Chapter 1 – Modern Project Management

1. Define a project. What are five characteristics which help differentiate projects from other functions carried out in the daily operations of the organization?

1). A project is a complex, non routine, one-time effort limited by time, budget, resource, and specifications.

2). Differentiating characteristics of projects from routine, repetitive daily work are below:

a). A defined life span

b). A well-defined objective

c). Typically involves people from several disciplines

d). A project life cycle

e). Specific time, cost, and performance requirements.

4 stages of Project Life Cycle:

1. **Defining: (GSTR)**
   a). Goals.
   b). Specifications.
   c). Tasks.
   d). Responsibilities,

2. **Planning: (SBRRS)**
   a). Schedules.
   b). Budgets.
   c), Resources.
   d). Risks.
   e), Staffing.

3. **Executing:** A major portion of the project work take place – both physical and mental. **(SCQF)**
   a). Status Reports
   b). Changes.
   c). Quality.
   d). Forecasts.

4. **Closing: (TTREL)**
   a). Train Customer.
   b). Transfer documents.

c). Release Resources.

d). Evaluation.

e). Lessons learned.

2. What are some of the key environmental forces that have changed the way projects are managed? What has been the effect of these forces on the management of projects?

1). Some key environmental forces that have changed the way we manage projects are
- a). the product life cycle,
- b). knowledge growth,
- c). global competition,
- d). organization downsizing,
- e). technology changes,
- f). time-to-market.

2). The impact of these forces :
- a). more projects per organization,
- b). project teams responsible for implementing projects,
- c). accountability,
- d). changing organization structures,
- e). need for rapid completion of projects,
- f). linking projects to organization strategy and customers,
- g). prioritizing projects to conserve organization resources,
- h). alliances with external organizations, etc.

3. Why is the implementation of projects important to strategic planning and the project manager?

Strategic plans are implemented primarily through projects—e.g.,
- a). a new product,
- b). a new information system,
- c). a new plant for a new product.

The project manager is the key person responsible for completing the project
- -) on time,
- -) on budget, and
- -) within specifications so the project's customer is satisfied.

If the project is not linked to the strategic plan of the organization, resources devoted to the project are wasted and a customer need is not met. This lack of connectivity occurs more in practice than most would believe.

4. The technical and sociocultural dimensions of project management are two sides to the same coin. Explain.

The system and sociocultural dimensions of project management are two sides of the same coin because successful project managers are skillful in both areas.

The point is successful project managers need to be very comfortable and skillful in *both*areas.

5. What is meant by an integrative approach to project management? Why is this approach important in today's environment?

An integrative approach to project management is one in which all the parts are interrelated. This approach is important because it can give an organization a competitive edge in today's environment.

An integrative approach includes two parts.

1). projects must have a strong link to the organization's strategic plan, which is directed toward meeting the customer's needs.

A project priority system reinforces this linkage by prioritizing projects according to their contribution to the strategic plan and allocates resources by the priorities set.

2). an integrative approach provides an integrated system for the actual implementation of the projects. This includes an information system which supports decision making and a sociocultural environment which creates a positive, active contribution from team members responsible for completing the project.

Chapter 2 – Organisation and Project Selection

1. Describe the major components of the strategic management process.

The major generic components of the process include the following:

a. Defining the mission of the organization

b. Analysis of the external and internal environments

c. Setting objectives

d. Formulating strategies to reach objectives

e. Implementing strategies through projects.

Characteristics of Objectives :

S Specific : Be specific in targeting an objective
M Measurable : Establish a measurable indicator(s) of progress
A Assignable : Make the objective assignable to one person for completion
R Realistic : State what can realistically be done with available resources
T Time related : State when the objective can be achieved, that is, duration

2. Explain the role projects play in the strategic management process.

Strategy is implemented primarily through projects.

Successful implementation of projects means reaching the goals of the organization and thus meeting the needs of its customers.

Projects that do not contribute to the strategic plan waste critical organization resources.

3. How are projects linked to the strategic plan?

Since some projects are more important than others, the best way to maximize the organization's scarce resources is through a priority scheme which allocates resources to a portfolio of projects which balance risk and contribute the most to the strategic plan.

4. The portfolio of projects is typically represented by compliance, strategic, and operations projects. What impact can this classification have on project selection?

By carefully aligning your project proposal with one classification, you may increase the chances of it being selected. Remember, senior management typically allots budgets for each category independent of actual project selection.

Knowledge of funds available, risk portfolio, senior management bias, etc. may cause some to attempt to move their project proposal to a different classification to improve the chances of the project being selected.

5. Why does the priority system described in this chapter require that it be open and published? Does the process encourage bottom-up initiation of projects? Does it discourage some projects? Why?

An open, published priority system ensures projects are selected on the basis of their contribution to the organization. If the priority system is not open, squeaky wheels, strong people, and key departments all get their projects selected for the wrong reasons. Bottom-up is encouraged because every organization member can self evaluate their project idea against priorities – and so can everyone else in the organization. To some, this approach may look intimidating but rarely is in practice; however, it does discourage projects that clearly will not make positive, significant contributions to the organization vision.

6. Why should an organization not rely only on ROI to select projects?

Financial criteria, like ROI alone, will not ensure that selected projects contribute to the mission and strategy of a firm. Other considerations such as developing new technology, public image, brand loyalty, ethical position, and maintaining core competencies should be considered. Furthermore, it is difficult or next to impossible to assess ROI for many important projects (e.g., Y2K projects). While ROI is likely to be a key consideration for many organizations, multiple screening criteria are recommended for selecting and prioritizing projects.

7. Discuss the pros and cons of the checklist versus the weighted factor methods of selecting projects.

Checklist Model

- Flexible
- Applies over a wide range of different types of projects, divisions, and locations
- Impossible to rigorously compare and rank project by priority
- Politics, power, and manipulation of project selection is very possible.

Weighted Factor Model

- Allows comparison and ranking of potential projects
- Open system
- Allows for self evaluation of proposed project
- Power and politic games are exposed.

Chapter 3 – Organisation Structure and Culture

1. What are the relative advantages and disadvantages of the functional, matrix, and dedicated team approaches to managing projects?

1. What are the relative advantages and disadvantages of the functional, matrix, and dedicated team approaches to managing projects?

The Functional Approach	Advantages : • No radical alteration in basic structure of the parent organization • Maximum flexibility in use of staff within functional units • In-depth expertise can be brought to bear on specific components of the project • Normal career paths can be maintained. Disadvantages : • Lack of project focus • Poor cross-functional	

	integration • Slow • Lack of project ownership.	
The Matrix Approach	Advantages : • Flexible utilization of resources across projects and functional duties • Project focus is provided by having a designated project manager • Specialists maintain ties with their functional group • Balances project prerogatives with technical requirements. Disadvantages : • Decision making can be bogged down as agreements have to be negotiated between project managers and functional managers • Dysfunctional conflict • Stress induced by multiple superiors • slow	
The Dedicated	Advantages :	

Team Approach	• Does not disrupt the basic structure of the parent organization • Concentrated project focus • Projects tend to get done quickly • Strong cross-functional integration. Disadvantages : • Dilemma of what to do with people once the project is over • Technical expertise limited to the people on the team • We/they attitude emerges between project team and rest of organization which inhibits integration of project with mainstream operations • Expensive – creation of project management role and duplication of services across projects.	

2. What distinguishes a weak matrix from a strong matrix?

The most distinguishing characteristic between a weak and strong matrix is :

the relative influence the project manager has over project participants and functional managers.

In a weak matrix the project manager role is limited to coordinating project activities. The functional managers are responsible for managing their segment of the project. The project manager has little formal authority over the project. In a strong matrix, the project manager controls most aspects of the project including design trade-offs and assignment of project personnel. The functional managers are responsible for supporting project completion. A project manager in the weak matrix is not likely to be involved in performance appraisals and compensation decisions while project managers in a strong matrix would.

3. Under what conditions would it be advisable to use a strong matrix instead of a dedicated project team?

Both structures can be quite effective.

