

Field Development Plan for Oil and Gas Reservoirs

Group No.: 5207

Prepared by		
Item No.	Student Name	Academic No.
1	Mariam S. Al-Atawi	2021203837
2	Ahmed Zakria Ali	2021203397
3	Arwa Abdulghafour	2021203396
4	Nada Ahmed Awad	2021203245
5	Fawzia Ayed bin Shahrn	2021201424
6	Faisal Fahad Al-Shamer	2021202834
7	Mohammed A. Al-Ghamdi	2021203393
8	Mohammed H. Al-Otaibi	2021200689

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1. **INTRODUCTION**

Field Development Plans (FDPs) provide the necessary support for field optimization, and include all activities and processes required to optimally develop a field.

In general, development activities and processes involves:

- environmental impact, geophysics, geology, reservoir and production engineering, infrastructure, well design and construction, completion design, surface facilities, economics and risk assessment

In particular, the activities and people involved in the development stage to:

- Define a precise Field Development Plan (FDP) – geologists, geophysicists and reservoir engineers
- Decide the best production/injection well placement and design – drilling engineers, reservoir engineers, geologists
- Select the optimal production facilities required to properly process hydrocarbons before their treatment – production engineers, reservoir engineers, facilities engineers
- Choose the transport options and route to export oil and gas – logistics engineers

The development of an oil and gas field costs millions of dollars and may require long time (5-10 years) to be fully realized. Costs and duration of the development phase depends on the location of the field, the size and complexity of the facilities, and the number of wells needed to achieve the production and economic targets.

A FDP project must consider:

- Objectives of the development
- Petroleum engineering data
- Operating and maintenance objectives
- Description of the engineering facilities
- Cost and manpower estimates
- Project planning budget proposal

Once the field development plan is approved and before the beginning of production, some actions follow:

- Detailed design of the facilities

- Procurement of the materials of construction
- Fabrication of the facilities
- Installation of the facilities
- Commissioning of all plant and equipment

We have assigned Mr. Ahmed Zakria as a project manager and all of his team will be the responsible for the successful completion and final results of this project by submit the required deliverables with time, budget and specifications. **This is the first part of project** and will address on the following subjects/efficiencies of the project:

- 1- Strategy
- 2- Governance, Structure and Process
- 3- Compliance, Standards and Regulations
- 4- Power and Interest
- 5- Culture and Values
- 6- Self-Reflection and Self-Management
- 7- Personal integrity and Reliability
- 8- Luthra Relationship and Engagement
- 9- Leadership
- 10- Teamwork
- 11- Conflict and Crisis
- 12- Resourcefulness
- 13- Negotiation

2. Strategy

The project strategy and objectives usually formulated by project manager, team member and stockholders or clients, and with unclear strategy and objectives many teams are disorganizing during performing their tasks because there is not anyone understand where the project should be a headed. Moreover, if objectives are not explicit, it becomes difficult to clearly define roles and responsibilities. In additional, on of important project strategy is a COMMUNICATION, and do not hide the important role of communications, whether among team members or with stakeholders and customers, and with an effective communication strategy will make the team members clearly understand their responsibility and increase the productivity to successes the project.

2.1 Vision

To be the pioneer consultant and model in performing the best practice for field development plans studies for all world oil and gas reservoirs.

2.2 Mission

- To have SAFE workplace and HEALTH operating environment.
- Perform all activities in a competitive, profitable and responsible way, creating lasting value to all project stakeholders.
- Integrate all surface and sub-surface assets to provide strategic Business Plans.
- To Maintain the Maximum Sustainable Capacity of the production profile for oil and gas for 30 years.
- Maximizing recovery of oil and gas.
- Minimize the operation risk & uncertainty.
- Utilize new state-of-the-art for static and dynamic reservoir models technology and workflow to enhance models.
- Optimize oil and gas reservoir deliverability (Well Placement, Artificial Lift practices (GL/ESP), Jacket/platform location and size, Assets of surface facilities).

2.3 Objectives

SMART goals are meant to address all of your major job responsibilities. When setting a goal, be Specific about what you want to achieve, make it Measurable by defining the metrics, and make it Achievable by knowing how, Realistic means are the goals and objectives easy to deliver, especially if you face problems

or complications, Timely can your project goals and objectives be met within the allocated time frame? Is it a key criterion to meet these deadlines. Often, the target must be relevant; it must align with the company's overall objectives. Finally, everyone can set up targets and goals, but they are unlikely to be reached if they are not realistically timed [1].

The objective of this project is to develop the oil and gas field by constructing new static and dynamic models to perform the following:

- Calculate the Original Oil & Gas in Place (OOIP & OGIO)
- Estimate the Oil & Gas reserve
- Production strategy to achieve the sustainable target rate.
- Develop the oil and gas facilities

2.4 Performance Measurement Indicators

Performance Measurement Indicators (PMI) are metrics that are put in place to track the specific performance of an organization's development based on its strategic plan, and we have many types of PMI such as quantitative, practical, directional, efficiency, operational, ... etc.

Each indicator should pass the test of CREAM methodology as shown below:

CREAM Methodology

Clear: indicators should be precise

Relevant: appropriate to the subject and evaluation

Economic: can be obtained at a reasonable cost

Adequate: the ability to provide sufficient information on performance

Monitorable: easily monitored, and amenable to independent validation

We will use the lead and lag measures to indicate the project performance and quality.

Strategic objectives	Lead measure	Lag Measure
<u>Technical Improvement.</u>		
Commonly this sector is concerned with technical data sources such as oil and gas reserve, number of wells, OOIP and OGIP.		
Improve the technical calculation of OOIP and OGIP	Add one more of methodology/approach to the calculation	Accept the result by increasing 3%
Increase number of wells		Overall volume reduce by 1%
<u>Stakeholders Satisfaction.</u>		
It's obvious that unsatisfied stakeholders will let them look for alternatives (approaching another consultant) to meet their needs		
Maximize stakeholders satisfaction	More account management	Count stakeholders satisfaction score
Decrease stakeholders attrition	Improved stakeholders service	Assess the number of stakeholders
<u>Learning and Development Program.</u>		
The main resources in this project is manpower, it is essential, especially in an environment where technology is changing rapidly, that they grow and learn continuously		
Improve the strategic/technical skills	Service/product cover ratio	Employee performance & satisfaction
Better development Program	Information availability	
<u>Oil and Gas Product Quality.</u>		
Oil and gas production pipeline designs are majorly conditional on their processing system. In the processing of surface facility (onshore and offshore facilities), a difference in crude oil due to of producing sour crude which has H ₂ S, consequently larger sweet oil is left behind. During all the process, oil and gas quality is measured to ensure its product is maintained and does not have H ₂ S.		
Maintain the total crude oil inside the production pipeline	Two production lines are installed in the process	Oil production should be more than 1 million barrels per day
Measure of how sour oil is (H ₂ S)	H ₂ S measures is installed on the inshore and offshore workplace	H ₂ s measurement is around 1-3

Table 1: Performance Measurements Indicators

2.5 Project Charter

Project Name	Field Development Plan for Oil & Gas Reservoirs
Project Description	Field Development Plans (FDPs) provide the necessary support for field optimization, and include all activities and processes required to optimally develop a field. In general, development activities and processes involves: * environmental impact, geophysics, geology, reservoir and production engineering, infrastructure, well design and construction, completion design, surface facilities, economics and risk assessment * Define a precise Field Development Plan (FDP) – geologists, geophysicists and reservoir engineers * Decide the best production/injection well placement and design – drilling engineers, reservoir engineers, geologists
Project Objective	To develop the oil and gas field by constructing new static and dynamic models to perform the following: * Calculate the Original Oil & Gas in Place (OOIP & OGIO) * Estimate the Oil & Gas reserve * Production strategy to achieve the sustainable target rate. * Develop the oil and gas facilities
Project Successful	When the deliverables meet the stakeholders requirements and with high quality, with respect to the project schedule and within project budget.
Project Participants	Project Sponsor, Project Manager, Team members
Project Resources	* 10 advanced computer machines, * 2,000,000 \$ * Organization premises * Manpower (experts and fresh graduate)
Project Constraints	* Operational cost * Oil and gas prices * Time * Quality
Project Risk	* Oil spill * Flaring * Pipe leaking
Project start and End	1/1/2022 - 31/12/2022

Table 2: Project charter

3. Governance, Structure and Process

3.1 Project Team and Units Organizational Structure

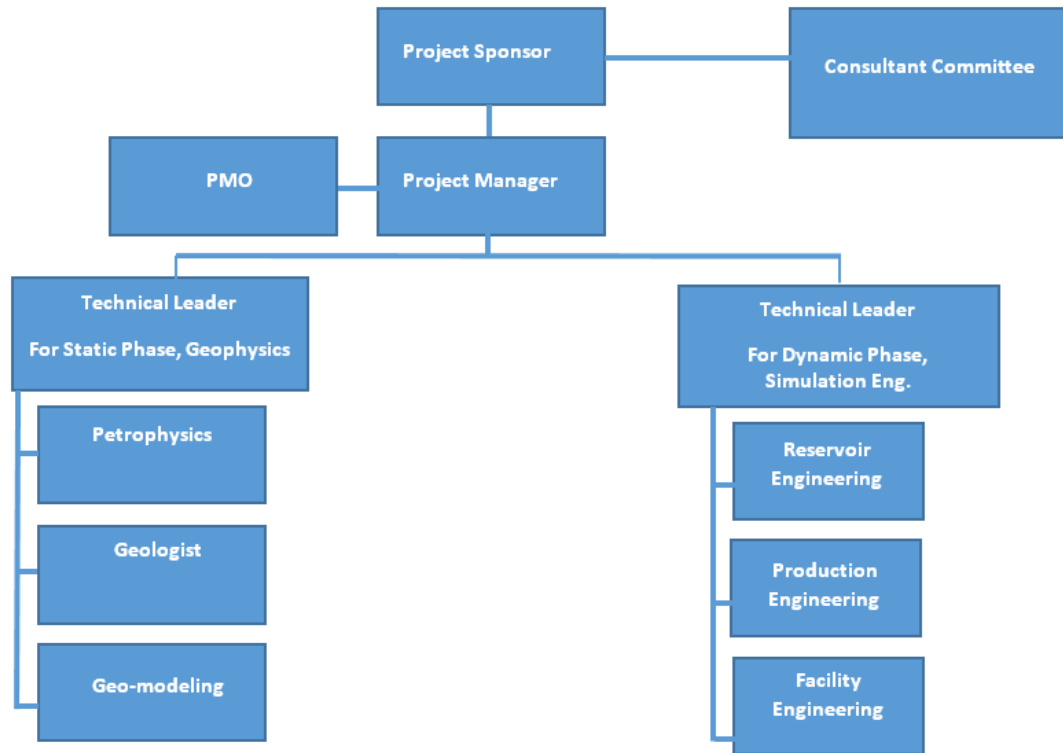


Figure 1: Project Organization

3.2 Practical and Scientific Bases for Developing the Structure

Organization design is a major factor determining an organization's performance and how the people work together in these organizations. In the paper, we argue that designing organizations should be scientific-based and forward-looking. This raises challenges in designing organizations in contexts and situations that are new and have not been seen before. Collaborative communities, new ventures, agile organizations, and temporary organizations are examples; experimentation permits us explore and examine what is and what might be and to examine the organizational design problem and perform experiments to understand the relationship between structure and coordination mechanisms of information, communications, decisions, trust, and incentives. The most important formalization tool of organization is as followings:

1. Organizational structure charter
2. Organization guide

Organizational structure's six elements are the 6 building blocks that managers must use in developing and structure organizational hierarchy. Elements of organizational structure are:

- (1) design jobs,
- (2) departmentalization,
- (3) establish reporting relationships,
- (4) distribute authority,
- (5) coordinating activities, and
- (6) differentiating among positions

3.3 Project Management Office (PMO) Model

PMOs may take other functions beyond standards and methodology and participate in strategic project management either as a facilitator or actively as owner of the Portfolio Management process. Tasks may include monitoring and reporting on active projects and portfolios (following up project until completion), and reporting progress to top management for strategic decisions on what projects to continue or cancel. The degree of control and influence that PMOs have on projects depend on the type of PMO structure within the enterprise; it can be:

- **Supportive**, with a consultative role.
- **Controlling**, does everything that a Supportive PMO does and more
- **Directive**, by taking control and managing the projects. It has a very degree of control or full control over the project.

We select the Directive Project Management Office for this project , because of it helps in achieving a high level of consistency across the projects because of the single authority and reporting structure. The extra reasons to select this type are:

- It Introduce effective repeatable project management processes and
- provide common supporting tools.
- It has a High level or full control over projects.
- To manage numerous projects
- To coordinate resources involving various departments
- Reliable and up-to-date information is what you require for making decisions

- Your projects are happening in a variety of departments, but are interdependent and possibly have an international setup
- You need their ability to make decisions quickly because you are working in a dynamic environment
- Your reporting requirements are constantly growing because increasingly more people want more specific information
- Project expenses are becoming a more critical issue
- Coaching and training
- You need to determine the projects' priorities and strategic contribution and take these into account

4 Compliance, Structure and Regulations

4.1 Compliance Model for the project delivers

Description	Accepted	Rejected	Completeness	Remarks
Check the technical assessment for the seismic	✓	-	Done	
Make sure the SOW following the organization rolls	✓	-	Done	
Check petrophysical properties distribution	-	✓	Done	Need to apply another methodology
Prepare weekly highlights and report	✓	-	Done	
Prepare the monthly presentation	✓	-	Done	
Submit the final deliverables of each approve milestone tasks	✓	-	Done	
Check the pressure match	✓	-	In progress	Need further work
Check the water match	-	✓	In progress	Need for more efforts to match it
Check the gas match	✓	-	Done	
Check the oil match	✓	-	In progress	Need further work
Check the rock properties match	✓	-	Done	
Check the volumetric calculation for the original oil and gas in place	✓	-	In progress	Need to provide reports
Check the reserves estimation	-	✓	In progress	Need to provide justification of new numbers
Check the design standard of surface facilities	✓	-	Done	

Table 3: Compliance Model

4.2 Check List Model for Three Project Stages (Start – Plan – Achieve – Close)

Phase 1: Starting	Timeline	Status	Remarks
Static Phase	1/2/2022	Done	
Dynamic Phase	1/1/2023	In progress	
Integrated Phase	1/7/2023	In Progress	
Phase 2: Planning	Timeline	Status	
Static Phase	1/3/2022	Done	
Dynamic Phase	1/3/2023	Done	
Integrated Phase	1/8/2023	In Progress	
Phase 3: Achieving	Timeline	Status	
Static Phase	1/9/2022	Done	
Dynamic Phase	1/8/2023	In Progress	
Integrated Phase	1/11/2023	In Progress	
Phase 4: Closing	Timeline	Status	
Static Phase	1/1/2023	Done	
Dynamic Phase	1/10/2023	In progress	
Integrated Phase	1/12/2023	In Progress	

Table 4: Check List Model for Three Project Stages (Start – Plan – Achieve – Close)

5 Power and Interest

5.1 Stakeholder Register and Stakeholder Management Plan

Stakeholder Register & Management Plan											
Project Manager : Ahmed Zakaria								Project Phase :			
Sr.	Name	Title	Role	Category	Power	Interested	Influence	Expectations	Communication Channels	Contacts Info/ Email & Mobile Number	
1	EXPOG	Owner	Sopnsor	External	H	H	H	Approve and cover the costs of the project	Video conference	114428888	EXPOG@gmail.com
2	Ahmed	Project Manager	Supervision	Internal	H	H	H	Complete the project on time within budget and agree delivery	Face-to-Face meeting	114206666	Ahmed@gmail.com
3	Mariam	Geophysic	Team Member	Internal	L	H	L	Do the requested tasks	Email	114206655	Mariam@gmail.com
4	Arwa	Petrophysics	Team Member	External	M	L	L	Do the requested tasks and prepare the weekly report	Email	114206644	Arwa@gmail.com
5	Nada	Geologist	Technical Expert	Internal	M	L	H	Mointoring and controing all activities on the Static phase	Face-to-Face meeting	114206633	Nada@gmail.com
6	Fawzia	Geomodeling	Team Member	External	L	H	L	Do the requested tasks	Email	114206622	Fawzia@gmail.com
7	Faisal	Reservoir Engineer	Team Member	Internal	L	L	L	Do the requested tasks	Email	114206611	Faisal@gmail.com
8	Mohammed	Simulation Engineer	Technical Expert	Internal	M	H	H	Mointoring and controing all activities on the Dynamic phase	Face-to-Face meeting	114206600	Mohammed@gmail.com
9	Abdullah	Production Engineer	Team Member	External	L	L	L	Do the requested tasks	Face-to-Face meeting	114206601	Abdullah@gmail.com
10	Abdulaziz	Facility Engineer	Technical Expert	Internal	L	H	H	Do the requested tasks	Video conference	114206602	Abdulaziz@gmail.com

Table 5: Stakeholder register and Management Plan

5.2 Stakeholder Power Matrix (Two Networks)

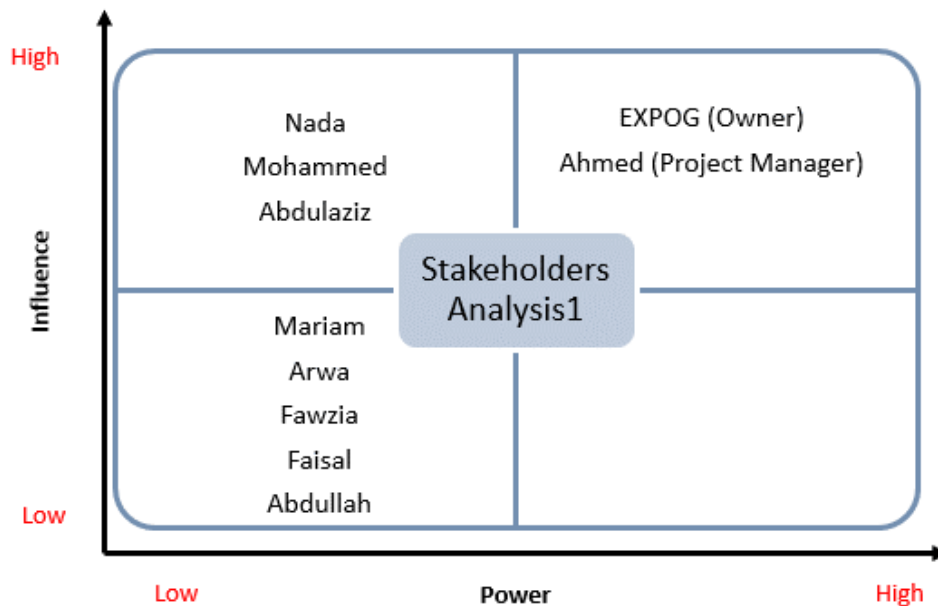


Figure 2: Power-Influence

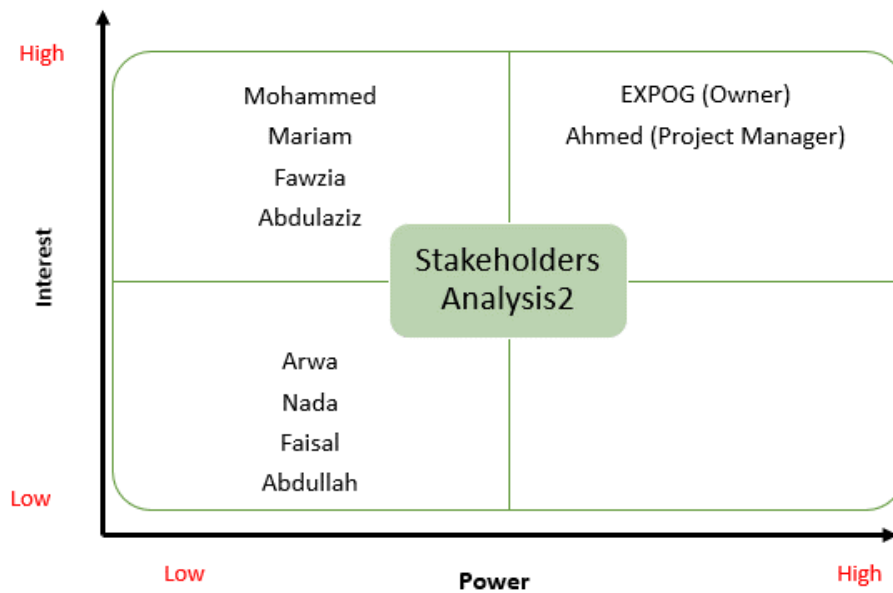


Figure 3: Power-Interest

5.3 To use the logical diagrams for the register of the stakeholder

No.	Name	Title	Aware?	Power	Supportive?	Interest
1	EXPOG	Owner	Aware	H	Supportive	H
2	Ahmed	Project Manager	Aware	H	Supportive	H
3	Mariam	Geophysic	No	L	Neutral	H
4	Arwa	Petrophysics	Aware	L	Supportive	H
5	Nada	Geologist	Aware	L	Neutral	H
6	Fawzia	Geomodeling	Aware	L	Supportive	H
7	Faisal	Reservoir Engineer	No	L	Neutral	L
8	Mohammed	Simulation Engineer	Aware	H	Neutral	L
9	Abdullah	Production Engineer	Somehow	L	Supportive	H
10	Abdulaziz	Facility Engineer	Somehow	L	Supportive	L

Table 6: Logical diagram for the register of the stakeholder

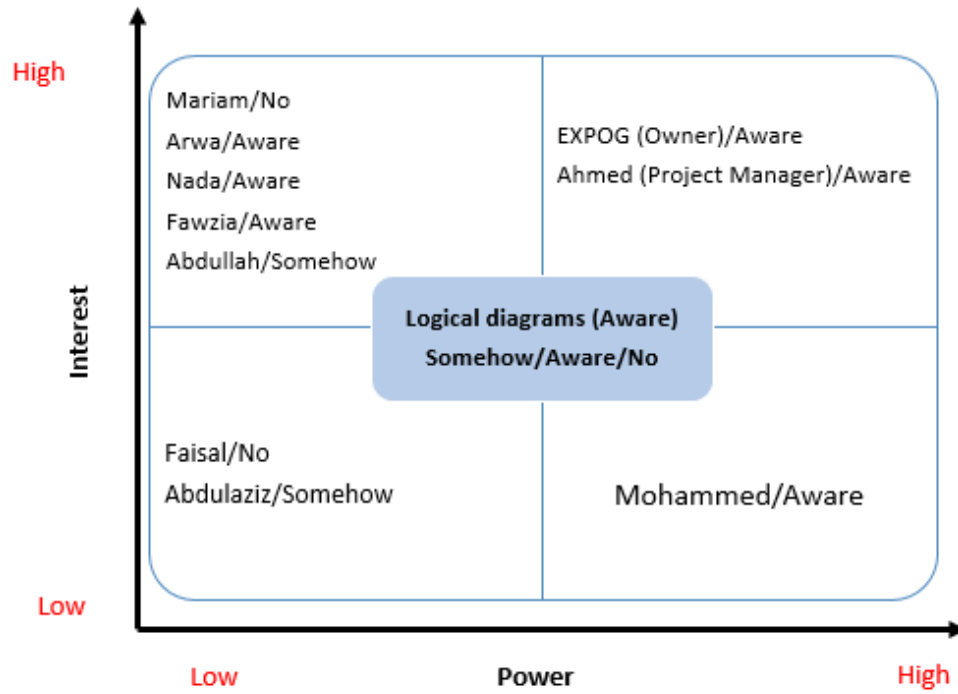


Figure 4: Power-Interest (Aware)

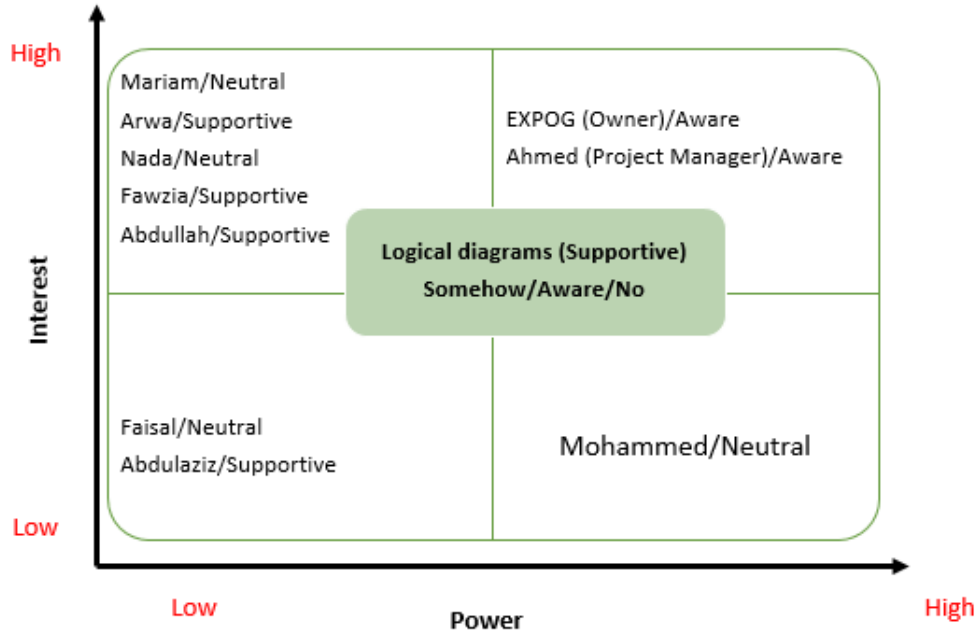


Figure 5: Power-Interest (Supportive)

6 Culture and Values

6.1 Organization Culture

Organizational culture is the way that guide to business success. It is the combination of expectations, values and practices that direct and inform the actions of all team member. Therefore, a great organizational culture leads to improving the performance of the team member. As a result of that, the goals and targets of the organization can be easily achieved.

