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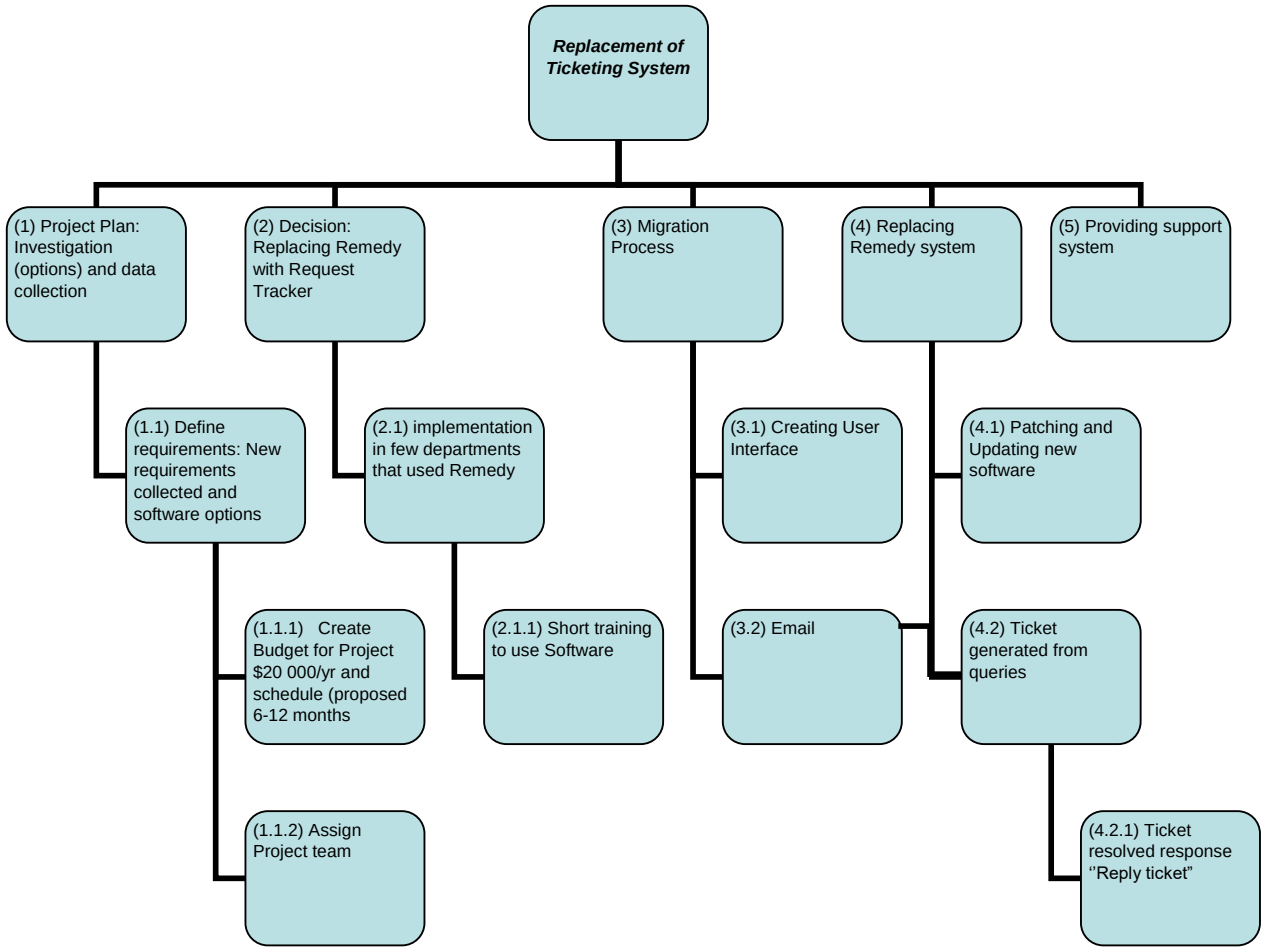
Question 1

1.1.

A Work Breakdown Schedule (WBS) is a product-oriented family tree subdivision of the hardware, services, and data required to produce the end product. The WBS is structured in accordance with the way the work will be performed and reflects the way in which project costs and data will be summarized and eventually reported. Preparation of the WBS also considers other areas that require structured data, such as scheduling, configuration management, contract funding, and technical performance parameters (Kerzner, 2003).