The strong matrix would be recommended when the organization cannot afford to have people work full-time on the project and when the culture of the organization supports the dual authority structure.

Dedicated project teams are recommended when speed is essential to success and there is not enough project work to warrant a formal matrix structure.

Dedicated project teams are also recommended when the prevalent culture within the organization does not support collaboration and innovation.

4. How can project offices (POs) support effective project management?

POs support effective project management by:

- Tracking project progress
- Promulgating best practices
- Providing project management training and consulting services
- Integrating latest advances in field of project management
- Being an organizational advocate

It should be noted that the extent to which a PO performs the above functions will vary from one organization to the next.

5. Why is it important to assess the culture of an organization before deciding what project management structure should be used to complete a project?

The culture of the organization can impact the effectiveness of different project management structures.

Organizational cultures that do not encourage teamwork, collaboration, and cross-functional integration need a stronger project management structure (i.e., project team, project matrix) to be successful.

6. Other than culture what other organizational factors should be used to determine which project management structure should be used?

The two major considerations are the percentage of core work that involves projects and resource availability.

Organizations, whose main business evolves around projects, should consider a projectized form of structure.

Organizations that have mainstream operations and projects should use a matrix structure.

When resource availability is limited then a matrix structure should be used that allows sharing personnel across projects and operations.

7. What do you believe is more important for successfully completing a project – the formal project management structure or the culture of the parent organization?

Both are important and an argument can be made for either structure or culture.

The bias of the authors is that culture is more important than structure since it more directly impacts behavior. A positive organizational culture can compensate for the inherent weaknesses of the formal structure. For example a functional or matrix structure can be effective if the norms and customs of the organization value teamwork and effective problem-solving. Conversely, a

functional or matrix structure is likely to be disastrous in a negative culture that encourages competition and looking out only for yourself.

Alternatively, one could argue that an organization can circumvent a negative culture by creating an independent project team or a strong project matrix. In either case, the strategy is to insulate the project team from the dominant organizational culture and create a unique project subculture.

Chapter 4 – Defining the Project

1. What are the six elements of a typical scope statement?

(Project Scope Checklist) :

a. Project objective

b. Deliverables

c. Milestones

d. Technical requirements

e. Limits and exclusions

f. Reviews with customer.

Many companies engaged in contracted work refer to scope statements as**statement of work (SOW)**
Project Charter: document that authorizes the PM to initiate & lead the project.

Scope creep : the tendency for the project scope to expand over time (usually by changing requirements, specifications, and priorities).

2. What questions does a project objective answer? What would be an example of a good project objective?

The project objectives answers what, when, and how much. To replace the Willamette bridge by August 3rd at a cost not to exceed $1.5 million.

3. What does it mean if the priorities of a project include: Time–constrain, Scope-accept, and Cost–enhance?

The project must be completed on a specific date, the scope can be scaled back in order to meet cost and time objectives, and when possible seek opportunities to reduce costs.

•Causes of Project Trade-offs

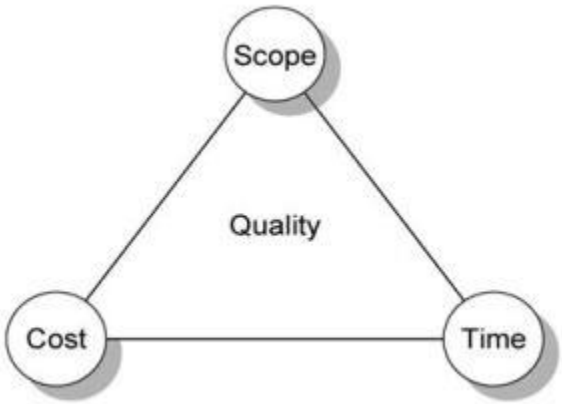
–Shifts in the relative importance of criterions related to cost, time, and performance parameters

•Budget–Cost

•Schedule–Time

•Performance–Scope

One technique found in practice that is useful for this purpose is completing a priority matrix for the project to identify which criterion is constrained, which should be enhanced and can be accepted.



01. Project Management Trade-offs

–Constrain: a parameter is a fixed requirement.

The project must meet the completion date, specifications and scope of the project, or budget

–Enhance: optimizing a criterion over others.

–Accept: reducing (or not meeting) a criterion requirement.

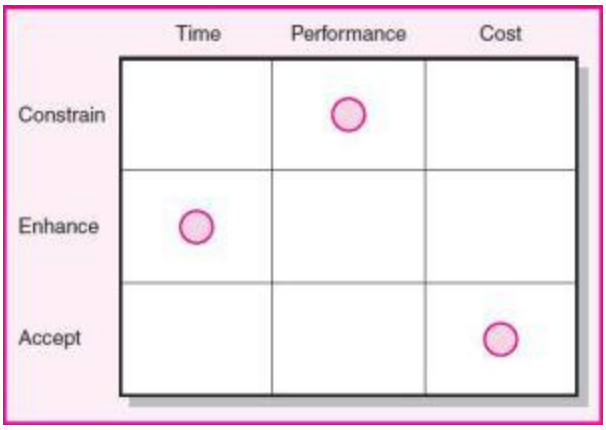


Fig 2. Project Priorities Matrix

•Work Breakdown Structure (WBS)

– Defines the relationship of the final deliverable (the project) to its subdeliverables, and in turn, their relationships to work packages.

– Best suited for design and build projects that have tangible outcomes rather than process-oriented projects.

The benefits of WBS:

- Facilitates evaluation of cost, time, and technical performance of the organization on a project.
- Provides management with information appropriate to each organizational level.
- Helps in the development of the organization breakdown structure (OBS). which assigns project responsibilities to organizational units and individuals
- Helps to plan schedule, and budget.

–Defines communication channels and assists
in coordinating the various project elements.

4. What kinds of information are included in a work package?

Work packages include the following types of information:

1. Work to accomplish a segment of the project
2. Time to accomplish the work package
3. Time-phased budget for the work package and total cost to complete the work package
4. Resources needed to complete the work package
5. Single person responsible for accomplishment of the work package
6. Monitoring points for measuring progress during implementation of the work package
7. Any specifications critical to the work package.

Organizational Breakdown Structure (OBS)

–Depicts how the firm is organized to discharge its work responsibility for a project.

5. When would it be appropriate to create a responsibility matrix rather than a full-blown WBS?

On smaller projects where verbal, face-to-face communication is possible, a responsibility matrix should be adequate. Sometimes a responsibility matrix is used for a segment of a project or one in which a team wishes to stress responsibility.

6. How does a communication plan benefit management of projects?

The advantage of establishing a communication plan is that instead of responding to information requests you are controlling the flow of information. Keeping stakeholders informed with timely information reduces confusion, unnecessary interruptions, and can provide project managers greater autonomy.

Why? Because by reporting on a regular basis how things are going and what is happening, you allow senior management to feel more comfortable about letting the team complete the project without interference

Chapter 5 – Estimating Project Times and costs

1. Why are accurate estimates critical to effective project management?

Without accurate time and cost estimates project control is ineffective. Inaccurate estimates can make the difference between profit or loss.

- Time and cost estimates are major inputs to project planning.
- Project control is completely dependent on accuracy of estimates.
- Estimates are needed to support good decisions.
- Estimates are used to determine project duration and cost.
- Estimates are used to develop cash flow needs.
- Estimates are used to develop time-phased budgets and establish the project baseline.
- Absence of estimates results in inaccuracies which result in time and cost under/overruns.
- The activity of estimating reduces error.

2. How does the culture of an organization influence the quality of estimates?

Organization culture can influence project estimates depending on the importance the organization places on estimating.

Use of top-down versus bottom-up estimating can influence estimates. How padding is handled strongly influences estimates. How organization politics is tolerated can severely influence estimates.

3. What are the differences between bottom-up and top-down estimating approaches? Under what conditions would you prefer one over the other?

Top-down estimates are:

1. typically used in the project conceptual phase, and depend on measures such as weight, square feet, ratios. Top-down methods do not consider individual activity issues and problems.