Professionals in the international oil and gas business are naturally endowed with a range of human emotions and now have their roots in an increasing diversity of cultures. Therefore, the interaction between social groups and proper management of human emotions must be continually optimized in an industry dominated by formidable technical challenges that relies on a multicultural workforce to solve those challenges. The impact of cultural diversity on business efficiency is certainly not new to this business, but has steeply intensified due to globalization. The increase in energy demand and unequal access to reserves has led to a situation where International Oil Companies (IOCs) struggle for access to hydrocarbon reserves, controlled by National Oil Companies (NOCs). As a result, energy negotiations and relation management now involve stakes higher than ever before. Consequently, any flaw in effective communication between stakeholders may have an adverse impact on the outcome of the business cooperation-causing loss of future business value.

6.2 Proposals of the organization Values That Can Be Adopted

These are the values that we share and must apply in all our actions, decisions and directions which we expect to judge ourselves and be judged by others.



1- Citizenship. It is an intrinsic value and sense of belonging. It is a bonding that keeps us together, helps us understand each other and allows us to work together for a single cause.



2- Innovation. It is Vital to drive growth and constantly improve everything that we do. It is an idea, sparks of brilliance that gives us the agility to change, take calculated risks and grow by learning from our past successes.



3- Teamwork. It is a quality that enables individuals to streamline their efforts towards fulfilling a larger responsibility. It is a trait that establishes cooperation, understanding and efficiency to complete a task effectively.



4- Accountability. It is a characteristic that ensures that we live by the highest standards in everything that we say or do. We communicate openly and invite. Provide and respect challenging views.



5- Integrity. We believe integrity is not a conditional word. It is an inner image of ourself, that reminds us that we must always do what is right for the organization even if nobody knows who did it. Integrity is not a search for rewards but an asset that defines our character

7 Self-Reflection and Self-Management

It is known that there are crucial components if were available, certainty, the project will success. These elements are: cost, quality, and scope.

7.1 Personal Behaviors influence on the Project

Team member's behaviors is considered one of the leading factors affecting the success in all mentioned elements.

We can mention some of the bad behaviors that could affect the project negatively such as: poor time management, dependent personality and losing temper.

7.2 Reasons and how to Solve the personal behaviors influence on the Project

Poor time management can lead into lateness in delivering the outputs. It can be solved through planning and categorization of the tasks. While dependent personality can cause stress on other team members and poor distribution of work tasks among the team it can be solved by engaging and educate the concerned team member about the good practices of communication and benefits of good team spirit. Finally losing temper can lead to unhealthy conflicts in the project and it can be solved by embracing the emotional intelligence practices.

7.3 SWOT Analysis

To be able to help organizations and project managers to identify and analyze their projects on different scales such internal and external strategic factors, we use the SWOT Analysis matrix that consist of Strengths – Weaknesses – Opportunities – Threats.

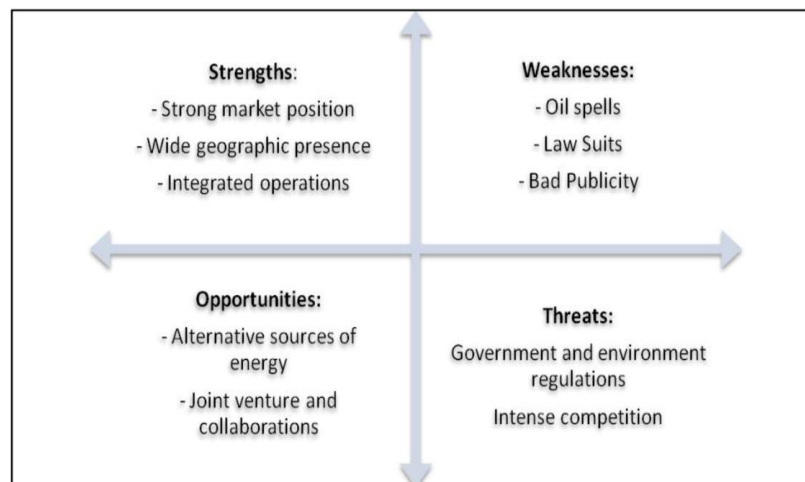


Figure 6: SWOT analyses

8 Personal Integrity and Reliability

8.1 Behaviors contradict the moral integrity

Many managers might see ethics and integrity as personal traits that do not affect the project and it solely affect the person himself and although it's a debatable topic but as per Harvard Business Review, ethics and integrity has everything to do with management. We can give examples such as trustworthiness, respectfulness and honesty, and responsibility. Each one can have different impacts either financially, socially and technically.

Trustworthiness is a very crucial trait and if we lack that we can introduce our project to risks like the spread of classified information and the person with that trait will not find it easy to establish communications and build relationships amongst the team.

8.2 To analyze the financial, social, and technical influence, if any, of such behaviors on the works of the project and the relationships

Respectfulness and honesty can be seen as your trade mark either for the project itself or yourself and once we lack that trait, we are risking the reputation of the organization and opportunities for getting projects. Responsibility is a major integrity trait and can help the project in cases of mistakes where the person can take the responsibility and find the solution to solve the problem instead of throwing it on others. Lacking such a trait can lead to many conflicts and lateness in delivering the outputs also the quality of the project can be compromised.

9 Personal Communication, Relationship and Engagement

Communication is a critical factor in project management. There are instances where projects have failed because of miscommunication and communication gaps. Project managers fill this gap by devising a good communication mechanism that will help him to communicate with the team members as well as stakeholders, sponsors, top-tier management and all the people who are connected to the project.

9.1 The Stakeholder Register

Stakeholder Register									
Project Manager :		Ahmed Zakaria							
Sr.	Name	Title	Role	Category	Power	Interested	Influence	Contacts Info/ Email & Mobile Number	
1	EXPOG	Owner	Sopnsor	External	H	H	H	114428888	EXPOG@gmail.com
2	Ahmed	Project Manager	Supervision	Internal	H	H	H	114206666	Ahmed@gmail.com
3	Mariam	Geophysic	Team Member	Internal	L	H	L	114206655	Mariam@gmail.com
4	Arwa	Petrophysics	Team Member	External	M	L	L	114206644	Arwa@gmail.com
5	Nada	Geologist	Technical Expert	Internal	M	L	H	114206633	Nada@gmail.com
6	Fawzia	Geomodeling	Team Member	External	L	H	L	114206622	Fawzia@gmail.com
7	Faisal	Reservoir Engineer	Team Member	Internal	L	L	L	114206611	Faisal@gmail.com
8	Mohammed	Simulation Engineer	Technical Expert	Internal	M	H	H	114206600	Mohammed@gmail.com
9	Abdullah	Production Engineer	Team Member	External	L	L	L	114206601	Abdullah@gmail.com
10	Abdulaziz	Facility Engineer	Technical Expert	Internal	L	H	H	114206602	Abdulaziz@gmail.com

Table 7: Stakeholder register

9.2 Personal and Effective Communication

If an effective communication methodology is not followed by the project manager, it may lead to many discrepancies and ultimately may also lead to project failure, which is not appropriate for the organization. It is also important that the right information is delivered to the right person. For instance, the information that is intended for stakeholders may not be appropriate or beneficial for the project team members and similarly team member's information may not be useful for top level management officials or stakeholders. Effective Communication is defined as the ability to transfer the information to another person effectually and proficiently. therefore, The interaction model of communication describes communication as a two-way process in which participants alternate positions as sender and receiver and

generate meaning by sending and receiving feedback. A communication strategy should be conceived at the project planning stages, so the key is its influence on the success of the project.

Projects that come with a lot of communication problems often lead to frustration, delays, and conflict within the workplace. This is the reason why using effective communication methods is very important for the success of the project. Without effective communication methods, it will be very difficult for the project to even move forward as the lack of methods will result in the misunderstanding of the project goals and even conflict among the stakeholders. Project managers have the responsibility to properly channelize the communication process so that the right persons receive the right information

Effective communication in the workplace is imperative in a leadership role and a good communication is what separates a poor leader from an exceptional one, having effective communication skills is the key to good leadership as well. When you communicate well with your team, it helps eliminate misunderstandings and can encourage a healthy and peaceful work environment. Efficient and open communication with your team will also let you get work done quickly and professionally. The moment you get the lines of communication open with your team, the process of carrying out tasks and projects will most likely go by smoothly. Plus, you will be surprised how meeting targets will become a whole lot easier.

9.3 Shapes, Model and Channels of the Personal Communication

Given the organisational and geographical diversity of project teams, it is important to consider all methods of communication. The main communication types in project management are verbal, non-verbal, writing, visual, and listening. These types transform into efficient project communication methods: emails, instant messages, meetings, voice and video calls. Today's enhanced technology allows us to communicate easily where ever the team members may be. Communication methods can either be active or passive.

ACTIVE communication methods being those used to communicate in the here and now, for example: (face to face meetings, video conference, meeting – one on one, or group, Telephone conference, or voice only web conference, Webinars, becoming increasingly popular for the delivery of presentation based activities, telephone – good old fashioned call and stand up presentations). **PASSIVE communication methods** would be those which recipients can adopt in their own time, for example: (pod cast, web cast, email, intranet bulletin boards, blogs, website, project newsletter – paper based and table top presentation).

Always ensure that a mix of active and passive methods of communication is used to complement each

other. This should be considered as part of the overall project management communication strategy.

Write	• Company official letters • Minutes of meetings • Posters • Reports • Notes	• Emails • Instant messaging/texting • Fax
Verbal	• Presentations	• Conversations • Phone call • Video Meeting
	Formal	Informal

9.4 Communication Matrix

Communication	Purpose	Medium	Frequency	Audience	Owner	Deliverable
Kickoff Meeting	Introduce project review objectives and goals	In person / Face-to-face	Once	Project team Project owner Stakeholders	Project manager	Agenda
Project Team Meetings	Review status of project	Face-to-face / conference call	Daily	Project team	Project manager	Agenda Project plan
Weekly Project Status Meetings	Update leadership on project status	Face-to-face / conference call	Weekly	Project manager Stakeholders	Project manager	Slide presentation Project plan
Project Status Reports	Detailed report on project status including progress, costs, and problems	Email	Weekly and <u>Monthly</u>	Project manager Stakeholders (except vendor and customer)	Project manager	Project status report Project plan

Table 8: Communication Matrix

9.5 Wrong Scenarios of Communication

No business runs perfectly but the way people communicate and work through problems 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, bad communication can begin to cripple an organization and have a negative impact on the entire staff. Learning to detect poor communication habits and replace them with healthy ones will have a positive effect on productivity and even financial success.

- Scenario 1: Floundering.

We've all had to deal with those people who seem to just ramble on endlessly without a point - those people who appear to be talking simply because they like the sound of their own voices When

you do decide to speak up, make sure that you're prepared to be clear and concise. That's the mark of a skilled communicator.

- **Scenario 2: Constantly interrupting.**

If you are one of those people who tend to jump in and interrupt or -- even worse -- try to complete people's sentences for them, you need to keep yourself in check

- **Scenario 3: Using filler words.**

"Hey, Jason. Umm ... I'm just checking in on that, uh... report to see if you think you'll, like, have that done by the end of the day."

9.6 Stakeholder Assessment Matrix

Stakeholder Assessment Matrix											
Project Manager :			Ahmed Zakaria								
Sr.	Name	Title	Role	Category	Power	Impact	Influence	Contacts Info/ Email & Mobile Number		How could the stakeholder contribute to the project	Strategy for engaging the stakeholder
1	EXPOG	Owner	Sopnsor	External	H	H	H	114428888	EXPOG@gmail.com	Providing support and approve whenever needed	Weekly meetings and emails that include detailed report on the project status
2	Ahmed	Project Manager	Supervision	Internal	H	H	H	114206666	Ahmed@gmail.com	Complete the project on time within budget and agree delivery	Daily meetings
3	Mariam	Geophysic	Team Member	Internal	L	H	L	114206655	Mariam@gmail.com	Do the requested tasks	Weekly meetings and emails
4	Arwa	Petrophysics	Team Member	External	M	L	L	114206644	Arwa@gmail.com	Do the requested tasks and prepare the weekly report	Weekly meetings and emails that include detailed report on the project status
5	Nada	Geologist	Technical Expert	Internal	M	L	H	114206633	Nada@gmail.com	Mointoring and controing all activities on the Static phase	Every week emails
6	Fawzia	Geomodeling	Team Member	External	L	H	L	114206622	Fawzia@gmail.com	Do the requested tasks	Weekly meetings
7	Faisal	Reservoir Engineer	Team Member	Internal	L	L	L	114206611	Faisal@gmail.com	Providing feedback for the final product if any	By emails whenever needed
8	Mohammed	Simulation Engineer	Technical Expert	Internal	M	H	H	114206600	Mohammed@gmail.com	Mointoring and controing all activities on the Dynamic phase	Daily meetings and emails
9	Abdullah	Production Engineer	Team Member	External	L	L	L	114206601	Abdullah@gmail.com	Do the routine work	Daily meetings and emails
10	Abdulaziz	Facility Engineer	Technical Expert	Internal	L	H	H	114206602	Abdulaziz@gmail.com	Do the requested tasks	Daily meetings and emails

Table 9: Stakeholder Assessment Matrix

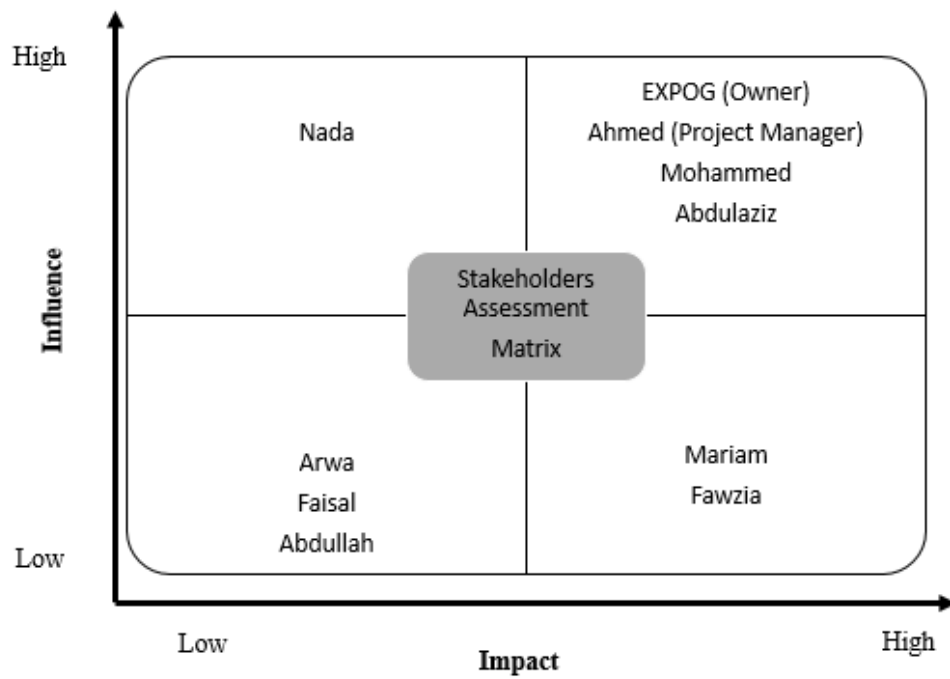


Figure 7: Stakeholder Assessment Matrix

10. Leadership

Leadership is the process of leading subordinates and team members to a successful outcome along with sharpening their skills. A leader uses his skills to support their subordinate's through inspiration, motivation, clear objectives to prevent any confusion, communication. The other main role of a leader is setting and achieving goals. Solving problems is one of the main characters originate in a leader.

Leadership is essential in any project. A project consists of many blocks and milestones which requires a leader to be able to break-down those blocks into smaller tasks for others to be able to understand and work on to be easily tracked, followed-up and submitted. Leadership skills are required to be able to submit a project. The role of the leader to steer his/ her team in order to achieve the main goals and outcomes. Nevertheless, a leader should also train the subordinates to become future leaders. Coaching and lead by example also with the other skills can sharpen young future leaders to lead in upcoming projects, lead companies, etc. ... One of the main leader responsibilities is to develop new leaders without the fear of losing his place. People view a coaching leader as one of the best leaders as he/ she are developing newer generations on how to lead.

Luthra (2015) explained the effective leadership and its connection with communication. Luthra also explained that an effective managers skills are accomplished by an effective leadership and pointed out that in older studies statistics showed that 70 to 90 percent of manager's time is spent with communications. He concluded that communicating is the most important skill required to have an effective leader which is reflected to an effective manager [2]. Verma (2015) paper included a systematic review of all available research on the importance of communication related to leadership. Verma came to a conclusion that good communication skills lead to better leaders, also pointed out in his study that the lack of research in the communication from a corporate and leadership perspective [3]. Arsovski and Nikezic (2012) explained leadership communications and quality along with the definition. Arsovski and Nikezic described the role of the leader towards their work and other leaders and how the quality of the communication plays an important role [4].

10.1 Leadership Model/Style

The suitable leadership Model for effective communication skill on my organization will be defined as **Affiliative Leadership (Emotional Leadership)**. To build the employee trust and increase employee morale, the project leader has to have a good communication and by this style of leadership, the communication will be more efficient and effective. It is Good for teams in need of a morale boost (team

need to repair). This leadership style puts people first and is used to resolve any conflict or tension that may have caused a breakdown in relationships. When used correctly and the negative emotional influence has been resolved, the Affiliative leadership style will naturally lead to other leadership styles.

10.2 Resons for selecting Affiliative Leadership Model/Style

- This style Emphasizes connection, harmony, and conflict resolution.
- The emotional needs of both the individual and the team are put first.
- It is Good for teams in need of a morale boost (team need to repair).
- Creates effective teams.
- It Increase employee morale.
- It Builds employee trust.
- It Provides guidance during crises.
- It Resolves conflicts more efficiently.
- It Reduces workplace stress.
- It is one of many styles of leadership that positively impacts employees.

10.3 Motivation Method

Motivation is something that moves the person to action, and continues him in the course of action already initiated. Motivation refers to the process by which a person's efforts are energized, directed, and sustained toward attaining a goal. The Motivation has three key elements: (1) The energy element is a measure of intensity or drive where the quality of the effort is considered along with its intensity. (2) High levels of effort lead to favorable job performance when the effort is directed toward, and consistent with, organizational goals. Finally, motivation includes (3) A persistence dimension where employees keep putting forth effort to achieve those goals.

Motivation is important because it allows you as a leader to meet and even exceed your own organizational goals

Individuals differ in motivational drive and their overall motivation varies from situation to situation and this five methods of the motivation:

- 1- Recognition and Celebrate milestones and achievements
- 2- upgrade or give promotion
- 3- give Bonus/Extra month salary
- 4- Development program of training
- 5- Give responsibility and Create a comfortable and inspiring workspace.

11 Teamwork

A team is an organized group of people who work together to achieve a common goal, they are committed to work together to complete a well-defined work. The tasks and activities of the project are assigned to all team members by the RACI matrix. It stands for: Responsibility, Accountability, Consult, and Informed. Table10 shows the RACI Matrix Model for Tasks/Activities with three administrative measures of the project:

- 1- Static phase,
- 2- Dynamic Phase
- 3- Integrated Phase

	Task/Activity	Sinor/Top Management Team		Geologist Modeling Team				Simulation Modeling Team		
		Project Sponsor/Owner	Project Manager	Geophysic	Petrophysics	Geologist	Geomodeling	Reservoir Engineer	Simulation Engineer	Production Engineer
Static Phase	Seismic Interpretation	I	R	A	C	C	I	I	I	I
	Petrophysic Interpretation	I	R	C	A	I	C	C	I	I
	Geology Study and Geomechanic	I	R	I	C	A	C	I	I	I
	Static Modelling	A	R	C	I	C	A	C	I	I
Dynamic Phase	Reservoir Engineering Analysis	I	R	I	I	I	C	A	C	C
	Upscaling & Upgridding	I	R	I	C	I	I	C	A	I
	Initialization	I	R	I	I	I	C	C	A	C
	History Matching	I	R	I	C	C	C	I	A	C
	Well Production Model	I	R, C	I	I	I	C	I	C	A
	Forecast Scenarios	A	R, C	I	I	I	I	C	A	C
Integrated Phase	Integrated Surface & Subsurface Models	A	R, C	I	I	I	I	C	A	C

R	Responsible	Who do the work to complete the task
A	Accountable	Final approving authority, ultimately answerable for the correct and accountability for completion the deliverable or task
C	Consulted	Those whose opinions are sought, typically subject-matter experts;
I	Informed	Those who are kept up-to-date on progress, often only on completion of the task or deliverable

Table 10: RACI Matrix Model for Tasks/Activities

12 Conflict and Crisis

12.1 Defining conflict and crisis

The concept of conflict and crisis has been identified in management literature by several environmental characters. both phenomena impact the organization negatively but to varying degrees. Crises are mainly associated with disasters and hazards that ruthlessly escolars and managers in practice as one of the endemic phenomena which every organization is bound to experience and respond to at any stage of its life circle as a result of its constant interaction and interdependence with the environment. However, the processes of formation of conflict and crisis differ significantly. While conflict may arise from personality differences and goal incompatibility, crises occur as a result of both natural and human action. Those crises occur mainly as a result of managerial errors arising from leadership and decision-making approaches of decision-makers. Consider that both conflict and crisis phenomena are an indispensable part of human interaction an ate the functionality of the organization if an urgent response is not taken to mitigate it, while this goes; conflict in itself is not complete such a dangerous phenomenon in its entirety as managers and scholars superficially perceive it to be. It is like a coin with two sides, where one face represents success and the second face represents failure. The functional aspect impacts the organization positively while the dysfunctional aspect leaves the organization with negative and destructive impacts just like a crisis. Therefore, we conclude that both conflict and crisis are inherent phenomena among people and the environments and of course cannot be eradicated but can only be managed through the adoption of approach context-fit strategies. Figure 8 shows the Life cycle of a conflict during the project

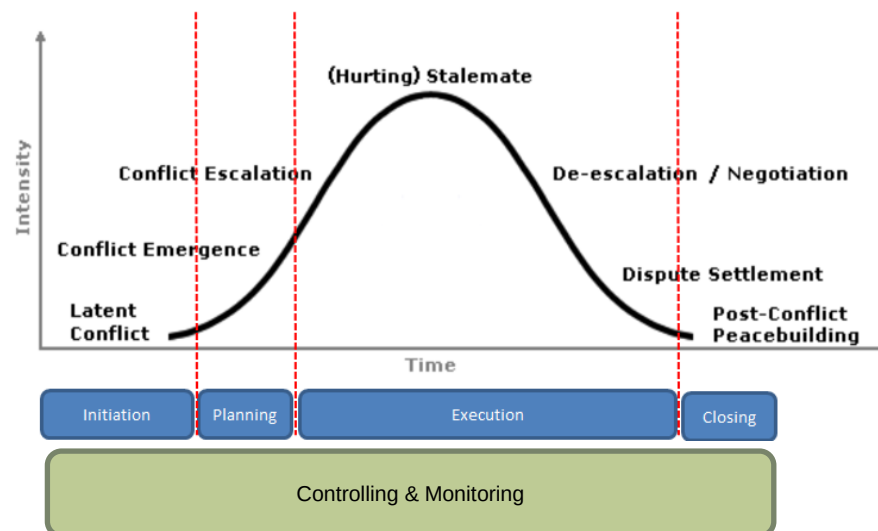


Figure 8: Life cycle of a conflict during the project

12.2 The expected scenarios for conflict in the project

Scenario 1: Supply Chain Crisis.

