ensuring that a project stays on track and taking appropriate action to ensure it does
4. Project Closure: Disbanding of all the elements that were required to run the project

## 1.5 Project Management Skills

**The role of the Leader** in project management is one of great responsibility. It's the project manager's job to direct and supervise the project from beginning to end. Here are some other roles:

(a) Leadership
(b) Communications
(c) Problem Solving
(d) Negotiating
(e) Influencing the Organization
(f) Mentoring
(g) Process and technical expertise

### (a) Leadership

Leadership is a complex phenomenon involving the leader, the followers, and the situation. Perhaps the best way for you to begin to understand the complexities of leadership is to see some of the ways leadership has been defined. Leadership researchers have defined leadership in the following different ways:

- *The creative and directive force of morale. (*Munson, 1921)
- *The process by which an agent induces a subordinate to behave in a desired manner*. (Bennis, 1959)
- *The presence of a particular influence relationship between two or more persons*. (Hollander & Julian, 1969)
- *Directing and coordinating the work of group members.* (Fiedler, 1967) *An interpersonal relation in which others comply because they want to, not because they have to*. (Merton, 1969; Hogan, Curphy, & Hogan, 1994)
- *Transforming followers, creating visions of the goals that may be attained, and articulating for the followers the ways to attain those goals*. (Bass, 1985; Fichy & Devanna, 1986)
- *The process of influencing an organized group toward accomplishing its goals.* (Roach & Behling, 1984)
- *Actions that focus resources to create desirable opportunities.* (Campbell, 1991)

- *The leader's job is to create conditions for the team to be effective.* (Ginnett, 1996)

**Leading and managing** are both essential management skills: one without the other is likely to produce poor results. Managing is primarily concerned with "consistently producing key results expected by stakeholders," while leading involves:

- Establishing direction—developing both a vision of the future and strategies for producing the changes needed to achieve that vision.

- Aligning people—communicating the vision by words and deeds to all those, whose cooperation may be needed to achieve the vision.

- Motivating and inspiring—helping people energize themselves to overcome political, bureaucratic, and resource barriers to change.

On a project, particularly a larger project, the project manager is generally expected to be the project's leader as well.

Leadership is not, however, limited to the project manager: it may be demonstrated by many different individuals at many different times during the project.

Leadership must be demonstrated at all levels of the project (project leadership, technical leadership, and team leadership).

**(b) Communicating**

*Communicating* involves the exchange of information and the ability to transmit and receive information with a high probability that the intended message is passed from sender to receiver.

The sender is responsible for making the information clear, unambiguous, and complete so that the receiver can receive it correctly. The receiver is responsible for making sure that the information is received in its entirety and understood correctly.

Few skills are more vital to leadership. Studies show that good leaders communicate feelings and ideas, actively solicit new ideas from others, and effectively articulate arguments, advocate positions, and persuade others.

The quality of a Leader's communication is positively correlated with subordinate satisfaction as well as with productivity and quality of services rendered.

Effective communication skills are also important because they provide leaders and followers with greater access to information relevant to important organizational decisions.

Communicating has many dimensions:

- *Written and oral, listening and speaking*
- *Internal* (within the project) and external (to the customer, the media, the public, etc.).
- *Formal* (reports, briefings, etc.) *and informal* (memos, ad hoc *conversations*, etc.)
- *Vertical* (up and down the organization) *and horizontal* (with peers and partner organization)

The general management skill of communicating is related to, but not the same as, Project Communications Management.

Communicating is the 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, when to communicate orally, when to write an informal memo, 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.

Project Communications Management is the application of these broad concepts to the specific needs of a project—for example, deciding how; when; in what form; and to whom to report project performance.

**(c) Negotiating**

*Negotiating* involves conferring with others to come to terms with them or reach an agreement.

Agreements may be negotiated directly or with assistance; mediation and arbitration are two types of assisted negotiation.

Negotiation is an approach that may help resolve some conflicts. Some important tips on negotiation include; preparing for a negotiation session;

keeping people and problems separate; focusing on issues, not positions and seeking win-win outcomes.

Negotiations occur around many issues, at many times, and at many levels of the project.

During the course of a typical project, project staff is likely to negotiate for any or all of the following:

- Scope, cost, and schedule objectives.
- Changes to scope, cost, or schedule.
- Contract terms and conditions.
- Assignments.
- Resources.

**(d) Problem Solving**

There are three steps involved in this important leadership role; identifying problem; analyzing its cause; and solving the problem.

*Problem solving* involves a combination of problem definition and decision-making.

*Problem definition* requires distinguishing between causes and symptoms. Problems may be:

- **Internal** (a key employee is reassigned to another project)
- **External** (a permit required to begin work is delayed).
- **Technical** (differences of opinion about the best way to design a product)
- **Managerial (**a functional group is not producing according to plan) or
- **Interpersonal** (personality or style clashes).

**(e) Decision-making**

*Decision-making* includes analyzing the problem to identify viable solutions, and then making a choice from among them.

Decisions can be made or obtained (from the customer, from the team, or from a functional manager).

Once made, decisions must be implemented.

Decisions also have a time element to them—the "right" decision may not be the "best" decision if it is made too early or too late.

**(f) Influencing the Organization**

*Influencing the organization* involves the ability to “get things done.”

It requires an understanding of both the formal and informal structures of all the organizations involved—the performing organization, customer, partners, contractors, and numerous others, as appropriate.

Influencing the organization also requires an understanding of the mechanics of power and politics.

Both power and politics are used here in their positive senses.

Power is “the potential ability to influence behavior, to change the course of events, to overcome resistance, and to get people to do things that they would not otherwise do.”

In similar fashion, “politics is about getting collective action from a group of people who may have quite different interests. It is about being willing to use conflict and disorder creatively.

The negative sense, of course, derives from the fact that attempts to reconcile these interests result in power struggles and organizational games that can sometimes take on a thoroughly unproductive life of their own.”

Influence can be exercised in a: variety of ways. It may be the 'bridge to engine room' approach, where the leader commands and controls. Or the influence can be exercised by guiding and facilitating the group's behavior so that the goal is accomplished.

Finally, leadership implies **that a leader motivates the group to spend energy in attaining the goals of the group**.

Influence without change or movement isn’t influence. Leaders make change happen, a difficult but vitally important task.

**(g) Mentoring**

Mentoring or being a Transformational leadership is more concerned with engagement between leaders and followers.

Leaders attempt to engage the full person of the subordinate and enthuse them. They arouse in their subordinates a heightened awareness of the key issues for the group or the organization. They seek to concern subordinates with achievement, growth and development.

*Creating a new vision* is something that almost all writers on transformational leadership emphasize.

The vision points the way to a new state of affairs. It is an appealing picture of a more desirable future. It inspires people to believe that the future is worth the upheaval of undoing the present.

A vision needs to be a source of self-esteem and a common purpose for members of the organization.

**(h) Technical Skills:**

A project manager must have *technical skills*. This relates to financial planning, contract management, and managing creative thinking and problem solving techniques are promoted.