2. good for rough estimates and can help select and prioritize projects.

Bottom-up time and cost estimates are

1. usually tied directly to the WBS and a work package.

2. made by people familiar with the task, which helps to gain buy-in on the validity of the estimate. Use of several people should improve the accuracy of the estimate. Bottom-up estimates should be preferred if time to estimate is available, estimating cost is reasonable, and accuracy is important.

4. What are the major types of costs? Which costs are controllable by the project manager?

the major types of costs:

1. Direct : controllable by the project manager.

2. direct overhead

3. general and administrative costs.

Direct overhead and general and administrative costs are only controllable in the sense that if the resource or project is finished early or late the costs will continue for the duration of the project.

Chapter 6 – Developing a Project Plan

1. How does the WBS differ from the project network?

a. The WBS is hierarchical while the project network is sequential.

b. The network provides a project schedule by identifying sequential dependencies and timing of project activities. The network sets all project work, resource needs, and budgets into a sequential time frame; the WBS does not provide this information.

c. The WBS is used to identify each project deliverable and the organization unit responsible for its accomplishment within budget and within a time duration.

d. The WBS provides a framework for tracking costs to deliverables and organization units responsible.

2. How are WBS and project networks linked?

The network uses the time estimates found in the work packages of the WBS to develop the network. Remember, the time estimates, budgets, and resources required for a work package in the WBS are set in time frames, but*without* dates. The dates are computed after the network is developed.

3. Why bother creating a WBS? Why not go straight to a project network and forget the WBS?

The WBS is designed to provide different information for decision making.

For example, this database provides information for the following types of decisions:

a. Link deliverables, organization units, and customer

b. Provide for control

c. Isolate problems to source

d. Track schedule and cost variance. Network doesn't.

e. Assign responsibility and budgets

f. Focus attention on deliverables

g. Provide information for different levels in the organization.

4. Why is slack important to the project manager?

Slack is important to the project manager because it represents the degree of flexibility the project manager will have in rearranging work and resources.

A project network with several near critical paths and hence, little slack, gives the project manager little flexibility in changing resources or rearranging work.

5. What is the difference between free slack and total slack?

Free slack usually occurs at the end of an activity chain—before a merge activity. It is the amount of time the activity can be delayed without affecting the early start of the activity immediately following it.

Since free slack can be delayed without delaying following activities, it gives some resource flexibility to the project manager.

Total slack is the amount of time an activity can be delayed without delaying the completion date of the project. Use of total slack in one activity can prevent its use on the following activity.

6. Why are lags used in developing project networks?
Two major reasons:

a. To closer represent real situations found in projects

b. To allow work to be accomplished in parallel when the finish-to-start relationship is too restrictive.

7. What is a hammock activity, and when is it used?
A hammock activity is a special purpose activity that exists over a segment of the life of the project.

A hammock activity typically uses resources and is handled as an overhead cost—e.g., inspection.

Hammock activities are used to identify overhead resources or costs tied directly to the project. The hammock duration is determined by the beginning of the first of a string of activities and the ending of the last activity in the string.

Hammock activities are also used to aggregate sections of projects to avoid project detail—e.g., covering a whole subnetwork within a project. This approach gives top management an overview of the project by avoiding detail.

Chapter 7 – Managing Risk

Question 1

1. Project risks can/cannot be eliminated if the project is carefully planned. Explain.

Project risks cannot be eliminated. It is impossible to be aware of all things that might happen when a project is being implemented. Undesirable events identified before the project begins can be transferred, retained/reduced, or shared. Contingency plans with trigger points and responsibility should be established before the project begins.

2. The chances of risk events occurring and their respective costs increasing change over the project life cycle. What is the significance of this phenomenon to a project manager?

The chances of risk events and estimated costs changing over the project life cycle are high. These events will impact project change control mechanisms. Moreover, such changes could be significant enough to require changes in scope. The project manager must ensure that

these changes are recorded and kept updated. Otherwise the integrity of the project control system will quickly deteriorate and become useless as a management tool.

3. What is the difference between avoiding a risk and accepting a risk?

Avoiding a risk is changing the project plan in advance so as to eliminate specific risks from occurring while accepting a risk means no preventive action is taken; contingency plans may be used if the risk materializes.

4. What is the difference between mitigating a risk and contingency planning?

Mitigating a risk refers to taking action to either reduce the likelihood that a risk (bad event) will happen and/or reduce the impact the risk has on the project. Contingency planning is developing a response if the risk occurs. Mitigating is preventive while contingency is reactive.

5. Explain the difference between budget reserves and management reserves.

Budget reserves are established to cover identified risks that occur while implementing a project work package or activity. If the risk does not materialize, the funds are removed from the budget reserve. The management reserve covers unforeseen risks and applies to the total project. These reserves are usually controlled by top management, the owner, and/or the project manager. Budget and management reserves are independent of each other.

6. How are the work breakdown structure and change control connected?

The WBS and change control are directly linked. Any change from the baseline developed from the WBS needs to be recorded. This link allows management to trace changes and problems directly to deliverables and the organization unit responsible.

7. What are the likely outcomes if a change control process is not used? Why?

If a change control process is not used, budgets and plans will self-destruct quickly. Tracking changes facilitates control and accountability of budgets and time. In addition, change control allows for coordination of changes further on in the project.

8. What are the major differences between managing negative risks versus positive risks (opportunities)?

Essentially the same process that is used to manage negative risks is applied to positive risks. The major differences occur in the responses. Instead of avoiding negative risks, project managers often try to exploit positive risks by taking action to ensure that the opportunity occurs. Instead of transferring risks to another party, project managers often share positive risks to increase the likelihood the opportunity can be exploited. Instead of mitigating negative risks, project managers

will take action to enhance the likelihood the opportunity will occur and/or increase the positive impact of the opportunity. Finally, project managers will often choose to accept both negative and positive risks, but be prepared to respond if either occurs.

Question 3 What are the main processes included in project quality management?

- Planning quality
- Performing quality assurance
- Performing quality control

(Kerzner H., 2006)

Question 4 What is project quality?

It is actually difficult to accurately define. ISO definition "the degree to which a set of inherent characteristics fulfils requirements" (ISO9000:2000). Most organizations view quality as a process of continuous improvement where lessons learned are used to enhance future products and services.

(Kerzner H., 2006)

Question 5 What is quality planning?

Planning quality includes identifying which quality standards are relevant to the project and how to satisfy those standards.

The main outputs of quality planning are:

- A quality management plan,
- Quality metrics (A metric is a standard of measurement. For example, failure rates of products produced, customer satisfaction ratings…)
- Quality checklists
- A process improvement plan
- Project documentation updates.

(Schwalbe K, 2009)

Question 6 What is quality assurance?

It is the collective term for all the formal activities and managerial processes that attempt to ensure that products and services meet the required quality level.

It includes activities and processes that ensure that all legal and regulatory requirements are met.

A good quality assurance system will

- Identify objectives and standards
- Be multifunctional and prevention oriented
- Plan for collection and use of data in a cycle of continuous improvement
- Include quality audits

(Kerzner H., 2006)

Question 7 What are quality audits?

They are an independent evaluation performed by qualified personnel that ensures that the project is conforming to the quality requirements and is following the established procedures and policies.

(Kerzner H., 2006)

Question 8 What is quality control?

It is the collective term for the activities and techniques within the process that are intended to create specific quality characteristics (e.g. continually monitoring processes, identifying and eliminating causes of problems, use of statistical process control to reduce variability and increase efficiency.)

It involves selecting what to control, setting standards, establishing measurement methods, comparing actual results to quality standards, acting to bring non conforming processes and materials back to the standard and including detailed documentation for all processes.

(Kerzner H., 2006)

Question 9 How would you develop a good quality plan? What information needs to be included in the quality plan?

The quality plan should be created by the PM and the project team.

The plan should use the WBS to identify specific quality actions for the lower-level activities. The PM must ensure that the actions are documented and implemented.