Work Breakdown Structure

Project Name:	Replacement of Ticketing System
Project Manager:	Ron Bashley
Date:	July – November 2017



1.2

Risk 1: the current system being used at OIT requires information to be translated amongst different departments. The issue with this is there is a risk of information being lost in translation or misinterpreted and there is no dedicated or assigned person for translation, so anyone on standby or who volunteers can translate the information. This may result in inconsistency in quality of information translated. If information is not translated properly can result in impacts on cost, time and resources.

Risk 2: after a decision was made to fix the current ticketing system, there is no mention in the case study of the project manager for the project, as mentioned in the case study there is no certainty in terms of who is in charge as Ron and Harry are on the same level.

Risk 3: Both Ron and Harry are reporting to different managers and this can pose a serious problem to the project as there is no proper integration between the two managers regarding reporting on project progress and management support. This could also lead to impacts on the budget for the project if there is no proper integration of results between the two managers

Risk 4: After the few first meetings, the rest of the committee involved on the project did not meet anymore, only Ron and his team met on a weekly basis. The risk with this is possible delays on the project as the team is not on par with progress on the project and they are not giving Ron the support required as a team leader. Another risk is pressure on Ron's team to deliver on the project on time. The lack of communication with the rest of the team resulted in poor assigning of responsibilities to the team, instead the work was assigned to people who volunteered to act and those considered capable to carry out the action plan. The risk with this is there is too many people working with the information, this can result in duplication of information which might consumes time on the project, cost on resources used and the overall quality of information generated especially if a person is assigned is not appropriate for the task.

Risk 5: There is no mention in the case study of how the project progress is recorded for evaluation by the project team and manager. The risk is if Ron decides to leave the company for example, the next person to continue on the project will not know where to continue with the project as project progress is not recorded anywhere in the form of formal reports. Ron and Harry's teams don't meet regularly as well to discuss the project progress, challenges faced.

Risk 6: Once the tickets are resolved, there is no forms or records to capture this except on email and the ticket itself, the risk here is if there is a system crash for example, all the data will be lost as there is no back up system.

1.3

Risk response

Risk 1: Have one dedicated, well suited and responsible person in the team to be responsible for the translations to avoid misinterpretations, this will result in improved quality rate of information generated, reduce potential negative impacts on the budget.

Risk 2: Assign a project manager for the project who will run the project to ensure the rest of the team knows who they report to and this will also help the project run smoothly. The project manager will ensure better control on the project and this will have an overall better quality in project execution.

Risk 3: assign one manager that both Ron and Harry can report to. This will ensure better quality on reporting, better control on project (project progress), budgets and resources allocated for the project.

Risk 4: Have the assigned project manager schedule weekly meetings and ensure all the team members attend these meetings. This will ensure better control on the project, Ron will get the better support he needs to ensure the project runs smoothly. Improve the communication between the team. Assigning responsible people for each task will ensure better control, better quality in results expected and meeting project deadline.

Risk 5: have a medium on which all the reports on the project are recorded and these reports are accessible for everyone on the project and the managers. This will also help for future purposes especially in assessing the performance of the new installed software and improving quality of the software and user support.

Risk 6: have a back-up system and database to keep record of all the forms and tickets resolved. This will assist in avoiding duplicate work done, help the team keep record of work done and outstanding work to be done. It will also help in improving quality of the software and assessing performance of assigned people to resolve ticket. Overall satisfactory in user preferences of the software.

Question 2

Project planning takes place at two levels. The first level is the corporate cultural approach; the second method is the individual's approach. The corporate cultural approach breaks the project down into life-cycle phases.

Benefits

The life-cycle phase approach is done to provide a methodology for uniformity in project planning. Many companies, including government agencies, prepare checklists of activities that should be considered in each phase (Kerzner,2003. These checklists are for consistency in planning. The project manager can still exercise his own planning initiatives within each phase. A second benefit of life-cycle phases is control (Kerzner,2003). At the end of each phase there is a meeting of the project manager, sponsor, senior management, and even the customer, to assess the accomplishments of this life-cycle phase and to get approval for the next phase (Kerzner,2003). In addition to monetary considerations, life-cycle phases can be used for manpower deployment and equipment/facility utilization (Kerzner,2003).
Life-cycle phase decision points eliminate the problem where project managers do not ask for phase funding, but rather ask for funds for the whole project before the true scope of the project is known (Kerzner,2003).

