

Research Project Management Manual

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Chapter - 1

Introduction to Project Management

Introduction

Realization of these objectives requires systematic planning and careful implementation. To this effect, application of knowledge, skill, tools and techniques in the project environment, refers to project management. Project management in recent years has proliferated, reaching new heights of sophistication. It has emerged as a distinct area of management practices to meet the challenges of new economic environment, globalization process, rapid technological advancement, and quality concerns of the stakeholders.

Project Definition

Project in general refers to a new endeavor with specific objective and varies so widely that it is very difficult to precisely define it. Some of the commonly quoted definitions are as follows. Project is a temporary endeavor undertaken to create a unique product or service or result.

Project is a unique process, consist of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective confirming to specific requirements, including the constraints of time cost and resource. Examples of project include developing a watershed, creating irrigation facility, developing new variety of a crop, developing new breed of an animal, developing agro processing center, Construction of farm building, sting of a concentrated feed plant etc. It may be noted that each of these projects differ in composition, type, scope, size and time.

Project Characteristics

Despite above diversities, projects share the following common characteristics.

- Unique in nature.
- Have definite objectives (goals) to achieve.
- Requires set of resources.
- Have a specific time frame for completion with a definite start and finish.

- Involves risk and uncertainty.
- Requires cross-functional teams and interdisciplinary approach.

Project Performance Dimensions

Three major dimensions that define the project performance are scope, time, and resource. These parameters are interrelated and interactive. The relationship generally represented as an equilateral triangle. The relationship is shown in figure 1.

It is evident that any change in any one of dimensions would affect the other. For example, if the scope is enlarged, project would require more time for completion and the cost would also go up. If time is reduced the scope and cost would also be required to be reduced. Similarly, any change in cost would be reflected in scope and time. Successful completion of the project would require accomplishment of specified goals within scheduled time and budget. In recent years a fourth dimension, stakeholder satisfaction, is added to the project. However, the other school of management argues that this dimension is an inherent part of the scope of the project that defines the specifications to which the project is required to be implemented. Thus the performance of a project is measured by the degree to which these three parameters (scope, time and cost) are achieved.

Project Life Cycle

Every project, from conception to completion, passes through various phases of a life cycle synonym to life cycle of living beings. There is no universal consensus on the number of phases in a project cycle. An understanding of the life cycle is important to successful completion of the project as it facilitates to understand the logical sequence of events in the continuum of progress from start to finish. Typical project consists of four phases- Conceptualization, Planning, Execution and Termination. Each phase is marked by one or more deliverables such as Concept note, Feasibility report, Implementation Plan, HRD plan, Resource allocation plan, Evaluation report etc.

Conceptualization Phase

Conception phase, starting with the seed of an idea, it covers identification of the product / service, Pre-feasibility, Feasibility studies and Appraisal and Approval. The project idea is conceptualized with initial considerations of all possible alternatives for achieving the project objectives. As the idea becomes established a proposal is developed setting out rationale, method, estimated costs, benefits and other details for appraisal of the

stakeholders. After reaching a broad consensus on the proposal the feasibility dimensions are analyzed in detail.

Planning Phase

In this phase the project structure is planned based on project appraisal and approvals. Detailed plans for activity, finance, and resources are developed and integrated to the quality parameters. In the process major tasks need to be performed in this phase are

- Identification of activities and their sequencing
- Time frame for execution
- Estimation and budgeting
- Staffing

A Detailed Project Report (DPR) specifying various aspects of the project is finalized to facilitate execution in this phase.

Execution Phase

This phase of the project witnesses the concentrated activity where the plans are put into operation. Each activity is monitored, controlled and coordinated to achieve project objectives. Important activities in this phase are

- Communicating with stakeholders
- Reviewing progress
- Monitoring cost and time
- Controlling quality
- Managing changes

Termination Phase

This phase marks the completion of the project wherein the agreed deliverables are installed and project is put in to operation with arrangements for follow-up and evaluation.

Project Classification

There is no standard classification of the projects. However, considering project goals, these can be classified into two broad groups, industrial and developmental. Each of these groups can be further classified considering nature of work (repetitive, non-repetitive), completion time (long term, short term etc.), cost (large, small, etc.), level of risk (high, low, no-risk), mode of operation (build, build-operate-transfer etc.). Industrial projects also referred as commercial projects, which are undertaken to provide goods or services for meeting the growing needs of the customers and providing attractive returns

to the investors/stake holders. Following the background, these projects are further grouped into two categories i.e., demand based and resource / supply based. The demand based projects are designed to satisfy the customers' felt as well the latent needs such as complex fertilizers, agro-processing infrastructure etc. The resource/ supply based projects are those which take advantage of the available resources like land, water, agricultural produce, raw material, minerals and even human resource. Projects triggered by successful R&D are also considered as supply based. Examples of resource based projects include food product units, metallurgical industries, oil refineries etc. Examples of projects based on human resource (skilled) availability include projects in IT sector, Clinical Research projects in bio services and others.