In every project: There is always great competition between the suppliers of the project, and often one supplier is preferred over another due to the personal relationships between the influential in the organization, the supplier chain, which in the future may cause a crisis in the project if one of the influential changes or leaves his position.

Scenario 2: Sectional conflict within the project.

Departments are often managed by managers who may be older than the current project manager, and some conflicts occur between the current departments with the new project manager, often for personal reasons or for other motives such as embarrassing the project manager in front of the organization for their interests in the organization

Scenario 3: Confidentiality of information and the difficulty of disclosing it.

In this project specifically, the information is considered a treasure that cannot be easily disclosed, and this will put a large number of complications in the lack of transparency among the members of one team and the ease of spreading rumors among team members, and more precisely, the difficulty of employment in these sensitive places, which are located on the political borders of countries Others may create a crisis in the project

12.3 Perfect Strategies for Dealing with Conflict

Understanding how you respond to conflicts and crises as well as having increased awareness of other management styles may help how you typically approach specific situations and lead to efficient and effective conflict resolution. There are several styles or strategies organizational leaders could adopt in dealing with conflict and crises such as escape strategy, cooperation strategy, confrontation strategy, containment strategy, proactive strategy, and reactive strategy. Each strategy has its own benefits. Knowing when and how to use each style of strategy can help control conflict and crisis during this project and lead to an improved working environment, resulting in a better bottom line. Different people use different methods to resolve conflict, and most people have one or more natural, preferred conflict resolution strategies that they use regularly. It is possible to scientifically measure an individual's inclinations toward specific conflict resolution strategies. In this project, we will discuss the different strategies of conflict resolution from the Thomas-Kilmann model.

The Thomas-Kilmann Model identifies five different approaches/strategies to resolving conflict. These approaches

include:

1. Avoiding

Someone who uses a strategy of "avoiding" mostly tries to ignore or sidestep the conflict, hoping it will resolve itself or dissipate.

2. Accommodating

Using the strategy of "accommodating" to resolve conflict essentially involves taking steps to satisfy the other party's concerns or demands at the expense of your own needs or desires.

3. Compromising

The strategy of "compromising" involves finding an acceptable resolution that will partly, but not entirely, satisfy the concerns of all parties involved.

4. Competing

Someone who uses the conflict resolution strategy of "competing" tries to satisfy their own desires at the expense of the other parties involved.

5. Collaborating

Using "collaborating" involves finding a solution that entirely satisfies the concerns of all involved parties. Figure 9 illustrates the Strategies of Conflict management by Thomas & Kilman.

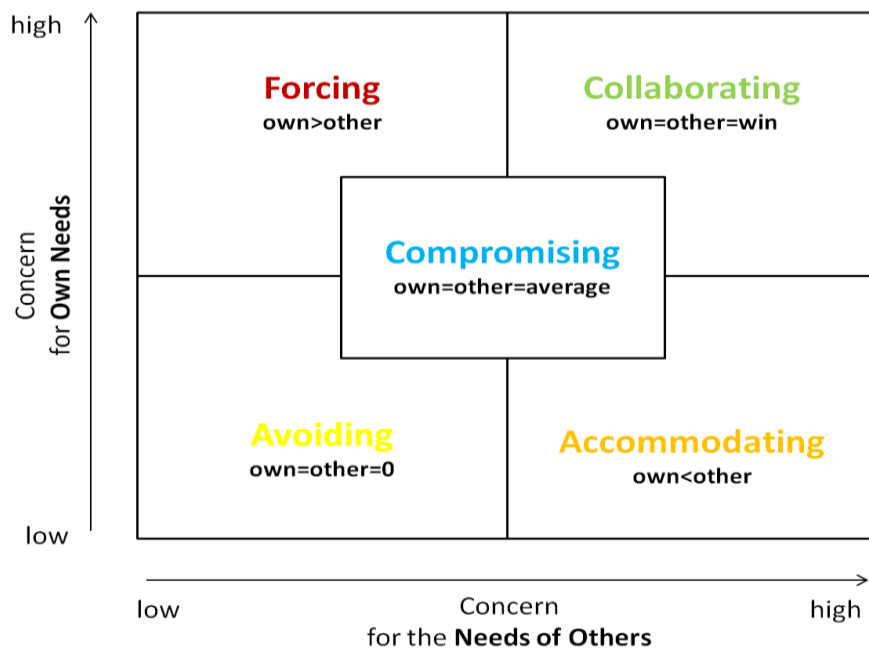


Figure 9: Strategies of Conflict management

In the face of conflict and crisis, the choice of management approach should mainly be guided by its type, level, and phase since conflict and crisis are endemic factors, managers should regularly carry out both internal and external diagnoses as a means of identifying early warning signs of disruptive conflicts and natural crisis's incubation period and possible manifestation time to provide adequate proactive and

reactive strategies to handle it ahead of time.

It is important to understand the root cause of an individual's or group's unhappiness. For example, a person in a team may seem to be struggling with an unmanageable workload, but they may be resentful of another employee who appears to have less work to do. It may also be a result of organizational changes, restructuring, or promotions given to other staff. To help you manage workplace conflict, look at the relationship between the employee and their manager, and their peers for signs of conflict and feelings which may influence them.

12.4 Root Cause Analysis:

Root cause analysis (RCA) is the process of discovering the root causes of problems in order to identify appropriate solutions. The analysis answers when, how, and why a problem occurred in the first place and implements an effective solution to ensure the problem doesn't happen again. Sometimes, the RCA process highlights other areas of improvement in the organization and provides an opportunity to eliminate future problems. There is not one single way to perform root cause analysis successfully. Instead, it encourages creative and critical thinking to discover all possible causes that led to the original problem. Many problem-solving tools and strategies can be used in the process. Figure 10 shows **The Process of the Root Cause Analysis.**

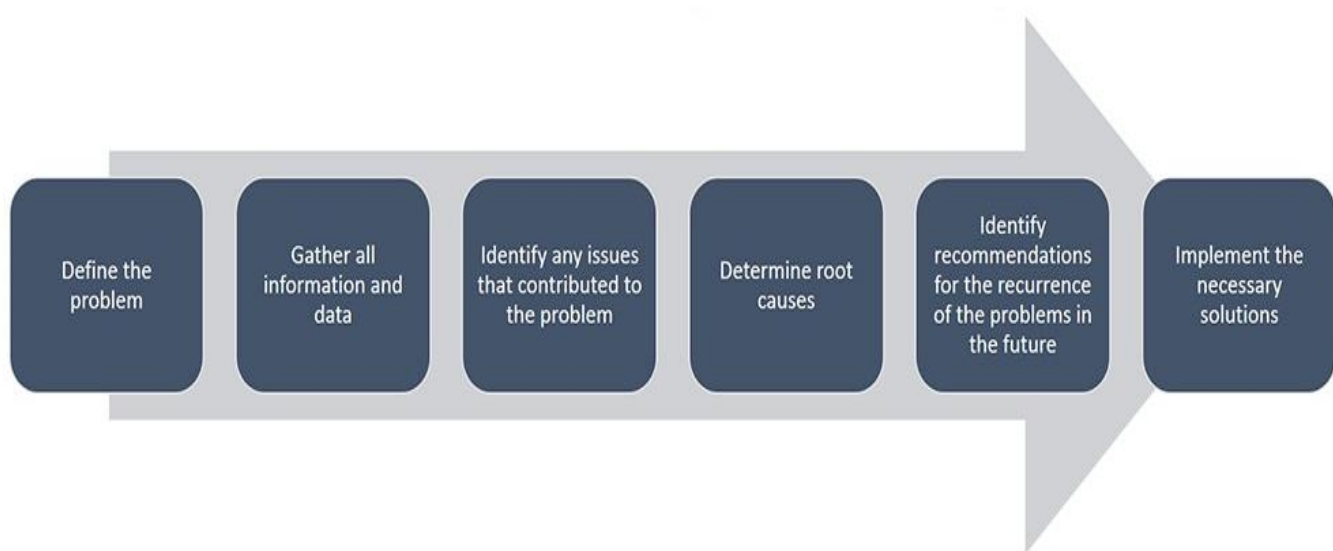


Figure 10: The Process of the Root Cause Analysis

Below are two common RCA tools used to identify causal relationships:

1. The 5 Whys

The 5 Whys method is a technique used to quickly determine the origin of a problem. The approach begins with a problem and asks why after every answer. As the name implies, why is asked five times in order to underlie the root causes of the problem.

The following demonstrates a 5 Why analysis example for one of the main problems and crises that we have in reality during the production and refinery operations which is hydrogen-induced cracking and we have to create a strategy for detecting the reasons for this cracking during the design of the project (Integrated Surface & Subsurface Models).

Problem: Refinery had to shut down plant operations.

- Why? Toxic fluid leaked into the plant from a pipe.
- Why? Corrosion under insulation created a hole in the pipe.
- Why? It had gone untreated for a significant amount of time.
- Why? Operators didn't know about the damage.
- Why? Operator/inspection personnel didn't perform routine inspections.

From this example, one can see that there are several areas of opportunity for improvement. If “why” was only asked twice, the solution would focus on corrosion under insulation. However, further questioning reveals that the true cause was a lack of routine inspections. The 5 Whys approach is a powerful tool that should be done by asking multiple questions to identify multiple root causes.

2. Fishbone Diagram

We will be using the fishbone diagram to analyze the root cause is for hydrogen-induced cracking.

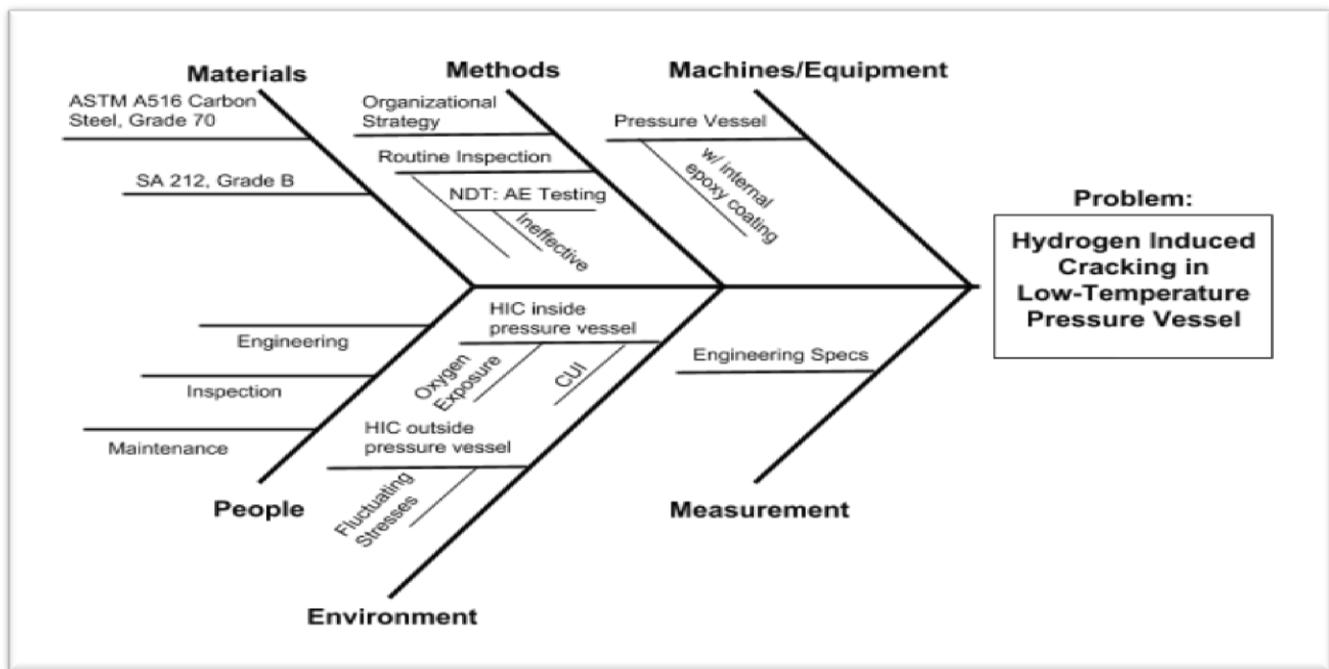


Figure 11: Fishbone diagram

Based on the 5 Whys analysis and the fishbone diagram, one can see that one major root cause was unplanned routine inspections. The fishbone diagram also illustrates that the nondestructive testing (NDT) method used was ineffective. Further investigation determined that advanced ultrasonic testing methods (e.g., phase array ultrasonic testing or time of flight diffraction) would be more reliable methods for detecting and characterizing corrosion. Thus, the solution to the corrosion problem would be develop routine inspection intervals for the pressure vessel and provide training to personnel to set-up and operate advanced NDT methods.

13 Resourcefulness

13.1 Distribution The Human Resources on The Functions

Human Resources play a key role in helping companies deal with a fast-changing business environment and a greater demand for quality employees. The essential qualities of a project environment are openness and acceptance. Junior, Middle, Senior, team members of all qualifications should never feel uncomfortable to speak their minds and providing their feedback on one or multiple aspects of a project, however controversial they are.

Professionals that feel free to express their points of view will always be more proactive, engaged, and creative. More importantly, an open working environment will allow you to identify some implicit assumptions held by the team that could, eventually, have an adverse effect on the quality of the work. It is also essential to stimulate colleagues to really hear each other's opinions. We are commonly conditioned to speak more than we listen. This aspect of the human condition should be slowly taken apart by instigating your team to engage in critical thinking and recognize a good idea when it's being forwarded by anyone in the group, despite their rank or qualifications. To do this, people need to be aware of the so-called "authority bias," which often makes people accept someone's opinions simply based on their status and not the arguments provided. You, as the project manager, as responsible for enforcing an accepting attitude towards all opinions. On the following table will shows the Distribution the Human Resources on The Functions of the project.

Item No.	Name	Role on the project	Contact Information	
			Phone No.	Email
1	EXPOG	Sponsor/Owner	114428888	EXPOG@gmail.com
2	Ahmed	Project Manager	114206666	Ahmed@gmail.com
3	Mariam	Geophysics	114206655	Mariam@gmail.com
4	Arwa	Petrophysics	114206644	Arwa@gmail.com
5	Nada	Geologist	114206633	Nada@gmail.com
6	Fawzia	Geomodeling	114206622	Fawzia@gmail.com
7	Faisal	Reservoir Engineer	114206611	Faisal@gmail.com
8	Mohammed	Simulation Engineer	114206600	Mohammed@gmail.com
9	Abdullah	Production Engineer	114206601	Abdullah@gmail.com
10	Abdulaziz	Facility Engineer	114206602	Abdulaziz@gmail.com

Table 11: Distribution The Human Resources on The Functions

13.2 Representation of The Schedule After Applying Crashing and Fast-tracking

Schedule compression offers two important techniques for scheduling time so projects are executed on schedule. Understanding these techniques and their application in compressing schedules can be very useful, whether in professional or personal spheres. Schedule compression refers to techniques used when a project manager wants to shorten the duration of the project without changing the scope of the project. It can be used when a project falls behind schedule and needs to catch up or to finish the project sooner than originally scheduled.

The two techniques you can use to shorten the project duration while maintaining the project scope are fast-tracking and crashing. Tables 12 and 13 illustrate the Representation of The Schedule After Applying Crashing and Fast-tracking, respectively.

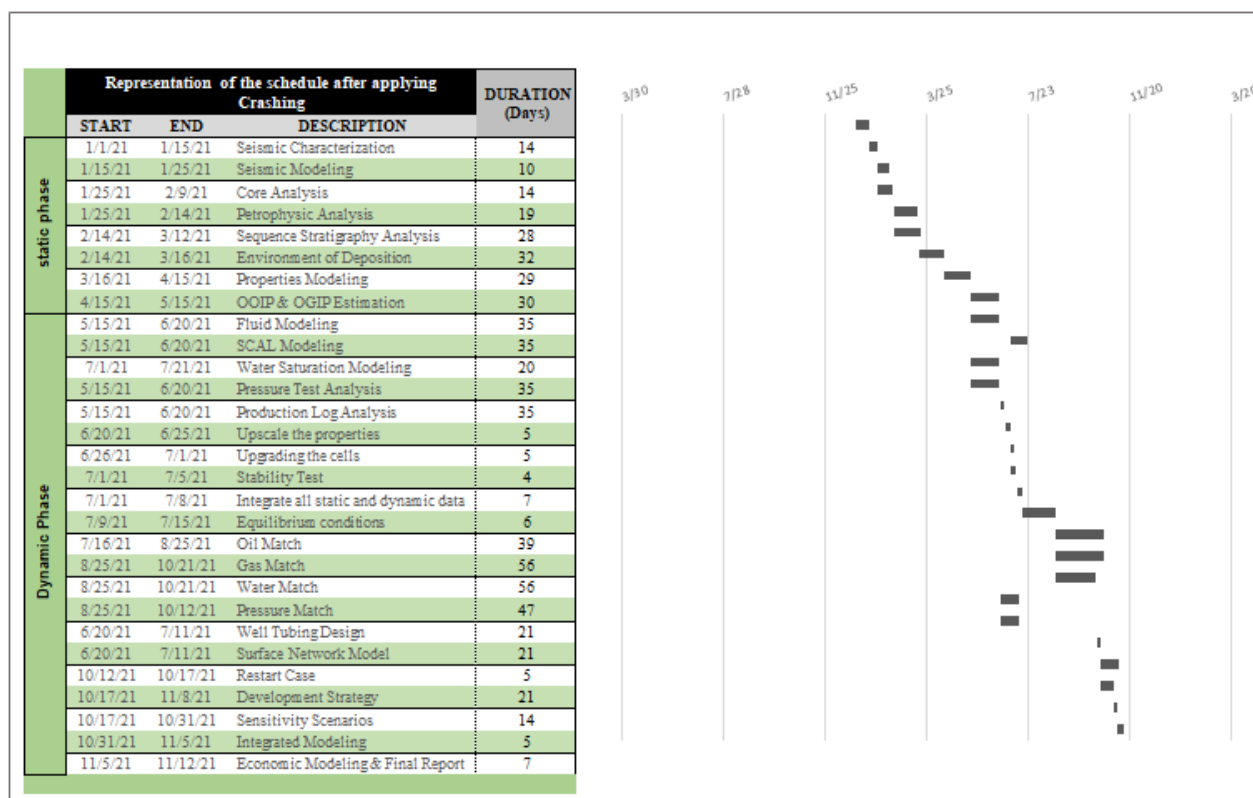


Table 12: Representation of the schedule after applying Crashing

What is Crashing?

Crashing is the technique to use when fast tracking has not saved enough time on the project schedule. With this technique, resources are added to the project for the least cost possible. Cost and schedule tradeoffs are analyzed to determine how to obtain the greatest amount of compression for the least incremental cost. And crashing is expensive because more resources are added to the project.

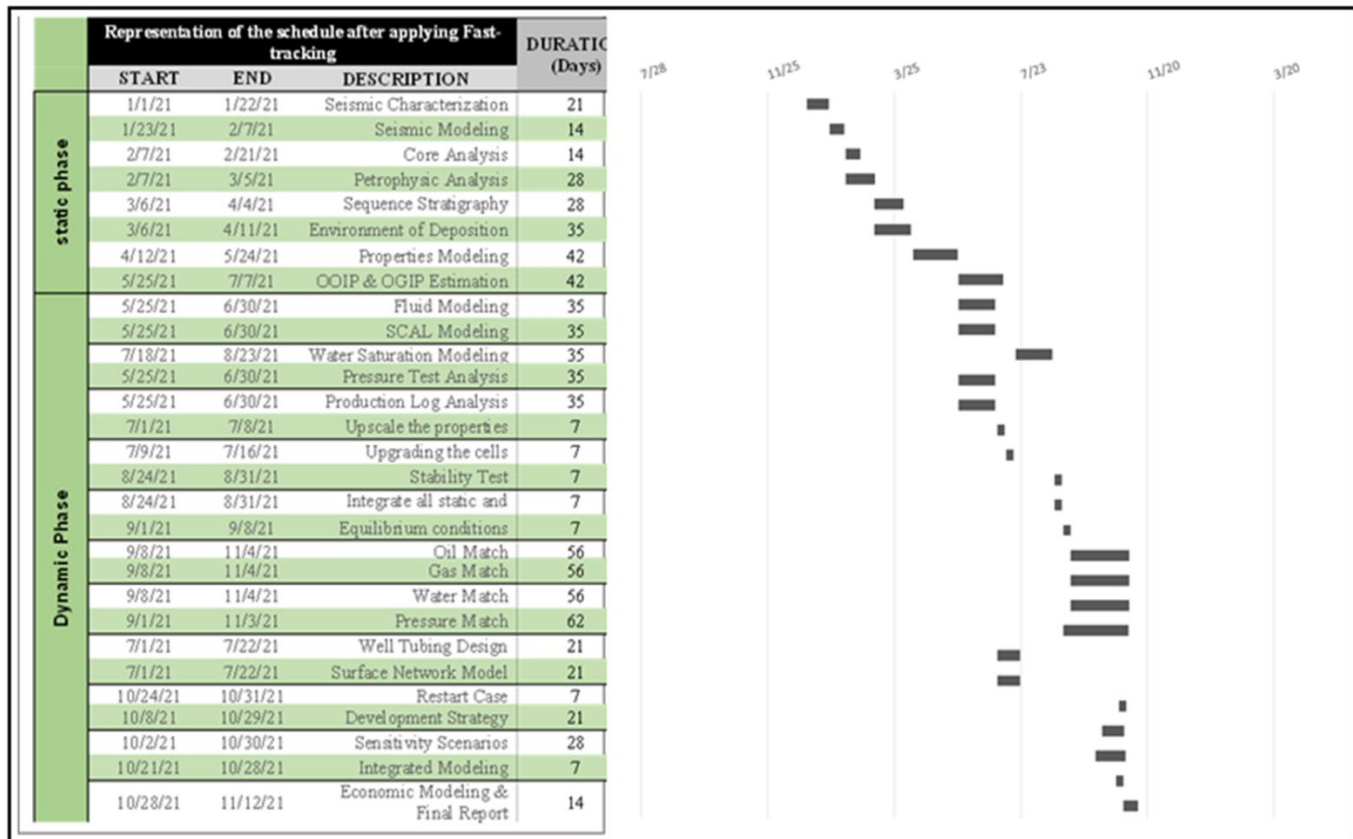


Table 13: Representation of the schedule after applying Fast-Tracking

What is Fast Tracking?

Fast-tracking is a technique where activities that would have been performed sequentially using the original schedule are performed in parallel. In other words, fast tracking a project means the activities are worked on simultaneously instead of waiting for each piece to be completed separately. But fast tracking can only be applied if the activities in question can actually be overlapped.

When you need to compress a schedule, you should consider this technique first, because fast tracking usually does not involve any costs. This technique simply rearranges the activities in the original schedule.

Although fast tracking may not result in an increase in the cost, it leads to an increase in the risk, because activities now being performed in parallel may lead to needing to rework or rearrange the project. And, reworking the project can cause the project to lose even more time. As a project manager, you'll have to weigh the pros and cons of fast tracking to understand whether it will be worthwhile to undertake increased risk.