Life-cycle phases:
- Conceptualization
- Feasibility
- Preliminary planning
- Detail planning
- Execution
- Testing and commissioning

The conceptualization phase includes brainstorming and common sense and involves two critical factors:
(1) identify and define the problem, and
(2) identify and define potential solutions.

In a brainstorming session, all ideas are recorded and none are discarded. The brainstorming session works best if there is no formal authority present and if it lasts thirty to sixty minutes. Sessions over sixty minutes will produce ideas that may resemble science fiction (Kerzner,2003).

The feasibility study phase considers the technical aspects of the conceptual alternatives and provides a firmer basis on which to decide whether to undertake the project (Kerzner,2003).

The purpose of the feasibility phase is to:

- Plan the project development and implementation activities.
- Estimate the probable elapsed time, staffing, and equipment requirements.
- Identify the probable costs and consequences of investing in the new project.

In practical terms, the feasibility study results should evaluate the alternative conceptual solutions along with associated benefits and costs. The objective of this step is to provide management with the predictable results of implementing a specific project and to provide generalized project requirements. The feasibility study report, is used as the basis on which to decide whether to proceed with the costly requirements, development, and implementation phases (Kerzner,2013). User involvement during the feasibility study is critical. The user must supply much of the required effort and information, and, in addition, must be able to judge the impact of alternative approaches. Solutions must be operationally, technically, and economically feasible. Much of the economic evaluation must be substantiated by the user. Therefore, the primary user must be highly qualified and intimately familiar with the workings of the organization and should come from the line operation (Kerzner,2013).

The feasibility study also deals with the technical aspects of the proposed project and requires the development of conceptual solutions. Considerable experience and technical expertise are required to gather the proper information, analyse it, and reach practical conclusions (Kerzner,2013).

The downfall of feasibility study not done correctly could result in improper technical or operating decisions made during this step which may go undetected or unchallenged throughout the remainder of the process. In the worst case, such an error could result in the termination of a valid project or the continuation of a project that is not economically or technically feasible (Kerzner,2013). In the feasibility study phase, it is necessary to define the project's basic approaches and its boundaries or scope.

A typical feasibility study checklist might include:

- Summary level
- Evaluate alternatives
- Evaluate market potential
- Evaluate cost effectiveness
- Evaluate producibility
- Evaluate technical base
- Detail level
- A more specific determination of the problem
- Analysis of the state-of-the-art technology
- Assessment of in-house technical capabilities
- Test validity of alternatives

- Quantify weaknesses and unknowns
- Conduct trade-off analysis on time, cost, and performance
- Prepare initial project goals and objectives
- Prepare preliminary cost estimates and development plan

The end result of the feasibility study is a management decision on whether to terminate the project or to approve its next phase (Kerzner,2013).

The table 1 below shows the percentage of direct labour hours/dollars that are spent in each phase:

Phase	Percent of Direct Labor Dollars
Conceptualization	5
Feasibility study	10
Preliminary planning	15
Detail planning	20
Execution	40
Commissioning	10

From the above table it is evident that at least 50% of the direct labour hours and dollars is spent before execution.

Preliminary planning or "defining the requirements" life cycle phase

This is the phase where the effort is officially defined as a project. In this phase, we should consider the following (Kerzner,2013):

- General scope of the work
- Objectives and related background
- Contractor's tasks
- Contractor end-item performance requirements
- Reference to related studies, documentation, and specifications
- Data items (documentation)
- Support equipment for contract end-item
- Customer-furnished property, facilities, equipment, and services
- Customer-furnished documentation
- Schedule of performance
- Exhibits, attachments, and appendices

These elements can be condensed into four core documents.

