

Developing ECO medical center



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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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1.1. Strategy:

Our strategy is based on what is being aspired and worked on in the Kingdom's Vision 2030 regarding green buildings.

we have been committed to contributing and fulfilling the promising vision goals driving us to be the first specialized company in Saudi Arabia in the ECO buildings in the medical sectors.

1.1.1. Vision:

Our vision to be the pioneers in field of green buildings in Saudi Arabia.

1.1.2. Mission:

Our mission is to provide professional services to restructure health centers and develop modern sustainable mechanisms with international specifications to keep pace with technical development and integrate them to create a sustainable environment for the targeted facilities.

1.1.3. Project objectives:

Our objectives are to rebuild and develop, 50% of total Ministry of Health medical buildings, minimize operational waste by 40%, and increase the operational capacity by 10% starting from 2023.

1.1.4. Project's Key Performance Indicators (KPI's):

1.1.4.1. Introduction:

The KPIs have been developed to prioritize improvements in support of overall our vision and materialize our goals. The KPIs are summarized into two categories:

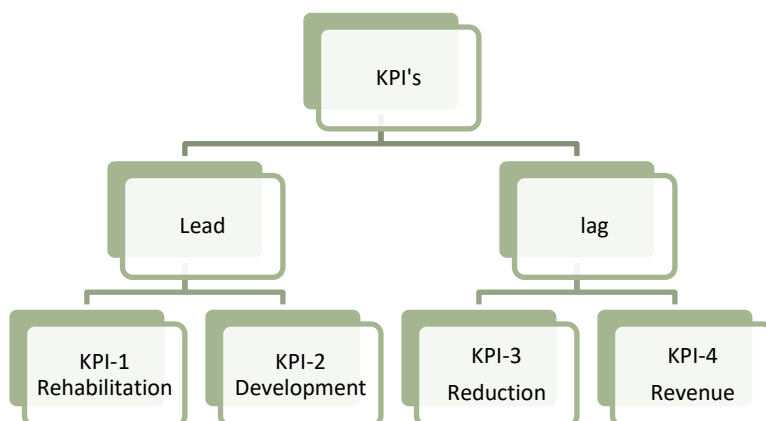


Figure 1 KPI's Categorization

1.1.5. Lead KPI

Reference no.	KPI
KPI-1	Develop and rebuild 80% of medical centers buildings during first 5 years from 2023.
KPI-2	Increase the green places by 50% of medical centers buildings during first 5 years from 2023

Table 1: Lead KPI's Summary Table

1.4.3. Lag KPI's:

Reference no.	KPI
KPI-3	Gradually reduce operational waste by 5 % annually.
KPI-4	Increase visitor flow by 5 % annually.

Table 2 Lag KPI's Summary Table

1.4.4. Lead KPI's Definition and Measurement:

KPI Ref	KPI Title
KPI-1	Develop and rebuild 80% of medical centers buildings during first 5 years from 2023.

Target performance against which the KPI performance will be assessed					
Bassline	Year 1	Year 2	Year 3	Year 4	Year 5
500	560	620	680	740	800
Description	The number of medical centers buildings that been rehabilitated and classified as safe and useful building from authorized governmental entity.				
Method of Calculation	Total Number of Classified Centers as Safe & Useful utilities / Sum of Total Medical Centers buildings * Sum of Total Medical Centers Buildings = 1000				

Table 3 KPI-1 Definition and Measurement

KPI Ref	KPI Title				
KPI-2	Develop 50% of medical centers buildings during first 5 years from 2023.				
Target performance against which the KPI performance will be assessed					
Bassline	Year 1	Year 2	Year 3	Year 4	Year 5
100	180	260	340	420	500
Description	The number of medical centers buildings that been developed and classified as investment opportunities building from authorized governmental entity.				
Method of Calculation	Total Number of Classified Centers as investment opportunities building / Sum of Total Medical Centers * Sum of Total Medical Centers = 1000				

Table 4 KPI-2 Definition and Measurement

1.4.5. Lag KPI's Definition and Measurement:

KPI Ref	KPI Title				
KPI-3	Gradually reduce operational waste by 5% annually				
Target performance against which the KPI performance will be assessed					
Bassline	Year 1	Year 2	Year 3	Year 4	Year 5
1 Billion	950.0 M	902.5 M	857.4 M	814.5 M	773.8 M

Description	Reduce the annual OPEX expenditure by 5 %
Method of Calculation	Sum of OPEX expenditure (last year) * 0.95 * Sum of OPEX expenditure 2022 = 1,000,000,000 SAR

Table 5 KPI-3 Definition and Measurement

KPI Ref	KPI Title				
KPI-4	Increase the capacity of total medical centers by 10 % annually.				
Target performance against which the KPI performance will be assessed					
Bassline	Year1	Year 2	Year 3	Year 4	Year 5
10,000	11,000	12,100	13,310	14,641	16,105
Patients	Patients	Patients	Patients	Patients	Patients
Description	Increase the capacity of total medical centers				
Method of Calculation	Total Number of totals medically equipped rooms and number of patients served				

Table 6 KPI-4 Definition and Measurement

1.5 Project Charter Model



Project Charter – ميثاق المشروع

DEVELOPING ECO MEDICAL CENTER

Date: 01/03/2022

1.5.1. Project Information

Project Title	Developing a medical center to be ECO in Riyadh city –Northern area
Program	Developing a medical center to be ECO in Saudi Arabia
Project Manager	Faisal Mohammed Almutairi
Program Manager	Mohannad Saaid Alfaqeeh
Sponsor	Enad Khaled Alotaibi
Project Start Date	01/01/2023
Project End Date	31/12/2029
Project Cost	100 million (Saudi Riyal)

Table 7 Project Information

1.5.2. Project Description

Develop 50 medical center to be Eco centers served by construct and develop utility and patient's zone.

1.5.2.1. Project Goals and Link it to Strategic Goals

Strategic Goals	Develop the medical centers buildings
KPI	Develop 50% of medical centers buildings during first 5 years from 2023
Project Goals	
1	Developing a medical center to be ECO in Riyadh city – Northern area
2	Increase Eco Service by 6.25 %

Table 8 Project Goals

1.5.2.2. Project scope

The project consists of:

1. Develop 30 medical center buildings in Riyadh city – Northern area.
 2. Increase The green areas.
 3. Use energy-saving products.
 4. Exploiting natural light
 5. Provide ECO medical equipment and supplies
-

Phase	Description	Duration
Develop the medical center	It consists of Re-design, Construct, and Rehabilitate the facilities operating areas, and the waiting areas	11 Months
Develop medical equipment and supplies to be ECO	It consists of Mobility Equipment, Lifts & Ramps, Beds, Power Wheelchairs & Scooters, power distribution, Use of Power saving solutions and bath & Shower Safety	4 Months
Construct wide green gardens	Build and run a wide area of green gardens in the medical centers	8 Months
Handover the First Center	Handover the first Medical Center Building to Ministry of Health	15 Months

1.5.2.3. Project Main Phases/Milestones

Table 9 Project Main Phases/Milestones

1.5.2.4. Project Budget Estimate

Phase	Budget
Develop the medical center	40 million (Saudi Riyal)
Construct wide green gardens	20 million (Saudi Riyal)
Develop medical equipment and supplies to be ECO	40 million (Saudi Riyal)

Table 10 Project Budget Estimate

1.5.2.5. Project Stakeholders Analysis

Name	Level
High Commission for the Development of AR Riyadh	Medium
Ministry of Health	High
National Energy Services Company (TARSHID)	High

Directorate of Health Affairs in Riyadh	High
Ministry of Finance	High
Saudi Electricity company	Medium
Ministry of Municipal and rural and housing	Medium

1.5.2.6. Assumptions

Sr.	Assumptions	Remarks
1	Water and wastewater network are working in good condition	N/A
2	The electric power system is connected and working in good condition	N/A

Table 11 Assumptions

1.5.2.7. Risks

Description	Level	Initial Respond
Infrastructure efficiency	Low	Utilities company to fix it.
Permits & Approval	Medium / High	Dedicate a high-level coordination with concern parties

Table 12 Risks

1.5.2.8. Approval list

Position	Name	Signature
PMO Manager	Mutaz Khwaytim Almutairi	
Finance Manager	Fahdah Mutlaq Alkahtani	
Engineering Department Manager	Ahmad Fhaid Almutairi	
MEP Manager	Enad Khaled Alotaibi	
IT Manager	Ali Hassan Yahia Almalki	
CEO	Mohannad Saaid Alfaqeeh	

Table 13 Approval List

1.6. Governance, Structure, and Process.

1.6.1. Develop an organizational structure for the teams and units of the project.

Our organizational structure provides a guidance to the stuff laying out the official communication reporting relationships that run the workflow of the company and the way of command.

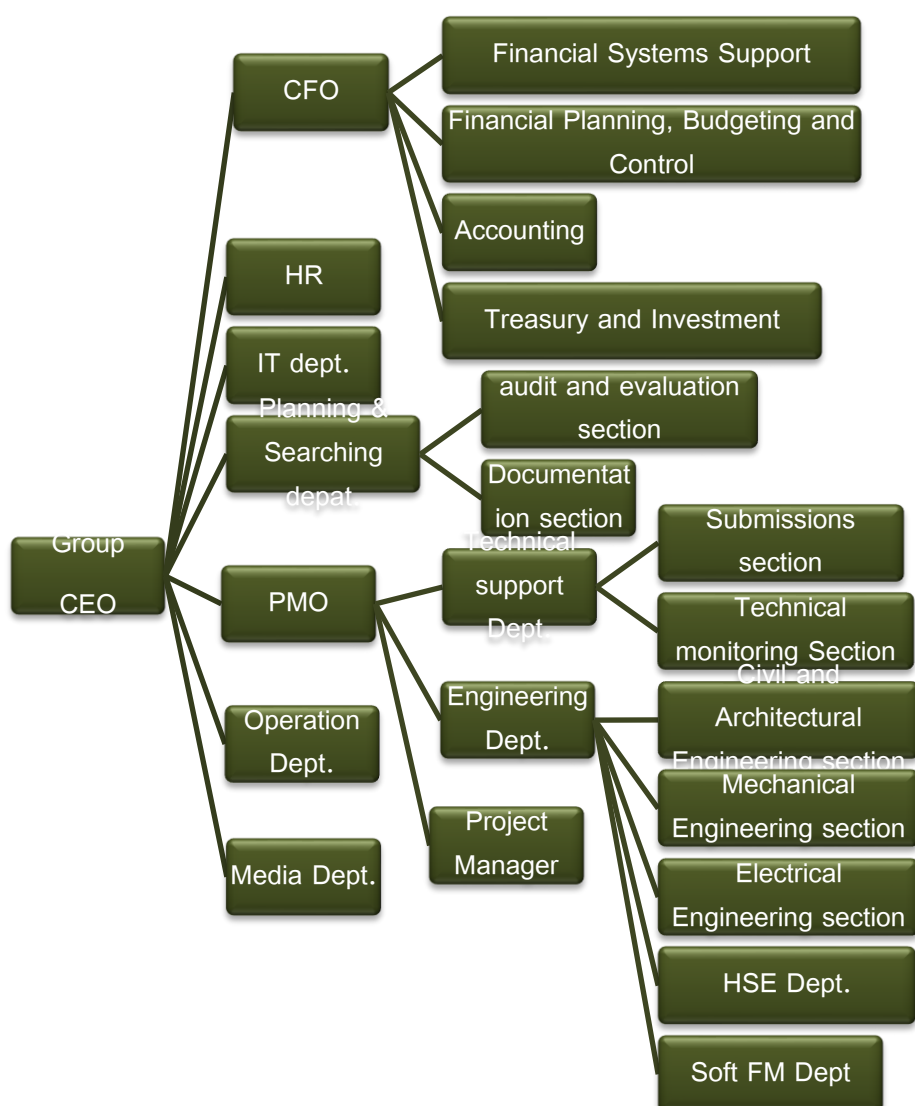


Figure 2 Organizational structure

1.6.2. Identify the practical and scientific bases, which adopted in developing the structure

The process of designing or developing the organizational structure is based on key organizational principles and foundations. It considers as a reference point for making decisions about multiple regulatory options.

The bases are:

- Specialization – Departmentalization.
- Relative importance for Main functions
- Integration and Harmony

1.6.3. Identify the project's office model, most appropriate to manage the project, in addition to mentioning the reason.



Figure 3 Types of PMO

For this project, we obtain our PMO to be (directive). Such huge projects with large organizations who have many projects running simultaneously that need technical support in many and varied places.

Also, this type is characterized by providing high professionalism in project management, as each manager writes periodic reports for the office, which ensures a very high level of consistency in the work at the level of all projects.

2.1 Compliance, standards, and regulations

2.1.1. Design a check compliance model before delivering the project outputs.

Project Name:	Developing a medical center to be ECO in Riyadh city – Northern area	Owner:	MOH	Main Contractor:	Nesma Construction
Date		Day		Ref.	001
Compliance Model					
No.	Deliverables	Responsible	Compliant (Yes/No/NA)	Remarks	
1	List of lessons learned	PMO	Yes		
2	Project closure document	PMO	Yes		
3	Budget Closure memo	PMO	Yes		
4	Final project status reports	PMO	Yes		
5	Supply contracts and process	PMO	Yes		
6	Completed the development of buildings	Project Manager	Yes		
7	Engineering report.	PMO	NA		
8	Summary disposal equipment and material	PMO	Yes		

Table 14 Compliance model

2.1.2. Develop Check List model for the three stages of the project (Start– Plan– Achieve– Close)

Project checklists are a simple but essential tool, often developed and distributed by a Project Management Office PMO.

Its purpose is to assist project managers in following the project governance processes established in the organization, in this way standardizing the approach and assuring its quality.

Initiation stage		
No.	Description	Status
1	The scope of the project clear	
2	The project fundings are approved	
3	All the stakeholders have been identified	
4	Identify a sponsor	
5	Confirmed the project delivery expectations	
6	All the project benefits been captured and are reasonable	
7	Aware of the process of getting the project approved	
8	The business case cover assumptions, dependencies, and constraints	
9	Risk assessment be conducted	
10	The project team established & resources available to start the project	
11	The business cases to start work are approved	
12	Develop Project charter	

Table 15 checklist of the Initiation stage

Planning stage		
No.	Description	Status
1	Develop project management plan	
2	Develop work breakdown structure	
3	Create a baseline for the project plan	
4	Project team comfortable with the project schedule	
5	Defined the milestones for the project	
6	Plan to track project progress	
7	Collect Requirement	
8	Develop resource plan for the duration of the project	
9	Define the scope	
10	Plan cost management	
11	Plan quality management	

12	Plan risk management	
13	Plan procurement management	
14	Plan stakeholder engagement	
15	Assign the PMO and the main contractors	
16	Organized a project kick-off meeting	

Table 16 checklist of the planning stage

Execution stage		
No.	Description	Status
1	Signed off & finalized the business requirements	
2	The project team are aware of the project deliverables	
3	All infrastructure requirements are finalized and addressed	
4	The team are aware of roles and responsibilities for everyone	
5	The team are aware of the benefits and business value of the project	
6	Planned the resources required for the implementation	
7	The project team aware of the project deadlines	
8	Developed a plan to update the system documentation	
9	Develop a list of critical tasks	
10	Will there be a need for environment setup required?	
11	The project team have the required hardware and software	

Table 17 checklist of the execution stage

2.1. Power And Interest

2.2.1 Develop a stakeholder register and form groups for them.

2.2.2 Develop the two networks: (Strength/Interest) and (Influence/ Strength)

According to the PMBOK Guide, “A stakeholder is an individual, group, or organization who may affect, be affected by or perceive itself to be affected by a decision, activity, or outcome of a project.”

The project can have multiplied stakeholders (internal/external), and each one may have varied interests and Influence from the project. Which all must be registered in the Stakeholder Register.

project stakeholder register is a project–related document that includes all the information about the project's stakeholders Which may include but not be limited to:

Stakeholder Name, Title, Power (low/high), Influence (low/high), Current engagement level (Unaware, resistant, neutral, supportive, or leading), Desired engagement level (unaware, resistant, neutral, supportive, or leading), Interests (their interest and needs) and Concerns (their concerns and when do we start identifying stakeholders).

Some stakeholders are obvious (e.g., project sponsor, project team, project manager, suppliers, Government, Owners, and customers).

#	Stakeholder	Category	Influence	Interest	Expectations
1	Sponsor	Internal	Leading	Supportive	Finance and approval
2	Project Manager	Internal	Leading	Supportive	Initiate, plan, execute, M&C, and close the project
3	Ministry of Health	External	H	Supportive	Obtaining all the necessary documents for the project
4	Ministry of Finance	External	H	Neutral	Financing

5	National Energy Services Company (TARSHID)	External	M	Supportive	Approval on power-saving designs
6	Directorate of Health Affairs in Riyadh	External	H	Neutral	Approvals, Supervision, Handover
7	Ministry of Municipal and rural and housing	External	M	Unaware	Regulations and permits
8	Contractors and Suppliers	External	H	Neutral	Manpower, resources supplying, and execution
9	Project Consultant	External	H	Resistance	Approving and acceptance
10	NUPCO	External	H	Supportive	Procurement
11	Project Team	Internal	H	Supportive	Work on a project in different areas
12	CBAHI	External	H	Supportive	Approvals and handing over

Table 18 Risk Register

2.2.3 Use the logical diagrams for the register of the stakeholder.

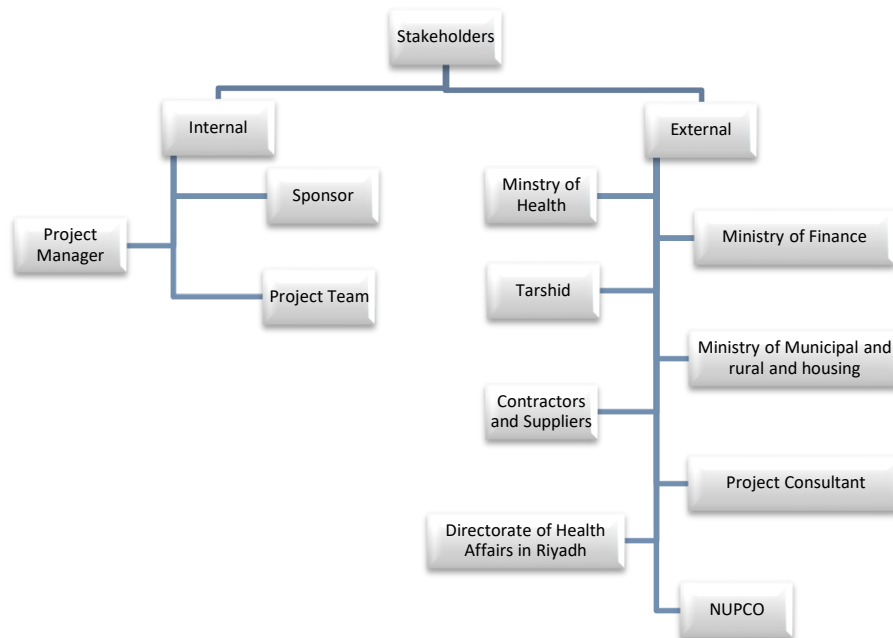


Figure 4 logical diagrams for the register of the stakeholder

2.2. Culture and Values

2.3.1. Identify the culture of the organization

The key to a successful organization is to have a culture based on a strongly held and widely shared set of beliefs that are supported by strategy and structure. When an organization has a strong culture, three things happen: Employees know how top management wants them to respond to any situation, employees believe that the expected response is the proper one, and employees know that they will be rewarded for demonstrating the organization's values.