14 Negotiation

Each negotiation is going to be different, no matter how often we've addressed similar situations. We will naturally be negotiating with people who have different styles, goals, and objectives. These people will be coming from different circumstances and have different standards. So, always take stock and gauge which negotiation skills each negotiation will demand from you and your team.

"In good deal making, 90% of the real negotiation happens before you sit down to negotiate"

"Effective negotiation is 90% attitude and 10% technique"

14.1 GENERAL RULES FOR THE NEGOTIATION

Despite how fundamental negotiation is to achieving our goals, the ability to negotiate successfully is not innate. Becoming a master negotiator involves understanding the primary approaches to negotiation, uncovering the psychological basis behind successful negotiations, and developing an effective negotiation style. These skills become even more important when encountering other experienced negotiators. Here are the 10 rules to make those negotiations successful during the life cycle of this project.

1. Make sure there is a bargaining zone
2. Power = information + alternatives
3. Know the objectives of the other side
4. Be willing to enter a deal, be willing to walk away, and be perceived as both
5. Make the time. Don't show you are in a rush
6. Give up "wants," take "needs"
7. Be on their side
8. Avoid and diffuse ego, righteousness, saving face, and rhetoric
9. Nothing is ever really off the table (and never say never...)
10. Is this an ongoing relationship?

14.2 Two Seniors of Negotiations Plans

Negotiation is not only a matter of changing the other part's makes. It is a complex process that relies basically on strategic approach.

Many strategic techniques can be applied to facilitate the process such as counterparts rethinking, scope

rethinking and trying to find relations between multiple deals.

Counterparts rethinking where we need to take into consideration that we should always look for the obvious parts. Like when the seller is looking for the buyer. Instead, we should understand the whole process that might consider a lot of parties like competitors, customers and suppliers.

Then scope rethinking where we need to focus and give attention that fundamental scope of any deal is not a given constant fact. Plus, we need to think positively and understand that there are different and many opportunities that if we seized to change the scope might eventually achieve great benefits. Finally, the links between the customers and by that we mean that we need to understand and focus on future negotiations as we usually do with the current value.

Figure 12 and 13 show the negotiation plan for offer and contract.

Negotiation Plan 1:

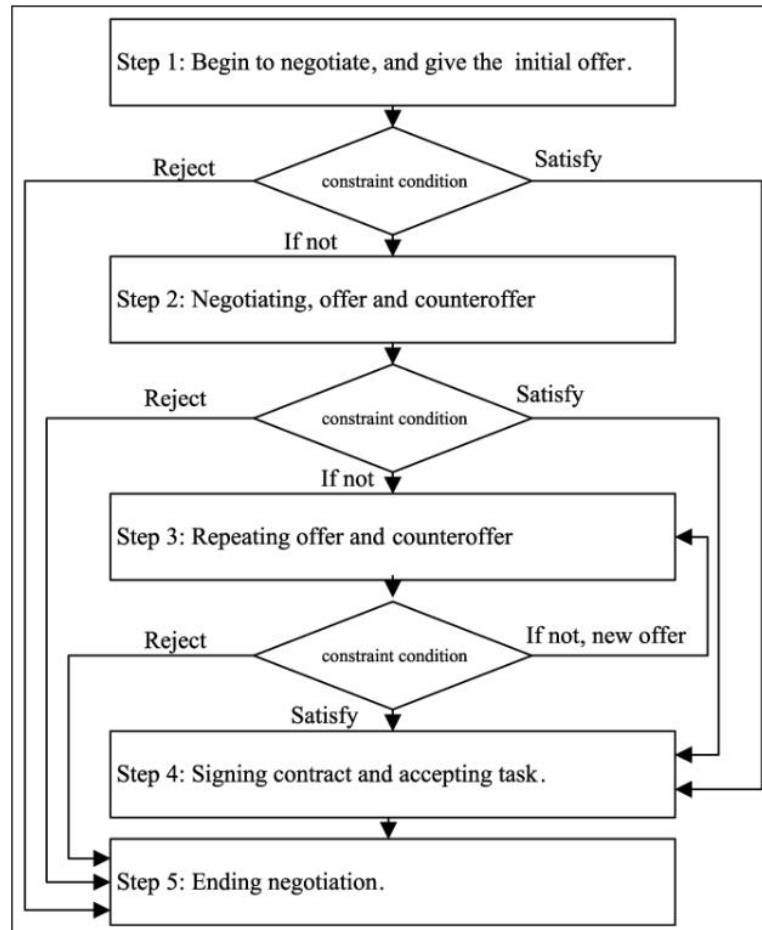


Figure 12: Negotiation plan 1

Negotiation Plan 2:

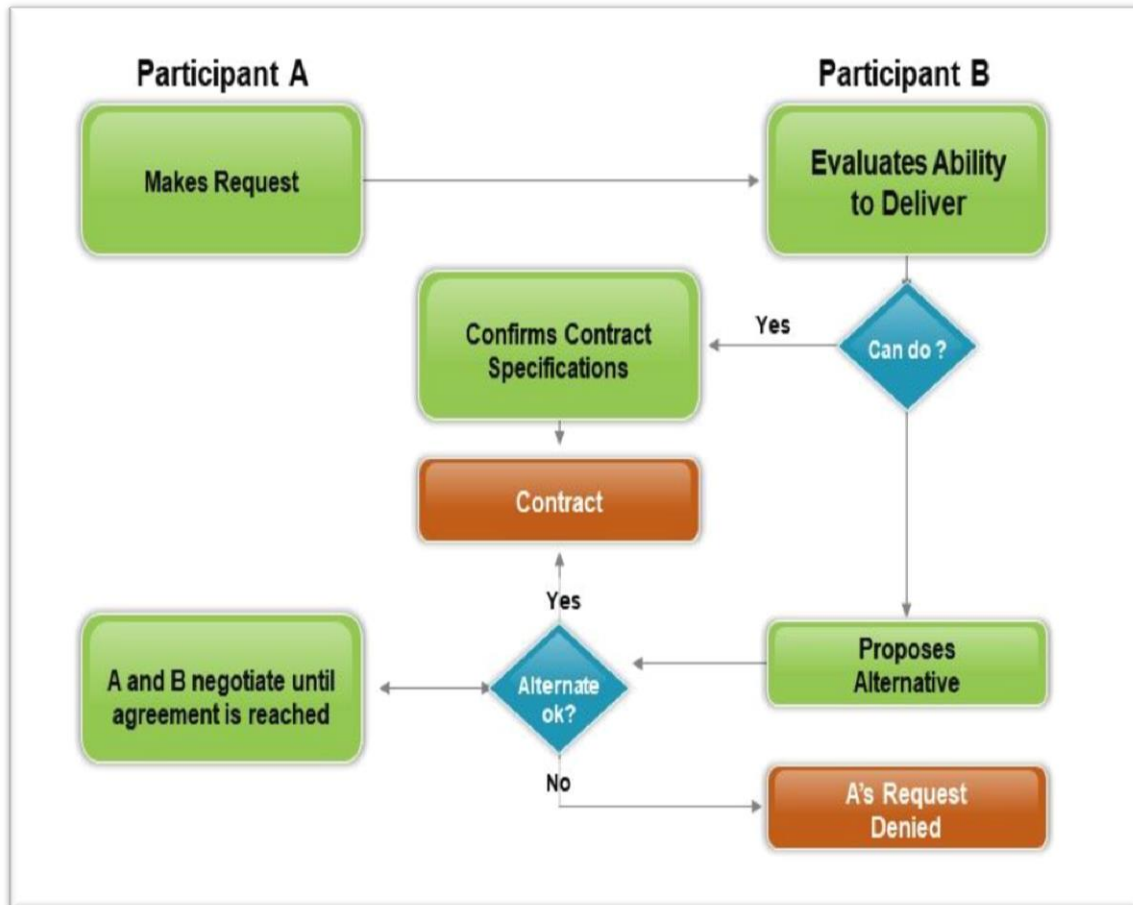


Figure 13: Contract Negotiation plan 2

15 Project Design

15.1 Triple Constraint of the Project

Project management triangle or also called a Triple Constraint can be described as a graphic triangle to illustrate the relationship between three primary forces in a project as shown in Figure 14. **Time** is the available time to deliver the project, **Cost** represents the amount of money or resources available and **Scope** represent the tools and techniques that enable the project team to forecast, anticipate and organize their work to meet these constraints and **Quality** (output of time, cost and scope) represents the fit to the purpose that the project must achieve to be a success.

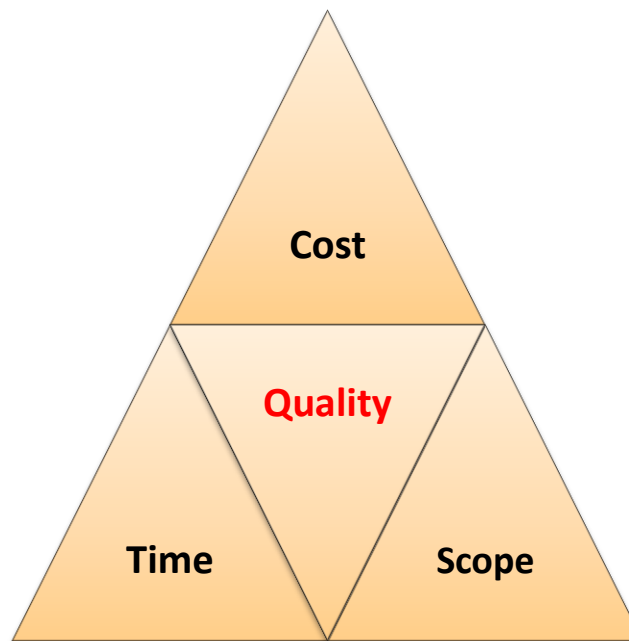


Figure 14: Triple Constraint of the Project

Cost Management

Cost refers to the amount of spending the clients (Oil and Gas Company) and contractors will have to produce in the duration course of the project. Cost effects the overall production as the client and contractors will have a different aim in cost management. The client's aim is to have the product at the end of the project, fully functional and within the scope of work. The client's role in cost is to comply with the needs of the company and to meet up with the expectation of the stakeholders. Whereas, the contractors aims to profit from the project by carefully managing the purchase of materials, workmanship wage and company's income. This is important if the company aims to be in the business and competitive with other engineering contractors in the market. Cost includes the financial ability of

both contractors and clients. Hence, we can assume cost is more important for contractors rather than the clients.

Time Management

Time constraint reflects the time allocated by the clients to the contractors to complete the project. Time is crucial to both sides as it is related to time and quality. The clients need the end product to be fully functioning to meet with demands worldwide. The contractors have to be punctual to secure more projects and earn the trust of the clients. Time must be managed efficiently to avoid delays and unnecessary spending. This is because more time equals to higher cost of production. A significant number of 5 international high-profile projects fail to be delivered on time and on budget. A number of undesirable characteristics are associated with failing projects: budget overruns, compromised project specifications, and missed milestones. In other words, the three basic dimensions of project success, namely time, cost and quality, are often in jeopardy. Thus, time is more important for the clients rather than the contractors.

Scope Management

The discipline of project management is about providing the tools and techniques that enable the project team to forecast, anticipate and organize their work to meet these constraints. Scope of work is the job specification in which is defined and produced by the client. The contractors execute the project based on the scope of work given. The contractors also have their own scope of work based on the client's expectations and needs. This scope of work weighs the time and costing as to not exceed the intended profit by the contractors. This is usually the reason, as to stay competitive with other contractors by having the funds, specialized tools and machineries, skilled and professional workers and it boosts the image of the company. The scope of work must be balanced in terms of time, cost and quality as to meet with the Project Management Triangle. The scope of work also gives problem solving answers to upcoming problems in the course of the project. The discipline of project management is about providing the tools and techniques that enable the project team to forecast, anticipate and organize their work to meet these constraints. Hence, the scope of work is more important to the contractors rather than the clients

Quality Management

The quality of the product defines the workmanship and the credibility of the contractors. Quality improvement is crucial for the contractors, it boosts the contractors' image and prospect, making them irresistible to the clients. This is because the client's filters contractors with the most value for money

service besides being reputable in the construction industry. A reputable image creates confidence in clients and a quality product means less maintenance over a long period of time. Quality is measured through client satisfaction and the longevity of the product, quality workmanship and efficient management of the contractors. Quality products and services, on the downside, cost more and take longer to complete. The scope of work is also more elaborate and critical by providing time is not critical, the delivery criteria are only one set against which success can be measured. Hence, this means the overall end product tells of the success of the overall project. Thus, quality is more important for clients rather than contractors.

15.2 Project Success Factors

Measuring the success of a project after the fact is important because it helps discern future strategies when planning new projects. Continuous improvement derived from the data gleaned from past projects lets PMs proactively identify any issues before the next occurrence. Using past data means new processes can happen with fewer mistakes and better management success.

Knowing what success factors matter at the end of a project is critical in not only assessing how that project went but also in making adjustments for the next one.

"A Project is considered to be successful if the goals are achieved"

Knowing what makes up success versus failure is important. Using your strengths to build up weak areas means you not only improve as a project manager but as a team leader as well. the following are the factors for the success project in any organization:

1- Satisfaction of Stakeholders

To assess whether a project is a success or failure, you need to know which stakeholders have to be happy. Measuring whether or not your stakeholders are satisfied is important as they have a vested interest in your success. Key stakeholders can make or break the success of a project so they are who you need to talk to when determining it as a success factor.

2- Budget

A second success factor to look at is budget and whether you delivered the project for the budget stated at the outset. You want to be able to both produce a product and meet your budgetary objectives so your

success shows. In a 2019 survey, results showed that 81% of organizations review budgets throughout a project. Similarly, 83% of organizations review changes in time and cost throughout a project. Good management demonstrates that you knew how to adjust as the project moved forward and that you kept the team or client informed when changes were needed. Knowing how to manage a budget is critical.

3- Target Delivery

Measuring success includes time management. Hard deadlines are important as they affect others as well. Again, if you need to move a deadline, that doesn't mean you failed. With communication, you can still attain success. Checking with teams about what is a priority and what dates might work can mean success by keeping everyone in the loop. While only 34% of projects get delivered on time and on budget with all specifications met, you can be in this 34% if you communicate well and work with your stakeholders.

4- Comprehensive Planning

Many project managers hurry to the project execution stage and do not take sufficient time for sound planning. Don't make a mistake here, invest sufficient time and resources in thorough scheduling. Having a detailed plan sets the ball rolling in favor of project success from the start. The team and the stakeholders of the project should always know from the beginning in which direction the project is heading. Comprehensive planning can help the team to meet crucial deadlines and stay well organized.

There are many benefits of smart planning. This starting step in the project allows a realistic time frame to be created. It gives accurate time for cost estimations to be produced and also helps in clear documentation of milestones and deliverables, which will make things much easier as the project progresses. Planning details the resource requirements and acts as a warning system. If there is any lapse, then the warning system will provide you clear visibility of what to expect.

5- Quality

Once the project is of good quality then you have a higher success factor. You want to understand and meet the stakeholder's expectations for quality and how to know if you have reached the standard expected. Understanding quality needs will lead to effectively working on features, budgets, and timelines to improve things.

6- Team Success

Another factor to use in gauging success is how your team feels about the process and final outcome. Looking at trust levels, contentment, and satisfaction all play into success. You get better results if your

team feels satisfied. A happy team feels pride in a project well-done which is great for the stakeholders. Knowing how to manage a team for success means the next project is something to look forward to. It is important to assign the right individuals to each aspect of the project and make sure they work together well. In addition, to have the most successful result, the entire team should be fully informed and involved, which means that communication has to be on par.

7- Client Analysis

While you want your stakeholders or clients to be happy, you have to find a way to gather data to get their overall outlook and satisfaction. Use sliders to do this. Have them rate various success factors so their answers are tangible and not just verbal. Seeing evidence and having the data in front of you means you can see strengths and weaknesses. This pinpoints what can be improved upon.

8- Effective Communication

With proper communication, many undesirable developments in projects could be prevented or at least discovered earlier. Ensure that formal communication processes (meetings, documentation), as well as informal processes, are implemented and used. Communication between members of the team plays an important role. Offer opportunities for your employees to come together outside the official meetings, for example, in your offices at the coffee corner.

9- Careful Management of Risks

Project managers know that planned things rarely go off. It is essential to produce a risk log with an action plan for the project's risks during the planning process. Ensure that your risk log is known by all key stakeholders and know where they can find it. If something happens, with the management plan that has already been set up, the team can quickly resolve the problem. When facing project risks, this will give the team confidence and help the customers feel comfortable with the project's progress.

10- Use a Professional Software

The quality of your chosen tools has a direct effect on the quality of your management. The role of project management software is commonly underestimated. Professional and intuitive software minimizes the risk of errors and miscalculations, provides the best possible overview of all relevant KPIs, and reliably

displays significant data on all necessary devices. The software promotes safe and easy team collaboration and is the basis for providing access to the information needed by each team member.

Invest in a professional and specific tool instead of working with Excel or other spreadsheet programs not created for project management needs. It will simplify your job, and it will affect the success of your project.

11- Monitoring and Controlling

Check your progress and regularly evaluate the results. To quickly understand if the project is on track, define key performance indicators (KPI), and use reports. You will recognize early on when things go sideways and can take countermeasures before greater harm is done.

12- Strong Closure of Project

If there is no strong closure for a project, it can continue to consume resources. The project team must be firm and agree with the client that it has met all critical success factors. It is necessary to agree and sign off on confirmation of the project delivery, testing, and release. Satisfaction surveys are good forms of documentation for future reference to be logged and filed and valuable information for future use.

15.3 Work Breakdown Structure

In project management, WBS stands for the Work Breakdown Structure. This is a foundational tool that will help you to plan, manage, and evaluate large projects. The WBS is a project management tool used to define and manage a project's deliverables, it is a hierarchical structure that breaks down complex activities into more manageable parts (starts with large objectives and breaks them down into smaller), allowing users to see the individual deliverables that need to be completed and assign to the team in order to reach a project's overarching goal. Rather than focusing on individual actions that must be taken to accomplish a project, a WBS generally focuses on deliverables or concrete, measurable milestones. These deliverables may also be called work packages, tasks, sub-tasks, or terminal elements. Table 15 shows the Work Breakdown Structure (WBS). The realistic project work breakdown structure (WBS) with code was defined by WBS Chart as shown in Figure 14.

Element No.	WBS Elements/Activity
1.0	Field Development Plan
1.1	Static Phase
1.1.1	Seismic Interpretation
1.1.2	Petrophysic Interpretation
1.1.3	Geology Study and Geomechanic
1.1.4	Static Modelling
1.2	Dynamic Phase
1.2.1	Reservoir Studies
1.2.2	Upscaling & Upgridding
1.2.3	Initilization
1.2.4	History Matching
1.2.5	Well Production Model
1.2.6	Forecast Scenarios
1.2.7	Integrated Modeling & Economic Modeling and Final Report

Table 14: Work Breakdown Structure (WBS)

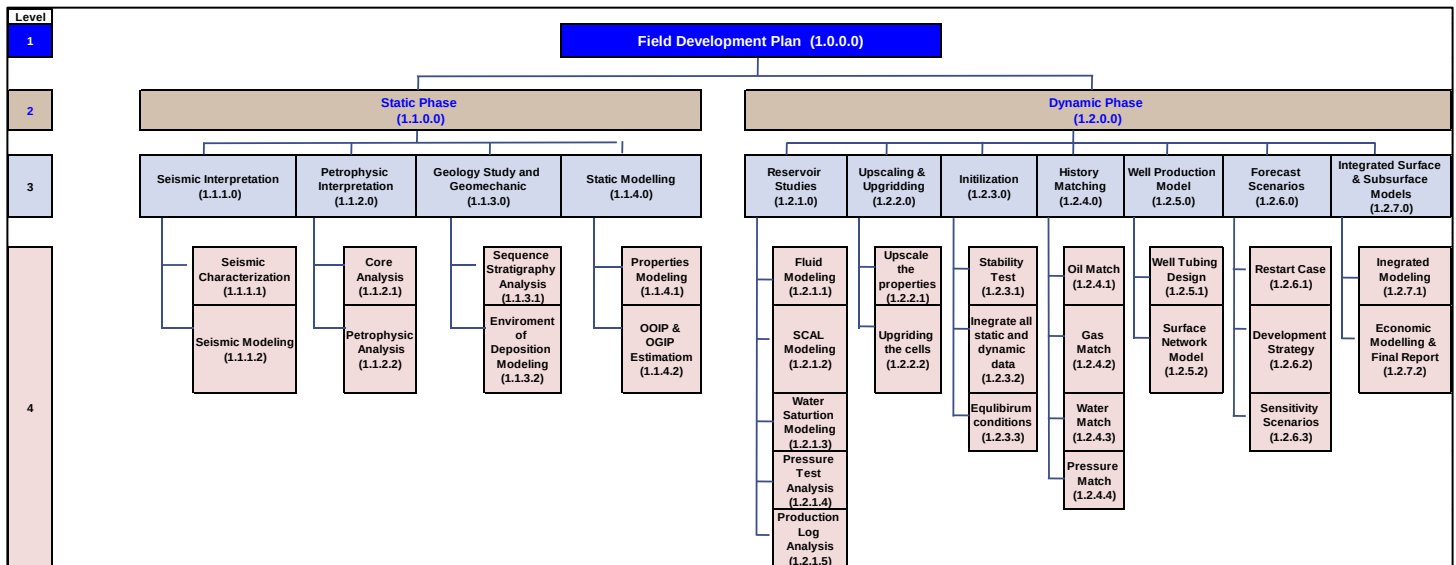


Figure 15: Work Breakdown Structure (WBS) with Code

Rules to create a Work Breakdown Structure, WBS

- 1. Include 100% of the work necessary to complete the goal.**
- 2. Don't account for any amount of work twice.**
- 3. Focus on outcomes, not actions.**
- 4. A work package should take no less than 8 hours and no more than 80 hours of effort.**
- 5. Include about three levels of detail.**
- 6. Assign each work package to a specific team or individual.**

16. Project Requirements and Objectives

Project requirements are conditions or tasks that must be completed to ensure the success or completion of the project. They provide a clear picture of the work that needs to be done. They're meant to align the project's resources with the objectives of the organization. The benefits of effectively gathering project requirements include cost reduction, higher project success rates, more effective change management, and improved communication among stakeholders.

Project requirements can be categorized into three main categories: business, solution, and stakeholder requirements.

According to the Project Management Institute, up to **70% of projects** fail due to issues with requirements.

5 Steps for Identifying and Gathering Requirements

1. Create a Plan
2. Identify and Gather Requirements
3. Review and Prioritize Requirements
4. Finalize Requirements
5. Manage Requirements

During project execution, you need to:

- Ensure your team is working on activities to deliver the requirements.
- Leverage the Requirements Traceability Matrix to manage change requests carefully to avoid scope creep.
- Assess new requirements that emerge due to testing or quality checks.



16.1 Requirement Traceability Matrix

The Requirements Traceability Matrix (RTM) is a tool to help ensure that the project's scope, requirements, and deliverables remain "as is" when compared to the baseline. Thus, it "traces" the deliverables by establishing a thread for each requirement- from the project's initiation to the final implementation.

The Requirements Traceability Matrix is used to track the project requirements through the Project Life Cycle. It documents each requirement, the source of the requirement, and traces how the requirement will be addressed through the project deliverables. Table 15 shows the Requirements Traceability Matrix.