Project management

Project management is a distinct area of management that helps in handling projects. It has three key features to distinguish it from other forms of management and they include: a project manager, the project team and the project management system. The project management system comprises organization structure, information processing and decision making and the procedures that facilitate integration of horizontal and vertical elements of the project organization. The project management system focuses on integrated planning and control.

Benefits of Project Management Approach

The rationale for following project management approach is as follows.

- Project management approach will help in handling complex, costly and risky assignments by providing interdisciplinary approach in handling the assignments.

Example: R&D organizations.

- Project management approaches help in handling assignments in a specified time frame with definite start and completion points. Example handling customer orders by Industries involved in production of capital goods.
- Project management approaches provide task orientation to personnel in an Organization in handling assignments. Example: Organizations in IT sector handling software development assignments for clients.

Chapter - 2

Project Formulation

Introduction

A project in the economic sense directly or indirectly adds to the economy of the Nation. However, an introspection of the project performance clearly indicates that the situation is far from satisfactory. Most of the major and critical projects in public sector that too in crucial sectors like irrigation, agriculture, and infrastructure are plagued by tremendous time and cost overruns. Even in the private sector the performance is not all that satisfactory as is evident from the growing sickness in industry and rapid increase in non-performing assets (NPAS) of Banks and Financial Institutions. The reasons for time and cost over runs are several and they can be broadly classified under-technical, financial, procedural and managerial. Most of these problems mainly stem from inadequate project formulation and haphazard implementation.

Project Identification

Project identification is an important step in project formulation. These are conceived with the objective of meeting the market demand, exploiting natural resources or creating wealth. The project ideas for developmental projects come mainly from the national planning process, whereas industrial projects usually stem from identification of commercial prospects and profit potential. As projects are a means to achieving certain objectives, there may be several alternative projects that will meet these objectives. It is important to indicate all the other alternatives considered with justification in favour of the specific project proposed for consideration. Sectoral studies, opportunity studies, support studies, project identification essentially focuses on screening the number of project ideas that come up based on information and data available and based on expert opinions and to come up with a limited number of project options which are promising.

Project Formulation

Concept

“Project Formulation” is the processes of presenting a project idea in a form in which it can be subjected to comparative appraisals for the purpose of determining in definitive terms the priority that should be attached to a project under sever resource constraints.

Project Formulation involves the following steps.



Opportunity Studies

An opportunity study identifies investment opportunities and is normally undertaken at macro level by agencies involved in economic planning and development. In general opportunity studies there are three types of study – Area Study, sectoral and Sub-sectoral Studies and Resource Based Studies. Opportunity Studies and Support studies provide sound basis for project identification.

Pre-feasibility Studies / Opportunity Studies

A pre-feasibility study should be viewed as an intermediate stage between a project opportunity study and a detailed feasibility study, the difference

being primarily the extent of details of the information obtained. It is the process of gathering facts and opinions pertaining to the project. This information is then vetted for the purpose of tentatively determining whether the project idea is worth pursuing furthering. Pre-feasibility study lays stress on assessing market potential, magnitude of investment, technical feasibility, financial analysis, risk analysis etc. The breadth and depth of pre-feasibility depend upon the time available and the confidence of the decision maker. Pre-feasibility studies help in preparing a project profile for presentation to various stakeholders including funding agencies to solicit their support to the project. It also throws light on aspects of the project that are critical in nature and necessitate further investigation through functional support studies. Support studies are carried out before commissioning pre-feasibility or a feasibility study of projects requiring large-scale investments. These studies also form an integral part of the feasibility studies. They cover one or more critical aspects of project in detail. The contents of the Support Study vary depending on the nature of the study and the project contemplated. Since it relates to a vital aspect of the project the conclusions should be clear enough to give a direction to the subsequent stage of project preparation.

Feasibility Study

Feasibility Study forms the backbone of Project Formulation and presents a balanced picture incorporating all aspects of possible concern. The study investigates practicalities, ways of achieving objectives, strategy options, methodology, and predict likely outcome, risk and the consequences of each course of action. It becomes the foundation on which project definition and rationale will be based so that the quality is reflected in subsequent project activity. A well conducted study provides a sound base for decisions, clarifications of objectives, logical planning, minimal risk, and a successful cost effective project. Assessing feasibility of a proposal requires understanding of the STEEP factors. These are as under Social, Technological, Ecological, Economic, and Political. A feasibility study is not an end in itself but only a means to arrive at an investment decision. The preparation of a feasibility study report is often made difficult by the number of alternatives (regarding the choice of technology, plant capacity, location, financing etc.) and assumptions on which the decisions are made.

