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COMPUTER SCIENCE

400 LEVEL

**ANSWERS**

* **SUMMARY OF CHAPTER SEVEN (7).**

**RISK**

Risk can be seen as the seen as the probability of a negative outcome to a decision or event or as a possible adverse outcome or event. They might be caused by the physical elements or they could be political, economic, commercial, technical or operational in origin. Risks can occur at any stage in a project. Some are associated with particular tasks and others originate from outside the project and can manifest themselves without warning. Little projects might not need special attention to risk management other than considering some of the insurance issues for any project that breaks new ground or is complex and large, a risk management strategy must be developed, first to identify as many potential risks as possible and then to decide how to deal with them. Large projects might appoint someone as a risk manager. Some projects may not be completed in their stated time, some might exceed their estimates, whilst others could be finished early and cost less than expected. The risk manager’s first problem is to identify the risks that might affect his or her project. Once identified and listed, risks can be ranked according to the probability of their occurrence and the severity of the impact if they should occur. This process will eliminate the most improbable risks arising from brainstorming, but it should bring to the fore those risk events that are most likely to happen or which would have the greatest impact on the project. For this analysis it is necessary to consider the possible causes and effects of every risk. Risk analysis can be qualitative or quantitative. There are different classes of risk

\*high chance – low impact

\*low chance – high impact

\*low chance – low impact

\*high chance – high impact

Risk register can be seen as where all the known risks have been listed, assessed and ranked. The risk register should be reviewed and updated regularly throughout the life of the project. It is advisable to use the computer to sort the risks according to their ranking, with the highest ranked risks placed at the top. When all the known risks have been identified, assessed, ranked and registered it is time to consider what might be done about them. These are the decisions that must be entered in the two columns at the right hand of the risk register. The project manager usually has a range of options:

\*Avoid the risk – The only way to avoid a risk is to abandon the possible causes, which could even mean deciding not to undertake a project at all.

\*Take precautions to prevent or mitigate risk impact – This is a most important part of risk management, requiring the active participation of all managers and staff. It needs high level risk prevention strategy combined with executive determination. Here are a few examples of the many possible practical measures, listed in random sequence:

- provision of protective gears for construction workers.

- erecting sign to show hazardous places.

- reducing the movement of people in construction site.

- proper disposal of waste and trash.

-frequent back up and secure offline storage of business data.

-avoidance of trailing electric cables in offices.

\*Accept the risk – Rain might make the day chosen for office relocation miserable for all concerned but the risk would have to be accepted. There are numerous small things that can go wrong during the course of any project, and most of these risks can be accepted in the knowledge that their effect is not likely to be serious, and that they can be overcome by corrective measures or replanning.

\*Share the risk – If a project, or a substantial part of it, appears to carry very high risk, the contractor might seek one or more partners to undertake the work as a joint venture. Then the impact of any failure would be shared among the partners. Sharing a risk big enough to ruin one company might reduce its impact to little more than a temporary inconvenience.

\*Limit the risk – There are occasions when project risks should only be accepted with safeguards in place to limit their potential effect. A good example is an internal project, perhaps for pure research, that cannot be adequately defined at the outset. No one can tell how much the project will eventually cost or what its outcome might be. Yet the opportunities are too great to consider avoiding the risk altogether.

\*Transfer the risk – Some risks, or substantial parts of them, can be transferred to another party on payment of a fee or premium. This leads to the important subject of insurance, which is discussed in the next section.

Insurance can also be made to prepare against risk. The client pays the insurance company a premium for this service, and the insurer might itself choose to spread the risk by sharing it with one or more other insurance companies. Categories of insurance

-legal liabilities (payments to others as a result of statutory, contractual or professional commitments, compensation awarded by the courts, legal expenses, but not fines imposed by the courts);

-protection against loss or damage to property, including temporary works and work in progress, owned construction plant, hired-in plant and employees’ effects;

-cover relating to personnel;

-pecuniary loss.

A policy may combine cover for two or more of the above classes of risk.

These are some risk covered by insurance, compensation to persons for bodily harm, property loss or damage, infringement of property rights, accidents, product liability, professional negligence, nuisance caused by the works and environmental damage. While those that are not covered by insurance where the insurer is not able to spread its risk over a sufficient number of similar risks, where the insurer does not have access to sufficient data from the past to be able quantify the future risk. Some risk events can have such a potential impact on a project that special crisis management contingency plans must be made. Such contingency plans can extend to projects that would need to be set up specially and rapidly to deal with the sudden crisis, for example in areas that are particularly liable to epidemic diseases, famine, flooding, hurricanes, earthquakes or other natural disasters.

Crisis contingency plans should also be put in place by process industries and other companies that carry out operations which, if they should go wrong.