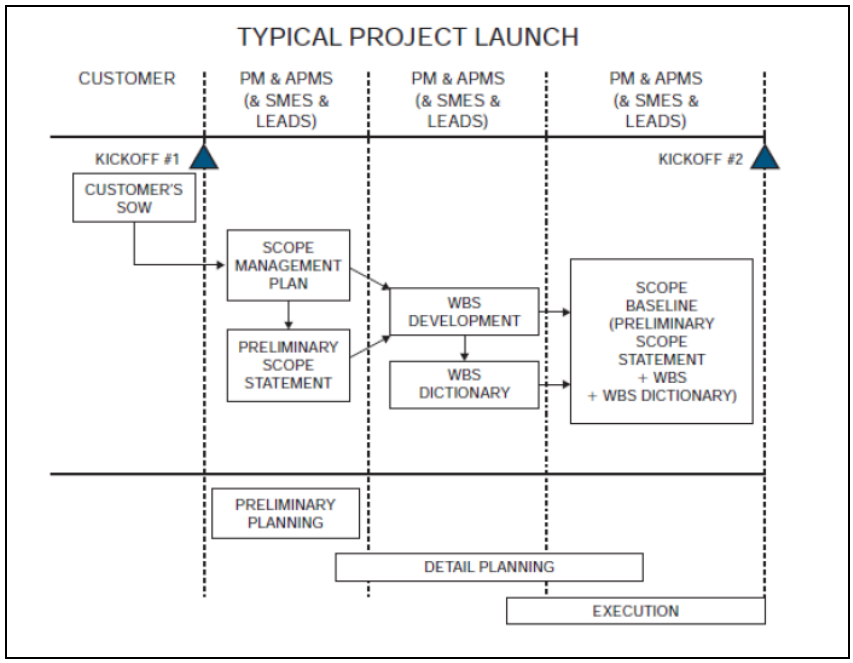


Figure 2: Adapted from Kerzner 2013

Evaluating and constructing a proposal

A project manager writes a proposal based on future work, this takes place during the feasibility phase where the organization decides whether to bid on the job (Kerzner,2013).

The following four ways highlight how proposal preparation can occur (Adopted from Kerzner, 2013):

● Proposal manager prepares entire proposal. This can work as long as the project manager is allowed to review the proposal before delivery to the customer and feels committed to its direction.

● Project manager prepares proposal but is assisted by a proposal manager. This is common, but again places tremendous pressure on the project manager.

● Proposal manager prepares proposal but is assisted by a project manager. This is the preferred method. The proposal manager maintains maximum authority and control until such time as the proposal is sent to the customer, at which point the project manager takes charge. The project manager is on board right from the start, although his only effort may be preparing the technical volume of the proposal and perhaps part of the management volume (Kerzner,2013).

Starting the project (Kick- Off meetings)

A launch of a project begins with a kick off meeting involving the major stakeholders responsible for planning, including the project manager (Kerzner,2013). The typical launch of a project begins with a kickoff meeting involving the major players responsible for planning, including the project manager, assistant project managers for certain areas of knowledge,

subject matter experts (SME), and functional leads. A typical sequence is shown in Figure 2. There can be multiple kickoff meetings based upon the size, complexity, and time requirements for the project. The major players are usually authorized by their functional areas to make decisions concerning timing, costs, and resource requirements (Kerzner, 2013).

Some of the items discussed in the initial kickoff meeting include:

- Wage and salary administration, if applicable
- Letting the employees know that their boss will be informed as to how well or how poorly they perform
- Initial discussion of the scope of the project including both the technical objective and the business objective
- The definition of success on this project
- The assumptions and constraints as identified in the project charter
- The project's organizational chart (if known at that time)
- The participants' roles and responsibilities

Estimates on cost and duration may be established in the kick-off meeting for a small or short-term project. The minimum key milestones in a cost estimating schedule are (1) a "kick-off" meeting; (2) a "review of ground rules" meeting; (3) "resources input and review" meeting; and (4) summary meetings and presentations (Kerzner,2013).

Project Planning

Successful project management must utilize effective planning techniques. The first step is understanding the project objectives. These goals may be to develop expertise in a given area, to become competitive, to modify an existing facility for later use, or simply to keep key personnel employed.

The objectives are generally not independent; they are all interrelated, both implicitly and explicitly. It may not always be possible to satisfy all objectives so it is important that the management to prioritize the objectives as to which are strategic and which are not (Kerzner, 2013).