The project feasibility studies focus on

- Economic and Market Analysis
- Technical Analysis
- Market Analysis
- Financial Analysis
- Economic Benefits
- Project Risk and Uncertainty

Chapter - 3

Network Analysis

Introduction

Network analysis helps the manager to calculate the duration and identify critical activities in project. Critical activities are those activities, which determine the overall duration of the project. The duration of the project is not necessarily the simple arithmetical sum of the individual activity durations because several activities occur concurrently in the project. Project duration would be equal to the sum of all individual activity durations only when all the activities in the project are sequential. The starting and finishing time for each individual activity is calculated through the network analysis. These computations provide a strong base for determining the work schedule. The network analysis includes the following.

- a. Event numbering
- b. Computation of the Earliest Start Time (EST)
- c. Computation of the Latest Start Time (LST)
- d. Computation of Earliest Finish Time (EFT)
- e. Computation of the Latest Finish Time (LFT)
- f. Identification of Critical Path
- g. Computation of Slack or Float

Event Numbering

It is common practice to number every event in the network so that they are not duplicated, every event is identified with a reference number in the network and every activity is identified by its preceding and succeeding event numbers. There are two systems in vogue for numbering events:

1. Random numbering system
2. Sequential numbering system

R a n d o m n u m b e r i n g s y s t e m ; In this system, events of a network are numbered randomly, thereby avoiding the difficulty in numbering extra

events due to insertion of new jobs. Sequential numbering system: In this system the events are numbered successively from the beginning to the end of the network. For any individual job, the head (succeeding) event must bear a higher number than the tail (preceding) event.

Fulkerson has reduced this sequential numbering to the following routine;

1. Find the initial event and number it '1' (An initial event is one which has arrows emerging from it but none entering it).
2. Now delete all the arrows emerging from the already numbered event(s). This will create at least one new initial event.
3. Number all the new initial events '2', '3' and so on till the final event is reached (the final event is one which has no arrows emerging from it).

The complete sequential numbering system described above is inconvenient when extra jobs have to be inserted. Extra jobs often mean extra events; when these events are numbered, all the events following them must be renumbered. One way to overcome this difficulty is to use tens only like 10 for the first event, 20 for the second event and so on.

Chapter - 4

Project Management Techniques

Introduction

Project management involves decision making for the planning, organizing, coordination, monitoring and control of a number of interrelated time bound activities. Project Manager therefore, often depends on tools and techniques that are effective enough not only for drawing up the best possible initial plan but also capable of projecting instantaneously the impact of deviations so as to initiate necessary corrective measures. The search for an effective tool has resulted in development of a variety of techniques. These project management techniques can be classified under two broad categories i.e., Bar Charts and Networks.

Bar Charts

Bar charts are the pictorial representation of various tasks required to be performed for accomplishment of the project objectives. These charts have formed the basis of development of many other project management techniques.

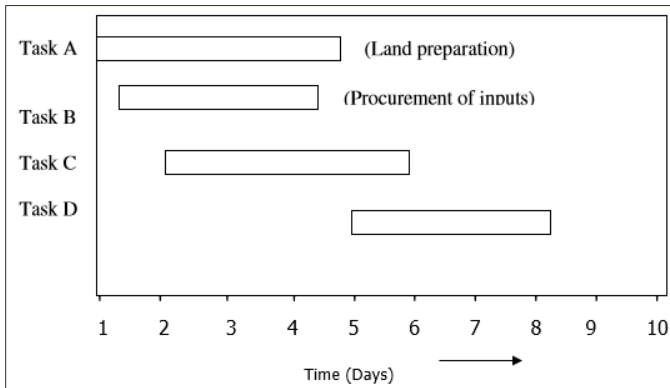
Gantt Chart

Henry L Gantt (1861 – 1919) around 1917 developed a system of bar charts for scheduling and reporting progress of a project. These charts latter were known as Gantt Charts. It is a pictorial representation specifying the start and finish time for various tasks to be performed in a project on a horizontal time-scale. Each project is broken down to physically identifiable and controllable units, called the Tasks. These tasks are indicated by means of a bar, preferably at equi-distance in the vertical axis and time is plotted in the horizontal axis (Figure 1). In this figure “Task A” is land preparation, “Task B” is procurement of inputs etc.

Land preparation (Task A) takes five days starting from day one. However, in practice the time scale is superimposed on a calendar i.e., if land preparation starts on 1st June it would be completed by 5th June. Length of the bar indicates required time for the task whereas the width has no significance. Though the bar chart is comprehensive, convenient, and very

effective, it has the following limitations:

- Like many other graphical techniques are often difficult to handle large number of tasks in other words a complex project.
- Does not indicate the inter relationship between the tasks i.e., if one activity overruns time what would be the impact on project completion.