MATRIX

REQUIREMENTS TRACEABILITY VERIFICATION MATRIX										
Project Name:	Field Development Plan for Oil and Gas Reservoirs									
Project Description:	Sustainability of energy has long been a key consideration for great countries and to remain with their strong economy, these countries will need to develop proactive integrated sustainability strategies that demonstrate continuously improving the sustainable production of oil and gas and emissions performance.									
Project Manager Name:	Ahmed Zakaria									
Agency/Firm:	EXPGO									
User Need ID	User Need Summary	Detailed Requirement ID	Detailed Requirement Summary	Document Section	DR Source Document	Verification Test Case ID	Compliance (Y/N/Partial/NA)	Notes/Comments/Date	Reviewer Initials	FDOT Initials
FDP-001	Continuous electrical power and communications	G-001	Install power service assembly	639-3	FDOT Standard Specs	TC015	Yes	APL PRODUCTS USED	HAS	
FDP-002	Performance measures and system validation	G-002	Send traffic measures of effectiveness (MOEs) to Regional Traffic Management Center (RTMC) Master Server and save for MOE report	Q - Testing	RFP	TC007	Partially	APL PRODUCTS USED	HAS	
FDP-003	Production system changes	PE-001	Furnish and install CCTV camera at locations shown in plans	682-1	FDOT Standard Specs	TC001	Yes	APL PRODUCTS USED	HAS	
FDP-004	H2S detection system (FDS) system for real-time data	PE-002	Install H2S detection system at locations shown in plans	660-2.2.1	FDOT Standard Specs	TC002	Yes	APL PRODUCTS USED	HAS	

Table 15: Work Breakdown Structure (WBS) with Code

16.2 Requirement Collection Methods

Project Management tools and techniques for requirement gathering:

For any project success, project result must meet stakeholder's needs and expectations. Capturing all project management requirements keeps you one step closer to project success. Prerequisites for project management process tools and techniques on requirement collection; Follow along below bullets, before deciding which tool to use:

- What are technical requirements for project management
- How to collect requirements for a project

The following are some of the well-known **requirements gathering techniques/methods** –

- Brainstorming
- Document Analysis

- Focus Group. A focus group is a gathering of people who are representative of the users or customers of a product to get feedback. The feedback can be gathered about needs/opportunities/ problems to identify requirements or can be gathered to validate and refine already elicited requirements.
- Interface analysis
- Interview. Interviews of stakeholders and users are critical to creating the great software.
- Observation. By observing users, an analyst can identify a process flow, steps, pain points and opportunities for improvement.
- Prototyping. Prototyping is a relatively modern technique for gathering requirements.
- Requirement Workshops. Workshops can be very effective for gathering requirements.
- Reverse Engineering. When a migration project does not have access to sufficient documentation of the existing system, reverse engineering will identify what the system does. It will not identify what the system should do, and will not identify when the system does the wrong thing.
- Survey/Questionnaire
- Expert Judgment
- Data Gathering
- Decision Making
- Data Representation
- Interpersonal & Team Skills
- Context Diagram

Requirements Gathering Steps

To help clients and developers manage the process of requirements gathering, we recommend these 5 steps:

Step 1: Understand Pain Behind The Requirement

Step 2: Eliminate Language Ambiguity

Step 3: Identify Corner Cases

Step 4: Write User Stories

Step 5: Create a Definition Of “Done”

16.3 Hierarchical Structure of The Objectives of The Project Connected to The Strategy

Often goals are set for organizations to achieve the strategic gains of the organization, which are related to the vision and mission of this organization, but why do organizations need to set goals from the outset?

We answer this question in the following points:

- Identify what the business aims to achieve.
- Give the business a sense of direction.
- Provide a focus to everyone in the organization.
- Drive decision-making and strategy plan.
- Motivate employees
- Provide a means for measuring success.

There are many common goals of exciting organizations and here we give some examples such as survival, maximum benefit, share marketing, market growth, corporate image, and continuous quality improvement. As we know that the tangible goals must be subject to the SMART scale, and this is what we have worked to achieve in the project and link all these goals to the general strategy of the organization to achieve its ambitious vision. Figure 16 shows the organization objectives hierarchy.

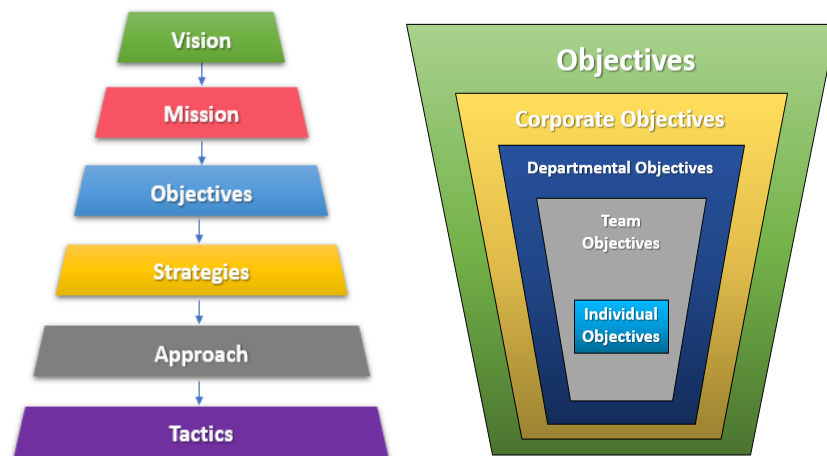


Figure 16: Organization Objectives Hierarchy

Connect the objectives to strategies: -

Objectives	Strategies
Calculate the Original Oil & Gas in Place (OOIP & OGIO)	To calculate the original oil and gas in place in conventional reservoirs is by volumetric analysis.
Estimate the Oil & Gas reserve	Strategy to estimate the (OOIP & OGIO) by imputing data for all parameters, components, or factors required for calculation in volumetric estimation method into the Microsoft visual basic platform
Production strategy to achieve the sustainable target rate.	1-Acting on raw data and industry insights 2-Reducing freshwater usage and boosting water recycling 3-Preventing oil and methane leaks 4-Improving auxiliary processes across the board 5-Investing into and implementing renewable energy
Develop the oil and gas facilities	1- Environmental impact, geophysics, geology, reservoir and production engineering, infrastructure, well design and construction, completion design, surface facilities, economics, and risk assessment. In particular, the activities and people involved in the development stage 2- Define a precise Field Development Plan (FDP). 3- Decide the best production/injection well placement and design. 4- Select the optimal production facilities required to properly process hydrocarbons before their treatment. 5- Choose the transport options and route to export oil and gas.

17. Project Scope

Project scope is the part of project planning that involves determining and documenting a list of specific project goals, deliverables, tasks, costs, and deadlines. Large projects tend to change as they progress. If a project has been effectively "scoped" at the beginning, then approving and managing these changes will be easier. Effective scope management requires good communication. That ensures everyone on the team understands the extent of the project and agrees upon exactly how the project's goals will be met. As part of scope management, the team leader should ask for approvals and signoffs from stakeholders as the project proceeds, ensuring that the proposed finished project meets everyone's needs.

17.1 Scope Statement (its limits- and objects that not include)

The documentation of a project's scope is called a scope statement or terms of reference. It explains the boundaries of the project, establishes responsibilities for each team member, and sets up procedures for how completed work will be verified and approved.

During the project, this documentation helps the project team remain focused and on task. The scope statement also provides the team with guidelines for making decisions about change requests during the project.

Defining project scope requires input from the project stakeholders. They work with project managers to establish the key elements of budget, objectives, quality and timeline. To determine the scope, project managers must collect requirements for what the stakeholders need from the project. This includes the following elements:

- The project's objective and deliverables
- When the project must be completed
- How much the stakeholders can pay for it.

The goal is to gather and record precise and accurate information during this process, so the project scope reflects all requirements. Doing this improves the chances for project leaders to deliver products that meet stakeholder expectations on time and on budget.

A project's scope statement should not be confused with its charter; a project's charter simply documents that the project exists.

The importance of defining a project's scope

Writing a project scope statement that includes information on the project deliverables is a first step in project planning. The benefits a project scope statement provides to any organization undertaking a new initiative include the following:

- Articulates what the project entails so that all stakeholders can understand what's involved
- Provides a roadmap that managers can use to assign tasks, schedule work and budget appropriately
- Helps focus team members on common objectives
- Prevents projects, particularly complex ones, from expanding beyond the established vision.

The scope provides a strong foundation for managing a project as it moves forward and helps ensure that resources aren't diverted or wasted on out-of-scope elements.

Table 16 explains the project scope statement (its limits and objects that are not included).

Project Name:	Field Development Plan for Oil and Gas Reservoirs
Prepared by:	Project Manager
Date:	1/Dec./2021
Project Justification:	To construct rigid static and dynamic models to perform the short and long term production forecast by implementing a good reservoir practices.
Product Description:	Sustainability of energy has long been a key consideration for great countries and to remain with their strong economy, these countries will need to develop proactive integrated sustainability strategies that demonstrate continuously improving the sustainable production of oil and gas and emissions performance.
Project Deliverables:	Static Model and Dynamic Model with economic evaluation and oil & gas reserve estimation
Out of Scope Item:	Plan and budget for facility construction
Project Objectives:	The objective of this project is to develop the oil and gas field by constructing new static and dynamic models to perform the following: 1- Calculate the Original Oil & Gas in Place (OOIP & OGIO). 2- Estimate the Oil & Gas reserve. 3- Production strategy to achieve the sustainable target rate. 4- Develop the oil and gas facilities.
Cost Objectives:	Project NOT to exceed 3,000,000 \$
Schedule Objectives:	Outsourcing of designated Oil and Gas technologies within 12 months
Acceptance Criteria	In accordance with approved outsourcing contract terms and agreements and warranties
Constraints:	1- Resources 2- Budget 3- Time
Assumptions:	1- Outsourcing has adequate S/W and H/W Resources. 2- Current Geologist and reservoir engineers will remain in place throughout the duration of project 3- Deliverables will be as defined in scope 4- Project objectives will be attained at the close of the project

Table 16: The Project Scope Statement (its limits and objects that are not included).

17.2 Scope Creep

Scope creep is a situation in which one or more parts of a project end up requiring more work, time or effort because of poor planning or miscommunication.

When documenting a project's scope, stakeholders should be as specific as possible **to avoid scope creep**

Scope creep explanation: when it comes to scope creep appearance, failure will reveal at any time and point of the project life cycle. It can be defined as the unauthorized and uncontrolled changes to any project that lead to going beyond the initial boundaries. In other words, every project goes through multiple steps at a specific time and has a deadline. Nevertheless, if the project needs much more time due to some struggles for any reason, at this point, it can be called scope creep. Undoubtedly, there are tremendous reasons for any organization to fall into scope creep.

The list below will mention some situations and examples that lead to scope creep:

- If there are ambiguous goals, plans, or obligations, the project will not finish on the specified time.
- Being unclear and unrealistic about anything related to the project will lead to failure.
- Miscommunication between the project manager, stakeholder, and the team about what should be done. For example, not making sure of delivering tasks, messages, or announcements, certainty leads to scope creep
- Complicity of describing the project such as having too many tasks and duties without simplifying them for the staff.

17.3 To illustrate Product Analysis Management

Product analysis is an important project management process that is necessary for projects that have products as part of the deliverable. it plays a crucial role for every project to deliver the desired demand and outcome at the final stage.

It is a tool that is used to define the scope of the product. It basically means that when analyzing the product through its scope, questions can be asked about it [product]. Moreover, the project team is also encouraged to formulate answers to describe the characteristics, functions, and others relevant to the product that will be manufactured.

Product analysis is an effective tool in project management. It is used in determining whether the product that will be delivered will be effective in drawing in its target client. It is important to take note that each application area has generally more accepted methods to create a good product that can be released to the

oil and gas industry but product analysis includes different sets of tools to analyze the product. These techniques include systems analysis, product breakdown, system engineering, requirement analysis, value analysis, and value engineering. All of these are necessary to effectively analyze a particular tangible product and deem it effective in the current oil and gas industry.

Product Analysis technique is used in the following processes:

PROCESSES	KNOWLEDGE AREA	PROCESS GROUPS
Define Scope	Project Scope Management	Planning

There are some examples of product analysis techniques such as:

- **Product Breakdown Structure (PBS)**

It can be used for analyzing, communicating, and documenting the results of the project. PBS is a hierarchical tree that provides arranged and clear statements to deliver the project.

- **Requirement analysis**

It is taking into consideration the requirements of analyzing, documenting, and managing conflicts. It should have a suitable action plan to accomplish the success of the project.

- **System analysis**

It is studying a business or a process to identify the goals and purposes and initiate robust systems that can accomplish them efficiently.

- **Value analysis**

It focuses on quality and satisfaction with low cost as much as it can. In other words, the value of the product is a must, but with a minimal cost.

17.4 Processes of Converting/Transformation Work Packages in WBS into Activities

Certainty, when there are so many tasks and obligations to do, with unorganized schedules, action plans, and neat diagrams, works will never end. Thus, WBS is created in order to make everyone knows his/her duties and keep the work running smoothly. In fact, it is like the cornerstone that gives effectiveness from the beginning of any project until it ends. Figure 17 demonstrates how the work package transforms into work breakdown structure that can facilitate the work for any institution.

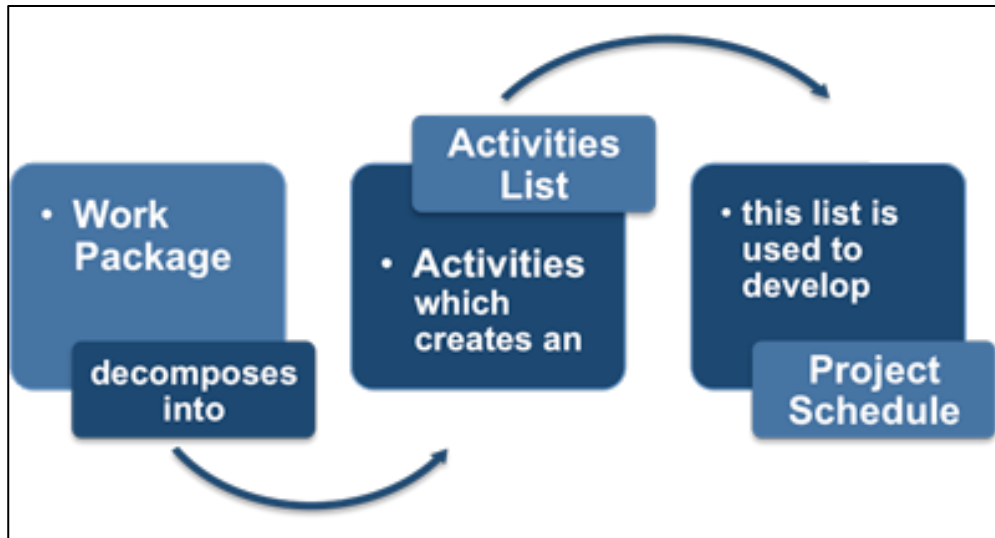


Figure 17: How The Work Package Transforms into Work Breakdown Structure

The creation of a WBS can be thought of as a six-step process as described below:

1. Get the appropriate stakeholders together.

2. Organize the first level according to how the work will be done or managed. There are three main options for organizing the top level of the WBS:

- **By phase.** This is probably the most common approach and will almost always be used when the project includes multiple phases.
- **By key deliverable.** This approach is normally used for single phase projects, or when the key deliverables are being developed using different project life-cycles. This is also the approach most widely used in defense projects.
- **By procurement step.** This approach is typically used when the bulk of the work on the project will be done by sellers in a buyer-seller environment.

3. Add a branch for project management deliverables and activities.

4. Generate additional detail for all branches. There are two major approaches here:

- **Top-down.** This approach is most effective when the product scope is well-understood. Working top-down means looking at each of the higher-level items and breaking them down into smaller items until you have enough detail to feel comfortable estimating.

- **Bottom-up.** This approach is almost always used when the product scope is poorly understood. Creating a WBS from the bottom-up involves brainstorming or other kinds of creative thinking to try to identify all of the artifacts which must be produced and all of the actions needed to do so.

5. Arrange related items into a hierarchy. As you develop your hierarchy, you are likely to identify many holes. You can fill these holes with additional or modified deliverables, additional or modified activities, or a rearrangement of the existing items.

6. Edit and revise as needed. Once the basic structure has been agreed, it is usually necessary to revisit the names and descriptions of the individual -items to ensure that they are both useful and correct. A word of warning: leave this step for last! Trying to get the words right before the structure is complete and clear is almost always enormously frustrating.

If you follow these six simple steps,

you will discover that the **"BS"** in your WBS means **"Brilliant Support"** for your project.

Work Package	Activity
• Lowest level of WBS • Output of "Create WBS" process. • Defined as part of Scope management. • Work packages are created before activities.	• Work package is decomposed to form activities. • Output of "Define Activities" process. • Defined as part of Schedule management. • Activities are created after work packages are created.

18. Project Time

18.1 Develop the Functions List or The Activities Included in each Work Packages in WBS

Table 17 summaries the project activities for each work packages in WBS.

Seismic Interpretation	Petrophysic Interpretation	Geology Study & Geomechanic	Static Modelling	Reservoir Studies	Upscaling & Upgridding	Initilization	History Matching	Well Production Model	Forecast Scenarios	Integrated Surface & Subsurface Models
Seismic Characterization	Core Analysis	Sequence Stratigraphy Analysis	Properties Modeling	Fluid Modeling	Upscale the properties	Stability Test	Oil Match	Well Tubing Design	Restart Case	Inegrated Modeling
Seismic Modeling	Petrophysic Analysis	Enviroment of Deposition Modeling	OOIP & OGIP Estimatiom	SCAL Modeling	Upgridding the cells	Inegrate all static and dynamic data	Gas Match	Surface Network Model	Development Strategy	Economic Modelling & Final Report
				Water Saturation Modeling		Equilibrium conditions	Water Match		Sensitivity Scenarios	
				Pressure Test Analysis			Pressure Match			
				Production Log Analysis						

Table 17: The project activities for each work packages in WBS

18.2 The Relationships Between The Activities

Project networks play important roles in carrying out construction activities in a timely manner, and they are among the key means of communication that project teams use to coordinate their efforts throughout the process of construction. Project networks are also among the key project artifacts that are used for preparing or investigating time-related claims and for determining entitlements to time extensions and/or delay damages. Activity dependencies are among the key characteristics and building blocks of project schedules. A project network not only contains project activities but also defines activity dependencies (also known as activity ties or activity relationships). A variety of activity dependencies exists, and activity relationships are categorized in different ways.

The four main types of activity dependencies include Finish-to-Start (FS), Start-to-Start (SS), Start-to-Finish (SF), and Finish-to-Finish (FF). The following briefly describes these relationship types:

- Finish-to-start (FS): A logical connection in which a successor venture cannot start until a predecessor activity has finished.
- Start-to-start (SS): A logical relationship in which a successor activity cannot start until a predecessor activity has started.
- Finish-to-finish (FF): A logical relationship in which a successor activity cannot finish until a predecessor activity has finished.

- Start-to-finish (SF): A logical connection in which a successor activity cannot finish until a predecessor activity has started.

In this Project, the activity dependencies created based on Finish-To-Start (FS) type as shown in table 18.

Activity	Toward Activity
1	2
2	3
	4
4	5
	6
6	7
7	8
	9
	10
	12
	13
8	14
14	15
15	11
11	16
	17
17	18
18	19
	20
	21
	22
22	23
	24
	25
25	26
	27
27	28
28	29
29	End

Table 18: The Activity Dependencies Created Based On Finish-To-Start (FS) Type

18.3 The Logical Diagram of The Project Activities, And Critical Path

A project network is a graph that shows the activities, duration, and interdependencies of tasks within your project.

The critical path method (CPM), or critical path analysis (CPA) is an algorithm for scheduling a set of project activities. A critical path is determined by identifying the longest stretch of dependent activities and measuring the time required to complete them.

Benefits of the project management network diagram

A network diagram allows a project manager to track each element of a project and quickly share its status with others. Its other benefits include:

- Visual representation of progress for stakeholders
- Establishing project workflows
- Tracking dependencies and potential bottlenecks

A project network diagram is an important tool because it helps teams visualize the activities that need to be completed over the duration of a project. It also gives crucial context like task duration, sequence, and dependency.

Figure 18 shows the logical diagram of the project activities with critical path, the critical path of this project is: **1-2-4-6-7-8-14-15-11-17-18-22-25-27-28-29** and the total duration is 52 weeks.

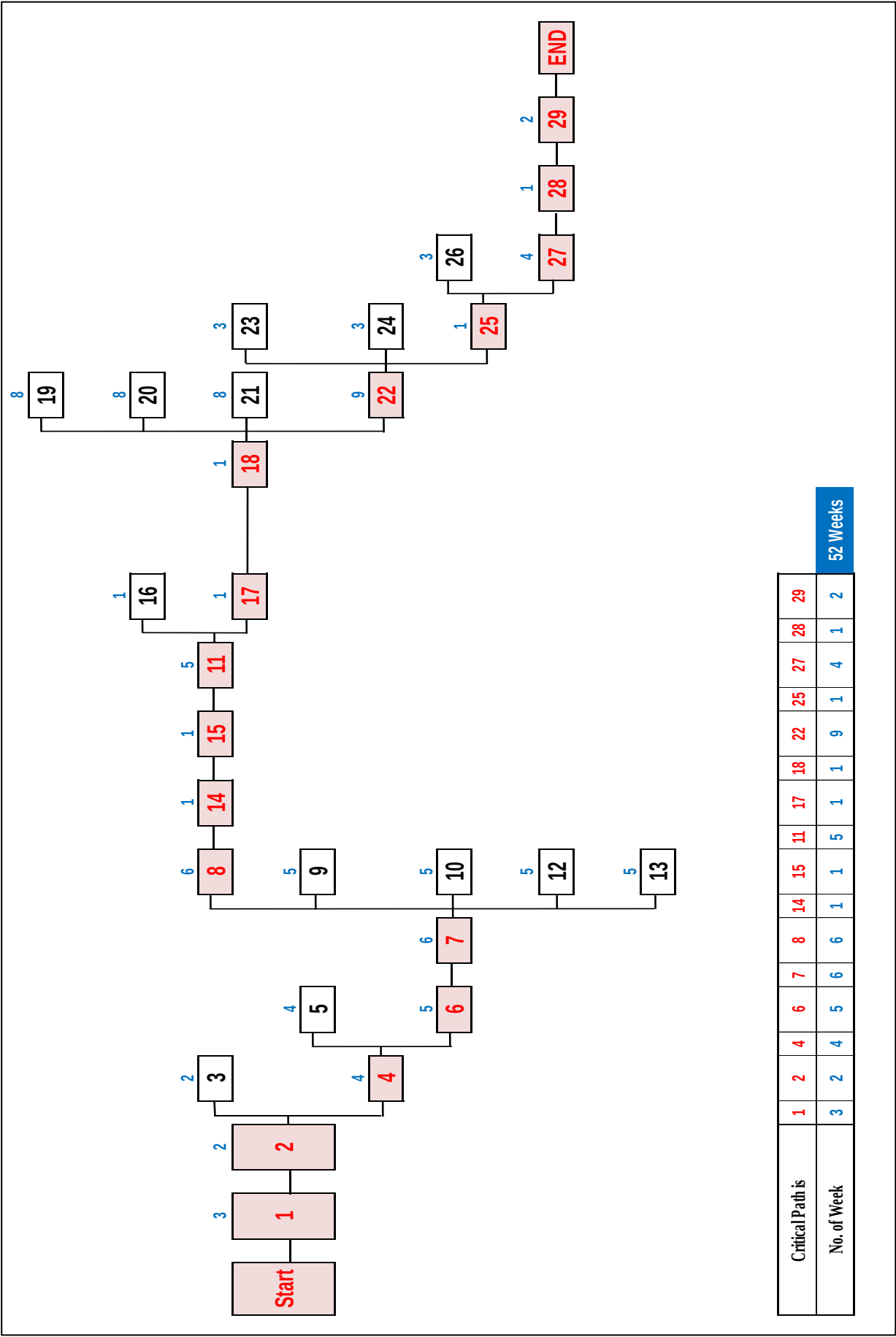


Figure 18: The Logical Diagram of The Project Activities with Critical Path

18.4 The Gantt Chart and Milestone Model

A Gantt chart (Also called: milestones chart, project bar chart, activity chart) is a bar chart that shows the tasks of a project when each task must take place, and how long each task will take to complete. As the project progresses, the chart's bars are shaded to show which tasks have been completed.

Use a Gantt chart when:

- Scheduling and monitoring tasks within a project
- Communicating plans or the status of a project
- The steps of the project or process, their sequence, and their duration are known
- You don't need to show which tasks depend on the completion of previous tasks

Gantt Charts focus more on the activities to be carried out to complete the project.