* **SUMMARY OF CHAPTER NINE (9).**

**PROJECT ORGANISATION STRUCTURES.**

Organization is key to a successful project, if all the project objectives are to be achieved, the people, communications, jobs and resources must be properly organized. An effective organization will have clear lines of authority and every member of the project will know what he or she is expected to do to make the project a success. This is part of the management communication framework needed to motivate all the staff employed. It is not possible to discuss organizational structures in any depth of detail without the aid of charts otherwise known as organogram. Organograms also have its short comings. Whenever an organization changes, or when a new project is opened, it is wise and customary to produce a new organization chart and distribute it. But that simple process, however innocently intended, can provoke strong and unexpected reactions. However, organograms with all their deficiencies and potential for causing individual discontent are the best, indeed the only, practicable way of depicting an organizational structure. They are, in themselves, a form of communication. A clearer picture of some of the problems encountered in project handling can be seen by studying the management organization structure of a manufacturing company.

Engineering projects, in common with most other customer-funded projects, are partly cyclical in nature. There are different kind of matrix organizations for different projects, for the single projects and multiple projects. Different matrix strengths the question now arises of how the degree of authority given to a project manager in a matrix compares with that enjoyed by the departmental or functional managers. That balance of power must be decided mainly by more senior management and can vary enormously from one matrix organization to another. The personal qualities of individual managers will also have influence on this power-sharing balance.

\*Weak matrix. In a ‘weak matrix’, each project manager’s degree of authority and control is less than that enjoyed by the managers of the functional departments. Each project manager is expected to plan and coordinate the project work, but is not empowered to issue direct commands through the line organization. Thus every project manager in a weak matrix is entirely dependent on the departmental managers for the provision of people and equipment for project tasks.

\*Balanced matrix. The ‘balanced matrix’ (or overlay matrix) is very similar to a weak matrix and is sometimes described as such. In the balanced matrix, there is a declared balance of power and authority between the project managers and the functional department managers. Project and functional managers are expected to collaborate constructively and allocate personnel and other resources to tasks according to genuine priorities to ensure the successful outcome of all projects.

A complete workgroup or team can be created for each project as a self-contained unit with the project manager placed at its head. The project manager is given direct line authority over the team and is responsible not only for planning, progress and work allocation but also for all technical aspects of the project. A task force is a form of pure project team, but its name implies a particular urgency and common sense of purpose. Task forces are particularly useful in management change projects, an argument that will be expanded in the next chapter. However, a task force can be used in any kind of project, whether it is to deal with a natural disaster or a particularly urgent industrial project.

Project teams have the advantage that they can each be directed to a single purpose: the successful completion of one project. A team can be completely autonomous. It is provided with and relies upon its own resources. There is no clash of priorities resulting from a clamor of different projects in competition for common (shared) resources. In any project organization that is complicated by the number of different participating companies, it makes sense to nominate one individual in each sub organization (including the customer) as the principal local information and communications coordinator. Each sub organization within the overall project organization is likely to have its own project manager and they will often be able to nominate and supervise an appropriate information coordinator. Sometimes companies adopt the solution of a hybrid organization, operating a matrix organization in general, but with teams set up for certain projects when the need arises. The matrix option allows the establishment of specialist functional groups which, in theory, have ‘eternal life’, independent of the duration of individual projects. Each member of every specialist group should be able to enjoy a reasonably stable basis for employment. An environment is created that facilitates the building of long-term trust and loyalty. Pooling specialist skills gives greater flexibility in allocating resources to projects. Concentration of specialist skills enhances the organization’s collective technical ability and quality. Organizational continuity promotes the accumulation of knowledge, expertise and experience with the passage of time, both for individuals and for the group as a whole. The case against the matrix. The matrix organization has its own characteristic disadvantages. Not least of these is the split responsibility which each group member faces between their line manager and the project manager. Too much reliance can be placed on the supposed eternal life of the matrix organization in modern times, when many businesses face sudden devastating changes as a result of mergers, takeovers, corporate re-engineering, downsizing or even failure. It must be said that project managers do not always enjoy the luxury of being able to organize their own workforce. They are more likely to be appointed to an organization that either exists already or has been established by more senior managers. In both cases the project manager has to accept the organization as a fait accompli.

Even if a project is of sufficient size to justify its own exclusive team, not all the problems of project coordination will necessarily be overcome. Very often it might be found impossible to house all the participants under one roof, or even in the same locality. Although team organization might be logical and ideal for the project, it could be physically impossible to achieve in practice. Specialist engineers and other experts located in small project teams are deprived of the benefits of working in a department with colleagues of their own specialist discipline. They are less able to discuss technical problems with their peers or to have access to the valuable fund of general historic technical and professional data plus current awareness that permanently organized specialist departments accumulate.