Typical problems with developing objectives adapted from Kerzner 2013 include:

- Project objectives/goals are not agreeable to all parties.
- Project objectives are too rigid to accommodate changing priorities.
- Insufficient time exists to define objectives well.
- Objectives are not adequately quantified.
- Objectives are not documented well enough.
- Efforts of client and project personnel are not coordinated.
- Personnel turnover is high.

The following four questions must be considered once the objectives are clearly defined,:

● What are the major elements of the work required to satisfy the objectives, and how are these elements interrelated?
● Which functional divisions will assume responsibility for accomplishment of these objectives and the major-element work requirements?
● Are the required corporate and organizational resources available?
● What are the information flow requirements for the project?

Careful planning and analysis must be accomplished by both the direct and indirect-labour-charging organizational units especially in large and complex projects. The project organizational structure must be designed to fit the project; work plans and schedules must be established so that maximum allocation of resources can be made; resource costing and accounting systems must be developed; and a management information and reporting system must be established (Kerzner,2013).

Information requirements necessary for effective program planning at project initiation (adapted from Kerzner,2013):

● The statement of work (SOW): this is a narrative description of the work to be accomplished. It includes the objectives of the project, a brief description of the work, the funding constraint if one exists, and the specifications and schedule. The schedule is a "gross" schedule and includes such things as the: Start date and End date, major milestones and written reports (data items) (Kerzner, 2013). The complexity of the SOW is determined by the desires of top management, the customer, and/or the user groups (Kerzner,2013).

There are four elements of scope:
 Scope: This is the summary of all the deliverables required for the project, such as products, services and results.
 Project Scope: This entails work that must be completed in order to achieve the final scope of the project such as products, services and end results.
 Scope Statement: This is document that provides the foundation of making future decisions such as scope changes. The purpose of the document is to ensure that all stakeholders have common knowledge of the project scope. The scope statement contains the objectives, description of deliverables, end results and justification of the project. The scope statement seeks to address seven questions: who, what, when, why, where, how and how many. The document validates the project scope against the statement of work provided by the customer.
 Statement of work: This is a description that narrate the end results to be provided under the contract (Kerzner, 2013).

● The project specifications

Specifications are used for man-hour, equipment, and material estimates. Small changes in a specification can cause large cost overruns. Another reason for identifying the specifications is to make sure that there are no surprises for the customer downstream. The specifications should be the most current revision (Kerzner,2013)

Specifications are standards for pricing out a proposal. If specifications do not exist or are not necessary, then work standards should be included in the proposal (Kerzner,2013

Description	Specification No:
Civil	100 (index)
Concrete	101
Field Equipment	102
Piling	103
Roofing	104
Structural design	124

Table 2 adapted from Kerzner 2013: List of specifications for statement of work

● The milestone schedule

Project start and end dates must be included if known. The other major milestones such as review meetings, prototype available, procurement, testing, and so on, should also be identified. There are two good reasons for preparing a separate schedule for data items. First, the separate schedule will indicate to line managers that personnel with writing skills may have to be assigned. Second, data items require direct-labour man-hours for writing, typing, editing, retyping, proofing, graphic arts, and reproduction (Kerzner, 2013).

All project milestone schedules must contain information such as:
- Project Start Date
- Project End Date
- Data items (deliverables or reports)

● The work breakdown structure (WBS): is a product-oriented family tree subdivision of the hardware, services, and data required to produce the end product. The WBS is structured in accordance with the way the work will be performed and reflects the way in which project costs and data will be summarized and eventually reported. Preparation of the WBS also considers other areas that require structured data, such as scheduling, configuration management, contract funding, and technical performance parameters (Kerzner, 2013). The work breakdown structure acts as a vehicle for breaking the work down into smaller elements, thus providing a greater probability that every major and minor activity will be accounted for (Kerzner, 2013).

The WBS is the single most important element because it provides a common framework from which (Kerzner, 2013):
● The total program can be described as a summation of subdivided elements.

- Planning can be performed.
- Costs and budgets can be established.
- Time, cost, and performance can be tracked.
- Objectives can be linked to company resources in a logical manner.
- Schedules and status-reporting procedures can be established.
- Network construction and control planning can be initiated.
- The responsibility assignments for each element can be established.