A good plan will:

- Identify external and internal customers
- Cause the design of a process that produces the features desired by the customer
- Bring in suppliers early in the process
- Cause the organization to be responsive to changing customer needs
- Prove that the process is working and that quality goals are being met.

(Kerzner H., 2006)

Question 10 What is meant by the cost of conformance and the cost of non-conformance? Give examples of both categories of cost.

- **Conformance** means delivering products that meet requirements. Examples of **conformance costs** are training, verification, testing, calibration, audits
- Cost of **non conformance** means taking responsibility for failures or not meeting quality expectations. Examples of **non conformance costs**are rework, warranty repairs, product recalls, complaint handling.

(Kerzner H., 2006)

Question 11 How have experts such as Deming, Juran, Crosby and Taguchi effected the quality movement? (You only need to answer this in general terms – optional question based on history – not for exam)

In general,

- The work carried out by these experts has made quality a visible criterion that companies now strive to achieve. Quality projects are used to meet customer expectations and not just company needs. Awards have been established to encourage and reward those who seek to achieve quality (e.g. Malcolm Baldrige National Quality Award).
- Pointing out the cost of poor quality helped to motivate companies to improve quality.
- Observing the economic successes and successes in the marketplace that were attributable to emphasis on quality made other companies take notice.

(Schwalbe K., 2009)

Specifically (in brief – details of the contribution of each expert would not be examined):

- **W, Edwards Deming** – believed management was preoccupied with today rather than the future. 85% of problems required management to change the process. (Deming's14 points for management)
- **Joseph M. Juran** – Juran trilogy (quality improvement, planning, control). 5 attributes of "fitness for use". Stressed the cost of quality and legal implications (Juran's 10 steps to quality improvement)
- **Phillip B. Crosby** – striving for zero defects; Crosby's14 steps to quality, 4 absolutes of quality (conformance to requirements, prevention, zero defects, cost of non conformance
- **Dr. Taguchi** – Robust design methods- quality should be designed into the product and not inspected into it; and quality is best achieved by minimising deviation from target value.

(Kerzner H., 2006)

Chapter 8 – Scheduling Resources and Costs

SPI < 1 Means : behind schedule.
CPI < 1 Means : Over budget.
CV < 0 Means : Over Budget.
CV > 0 Means : Under Budget.
SV < 0 Means : Behind schedule.
SV > 0 Means : Ahead Schedule.

1. How does resource scheduling tie to project priority?

Resource scheduling ties to project priority because resources are limited. Remember, the priority system ranks projects which then determines which project each resource should work on first.

2. How does resource scheduling reduce flexibility in managing projects?

Resource scheduling systems usually reduce flexibility because when resources are considered, computer routines use slack to get an "efficient" schedule. When slack is used up, flexibility is lost and the risk of delaying the project increases. If the resource conflict occurs on the critical path, the project is delayed.

3. Present six reasons scheduling resources is an important task.

Several reasons for scheduling resources are to:

- Check if existing resources are adequate and available
- Decide which resources have priority
- Assess the impact if another project is added to the pool
- Determine where the real critical path is. Are there unforeseen dependencies?
- See what happens to the risk of being late if slack is used up developing a schedule
- Decide if outside contractors have to be used
- Decide if an imposed project duration is realistic.

Note that there are many more reasons for scheduling resources – e.g. it allows you to develop the time-phased budget which allows you to monitor and control the project schedule and budget (see chapter 13 for more details), allows you to generate cash flow statements, resource usage schedule ….

4. How can outsourcing project work alleviate the three most common problems associated with multiproject resource scheduling?

Outsourcing can be used to reduce project slippage, improve utilization of critical resources, and avoid resource bottlenecks. For example, project delays can be avoided by contracting key activities when resources are not available internally. Likewise, hiring consultants to help with Y2K problems allows critical IT people to work on specific problems, while the outsiders work on standard programs. Not only does the project get done on time, but the company avoids hiring IT personnel to meet a short term need.

5. Explain the risks associated with leveling resources, compressing or crashing projects, and imposed durations or "catch-up" as the project is being implemented.

(Crashing means reducing the project duration.)

The risks associated with leveling, crashing, and "catch-up" are similar to those noted in question 2. Flexibility is decreased and risk of delay is increased. For example, slack is used up and may cause other bottlenecks later in a sequence of activities. Having time buffers at merge points before the project begins could help avoid some of the need to crash activities. Decoupling critical activities can help to cut time if decoupling is possible and resources can be shifted; however, the risk is typically reduced only slightly.

6. Why is it critical to develop a time-phased baseline?

Other systems do not measure how much work is accomplished for the money spent! Hence, without time-phasing cost to match your project schedule, it is impossible to have reliable information for control purposes.

Options When Resources Are Not Constrained :

1. Adding Resources :

- The most common method for shortening project time is to assign additional staff and equipment to activities.
- Doubling the size of the workforce will not necessarily reduce completion time by half.

2. Outsourcing Project Work :

- A common method for shortening the project time is to subcontract an activity.
- The subcontractor :
  1. may have access to superior technology or expertise that will accelerate the completion of the activity.
  2. frees up resources that can be assigned to a critical activity and will ideally result in a shorter project duration.

3. Scheduling Overtime :

- The easiest way to add more labor to a project is not to add more people, but to schedule overtime.
- **Advantages :**
  1. By scheduling overtime you avoid the additional costs of coordination and communication encountered when new people are added.

2. I

f people involved are salaried workers, there may be no real additional cost for the extra work.

3. There are fewer distractions when people work outside normal hours.

- **Disadvantages :**
  1. hourly workers are typically paid time and a half for overtime and double time for weekends and holidays.

  2. Sustained overtime work by salaried employees may incur intangible costs.
- Overtime and working longer hours is the preferred choice for accelerating project completion, especially when the project team is salaried.

4. **Establish a Core Project Team :** Assigning professionals full time to a project avoids the hidden cost of multitasking in which people are forced to juggle the demands of multiple projects

5. **Do It Twice—Fast and Correctly:**

If you are in a hurry, try building a "quick and dirty" short-term solution, then go back and do it the right way.

Options When Resources Are Constrained:

1. Fast-Tracking
2. Critical-Chain

3. Reducing Project Scope

4. Compromise Quality

Chapter 9 – Reducing Project Duration

1. What are five common reasons for crashing a project?

Reasons given could include:

- Imposed deadline in which disfavor will be earned by not meeting superior's deadline
- Time to market competitive advantage
- Realize benefits from incentive contracts
- To make up for lost time and avoid contract penalties
- Save extensive overhead costs
- Free up resources to work on other projects
- Exceed customer expectations.

2. What are the advantages and disadvantages of reducing project scope to accelerate a project? What can be done to reduce the disadvantages?

Reducing the scope of the project can lead to big savings both in time and costs. It typically means the elimination of certain tasks. At the same time scaling down the scope may reduce the value of the project such that it is no longer worthwhile or fails to meet critical success parameters. The key is reassessing the project requirements to determine which are essential and which are optional. This requires the active involvement of all key stakeholders. More intense re-examination of requirements may actually improve the value of the project by getting it done more quickly and for a lower cost.

3. Why is scheduling overtime a popular choice for getting projects back on schedule? What are the potential problems for relying on this option?

Scheduling overtime is popular because it is possible that if it involves salary workers there may be no additional cost for the project. Even if it involves additional costs, you avoid Brook's law and minimize additional coordination and training costs. The disadvantages are the additional time and half costs associated with hourly overtime and stress and fatigue that come with working long hours which can lead to accidents, inferior performance, and turnover.

4. Identify four indirect costs you might find on a moderately complex project. Why are these costs classified as indirect?

Indirect (overhead) costs are costs that cannot be attributed to a specific activity or work package. Examples of indirect costs are supervision, consultants, debt interest charges, machinery common to several activities, accounting and information processing, public relations, penalties or incentives for early or late completion. In practice it is amazing how many project compression decisions are made without serious consideration of indirect costs.

5. How can a cost-duration graph be used by the project manager? Explain.

A cost-duration graph is useful to the project manager for comparing alternatives. Any alternative that moves the project duration away from the optimum cost-duration point will increase costs. Additionally, incentives and penalties can be evaluated against the total, low cost point.