Milestone Plans focus mainly on the end-dates by which something needs to be complete or by which certain objectives need to be achieved.

In this project we have 8 milestones and tables 19 and 20 show the milestone model and the Gantt chart of the project (with milestone), respectively.

Milestones	Week No.
Petrophysic Interpretation	Monday; Week 3
Geology Study and Geomechanic	
Static Modeling	Saturday; Week 6
Upscaling & Upgridding	Thursday; Week 6
History Matching	Monday; Week 7
Restart Case	Thursday; Week 7
Forecast Scenarios	
Integrated Modeling & Economic Modeling and Final Report	

Table 19: Milestone Model

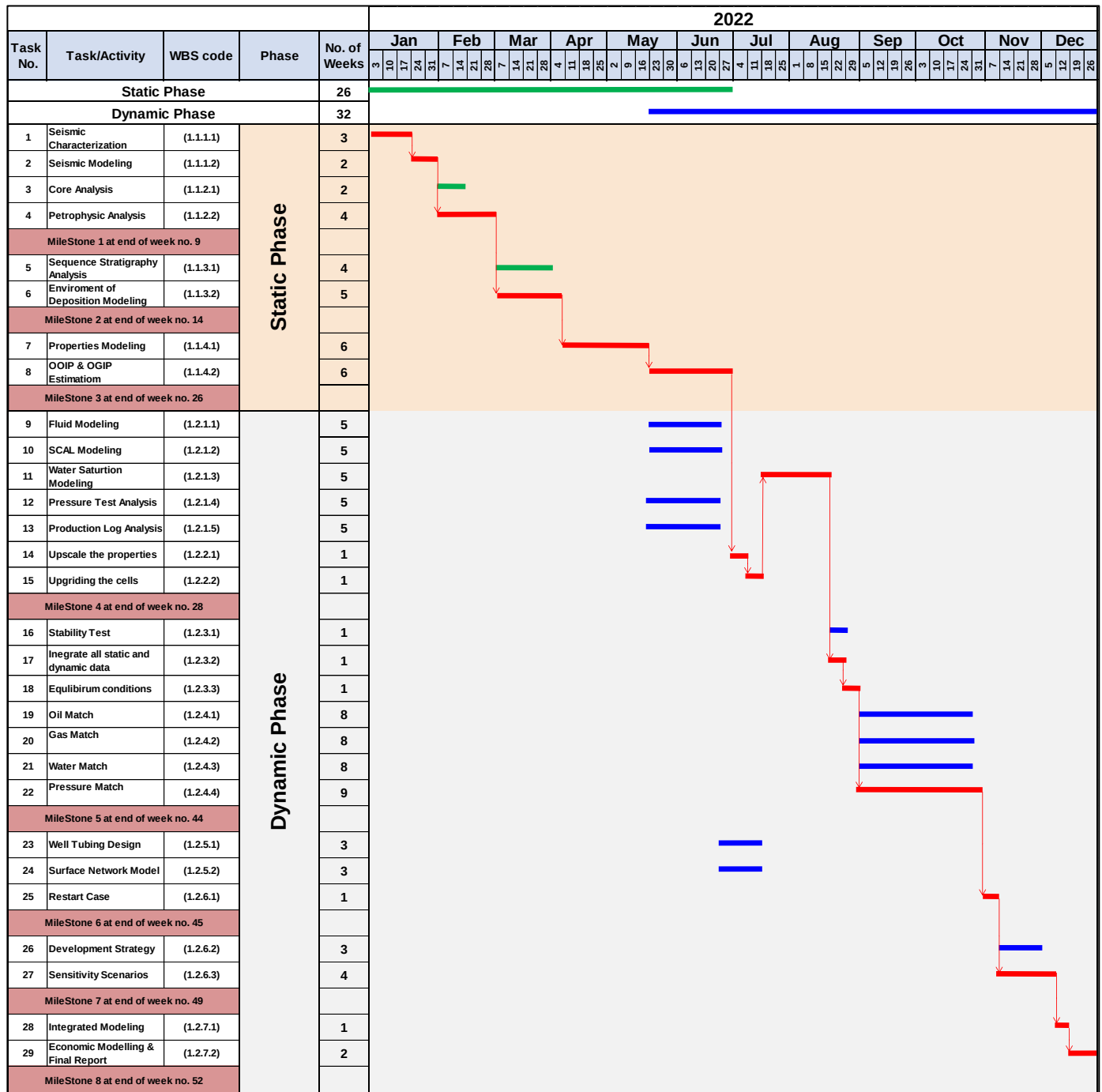


Table 20: The Gantt Chart of The Project with Milestone.

19. Project 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. Project quality management happens with these three processes:

1. Quality planning
2. Quality assurance
3. Quality control

19.1 Deming Model for Quality

Since the Oil and gas institutions started to become giant throughout the past years, they did not forget thinking about some effective and efficient methods to increase and enhance quality. Undoubtedly, there are a lot of procedures and methods to make sure of pursuing improvement. For instance, Deming circle is one of the effective methods that implemented in the most companies. Plan, Do, Check, and Act are the sequential four key stages of Deming cycle. Every stage of the cycle helps to fulfil the demand of a successful project.

- The first step is the **PLAN**, which is existed for improving the process.
- The second step is **DO**, and on this stage implementing the plan and measuring the performances are important.
- On the third step which is the **CHECK** , the employees and the teams address the measurements in order to meet the effective and efficient outcomes.
- The final stage is **ACT**, and the team should be careful about any changes before the cycle has to start again (Atanas, Rodrigues & Simmons, 2015). If these steps are applied on any organization, that certainly, will increase improvements.

Figure 19 explains the Deming circle (Atanas, Rodrigues & Simmons, 2015).

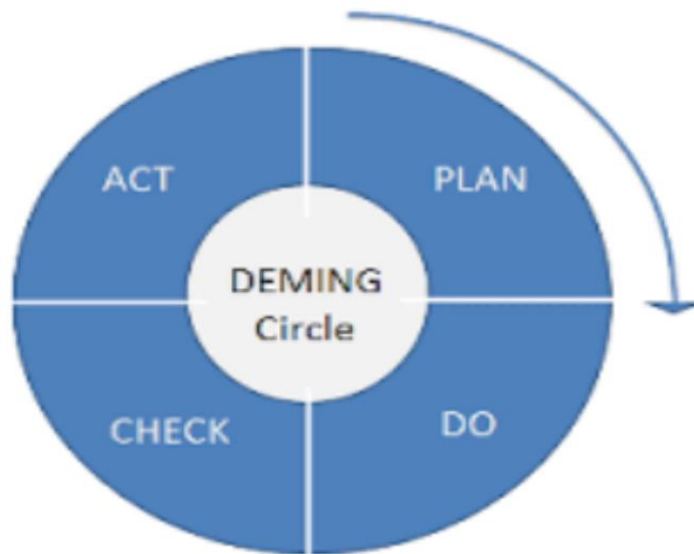


Figure 19: Deming circle (Atanas, Rodrigues & Simmons, 2015)

19.2 SIPOC Model and Ishikawa

SIPOC diagram stands for; **Supplier**, **Input**, **Process**, **Output**, **Customer**, and it can be described as a framework that aims to enhance supply chain management (SCM) procedure in the supply chain network (Mishra, & Sharma 2014). This type of diagrams helps organizations to observe how the business of every day runs smoothly and keep focusing on the work chain.

Table 21 shows the SIPOC model by setting every element on the appropriate category for Oil and gas company:

Supplier	Inputs	Process	Output	Customer
- Trading department of Xxxxx - Service suppliers - Technology suppliers	- Characteristics of crude - Crude oil - Working standards	- Distillation (separation) - Conversion - Treatment	- Gasoline - Diesel - Kerosene - Lubricants - LPG - Fuel oil	Supply department of Xxxxx

Table 21: SIPOC diagram for oil & gas company (Montanus, 2016).

Figure 20 shows the another effective method of improving quality for any institution, and it has two names which are (Ishikwawa/ Fishbone). It illustrates information that collected for the six categories agreed after conducting a meeting with the group members, about identifying problems that the company faced (Luca, 2016). The main purpose is to dig deeper, in order to go through the first incident happened, to understand what might cause problems for the organization, so that can help them to find effective solutions. In other words, the six categories started with examples (problems) of the oil and gas company and set some root causes to find the potential solutions.

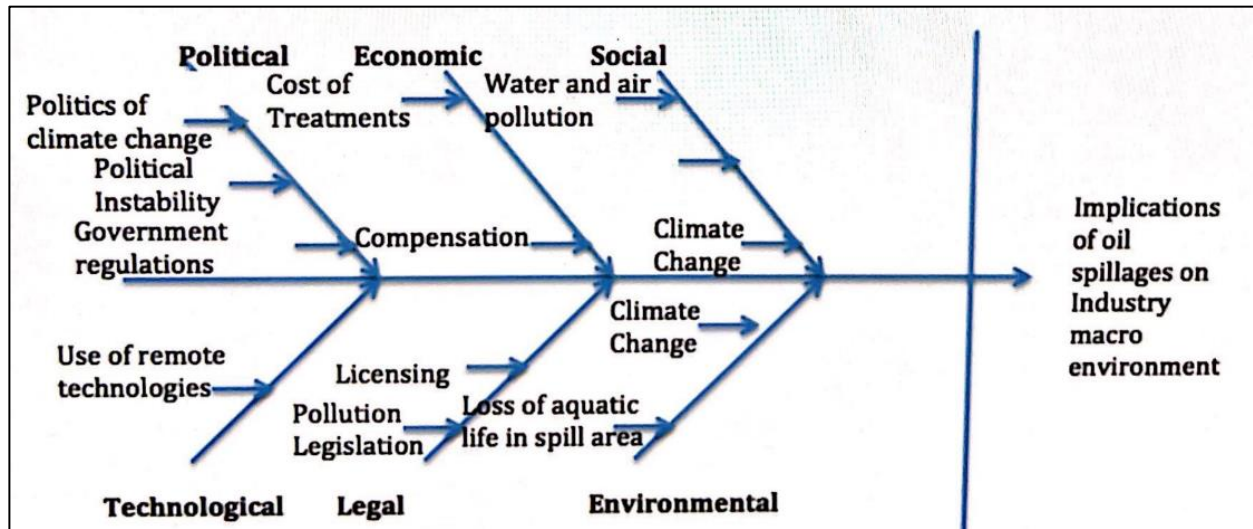


Figure 20: Ishikwawa model for Oil & gas company (Week 2: Oil and Gas Business research skills, 2015).

20. Project Finance

Project finance is the long-term financing of infrastructure and industrial projects based upon the projected cash flows of the project rather than the balance sheets of its sponsors. Usually, a project financing structure involves a number of equity investors, known as 'sponsors', and a 'syndicate' of banks or other lending institutions that provide loans to the operation. They are most commonly non-recourse loans, which are secured by the project assets and paid entirely from project cash flow, rather than from the general assets or creditworthiness of the project sponsors, a decision in part supported by financial modeling. The financing is typically secured by all of the project assets, including the revenue-producing contracts. Project lenders are given a lien on all of these assets and are able to assume control of a project if the project company has difficulties complying with the loan terms.

20.1 Cost Breakdown Structure and Project Balance in Accordance with WBS

A Cost Breakdown Structure (CBS) is a breakdown or hierarchical representation of the various costs in a project. The Cost Breakdown Structure represents the costs of the components in the Work Breakdown Structure (WBS). The CBS is a critical tool in managing the project lifecycle, especially the financial aspects of any project by creating a structure for applying measurable cost controls.

Project Balance

When an organization embarks on a special project, generally, the first task is to define what the project objective will be as it relates to expected deliverables. This task is usually accomplished fairly quickly by initial stakeholders; they include operations managers and other staff interested in the benefit the project deliverables will bring to the operation. Problems generally begin to arise when the project has been approved and the process of defining how to create the project deliverable, what costs will be associated, what resources will be required, and how to schedule these resources for a special project in addition to their normal daily tasks must be considered. Projects have to be structured and managed, maintaining a balance between utilizing the organization's resources for daily operations and for required tasks to complete work activities on a project.

Resources can be human resources and any other resources, including financial requirements, that will be needed on a project; however, they have to be defined, showing how they can be utilized in the balance of daily operations tasks and special project tasks. This can create a challenge for operations managers because they have an obligation to daily work activities but want to see special projects completed and struggle with ways to balance human resources and other resources within their department to complete

both of these tasks. Part of this dilemma stems from the department manager being loyal to his obligation in the daily operations and will typically err to ensuring operations are not impacted, thus creating constraints for utilizing resources on special projects. The other part of this dilemma might be the department manager's inexperience with scheduling resources for both departmental tasks and project tasks. Project managers who are separated from operational departments do not share the same loyalty and, in fact, are probably more loyal to completing project tasks and will negotiate with departmental managers in scheduling resources for project tasks. Project managers can also solicit the use of resources from outside the organization to complete project activities if internal resources are simply not available.

The second component that presents a challenge with special projects in an organization is defining all the costs associated with project activities and developing an overall budget for a special project. Typically, the error in costing projects is looking at project activities at a high level and trying to associate a more "generalized" cost to complete the entire activity, not taking into account all the specifics within each activity. Although this approach can be used in cost estimating a project, it is typically the reason that projects go over budget and that project activity costs are difficult to control. If project activity costs have been established based on the overall activity, as the activity plays out and specific tasks have resource, material, and equipment requirements that have not been accounted for, these requirements can add costs. Because these resources are needed, these costs present challenges in trying to control costs for the overall activity. Project managers typically have more time and techniques to break down activities to understand all the associated costs to derive a more accurate work activity cost and project budget. Organizations that do not have project management capabilities will ultimately struggle with the implementation of projects in defining project costs, scheduling resources, and controlling project work activities. The key element, in addition to properly costing and scheduling a project, is in the control of costs and scheduling of activities and resources to ensure a project completes an objective at the estimated cost and within the allotted schedule. Table 22 explains the Cost Breakdown Structure (CBS) and Project Balance in accordance with WBS. **The total duration of the project is 52 weeks (12 months) and total cost is 300,000 \$.**

WBS	Task Name	Cost (\$)	Activity Duration (Weeks)
1.1.1	Seismic Interpretation	55,000	5
1.1.2	Petrophysic Interpretation	45,000	4
1.1.3	Geology Study and Geomechanic	35,000	5
1.1.4	Static Modelling	25,000	12
1.2.1	Reservoir Studies	30,000	5
1.2.2	Upscaling & Upgridding	10,000	2
1.2.3	Initilization	10,000	2
1.2.4	History Matching	50,000	9
1.2.6	Forecast Scenarios	20,000	5
1.2.7	Integrated Modeling & Economic Modeling and Final Report	20,000	3
	Total Budgeted Cost	300,000	52

Table 22: Cost Breakdown Structure (CBS) and Project Balance in accordance with WBS

20.2 Earned Value Management of the Project after ending of 20% of Project Period and Completion 50% of Outputs

Figure 21 explains the calculation of Earned Value Analysis Report.

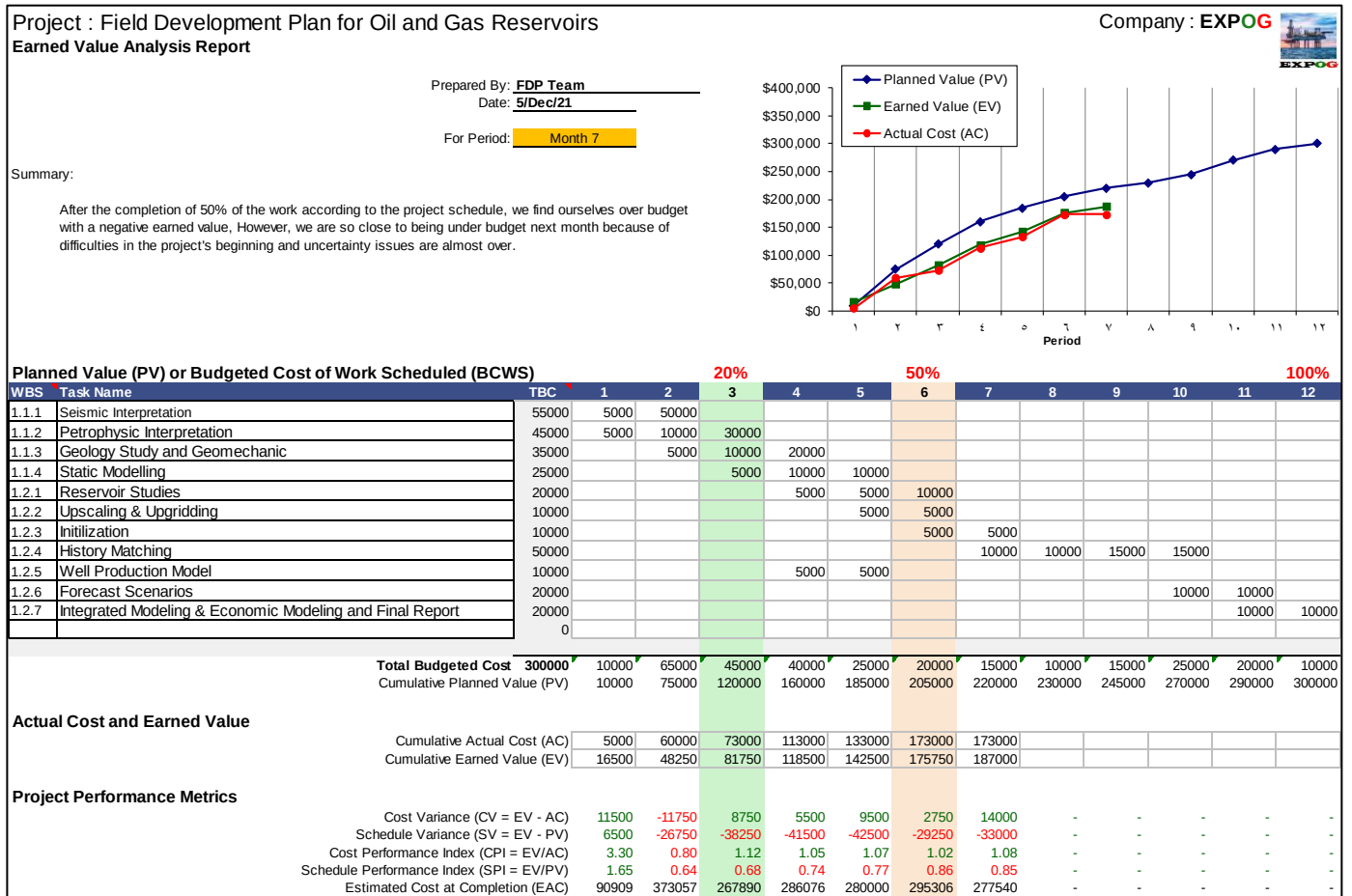


Figure 21: Earned Value Analysis Report

20% of project's period can be calculated as follow:

- 20% multiply by 52 weeks (project duration) = 10.4 weeks.

Project is 50% complete,

- then the earned value = Project Budget 300,000 * 0.5= 150,000 \$.

However, to properly use earned value, a few additional calculations must be considered such as cost and schedule variance analyses.

1. Scheduled variance (SV)

- The project duration is 52 weeks the project is 20% of project period. That means the Planned Value $PV = 20\% = 10.4$ weeks.
- Since the project is complete 50% which means 50% of the duration that equals to 26 weeks = $EV = 26$ weeks

So, the $SV = EV - PV = 26 - 10.4 = 15.6$ (It indicates that the project is ahead of schedule)

2. Cost Variance (CV)

$$CV = EV - AC$$

- $EV = 150,000$ \$ and the Actual Cost (AC) is $173,000$ \$
- $CV = 150,000 - 173,000 = -23,000$ \$, it indicates that the project is over budget.

Additional to above the Scheduled and Cost Performance Index can be calculated as follow:

- Schedule Performance Index = $SPI = EV/PV = 26/10.4 = 2.5$ (Ahead of schedule).
- Cost Performance Index = $CPI = EV/AC = 150,000/173,000 = 0.86$ (Over Budget).

21. Project Resources

It rarely happens that you have all resources as per your schedule to complete the project. Even if you have them, during project execution any risk can take away that freedom and you will have to manage with fewer resources. Even when you have all the necessary resources, as a project manager it is your responsibility to use resources efficiently and save costs for the company.

21.1 Resource Leveling and Smoothing

To achieve the objectives of the resource efficiently, you use resource optimization techniques. Two such resource optimization techniques are as follows:

- Resource Leveling
- Resource Smoothing

These techniques allow you to complete the project with minimal obstruction.

Resource Leveling

You use resource leveling when you have limited resources and you may extend the schedule. Figure 22 shows the Resource Leveling of the project.

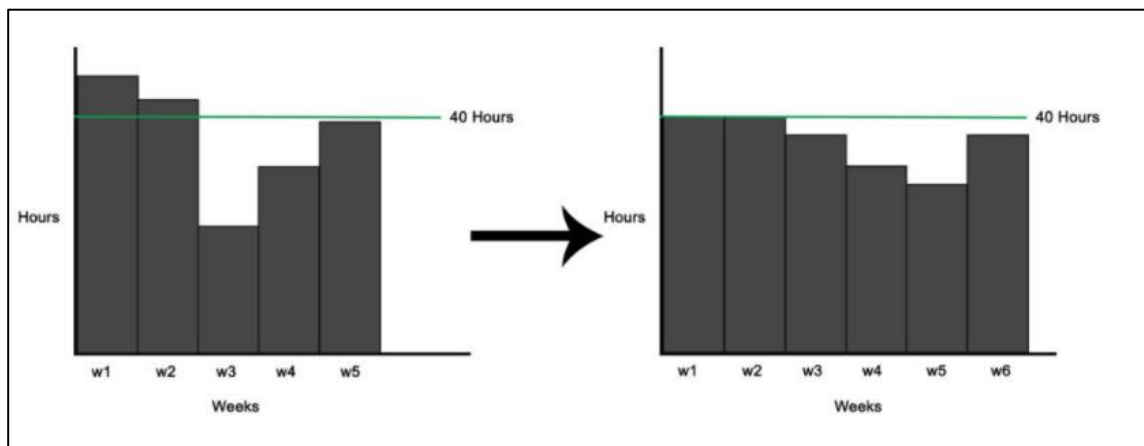


Figure 22: Resource Leveling of the Project

Resource leveling is used when:

- A critical resource may not be available for a certain duration;
- A critical resource may not be available at a certain point of time;
- You have to share a resource with another project;

- The demand for a resource exceeds the supply.
- you must keep some resource usage at a constant level.

In resource leveling, you are asked to optimize the limited resources given to you. Here the schedule is not fixed. Resource leveling answers the question of when you will be able to complete the project with the given resources. Resource leveling is sometimes called resource-constrained scheduling (RCS). If resources are not available, the project duration may change.

Resource Smoothing

You use resource smoothing when you have to optimize the resources and you cannot extend the schedule. Figure 23 shows the Resource Smoothing of the project.