Employers have a vital role in perpetuating a strong culture, starting with recruiting, and selecting applicants who will share the organization's beliefs and thrive in that culture, developing orientation, training, and

performance management programs that outline and reinforce the organization's core values and ensuring that appropriate rewards and recognition go to employees who truly embody the values.

If an organization's culture is going to improve the organization's overall performance, the culture must provide a strategic competitive advantage, and beliefs and values must be widely shared and firmly upheld. A strong culture can bring benefits such as enhanced trust and cooperation, fewer disagreements, and more efficient decision-making. Culture also provides an informal control mechanism, a strong sense of identification with the organization, and shared understanding among employees about what is important. Employees whose organizations have strongly defined cultures can also justify their behaviors at work because those behaviors fit the culture. See Toxic Workplace Cultures Hurt Workers and Company Profits.

2.3.2. Provide proposals of the organization's values that can be adopted.

The basic aspects that can give essential information on the general nature of the study are presented in this part. To this end, the background of the study, statement of the problem, objectives of the study, research questions, significance of the study, the scope of the study, limitation of the study, and organization of the study are covered.

The organization is a collectivity with a relatively identifiable boundary, a normative order, and ranks of authority, communications system, and membership coordinating systems. This collectivity exists on a relatively continuous basis in an environment and engages in activities that are usually related to set of goals (Hall, 1999). These activities have outcomes for organizational members, the organization itself, and for the society. The essence of organizations revolves around the development of shared meanings, beliefs, values, and assumptions that guide and are reinforced by organizational behavior. These shared meanings, values, and assumptions represent the organizational culture

Organizational culture plays a significant role in the provision of goods and services. Therefore, studying its effects on decision-making has meaningful importance as it helps in realizing the extent to which organizational culture influences the efficiency and effectiveness of an organization. Every researcher should have something to contribute since a lot of time, money and above all human energy is exerted to do it.

3.1 Self-reflection and self-management

3.1.1 Specify “3” personal behaviors of the student that can influence the project.

3.1.2 Study such behaviors, identify their reasons, and how they can be eliminated

3.1.2.1. Inadequate assignment skills

Being the project manager, I assign much of the work to my team individuals. Here's the issue – group individuals are befuddled; they're not beyond any doubt of what is expected and when things are due.

Things to do:

Assigning tasks should reflect on the team members, their skills, their availability, whether the tasks would see them working to their strengths, or if there is an opportunity for their individual growth and development.

Be transparent about this process and let the team members know why you have made a particular selection when you delegate a task, delegate the authority as well to complete it, as this is helpful in their leadership journey, and let your team member knows what is expected from them while being available to discuss the issues and provide them the support they need. (Coaching, n.d.)

3.1.2.2. Poor listener

Faulty listening is often responsible for mistakes, reduced effectiveness, and missed opportunities. There are numerous cases of failed projects where communication – the proper sending and receipt of information was listed as a prime contributor. (Goldstein, 2013)

Things to do:

Focus more on the person speaking. Make good eye contact and engage by asking specific questions, say something like "How would you improve on this approach?" or "What do you think we should tackle first?" This requires critical thinking, so they'll pay closer attention. And, if they've already lost, you'll be able to catch it in the initial conversation and pinpoint what needs clarification. (MCCORD, 2017)

3.1.2.3. Too many projects' meetings

Some project managers keep their team members in meeting prison, and often, the meetings are things that could have been managed in better ways. This behavior leads to a negative impact on the team members who are busy trying to complete their project work.

6.2 Study such behaviors, identify their reasons, and how they can be eliminated.

Things to do:

Eliminate recurring meetings when possible. Eliminate status meetings gather status information and share through status reports, cancel meetings without agenda. Always ask yourself: Is there another way to handle something that does not involve a lengthy meeting? A quick conference call. An email. Instant messenger. A quick stand-up meeting.

3.1.3 Conduct a self-professional assessment by using the SWOT model

S	Internal Strengths
1	Many health services costumers
2	Reducing operating costs

W	Internal Weaknesses
1	Rising costs of building renovations
2	High costs for Eco materials.

3	Many old medical centers	3	The complexity of operating tasks
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O	External Opportunities	T	External Threats
1	Saudi Vision 2030	1	Availability of professional workers
2	The increasing demand of health services.	2	Raw materials increase costs
3	Diversity of new projects	3	Communication with concerned Government sectors.

Figure 5 SWOT analysis

3.2 Personal integrity and reliability

3.2.1. Provide “3” behaviors that contradict moral integrity.

3.2.2. Analyze the financial, social, and technical influence, if any, of such behaviors on the works of the project and the relationships.

3.2.2.1. Team Member Violation

Bad behaviors of the team member in dealing with work could affect the workflow and the productivity of the assigned tasks, which leads to uncompleted duties or non-compliance tasks, tasks could be a due date to complete the project.

In such encounters, an internal policy should be developed to report such immoral actions, the incoming reports will be investigated by a committee to study these communications, and the results of the study of the communications are submitted to the stakeholders to review it and take the required action towards the violator.

3.2.2.2. Professional Integrity

Professional integrity affects several aspects of the project, including the financial and technical aspect, in which the project manager may have some personal interests in awarding contracts to suppliers that have a direct or indirect relationship with him for personal financial profit and overriding them over the quality of materials used in the project. Thus, this affects the final output of the project and may result in a distortion of the company's reputation in the labor market and additional financial costs to correct what has been accomplished from previous work.

Therefore, a special committee must be formed to review the offers submitted by suppliers, with a limit of three offers, and the conditions and technical specifications of the materials are verified, and then the contract is awarded to the best supplier that meets the technical conditions at the appropriate price, which does not exceed the allocated budget.

3.2.2.3. Failure to comply with the statutory requirements

Disappointment to comply with the statutory necessities leads to the suspension of the company's projects and thus the disappointment to follow the time plan for the completion of the project and to weaken the company's validity towards its clients. In this manner, an independent division must be allocated to guarantee that all the statutory prerequisites of the significant administrative authorities are completed to maintain a strategic distance from any sudden stoppage of work since of noncompliance with them.

3.3. Personal communication

3.3.1. Prepare the register of the stakeholder.

A stakeholder register is a document that describes who (individual or group) is affected by a project and their effect and impact on the project.

No.	Stakeholders	Channels of & personal communication	No.	Stakeholders	Channels of & personal communication
1	Sponsor	- Physical & Virtual meetings - Phone - Emails	4	NUPCO	- Authorization letters. - Physical and Virtual Meetings. - Phone: +966 9200 18184
2	Project Manager	- Physical & Virtual meetings - Phone - Emails	5	CBAHI	- Virtual Meetings. - Phone: 920012512 - Email: cbahi@cbahi.gov.sa
3	Ministry of Health	- Authorization letters. - Physical and Virtual Meetings. - Email: 937@moh.gov.sa - Phone: 937	6	Ministry of municipality and accommodation	- Authorization letters. - Physical and Virtual Meetings. - Email: support@balady.gov.sa - Phone: 940

Table 19 shows personal communication with stakeholders and communication channels

3.3.2. Identify the personal communication and the effective communication

Communication is one of the main pillars of a standing business, and all organized activity worldwide relies on the process of business communication. This could be anything from managerial communication to technical communication with suppliers. (DINARDI, 2019)

Communication streamlines the information that helps to transmit ideas and thoughts between business members to gain the full picture of the objectives, communication is divided into two categories, the first one is formal communication which is meeting whether is a physical or a virtual document by minutes of meeting MOM.

While the informal category relies on emails and phones, Emails must be with a direct subject line, clear body in addition to closing sentences to determine the requirements of the email and expected action from the team members. While the phone conversations must be conducted in a quiet space with clear sound stating the requirements such as clarity of specific matter or feedback regarding the project's tasks.

Effective communication is defined as communication between two or more persons in which the intended message is – properly encoded, delivered through the appropriate channel, received, properly decoded, and understood by the recipient(s).

In a business organization, communication is said to be successful when the data or information shared among the team members successfully contributes towards the organization's goals. (Effective Communication, n.d.)

The successful delivery of the message depends on several influences, including clarity and transparency in the delivery of the message, commitment, personal skills of the sender, and its understanding through the receiver.

3.3.3. Identify the shapes, models, and channels of personal communication.

In reference to (table 3.2) which clarify stakeholder and the channels of communication among team members, using these communication channels will have a great impact towards achieving successful

communications, a furthermore to facilitate effective communication there are many communication models to reduce time waste and failure of communications as follow:

1. Transmitter–receiver model according to Shannon.
2. Weaver, the 4–ear model according to Schulz von Thun.
3. Iceberg model according to Watzlawick.
4. Berol’s SMCR model of communication.

David K. Berlo's Model of Communication focuses on four elements:

Source (S), Message (M), Channel (C), and the Receiver (R). Under each of these are different factors that affect the communication process.

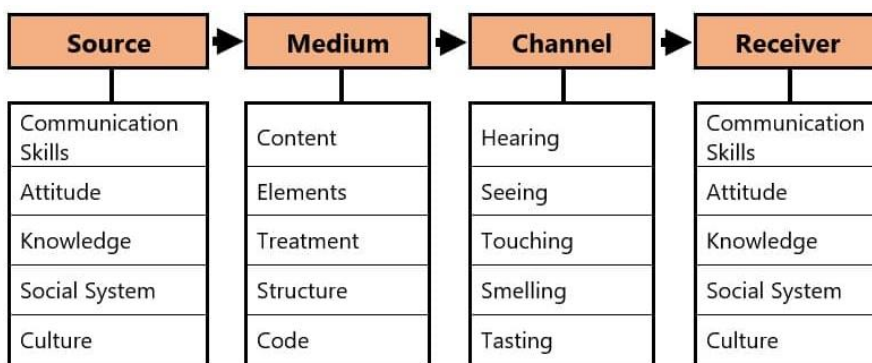


Figure 6 David K. Berlo's Model of Communication

- 1– The **Source (S)** is the **origin of the message**. Also called the speaker, sender, or encoder.
- 2– The **Medium (M)**: is the **Message** or is the **idea, opinion, emotion, or information** conveyed by the speaker.
- 3– The **Channel (C)** is the medium through which the message is delivered from the source to the receiver.
- 4– The **Receiver (R)** is the one who receives, understands, analyzes, and interprets the message. Also known as the listener, audience, or decoder.

3.3.4. Establish the communication matrix.

A communication matrix is a methodology that documents and summarizes the communication plan for the project. To stay effective and in line with the goal of the project, the communication matrix should be accessible to all stakeholders and updated throughout the project.

Information	Method of communication	Sender	Receiver	Timing of communications
Documents (draft)	Email and share drive	Documents controller	Sustainable project manager	Monthly
Documents approval	Email and share drive and meeting	Project teams leaders	Sustainable project manager	Monthly
Time usage hours	Email	Project manager and project team	Environment team	Weekly
Project status reports	Phone or meeting	Project manager	Overseeing VP	Monthly
Team status change	Phone or meeting	Team Members	Project manager	Monthly
Expense approval	Email or meeting	Project manager	Overseeing VP	Monthly
Work requests	Email or fax	Project manager	Vendors	Daily
Request of review	Email or meeting	Project manager or project team	Project team	Daily

Table 20 Communication Matrix

3.3.5. Provide 3 wrong scenarios of communication.

No business runs perfectly, therefore, the methods people communicate and work through obstacles can be a sign of a company's overall well-being. Healthy communication in the workplace is critical for driving

results while also creating a positive work environment. However, wrong communication can begin to cripple an organization and have a negative impact on the entire staff. Learning to detect poor communication behavior and develop them with healthy ones will have a positive effect on productivity and even financial success

3.3.5.1. Project Intimidation

Intimidation tactics are a form of negative communication that quickly creates a toxic and often fear-filled project environment. A project manager who bullies his team members into getting things done is likely to experience high turnover rates. It can also occur between team members competing for the same promotion. This unnerving type of behavior is often in the form of direct verbal language or physically threatening actions. Examples of intimidation include loud speech, physically taking over the workspace, or standing in close physical proximity to cause discomfort.

3.3.5.2. Listening Failure

There are times to forge a path forward in business, but leaders and employees who operate as disconnected individuals and fail to listen to those around them are engaging in poor communications. In an office environment, failing to listen to co-workers is also problematic. It creates an ecosystem of disregard for individual feelings and devalues personal relationships in the workplace. For example, if employees express concern over an issue they see in the workplace, but the manager doesn't evaluate their inputs of the problem in greater detail or investigate the issue, the problem may go ignored and the employees will likely feel that their input does not matter. Workers want to feel that their ideas have value and know that they are recognized as valuable contributors to the corporate mission.

3.3.5.3. The Game of Blame

Another shape of wrong communication is closely attached to ethics and responsibility. Failing in owning a mistake or to accept the responsibility for a missed deadline shows a lack of responsibility. Yet, blaming others is counterproductive and does not work towards a solution for the common good. Learning to accept responsibility and move forward is one positive solution. However, those who continue to blame others for their mistakes will damage working relationships and may find themselves ostracized

2.2.4 Develop and prepare stakeholder assessment matrix

Stakeholders' assessments:

C: Current, D: Desired

No.	Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
1	Sponsor					C&D
2	Project manager					C&D
3	Ministry of Health				C&D	
4	NUPCO				C&D	
5	CBAHI				C&D	
6	Ministry of municipality and accommodation	C			D	
7	Consultant		C		D	
8	Contractors	C			D	

Table 21 Stakeholders' assessments

4.1. Leadership:

4.1.1. Describe and identify the leadership model, which is preferred to the project leadership.

4.1.2. Specify the reasons for which such a model is preferred.

4.1.3. Provide “5” proposals for the motivation methods that are compatible with the nature of the project.

The health field has a greater need for leadership than any other field. health projects are large and technically complex, and they involve a combination of specialized skills. Thus, the teams are not only large but are also multi-disciplinary and the members are from several different disciplines, and this makes leadership important in this field.

Following are some examples of leadership styles:

- 1) Autocratic leadership
- 2) Democratic leadership
- 3) Transformational leadership
- 4) Transactional leadership

Autocratic leaders tell others what to do and expect them to comply obediently. Although it may work in certain circumstances in the short run, but this is not effective in the long run.

Democratic leaders are those who make their decisions final only after consulting with the people they are leading based on the consensus. This style claims that popular decisions are not always the best that can be taken, so they will not produce the desired outcomes.

Transformational leaders on the other hand empower their team members to develop their own decisions based on the information provided to them and exert little control over the decision-making process. This may be a time-consuming process but works well when the team members are very committed to the best interest of the organization.

Transactional leaders are result-based leaders who ask their team members to focus only on the goals at hand. These leaders also believe in rewarding subordinates. Opponents of this leadership style say that this is too narrowly focused and often centered on the wrong concerns.

The key to being a successful leader is to have the right behavior, skills, and actions, and less on personal characteristics. To be effective, leaders must exhibit the ability to identify and apply the optimal leadership style for any given situation rather than relying on predefined personalities. The leader should be able to adapt to change and sometimes contradictory circumstances in which they need to show versatility and flexibility.

All transformational factors which are charisma, inspirational motivation, intellectual stimulation, and individualized consideration, and transactional factors which are contingent reward, management-by-exception, active, and passiveness was of great importance for the effectiveness of any leadership.

Inspirational motivation, idealized attributes, intellectual stimulation, idealized behaviors, contingent rewards, and individualized considerations are well-perceived leadership elements among our company.

As a company, we leverage transformational leadership to ensure greater employee satisfaction and performance.

In addition, below are some key points that the leader should do to motivate the team members:

- The team should be treated fairly by the leader and with a good attitude.
- Leader should recognize the accomplishments of his team members.
- Efforts by the leader to challenge the team to increase their expertise and capabilities.
- Leader should communicate to the team the big picture and what the team is expected to accomplish.

4.2 Teamwork

4.2.1 design RACI model for 3 administrative measures of the project.

