8.3 SOFTWARE PROJECT MANAGEMENT

"Software project management is a sub-discipline of project management in which software projects are planned, monitored and controlled."

OR

"Project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements."

The primary challenge of project management is to achieve all of the project goals and objectives while adhering to classic project constraints-usually scope, quality, time and budget. The secondary-and more ambitious-challenge is to optimize the allocation and integration of inputs necessary to meet pre-defined objectives. A project is a carefully defined set of activities that use resources (money, people, materials, energy, space, provisions, communication, motivation, etc.) to achieve the project goals and objectives.

8.3.1 Project Management Triangle

Like any human undertaking, projects need to be performed and delivered under certain constraints. Traditionally, these constraints have been listed as scope, time, and cost. These are also referred to as the Project Management Triangle, where each side represents a constraint. One side of the triangle cannot be changed without impacting the others. A further refinement of the constraints separates product 'quality' or 'performance' from scope, and turns quality into a fourth constraint.
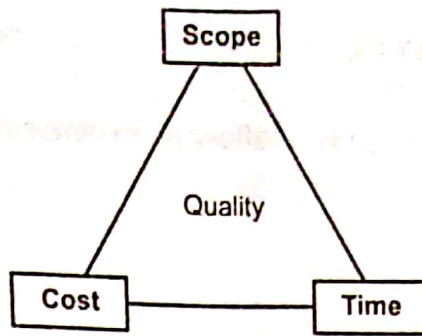
The time constraint refers to the amount of time available to complete a project. The cost constraint refers to the budgeted amount available for the project. The scope constraint refers to what must be done to produce the project's end result. These three constraints are often competing constraints: increased scope typically means increased time and increased cost, a tight time constraint could mean increased costs and reduced scope, and a tight budget could mean increased time and reduced scope.

3.4 ACTIVITIES COVERED BY SOFTWARE PROJECT MANAGEMENT

Project management is composed of several different types of activities such as:

- Analysis and design of objectives and events
- Planning the work according to the objectives
- Assessing and controlling risk (or Risk Management)
- Estimating resources
- Allocation of resources
- Organizing the work
- Acquiring human and material resources
- Assigning tasks
- Directing activities
- Controlling project execution
- Tracking and reporting progress (management information system)
- Analyzing the results based on the facts achieved
- Defining the products of the project
- Forecasting future trends in the project
- Quality management
- Issues management
- Issue solving
- Defect prevention
- Identifying, managing and controlling changes
- Project closure (and project debrief)
- Communicating to stakeholders
- Increasing/ decreasing a company's workers

8.5 PROJECT COST ESTIMATES

A typical software project comprises of the following expense heads:

(i)   Manpower Cost
(ii) Hardware Cost
(iii) Software Cost
(iv) Travel Cost
(v)   Training Cost
(vi) Administration Cost

(i) Manpower Cost : For estimating manpower cost, it is normal practice to categorize the manpower into three to five categories and associate a monthly rate for each category. The rate should only include costs directly paid towards salaries, sub-contracting fees and related perquisites.

(ii) Hardware Cost : Hardware cost will also have to be computed on a unit costing basis. Let us take a typical project which uses personal computer as front end workstations and a unix server at the backend. It is possible that the unix server is shared across many projects. The organisations must work out unit costs for a month for each hardware item which can be utilized for a project.

(iii) Software Cost : Software cost are normally assigned on number of licenses or number of users using one license of the software. Again these are easy to determine once the environmental software is decided and the project team organization is finalized. The organisation must have worked out unit cost for every license of the software on a monthly basis.

(iv) Travel Cost : Travel cost must be estimated based on the requirements for travel for the project. Typically this could include cost of travel for review meetings, requirements specifications, implementations etc. This must be done based on best available data at this stage.

(v) Training Cost : Training cost will include the cost of application, technical and general training which the project team members will have to undergo before they start working on the project. It could also include the costs relating to travel for training, faculty charges and premises for training.

(vi) Administration Cost : Administration Cost typically include charges relating to premises utilities communication and convergence costs. It could also involve the cost of corporate overheads. These costs are normally worked out in most organisations on a per seat cost and the project is charged on the number of set as occupied it.

8.6 RISK ANALYSIS

Risk analysis is a set of techniques used to investigate problems created by uncertainty and to assess their effects. Today it is used in many areas, especially where safety is important. Now the project management in the area of IT (information technology) is becoming hot topic. And the risk problems in IT projects, especially in software development projects become more and more concentrated in software project management. So risk analysis in the area of software development project becomes increasingly important. This work analyses systematically the characteristics of project management for software itself, then the paper analyses the risk of software development projects in the following two aspects: one

for owners and another for contractors. To owners the paper identifies and analyses the risk in software development projects according to lifecycle of a project. To contractors the paper identifies and assesses the risk of managing software development project on the basis of investigation of software development project in the IT enterprises of China. Let us try and understand some of the common risks encountered in most software projects.

(a) Product Size Risks

Few experienced managers would debate the following statement: Project risk is directly proportional to product size. The following risk item issues identify generic risks associated with product size:

- Estimated size of the product in LOC or FP?
- Degree of confidence in estimated size estimate?
- Estimated size of product in number of programs, files, transactions?
- Percentage deviation in size of product from average for previous products?
- Size of database created or used by the product?
- Number of users of the product?
- Number of projected changes to the requirements for the product? Before delivery? after delivery?
- Amount of reused software?

In each case, the information for the product to be developed must be compared to past experience. If a large percentage deviation occurs or if numbers are similar, but past results was considerably less than satisfactory, risk is high.

(b) Business Impact Risks

An engineering manager at a major software company placed the following framed plaque on his wall "God grant me brains to be a good project manager and the common sense to run like hell whenever marketing sets project deadlines!" The marketing department was driven by business considerations, and business considerations sometimes come into direct conflict with technical realities. The following risk item issues identify generic risks associated with business impact :

- Affect of this product on company revenue?
- Visibility of this product by senior management?
- Reasonableness of delivery deadline?
- Number of customers who will use this product and the consistency of their needs relative to the product?
- Number of other products/systems with which this product must be interoperable?
- Sophistication of end users?
- Amount and quality of product documentation that must be produced and delivered to the customer?
- Governmental constraints on the construction of the product?