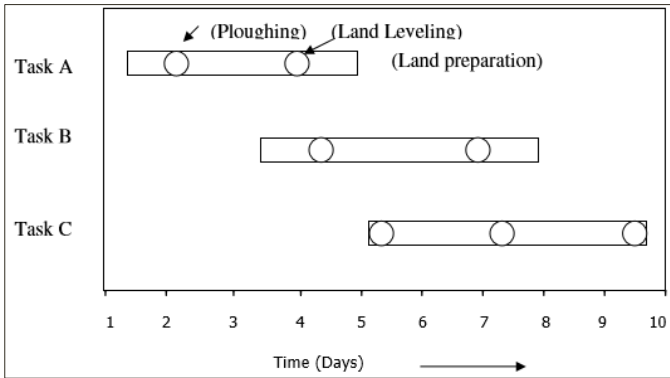


Bar Chart

Milestone Chart

Milestone chart is an improvement over the bar chart (Gantt chart) by introducing the concept of milestone. The milestone, represented by a circle over a task in the bar chart indicates completion of a specific phase of the task (Figure 2). For example, land preparation (Task A) includes ploughing and leveling. From the simple bar chart it is difficult to monitor progress of the ploughing. Introduction of a milestone on day 3 would specify that the ploughing would be completed by day 3 of the project i.e. 3rd June. In a milestone chart a task is broken down in to specific phases (activities) and after accomplishment of each of the specific activity a milestone is reached or in other words an event occurs. The chart also shows the sequential relationship among the milestones or events within the same task but not the relationship among milestones contained in different tasks. For example, in figure 2, the milestone 2 of task A cannot be reached until the milestone 1 is crossed and the activity between milestone 1 and 2 is over. Similarly, in task B the milestone 4 can begin only after completion of milestone 3. But the relationship between the milestone of task A and task B is not indicated in the milestone chart. Other weaknesses of this chart are as follows: Does not show interdependence between tasks.

- Does not indicate critical activities.
- Does not consider the concept of uncertainty in accomplishing the task.
- Very cumbersome to draw the chart for large projects.



Milestone chart

Networks

The network is a logical extension of Gantt's milestone chart incorporating the modifications so as to illustrate interrelationship between and among all the milestones in an entire project. The two best-known techniques for network analysis are Programme Evaluation and review Technique (PERT) and Critical Path Method (CPM). These two techniques were developed almost simultaneously during 1956-1958. PERT was developed for US navy for scheduling the research and development activities for Polaris missiles programme. CPM was developed by E.I. du Pont de Nemours & Company as an application to construction project.

Though these two methods were developed simultaneously they have striking similarity and the significant difference is that the time estimates for activities is assumed deterministic in CPM and probabilistic in PERT. There is also little distinction in terms of application of these concepts.

PERT is used where emphasis is on scheduling and monitoring the project and CPM is used where emphasis is on optimizing resource allocation. However, now-a-days the two techniques are used synonymously in network analysis and the differences are considered to be historical.

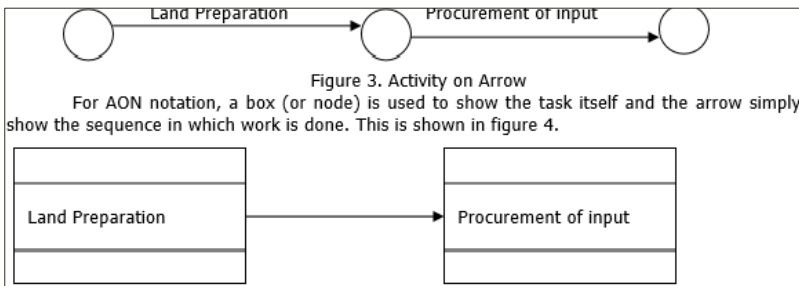
Both CPM and PERT describe the work plan of project where arrows and circles respectively indicate the activities and events in the project. This arrow or network diagram includes all the activities and events that should be

completed to reach the project objectives.

The activities and events are laid in a planned sequence of their accomplishments. However, there are two types of notations used in the network diagram. They are as under,

1. Activity-on-Arrow (AOA), and
2. Activity-on-Node (AON).

In AOA notation, the arrow represents the work to be done and the circle represents an event – either the beginning Of another activity or completion of previous one.



AON Diagram

Most project management software usually uses AON diagram. AOA network diagram are usually associated with the PERT diagram. This would be used in the following sections.

1.3.1 Programme Evaluation and Review Technique (PERT)

The PERT technique is a method of minimizing trouble spots, programme bottlenecks, delays and interruptions by determining critical activities before they occur so that various activities in the project can be coordinated.

PERT terminology

Some of the terms frequently used in PERT are as follows.

