

**Ministry of Higher Education
and Scientific Research
Al-Mustaqbal University College
Department of Technical Computer Engineering**



Subject: PROJECT MANAGEMENT

4th Class

Lecture One

By

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(1)

PROJECT MANAGEMENT ادارة المشاريع

وتسمى في بعض الأحيان بما يلي:

- System Engineering هندسة الانظمة
- System analysis تحليل الانظمة
- Operation research بحوث العمليات
- Optimization الأمثلية

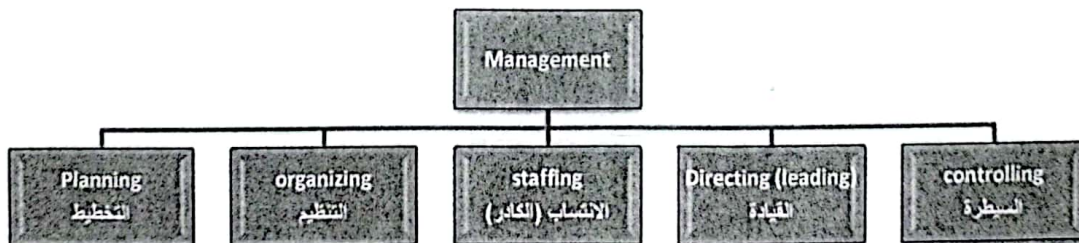
وتعرف ادارة المشاريع:

Project management is the use [The application) of knowledge, skills, tools, and techniques to plane and implement activities to meet or exceed stakeholder needs and expectation from project.

(2)

Project management is a set of principles method and techniques for effective planning of objective. Oriented work.

THE ELEMENT OF MANAGEMENT عناصر ادارة المشاريع





(3)

دلائل ادارة المشاريع

OBJECTIVE OF THE PROJECT MANAGEMENT

1. Schedules الجدولة
2. Budgets including resource allocation الميزانية بادخال المصادر المحلية
3. Scope (product) definition (الهدف) مدى ومجال الانتاج

STEPS/ PHASE OF PROJECT MANAGEMENT

خطوات او اطوار ادارة المشاريع (خطوات المشروع)

1. Project initiation (الأولي) المشروع التمهيدي
2. Project planning خطة المشروع
3. Project Scheduling جدول المشروع
4. Project costing كلفة المشروع
5. Project control (القيادة) عملية السيطرة
6. Project termination evaluation (تقدير) المشروع تقييم

IMPLEMENTATION OF PROJECT MANAGEMENT TECHNIQUE

مقاييس (خصائص) ادارة المشاريع

1. Cost reduction تقليل الكلفة
2. Time reduction تقليل الوقت
3. Resource allocation تحديد المصادر المحلية
4. Increased quality زيادة وتحسين النوعية

مما سبق نستنتج ما يلي

PROJECT MANAGEMENT BODY OF KNOWLEDGE (PMBOK)

1. Scope الهدف
2. Time الوقت
3. Cost الكلفة
4. Quality النوعية



PM.DABM.001

1.0 INTRODUCTION TO PROJECT MANAGEMENT

Project management offers a structured approach to managing projects. More managers are entering the field of project management and their success will be helped by their ability to develop a fully integrated information and control system to plan, instruct, monitor and control large amount of data, quickly and accurately to facilitate the problem-solving and decision making process.

To achieve these goals, the project manager needs a comprehensive toolkit using a computer producing organization charts, work breakdown structures, barcharts, resource histograms and cash-flow statements.

As the project manager is the single point of responsibility, it is his/her job to set up a management structure which not only meets the needs of the project, but the need of the organization, the needs of the stakeholders and the needs of the individuals working on the project.