RACI Model							
Project Deliverable	Executive Sponsor	Project Sponsor	Project Manager	Functional Lead	SME (Subject Matter Expert)	architect	Team Project Member
Initiate Phase Activities							
• Submit Project Request	A/C	R/A	R/A	A/C	C		
• Request Review by PMO			R	c			
• Research Solution	I	C	R/A	A/C	C		
• Develop Business Case	I	A/C/I	R/A	C	C		
Plan Phase Activities							
• Create Project Charter	C	C	R/A	C	C		
• Create Schedule	I	I	R/A	C	C		C
• Review Plans		R	C	I		A	
• Create Additional Plans as required	I	I	R/A				I
Execute Phase Activities							
• Build Deliverables	C/I	C/I		R/A	R/A		R/A
• Create Status Report	I	I	R/A	R/A	R/A		
Control Phase Activities							
• Perform Change Management		C	R	A	A		A

Close Phase Activities							
• Create Lessons Learned	C	C	R/A	C	C		C
• Estimated Budget		A	C	R	I		
• Final Review		R	A	C	I		
• Create Project Closure Report	I	I	R/A	I	I		I

Table 22 RACI model

KEY	R = Responsible
	A = Accountable
	C = Consulted
	I = Informed

Table 23 RACI model Key

4.3. Conflicts and Crisis

4.3.1. Identify the conflict and crisis

Social conflict is the struggle for agency or power in society. Social conflict occurs when two or more people oppose each other in social interaction, and each exerts social power with reciprocity to achieve incompatible goals but prevents the other from attaining their own. It is a social relationship in which action is intentionally oriented to carry out the actor's own will despite the resistance of others

Conflict theory emphasizes interests, rather than norms and values, in conflict. The pursuit of interests generates various types of conflict, which is thus seen as a normal aspect of social life, rather than an abnormal occurrence. Competition over resources is often the cause of conflict. The theory has three tenets

Society is composed of different groups, which compete for resources

Societies may portray a sense of co-operation, but there is a continual power struggle between social groups as they pursue their own interests. Within societies, certain groups control specific resources and means of production

Social groups will use resources to their own advantage in the pursuit of their goals and often take advantage of those who lack control over resources. As a result, many dominated groups will struggle with other groups to gain control. Most the time, the groups with the most resources will gain or maintain power since they have the resources to support their power. The idea that those who have control will maintain control is known as the Matthew effect

One branch of conflict theory is critical criminology, a term based upon the view that the fundamental cause of crime is oppression, which results from social and economic forces operating within a given society. The perspective stems from the German philosopher Karl Marx, who viewed the justice system and the laws to favor the rich and the powerful in a society and for the poor to be punished far more severely for much smaller crimes

4.3.2. Provide 3 expected scenarios of the conflict's events in the project.

conflict resolution algorithm, that, can, provide, automated separation assurance for the next generation air traffic control system. The algorithm generates resolution trajectories that can be sent to the aircraft from a ground-based system via data link. The algorithm can also be installed on board aircraft. It handles the complete spectrum of conflict types encountered in en, route airspace, including ascents and descents to arrival fixes. The resolution trajectories consist of amendments, and changes to flight plans (route changes), altitude clearances, and descent speed profiles. The trajectories are similar to those, that controllers

customarily issue to pilots, in resolving, conflicts. The algorithm generates 4D resolution trajectories by evaluating, successive alternative trial resolution maneuvers.

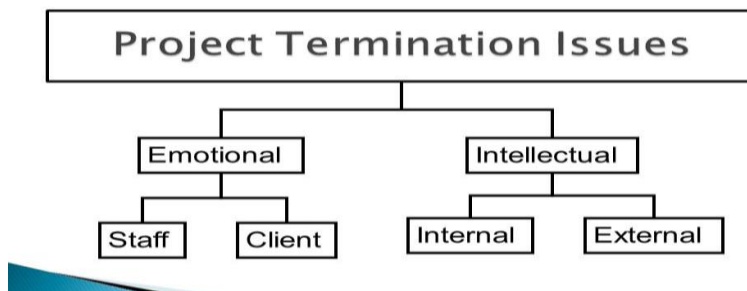


Figure 7 Project termination issues

4.3.3. Set the optimal strategies to deal with each conflict, and specify the reason for preference

It's important to remember that there are many strategies we can use in conflict situations, but each of us tends to habitually use some strategies more often than others. To resolve a conflict most effectively, we should use the strategy that is most appropriate for that conflict situation. However, that strategy might not be the strategy that we habitually use

How often do we make the mistake that Shaun Williams (celebrating in the photo above) made on Sunday, i.e., responding to a conflict situation the way we feel like responding rather than the way we should respond? The incident occurred at the end of a very close game—a time when his team could not afford any penalties. When tempers flared between one of Williams' teammates and an opponent, Williams ran across the field and began to fight. Predictably, his team was penalized, and he was ejected. The penalty was very unfortunate as his team, the Giants, narrowly lost the game. The loss brought their season to an end. Williams' poor choice of a conflict management strategy was a giant blunder

To manage conflict well, we must remember that there are several conflict management strategies.

The key to managing conflict well is choosing and executing the strategy that best fits the situation

Conflict Management Strategies

There is a menu of strategies we can choose from when in conflict situations

Forcing – using formal authority or other power that you possess to satisfy your concerns without regard to the concerns of the party that you conflict with Accommodating – allowing the other party to satisfy their concerns while neglecting your own.

Avoiding – not paying attention to the conflict and not taking any action to resolve it Compromising – attempting to resolve a conflict by identifying a solution that is partially satisfactory to both parties, but completely satisfactory to neither.

Collaborating – cooperating with the other party to understand their concerns and expressing your own concerns in an effort to find a mutually and completely satisfactory solution (win-win)

Research on conflict management styles has found that each of us tends to use one or two of the above five strategies more than the others. For instance, some people predominantly use collaborating when in interpersonal conflict situations. In other words, although there are five different ways to handle conflicts, such a person is more likely to collaborate than they are to force, accommodate, avoid, or compromise. There are many advantages to using a collaborating strategy to handle interpersonal conflict situations. Collaborating with the other party promotes creative problem solving, and it's a way of fostering mutual respect and rapport. However, collaborating takes time, and many conflict situations are either very urgent or too trivial to justify the time it takes to collaborate. There are many conflict situations that should

be handled with one of the other four conflict management strategies rather than collaboration. Managers who are very skilled at conflict management are able to (a) understand interpersonal conflict situations and (b) use the appropriate conflict management strategy for each situation

4.3.4. Develop root Cause Analysis

Root cause analysis (RCA) was developed by manufacturers in the 1950s to better understand industrial events. The goal is, as the title suggests, to identify the primary, or “root,” cause of the problem under analysis. One of the first users of this technique was Toyota, who famously used the “5 whys” technique.

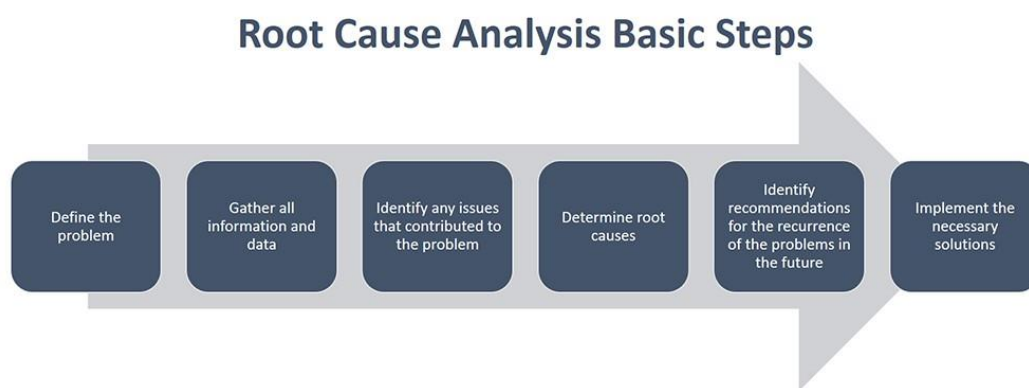


Figure 8 Root Cause Analysis Basic Steps

By asking “why” at least five times during the investigation of a breakdown or undesired event, quality personnel are forced to drill down layer by layer to understand progressively more fundamental causes

Although such charts are usually read from left to right, they are often created from right to left, starting with the event and using logic and time information to add relevant causal factors. Note also that the blood bank, hospital engineering, preoperative nursing, anesthesia, and surgery are all involved in this particular event, underscoring the multidisciplinary nature of properly performed RCAs.

Root cause analysis RCA is a process or technique used to identify the most fundamental reason or contributing causal factor as to why a problem occurred. It is a retrospective assessment, focused on finding vulnerabilities in the system and developing countermeasures. The process of RCA addresses four basic questions. 1. What happened? 2. Why did it happen? 3. What are the contributing causal factors? 4. What can we do to prevent it from happening again? The emphasis must be on developing effective countermeasures. The RCA team must be interdisciplinary in nature, involving experts from the front line who are closest to the safety process and who have the best ideas to solve the problem. RCA is a process that continually digs deeper by asking, “Why, why, why?” at each level of an event. It is a process that identifies changes that need to be made to systems, is as impartial as possible, and moves beyond blame. The RCA process must consider human factors and other factors, related processes, and systems, and analyze the underlying cause-and-effect relationships. Relevant literature must be reviewed during the process and internal consistency must be achieved. The RCA must identify risks and their potential contributions to safety errors and must determine potential improvements in processes or systems. To be credible, an RCA must include the participation and support of the leadership of the organization and those most closely involved in the safety process and systems.

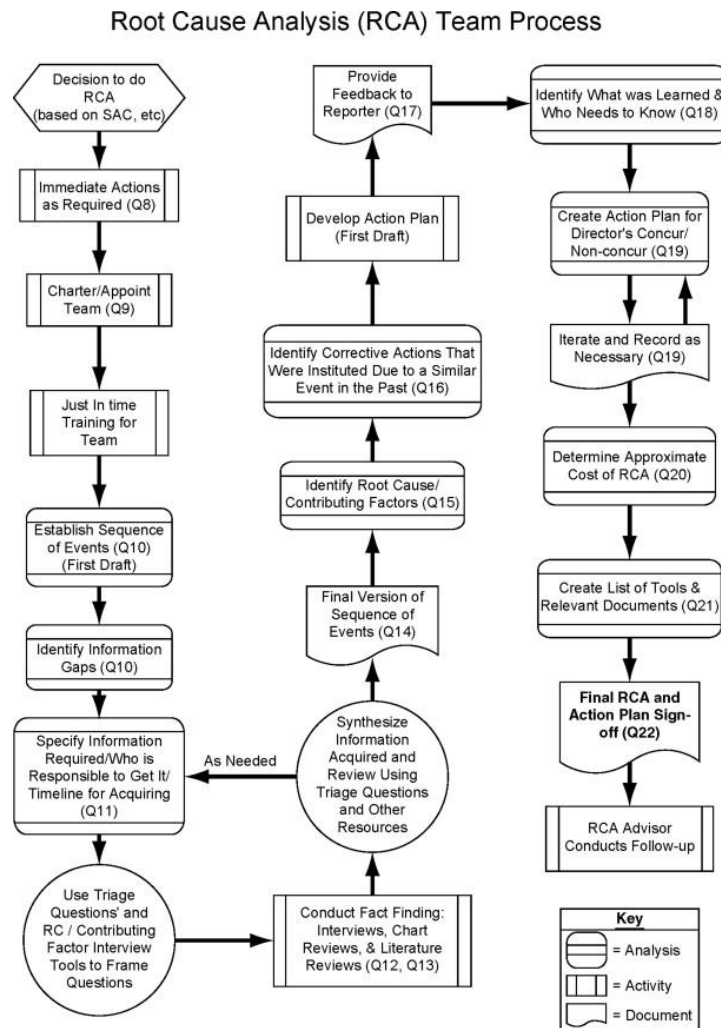


Figure 9 Team process

5.1. Resourcefulness

5.1.1 distribute the human resources on the functions.

Resourcefulness is defined as the ability and creativity to cope with difficulties.

The key to being resourceful is to ask the right questions in a positive way.

This is done by adopting an attitude of the art of the possible: extreme positive thinking.

Becoming resourceful is a journey for you, your team, and even your organization.

Table 24 distribute the human resources on the functions

NO.	Functions	Resources	Time per week
1.1	Assigning a team to the inventory of the Final Project (Developing a medical center to be ECO)	3	1
1.2	Communicate with involved authorities	3	2
1.3	Get the policies of the environment & all necessary documents	3	2
1.4	get the approvals from the sponsor to provide the project charter	3	1
2.1	Studying the required jobs	4	1
2.2	Recruiting the work teams	4	2
2.3	Rehabilitation the staff	6	4
3.1	Assigning a team to study the market	4	1
3.2	make plan for delivery of materials and store it	4	1
3.3	Purchase the materials	3	1
4.1	Assign the PMO & the main contractor	2	1
4.2	Approval of designs and work plan	4	1
4.3	Kickoff the executing	300	35
4.4	furnishing work	40	12
4.5	Hand over all deliverables	3	2

We'll be able that we're resourceful. instead of giving up when coming across an issue, we're unprepared to deal with, we become determined to find a solution.

5.1.2 Analyze the influence of conducting crashing and tracking process

Fast-tracking and Crashing techniques are used in project management and all these techniques have the same importance in the compression of the project schedule as per applicability and situations.

Fast Tracking:

In this technique, the project manager makes the project activities in parallel instead of series and try to achieve the project timeline duration. However, risks are involved in the fast-tracking technique because parallel activities might be:

- 1– Increase the reworking some time.
- 2– Works only when the activities are independent of each other.
- 3– No change in cost but an increased risk.

Crashing:

Crashing is a technique which use for meeting the deadline of the project. This technique is based on increasing the resources in some phases to complete the work earlier or on time. However, risks are involved in the crashing technique might be:

- 1– Project cost increases in this technique due to more resources.
- 2– It May not be adequate and could result in Quality issues.
- 3– Not all processes can be made faster by the mere addition of resources.

projects may need to compress the schedule for different reasons. However, the Projects manager can consider different factors to decide which method will be better for various sets of activities in the schedule.

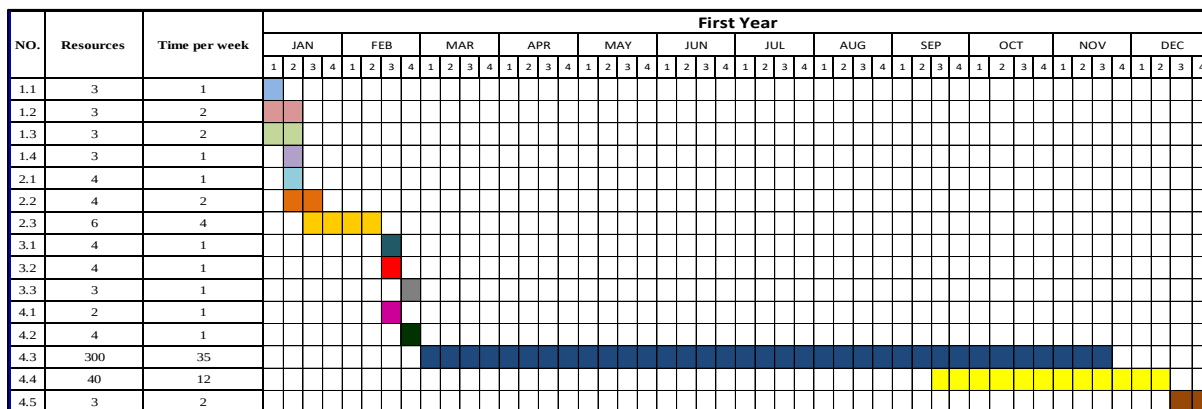


Figure 10 Fast Tracking

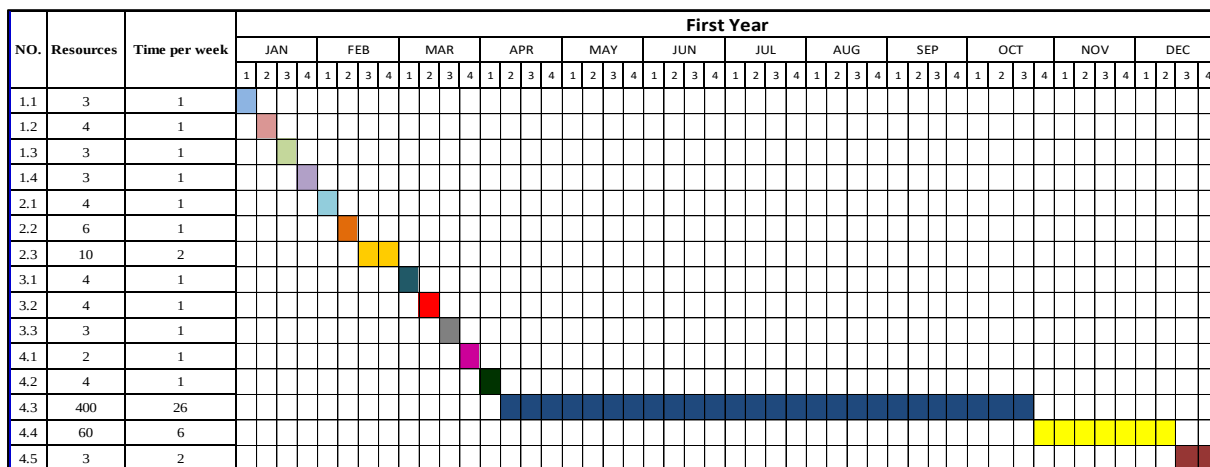


Figure 11 Crashing

5.2. Negotiations

5.2.1. Develop general rules for the negotiation process.

The major components are a detailed plan of all project requirements, as well as a negotiation agreement to avoid any potential conflicts of interest both internally and outside. In addition, we will successfully lead the two parties' matching concepts.

Internal negotiations are a part of gathering all departmental requirements, discussing the project's values, and completing it by resolving all points.

External negotiations will necessitate the participation of other entities, and our relationship value and project strategies will provide us with the opportunity to explore future requirements and match interests to a perfect negotiation.



Figure 12 Negotiation process

5.2.2. Prepare 2 negotiation plans

First, we've decided to apply the BATNA (Best alternative to a negotiated agreement) to our agreement to make our negotiations much more powerful, and it will serve as a framework for our strategy.

Second, we focus on adding our project aim to persuade of our project's conclusion, and we explain the worth of the result in terms of bringing sustainability to our buildings during our strategy discussion. We also demonstrated our dedication to this initiative by providing scientific evidence of the cost-effectiveness of implementing our vision's sustainability.

6.1 Project design:

6.1.1 Identify the Triple constraint of the project

The triple constraint of project management has been given many names – the Project Management Triangle, Iron Triangle, and Project Triangle – which should give you an idea of how important the Triple

Constraint is when managing a project. If you're managing a project, then you're working with the Triple Constraint.