Activity: A recognizable work item of a project requiring time and resource for its completion.

Dummy Activity: An activity that indicates precedence relationship and requires no time nor resource.

Critical Activity: Activities on the critical path having zero slack / float time.

Critical Path: The longest time path connecting the critical activities in

the project network. The total time on this path is the shortest duration of the project.

Event: An instantaneous point in time signifying completion or beginning of an activity.

Burst Event: An event which gives rise to more than one activity.

Merge Event: The event which occurs only when more than one activity is accomplished.

Expected Time: The weighted average of the estimated optimistic, most likely and pessimistic time duration of a project activity:

$$T_o + 4 T_M + T_p \text{ Expected Time (TE) = -----}$$

Where, T_o = is the Optimistic time, T_M = is the Most likely time,

T_p = is the Pessimistic time

Earliest Start Time (EST): The earliest possible time at which the event can occur. The EST also denotes the Earliest Start Time (EST) of an activity as activities emanate from events. The EST of an activity is the time before which it cannot commence without affecting the immediate preceding activity.

Latest Start Time (LST): The latest time at which the event can take place. Also referred as the Latest Start Time (LST) indicating the latest time at which an activity can begin without delaying the project completion time.

Slack: The amount of spare time available between completion of an activity and beginning of next activity.

Steps for Network Analysis

The six steps of network analysis are as follows.

1. Prepare the list of activities
2. Define the inter relationship among the activities.
3. Estimate the activity duration
4. Assemble the activities in the form of a flow diagram
5. Draw the network
6. Analyze the network i.e. compute EST and LST; identify critical events, critical path and critical activities.

Swot Aanlysis

Swot: Description

- A SWOT analysis generates information that is helpful in matching an organization or group's goals, programs, and capacities to the social environment in which it operates.
- It is an instrument within strategic planning.
- When combined with dialogue it is a participatory process.

S.W.O.T. Analysis

- **Factors internal to organization**
 - Strength
 - Weakness
- **Factors external to organization**
 - Opportunities
 - Threats

Simple rules for Swot analysis

- Be realistic about the strengths and weaknesses of your organization or group.
- Distinguish between where your organization is today, and where it could be in the future
- Be specific: Avoid gray areas.
- Always analyze in relation to your core mission.
- Keep your SWOT short and simple. Avoid complexity and over analysis
- Empower SWOT with a logical conceptual framework.

Title of the research scheme: Empowerment of women through Vocational Training

- Year of Start:- 2016-17
- Location:- Udaipur

Objectives of the scheme

1. To promote employment oriented skill, up gradation training to the adolescent girls and women from the community
2. To use these groups as a platform for generating awareness on social issues
3. To encourage self-employment by acting support agency for providing necessary help
4. To certify and to liaison with the trained institutes in order to strengthen training placements opportunities for the trained girls and women.

Staff associated in the scheme

- Premlata PI
- Kiran CO-PI

Strength

Internal positive aspects that are under control and upon which you may capitalize your planning

- Work experience.
- Education, included value-added features.
- Strong technical knowledge within your field like:- hardware, software, programming languages.
- Value adding additional programmes
- Reputation & brand image
- Examination & Evaluation Process
- Research projects/Consultancy
- Industry interactions
- Highly competent faculty
- Modern equipment's
- Unique programmes offered
- Specific transferable skills like:- communication, teamwork, leadership skills.
- Personal characteristics like:- strong work ethic, self-discipline,

ability to work under pressure, creativity, optimism or a high level of energy.

- Good contacts/successful networking
- Interaction with professional organizations.

Weakness

Internal negative aspects that are under your control and that you may plan to improve.

- Lack of work experience
- Wrong major
- Lack of competent
- Inadequate facilities
- Outdated guidance
- Lack of industry orientation
- Weak employability of students
- Lack of research activities
- Internal Funding difficulties for projects
- Low GPA
- Wrong major
- Lack of goals, lack of self-knowledge
- Lack of specific job knowledge
- Weak technical knowledge
- Weak skills (leadership, interpersonal, communication, teamwork)
- Lack of female participation
- Male dominance society

Opportunities

Positive external conditions that you do not control but of which you can plan to take advantage

- Strong network
- Positive trends in your field that will create more jobs like:- growth,

globalization, technical advances)

- Growing demand
- Growing demand for Technically qualified people
- Opportunities for professional development in your field.
- New Technology Developments
- Research opportunities
- Collaborations with researcher
- Diversification

Threats

Negative external conditions that you do not control but the effect of which you may be able to lessen.