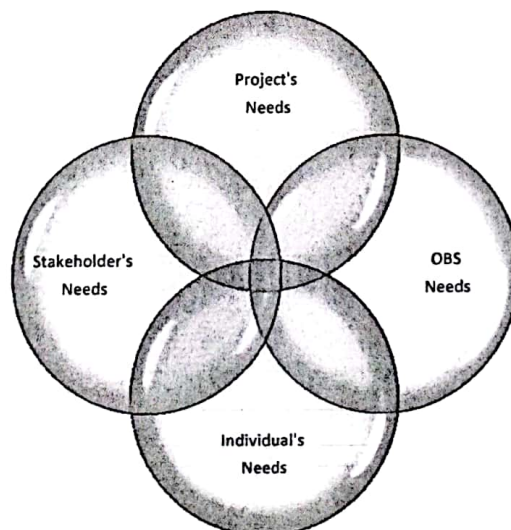


Figure 1.1: Intersecting Needs



1.1 DEFINITION OF PROJECT MANAGEMENT

Project Management is defined as

"the application of knowledge, skills, tools and techniques to project activities in order to meet stakeholder needs and expectation from the project."

Project management body of knowledge (PMBOK) defines a project as: "..... wig a temporary endeavour undertaken to create a unique product or service.

Temporary means that every product has a definite end. Unique means that the product or service is different in some distinguishing way from all similar products or services."

Project manager, as the single point of responsibility, will be responsible for either performing the work or delegating it.

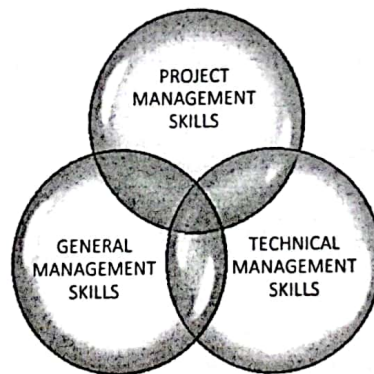


Figure 1.2: Intersecting Management Skills



The **PMBOK** describes project management under the following Nine(9) knowledge areas:

1. Project Integration: integrates the three main project management processes of planning, execution and control.
2. Project Scope Management includes the processes required to ensure that the project includes all the work required to complete the project successfully.

It consists of

- authorisation
- scope planning
- scope definition
- scope change management, and
- Scope verification

3. Project Time Management: includes the process required to ensure timely performance of the project.

It consists of

- activity definition
- activity sequencing
- duration estimating
- establishing the calendar
- schedule development, and
- time control



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

It consists of

- resource planning
- cost estimating
- cost budgeting
- cash flow and
- cost control.

5. Project Quality Management includes the process required to ensure that the project will satisfy the needs for which it was

It consists of

- determining the required condition
- quality planning
- quality assurance, and
- quality control

6. Project Human Resource Management: includes the process required to make the most effective use of the people involved with the project.

It consists of

- organisation planning
- staff acquisition and
- team development



7. Project Communications Management: includes the process required to ensure proper collection and dissemination of project information.

It consists of

- communication planning
- information distribution
- project meetings
- progress reporting, and
- administrative closure.

8. Project Risk Management: includes the process concerned with identifying, analyzing, and responding to project risk.

It consists of

- risk identification
- risk quantification and impact
- response development, and
- risk control.

9. Project Procurement Management: includes the process required to acquire goods and services from outside the performing project team or organization

It consists of

- procurement planning
- solicitation planning
- Solicitation
- source selection
- contract administration, and
- contract closeout.



The body of knowledge are subdivided into four core elements which determine the deliverable objectives of the project:

- Scope
- Time
- Cost
- Quality

The other knowledge areas provide the means of achieving the deliverable objectives, namely:

- Integration
- Human resources
- Communication
- Risk .
- Procurement and contract.
-

1.2 BENEFITS OF PROJECT MANAGEMENT

The benefits of using a project management approach, obviously follows on from addressing the needs of the project. Hence, the project manager is responsible for developing a plan through which the project can be tracked and controlled to ensure the project meets preset objectives.

Application of planning and control system will incur additional management costs. It can be justified because without it, may leads to poor management decisions, mistakes, rework and overrun.



Some of main benefits associated with a fully integrated project planning and control system are;

- Client – Project Manager as a provider to all necessary information.
- Single Point of Responsibility.
- Estimating capability.
- CPM - Critical Path Method.
- Fast Track – Meeting target delivery at earliest schedule.
- Schedule Bar chart.
- Project Integration.
- Reporting Interfaces integrating;

Work Breakdown Structure (WBS) for project reporting.