Therefore, it can be easily argued that the Triple Constraint might be the single most important concept in the history of project management. When used in combination with effective project management software, it can give you the ability to drive your projects to success.

What Is the Triple Constraint in Project Management?

So, what is the Triple Constraint? That's easy, it's a model of the constraints inherent in managing a project. Those constraints are threefold:

Cost: The financial constraints of a project, also known as the project budget

Scope: The tasks required to fulfill the project's goals

Time: The schedule for the project to reach completion

Basically, the Triple Constraint states that the success of the project is impacted by its costs, time, and scope. As a project manager, you can keep control of the triple constraint by balancing these three constraints through trade-offs. We'll explain how these trade-offs work in the section below.

While it's true that the Triple Constraint is an important part of any successful project, it doesn't determine success. Projects are made from many parts, more than the three that make up the Triple Constraint.

That's why some project management experts have added three more constraints to the model, to better reflect the most critical areas of a project. Here they are:

Quality: There are quality standards for every project, whether its final deliverable is a tangible or intangible product. Project managers need a quality management plan to control quality

Risk: Risk is inherent to any project. That's why project managers need to create a risk management plan to explain how project risks will be handled

Benefit: There are different types of benefit obtained from a project. Project managers must ensure that project stakeholders get the best financial benefit possible.

How Does the Triple Constraint Work?

As stated above, project managers can increase or reduce the cost, time, and scope of a project with trade-offs to keep it on schedule and under budget. Let's see how these project triangle trade-offs work with some examples.

Time and Scope: You can reduce your project scope to also reduce your project duration if you're running behind schedule. In the opposite case, you can increase the length of your project timeline in case the project stakeholders come up with extra project activities.

Cost and Scope: By reducing the project scope, you'll need to execute fewer tasks, which means lower costs. In the opposite case, a larger project scope means higher costs.

Cost and Time: In some projects, time and cost can be directly related. For example, the costs of renting equipment or labor are directly proportional to the time you need them for.

All these scenarios are applying the Triple Constraint for managing the project, but there are many more possible trade-offs that can occur in a project, which also involve quality, risk, and benefit.

By using a project management dashboard, a manager can keep sight of the project as it progresses.

Metrics such as the schedule, cost and scope of the project are easy to track. With this information, a project manager can identify issues and adjust the Triple Constraint to prevent those issues from developing into problems. Project Manager features a real-time dashboard that presents all the critical project data that impacts the triple constraint.

dashboard for tracking the triple constraint

How to Manage the Triple Constraint

The Triple Constraint appears simple, but that's only on the surface. Each of the three points of this triangle can be unpacked to reveal deeper meaning.

Cost

The financial commitment of the project is dependent on several variables. There are the resources involved, from materials to people, which all include costs.

There are also the fixed and variable costs inherent in any project, such as equipment or labor, which must be calculated. This can seriously come into play with the use of contract workers or outsourcing

This is what project managers do to control costs:

Estimate the costs for all the tasks in the project scope

Create a project budget based on the estimated costs of the project

Use the project budget as a cost baseline, which is employed to control costs during project **execution**

Control all project costs to keep spending under the project budget

Adjust the project budget when necessary

Related: [Free Project Budget Template](#)

Scope

As mentioned, the project scope refers to all the project work required to complete the project. Managing that work is critical for project success. When managing scope, it's critical that you prioritize your tasks, enabling you to plan and assess. When managing scope, it's critical that you prioritize your tasks, enabling you to plan and assign resources effectively

To manage scope, project managers

Use a scope management plan to clearly define what project activities will be done

Share the scope management plan with all stakeholders, so everybody is on the same page

Use change orders to avoid scope creep and keep track of all changes made to the project scope

Manage stakeholder's expectations to maintain the project scope

Use task management tools and techniques to keep track of all project activities in the scope

These scope management actions taken by project managers are all essential because the amount of time each task will require is critical to the cost and quality of the final product. This can have a great impact on schedule and cost, especially so if the project is on a large scale.

Project Manager has task management features that make it easy to assign, sort and prioritize your tasks.

This way you can delegate all the critical project tasks to the right people, preventing the dreaded scope creep. Plus, by offering file sharing and task comments, we enable collaboration on the task level

task management features to manage scope in the triple constraint

Time

At its basic, the project schedule is the estimated timeline allotted to complete the project or produce the final deliverable. Usually, this is figured out by first estimating the time that each project task will take.

A Work Breakdown Structure (WBS) is used to identify all the project activities. Then project managers can use different scheduling techniques such as the critical path method or PERT charts to determine the total duration of the project.

Here's what project managers do to control the project schedule:

Use a Gantt chart to visualize the project schedule, define task sequences and monitor the duration of each task

Create policies, procedures, and documentation for planning, executing, and monitoring the project schedule

Allocate resources effectively using a resource schedule to avoid bottlenecks

Compare the schedule baseline to actual progress to determine if projects are on track

Now that we've learned what most project managers do to control the triple constraint, let's learn about the project management tools that you can use to help you with this process.

Project Manager's Gantt chart allows you to track the triple constraint online

Controlling the Triple Constraint with Project Manager

As mentioned at the top of the post, the triple constraint when used in conjunction with a project management software is the best way to control your project and lead it towards a successful end. Project Manager is a cloud-based project management software with real-time data that gives project managers the power to manage each arm of the triple constraint: costs, time, and scope.

Costs

Project Manager helps you track your project costs to make sure you're not overspending. You can create budgets, add project expenses, and input hourly rates for all your resources. The real-time dashboard tracks cost and five other metrics across your project and reports on them instantly in easy-to-read charts and graphs. This is an easy way to keep an eye on your costs and make sure you're aligned with your budget. Now you can catch budget issues before they become a problem.

Project Manager's dashboard view, which shows six key metrics on a project

Time. Your schedule can get away from you, but not with Project Manager. When tasks are updated, they're instantly reflected across the software. That means, your reports and dashboard are accurate and current. You can even watch the progress of individual tasks on the online Gantt chart, where the duration bar indicates how much progress has been made on the task.

Timesheets are synced with the team's tasks, which makes it easy for team members to select their task and just enter it. This brings their time into the timesheet, which can then be previewed and approved with a few clicks.

Scope

Scope is going to change throughout the project, and Project Manager has the tools to stay flexible with those changes. There are multiple project views, so you can switch from the Gantt to the Kanban board to get visibility into your workflow. Kanban cards, which represent tasks, are set by priority, which can change as the relevance of those tasks change.

6.1.2 Set up a list of the project success factors.

The world is changing fast, but when it comes to managing successful projects, many things stay tried and true. Ultimately, you want to foster a powerhouse project team that's focused on objectives and responsive to new information. Here are eight key factors that can help make a project successful.

Clear Project Goals and Objectives:

To achieve success, it must be clear what the project success criteria are. Before starting, help your team understand what you want to achieve — not just for your project but also for your client's business or community.

Align with relevant stakeholders on your key performance indicators (KPIs), and if possible, keep them visible. As you arrive at critical decision points, go back to these goals to determine the best courses of action.

Diligent Research and Data Gathering:

One of the most important project success factors is the discovery phase, when project managers work closely with clients to gain more insight into their problems, industry, past initiatives, capabilities, and more. This will equip you with information to formulate better strategies and anticipate possible hurdles. When projects start, it's tempting to jump the gun and get to work. It's exciting while you're brimming with ideas. Plus, a quick and straightforward schedule can impress stakeholders. However, it's important to remember that the benefits of forgoing this critical stage are only temporary and will quickly be eclipsed by their downsides. If you want to increase your chances of success, don't skip the discovery phase!

Grounded Estimates and Plans:

Unrealistic estimates and lofty promises are the most common ways project teams set themselves up for project failure. It can be tempting to give small, aggressive estimates because they seem to define the team members' competence. But if you want to increase your project's chance of success, you and your team may have to learn to set this ego aside or work around it.

Consider using good planning methods like planning poker, where discussions are encouraged around estimates. Look into your best, worst, and most realistic scenarios. Add padding and contingencies as needed. Conduct project planning according to how things are, not how you want things to be.

Optimized Workflow and Systems:

Systems and workflows are set processes for your team to follow when implementing your project plans. They're efficient ways to set expectations and manage communication. They also minimize confusion, which can be massively beneficial during the busiest phases.

Take the time to evaluate your workflow and system after critical phases of your project to spot inefficiencies. Check in with your team and stakeholders to identify areas you can automate and optimize project management strategies.

Barring extreme situations, it's not advisable to do major overhauls in the middle of a project. Still, keep an eye on tweaks that can offer tremendous results.

Real-Time Progress and Resource Tracking:

Once you start executing project tasks, you'll have a natural tendency to focus only on what's at hand.

But as the project manager, it's your responsibility to keep your goals and project objectives in view.

Without this presence of mind, you risk wasting resources and missing deadlines.

Nowadays, project management software is equipped with features for real-time task tracking and reporting, productivity monitoring, budget management and cost tracking, and more. Maximizing these features can enable you and your team to spot bottlenecks, foresee issues and delays, and stay in touch with your big objectives as you make incremental project progress.

Scope, Change, and Priority Management:

With the rise of information overload, it can be tempting for teams and stakeholders to implement every new idea and iterate after every exciting insight. While project management methodologies such as Agile Scrum exist to welcome new findings and iterations, these iterations should still come with thorough discernment and evaluation.

Finding the balance between openness to new ideas and firmness against scope creep is critical for project managers. While change can be good, new changes in scope must be evaluated against the

project's objectives and the availability of resources. Keep priorities clear to help your team manage their efforts — so they don't go to waste.

Healthy Team Culture:

If you've ever wondered how self-managing teams exist, then you've already stumbled upon the importance of healthy team culture.

A team's culture defines what they consider normal and unusual. This influences their decisions and actions, regardless of whether they're being supervised by management. Safety, empowerment, and accountability create a breeding ground for collaboration, constructive feedback, problem-solving, initiative, and grit.

Documentation and Knowledge Management

Another critical success factor in project management is constant improvement. For actions and decisions to be reviewed, they have to first be properly documented. Documentation can feel like an extra administrative task for project managers. But done right, it has many benefits.

Proper documentation and knowledge management can help you trace your team's thought process. You can use this to communicate better with stakeholders, onboard new team members, and conduct object evaluations at the end of your project. Leveraging your previous findings in future projects is also made possible when these are adequately recorded.

Finally, documenting your project success can increase your team's credibility and help you acquire more clients moving forward.

A Solid Foundation Is Key to Project Success

The key to building an agile and productive team is providing a solid foundation with sound systems and values. This firm grounding in project management will empower project team members to explore new ideas, take risks, and ultimately succeed and innovate.

6.1.3 Develop and identify work breakdown structure.

The Project Management Body of Knowledge, an internationally recognized collection of processes and knowledge areas accepted as best practice for the project management profession, defines the work breakdown structure as a "hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables." With a WBS, you begin with the desired outcome or product, which you then break down or decompose into the smaller deliverables or tasks needed to create it.

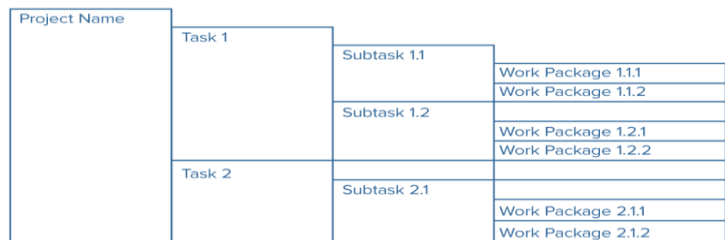


Figure 13 WBS structure

In a WBS, the deliverable can be an object, a service, or an activity. By focusing on deliverables rather than methods — the what, not the how — a work breakdown structure helps eliminate unnecessary work to get the intended result. A well-thought-out WBS aids in scheduling, estimating costs, and determining risk. It is usually a visual chart or diagram that spells out a project's timeline and process while capturing

each task, subtask, and deliverable that will be created and executed throughout. It's often rendered as an outline, like a table of contents, but can be organized using tabs or other visual organizational systems.

Rod Baxter, co-founder of Value Generation Partners and author of the *Project Management for Success Handbook*, calls the WBS “a necessary element to the product management lifecycle. It takes skill and practice to create, but it is essential to help you meet release dates and become efficient.”

The Characteristics of an Effective Work Breakdown Structure

An effective work breakdown structure cannot be slapped together overnight or by one person. To be truly effective, a WBS should:

- Spell out everything related to creating and delivering the project, including all deliverables and milestones.
- Be created by the project manager and others directly involved in the project and not, for example, handed to a project manager “from above” or from a client. This way, those who will be held accountable spell out what they will be doing, and they can buy in completely to what and how it will be delivered.
- Express all the information *visually*, so that the concepts are easily grasped and organized.
- Be a living document; dependencies and risks can affect timeline and/or scope, so the WBS needs to be treated as an organic guide, that operates as the “true north” of the project, while being adapted and modified as needed
- Be adaptable to any format or platform, so that team members can quickly access and act upon it, wherever they are, on any device

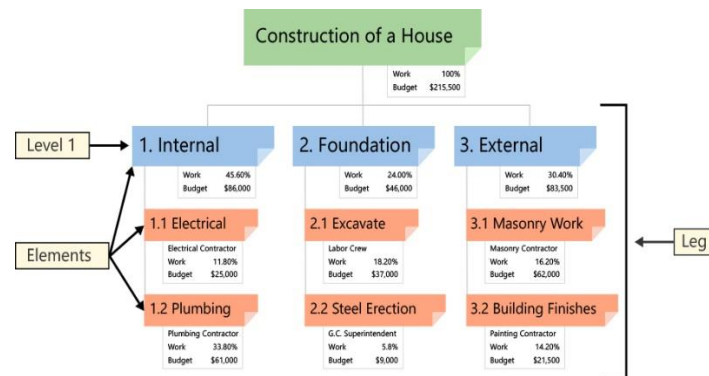


Figure 14 Construction of house WBS

Key Terms and Steps to Keep You Moving Forward

The WBS structure, or dictionary, is a fluid document, but will always include certain information. Here are the elements of a thorough, reliable WBS dictionary. Note that the elements that roll under each phase can be moved or adjusted as desired. Here is one example, involving the development of software, but notice that the project is not simply about the phases of software creation and testing.

1. The Title of the Project
2. Initiation
 - A – Deliverable: Submit the project charter
 - B – Project sponsor reviews project charter
 - C – Project charter is signed and approved
4. Planning
 - A – Create the preliminary scope statement

B – Determine the project team

C – Project team kickoff meeting

5. The project plan

A – Develop the project plan

B – Submit the project plan

C – Milestone: Project plan approval

6. Execution

A – Project kickoff meeting

B – Verify and validate user requirements

C – Design the system

D – Procure hardware and software

E – Install development system

7. Testing phase

A – Install live system

B – Do user training

8. Go live

9. Control

10. Project management

A – Project status meetings

B – Update project management plan

C – Risk management

11. Closeout

- 12. Audit procurement
- 13. Document lessons learned
- 14. Update files and records
- 15. Gain format acceptance
- 16. Archive files and all documentation

6.2 Requirements and objectives

6.2.1 Identify Requirement traceability matrix

A requirements traceability matrix (RTM) is a vital part of the lifecycle of any embedded system, helping organizations ensure their products are safe and meet intended standards. While the matrix has long been associated with medicine, technology, and engineering, the approach works well for any project regardless of industry. A requirements traceability matrix is a tool used to identify and maintain the status of project requirements and deliverables.

Understanding a requirements traceability matrix

Organizations use the RTM matrix to ensure project scope, requirements, and deliverables remain true to the established baseline. In most cases, this means documenting the links between the user requirements proposed by the client to the system being built. Each requirement is traced with a test case to ensure an adequate level of testing is accomplished.

The process of reviewing the test cases for each requirement is called traceability. This process in turn enables the organization to determine which requirements caused the most number of defects during a testing cycle. While this highlights areas for improvement, it also helps address process weaknesses and

future roadblocks. What's more, RTMs are used to counter the growing complexity seen in product development.

How to create a requirements traceability matrix

The needs of every business will be different, but most RTMs will have the following column headings for each requirement:

1. **Requirement ID** – a unique identifier given to each requirement so it can be easily traced over the project lifecycle.
2. **Category** – where the requirement is classified into a broad category such as functional, non-functional, security, performance, usability, and so forth.
3. **Priority** – teams can use a low-medium-high scale or use mandatory, should have, and nice to have.
4. **Source** – the name of the stakeholder who identified the requirement.
5. **Business objective** – or the objective the requirement will help the business meet. This typically comes from the project charter or business case.
6. **Deliverables** – here, list the deliverables that comprise the requirement.
7. **Verification** – how will each requirement be tested satisfactorily? In software development, verification may depend on 99.9% uptime.
8. **Validation** – detailing how the requirement will be validated or tested. This is usually via user acceptance tests, achieving milestones, or meeting KPIs.

Most RTMs can be created in an Excel spreadsheet. However, businesses can also use requirements management tools such as Visure Requirements, Modern Requirements4DevOps, and ReQtest.

Various types of requirements traceability matrices

There are three different types of RTMs according to the traceability strategy used:

1. **Forward traceability** – these matrices map the requirements to the test cases and ensure the project progresses in the desired direction via thorough testing.
2. **Backward traceability** – in contrast, these matrices map the test cases to the user requirements. This helps the project team avoid scope creep.
3. **Bidirectional traceability** – essentially, a combination of forward and backward traceability. The most robust RTMs incorporate bidirectional traceability because it establishes a relationship between two artifacts that can be traced from one to the next and back again. Ideally, the business should also be able to trace back from requirements to business goals to answer why the requirement exists in the first instance.

Key takeaways:

- A requirements traceability matrix is a tool used to identify and maintain the status of project requirements and deliverables. Organizations use the RTM matrix to ensure project scope, requirements, and deliverables remain true to an established baseline.

- A requirements traceability matrix can be created by using a spreadsheet or dedicated requirements management software. Each requirement should have information pertaining to a unique identifier, category, priority, source, business objective, deliverables, verification, and validation.
- There are three types of requirements traceability matrix depending on the traceability approach used: forward, backward, and bidirectional. Most businesses prefer bidirectional RTMs because they are more robust.