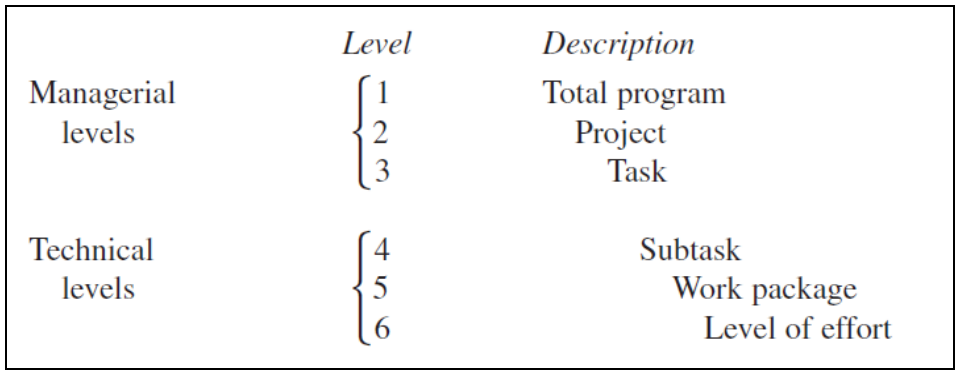


Figure 3: Example of Six Level indented work break down structure (Adapted from Kerzner,2013)

The importance of structuring projects into life-cycle phases is to provide management with control of the critical decision points in order to (Kerzner, 2013):

- Avoid commitment of major resources too early
- Preserve future options
- Maximize benefits of each project in relation to all other projects
- Assess risks

Question 3

These objectives may be incompatible with or irrelevant to a low-price strategy:

● A suspiciously low price, particularly on cost-plus type proposals, might be perceived by the customer as unrealistic, thus affecting the bidder's cost credibility or even the technical ability to perform (Kerzner, 2013). This brings doubt about the overall product quality and performance of the product in question.

● The bid price may be unnecessarily low, relative to the competition and customer budget, thus eroding profits (Kerzner, 2013). If the bid is too low, it may pose difficulties to make any profits by approving the bid especially to the competitors and could result in possible monopoly .

● The price may be irrelevant to the bid objective, such as entering a new market. Therefore, the contractor has to sell the proposal in a credible way, e.g., using cost sharing (Kerzner, 2013).

● Low pricing without market information is meaningless. The price level is always relative to (1) the competitive prices, (2) the customer budget, and (3) the bidder's cost estimate (Kerzner, 2013).

● The bid proposal and its price may cover only part of the total program. The ability to win phase II or follow-on business depends on phase I performance and phase II price (Kerzner, 2013).

● The financial objectives of the customer may be more complex than just finding the lowest bidder. They may include cost objectives for total system life-cycle cost (LCC), for design to unit production cost (DTUPC), or for specific logistic support items. Presenting sound approaches for attaining these system cost–performance parameters and targets may be just as important as, if not more important than, a low bid for the system's development (Kerzner, 2013).

In conclusion, despite customer pressures toward low cost and fixed price, the lowest bidder is certainly not an automatic winner. Both commercial and governmental customers are increasingly concerned about cost realism and the ability to perform under contract. A compliant, sound, technical and management proposal, based on past experience with realistic, well-documented cost figures, is often chosen over the lowest bidder, who may project a risky image regarding technical performance, cost, or schedule.

Question 4

Risk management processes were developed and implemented where risk information was made available to key decision-makers. The risk management process, however, should be designed to do more than just identify the risk. The process must also include: a formal planning activity, analysis to estimate the likelihood and predict the impact on the project, a handling strategy for selected risks, and the ability to monitor the progress in reducing these selected risks to the desired level (Clements and Gido ,2012)

It is then important for the project team to fist understand what a risk is and what type of risk exist, their impacts and lastly the probability of the risk .

Risk is a measure of the probability and consequence of not achieving a defined project goal (Kerzner, 2003). Risk is not always easy to assess, since the probability of occurrence and the consequence of occurrence are usually not directly measurable parameters and must be estimated by statistical or other procedures (Kerzner,2003).