- Competition with superior skills, experience and knowledge
- Negative trends in your field that diminish jobs (downsizing, obsolescence)
- Competition in production
- Decreasing productivity
- Change in Technology and Declining availability of qualified faculty

Chapter - 5

Funding Agencies

(1) University Grants Commission (UGC)

- I. Introduction UGC strives to promote teaching and research in emerging areas in Humanities, Social Sciences, Languages, Literature, Pure Sciences, Engineering & Technology, Pharmacy, Medical, Agricultural Sciences etc.
- II. Name of scheme(s) Major and Minor Research Projects Objective(s)
§ To promote excellence in research in higher education by supporting research programmes of University and College teachers in various disciplines. § Traditionally, universities have been the centers of research. Although, the Government has a network of science and technology laboratories for research and development, the major base of researchers in science and technology remains with the universities. Therefore, university and college teachers need to be supported to meet this requirement.

Contact Address The Secretary, University Grants Commission, Bahadur Shah Zafar Marg New Delhi – 110002, Tel. No: (011) 23234019, 23236350, Fax. No.: (011) 23239659 Website: www.ugc.ac.in

(2) All India Council for Technical Education (AICTE)

- I. Introduction The All India Council for Technical Education (AICTE) has been performing its regulatory, planning and promotional functions through its Bureaus, namely: Administration; Finance; Planning and Coordination; Under Graduate Studies; Post Graduate Education and Research; Faculty Development; Quality Assurance; and Research and Institutional Development Bureaus; and through its Regional Offices located in various parts of the country. II. Name of scheme(s) i) Research & Institutional Development Schemes a) Modernization & Removal of Obsolescence Scheme (MODROBS) § To equip technical institutions with modern infra-structural facilities in laboratory(s)/workshop(s)/computing facilities to enhance functional efficiency for teaching, training and research purposes. Creation of new laboratories is not envisaged. Maximum Funding is

Rs. 15 lakhs with 2 years duration. § The aims are contemporary Lab Work, relevant project work, indirect benefits to faculty/students of the institution through training programmes and consultancy work.

b) Research Promotion Schemes (RPS) RPS aims to create research ambience by promoting research in technical disciplines and innovations in established and emerging technologies; and to generate Masters and Doctoral degree candidates. The three research avenues within RPS are the following:

§ Proof of Concept work - Independent research activity which can lead to growth of knowledge/process in an area, which can grow into a major project. Funding for such projects would be limited to a one time grant of Rs. 5-10 lakhs. § Capacity Building for research – A young faculty (30 years limit) with grant of Rs. 10-12 lakhs, is encouraged to carry out research at Doctoral level in a reputed institution. The funding can be used for both drawing of salary during leave without pay condition and towards purchase of equipment to carry out research in a Novel area. § Patentable technology development by a group of faculty members, having proven track record, who aim at developing new research facilities, at the parent institution, being motivated chiefly by high-end output such as patentable technologies. Funding to such projects would be limited to a one time grant of Rs. 20 lakhs.

ii) Industry-Institute Interaction Schemes

- a) **Industry Institute Partnership Cell (IIPC):** To establish institute-industry liaison by encouraging:
 1. Conduct of industrial training programmes
 2. Facilitating exchange of resource personnel
 3. Carry out industrial R&D
 4. Conduct of industrial visits
 5. Developing appropriate curricula and
 6. Undertake consultancy services, etc.
- b) **Entrepreneurship Development Cells (EDC):** To encourage students to consider self-employment as a career option and provide training in entrepreneurship.
- c) **National Facilities in Engineering & Technology with Industrial Collaboration (NAFETIC)** To establish national level facilities in the frontier areas of Engineering & Technology through collaboration between industry(s) and institutions for product development, basic research, trouble shooting, consultancy, testing & training purposes.

- d) Nationally Coordinated Project (NCP):** To plan, coordinate & execute integrated R&D programmes at national level by a group of institutions. The technical/ financial/ administrative deliverables are to be spelled out clearly by the networking institutions with the lead institution being an IIT/IISc/IIM/NIT.

III) Areas of research support Engineering and Technology, Architecture, Town Planning, Management, Pharmacy, Hotel Management and Catering Technology, Applied Arts and Crafts etc.

Contact Address: Adviser-II,RID Bureau, All India Council for Technical Education NBCC Building, East Wing, 4th Floor, Pragati Vihar, Bhisham Pitamah Marg, New Delhi –110 003,Telefax No: (011) 24369632, E-mail: rid@aicte.ernet.in,Website: www.aicte.ernet.in

(3) Council of Scientific and Industrial Research (CSIR)

I. Introduction

The major functions of CSIR include promotion, guidance and coordination of scientific and industrial research in India; establishment or development of and assistance to existing special institutions or departments for scientific study of problems affecting particular industries and trades; award of fellowship; utilization of Council's R&D results for industrial development; collection and dissemination of S&T information; and technology generation, absorption and transfer.