Organization Breakdown Structure (OBS) for corporate reporting.

- Response Time – timely response to project performance.
- Trends - progress trends of time, cost and performance.
- Data Capture.
- Procedures (Company's Standard on procedures and work instructions).
- Project Office as centre.
- Closeout Report (for reference by next project team).
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1.3 ROLE OF PROJECT MANAGER

As the single point of responsibility, it is the project manager who integrates and co-ordinates all the contributions, and guides them to successfully complete the project.



Some desirable project manager attributes (quality);

- Ability to select and develop an operational team from a standing start.
- Leadership and management ability.
- Ability to anticipate problems, solve problems and make decisions.
- Ability to integrate the project stakeholders.
- Operational flexibility.
- Ability to plan, expedite and get things done.
- Ability to negotiate and persuade.
- Understand the environment within which the project is being managed.
- Ability to review, monitor and apply control.
- Ability to administer the contract, the scope of work and scope changes.
- Ability to manage within an environment of constant change.
- Ability to keep the client happy.

Project management emerged because of the growing demand for complex, sophisticated, customized goods and services and the exponential expansion of human knowledge. The former depends on the integration of product design with production / distribution and the latter allows a number of academic disciplines to contribute to the development of goods and services.



Elements of management

1. **Planning**
2. **Organizing** involves:
 - a. Establishing a structure to be filled by people, aimed at reaching the defined goals and objectives.
 - b. Defining job content, interfaces, responsibilities, authority, and resource allocation.
3. **Staffing** involves:
 - a. Filling the positions in the organizational structure with suitable people.
 - b. Keeping the positions filled, in order to execute the plan.
4. **Directing (or Leading)** involves:
 - a. Creating an environment in which individuals, working together in groups, can accomplish well-selected aims.
 - b. Influencing people to contribute to reaching the goals and objectives.
 - c. Using leadership styles, communication, conflict resolution, delegation, etc. in order to overcome the problems arising from people issues (attitudes, desires, motivations, behavior in groups, etc.). on a project.
5. **Controlling (and co-ordination)** involves:
 - a. Measuring actual performance.
 - b. Comparing actual- with desired results and implementing corrective actions - e.g. by controlling the actions of the people doing the work.

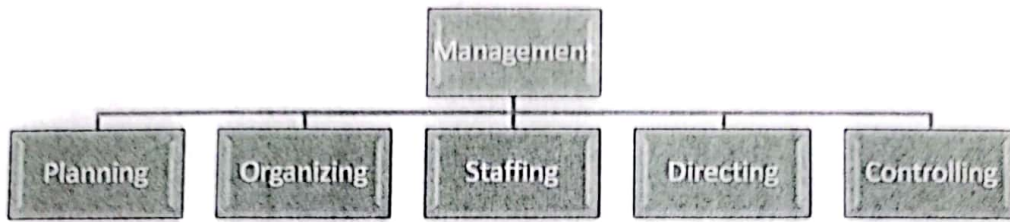


Fig. (1) Block diagram of elements of management.

Project is an assignment/task/job that has to be undertaken and completed within a set time, budget, resources and performance specifications designed to meet the needs of stakeholder and beneficiaries.

Project Management is the use of knowledge, skills, tools, and techniques. to plan and .. implement activities to meet or exceed stakeholder needs and expectations from a project. Project Management is a set of principles, methods and techniques for effective planning of objective-oriented work, thereby establishing a sound basis for effective scheduling, controlling and re-planning in the management of programs and projects. In other words, it provides an organization with powerful tools that improve the organization's ability to plan, organize, implement and control its activities and the ways it uses its people and resources.

Objectives of the Project management

The basic purpose for initiating a project is to accomplish some goals. The reason for organizing the task as a project is to focus the responsibility and authority for the attainment of the goals on an individual (project manager) or a small group (project team).