Risk has two primary components for a given event:
- A probability (likelihood) of occurrence of that event
- Impact of the event occurring (amount at stake)

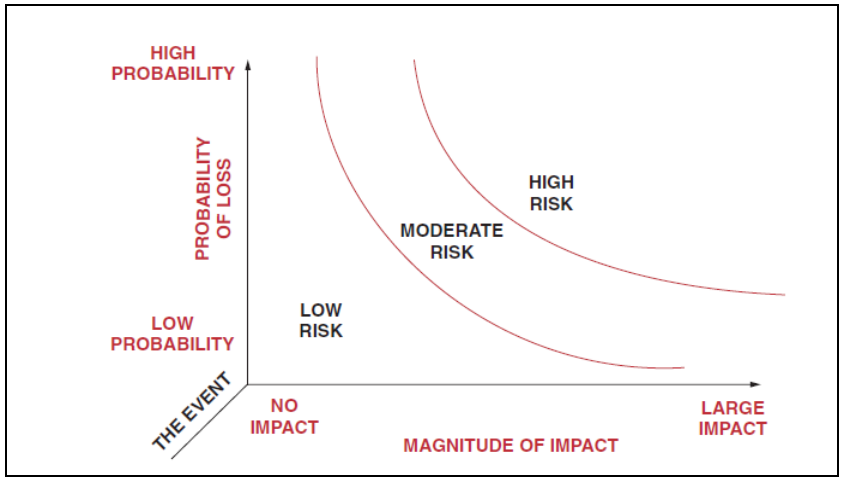


Figure 3.1: Risk assessment (adapted from Kerzner, 2003)

Once the team has knowledge of the risk, it is important to do risk planning. Risk planning is iterative and includes the entire risk management process, with activities to assess (identify and analyse), handle, monitor (and document) the risk associated with a program. An important output of the risk planning process is the Risk Management Plan (RMP) (Kerzner, 2003).

Risk planning develops a risk management strategy, which includes both the process and implementation approach for the project. Early efforts should establish the purpose and

objective, assign responsibilities for specific areas, identify additional technical expertise needed, describe the assessment process and areas to consider, define a risk rating approach, delineate procedures for consideration of handling strategies, establish monitoring metrics (where possible), and define the reporting, documentation, and communication needs. The RMP is the risk-related roadmap that tells the project team how to get from where the program is today to where the program manager wants it to be in the future. The key to writing a good RMP is to provide the necessary information so the program team knows the objectives, goals, and techniques of the risk management process: reporting, documentation, and communication; organizational roles and responsibilities; and behavioural climate for achieving effective risk management (Kerzner,2003).

The next step a team should take is doing risk planning training for all the people involved in the project. It is important that risk management training be performed by individuals, whether inside or outside the project, with substantial "real world" experience in making risk management work on actual projects; else the training may be nothing more than an academic exercise with little or no value. Finally, risk management training should be tailored to various groups within the project as necessary, and a different emphasis may exist for decision-makers versus working-level personnel and technical versus nontechnical personnel (Kerzner, 2003).

Once training has been offered the next stem that follows is risk assessment. Risk assessment is the problem definition stage of risk management, the stage that identifies and analyses program issues in terms of probability and consequences, and possibly other considerations (e.g., the time to impact). The results are a key input to many subsequent risk management actions. It is often a difficult and time-consuming part of the risk management process. Tools are available to assist evaluators in assessing risk, but none are totally suitable for any program and are often highly misleading if the user does not understand how to tailor and apply them or interpret the results (Kerzner, 2003). Despite its complexity, risk assessment is one of the most important phases of the risk management process because the calibre and quality of assessments can have a large impact on program outcomes. The components of assessment identification and analysis are performed sequentially (Kerzner,2003).