6. Reducing the project duration increases the risk of being late. Explain.

Compressing the project duration means slack (float) on noncritical activities will be reduced. When slack of noncritical activities is reduced, the chance of new critical paths occurring increases; hence, the risk of the project becoming late increases. In addition, compressing will have the following other impacts on managing the project:

- Reduces flexibility by using slack
- Can increase number of critical activities
- Can increase interdependencies of paths
- Makes resource scheduling tighter (critical)
- May increase costs.

7. It is possible to shorten the critical path and save money. Explain how.

The only way to shorten the critical path and save money is to have indirect costs which are greater than the additional direct costs of shortening the critical path one unit of time. The difference is a savings.

Chapter 10 – Leadership: Being an Effective Project Manager

1. What is the difference between leading and managing a project?

Leading involves recognizing and communicating the need to change course and direction of the project, aligning people to this new direction, and motivating the team to overcome obstacles to achieve the new objectives. Managing is about formulating plans and objectives, designing procedures to achieve those objectives, monitoring progress, and taking corrective action. Managing is about putting out fires and maintaining the course. Leading is about change, and altering the course of a project.

2. Why is a conductor of an orchestra an appropriate metaphor for being a project manager? What aspects of project managing are not reflected by this metaphor? Can you think of other metaphors that would be appropriate?

There are many parallels between conducting an orchestra and managing a project. Conductors and project managers integrate the contributions of others. Each is dependent upon the expertise and talents of others. They facilitate performance rather than actually perform. Project managers orchestrate the completion of the project by inducing participants to make the right decision at the right time. Both control the pace and intensity of work by coordinating the involvement of players. Finally each has a vision of performance that transcends the music score or project plan.

The conductor metaphor works best in describing how a project manager interacts with project members to complete the project. The metaphor fails to capture the intricacies of dealing with all of the project stakeholders (government officials, contractors, top management, customers) that impact the project.

Other metaphors that emerge from class discussions include: quarterback, steering wheel, and ship's captain.

3. What does the exchange model of influence suggest you do to build cooperative relationships to complete a project?

According to the exchange model of influence, the primary way to gain cooperation is to provide services and resources to others in exchange for future resources and services (quid pro quo). The key is to find out what you can offer others that is of value to them so that they will feel obligated to reciprocate. Here the notion of influence currencies is useful in identifying different ways to gain cooperation from others. A second key is building a positive "bank account" with those whom you are dependent upon so that they are inclined to cooperate with you.

4. What differences would you expect to see between the kinds of influence currencies that a project manager in a functional matrix would use and the influence a project manager of a dedicated project team would use?

This question is designed to explore the impact that the project management structure has on the ability of project managers to exercise influence over team members. The key point is that the project manager of a dedicated team has more formal authority over the participants and the project and, therefore, greater access to influence currencies than the project manager in a functional matrix. For example, the dedicated project manager is responsible for assigning project work, while functional managers do so in a functional matrix. A dedicated project manager will have greater access to position-related currencies. Since dedicated projects are used for high priority projects, the dedicated project manager is likely to develop inspiration-related currencies. Project managers in a functional matrix compensate for their lack of formal authority by exercising informal influence through the use of relationships and personal currencies.

5. Why is it important to build a relationship before you need it?

People are likely to be more cooperative if they know you, and you have developed a personal relationship with them. When people view you as pleasant, credible, and helpful based on past contact, they are more likely to be responsive to your requests for help and less confrontational when problems arise. The key is building a positive credit in the relationship that you can tap into when you need help.

6. Why is it critical to keep the project sponsor informed?

The project sponsor is a powerful ally who uses his/her influence to protect the project when it comes under attack in higher circles of management. Project sponsors need to be kept informed so that they can defend the project to the best of their abilities.

7. Why is trust a function of both character and competence?

Character alone is not likely to engender trust. People must have confidence in the other person's abilities and competence. For example, you are unlikely to follow someone who has the best of intentions if he/she has a track record of failing to get things done correctly. Conversely, one will not trust someone who is very competent but has a doubtful character. For example, you are unlikely to follow someone who is quite competent if you believe he/she is only looking out for what is best for him/her.

8. Which of the eight traits/skills associated with being an effective project manager is the most important? The least important? Why?

This question is designed to generate discussion rather than having a definitive answer. Most people will suggest either emotional intelligence, systems thinker, skillful politician, or personal integrity. (You should discuss and debate your choices and reasons in the tutorial class. The key is to think about how these traits relate to being an effective project manager. For example, personal integrity is important because it leads to trust which facilitates more effective interaction. Alternatively, being a skilled politician is necessary to deal with different stakeholders with conflicting agendas.) You should come to the conclusion that while some traits may be more important than others, all are important to being an effective project manager.

Chapter 11 – Managing Project Teams

1. What are the differences between the five-stage model of team development and the punctuated equilibrium model?

The **five-stage model** asserts that effective project groups evolve in a predictable manner.

1. **Forming** :
   - A group of ppl come together to accomplish a share purpose.
2. **Storming** :
   - Disagreement abt mission, vision and approaches combined w/ the fact that team members are getting to know ea othr can cause strained rel & conflict.
3. **Norming** :
   - The team has conciously / uncounciously formed working rel that are enabling progress on the team's obj.
4. **Performing** :
   - Effective already perform the team.
5. **Adjourning** :
   - invlv the proc of "unforming" the group, letting go the group strct.
   - invlv completing the tasks.

(source: about.com)

2. What are the elements of an effective project vision? Why are they important?

There are four key elements to an effective vision.

1. the vision must make strategic sense.
   - otherwise others will not see it as appropriate or realistic
2. one must be able to communicate it to others.
   - they understand it and choose to pursue it
3. the project leader must have a personal passion to achieve it.
   - it is seen as being credible and has the full support of the project manager.
4. the vision should inspire others to give optimal effort.
   - visions motivate superior performance and therefore must be a source of inspiration to others.

3. Why should a project manager emphasize group rewards over individual rewards?

Because most project work is a collaborative effort, it makes sense that the reward system encourages teamwork. Recognizing individuals can distract from team unity. Because project work is interdependent it can be very difficult to distinguish who truly deserves individual credit. Group cohesion can be undermined if members feel that others are receiving special treatment. Camaraderie can vanish, to be replaced by bickering and obsessive preoccupation with internal group politics. Such distractions can absorb a tremendous amount of energy that would otherwise be directed to completing the project. Individual rewards should only be used when there is clear agreement that a member deserves special recognition.

4. What is the difference between functional and dysfunctional conflict on a project?

It can be difficult to discern whether a conflict among project members is functional or dysfunctional. The key is how conflict affects project performance, not how individuals feel.

Members can be upset and dissatisfied with each other, but as long as the conflict enhances project performance then it is considered **functional**.
Conversely, if the conflict distracts from project performance by degenerating into personality clashes or creating unnecessary delays in critical project work, then the conflict is considered **dysfunctional**.

5. When would it be appropriate to hold a formal team-building session on a project?

Formal team-building sessions should be used whenever it is believed that such activities will enhance the performance of the project team. This would especially be true at the beginning of a project when the session would help develop a team identity among a group of strangers. Likewise, team-building activities could be used to assimilate new project members once the project is underway. Devoting time and attention to team-building would also be appropriate when the project team is experiencing problems working together or needs to elevate its performance to meet new project demands. The sessions would be useful in identifying and changing dysfunctional behavior as well as re-energizing the team to higher levels of performance. One mistake project managers make is that they resort to formal team-building activities after they realize the team is in trouble. It might be wiser to utilize team-building sessions earlier to encourage collaboration and to prevent small problems from escalating into major problems within the team.

6. What are the unique challenges of managing a virtual project team?

There are many challenges associated with managing a spatially separated, virtual team. Two of the biggest challenges are

1. developing trust within the team and
2. effective communication patterns.