Project Management is a means by which to fit the many complex pieces



of the project puzzle together, both human and technical, by use of:

- Schedules
- Budgets, including resource allocation
- Scope (product) definition

Project Management fulfills two purposes:

1. Technical: Documentation techniques to communicate
 - The 'plan'
 - Status which compares 'planned' versus 'actual performance'
2. Human: Managerial skills to be a better 'manager of people as well as the project'

Implementation of project management technique can have significant results such as:

1. Cost reduction
2. Time reduction.
3. Resources allocation.
4. Increased quality.

Steps/Phases of Project Management

The steps followed for project management are essentially the steps for successful project initiation, development and completion.

1) PROJECT INITIATION'

- Concept definition, which includes identification and selection of opportunities and identification of objectives –
- Feasibility study and justification

2) PROJECT PLANNING

- Scope definition



- Goal definition, includes time, money, resources and product targets
- Project requirements - definition of deliverables
- Project objectives - definition of major work efforts, quantifiable
- Work break down structure
- Analysis & break down of project into smaller pieces of work
- Development of checklist of everything that needs to be done
- Team building
- Selection of project manager
- Selection of team members,
- Use resource matrix to match skills task requirements

3) PROJECT SCHEDULING

- Determining sequence of work
- Building network / interdependence
- Analysis of interdependence, estimation of total duration (CPM, "PERT) and determination of Critical Path
- Establish milestones
- Graph on time chart (Gantt chart)
- Determining human resource loading
- Establishing milestones / reporting periods

4) PROJECT COSTING

- Estimate costs, capital / operating
- Develop cost spreadsheets

5) PROJECT CONTROL

- Done periodically (at milestones)
- Time control, status, deviations from plan, replanning, new



estimates

- Cost control, Expenditure, deviations from plan, new estimates
- Quality control, performance versus performance criteria

6) PROJECT TERMINATION / EVALUATION

- Post project activity.
- Statistics from monitoring progress.
- Client feedback .
- Profitability or not of the project .
- Post implementation report.

6. REFERENCES

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- 2- J.R. Meredith and S.J. Mantel "Project Management", J. Wiley &
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PLANNING.

This process performed to define and mature the project scope, develop the project management plan, and identify and schedule the project activities that occur within the project.

SCHEDULING

Scheduling is the process of determining when project activities will take place depending on defined durations and precedent activities. Schedule constraints specify when an activity should start or end based on duration, predecessors, external predecessor relationships, resource availability, or target dates.

CONTROL

Control is the process of comparing actual performance with planned performance, analyzing the differences, and taking the appropriate corrective action.

PROJECT PLANNING AND SCHEDULING

Project Planning begins as soon as Definition allows. The process involves planning subprojects first and hence Definition must at least have identified the sub-projects and the major tasks involved in them. From this point, Planning and Definition tend to continue in parallel as a series of iterations, gradually refining and hardening both Definition and Plans.

The purpose of the Project Plan at this stage is to provide detailed realistic estimates of time, duration, resource and cost, and planning should be carried out only in sufficient detail to allow this to be achieved. Detailed planning for allocation of tasks to individuals is carried out progressively as the work proceeds.



Where there are sub-projects these should be planned first and then combined to produce the overall project plan. Produce a plan for each sub-project, or for the total project if there are no sub-projects as follows:

1- Identify Major Activities

Break the work down into activities of the order of 20-50 days of effort, ensuring that milestones correspond to completion of one or more of these. In practice the achievement of a milestone is usually a good basis for identifying an activity e.g. “prepare and perform user training”.

2- Identify and Chart Dependencies

Produce a network chart for the sub-project showing dependencies between the major activities and dependencies on other sub-projects or external events.

3. Estimate Effort and Duration

Estimate effort and duration of each major activity.

4. Provide Contingency

At this stage estimates are likely to be 'soft' and probably expressed in ranges, because precise details of the work are not settled. Contingency needs to be allowed both on the estimated effort and elapsed time because of:

- The likelihood of unforeseen work arising,
- The likelihood that tasks will take longer than expected,
- The likelihood of changes to requirements or plans before publication. (Subsequent changes should be processed through Change Control).



Contingency provision should remain evident in plans (probably as one or more contingency 'tasks').

This provision should then progressively be removed from plans during Tracking and Control as a result of either:

- being used up by e.g. tasks taking longer than planned,
- or reaching a point where uncertainty is reduced such that a part of contingency provision can safely be deleted. This usually means the deletion of contingency allowed, but not used, on tasks now completed.