The Human Resource Development (HRD) Group of Council of Scientific & Industrial Research (CSIR) has a mandate to develop and nurture S&T manpower at the national level. It also promotes, guides and co-ordinates scientific & industrial research through research grants to Scientists/Professors working in Universities/R&D Institutes of Higher learning.

II. Name of scheme(s) & Objective(s)

- 1. Research Schemes:** To promote research work in the field of S&T including agriculture, engineering and medicine. Multi-disciplinary projects which involve inter-organizational cooperation (including that of CSIR Laboratories) are also considered. Preference is given to schemes which have relevance to research programmes of CSIR laboratories.
- 2. Sponsored Schemes:** The Directors of CSIR laboratories may invite applications for research grants in specific areas of interest to their respective laboratories. They will forward these to the CSIR HRD

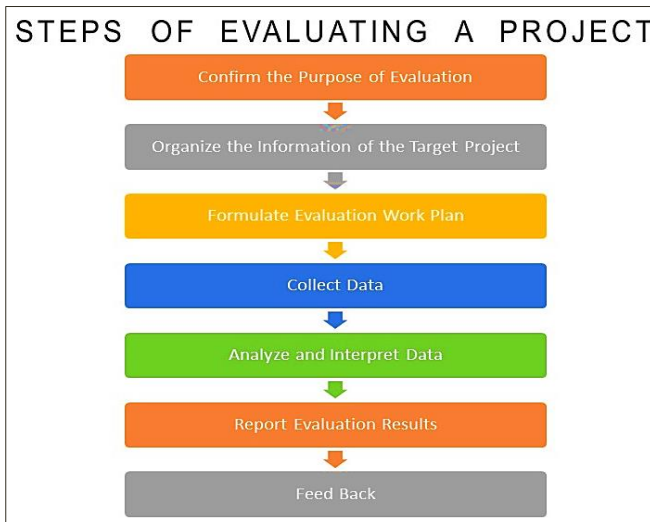
Group. The scheme enables the CSIR laboratories to interact with university system, so that the CSIR laboratory can take the help of the faculty there to undertake part of the work of its core programme, for which it either does not have the time and or expertise.

- 3. Emeritus Scientist Scheme:** To provide support to superannuated outstanding scientists to pursue research in their respective field of specialization and having relevance to the programmes of CSIR.

Chapter - 6

Project Evaluation

Before the team is dissolved and begins to focus on the next project, a review is conducted to capture the lessons that can be learned from this project, often called a lessons-learned meeting or document. The team explores what went well and captures the processes to understand why they went well. The team asks if the process is transferable to other projects. The team also explores what did not go well and what people learned from the experience. The process is not to find blame, but to learn. Quality management is a process of continual improvement that includes learning from past projects and making changes to improve the next project. This process is documented as evidence that quality management practices are in use. Some organizations have formal processes for changing work processes and integrating the lessons learned from the project so other projects can benefit. Some organizations are less formal in the approach and expect individuals to learn from the experience and take the experience to their next project and share what they learned with others in an informal way. Whatever type of approach is used, the following elements should be evaluated and the results summarized in reports for external and internal use.



Perspectives of Five Evaluation Criteria Relevance

To examine the justifiability or necessity for project implementation

Necessity

Does a project match the needs of a target area or society?

Does a project match the needs of target groups?

Priority

Is a project consistent with the Japan's foreign assistance policy and JICA's country programs?

Is a project consistent with a partner country's development plans?

Relevance as a Means

Is project strategy producing impact on development issues in related sector of a partner country? (Are selected approaches, target areas or groups appropriate? Are there any synergistic effects of other donors' projects in the same sector? etc.)

Are selected target groups considered appropriate (as a target or in the size)?

Is a project relevant from the equality point of view? (Are project effects and costs equally shared? Is there any ripple effect beyond target groups? etc.)

Does Japan have an advantage in extending technical cooperation in the related sector or sub-sector? (Is there any accumulation of know-how and experiences regarding target technologies in Japan? etc.)

Effectiveness: To examine project effects

Is the project purpose specific enough? (Are indicators and means of verification appropriate?)

Has the project purpose been achieved (or is it going to be achieved)?

Did (or does) the achievement result from outputs?

Is there any influence of important assumptions on the attainment of the project purpose?

What are the hindering/contributing factors for effectiveness?

Efficiency: To examine project efficiency

Was (or is) the cost of inputs justified by the degree of achievement of outputs?

(This can be compared with the similar projects of other donors or of the partner country.)

Were (or are) there any alternatives that would have achieved (or will achieve) same level at lower costs? Could (can) higher level of achievement be expected at the same costs?

Was (or is) the cost of inputs justified by the degree of achievement of the project's purpose? (This can be compared with similar projects of other donors or of the partner country.)

Were (are) there any alternatives that would have achieved (or will achieve) the same level at lower costs?

Could (can) a higher level of achievement be expected at the same costs?