People tend to find it difficult to trust someone whom they have met one or two times or not at all. Furthermore, unlike when members work side by side and can readily assess the competence and effort displayed by fellow team members, the actions of distant members are not visible. Finally, physical separation prohibits informal socializing that contributes to trust among participants. Reliance on electronic, as opposed to direct communication, can be problematic. Managers not only have to overcome time zone differences and cross-cultural variations, but they are missing visual cues that contribute to effective communication.

7. What can a project manager do to avoid some of the pitfalls of a highly cohesive project team?

1. PM need to be aware that there is a potential downside to a highly cohesive team and **be able to recognize the symptoms** associated with the pathologies described in the chapter.
2. They **can take preemptive action to reduce the isolation of the team** by encouraging the maintenance of ties with the rest of the organization as well as with other project stakeholders.
3. They **can personally reinforce the connection between the project and the mission and policies of the parent organization**. They can also encourage functional conflict and discourage the group from developing a "holier than thou" attitude. They can also use the nominal group technique to encourage the surfacing of dissenting opinions.
4. They **can hold formal team-building sessions** to identify and eliminate dysfunctional norms and refocus the team's attention on project objectives.

Chapter 13– Progress Performance Measurement and Evaluation

1. How does a Tracking Gantt chart help communicate project progress?

The Tracking Gantt chart graphically compares the plan and actual time performance. The bar-chart layout makes it very easy to see differences between planned schedule and actual start, finish and remaining activity times.

2. How does earned value give a clearer picture of project schedule and cost status than a simple plan versus actual system?

Earned value gives a clearer picture than a simple plan versus actual system because the earned value system includes the time variable in measuring progress. Plan versus actual can lead to false conclusions. Earned value measures what work was accomplished for the money spent.

3. Schedule variance (SV) is in dollars and does not directly represent time. Why is it still useful?

SV gives a project view of how well all of the scheduled activities are meeting planned dates. Research shows that after twenty percent of a large project is complete, SV is a relatively good indicator of schedule performance (even though it is in dollars or labor hours).

4. How would a project manager use the CPI?

The cost performance index (EV/AC) is a popular index. An index of .60 indicates that 60 cents of work has been completed for each actual dollar spent. This would suggest to the project manager that the project will be over budget or big savings in remaining work will be needed to bring the project in on budget.

5. What are the differences between BAC and EAC?

BAC is the planned budget at completion. EAC is the estimate at completion. EAC can be calculated two ways. First is simply by formula, which is used in software programs; the formula applies a performance ratio from past work on the project to the remaining work for an EAC. A second method uses new cost estimates that have been made by project participants concerning specific work packages; these new estimates are then factored into the EAC.

6. Why is it important for project managers to resist changes to the project baseline? Under what conditions would a project manager make changes to a baseline? When would a project manager not allow changes to a baseline?

The usefulness and integrity of the baseline, as a mechanism for monitoring progress and tracing back to the problem, can be eroded by constant changing of the baseline. Therefore, changes in baselines should be limited to major scope changes—for example, when the project will fail or the change represents a significant improvement of the project. Customers can request scope changes. Internally scope changes can come from project personnel—e.g., significant design changes to improve a product. Natural disasters can force a baseline change. Sometimes the complete elimination of a cost account can result in a baseline change. Don't change for small changes such as price and planning errors. Changes to "improve performance" should not change a baseline. Changes should not occur after a work package or cost account is complete.

Next is a review sheet that students have found useful in applying earned value concepts and indexes.

Basics		**Calculation**	
PV	The planned time-phased value of the work that is scheduled		
EV	Earned value is simply percent complete times its budgeted cost of the work	EV = % Complete * Original budget	
AC	Actual cost of the work completed		
BAC	The total planned value of the project *Comments:* Budgeted cost at completion		
Cost			
CV	Cost variance adjusted budget costs to the actual	CV = EV – AC	

	spent costs *Comments:* Negative number indicates over budget. Positive number indicates under budget. Need to know % over budget to indicate magnitude.		
CPI	Cost performance index is a measure of cost efficiency on a project *Comments:* A value less than 1indicates a cost overrun. A valuegreater than 1indicates cost savings. **CPI = .90**means "**we are only earning 90 cents of planned work for each dollar spent**." Found on the EV Cost Indicators Table in MS Project.	CPI = EV / AC	
TCPI	To complete performance index *Comments :* The amount of value each remaining dollar must earn for the project to stay within budget. A number **greater than 1** meansthere is **more work**than there isbudget left. A number **less than 1** means there is**less work** than there is budget left. Found on the EV Cost	TCPI =(BAC – EV) / (BAC – AC)	

	Indicators Table in MS Project.		
Schedule			
SV	Schedule variance: How much work that has been done compared with how much should have done at this point in time *Comments :* Negative number indicates work that was suppose to be done at this time has not been done. Positive number indicates work that was not suppose to be done by this time has been accomplished. **SV = -1,000** means**$1,000 worth of work that was scheduled to be done** at this time has not been accomplished.	SV = EV – PV	
SPI	Schedule performance index is a measure of schedule efficiency on a project *Comments :* A value **less than 1**indicates that work on the project is**behind schedule**. A value **greater than 1** indicates work on the **ahead**of **schedule**. **SPI = 1.10** means "**$1.10 worth of work has been accomplished for each $1**	SPI = EV / PV	

	worth of scheduled work." Found at MS EV Schedule Indicators Table.		
Critical Path	Look at current activity on the critical path or most recent milestone to see if it is on schedule *Comments :* Compare the planned early start of most recent critical activity with the actual start. Alternative compare most recent milestone date and actual milestone date.		
PCIB	Percent complete in terms of *budget* *Comments :* What percentage of work has been completed to date based on planned budget. A good indicator of how much of the project has been completed. Not available in MS Project.	PCIB = EV / BAC	
PCIC	Percent complete in terms of *expected costs* *Comments :* What percentage of work has been completed to date based on revised estimates of total project costs. Preferred when you have confidence in revised estimates and or budget is	PCIC = AC / EAC_e	

	not fixed. Not available in MS Project.		
Forecast			
EAC_f	Forecasted estimate cost at completion *Comments :* If we continue with the same efficieny (CPI) on the project, how much will the total cost be? Reliability increases as PCIB or PCICincreases.Note that the formula can also be expressed as $EAC_f = (AC*BAC)/EV$	$EAC_f = AC + [(BAC - EV) / CPI]$	
EAC_{re}	Revised estimate cost at completion *Comments :* ETC equals the revised estimates for remaining work. Only valid if revised estimates have been entered.	$EAC_{re} = AC + ETC$	
VAC	Forecasted cost variance *Comments :* Positive number indicates that the project will be completed under budget. A negative number suggests that it will be completed over budget. Gray & Larson refer to it as VAC_f. Preferred on large	$VAC = BAC – EAC_f$	

	projects and when it is not practical to obtain valid revised estimates.		
VAC_{re}	Revised estimate cost variance *Comments :* Positive number indicates that the project will be completed under budget. A negative number suggests that it will be completed over budget.	$VAC_{re} = BAC – EAC_{re}$	

Exercises

1. In month 9 the following project information is available: actual cost is $2,000, earned value is $2,100, and planned cost is $2,400. Compute the SV and CV for the project.

CV = EV – AC = 2,100 – 2,000 = +100

SV = EV – PV = 2,100 – 2,400 = -300

2. On day 51 a project has an earned value of $600, an actual cost of $650, and a planned cost of $560. Compute the SV, CV, and CPI for the project. What is your assessment of the project on day 51?

CV = EV – AC = 600 – 650 = -50

SV = EV – PV = 600 – 560 = +40

CPI = EV / AC = 600 / 650 = .92

3. Given the project network and baseline information below, complete the form to develop a status report for the project at the end of period 4 and the end of period 8. From the data you have collected and computed for periods 4 and 8, what information are you prepared to tell the customer about the status of the project at the end of period 8?

The project appears to be doing nicely. In both periods 4 and 8 the cost variance is positive—+$300 and +$400, respectively. This suggests a pattern of good cost variance that is under budget.