Figure 15 Requirements Traceability Matrix

6.2.2 Specify the methods used in requirement collection.

When it comes to any type of project, requirement collection plays a key role. Requirement's collection is not only important for the project, but it is also important for the project management function.

For the project, understanding what the project will eventually deliver is critical for its success. Through requirements, the project management can determine the end deliveries of the project and how the end deliveries should address client's specific requirements.

Although requirements collection looks quite straightforward, surprisingly, this is one of the project phases where most of the projects start with the wrong foot. In general, majority of the failed projects have failed due to the wrong or insufficient requirements gathering. We will discuss on this in the following section.

Following is an illustration indicating where the requirements collection comes in a project:

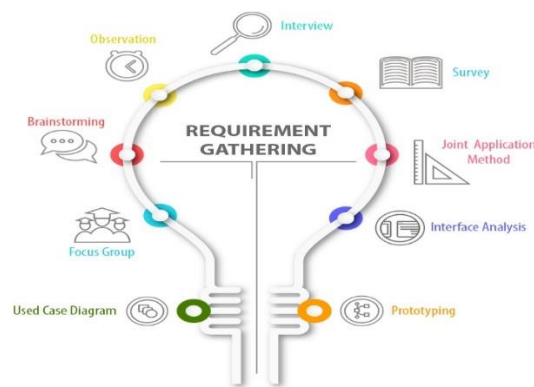


Figure 16 Requirement Gathering

The Importance of Requirements

Let's take a software development project as an example. Once the project initiation is over, the business analyst team is in a hurry to collect requirements. The BA (business analysts) team use various methods to capture project requirements and then pass the requirements to the project team. Once business requirements are converted into technical requirements, the implementation starts.

Although the above cycle looks quite normal and trouble-free, the reality is somewhat different. In most of the cases, the BA team is unable to capture all the requirements related to the project. They always overlook a portion of requirements. During the construction of the project, usually the client recognizes the requirements gaps of the project.

The project team will have to implement these missing requirements with no additional client payments or with client approved change requests. In case if it was BA team's fault, the service provider may have to absorb the cost for implementing the missing requirements. In such instances, if the effort for missing requirements has a significant impact on the cost of the project, the project may be a financial loss for the service provider.

Therefore, the requirement collection process is the most important phase of any project.

The Process for Requirements Collection:

To requirements collection, there are a few methods used by the business analysts. These methods usually differ from one project to another and one client organization to another.

Usually, requirements for a new system are gathered from the potential end-users of the system. The methods used for gathering requirements from these potential end-users vary depending on the nature of the end-users. As an example, if there is many end-users, then the workshop method can be used for requirements collection.

In this method, all the potential end-users are asked to participate for a workshop. In this workshop, the business analysts do engage with the users and collect the requirements for the new system. Sometimes, the workshop session is video recorded in order to review and capture any user feedback.

If the user base is quite small in number, the business analysts can carry out face-to-face interviews.

This is the most effective way of finding all the necessary requirements as the business analyst can have all their questions asked and cross questioned as well.

Questioners can be used effectively for requirements collection process, but this should not be the only method of interacting with the end-users. Questioners should be used as a supporting feature for interviews or a workshop.

In addition to the above methods, there are many other specific methods that can be used for specific conditions.

Tips for Successful Requirements Collection:

Following are some of the tips for making the requirements collection process successful:

1. Never assume that you know customer's requirements. What you usually think could be quite different to what the customer wants. Therefore, always verify with the customer when you have an assumption or a doubt.
2. Get the end-users involved from the start. Get their support for what you do.
3. At the initial levels, define the scope and get customer's agreement. This helps you to successfully focus on scope of features.
4. When you are in the process of collecting the requirements, make sure that the requirements are realistic, specific, and measurable.
5. Focus on making the requirements document crystal clear. Requirement document is the only way to get the client and the service provider to an agreement. Therefore, there should not be any gray area in this document. If there are gray areas, consider this would lead to potential business issues.

6. Do not talk about the solution or the technology to the client until all the requirements are gathered. You are not in a position to promise or indicate anything to the client until you are clear about the requirements.
7. Before moving into any other project phases, get the requirements document signed off by the client.
8. If necessary, create a prototype to visually illustrate the requirements.

Conclusion:

Requirement collection is the most important step of a project. If the project team fails to capture all the necessary requirements for a solution, the project will be running with a risk. This may lead to many disputes and disagreements in the future, and as a result, the business relationship can be severely damaged.

Therefore, take requirement collection as a key responsibility of the project team. Until the requirements are signed off, do not promise or comment on the nature of the solution.

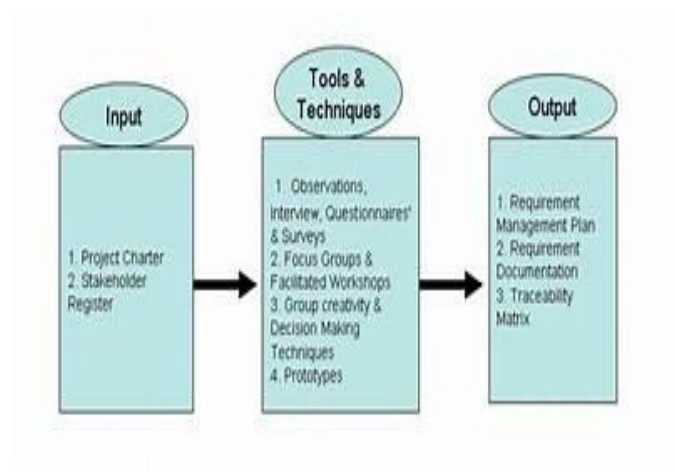


Figure 17 Project scope Management

6.2.3 Develop the hierarchical structure of the objectives of the project

A Work Breakdown Structure (WBS) is defined in the Project Management Body of Knowledge (PMBOK®) Guide, 4th Edition, as:

“A deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables. It organizes and defines the total scope of the project.”

A well-developed Work Breakdown Structure (WBS) provides you with a way to ensure you have captured all project deliverables so that you can more easily assign duration and resources to complete the tasks.

To develop your WBS follow these simple steps:

- Identify major components of the project
- Break the major components into sub-components
- Break each sub-component into an activity and task (work package)
 - This is where you will assign the work to be done
- Sequence and date all activities and tasks and look for dependencies (e.g., a task that cannot begin until an earlier task is completed)
- Create your WBS

Example graphical WBS:

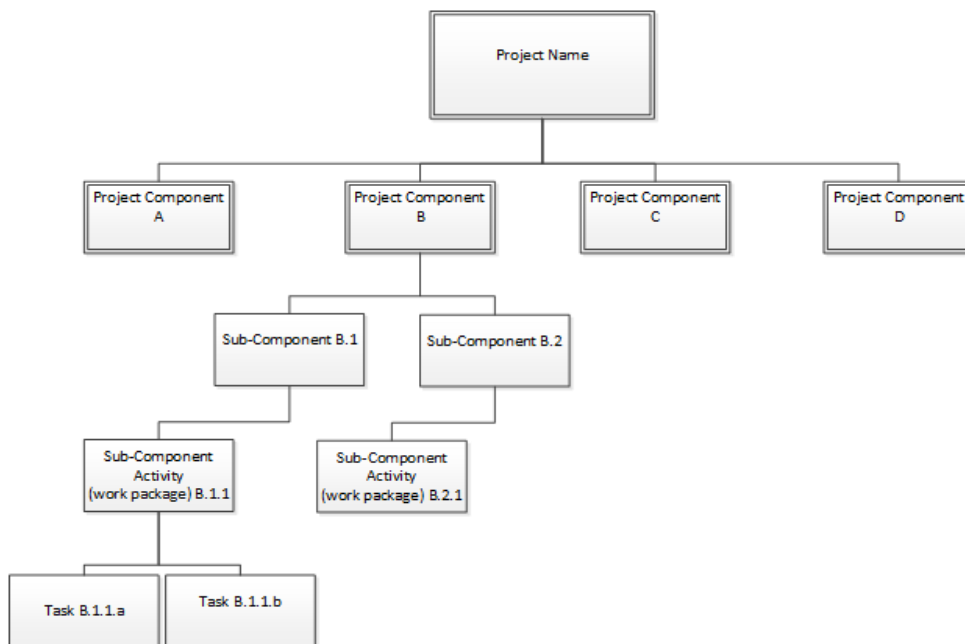


Figure 18 Example of graphical WBS

A WBS can also be developed as an outline:

- Project Component B
 - Sub-Component B.1
 - Sub-Component Activity (work package) B.1.1
 - Task B.1.1.a
 - Task B.1.1.b
 - Sub-Component B.2
 - Sub-Component Activity (work package) B.2.1
 - Task B.2.1.a
 - Task B.2.1.b
 - Task B.2.1.c

Use the WBS to develop your project schedule. The work packages – activities and tasks – are used to determine duration, cost, and resource needs for the project. I like to break down the activities to a point where duration for completion, cost and resources can more easily be determined.

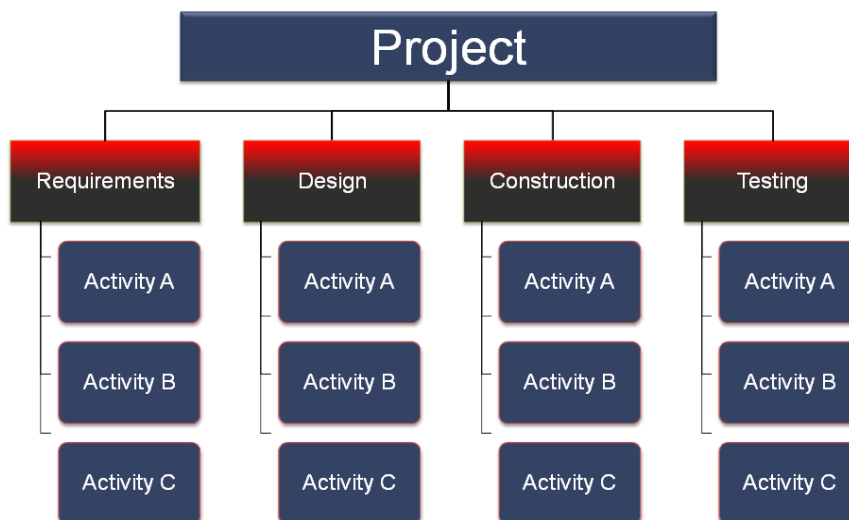


Figure 19 WBS activities

7.1 Scope:

7.1.1 Develop, identify, and prepare the scope statement.

Through our experience working with project teams in many industries on hundreds of projects, we recognize that although Project Managers and project teams may understand the theory and value of developing a Project Scope Statement, many do not have viable tools, techniques or processes for creating a one. Unfortunately, Project Managers may attempt to write the Project Scope Statement on their own or assign this effort to a team member. Often, they move forward with a scope statement completed by one person or route the scope statement to other stakeholders seeking input, buy-in, or approval. This process can take weeks and usually results in missing portions of key information needed to effectively manage scope on the project. In this situation, Project Managers are faced with spending too much time trying to recognize and

manage scope creep due to unclear project boundaries. This paper illustrates how to build a scope statement while gaining alignment from all project stakeholders in a matter of days. The alignment gained in the scoping effort will carry through the remainder of the project. This paper presents core concepts to effectively plan and run a scope statement workshop, using collaborative JAD techniques, to build the needed scope outputs for a project.

Scope Management Overview

Project Scope Management involves ensuring all of the required work and only the required work necessary to complete the project is accomplished (PMI, 2004, p103). Any work that does not support the needs of the project is Out Of Scope and should not be performed. This concept seems obvious, but unfortunately only 29% of projects are completed successfully. This means 71% of projects either fail outright or are “challenged” – completed over budget, behind schedule, or deliver fewer features and functions than the Customer expected (Standish Group, 2004).

The top 4 factors associated with project failures are:

- Poor End–User / Customer Involvement
- Poor Executive Management Support
- Improper Planning
- Unclear Statements of Requirements

Facilitated Workshop Overview

JAD (Joint Application Design) workshops can effectively address poor End–User / Customer involvement, poor executive management support and unclear statement of requirements by incorporating collaborative techniques. JAD workshops are led by a neutral Facilitator (i.e., someone without a stake in the project) to

engage all the appropriate stakeholders as participants in a workshop to make project decisions and create project deliverables.

JAD workshops must be fully planned prior to conducting the workshop. Planning enables the project management team and the Facilitator to agree on the scope deliverables and activities for creating these deliverables in the workshop. A standard Planning Template and Facilitator's Agenda can save time preparing for the workshop and creates consistency in the planning effort. The Facilitator conducts the workshop using collaborative techniques to collect information, validate this information and continually adjust it to ensure it is clear, complete and addresses the needs of the project. The results of facilitated JAD workshops are consensus among workshop participants, ownership, and buy-in on all decisions made and all deliverables produced.

The Project Scope Statement Workshop

The Project Scope Statement provides the documented basis for making all project decisions and is used to direct the project effort and communicate the project scope to the project team and other project stakeholders. Projects that do not have a Project Scope Statement are plagued with scope creep issues. When a project team creates a Project Scope Statement early in the project lifecycle, they define the boundaries of the project. The team understands the business need and the expected outcome of the project, recognizes constraints that will limit their options for developing a solution, are aware of assumptions regarding decisions outside their control, gain alignment on high level requirements, understand processes they are affecting, and recognize entities the project solution will interface with. These tools allow the project manager, project team and stakeholders to make informed decisions on what is included in the scope of the project, as well as recognize when all of the requirements for the project have been identified and appropriate solutions defined.

The facilitated JAD Workshop to create a Project Scope Statement includes these scope deliverables:

- Business and Project Objectives
- Context Diagram Reflecting Business Processes Impacted and External Entities (Interfaces)
- Project Constraints
- Project Assumptions
- Critical Success Factors
- Proposed Product / Service Statement

Additionally the JAD workshop produces a current Business / System Environment Assessment known as a SWOT Analysis (Strengths, Weaknesses, Opportunities, and Threats).

Business / Project Objectives

Objectives define the targeted changes in the organization the project is expected to achieve. They are the reason for the changes that will be introduced as a result of completing the project. Objectives are defined at two levels: Business Objectives and Project Objectives.

Business Objectives describe the high level results the organization expects to achieve relative to the overall business strategies. These results are achieved through the execution and implementation of one or more projects. Understanding Business Objectives helps the project team understand how their project fits in with the direction or strategic plan of the company.

- Business Objectives Example:
 - o Increase sales revenues by \$200,000 by the end of 2007

Project Objectives describe the changes that will occur as a direct result of the team's specific project effort.

Project Objectives state at a high level what the project team will do to address some part of the Business Objective.

- Project Objective Example:
 - o Design, Build and Implement a new inventory management system replacing 3 redundant inventory systems by 2nd quarter 2007

Objectives must be understood and bought into by all project stakeholders. To help accomplish this, Objectives should be SMART:

- Specific – the objective is clearly stated
- Measurable – metrics exist or can be created to determine when the objective has been met
- Attainable – the team agrees the objective is realistic
- Relevant – the objective fits the organization's strategic plan and supports the project charter
- Time-based – a date for achieving the objective is stated. Objectives without target dates are merely dreams.

The process for documenting Objectives is to review and clarify each Objective stated in the Project Charter. If the project charter did not include the Objectives, the workshop participants will document the Objectives with help from the Project Sponsor during this activity. It is important to understand that the project team does not have the option of deciding what Objectives they want to address. The Project Sponsor must be involved since the Sponsor establishes the Objectives. Objective statements are reviewed and clarified until each statement is clear and meaningful.

Many times, project teams are confused about the level of information captured in an Objective statement and tend to include too much detail. Objectives are high level statements. Clearly stated Objectives describe what must be accomplished, but do not communicate the details for how the Objective will be achieved. Using appropriate vocabulary will help the participants define the Objectives at the correct level. Business Objectives should start with verbs like: Improve, Reduce, Minimize, and Increase. These verbs paint the

picture of the change in results the organization is striving for. Project Objectives should start with verbs like: Replace, Design, Install, Implement, and Automate. These verbs paint the high level picture of what the project team will do to achieve the change.

Context Diagram, Business Processes, External Entities

The Context Diagram is a high level picture depicting the boundaries of the project. It communicates what is “In Scope” for the project. The diagram is a one page process model – built at Level Zero (0) or the 50,000 foot level. Details about the project boundaries are not clear at this point, but understanding the major pieces of functionality and interface points are identifiable. The Context Diagram includes two components: Business Processes and External Entities (Exhibit 1). The Business Processes are presented inside the center box of the Context Diagram while the External Entities are presented as boxes surrounding the center box and connected with lines and arrows to represent flows of information.

Business Processes

A Business Process describes actions or capabilities that will be affected by the project, either changes to existing processes or creation of new processes. Project teams often confuse processes with departments (e.g., Accounting, Procurement, Marketing, etc.). A Business Process is not a department, but it does describe the work that people in departments perform. Many times this work is performed by multiple departments, a primary department (e.g. Accounts Payable Department enters, approves and pays invoices) and secondary departments (e.g., Marketing Department can initiate an invoice). Business Processes focus on the work being performed, not who is doing the work.

Exhibit 1: Context Diagram

Think of a Business Process as a “machine” that transforms things. It must have at least one input going into the machine and at least one output coming out. The output must be different from the input which is

a result of the processing that occurred. Typically seven (7) or less Business Processes can be defined for any given project scope. Lower levels of work defined during the Business Process activity are typically pieces of a higher level process and can be rolled up into another Business Process. During the Scope Definition workshop, Business Processes will be defined at the highest level. Later in the project lifecycle, Business Processes may be decomposed into lower level sub-processes, as needed. Each Business Process should contain enough descriptive information to clearly differentiate one Business Process from another.

- Business Process Examples:
 - Calculate a Payment
 - Prepare a Meal
 - Enroll a Customer

If the project has been initiated to modify an existing product or service, a list of Business Processes from the current environment may already exist. This list can be reviewed to decide which Business Processes will be adjusted or added. If a list of Business Processes does not exist, the Facilitator will use Brainstorming to help the participants define the Business Processes affected by the project. Business Processes defined during the Scope Definition workshop are used to categorize lower level Business Requirements later during the project lifecycle.