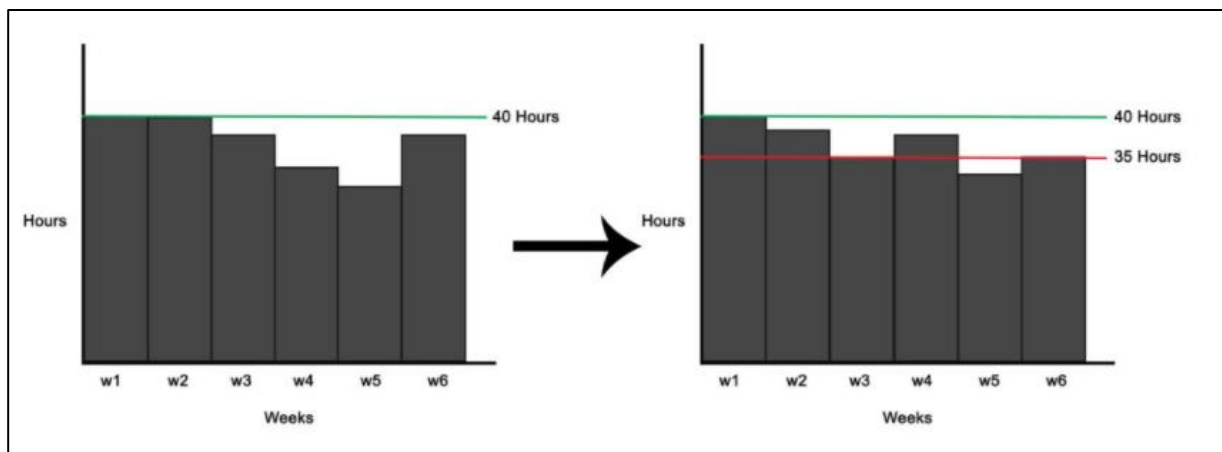


Figure 23: Resource Smoothing of the Project

Since you cannot extend the schedule, the project completion date and the critical path will stay the same. Here the activities cannot be delayed more than their total and free float. Using float in this technique will cause you to lose some flexibility from your path; however, the schedule will be optimized, efficient and cost-effective. In resource smoothing, you must be careful to avoid any delay inactivity as it may affect your critical path. Time is the main constraint here. You have a fixed schedule and are asked to optimize resources. Resource smoothing is also known as time-constrained scheduling (TCS). The project end date cannot be changed, and you have to optimize resources within the float.

Comparison of Resource leveling and Resource smoothing

Table 23 shows the comparison of the two resource optimization techniques.

	Resource leveling	Resource smoothing
1	Resource limited scheduling technique; Importance is given to the limited resources	Time limited scheduling technique; Importance is given to the duration of the project
2	Removes all resource conflicts	Removes as much resource conflicts as possible; but, may not remove all resource conflicts
3	May not require additional resources	May require additional resources to address left over resource conflicts
4	Activities may be shifted beyond the float available while rescheduling the activities	Activities are shifted only to the extent of the float available
5	Generally, the project duration gets extended	The project duration remains the same
6	May change the critical path	No change in critical path

Table 23: Comparison of Two Resource Optimization Techniques

21.2 Distributing The Project Resources of Equipment and Tools

Resource management is the efficient and effective deployment of an organization's resources when they are needed. Such resources may include financial resources, inventory, human skills, production resources, or information technology. To utilize project resources effectively and ensure that they meet their anticipated performance goals, project managers play the role of both people manager and functional manager. Project resource management techniques address how resources need to be managed while working in different project situations. Table 24 shows the Distributing The Project Resources of Equipment and Tools.

	Sinor/Top Management Team		Geologist Modeling Team				Simulation Modeling Team			
Project Resources	Project Sponsor/Owner	Project Manager	Geophysic	Petrophysics	Geologist	Geomodeling	Reservoir Engineer	Simulation Engineer	Production Engineer	Total
Office	-	1	1	1	1	1	1	1	1	8
Personal Computer	-	1	1	1	1	1	1	1	1	8
Office Telephone	-	1	1	1	1	1	1	1	1	8
Normal Printer for A4 and A3 papers	-	1	-	-	1	-	-	1	-	3
Advanced Printer for Map	-	-	-	-	-	-	-	1	-	1
Technichal Software	-	-	1	1	1	1	1	1	1	7
Project Management Software	-	1	-	-	1	-	-	1	-	3
Coffe Machain	-	1	-	-	1	-	-	1	-	3
Meeting Room	-	1	-	-	-	-	-	-	-	1

Table 24: The Distributing The Project Resources of Equipment and Tools

22. Project Procurement

Procurement is the act of obtaining goods, supplies, and/or services. Therefore, project procurement is obtaining all of the materials and services required for the project. Project procurement management encompasses the processes used for making sure project procurement is successful. Project procurement management includes three primary processes. These are:

1. Plan procurements
2. Conduct procurements
3. Administer (or control) procurements

22.1 Develop the procurement execution process and contractor selection

Procurement Execution Process

The project procurement cycle reflects the procurement activities from the decision to purchase the material or service through to the payment of bills and closing of procurement contracts. Managing the procurement of products, materials, goods and services effectively consists of establishing and following process steps through the entirety of the procurement lifecycle. These process steps can differ by organization, based on company needs and project goals. Procurement execution processes typically include the following key steps:

Step 1: Specifying and Planning

Establish the product or service need, set the specifications for the product itself and conduct planning, or forecasting, based on existing data and projections, for when and how the product is ordered or reordered.

Step 2: Identifying and Selecting Suppliers

Identify and select a supplier to meet product needs, either from established relationships with approved vendors or preferred suppliers or by researching new suppliers and sending out an RFX: a request for information/proposal/quotation.

Step 3: Negotiating and Contracting

Negotiate the best price and terms for the product through competitive bidding from suppliers with their quotes and then direct negotiations to clearly communicate requirements and set expectations. With all terms agreed upon, finalize and sign the supplier contract.

Step 4: Placing the Purchase Order

The purchase order (PO) specifically defines the price, product specifications, and all terms and conditions of the product and/or service being supplied. It also serves as the “source of truth” of the product being procured for various impacted business units.

Step 5: Expediting

Expediting the product order is sometimes necessary (i.e. earlier than expected product obsolescence, a schedule change, etc.). Examining the timeliness of deliveries during this step can reveal underlying issues to address, such as lack of clarity on payment dates, delivery times and completion of work.

Step 6: Receipt and Inspection of Purchase

Review all orders against the established specifications and quality standards and conduct “a three-way match” of the PO with the invoice and the packing slip/receiving document. If what was delivered does not meet the standards specified, completing a receiving discrepancy report may be part of this step.

Step 7: Invoice Clearing and Payment

Align purchasing and accounts payable to complete the process of buying the product after inspection and confirmed document alignment (PO, invoice, packing slip/receiving document).

Step 8: Maintaining Records and Relationships

Retain all proper records in the case of an audit, for tax information, to confirm product warranty and for ease of product re-ordering. Provide data and feedback to the supplier based on key performance indicators to identify areas for improvement and/or needed changes in the product or the supplier contract.

Selecting the Contract Approach

The technical teams typically develop a description of the work that will be outsourced. From this information, the project management team answers the following questions:

- **Is the required work or materials a commodity, customized product or service, or unique skill or relationship?**
- **What type of relationship is needed: supplier, vendor, or partnership?**
- **How should the supplier, vendor, or potential partner be approached: RFQ, RFP, or personal contact?**
- **How well known is the scope of work?**
- **What are the risks and which party should assume which types of risk?**
- **Does the procurement of the service or goods affect activities on the project schedule’s critical path and how much float is there on those activities?**
- **How important is it to be sure of the cost in advance?**

The procurement team uses the answers to the first three questions listed above to determine the approach to obtaining the goods or services and the remaining questions to determine what type of contract is most appropriate. A key factor in selecting the contract approach is determining which party will take the most risk. The team determines the level of risk that will be managed by the project and what risks will be transferred to the contractor. Typically, the project management team wants to manage the project risk, but in some cases, contractors have more expertise or control that enables them to better manage the risk

associated with the contracted work. Selecting the Contract Approach typically include the following key steps:

1- Soliciting Bids

A solicitation is a process of requesting a price and supporting information from bidders. The solicitation usually takes the form of either an RFQ or an RFP. Partnerships are pursued and established differently on a case-by-case basis by senior management.

2- Qualifying Bidders

Potential bidders are people or organizations capable of providing the materials or performing the work required for the project. On smaller, less complex projects, the parent company typically has a list of suppliers and vendors that have successfully provided goods and services in the past, and the project has access to the performance record of companies on that list. On unique projects, where no supplier lists exist, the project team develops a list of potential suppliers and then qualifies them to become eligible to bid on project work. Eligible bidders are placed on the bidders' list and provided with a schedule of when work on the project will be put out for bid. The eligibility of a supplier is determined by the ability to perform the work in a way that meets project requirements and demonstrates financial stability. The ability to perform the work includes the ability to meet quality specifications and the project schedule. During times when economic activity is high in a region, many suppliers become busy and stretch their resources. The project team investigates the potential suppliers before they are included on the bidder's list, to ensure that they have the capacity and track record to meet deadlines.

3- Request for Quote

An RFQ focuses on price. The type of materials or service is well defined and can be obtained from several sources. The bidder that can meet the project quality and schedule requirements usually wins the contract by quoting the lowest price.

4- Request for Proposal

An RFP accounts for price but focuses on meeting the project quality or schedule requirements. The process of developing a proposal in response to an RFP can be very expensive for the bidder, and the project team should not issue an RFP to a company that is not eligible to win the bid.

5- Evaluating Bids

Evaluation of bids in response to RFQs for commodity items and services is heavily graded for price. In most cases, the lowest total price will win the contract. The total price will include the costs of the goods or services, any shipping or delivery costs, the value of any warranties, and any additional service that adds value to the project. The evaluation of bids based on RFPs is more complex. The evaluation of proposals includes the price and also an evaluation of the technical approach chosen by the bidder. The project team

evaluating the proposal must include people with the expertise to understand the technical aspects of the various proposal options and the value of each proposal to the project. On more complex projects, the administrative part of the proposal is evaluated and scored by one team, and the technical aspect of the proposal is evaluated by another team. The project team combines the two scores to determine the best proposal for the project.

6- Awarding the Contract

After the project team has selected the bidder that provides the best value for the project, a project representative validates all conditions of the bid and the contract with the potential contractor. Less complex awards, like contracts for printed materials, require a reading and signing of the contract to ensure that the supplier understands the contract terms and requirements of the project schedule. More complex projects require a detailed discussion of the goals, the potential barriers to accomplishing those goals, the project schedule and critical dates, and the processes for resolving conflicts and improving work processes.

7- Managing the Contracts

The contract type determines the level of effort and the skills needed to manage the contract. The manager of supplier contracts develops detailed specifications and ensures compliance with these specifications. The manager of vendor contracts ensures that the contractors bidding on the work have the skills and capacity to accomplish the work according to the project schedule and tracks the vendor's performance against the project needs, supplying support and direction when needed. The manager of partnering arrangements develops alignment around common goals and work processes. Each of these approaches requires different skills and various degrees of effort.

After the contract is awarded, the project team tracks the performance of the contractor against performance criteria in the contract and his or her contribution to the performance of the project. Usually, contractors deliver the product or service that meets the quality expectations and supports the project schedule. Typically, there are also one or two contractors that do not perform to project expectations. Some project managers will refer to the contract and use it to attempt to persuade the contractor to improve performance or be penalized. Other project managers will explore with the contractor creative ways to improve performance and meet project requirements. The contract management allows for both approaches to deal with non-performing contractors, and the project team must assess what method is most likely to work in each sit

22.2 Develop Vendor Comparison Model (Scoring Model)

A scoring model is a tool you use to assign a comparative value to one or more projects or tasks. Scoring models allow governance teams to rank potential projects based on criteria such as risk level, cost, and

potential financial returns. The type and weight of criteria you choose will affect the results, so select the most critical factors for your organization and weigh them accordingly. While your company's highest-level decision-makers will ultimately choose which elements are most important, a project manager may facilitate this decision-making process by providing a survey or template to determine the most important factors for each respondent.

A scoring model should be simple and customizable, as well as produce results that are easy to understand. Scoring models provide insight into the overall value of a project, but since "value" is subjective, your model must reflect your organization's values.

Project scoring models are a crucial tool for project selection. By creating a value-weighted list to compare potential projects, an organization can easily identify where it should allocate resources and identify its next course of action.

"Management teams need to craft a strategy, and then agree on criteria and weighting factors for prioritizing projects,

"Compare all projects against each other and repeat the process for each criterion. The objective is to come up with an ordered list of projects."

There are four key steps to building scoring models for any kind of project. You need to have a goal in mind, determine your scoring criteria, assign your scores to those criteria, and compare the results of your aggregated data.

Step 1: Identify the Scoring Criteria:

Survey your governance board and determine the most relevant scoring criteria for your projects. If possible, limit your criteria to no more than five factors for ease of comparison.

Step 2: Weight the Scoring Criteria:

Determine the weight of each criterion. They may all be equal weight, or you may find that some criteria are more essential than others. Consider using our scoring criteria selection template to prioritize your criteria and simplify this process.

Step 3: Record Your Input:

Input your scores for each criterion and each project. Consider finding an average score for each element from the scores of your individual selection team members.

Step 4: Analyze the Results:

Compare the resulting scores and determine if you need more information to reach a consensus. If two or more projects receive the same score, consider comparing specific budgets or timelines to narrow the choice further. It is good practice to monitor your lead scoring results regularly to know when your lead scoring model requires an iteration. Be open to maintenance, tweaking, testing, and improvement. Developing a lead scoring model takes time, and it can always be improved.

Table 25 shows the **Scoring Model** (Vendor Comparison Model).

No	Criteria	Weight
1	Hardware and Software	25
1.1	Number of specific PCs will install	8
1.2	New Hardware and technology system will apply	7
1.3	Number of main software licenses	10
2	Static and Dynamic Scope of Work	30
2.1	Timeframe	5
2.2	Review and analysis of Reservoir Engineering Data	5
2.3	Static model review	5
2.4	Dynamic Model Construction and Initialization	5
2.5	History Matching	5
2.6	Development Strategies	5
3	Manpower	40
3.1	Engineer with more than 10 years experiences	12
3.2	Expert with more than 20 years experiences	13
3.3	Contractor experiences related with regional reservoir	8
3.4	Availability of manpower	7
4	Training to KJO engineers	5
4.1	Number of Software will be training (i.e. Petrel, Eclipse, etc)	3
4.2	Timeframe for training	2
Total Score		100

Table 25: The Scoring Model (Vendor Comparison Model).

23. Project Plan and Control

Project Planning & Control supports the publication of the Association for Project Management's (APM) guide, 'Planning, Scheduling, Monitoring, and Control – The Practical Project Management of Time, Cost and Risk.'

In a project, it is very easy to lose sight of the actual objectives. Large projects acquire a life of their own and, if left to themselves, can spin out of control.

There have to be mechanisms to control the project and to ensure that the project is proceeding as planned. Mostly, the control over a project focuses on the following three elements of the project:

- 1- Performance
- 2- Cost
- 3- Time

The objective of having controls is to find out that there is a problem and then to alter the course by taking corrective measures. Project control is not simply waiting for things to go wrong and then fixing them. It is chiefly to have systems to identify problems before they manifest themselves. There are three basic types of control mechanisms- cybernetic, go/no-go, and post-performance.

23.1 Invitation and Virtual Record of a Virtual Meeting

In recent months, virtual meetings have become a necessity for organizations of every type because of COVID-19.

Regardless of the type of meeting you are hosting, you will want to do all that you can to ensure that the participants have the proper notice of your meeting and that they're prepared to present and discuss all topics when they log in. As a virtual meeting presenter, you'll also want to be sure that the participants are actively engaged during the meeting. Virtual meetings give you much control over your meeting time which makes it easier to adhere to designated time allotments. A virtual meeting agenda template will help you to be sure that you're starting and stopping your meetings on time and that they are productive.

Some techniques for making an effective virtual meeting:

- 1- Focused meetings are better than ambitious meetings
- 2- Keep it short
- 3- Test it out

Don't be afraid of trial and error. Try various methods of meeting planning to see what works best for your company. After a meeting, ask for feedback or ways to improve the process for the next team. Maybe your team needs more time in advance to brainstorm, or maybe the status calls should be more or less frequent.

To create a perfect meeting agenda for virtual teams:

- 1- Set the objective of the meeting
- 2- Choose the meeting duration
- 3- Double-check the invite list
- 4- Give each presenter a set amount of time

Tables 26, 27 and 28 illustrate the virtual meeting attendance template and Topics & Duration for each member team and virtual meeting agenda template, respectively.

Date	Every Sunday	Duration: 50 Min	Time	At 9:00 A.M
Link to virtual meeting:		www.Zoom.com		
Contact name and phone number for people having questions or having trouble logging in		List of attendees and their titles or positions		
Name	Phone No.	Name	Positions	
1- Ahmed	114206666	1- Ahmed	Project Manager	
2- Mariam	114206655	2- Mariam	Geophysics	
3- Arwa	114206644	3- Arwa	Petrophysics	
4- Nada	114206633	4- Nada	Geologist	
5- Fawzia	114206622	5- Fawzia	Geomodelling	
6- Faisal	114206611	6- Faisal	Reservoir Eng.	
7- Mohammed .H	114206600	7- Mohammed .H	Simulation Eng.	
8-Mohammed .A	114205577	8-Mohammed .A	Producton Eng.	

Table 26: Virtual meeting attendance template

Topic	Presenter	Duration	Preparing work to bring on the deck
Introduction	Ahmed	2 Min	
Topic 1	Fawzia	10 Min	Send over slides to add to the deck
Topic 2	Mohd .H	5 Min	N/A
Topic 3	Arwa	5 Min	N/A
Topic 4	Mariam	7 Min	Prepare one action items
Topic 5	Faisal	10 Min	Send over slides to add to the deck
Topic 6	Mohd. A	3 Min	N/A
Ending /Questions	Ahmed	8 Min	

Table 27: Topics & Duration for each member team

Virtual meeting agenda template			
Date	01/07/2022	Time	11:00 AM
Access Code		1234ABCD	
Attendees: Ahmed , Arwa , Fawziah , Faisal , Mariam , Nada , Mohammed .A , Mohammed .H			
Agenda: <u>Last meeting follows up:</u> • X • X2 • X3 • X4 <u>New Business:</u> • Y • Y2 • Y3 • Y4 <u>Action Items:</u> • Z • Z2 • Z3 • Z4 <u>Adjournments:</u> • W • W2 • W3 • W4 Next Meeting's Agenda: • L • L2 • L3 • L4			

Table 28: Virtual meeting agenda template

Tips for Getting the Most from Your Virtual Meeting Agenda:

- 1- Publish the virtual meeting agenda at least five days before the date of the meeting.
- 2- Host a group call with meeting presenters.
- 3- Make a few announcements at the beginning of the meeting.
- 4- Use polling tools and ask questions to encourage engagement.
- 5- Contact any meeting presenters before the meeting.

- In addition to listing presentations and speakers, it helps to contact each presenter directly at least a few days before the meeting to make sure they're prepared and ensure they can complete their presentation within the allotted time.

6- Document your meeting.

23.2 The performance measurement course & Reports

One of the key tasks in project management is the tracking of the progress and performance of a project. As a prerequisite, the criteria for measuring performance need to be clearly defined and agreed upon by the project's stakeholders. This is done by establishing a performance measurement baseline (PMB).

a performance measurement baseline (PMB) is a tool used by project managers to define project parameters – outline the project cost, scope, and schedule. When the estimates are approved and set in stone, the PMB becomes a reference center for measuring project success, earned value, or any deviations from the initial plan. Mainly, a PMB is needed to compare your project plan and actuals to an initially approved budget. It's a measuring stick you'll pull out every time stakeholders approach for updates. Figures 24 and 25 show the Performance measurement baseline and PMB Focused on (Cost, Technical, Schedule).

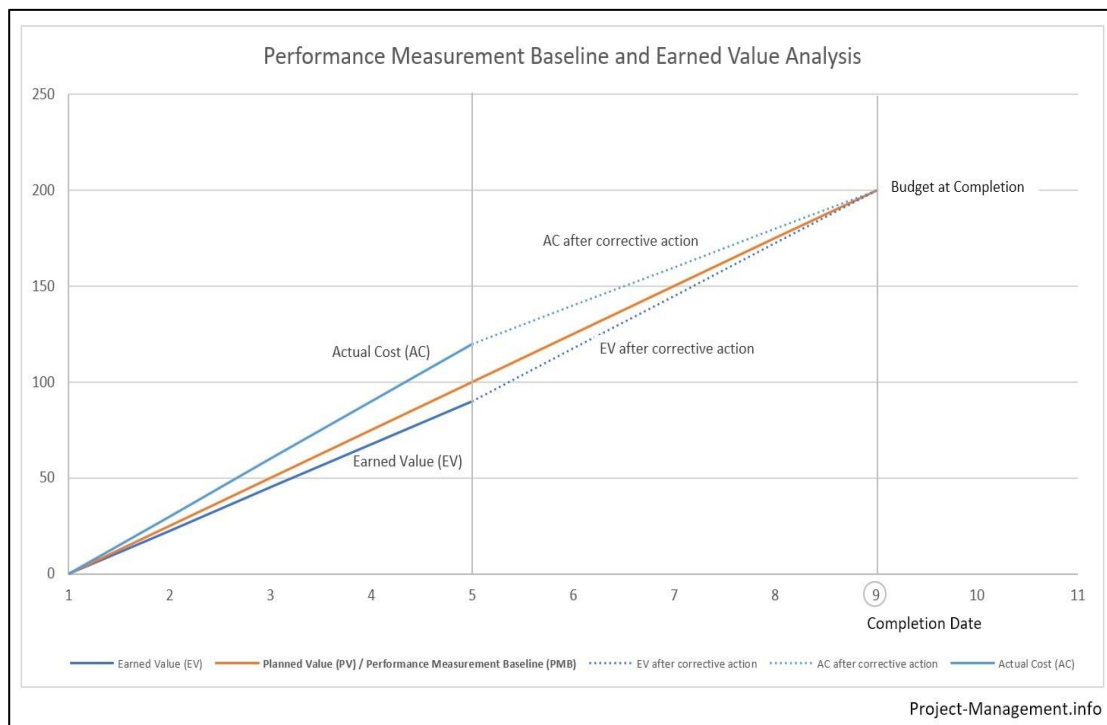


Figure 24: Performance measurement baseline

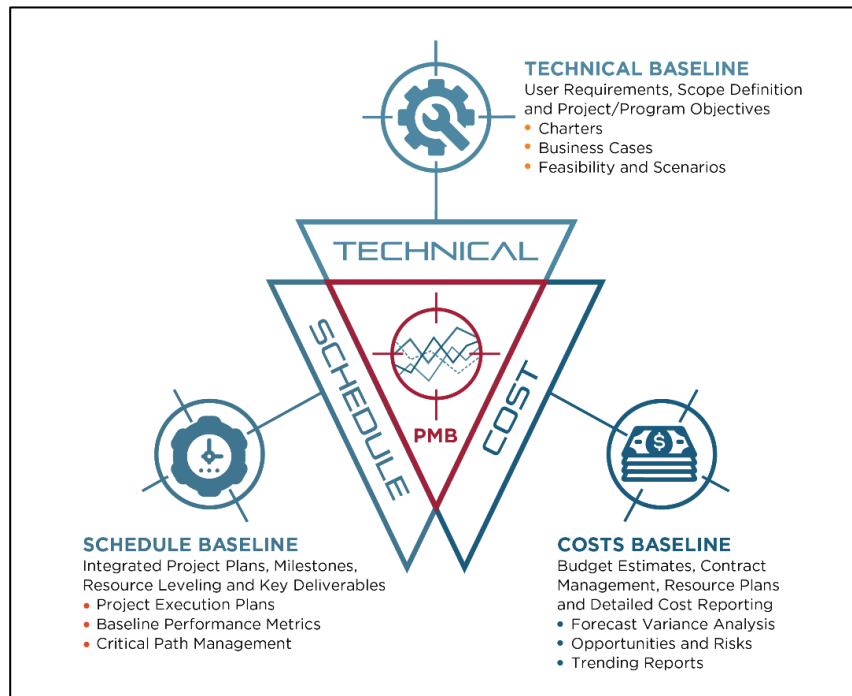


Figure 25: **PMB** Focused on (Cost, Technical, Schedule)

The benefits of a performance measurement baseline:

- 1- Improved Communication.
- 2- Better risk and change control.
- 3- Finer estimates and project experiences overall.
- 4- Effective performance assessment.
- 5- Higher returns on investment.

Not setting a baseline, in turn, makes it difficult to understand project management KPIs.

Types of project baselines:

1- Technical baseline.

The scope baseline is your approved scope statement. It's a detailed set of project requirements divided into milestones and tasks that provides a comprehensive snapshot of project deliverables. Scope baseline is used as a basis for comparison between the initially approved project deliverables and the actual project performance.

2- Schedule baseline.