The schedule variance is also positive—+$300 and +$400 for period 4 and period 8. Since Task D is already 25% complete, Task B must have been completed at least one period early.

End of Period 4

Task	Actual % Complete	EV $	AC $	PV $	CV $	SV $
A	Finished	400	300	400	+100	0
B	50%	1200	1000	800	+200	+400
C	33%	500	500	600	0	-100
D	0%	0	0	0	0	0
E	0%	0	0	0	0	0
Cumulative Totals		**$2100**	**$1800**	**$1800**	**$+300**	**$+300**

End of Period 8

Task	Actual % Complete	EV $	AC $	PV $	CV $	SV $
A	Finished	400	300	400	+100	0
B	Finished	2400	2200	2400	+200	0
C	Finished	1500	1500	1500	0	0
D	25%	400	300	0	+100	+400
E	33%	300	300	300	0	0

F	0%	0	0	0	0	0
Cumulative Totals		**$5000**	**$4600**	**$4600**	**$+400**	**$+400**

Note: Completion of the answer sheet requires constant reference to the baseline figure.

4. **Given the following project network, baseline, and status information, develop status reports for periods 2,4,6,8 and complete the performance indices table. Calculate the EAC_f and the VAC_f. Based on your data, what is your assessment of the current status of the project? At completion?**
The project is performing nicely in terms of cost. The project is currently 23 (000) under budget and is getting $1.18 worth of work for each dollar spent. In terms of the schedule, the SV indicates that there is $4 (000) worth of work that was supposed to have been done by the 8th period that has not been done. This work concerns activity D which is only 33% complete instead of the planned 55% complete. Since D is a critical activity the project is behind schedule. The project is 75 percent complete.
In terms the future, if the project continues to earn 1.18 for each dollar spent the forecasted cost at completion would be 175 (000). The project would therefore be forecasted to come in 31 (000) under budget. However this may change since the project has incurred a significant cost over-run so far for activity D which is only 33% complete. If this pattern continues savings earned on other activities could be quickly absorbed and the project would not come in under budget. Management needs to investigate Activity D and take corrective action if possible. Assuming that there is no positive change in Activity D the project will be completed 1-2 time units late.

Status Report: Ending Period 2

Task	**% Complete**	**EV**	**AC**	**PV**	**CV**	**SV**
A	**75%**	**30**	**25**	**20**	**5**	**10**
B	**50%**	**16**	**12**	**12**	**4**	**4**
Cumulative Totals		**46**	**37**	**32**	**9**	**14**

Status Report: Ending Period 4

Task	**% Complete**	**EV**	**AC**	**PV**	**CV**	**SV**
A	**100%**	**40**	**35**	**40**	**5**	**0**

B	**100%**	**32**	**24**	**24**	**8**	**8**
Cumulative Totals		**72**	**59**	**64**	**13**	**8**

Status Report: Ending Period 6

Task	**% Complete**	**EV**	**AC**	**PV**	**CV**	**SV**
A	**100%**	**40**	**35**	**40**	**5**	**0**
B	**100%**	**32**	**24**	**32**	**8**	**0**
C	**75%**	**36**	**24**	**24**	**12**	**12**
D	**0%**	**0**	**0**	**6**	**0**	**-6**
E	**50%**	**14**	**10**	**8**	**4**	**6**
Cumulative Totals		**122**	**93**	**110**	**29**	**12**

Status Report: Ending Period 8

Task	**% Complete**	**EV**	**AC**	**PV**	**CV**	**SV**
A	**100%**	**40**	**35**	**40**	**5**	**0**
B	**100%**	**32**	**24**	**32**	**8**	**0**
C	**100%**	**48**	**32**	**48**	**16**	**0**
D	**33%**	**6**	**20**	**10**	**-14**	**-4**

E	**100%**	**28**	**20**	**28**	**8**	**0**
Cumulative Totals		**154**	**131**	**158**	**23**	**-4**

Performance Indices Summary

Period	EV	AC	PV	SPI	CPI	PCI-B
2	**46**	**37**	**32**	**1.44**	**1.24**	**22%**
4	**72**	**59**	**64**	**1.13**	**1.22**	**35%**
6	**122**	**93**	**110**	**1.11**	**1.31**	**59%**
8	**154**	**131**	**158**	**.97**	**1.18**	**75%**

Forecast Costs at Completion

$$VAC_f = BAC - EAC_f$$

$$VAC_f = 206 - 175$$

$$VAC_f = 31$$

Chapter 14 – Project Closure

1. How does the project closure review differ from the performance measurement control system discussed in Chapter 13?

Project closure review : a macro view of project performance as a part of the total organization.

Although closure is concerned about current or past performance of the project, project closure is also concerned with assessing organizational culture and support of projects, the project's fit within the total portfolio of projects, project priorities, team performance, and lessons learned.

The closure review is intended to include all factors relevant to the project and managing future projects.

2. What major information would you expect to find in a project review?

- Classification of the project—e.g., large/small, platform/incremental, complex/ typical
- Analysis of information gathered
- Recommendations
- Lessons learned
- An appendix with backup information to support recommendations.

3. Why is it difficult to perform a truly independent, objective review?

In most cases those performing the review have some previous knowledge of the project, which presents opportunities for bias.

Sometimes the review team, or facilitator, is perceived as a jury, but even jury members come with built-in biases. For example, internal politics have been known to enter into decisions concerning closure of a project.

The simple point is that every attempt should be made to keep the review independent and objective. If the review of projects is a regular procedure for all projects, the negative stigma of audits is minimized.

4. Comment on the following statement: "We cannot afford to terminate the project now. We have already spent more than 50 percent of the project budget."

If organizational priorities have changed so the project no longer supports organizational strategy, the project should be terminated.

Basically, costs to the time of the audit are sunk costs.

The decision to continue or shut down should rest on estimated future costs and project benefits.

5. Why should you separate performance reviews from pay reviews? How would you do this?

These two activities are not compatible. It is difficult to be both a judge and a coach at the same time. Performance reviews are intended to encourage changes in behavior, encourage career development, and support continuous organizational learning. These reviews focus on social and technical contributions the individual contributed to the project team. For example, the 360-degree feedback process has been used successfully to improve the ability of people to work on teams. As long as performance reviews are not directly related to pay and promotion decisions, such reviews are more readily accepted and even perceived as positive for the individual and organization.

Since pay reviews can result in negative or positive outcomes for a career, they are perceived as very serious by most individuals. Pay reviews should be more carefully structured and based on clear standards and criteria known to the person being evaluated. Every attempt should be made to avoid confrontation.

6. Advocates of retrospective methodology claim there are distinguishing characteristics that increase its value over past lessons learned methods. What are they? How does each characteristic enhance project closure and review?

- ***Uses an independent facilitator.*** The facilitator is held responsible for identifying and implementing lessons learned. Independence encourages gaining more information from stakeholders.
- ***Includes a minimum of three in-process learning gates during the life project cycle.*** These gates catch problems and success during project execution (while the project is in flight). Corrective action can be taken immediately
- ***Each retrospective has an owner.*** Assigning an owner who has knowledge and an interest in the retrospective, provides a resource for other project managers who wish to acquire more firsthand information.
- ***Develops a repository that is easy to use.*** Such a repository is a basic requirement of retrospective methodology. Typically, this repository is an electronic search engine that allows the client to selectively search by project characteristics.
- ***Mandates a discipline that ensures retrospective are used.*** Managers of a future project are required to review retrospectives of similar projects. Failure to avoid a problem or use a success noted in a past retrospective has dire consequences.

Sample Exam PRM T3

Students MUST answer all SIX (6) questions.

All answers are to be written in the Examination Answer Booklet supplied.