Specific vocabulary is used to define Business Processes at the appropriate level. Business Process are stated in Verb / Noun format and describe an action being performed. The use of Action Verbs versus Empty Verbs is encouraged. When participants close their eyes they should be able to visualize the work occurring associated with Action Verbs; whereas Empty Verbs do not provide a clear picture of any action.

- Action Verb Examples:

- Evaluate
- Cook
- Inspect
- Calculate

- Empty Verb Examples:

- Manage
- Process
- Handle

The Business Process brainstorm may result in 20 or 30 potential processes – remember, we are looking for 7 or less high level processes. The first brainstormed idea is reviewed, clarified and if accepted as a Business Process, it is given a unique identifier. Each subsequent idea is then reviewed and clarified. The Facilitator asks if the idea is part of a prior Business Process already defined and if so, this idea is moved to the description of the other Business Process. Through multiple review passes, similar processes are grouped together and redundant processes are deleted until 7, or less, Business Processes remain. The resulting Business Processes are copied to the Context Diagram and placed in the middle box on the diagram labeled Business Processes.

External Entities

An External Entity is a person, organization or system that performs processes which are outside the scope of the project. Inputs and Outputs are always described from the perspective of the Business Process. Business Processes either send information to the External Entity (Output) or receive information

from the External Entity (Input). The project scope does not include the processes performed by the External Entities. It does include providing the interface between the Business Processes and the External Entity.

Project teams often list too many External Entities on their Context Diagram. They mistakenly assume everything the company does is affected by this project, or they fail to group similar External Entities together. Participants can validate an interface legitimately exists between the Business Processes and the External Entity by defining the information that flows between them (Inputs and Outputs).

7.1.2 Develop, identify, and explain Scope creeping

We all need to be careful about dealing with increasing or changing scope in order to avoid nasty surprises.

In this article, I'm going to discuss:

1. What Is Scope Creep?
2. How It Can Hurt Your Projects?
3. How To Mitigate It When It Happens?

I'll be delving into real-world examples of scope creep in agile projects—where there isn't even a fixed scope to begin with. Also important, I'll talk about the positive aspects of a changing scope and arm you with a sound approach to embrace it. Because scope change can be good!

What Is Scope Creep?

So what is scope creep, exactly? Simply put, it occurs when the scope, deliverables, or features on a project expand from what was originally set—without being accounted for in additional time or budget. It can affect any fixed scope project. It's a very common thing, as it can happen both intentionally and unintentionally, stemming from any number of the people involved in a project.

Unfortunately, scope creep can lead to project failure: maybe you don't hit the deadline, you burn through the entire budget (and more), and all without delivering the right thing. And who wants that?!

How Does Scope Creep Undermine A Project?

Has it happened to me? Yes, plenty of times! Here's a quick scope creep case study from my experience to illustrate how easily it happens—and how it doesn't always come from a direct client request:

Case Study: My Experience With Scope Creep

I inherited a project with a more classic Waterfall setup: there were wireframes and a design phase, which then moved into the project development stage. I picked it up as it was entering development. It was straightforward enough: we were building the frontend on top of a white-labelled backend from another agency. We had signed off wireframes and designs and had run through everything with the client and agency...what could possibly go wrong?

Well! It turns out that the other agency was iterating on their backend build and frequently releasing new code. Funnily enough, they didn't account for us building on top of the old code, so our code broke with every release... *deep sigh*.

This meant we had to go back through our code, updating it to work with the continuous changes from the other agency. This was unaccounted for—but it was work we had to do. At first, we did the odd, small fix on an ad hoc basis, but more and more problems started to occur. Although we raised this with client, we tried to fold the extra work into our project rather than flagging to the client that we needed to determine a solution together before proceeding with the build.

Oh, the benefit of hindsight! What happened? We fell deeper and deeper into redeveloping the existing code—timelines got extended, we missed our deadline, and we came under a lot of pressure towards the end of the project. The team was demotivated, the client wasn't happy, and none of this was actually our fault! In the end, the project was delayed by two months, a huge amount of time, unaccounted for. In the end, all we wanted was to wash our hands of it and forget it ever happened.

So, what could we have done?

The People Involved: Who Actually Causes Scope Creep

It's useful to take a look at your project and identify who could be causing scope creep. This can help you to identify it early and determine your approach to solving the issue. Hint: it's not always the client causing these issues, as you can see in my example above.

Team Member

Scope creep can come from people in your internal project team for a number of reasons:

1. The project team member is unclear on what the scope of the project is.

Ensure that at the beginning of the project, any requirements or deliverables are already outlined in a scope statement or project plan, and that everyone working in the team is fully aware of these. If scope is being set, make sure conversations involve the team that will be working on the project as much as you can. If that's not possible, at the very least run a kick-off meeting with the team and make sure everyone is fully aware of what has been agreed upon. Then, during the project, make sure you hold regular team check-ins to keep everyone on the same page.

2. The team member wants to develop what they want to develop, and not what's in scope.

People have much more understanding when they are involved—when they feel like they own it. Involving your team in setting the scope is really useful in getting their buy-in for what they'll design and build. Make sure everyone is working as a team. If someone goes away to produce something out of scope because they want to, others on the project won't be as invested in what is happening, causing friction and differing ideas on what the scope is.

3. The team member makes decisions in a vacuum.

Sometimes, team member chooses a way to solve a problem that has an impact on scope, often without realizing. Even adding a half day of extra work to do something slightly different could impact the rest of your project. For example, if a designer or UX person decides to include some functionality on a site without discussing with the developer, who knows what this could do to your overall scope, without any investigation? Make sure you set your team up from the beginning of a project to work together and understand each other's' decisions. When someone raises a query or issue with you directly, share it with everyone if there's a bigger decision to be made. Get people working together to define and find solutions to problems. Make sure everyone is in contact (whether face-to-face or remote) regularly. Most successful projects are enabled by teams that work well together.

Internal Stakeholders

Your project scope can be influenced internally in your organization from key stakeholders. They might have a vision for the organization that involves delivering more for your project, or they might want to push a different agenda. For example, sometimes a client relationship is more important to an organization than staying within scope in your project.

Make sure your internal stakeholders understand what you are trying to deliver and by when. If something would have a knock-on effect on your project, clearly lay out what impact this will have—whether it's financial, perception-based, or otherwise.

Users

User testing should (hopefully) be part of your project or product set up. User feedback on a product can influence a course of events that ultimately increases scope. What happens if you get feedback from your users showing that something that you can't ignore? Even if it might increase your scope, it needs to be addressed.

When you've collated results from testing, review with your team to identify the necessary changes to implement. Prioritize so you understand which changes would have the greatest impact to the users' experience. Then, work out what level of changes you can comfortably incorporate without affecting scope. If any of the necessary changes would mean increased scope, speak to your client or stakeholder about it. Also important is to make sure you understand what impact not implementing the change would have.

7.1.3 Illustrate product analysis management.

As we saw in my personal case study, dependencies coming from other parties can affect your feed. Whether that's an external company, third-party APIs, content providers—if you are relying on anyone else externally to complete the project, you need to be aware of the impact they can have.

Make sure you identify your project dependencies when you kick-off the project. Try to think about what impact they could have on your project, and how they could affect your scope. For example, what if your content provider sent you content that wasn't in the format that was easiest to implement or upload within the website. Could this add extra time your side? Obviously, you'll never cover every eventuality—but having this risk-planning frame of mind at the beginning means that you can raise these dependencies at the beginning of your project with the client or stakeholder and ensure they understand the potential impact.

You

The biggest issue when it comes to you, the project manager, causing scope creep stems from the temptation to try and make things work within your existing budget and timeline, without flagging to your client or stakeholder. Yes, it can be a difficult conversation when you have to say you can't do something unless you raise a change request and go through the official change control process—but

this conversation is a lot easier to have earlier on, rather than down the line when you're over time and budget.

Make sure you're raising issues as soon as they happen, rather than waiting. If you or your team identify an issue, work through possible scenarios for different solutions, and present them to the client or stakeholder. For example, if extra work is necessary, see what can be descoped instead—is there anything you are doing in your project that isn't needed for the first release?

Client

And yes, we can't conclude this section without mentioning the obvious: the client. This one is in fact easier to spot, as most PMs are already primed to do so! Be aware of clients adding in small requests that gradually build up, changing their mind on what was agreed, or suggesting new ways to do things that can affect the amount of effort needed. Make sure you're honest and upfront with them if they are asking for something that will cause scope creep. Also, frame your responses so that you aren't just saying "no" all the time. Try to phrase it so that you are suggesting an alternative, for example:

"This new request is going to have *this specific* impact on time/budget. We've taken a look at the priorities—how about replacing *this* with *that* instead? It achieves a similar outcome because..."



Figure 20 Main Causes of scope creep

Not having a clear scope

Clarity is extremely important on any project. If you don't clearly define your scope at the beginning, it can cause big problems down the line.

How to eliminate it: make sure the scope is clear to everyone working on the project. Involve your team in setting the scope so that they are bought into what they are delivering.

Not having client agreement

If the client isn't bought into the scope, they are likely to change their mind—and the deliverables—later.

How to eliminate it: ensure the client understands what is—and isn't—in scope. Don't just send a document outlining the deliverables—speak to them and walk them through it properly. Be transparent: ask questions such as, "Are you clear on what this deliverable is and what you'll get?"

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Not involving the client throughout

Gone are the days where you do a month or two of work and then send the final results of this period to your client for feedback. This results in surprises, with finalized work having to be redone, and impacts the project timeline and budget.

How to eliminate it: collaborate closely with your client. Show them the work in progress, iterate, and proactively involve them throughout the journey.

Not raising issues proactively

Hiding behind issues and not being transparent with the client or stakeholder seems easier at first, but you'll come to regret it later on.

How to eliminate it: raise issues right away, when they happen (just make sure you've had time to work through some solutions first!).

QA needing more time than estimated

Ah, the age-old issue of QA estimation. How can you accurately estimate how many bugs will be raised, how long they will take to fix, and what impact this will have?

How to eliminate it: estimate a percentage of the development work based on the complexity of build, then add contingency. Don't just throw a percentage at this—speak to the QA Analyst and get them to review. Additionally, pre-define the browsers and devices you'll test against, along with the types of issues. This will help you refine your QA estimate. Also, consider using automated testing to save

time—the articles Pros and Cons of Manual and Automated Testing and Best Automation Tools provide background on automated testing.

Not prioritizing among features

In a Waterfall-style project, your product will likely be built step-by-step until you reach the whole, shiny, new thing. This could lead to thinking everything is a priority. If you don't have clear priorities among features, it's hard to understand what can be descoped when adjustments to requirements begin to surface.

How to eliminate it: prioritize features by identifying what's necessary for releasing a usable product.

Consider a more Agile approach where you build the minimum for release as quickly as possible:

identify which features are absolutely necessary for users, and build a working product that can be tested and used by a customer at each stage.

Not agreeing on how to handle change

If you haven't agreed on how to handle change at the beginning of a project, it only makes sense that it's going to be difficult to work through changes in scope at a later date.

How to eliminate it: outline in your Statement of Work (or similar document) how you'll handle change.

If you'll use Change Requests, ensure you detail what's in scope, what's out of scope, and how to raise a Change Request.

Estimating poorly

Estimation is very difficult to get right. It's a challenge to be accurate at the beginning of a project when there are many unknowns. Certain things may not get accounted for, and you end up tied to this extra scope to be able to deliver your overall project.

How to eliminate it: involve your whole team in estimation. Don't work in a silo and make guesses.

Ensure you've explored and determined client and business requirements against user requirements before estimating. Instead of estimating based on deliverables, look at the following:

- Estimate for a discovery period to determine what you'll be building—at the end of this you can provide a more accurate estimate for the rest of the project.
- Consider using a Time and Materials pricing model rather than Fixed Price. Since you are billing actual hours on the project, it can be much more flexible.
- Don't specify exactly what features are being built and how within the scope—allow room for change.

Not interrogating new requests

It's easy to take on new requests or ideas from clients or team members, believing that they are the right path forward (*Well, they do know what they're doing, right?*). If you don't interrogate these requests properly you could end up accepting new scope, duplicating work or building unnecessary features without noticing.

How to eliminate it: review all new requests with the full team. Create a clear understanding of what the request is, the impact of incorporating it, and its outcome for the user. Then, prioritize the new request and cross check to make sure it's not already being delivered elsewhere.

Not involving users early enough

I've seen many a project go to the final stages (and even past that) before actually putting it in front of real users. It's tempting to fool ourselves thinking that we (the clients, the business, the team) know the users well enough to avoid interacting with them. If you're not incorporating user feedback early on, you can go far down a route that doesn't test well with users. At that point, your scope can suddenly spiral.

How to eliminate it: get users using the product or service as early as possible. If the client or budget holder doesn't want to pay for this, work through the benefits and the negative impact it could have by not performing this early user validation. Have a plan to address user feedback wherever it comes within the project.

How To Manage Scope Creep in Agile?

Scope creep generally applies to projects with a fixed scope. What if I'm using an Agile methodology? Well, Agile embraces change—and frankly, so should you if you're working within different processes or methodologies.

7.2 Time:

7.2.1 Develop the functions list or the activities included in each work package in WBS

Work Package	Activities		Description	Duration
		A	Start	0
Team Works	1.1	B	Assigning a team to inventory of medical centers	1
	1.2	C	Communicate with involved authorities	2
	1.3	D	Get the policies of environment & all necessary documents	2

	1.4	E	Get the approvals from sponsors to provide the project charter	1
Staff	2.1	F	Studying the required jobs	1
	2.2	G	Recruiting the work teams	2
	2.3	H	Rehabilitation of the Staff	4
Materials	3.1	I	Assigning a team to study the market	1
	3.2	J	Make plan for delivery of materials and storage	1
	3.3	K	Purchase the Materials	1
Constructions / Preparations works	4.1	L	Assign the PMO & the main contractor	
	4.2	M	Approval of designs and work plan	1
	4.3	N	Kickoff the executing	35
	4.4	O	Finishing work	12
	4.5	P	Hand over all the deliverables	2
		Q	Finish	0

Table 25 work package in WBS

7.2.2 Illustrate the relationships between the activities

Activities in this project will be undertaken or executed chronologically and the work packages will follow one after each. In short, the first work package will be the first to be completed before the second work package and the activities will also follow. These are the activities involved in construction of the Medical Centers buildings.

Activity	Predecessor	Duration
A	–	0
B	A	1
C	B	2
D	C	2
E	D	1
F	E	1
G	F	2
H	G	4

I	H	1
J	I	1
K	J	1
L	K, E	1
M	L	1
N	M	35
O	M	12
P	N, O	2
Q	P	0

Table 26 Relationships of activities

7.2.3 Develop the logical diagram of the project activities and identify the critical path

The critical path is the longest sequence of activities and events that must be completed to the project from the start to the completion stage. This path describes the longest time taken by the project team to execute.

In this case, the critical path is:

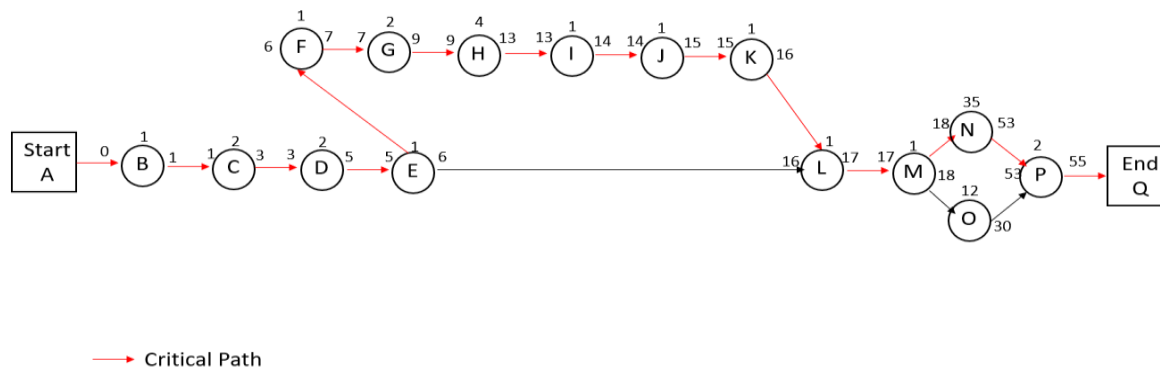


Figure 21 Critical Path

7.2.4 Prepare Gantt chart and Milestones model.

Gantt Chart:

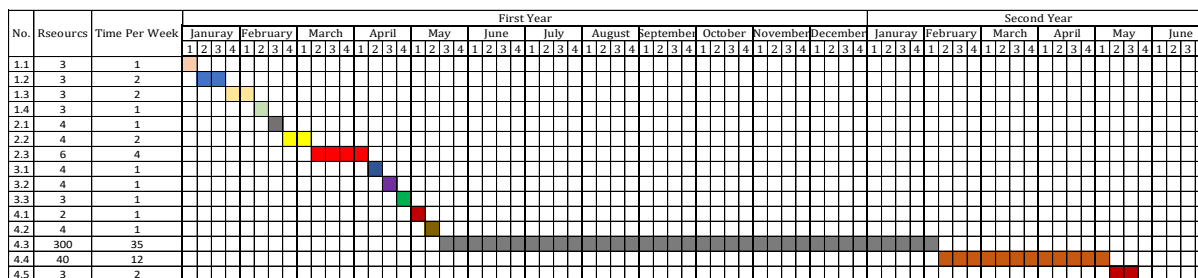


Figure 22 Gantt Chart

Milestones:

Milestones	Deception	Duration
Develop the service Area	Contain Flower shops, Cafeteria, Coffees, and kids Area.	6
Develop the social Community zone	Rebuild Gardens, Green zones, construct the restaurants and coffee shops of the green zones	9
Develop the Clinics to be Eco Friendly	Develop 50 medical buildings in north Riyadh	12

Table 27 Milestones

7.3 Quality:

7.3.1 Clarify Deming model for quality.

Project quality management is the process of continually measuring the quality of all activities and taking corrective action until the desired quality is achieved. Quality management processes help to control the cost of a project, establish standards, and determine the steps to achieving and confirming those standards. Effective quality management of a project also lowers the risk of product failure or unsatisfied, unhappy clients.