As simple as that, the schedule baseline is the approved project schedule. It's the project timeline with start and end dates, assigned roles, and estimates that you were able to build with the knowledge you had before

the project began. Schedule baselines are then used to calculate the variance between planned and actuals. For example, if a milestone was planned for 2 weeks, but it took 3 weeks to complete during execution, there is a 1-week variance, eventually meaning a 1-week delay in the project schedule.

3- Cost baseline.

The cost baseline answers the question: How much will the project cost? In other words, your approved project budget. In turn, the schedule baseline helps determine when this money will be spent.

Each of the three baseline types above can reveal useful trends about projects when they're in progress. All together they contribute to the performance measurement baseline.

Performance reporting components:

Performance reporting is the process of collecting raw data, deciphering the coherence between the goals and process, and creating and distributing performance information to stakeholders. There is an added aspect of reporting and that is the clarification of the use of resources to obtain the goals that have been set. In a performance report clarification should be done alongside the information provided on scope, cost, schedule quality, and procurement, as well as the following inputs, should be taken into consideration.

- 1- **Data on work performance:** This information outlines the work that is being performed, completed recently, and what the follow-up steps will be.
- 2- **Units of Performance measurement:** These measurements include schedule variances, cost variance, cost performance index, schedule performance index, and planned value among others. These values help with reporting unbiased and relevant quantifiable information, thus making better reports.
- 3- **Completed forecast:** This measure is the predictor of future roadblocks in the process. Forecast completion or completed forecast is often expressed using two factors: estimate at completion and estimate to complete, which gives time and amount predictions for completing a project.
- 4- **Measures for quality control:** Activities that compare results to quality standards and processes are called quality control measures. These are put in place to ensure the product provided is of the highest quality.
- 5- **Project Management Plan:** This contains the performance measurement baseline, which is the basis for approved management control.
- 6- **Requested changes approval:** In the change request approval input, any changes that have been approved are ready to be put in place. After project changes have been approved, they need to be placed in front of stakeholders so these changes can be communicated and implemented.
- 7- **Produced actions:** These refer to all the actions, results, products associated with producing and completing the task.

Table 29 and 30 show the performance measurement methodology template and performance measurement dashboard, respectively.

PERFORMANCE MEASURE:	EXAMPLE		
Owner:			
<i>The person is responsible for collecting the data. Provide their name and phone number.</i>			
Why is this measure being used or reported?			
<i>Indicate one or more: Vision Plan, Strategic Plan, Department Budget Scorecard, Benchmarking Only, or Other (indicate specific use).</i>			
Is this a benchmarked performance measure?		Indicator Type:	
<i>Indicate another benchmarking source</i>		<i>Input, Output, Efficiency, Outcome</i>	
Why It Matters:			
<i>Thoroughly describe the measure, explaining its significance to the city and/or department; why you think it is important to track.</i>			
Definition and Data Source:			
<i>How would this performance measure be recreated? What electronic database contains this data? How the report is run? Who runs the report? Who maintains the excel document? Is this measure calculated by using other measures or data? If so, provide the equation. If the data source is from another agency, such as Broward County, be as specific as possible as to the department and division, and how the information was accessed.</i>			
Reporting Frequency:		Accumulation:	
<i>How often is this performance measure reported and evaluated? (Monthly, Quarterly, Fiscal Year, Calendar Year, etc.)</i>		<i>How is this performance measure accumulated throughout the reporting year? (Average, Sum, etc.)</i>	
Unit:		FY 2021 Target:	
<i>Days, Documents, Numbers, Dollars, Calls, etc.</i>		<i>What is the FY 2021 target for this measure?</i>	
Target Type:			
<i>How was the target established? Is it a Regulatory Requirement, Industry Standard, Benchmark (if so, average or best); Customer Requirement (how was this determined?); Historical Performance (how many years?); Within our Control, Process Capacity, Management Wisdom, Stretch Target or Other (specify)?</i>			

Table 29: Performance measurement methodology template

Performance Measurement Dashboard

PROJECT NAME	Field Development Plan for Oil and Gas Reservoirs (FGP)		
REPORT DATE	25-Nov-2021		
PROJECT STATUS	On track		
COMPLETED		34%	

TASKS	ASSIGNED TO	PRIORITY	STATUS
Set Kick-Off Meeting	Ahmed		COMPLETE
Agree on Objectives	Mariam	★	COMPLETE
Detailed Requests	Faisal		COMPLETE
Hardware Requests	Nada	★	OVERDUE
Final Resource Plan	Mohammed .H		COMPLETE
Staffing	Fawziah	★	IN PROGRESS
Technical Requests	Mohammed .A		IN PROGRESS
Testing	Ahmed	★	NOT STARTED
Dev. Complete	Anwa	★	NOT STARTED
Hardware Configuration	Mariam		NOT STARTED
System Testing	Ahmed	★	NOT STARTED
Launch			

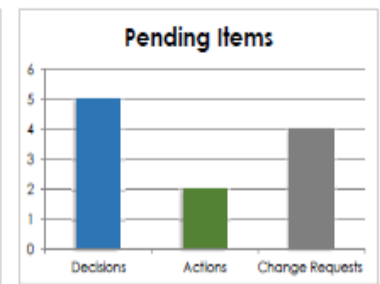
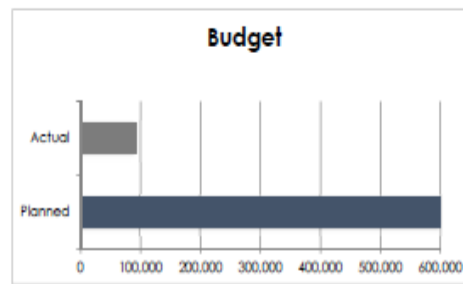
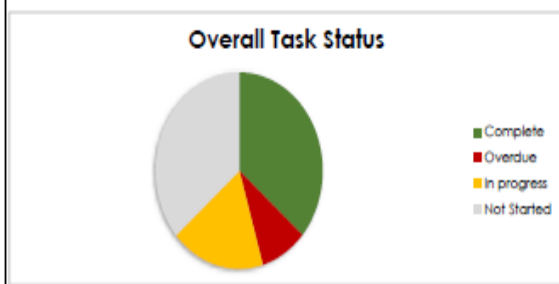
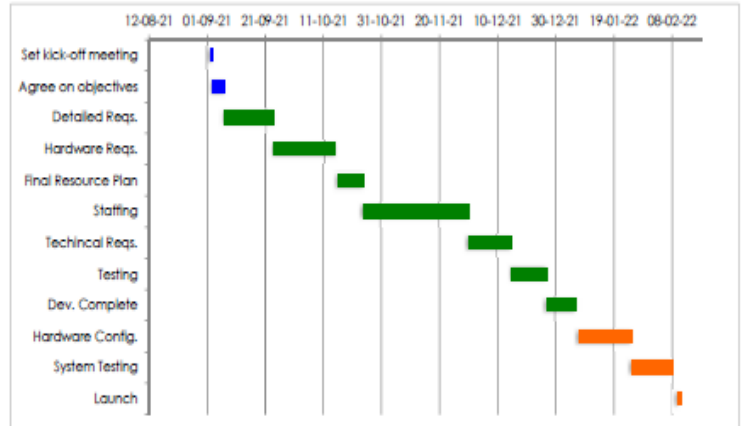


Table 30: Performance measurement Dashboard

23.3 Change Request Model

Every project addresses changes differently according to their needs and process maturity and supports a flexible change-management system to accommodate many styles of managing change. Table 31 explains the Change Request Form.

Change Request Form			
Project Name		Field Development Plan for Oil and Gas Reservoirs	
Request No.	8	Date of Request	23 Nov. 2022
Requested by	Project Manager		
Change Description			
Increase expert technical manpower to the project.			
Change Reason			
To add value to the project which will improve the quality of product and deliverables.			
Impact of Change			
Impact on time and cost (decrease the time and increase the cost of the project).			
Decision			
☒ Approved ☐ Rejected ☐ Approved with Modification ☐ Deferred			
Justifications			
Will reduce the project period and increase the quality of product.			

Table 31: Change Request Form

24 Project Risk and Opportunity

24.1 Risk and Opportunity (Definition, Benefits and Technique of identification by using RBS

Risk is often defined in terms of uncertainty or deviation from the expected/required outcomes. Risk management helps and supports an organization to identify, evaluate, analyze, monitor, and mitigate the risks that threaten the achievement of the organization's strategic objectives in a disciplined and systematic way. Risk management is intentionally proactive, not reactive. It can be as simple as one crew member mentioning that a coworker needs to wear her safety glasses, or it may involve something as complex as a full asset allocation modeling of all of your organization's capital assets. Risk management practices can even be applied to events as broad and far-reaching as the loss of a major employer in the community. Different situations and events can simultaneously result in both good and bad consequences. Each consequence may require a different risk management strategy. The following are the most benefit of the risk management:

- A proactive rather than reactive approach.
- Reduces surprises and negative consequences.
- Prepares the project manager to take advantage of appropriate risks.
- Provides better control over the future.
- Improves chances of reaching project performance objectives within budget and on time.

There are many studies of cases to manage the risk for any projects to reduce the likelihood and the impact of any risks occurred. The following are case studies for how to manage the risks in oil and gas companies:

2.1 Risk Management of Oil and Gas Company in Terms of Strategic Transformations

Lenkova (2017) explained the urgency of the use of risk management in the oil and gas industry. The author explained the risk management functions of Russian oil and gas companies. Lenkova demonstrated and distinguished the major risks. Political, socioeconomic, environmental, and scientific-technical external risks are identified. However; the author proposed to prepare the internal risks as well; risks of production activity, risks of the support activity, risks in the reproductive sphere, risks in the sphere of circulation, and risks in the sphere of management [5].

2.2 Necessity to Study of Risk Management in Oil and Gas Industries (Case Study: Oil Projects)

Karami (2020) explained the need to study the risk management in oil and gas related projects as many projects experience operational failures and issues and this could be prevented by risk management

methods. The author also explained the advancement of the software and hardware methods in risk assessment approaches. The authors also explained the importance of risk management in Iranian companies and how the implementation of such methods will aid project managers in succeeding in their projects [6].

The risk management process begins by trying to generate a list of all the possible risks through brainstorming, problem identification and risk profiling that could affect the project. Typically, the project manager pulls together, during the planning phase, a risk management team consisting of core team members and other relevant stakeholders. Research has demonstrated that groups make more accurate judgments about risks than individuals do. Figure 26 shows the risk breakdown structures (RBS) to support and help the management teams to identify and eventually the analyze risks.

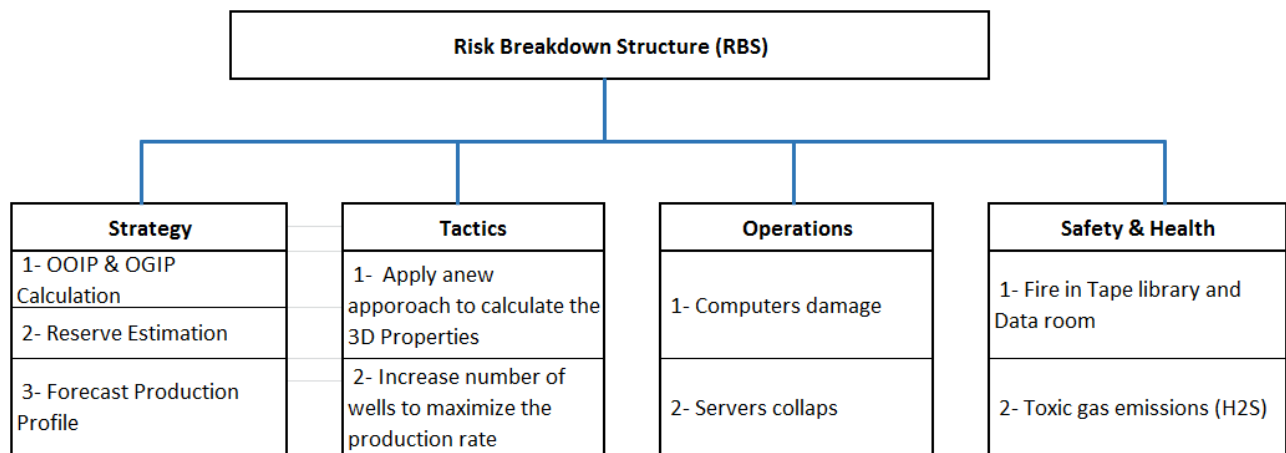


Figure 26: Risk Breakdown Structure (RBS)

24.2 Risk Register

After submitted the RBS, the Risk Register was defined to present the risk type and level. Table 32 shows the risk register.

Item No.	Risk Name	Risk Type
1	OOIP & OGIP Calculation	opportunity
2	Reserve Estimation	opportunity
3	Forecast Production Profile	opportunity
4	Apply anew apporoach to calculate the 3D Properties	control
5	Increase number of wells to maximize the production rate	control
6	Computers damage	hazard
7	Servers collaps	hazard
8	Fire in Tape library and Data room	hazard
9	Toxic gas emissions (H2S)	Compliance

Table 32: Risk Register

24.3 Qualitative Risk Analysis

Qualitative risk analysis is the “process of prioritizing risks for further analysis”. All risks should be prioritized; therefore, a qualitative analysis should be performed. The identified risks should be captured on the risk register, and the team should perform the qualitative analysis to update the probability and impact of the risks. The qualitative analysis should be performed throughout the project life cycle and not as a one-time activity as events can occur that will impact the probability, impact or both factors of risks.

After defined and submitted the risk register and risk matrix, the risk contingency budget should be calculated to cover the impact of risks on project by using Expected Monetary Value technique (EMV). EMV is a quantitative analysis by multiplying the risk probability with the cost impact [7]. Table 33 shows the qualitative risk analysis which will be added to the 9 budget as a risk contingency budget.

Item No.	Risk Name	Risk Type	Risk level	
			Likelihood	Impact
1	OOIP & OGIP Calculation	opportunity	High	Low
2	Reserve Estimation	opportunity	High	Low
3	Forecast Production Profile	opportunity	High	Low
4	Apply anew apporoach to calculate the 3D Properties	control	Low	Low
5	Increase number of wells to maximize the production rate	control	Low	Low
6	Computers damage	hazard	Low	High
7	Servers collaps	hazard	Low	High
8	Fire in Tape library and Data room	hazard	High	High
9	Toxic gas emissions (H2S)	Compliance	High	High

Table 33: The qualitative risk analysis

24.4 Risk Response Strategies

After defined the risk register, the risk response was defined to present the strategy of response to deal with the risk, control measure and action to the risk. Table 34 shows the risk response strategies.

Item No.	Risk Name	Risk Type	Risk level		Strategy of Respons	Control Masure	Action to the risk
			Likelihood	Impact			
1	OOIP & OGIP Calculation	opportunity	High	Low	Treat	Corrective	Adopt
2	Reserve Estimation	opportunity	High	Low	Treat	Corrective	Adopt
3	Forecast Production Profile	opportunity	High	Low	Treat	Corrective	Adopt
4	Apply anew apporoach to calculate the 3D Properties	control	Low	Low	Tolerate	Detective	Accept
5	Increase number of wells to maximize the production rate	control	Low	Low	Tolerate	Detective	Accept
6	Computers damage	hazard	Low	High	Transfer	Directive	Adapt
7	Servers collaps	hazard	Low	High	Transfer	Directive	Adapt
8	Fire in Tape library and Data room	hazard	High	High	Terminate	Preventive	Avoid
9	Toxic gas emissions (H2S)	Compliance	High	High	Terminate	Preventive	Avoid

Table 34: Risk Response Strategies

After defined the risk register and the risk response strategies, the risk matrix was used to simplify the risk register and response strategies as shown in figure 27.

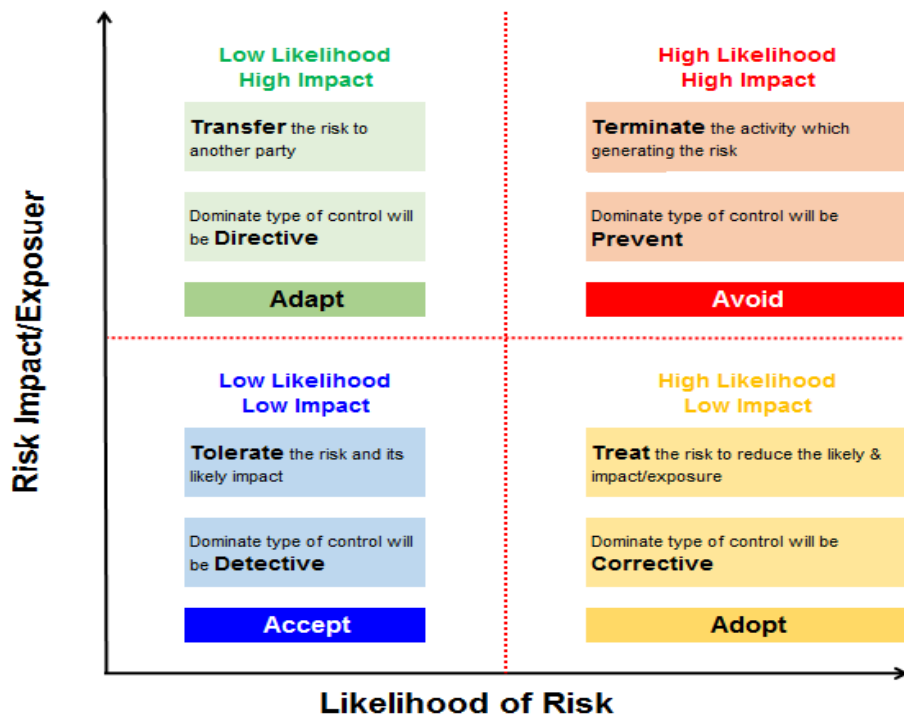


Figure 27: Risk Matrix

The Risk Matrix is a matrix that is used during risk assessment to define the level of risk by considering the category of probability or likelihood against the category of consequence severity. Also, used to show the strategy of response and the controls measures to the risk. This is a simple mechanism to increase visibility of risks and assist management decision making.

When the risk materialize at **High likelihood and High impact**, the strategy of response to this risk will be **Terminate** the activity which generating the risk and the dominate type of control measure will be **Preventive controls** and the organization should decide to **Avoid** this risk.

For the risk occurred at **High likelihood and Low impact**, the strategy of response to this risk will be **Treat** the risk to reduce the likely & impact/exposure and the dominate type of control measure will be **Corrective controls** and the organization should decide to **adopt** contingency plans and responses.

For the risk materialize at **Low likelihood and High impact**, the strategy of response to this risk will be **Transfer** the risk to another party and the dominate type of control measure will be **Directive controls** and the organization should decide to **adapt** the activities and procedures.

Finally, When the risk materialize at **Low likelihood and Low impact**, the strategy of response to this risk will be **Tolerate** the risk and its likely impact and the dominate type of control measure will be **Detective controls** and the organization should decide to **Accept** this risk.

25 Project Stakeholder

Every project has stakeholders. Yet the number and involvement of stakeholders vary greatly among the different types of projects and industries. A small, lean software development project, for instance, might only have a few stakeholders. On the other hand, a mega-project, e.g. construction of infrastructure, can involve a huge number of individual stakeholders and groups of stakeholders. Irrespective of the size of the project, managing a project's relationship with stakeholders is crucial to ensure project success. This is especially true for influential and interested stakeholders.

25.1 Stakeholder Engagement Assessment Matrix

The Stakeholder Engagement Assessment Matrix is a simple yet powerful project management technique to document desired and monitor actual engagement levels of stakeholders. It helps identify potential gaps in the involvement of stakeholders. Generally, the stakeholders may fall in one of the five levels of engagement namely:

- Unaware,
 - Resistant,
 - Neutral,
 - Supportive &
 - Leading"
- The current level of engagement is documented with a "C".
 - The desired level is represented with a "D".

A "C" can basically occur in any of these columns. However, a "D" is typically not applicable for the "unaware" or "resistant" columns for obvious reasons (do you really wish to have resistant stakeholders in your project?).

It is important to see the current levels of engagement of each stakeholder as illustrated in table 35 and ensure that they all become supportive of the project.

Stakeholder Engagement Assessment Matrix									
Project Manager :				Ahmed Zakaria					
Sr.	Name	Role	Interested	Influence	Unaware	Resistant	Neutral	Supportive	Leading
1	EXPOG	Owner/Sopnsor	H	H					C, D
2	Ahmed	Project Manager	H	H				C	D
3	Mariam	Geophysic	H	L			C		
4	Arwa	Petrophysics	L	L				C	
5	Nada	Geologist	L	H				C	D
6	Fawzia	Geomodeling	H	L				C	
7	Faisal	Reservoir Engineer	L	L				C	
8	Mohammed	Simulation Engineer	H	H				C	D
9	Abdullah	Production Engineer	L	L			C		
10	Abdulaziz	Facility Engineer	H	H				C	D
H= High L= Low C= Current Engagement Level D= Desired Engagement Level Note: - Different stakeholders with similar influence/interest can have different level of engagements - Some stakeholders can have the same engagement level as both current and desired level.									

Table 35: Stakeholder Engagement Assessment Matrix

26 SUMMARY

- The complicated chains of command which can slow down decision-making.
- Inconsistencies in management at different levels which can impede work
- Delays in communicating vertically through the levels and horizontally between teams
- Disconnect of employees from top-level management
- We note that the AC curve exceeds the PV curve since the beginning of the project with a slight exceedance that was broken in the last month and that the acquired value is in continuous improvement, and according to performance indicators and reassessment of risks after the end of the half-period of the project and the continuity of work in this way, we will not find a large gap between the planned and actual work with an increasingly clear in earned value
- Organizations tend to embrace any opportunity leading to success and try hard to eliminate any waste, weakness, or struggle can give negative affect Such as scoop creep. Also, they advocate to deliver the best services and products to the customer after addressing and analyzing them. They use multiple techniques and procedures like WBS, deeming model, SIPOC, and Ishikawawa to accomplish best outcomes.
- Post the updated Action Plan online, and set up regular Oil and Gas Subcommittee conference calls to work on the implementation of the updated Action Plan (calls to be held every 2 months).
- Identify options for continued collaboration amongst Oil and Gas Subcommittee Members and the Project Network.
- The project is on the track.
- We have overdue 1 task through the project schedule, Due to post-Covid 19 supply chain problems.
- Some corrective actions have been taken and there are still requests for change awaiting stakeholder approval at the next meeting to be held at the end of December 2021

27 RECOMMENDATIONS

- 1- It has been often found that projects fail because of a lack of appropriate and continuous stakeholder engagement. The project manager's prime responsibility includes knowing the stakeholders, knowing their needs and expectations well, and taking all of them together for ensuring project success. It is important to note that stakeholder identification, developing strategies for effectively engaging them, and actually engaging with them will be a continuously ongoing effort throughout the project life cycle.
- 2- DO NOT share information that is considered official use only, proprietary, sensitive, restricted, or protected in any way during the presentations or during any sidebar or casual conversations.
- 3- A copy of the minutes of a meeting is sent only to the members present at the meeting, and accordingly, the required work and preparation for the next meeting will be done.
- 4- In case the project is behind schedule, virtual meetings will be increased periodically until we find solutions to the difficulties we face.
- 5- Data should be available for constant review.
- 6- Because of the delay in the project schedule, Performance should be reported daily or weekly.
- 7- Suppliers should be evaluated upon the quality and delivery performance.
- 8- The connection between accounting and performance measurement should be cut.
- 9- Should convey information through as few and as simple a set of measures as possible.
- 10- It is favorable to integrate fuzzy based earned value analysis with time cost trade off optimization models. This control mechanism can help project manager to take the advantage of a comprehensive model to schedule, control, and reschedule a project through the life cycle
- 11- Tall organizations are very complex. Strategies should be in place to deal with the challenges that are likely to occur under this structure. This could include creating a decentralized organizational

structure one in which senior management assigns the authority for limited decision-making to lower levels in the organization.

12- The necessity of investing in renewable energy and implementing it on the ground to ensure the sustainability of these projects

13- In order to achieve the goals with minimal defects, institutions should not have scope creep.

14- WBS, deeming model, SIPOC, and Ishikawawa help organizations to continue improving with high quality. Thus, it is crucial to focus on these kinds of techniques to achieve the highest results.

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