TOTAL EXAMINATION MARKS

50 MARKS

NOTE: *This is a "marking guide" only, it is not a sample solution with model answers. It gives you an indication of what is required to answer each question. In some cases the answer is only given in point form and in some cases reference is given to the appropriate section of the text book where you can find a more complete answer. In the actual examination, make sure that you answer the questions in full.*

Question 1

7 Marks

(a) A project life-cycle typically passes through defining, planning, executing and closing stages. List the main activities that are performed in the defining and closing stages. (4 marks)

2 marks for the description of defining and 2 for the description of closing– (see chp 1, page 7)

Defining – project gets defined in terms of goals/objectives, specifications, teams are formed – may have tasks and responsibilities assigned

Closing – handover of deliverables to "customer", may involve training, make sure everything is delivered, payments finalised .., release resources, + evaluation and lessons learned

(b) There are both financial and non-financial criteria that need to be considered when selecting which projects will be supported within an organisation. Givethree reasons why an organisation may support projects that do not have high profit margins. (3 marks)

Financial reasons alone will not ensure that selected projects contribute to the mission and strategy of an organisation. Other considerations such as: (see page 39)

Capturing market share, Making it difficult for competitors to enter the market,

To develop an enabler product,

Developing a new core technology ,

Developing projects that are for public relations, to restore corporate image or enhance brand recognition and brand loyalty,

Develop core technology that will be used in next-generation products,

To prevent government intervention and regulation

(any three of the above for three marks)

Question 2

6 Marks

(a) What is meant by a "matrix organisation"? (2 marks)

This is a hybrid organisational form in which the project management structure is "overlaid" on the normal functional hierarchy.

There are normally 2 chains of command – one along the functional lines and the other along project lines.

(b) What are the advantages and disadvantages of a matrix organisation? (4 Marks)

Advantages

1. efficient – sharing of resources and expertise across projects
2. a stronger project focus than in a functional organisation structure
3. easier post project transition than if just dedicated project teams – team members still have ties with their functional group when the project ends
4. flexibility – in terms of resource utilisation across various projects

Disadvantages

1. dysfunctional conflict – tension between the different managers- different perspectives – they will have different and conflicting agendas and accountabilities
2. stressful for the project participants with more than one boss – how they prioritise – scarce critical resources can be "spread thin"
3. infighting – competition for scarce resources
4. slow – decision making can get bogged down as agreements have to be made across multiple functional groups.

(2 marks for a reasonable description of the advantages and 2 marks for a reasonable description of the disadvantages)

Question 3

5 Marks

Describe each of the stages in the 5-stage team development model. (5 marks)

One mark for naming and describing each stage –

1. forming,

2. storming,
3. norming,
4. performing,
5. adjourning

(must give a brief description of each – see chpt 11 pages377-378)

Question 4

5

Marks

(a) What are the advantages of performing resource levelling?

more "level use" of resources you have more efficient use of the available workers

Explain the following concept: with a more "level use" of resources you have more efficient use of the available workers – there are less likely to be times when there is a need for more workers than are available (which can be a problem for the project schedule and cause delays) or times when there are too many workers and not enough work (either costly for the employer to pay them when they are not being productive or unsatisfactory for the worker in terms of a steady income …) **(1 mark)**

(b) What are the disadvantages of performing resource levelling? (1 mark)

Loss of flexibility and increase in sensitivity in the network/schedule because slack has been reduced.

(c) In what ways could you prepare yourself if you found that you were required to work overseas on an international project? (3 marks)

1. depend on the length of stay, how closely you need to work with people of that country,
2. how different the culture is compared to your own – i.e. how much cultural fluency is required.
3. Basics to do: Research the country in terms of :
    1. religion,
    2. dress codes,
    3. business protocols,
    4. politics,
    5. social etiquette,
    6. history.
    7. If the language will be different, learn some basics in the language.
4. For a longer project you may need more in depth training in the language and culture.

Question 5

11

Marks

This question is based on the following network diagram for a project:

(a) Given that the customer would like the project to be completed in 15 weeks, produce a table that lists the following values for each activity: estimated duration (ED), earliest start time (ES), earliest finish time (EF), latest start time (LS), latest finish time (LF) , free slack (FS) and total slack (TS). (6 marks)

You should copy and then complete the following table in your exam answer booklet.

Activity	ED	ES	EF	LS	LF	FS	TS
Task A	3	0	3	-4	-1	0	-4
Task B	2	0	2	-3	-1	1	-3
Task C	3	0	3	0	3	0	0
Task D	8	3	11	-1	7	0	-4
Task E	7	3	10	3	10	4	0
Task F	3	11	14	7	10	0	-4
Task G	5	14	19	10	15	0	-4

(b) Given the current estimates can the project be completed in 15 weeks? Explain your answer. (1 mark)

No. The calculations show that unless the durations of activities on the critical path (and activity B) are reduced, the project cannot be completed in 15 weeks. The current prediction is 19 weeks.

(c) What is the critical path for this project? (1 mark)

A-D-F-G

(d) What does it mean if the slack of an activity is negative? (1 mark)

The project cannot finish "on time".

(e) Describe two options for reducing project duration when resources are constrained. (2 marks)

A good description of any 2 of the following (see chapter 9, pages 310-311):

1. Fast tracking
2. Critical-Chain project management
3. Reduce project scope
4. Compromise quality

Question 6

17 Marks

Given the following time-phased work packages and project network diagram,

	Work Package Cost by Week (costs are in thousands of dollars)			
WP 1	1	1		
WP 2	2	3		
WP 3	1	3	1	

WP 4	2	2	2	2

(a) Develop a time-phased budget for the project by copying and then completing the following table in your exam answer booklet: (3 marks)

		Week									
WP	**Budget**	1	2	3	4	5	6	7	8	9	
WP 1	2	1	1								
WP 2	5			2	3						
WP 3	5			1	3	1					
WP 4	8						2	2	2	2	(1mark to here)
Total	20	1	1	3	6	1	2	2	2	2	(1 mark this row)
Cumulative		1	2	5	11	12	14	16	18	20	(1 mark this row)

(b) According to your calculations, what should be the cumulative budgeted cost at the end of week 6? (1 mark)

$14,000

(c) Copy and complete the following form to provide a status report for the project at the end of week 3:

End of week 3		
WP	**Actual % complete**	**EV**

(Earned Value)AC

(Actual Cost)PV

(Planned Value)CV

(Cost Variance)SV

(Schedule Variance)WP1Finished 1.5 WP250% 2 WP350% 4 WP40% **Cumulative totals**

(4 marks)

End of week 3		
WP	**Actual % complete**	**EV**

(Earned Value)AC

(Actual Cost)PV

(Planned Value)CV

(Cost Variance)SV

(Schedule Variance)WP1Finished21.520.50WP250%2.5220.50.5WP350%2.541-1.51.5WP40% **Cumulative totals**77.55-0.52

(d)What does this data tell you about the budget and schedule at the end of week 3?

(2 marks)

Currently going over budget and ahead of schedule – WP3 is ahead of schedule, but has still cost more than its earned value

(e) Calculate the cost performance index (CPI) at the end of week 3. (Show any formulae that you use and your working.)

(2 marks)

CPI = EV/AC = 7/7.5 = .93 (important to show formula and working in case there was an error in your actual calculation.)

(f) Explain what this value of CPI means. (1 mark)

Currently actually only achieved 93c worth of work/value for every dollar actually spent, so going slightly over budget.

(g) Describe one method that you could use to calculate the EAC (estimated cost at completion): (1 mark)

Either

1) Using the CPI as the basis for forecasting – assuming project will continue with the same efficiency. The formula is:

EAC = AC + ((BAC – EV)/CPI)

where BAC is the total planned value of the project and AC is the cumulative actual cost to date, EV is the earned value to date.. (1mark)

7.5 + ((20 -7))/.93) = 21.47850 (i.e. $21,478.50) (this would be the result if you were asked to do the calculation using this method. Not required to answer this question.)

Or

2) EAC = AC + ETC(revised)

Where experts in the field have changed the baseline because new information tells them that the original estimates are not accurate. ETC is the new revised estimate to completion. AC is the cumulative actual cost to date.

(h) In addition to monitoring the budget and schedule, it is important that quality is maintained throughout the project. What are the main processes in project quality management? (3 marks)

1. Planning quality
2. Performing quality assurance
3. Performing quality control