The Deming cycle is a continuous quality improvement model which consists of a logical sequence of four key stages: *Plan*, *Do*, *check*, and *Act*. Shown in figure 7.1.

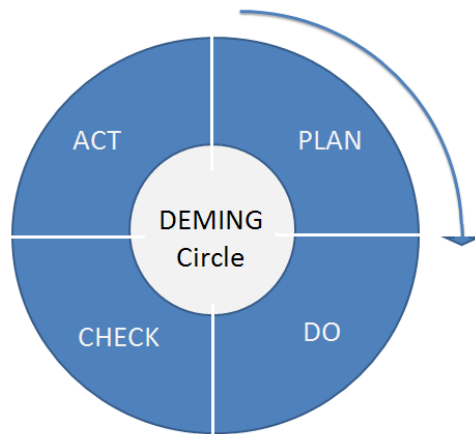


Figure 23 Deming Circle

In Deming's approach, the process of improving an organization does not have to be limited to its processes alone but it can be applied to the whole organization. The key points on which Deming was working are:

- Having a system for continuous quality improvement.
- Reducing errors and defects through higher levels of quality uniformity.
- Understanding the meaning of quality in the context.

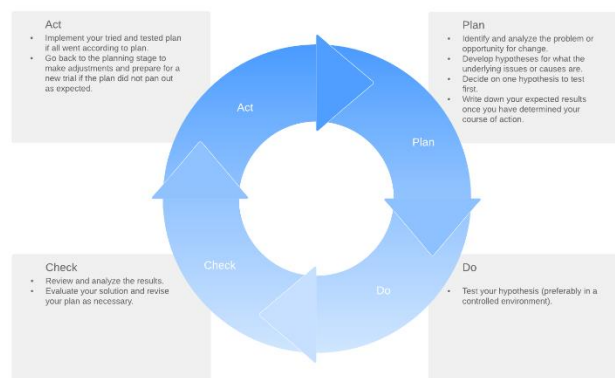


Figure 24 Deming circle cycle model

7.3.2 Develop the SIPOC model and Ishikawa for one of the issues of the project outputs.

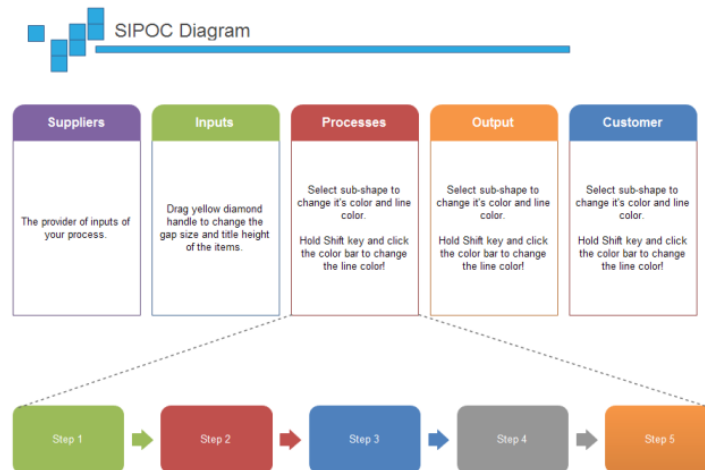


Figure 25 SIPOC Diagram

SIPOC TOOL APPLIED TO PROJECT MANAGEMENT PROCESS

S	I	P	O	C
Supplier	Input	Process	Output	Customer
Project Team	Employees' Profiles	Formulate project team	Project team formulated with defined roles and responsibilities	Business Owners
Human Resource Department	Process Map	Develop project policy	Project policy created and approved	Stakeholders
Business Owner	Management review	Determine project baseline	Baseline data measured and identified	Sponsor
Procurement Department	Project charter	Identify Significant Project Users (SPUs)	SPUs identified, measured, stratified and prioritized	Employees
Finance Department	Business Strategy	Conduct gap analysis	Project analyzed and causes identified	Project Team
Project Management Team	Procurement Strategy	Conduct root cause analysis	Objectives, targets, and action plans developed	Facility Managers
Top Management	Project Bills	Develop project management opportunities	Control plan procedures developed	Local Community
Engineering Technical Department	Measurements	Control and sustain		Legal Authorities
Consultants	Measured Baseline Data			
Auditors	Operational Standards			
	Legal and other Requirements			
	Gap in Project Performance			
	Brainstormed Ideas			
	Information about new technologies			
	Results From root Cause Analysis			
	Resources Availability			
	Funds Availability			
	Generated Objectives, Targets and Action Plan			
	Communication Plan			
	Contingency Plan			
	Corrective and Preventive Actions			
	Internal Audit			

Table 28: SIPOC Diagram

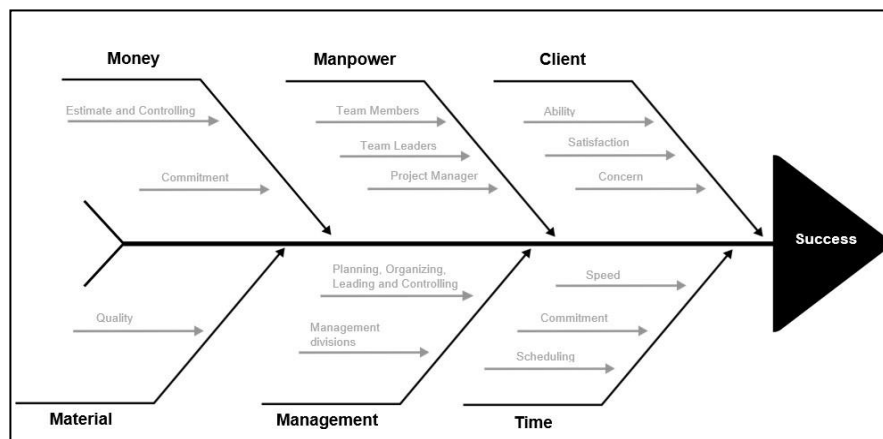


Figure 26 Ishikawa Diagram (Fishbone)

8.1 Finance

8.1.1 Establish Cost Breakdown Structure, and the project balance by WBS.

This represents the cost estimate of each work package and the cost of activity or task of each work package. Each activity will be allocated its own budget for a better execution of the project. The table below (Table 20.1.1.1) shows the Cost Breakdown Structure & Project Balance in Accordance with WBS (Top-Down Approach).

Cost Breakdown Structure & Project Balance in Accordance with WBS (Top-Down Approach)						
ID	WBS	Title	Duration	unit	Unit Cost	Total Cost
1	1	The Foundation Costs				
2	1.1	Buildings (Constructions, Development and Renovation)				
3	1.1.1	•Develop the Service areas				
4	1.1.1.1	Flower and shopping area	6	50	500,000	25,000,000

5	1.1.1.2	Kids area	6	3	1,000,000	3,000,000
6	1.1.1.3	Cafeterias and coffee shops	6	2	2,000,000	4,000,000
7	1.1.2	•Develop the social Community Zone				
8	1.1.2.1	Rebuild the Gardens and green areas	9	2	2,000,000	4,000,000
9	1.1.2.2	Construct a Restaurants & Coffee–Shop area (Green)	9	10	600,000	6,000,000
10	1.1.3	•Develop the Clinics to be ECO friendly				
11	1.1.3.1	Develop 50 medical buildings in North Riyadh	12	50	1,000,000	50,000,000
12	1.2	Maintenance for Buildings, Gardens, clinics & Social Area	12	1	–	2,500,000
13	1.3	Bills for (water, electricity)	12	115	5000	575,000
14	Total Foundation Costs		12	38	7,105,000	95,075,000
15	2	Organization & Administrative Costs				
16	2.1	Organizations Employee (Salary, costs newemployee, others.)	12	40	108000	4,320,000
17	Total of Organization & Administrative Costs				108,000	4,320,000
18	3	Insurance Cost				
19	3.1	Buildings Insurance (Equipment, Tools)	12	1	1,000,000	1,000,000
20	3.2	Laborers & Employee Insurance	12	40	20,000	800,000

2 1	Total Insurance Cost				1,020,000	1,800,000
2 2	4	Reserve Budget Costs 5% of the budget (90,000,000) SAR			4,500,000	4,500,000
2 3	Total Estimated Costs		12	1		105,695,000

Two types of revenue in this project are targeted:

1. Fixed Revenue: Rent of services areas (Table 8.2)
2. Variable Revenue: Number of medical services achieved (Table 8.3)

Table 29 Cost Breakdown Structure

Revenue Items	Unit	Price	Annual revenue
Fixed Revenue (Rent)			
Flower and shopping area rent	50	700,000	35,000,000
Restaurants & Coffee–Shop area rent	10	1,100,000	11,000,000
Kids area rent	3	1,200,000	3,600,000
Total Fixed Revenue (Rent)			SAR 49,600,000

Table 30 Fixed Revenue

Visitors Tickets Revenue				
Capacity of visitors	#Numbers of visitors per day	service Price	Total revenue per day	Annual Total services Revenue

Number of visitors (Max capacity)	1000	30	30,000	10,800,000
Number of visitors (Average)	300	30	9,000	3,240,000

Table 31 Variable Revenue

Total revenue (Based on average)	52,840,000
(Mins)Total cost	105,695,000

Payback Period:

Time	Net Cash Flow	Cumulative cash flow
Year 0	105,695,000	105,695,000
Year 1	52,840,000	(52,855,000)
Year2	52,840,000	(15,000)

Table 32 Payback Period

Payback period = $105,690,000 / 52,840,000 = 2$ years

The result it would take 2 years to reach the payback period and the shorter the payback, the more desirable the investment. Conversely, the longer the payback, the less desirable it is.

Net Present Value:

Net Present Value (NPV) is calculated using the formula given below

$$NPV = \sum (CF_n / (1 + i)^n) - \text{Initial Investment}$$

0 = Initial investment (since it is an outflow, the number will be negative) F_t = Net cash inflow for period (t)

K = Required rate of return (nominal)

–	K	Year 0	Year 1	Year 2	Year 3	Total
Required	15%					
Outflows		105,695,000				105,695,000
Inflows			52,840,000	52,840,000	52,840,000	105,680,000
Net inflows			52,840,000	52,840,000	52,840,000	(15,000)
NVP			14,950,615			

Table 33 Net Present Value

The result of NPV is positive (14,950,615) The project meets the minimum required rate.

Calculate Earned Value Management of the project after ending of 20% of its period and completion of 50% of the outputs case-by-case basis:

Earned value is useful to project manager to measure the performance of the progress. It is calculated in relation to total budget and percentage of the project completion.

Time and cost factors of the project are taken into consideration in calculating earned value. Project managers use Earned Value to indicate whether the project is ahead or behind in relation to time and cost allocated.

Earned Value = Percentage complete of the activity $\times$ task budget to calculate the Schedule Variance (SV) we need to use the below formula:

$$SV \text{ (Schedule Variance)} = EV \text{ (Earned Value)} - PV \text{ (Planned Value)}$$

In this Project when we completed 50% into the project & the Budget (105,580,000) SAR. EV (Earned Value) = (Total Project Budget) $\times$ (The Percentage of Work That Should Be Done by Now, Based on Time Elapsed)

$$EV \text{ (Earned Value)} = (105,580,000) \times (50\%) = 52,790 \text{ SAR}$$

The project period is 12 months, and if we completed 50% of outputs during 20% of the period that means $(20\% \times 12 \text{ months}) = 2.4 \text{ months}$.

That means we will have completed 50% of the outputs within 2.4 months. So, the planned progress is 6 months while the actual progress is 2.4 months.

The Schedule Variance (SV): Schedule variance is the difference between the planned progress and the actual progress to date $= (6) - (2.4) = 3.6 \text{ months}$.

Positive results mean we are proceeding according to our schedule.

9.1 Resources

9.1.1 Explain the concept of Resource Leveling and Smoothing.

Resource leveling is a concept in project management that describes the ability to complete a project with restricted resources (Carstens, D. S., & Richardson, G. L.) (2019). It considers the paucity of resources.

When it comes to project execution, resources are crucial, and when resources are scarce, the project manager must be prepared to repurpose or maximize them. We will ensure that resources are easily available and that resource leveling is improved to match the needs of this project.

Resource smoothing, on the other hand, considers the fact that time is a limited resource and that the project must be completed within the time frame set. Project managers must use resource leveling and resource smoothing to complete projects with limited resources and time.

Distributing project resources of equipment and tools.

Resources play a significant role in the project's execution. Raw materials, finance, equipment, and tools, as well as labor resources, are all resources in a project.

EQUIPMENT CHECKOUT FORM

Name: _____

Department: _____

ID #: _____

Email: _____

Date: _____

PO: _____

QTY	Materials	STOCK	CONDITION LEAVING	CONDITION RETURNING

1. You must be a member of the project team and have a valid ID card.
2. By the date specified in the Handbook, the employee agrees to return all equipment stated above in the same condition as when it was issued. If the equipment is lost, stolen, damaged, or not returned by the deadline specified in the Handbook, the project team member account will be charged.
3. When the equipment is returned, it will be assessed for damage and other issues.
4. The signature of a project team member certifies that he has read, comprehended, and agreed to the terms and conditions of this agreement.

SIGNATURE

DATE

DEPARTMENT NAME

PHONE NUMBER

- **Below are some examples of Job Descriptions:**

- ❖ **CEO Job Description.**

Role Overview:

- Develop a clear growth strategy with the Board of Directors, along with a detailed implementation plan.
- Leading the company's short- and long-term strategy formulation.
- Providing strategic, financial, and operational leadership, as well as integrating the company's strategic directions.
- Work closely with the Board of Directors, managing the operation and serving as the primary link between the company's many partners and customers.
- Examine the company's financial, operational, and sales and marketing structures in order to develop a strategy for continuous improvement and increased operational efficiencies.

Requirements:

- 20 years of experience.
- Supply chain Background.
- Business acumen and project management.
- Leadership skills.
- Collaborative.
- Budget control.

❖ Finance Manager Job Description:

Role Overview:

- Prepare the annual budget with the help of all department leaders.
- On various assignments, collaborate with both internal and external auditors to ensure correct compliance and reporting.
- To guarantee that there are no errors in reports, control the cash flow and regulate financial operations inside the organization.

Requirements:

- Bachelor's Degree in finance or related field.
- Minimum 5 Years of experience in a similar role.
- Organization – good organization skills and prioritization ensure that tasks are completed on time.
- Communication skills – working with colleagues, clients, and auditors on a regular basis, ensuring clear communication with a professional demeanor.

❖ HR Manager Job Description:

Role Overview:

- Ensures that the country's HR and management processes comply with local legislation; handles local interactions with foreign authorities
- Is in charge of (proactively) managing labor relations and executing effective local negotiations. This entails managing all relationships, whether directly or indirectly. Staff representatives, safety committees, and union delegations.
- Advising and assisting managers and staff through all areas of the Performance Enhancement process, including cascade objectives, appraisals, compensation planning, relative evaluation, human resources planning (HRP), multi-rater feedback, employee development, and career management..
- Conducts due diligence on possible acquisitions and is in charge of the HR integration and divestment strategy.

Requirements:

- is seasoned HR Manager with strong business acumen who can lead change management projects across the country. He or she has 5 to 7 years of experience in a similar setting.
- on the HR front, and is well-versed in the local HR legislation and requirements to guarantee that business managers are properly counseled on the legal consequences of their business plan.

- To converse over the phone, via email, and in international meetings, the incumbent must have a good level of English proficiency.

❖ **IT Manager Job Description:**

Role Overview:

- Manage IT and computer systems.
- Plan, control, and evaluate IT and electronic data operations.
- Design, develop, implement, and coordinate systems, policies, and procedures.
- Ensure security of data, network access, and backup systems.
- Assist in building relationships with vendors and creating cost-efficient contracts

Requirements:

- Proven working experience with a minimum of 5 years of relevant experience.
- Excellent technical management, data analysis, and computer hardware/software system understanding.
- Practical knowledge of computer networks, network administration, and network installation.
- BS in Computer Engineering, Computer Science, or similar field.

❖ **Planning Manager Jo Description:**

Role Overview:

- Managing the performance of the baseline schedule and the maintenance and control.
- Collecting and interpreting schedule data and providing output to the program and project teams.
- Actual performance is compared to the timetable to identify delays, and early and late completion.
- collaborating with project technical experts to define timetable changes and identify deviations from the initial plan.
- Identifying and assessing the associated scheduling, resource conflicts, and potential cost implications and issues
- Collecting and interpreting schedule data and providing output to the program and project teams.

Requirements:

- A Degree in Engineering.
- Minimum 15+ years post-graduate experience.
- Good knowledge and experience of the project lifecycle for mixed-use projects in respect to planning, cost, and schedule control.

- a thorough understanding of the design process and construction methods.

❖ **Media Manager Job Description:**

Role Overview:

- Localize brand strategy execution to resonate with the city's cultural references.
- Utilize Build and execute partnerships with other brands to drive awareness.
- Activate the brand in different city–relevant customer touchpoints (events, malls, public areas,).
- Understand different attribution models and analyze the different channels for efficient media mix.

Requirements:

- 10+ years of experience building and managing marketing campaigns with a mix of digital, offline and BTL experience.
- Experience in managing teams, people, and agencies.
- Strong written and verbal communication skills in English.

❖ **Project Manager Job Description:**

Role overview:

- Managing relationship with the client and other parties, by acting as the central point of contact.
- Ensuring compliance with the Employers requirements via technical reviews.
- Assisting the client's Project Manager in the preparation of Tender docs, evaluating tender docs, and tender queries.
- Managing the Project Management team.
- planning, executing, monitoring, and closing projects.
- Managing project team members.
- Project budget and schedule estimation and management.
- Providing reports and documentation on project stage and progress.

Requirements:

- A bachelor's degree in Engineering, or a related field.
- Certified PMP status or member of the equivalent institution.
- Possess 7+ years' experience in delivering fully coordinated, multi–disciplinary Project Management and Construction Management projects.
- Worked over 5 years of your experience.

- The ability to converse in technical matters across all disciplines associated with our Project Management and Construction Management projects.