What are the factors that inhibit or contribute to the efficiency of project implementation process?

(Examples) Were inputs delivered in an appropriate timeframe? Were the size and the quality of inputs appropriate?

Is there any influence of important assumptions on the process from inputs through output?

Is there any influence of preconditions? etc.

What are the hindering/contributing factors for effectiveness?

Impact: To examine the project's effects including the ripple effects in the long term

Has the overall goal been achieved (or is it going to be achieved)?

Did (or does) the achievement of the overall goal result from the project purpose?

Is there any influence of important assumptions on attainment of the overall goal?

Is there any unexpected positive or negative influence including ripple effects?

Conduct the study from various viewpoints such as policies, economics and finance, organization and institution, technologies, society and culture, and environment. Some examples of survey questions are:

Is there any influence on policies?

Is there any economic influence on a target society, project

implementing?

Agencies, and the beneficiary?

Is there any influence on the organization, related regulations and legal?

System arrangement?

Is there any influence on technological innovation?

Is there any influence on such issues as gender equality, human rights, disparities between the rich and the poor, peace and conflicts?

Is there any influence regarding the issue of environmental protection?

Is there any specific impact observed, either positive or negative, due to the differences of gender, race, and social class?

What are the hindering and contributing factors for impact?

What are unexpected factors that produced positive and negative influence?

Sustainability: To examine the sustainability after the termination of JICA's cooperation

Are the expected effects described in both the project purpose and the overall goal going to be sustained after the termination of assistance?

What are the factors that inhibit or contribute to the appearance of those sustainable effects?

Conduct the study from various viewpoints such as policies, economics and finance, organization and institution, technologies, society and culture, and environment. Some examples of survey questions are:

Is political support sustained?

Does the organization have the capacity to carry out activities?

Are the personnel located in appropriate manner?

Is the budget, including ordinary expenses, secured?

Does the decision-making process appropriately function? etc.

Are related regulations and legal system arranged?

Is the organization financially independent, or is the financial support continuously provided?

Are necessary technologies maintained and prevalent? Is the equipment appropriately maintained?

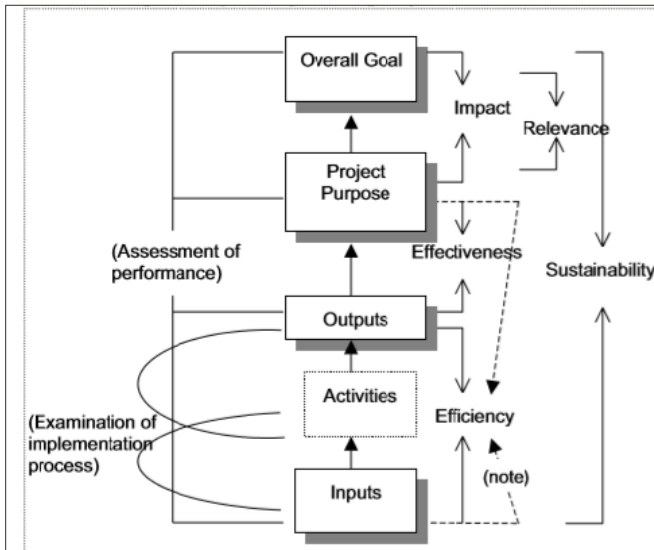
Would a negative influence on the social and cultural aspects, if any become obstacles in carrying out activities?

Are there any negative influences on sustainability because of the?

Lack of consideration to women, the poor, and the socially vulnerable?

Would a negative influence on the environment inhibit carrying out activities?

Was (or is) the ownership of implementing agencies and related ministries assured?



This figure mainly shows the relationship between the Five Evaluation Criteria and the Log frame.

Log frame is only one of the information sources in an evaluation and one needs to look at other information as well. For instance: for “relevance,” such information as development plans of a partner country, background of project, the needs of the beneficiary, project strategies, and the formulation of plans is needed; “efficiency” needs to be analyzed from three viewpoints:

1. productivity;
2. cost-benefit; and
3. cost-effectiveness;

for “impact,” not only the overall goal described as an expected effect in log frame, but also unexpected positive and negative influences have to be

investigated; the relevance of project strategies in a program's framework is also examined; for "sustainability," various questions have to be raised as is described in table and for "effectiveness" and "impact," when examining the causal relationship between project implementation and effects, such aspects as internal conditions, implementation process, and unexpected external conditions should be included.

References

1. Gary R. Heerkens., 2002. Project Management, published by The McGraw-Hill Companies.
2. Project Management 2007, Published by the open university of Hong Kong rCreative Commons-ShareAlike 4.0 International License (<http://creativecommons.org/licenses/by-sa/4.0/>).
3. Introduction to Project Management, 2020., published at coursera <https://www.coursera.org>