5. Schedule Major Activities

Determine start and end, dates for each major activity and produce a bar chart or other diagram, showing relationships between activities.

6. Calculate Resource Requirements

Calculate requirements for each time period. Identify needs for each resource type (e.g. systems analyst, user staff) and identify needs for special skills or scarce resources.

7. Calculate Costs

Calculate costs for the sub-project. This should include 'hardening up' items such as cabling, training etc., for which an order of costs had been produced previously.

8. Determine Overall Costs and Benefits of the Project

The cost/benefit justification should have already been stated in the feasibility study. This stage provides the opportunity to review the case in the light of more detailed information.



9. Document the Project Plan

Once a viable plan has emerged (i.e. conflicts have been resolved, resource availability has been confirmed etc.) the Project Manager should produce the Project Plan covering:

- Project Schedule. This should show major activities by sub-project on a bar chart or other diagram. The chart should also show project milestones and target dates. Show contingency as a single provision at the end. Include an overall project network showing the critical path. Narrative explanation may be included for clarification.
- Major Check points and Reviews. List the dates of Checkpoint Reports, Checkpoint Meetings, Steering Group Meeting and the Post-Implementation Review.
- Deliverables. List the major products of the project with delivery dates and acceptance procedures.
- Resources. Summarise the resource needs from the sub-project plans.
- Costs and Benefits figures. Revise and refine as a result of completion of Definition and Planning
- Potential Problems. List any risks, problems or assumptions which may jeopardize the Plan, together with actions needed to correct the situation.

10. Ensure Management Systems are in places

Project Implementation and Control

The role of the project manager falls into three areas:

- i) Management of stakeholders



- ii) Management of the project life cycle
- iii) Management of performance

An approach needs to be developed for each of these. Control and monitoring procedures need to be put in place and appropriate information systems developed. The procedures which are put into place can only be successful if:

- a) there is satisfactory information to enable the team to manage the project effectively;
- b) they are simple and easy to operate and understand;
- c) they have the full support of the project team.

How should this relate to the three categories referred to above?

i) Management of stakeholders:

Stakeholders' interest must be monitored to ensure that:

- 1. their interest and support is, maintained;
- 2. their views and ideas are being adequately reflected in the project development;
- 3. their personal success criteria are being pursued and achieved;
- 4. Environmental change is fully taken into account.

ii) Management of the project life cycle:

This is probably the most conventional view of project control!. Feedback systems need to be set up to monitor key areas. The key areas would be as follows:

- 1. The project timetable, with particular reference to critical event times and potential bottlenecks. There should be feedback on



activity times achieved and their effect on the whole project. If network analysis is used, then it is vital that the network is reworked and updated to take into account the actual performance achieved.

2. The project budget; budgetary control procedures can be used as in respect of any other form of budget.
3. Quality and performance standards; these need to be monitored against the original project specification subject to changes agreed with stakeholders in the course of project development. Where possible this should all be done through positive reporting which will require action to be taken.

iii) Management of performance:

This is the least tangible but possibly the most important of the three categories. How it is tackled will depend upon what kind of project is being carried out. It is unlikely that the project team will spend all of their working time together in close proximity and under the direct supervision of the project manager. It is much more likely that they will work apart most of the time, only meeting up occasionally and only meeting with the project manager from time to time. Control issues that need to be considered therefore would be:

1. How to get the best out of the team when they are together. If you are holding meetings then they should be purposeful and effective. They should not simply be part of the routine. Having said that, they may be an important element in binding the team together and in developing a team approach to planning and monitoring, of performance.



2. Ensuring people work when the team is apart. You need to set people realistic deadlines and ensure that they see the importance of their contribution and that their contribution is fully valued.
3. Communications are important in terms of disseminating information and keeping everyone informed. There are views that team members should be given information on a need to know basis but this approach can cause problems.
4. Ensuring continuing commitment by the team and adherence to the values and beliefs being pursued by the team.
5. Change, in particular, needs to be communicated to team members quickly and effectively. It is important to stress once again the need to look at the team and also for the project leader to look inwards at his or her own performance.

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