❖ **Operation Manager Job Description:**

Role overview:

- Manage the delivery of Operation management services for PMC programs across the organization, including the management of contractors, provision of O&M PMC services to clients, etc.
- Ensure that program management policies and procedures are developed.
- Ensure that at risk management policies and processes, such as risk identification and mitigation, are followed.

Requirements:

- To be successful in this exciting job, we want you to have at least 15 years of experience and a bachelor's degree in engineering or comparable certification.
- experience in the infrastructure industry and has managed Key projects.
- exhibited a broad understanding of project planning and execution management.
- Organizes and directs all functional managers to guarantee that all project requirements are met.
- Accountable and fully responsible in meeting project objectives and Company directions.

Has overall responsibility for securing the project resources needed to plan and carry out the job.

9.2 Procurement

9.2.1 Develop the procurement execution process, and contractor selection.

According to our corporate policy, the procurement process is divided into four stages, as shown in Figure 22. 1. The procurement process begins with Pre-Requisites, which are most likely ignored until they are submitted by the requester to the procurement department, which will validate the request and either reject or approve it before moving on to the bidding process, which includes several procurement execution sub-processes that must be met before moving on to the awarding process.



Figure 27 Procurement Execution Process Stage

The table below details these four process stages:

Stage	Process Title	Description	Remarks
1	Pre– Requisite:	The requester is currently compiling the tender at this stage (Bid)	
2	Submission Request:	The procurement specialist analyzes the request at this step and validates it under three conditions: i. Rejected & refusal: The request falls short of the minimum standards. ii. Clarification & explanation: requesting additional information or requesting the addition of missing documents. iii. Approve & confirmation: The request complies with the requirements, allowing it to move on to the next step of the procurement bidding process.	The request will include bid documents such as (RFI, RFP, RFQ, etc.)
3	Bidding:	This stage consists of 4 sub–processes: i. Announcement ii. Bid Opining (Technical & Financial Proposal) iii. Evaluation (Technical & Financial proposal) iv. Contractor Selection	Process details are explained as shown below in item no. 22.1.1
4	Awarding:	Our organization has established two sets of criteria for choosing who should be awarded a contract. These two criteria are primarily based on:	

		i. Lowest price and financial capability (financial): the criteria are outlined in bid documents and assessed by the Financial Evaluation Committee ii. Technical evaluation committee evaluates the most economically advantageous tender (technical): the criteria are established in the bid documents and are examined by the Technical Evaluation committee a result, the bid winner will sign the contract and give over the site during this stage, based on the results of the bidding process stage and the selection decision made.	
--	--	---	--

Table 34 Procurement Execution Process Stage Descriptions

Bidding: Because of the sensitivity of these processes, the corporation has managed each and every step of the Procurement Execution Process Stages, in the Bidding (Execution Process), which are comprised of four sub-processes.

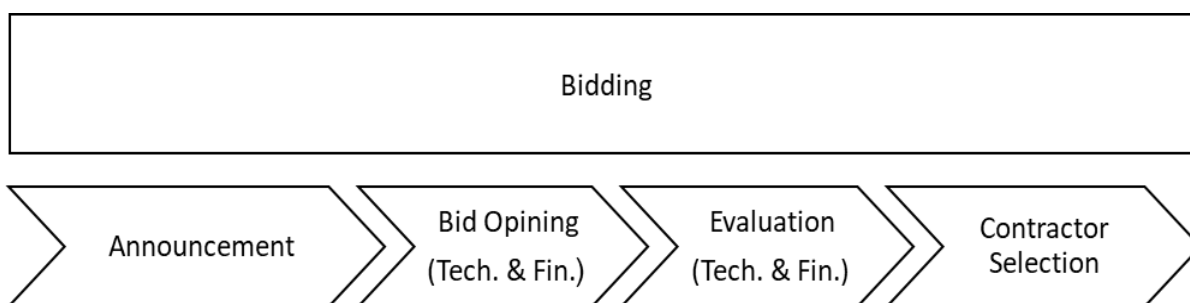


Figure 28 Procurement Bidding Execution Process

Announcement: The procurement department announces the business opportunity through the company portal during this procedure. Only bidders who have been prequalified by the company in terms of technical and financial qualifications are eligible to purchase the bid.

Bid Opening (Technical & Commercial): The procurement department formalized the technical and financial Bid Opening Committee during this process. A Bid Opening Committee will be made up of procurement personnel as well as a rotating membership from other departments and/or members of the organization. A minimum of three (3) people will make up the Bid Opening Committee. Formalize the technical and financial Bid Evaluation Committee immediately.

Evaluation (Technical & Commercial): Members of the Evaluation Committees must have the requisite skills, knowledge, and experience in relation to procurement criteria. Bid Evaluation Committees shall be made up of up to five (5) individuals who have the necessary technical skills to assess specific tenders. Experts in the field may also be used. The Committee's overall membership should be an odd number, with members with expertise in the following areas.

- Technical expertise and understanding are being elevated.
- End user representation.
- Contracting and procurement skills.
- Expertise in financial management or analysis.
- Legal expertise.

Any bidder who does not meet the technical (70%) and financial (75%) requirements, as well as the health and safety program, will be disqualified.

Contractor Selection Criteria: To win the bid based on the technical and financial criteria mentioned in tables 22.2 and 22.3, the bid winner must have the highest technical and financial scores as weighted in below figure 22.3. Then, using the technical and financial scores, determine the ultimate score in the following formula 22.1:

Score = (Technical Score * 60%) + (Financial Score * 40%) (formula 22.1)

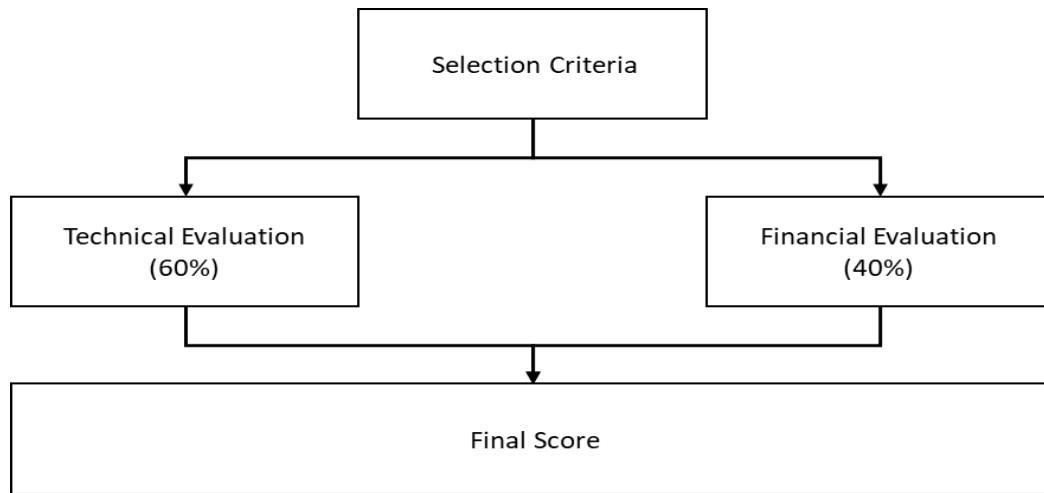


Figure 29 Selection Criteria References and Waiting

Technical Criteria:

Criteria no.	Wight, %	Subject
1	15	Scope Plan
2	5	Construction materials
3	5	contractors Experience and Supply Chain
4	10	Schedule
5	5	Project Organization and Work Plan
6	PASS / FAIL	Health and Safety Program*
7	5	Key Personnel's Resumes
8	15	Quality Program
9	5	List of Standard Specifications
10	10	Miscellaneous Information
11	10	Experience Statement
12	5	Environment Compliance
13	10	Plan for Imports and Materials Management
Total	100	

Table 35 List of Technical Criteria

** If Health and Safety Program fails, the bidder will be rejected.*

Financial Criteria:

Criteria no.*	Wight, %	Subject
1	50	Proposal pricing of the bidder
2	15	Items balancing
3	20	Variation in costs
4	15	Content from the area
Total	100	

Table 36 List of Financial Criteria

** Company Financial Statement must be accepted by the company under the prequalification*

22.3 Scoring Model:

Tender	1 (Company X)	2 (Company Z)
Technical Score		
Financial Score		
Final Score <i>(Technical Score * 60%) + (Financial Score * 40%)</i> *		

Table 37 Scoring Model

** The highest score will win the bid*

9.3 Plan and control

9.3.1 Prepare agenda– Invitation and virtual record of a virtual meeting.

Prepare agenda:

MEETING AGENDA

Date: December 20.2021

Time: 2 p.m.

Location: Conference Room at ESU

Agenda Details:

Goals: rebuild, develop, rehabilitate 50% of total Ministry of Health medical buildings, minimize operational waste by 40% and increase the revenue by 10% within ten years starting from 2023.

1. Review the Saudi vision 2030 and how the Developing eco medical buildings will affect Saudi income in general

Time: 15 minutes

Purpose: Share information

Leader: Mohannad Alfaqeeh, (Team Leader)

2. How we can Developing eco medical buildings companies' revenue?

Time: 30 minutes Purpose: Decision

Leader: Faisal Al Mutairi,

- a. talking about sales numbers in the future.
- b. Identify any trends in sales numbers.
- c. Brainstorm ideas on how to increase Developing eco medical buildings companies' revenue?

3. How can we Increase visitors?

Time: 15 minutes Purpose: Decision

Leader: Ali Hassan Yahia Almalki,

- a. What do we need to prepare for Increase visitors?
- b. Review the attached marketing and materials.

- c. Identify tasks for each team member.
- d. How will we track the effectiveness of this project
- e. Review income goals for the Saudi Eco Medical buildings.

4. End of meeting review

Time: 5 minutes Purpose: Decision

Leader: Mohannad Alfaqeeh, (Team Leader)

- a. What did we do well in this meeting?

b. What should we do differently next meeting?

Project Management	
Riyadh, Saudi Arabia	
April	20.2021
Dears Ministry of Health Representative, National Energy Services Company (TARSHID) Representative, Directorate of Health Affairs in Riyadh Representative, Ministry of Municipal We are writing this letter to inform you of the coming meeting about ECO Medical Center buildings at Riyadh City, <i>Conference Room at ESU on April 20.2022 in the afternoon from 2 pm TO 3 pm. You are hereby invited to attend this meeting.</i> Meeting Agenda: -Review the Saudi vision 2030 and how the Green medical centers buildings will affect Saudi income in general. - How do we can Increase eco medical buildings companies' revenue. - How do we can Increase visitors. Your presence is highly appreciated.	
Team Leader Mohannad Alfaqeeh	Chairman Ahmad Fhaid Almutairi

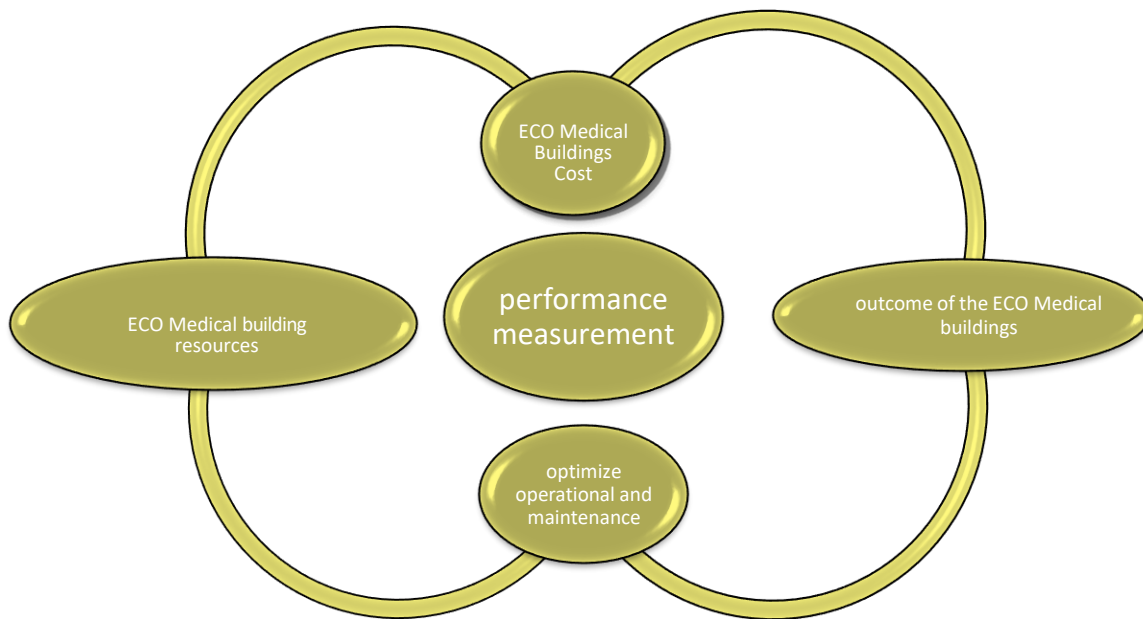


Figure 30 Performance measurement

ECO Medical building cost:

ECO Medical building cost and performance that will provide a simple method for measuring whole building cost and performance that would generate data that could be used to demonstrate the life-cycle benefits of ECO Building design to financial makers. The measurements for the cost and performance impact of water, energy, maintenance, and operations, be compared to similar buildings with more medical typical designs.

ECO Medical resources:

ECO Medical building makers and designers have begun performing studies related to the resources and benefits of sustainable design. The important thing in this stage is the environmental impacts. For example, natural disasters, we must mitigate the devastating impact (as much as possible) on the ECO Medical buildings. so, we must prepare preparedness plans, to aim and dealing with the repercussions of the situation with flexibility commensurate at emergency developments. In addition to immediate intervention to protect and save the ECO Medical buildings during emergency response to disasters.

Optimize operational and maintenance:

ECO Medical building may have been design and construction, it can only remain so if it is operated responsibly and maintained properly. For example, the use of toxic cleaning products can deteriorate indoor air quality and materials; that will be failure to control project points. Sustainable operations and maintenance practices focus primarily on the actions of building occupants, and encompass safety, health and safety, comfort, and productivity, with an understanding of the need for subsequent generations to reuse and recycle building components. and maintenance personnel are part of the project planning and development process, such as by establishing commissioning criteria at the onset of a project.

Outcome of the ECO Medical building:

The sustainable preservation is that guarantees a longer and more productive life for ECO Medical buildings, and it will be better life for their users. By preserving and promoting ECO Medical buildings as a tool for social, economic, and environmental development.

9.3.3 Develop Change Request Model

Change request number	ESU– PMG697– changing working hours at Summer and Winter
Requested by	Mohannad Alfaqeeh
Reason for the request	During winter, the axial tilt is away from the sun. This results in longer nights. Longer nights at winter. (In summer the axial tilt is towards the sun, resulting in longer days.
Impact analysis	distribute working hours at winter only – workers are agreed
Alternative analysis	Working at night during the winter days

Recommendation	as per Saudi Arabia weather at summer, it is so hot, this change request will help workers to work comfortably and is recommended at winter times.
Received by	Dr. Waleed Sulaiman.
Status	Approved
Date of CR status	19 April 2022

Table 38 Change request Model

10.1 Risk and opportunities

10.1.1 Identify Risks (threats) and opportunities and give examples.

RISKS	Examples
Technology risk	Risk of project failure due to a lack of proper information systems, management information systems, and other software.
Communication	Language barrier and a faulty communication mechanism
Inadequate skills	The project team lacked competence and technological know-how
Performance risk	There was no coordination in the project implementation.
Cost risk	High cost of raw material.
Health and safety	risk of disease

Table 39 Risks

OPPORTUNITIES	Examples
Marketing	Available marketing and advertising platforms
Healthcare	High customer base and awareness
Construction	Professional skills
Software development	software and information systems.
Information technology	High investment

Energy	Environmentally friendly energy for construction
--------	--

Table 40 Opportunities

10.1.2 Prepare Risk register.

ID	Risk	Likelihood of the risk occurring	Impact if the risk occurring	Owner	Mitigation
1	Technology risk	medium	medium	Project sponsor	Define scope
2	Communication	medium	high	Project manger	Set communication system
3	Inadequate skills	medium	high	Project sponsor	Hire experts
4	Performance risk	high	medium	Project sponsor	Make plans
5	Cost risk	medium	high	Project sponsor	Budget
6	Health and safety	low	medium	Project sponsor	planning

Table 41 Risk register

10.1.3 Qualitative Risk Analysis

It is the process of assessing the certainty of the risk occurring through prioritizing different risks and predicting the probability of the same risks occurring during project completion.

Risk 1	Technology
Risk 2	Communication
Risk 3	Inadequate skills
Risk 4	Performance risk
Risk 5	Cost risk
Risk 6	Health and safety

Table 42 Risk Analysis

LIKELIHOOD	HIGHLY LIKELY	Risk 2	Risk 5	Risk 6
	LIKELY	Risk 3		Risk 1

	UNLIKELY		Risk 4	
		LOW	MEDIUM	HIGH
		IMPACT		

Table 43 Risks Likelihood

10.1.3 Specify Risk response strategies.

This refers to the strategy we'll use to identify, manage, and mitigate the risks we've identified. Even though the risk will come suddenly and inevitably, mitigation will be critical in reducing the consequences. To mitigate the risks, our organization will implement the following risk response measures.

	Risk Response Strategies
Technology	Ensuring the IT of modern environmentally friendly technology.
Communication	Make a communication strategy.
Inadequate skills	Experts and people with technological knowledge should be hired.
Performance risk	Ensure that resources and people are coordinated.
Cost risk	Make a realistic financial budget.
Health and safety	Provide safety equipment to the project team.

Table 44 Risk Response Strategies

10.2 Stakeholder

10.2.1 Prepare Stakeholder engagement assessment matrix.

This document is crucial because it demonstrates the shareholders' level of commitment to the project's completion. The shareholders' involvement is critical in identifying the gap.

Stakeholders' assessments:

C = CURRENT, D= DESIRED

#	Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
1	Sponsor					

2	PM					
3	Supply chain			D		
4	Competitors	C				
5	Ministry of Health				D	
6	TARSHID				D	
7	Saudi Electricity Com			D		
8	National water Com				D &C	
9	Contractors				C	

Table 45 Stakeholders' assessments