QUESTIONS	YES	NO
Has the project leader's authority been established?		
Is the core team appointed?		
Does the core team understand the project purpose?		
Have the stakeholders been identified		
Have stakeholder management responsibilities been allocated?		
Have the project objectives been established?		
Have the project benefits been identified and quantified?		
Are there clear deadlines and a project timescale?		
Is there a known business critical date established?		
Is there a scope statement?		
Are the project boundary limits clearly established?		
Is there an impact if the project fails?		
Are the right skills available in the team/organisation?		
Can the project brief be accurately derived?		
Have all the project constraints been identified?		
Are there identifiable consequences of late completion?		
Has the project brief been approved?		
Have all the key stages been clearly identified?		
Have the key stage dependencies been established and agreed on?		
Are the key stage durations agreed and accepted?		
Is the project schedule realistic and achievable?		
Have key stage responsibilities been allocated and accepted?		
Have workload priorities been clearly established?		
Have line managers accepted and committed their staff involvement?		
Have all resources required given commitment to their responsibilities?		
Has the plan been developed to a low enough level for effective control?		
Have key stakeholders signed off the project plans?		
Are project procedures established and understood?		
Has a milestone schedule been established?		
Have performance measures been derived?		

Figure 3.2: Risk template that the project team can adopt (Adapted from Kerzner, 2013)

Common practice is to classify project risk according to its source, either objective or subjective.

- Objective sources: Recorded experience from past projects and the current project as it proceeds
- Lessons learned files
- Program documentation evaluations
- Current performance data
- Subjective sources: Experiences based upon knowledgeable experts
- Interviews and other data from subject matter experts

Any source of information that allows recognition of a potential problem can be used for risk identification. These include, but are not limited to

- Systems engineering documentation
- Life-cycle cost analysis
- Plan/WBS decomposition
- Schedule analysis
- Baseline cost estimates

The risk management plan process includes the following steps which a project team can implement in their risk management process:

a) Define objectives

Risk may be defined as any event or constraint that prevents the project manager or team from achieving the project's goals and objectives. It is therefore necessary at the outset to define these goals and objectives in some detail, and to indicate who is responsible for achieving them (Clements and Gido, 2012).

b) Identify risk

Having defined the business objectives by one of the above breakdown structures, the next step is to identify what areas of risk, uncertainty and triggers could prevent the progress team from achieving these stated objectives (Clements and Gido, 2012).
Techniques for identifying risk include:

- Analysing historical records and closeout reports
- Safety reports (health and safety requirements)
- Structured questionnaires
- Structured interviews
- Brainstorming
- Structured checklists
- Flow charts
- Judgement based on knowledge
- Scenario analysis

c) Quantify risk

Having identified a range of possible risks, the next step is to quantify the probability (likelihood) of the risk occurring and the impact or consequence to the project, or to the amount at stake. These risks should be assessed in consultation with appropriate stakeholders. For any given risk, whether it is a natural disaster, a liability, or a worker's compensation loss exposure, the following steps should be followed to analyse the frequency and severity of the risk (Clements and Gido, 2012):
i. Assign a category for the frequency of occurrence of a loss event.

ii. Assign a category for the severity of the loss event.
iii. Multiply the frequency value by the severity value.
iv. Prioritise the ratings for all loss exposures.

d) Develop a response

Risk response includes the development of proactive measures to counteract identified risks and changes in risk over the course of a contingency planning (Clements and Gido, 2012) suggest the development of a separate risk response plan. Having identified, quantified and prioritised the risks, you need to develop a risk response plan which defines ways to address adverse risk and enhance entrepreneurial opportunities before they occur. The range of responses includes:

- Eliminate risk.
- Mitigate risk.
- Deflect risk.
- Accept risk (contingency).
- Turn risk into an opportunity.

A contingency plan must also be formulated. A typical contingency plan should contain the following information (Clements and Gido, 2012):

- Title
- WBS identification number
- Risk/risk events/threats
- Trigger events
- Contingency actions
- Responsible persons
- Cost implications
- Time implications
- Tasks effected
- Influence of critical path

e) Risk control

The risk control function implements the risk management plan to make it happen. This is the most important part, but surprisingly is often neglected. The risk management plan needs to be communicated to the entire project team, and where necessary, followed up with appropriate training and practice runs (Clements and Gido, 2012).
The risk management plan should consider:

- Changes in the scope work.
- Changes in the build method.
- Changes in the team members.
- Changes in the suppliers.

The ultimate goal of risk management is risk mitigation. Risk mitigation involves defining the necessary steps to counter threats and to enhance opportunities. It is the active steps taken to lessen the effects that a particular identified risk might have on a project outcome. It is also the continuous measures taken during the life cycle of a project in order to ensure proactive actions to unforeseen circumstances (Clements and Gido, 2012).

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