

Fiberglass Factory



Group No. 5164

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Introduction

The fiberglass industry is a recent industry in the Arab countries. About 350 thousand products are produced from fiberglass materials in various aspects of uses. The fiberglass industry relies on impregnating a fabric with special specifications made of fiberglass, which is impregnated with a treated polyester material to harden after a certain time to become a type of thermoset plastic armed with fiberglass to give a solid material or material with high mechanical properties close to the properties of steel 3. One of the most popular uses for fiberglass is the manufacture of fast yachts and yachts

Among the advantages of fiberglass products is the ease of repairing fractures and cracks from industrial products, the ease of treating cracks in the products and the ease of treating fractures.

When exposed to water, it does not absorb moisture and does not change chemically or physically. Its composition is not affected under any conditions.

The purpose of the research is to explain the Manufacture of fiberglass boats suitable and environmentally friendly for the purposes of fishing, sports or picnic and service job inside Ports and others. The sizes of these boats' variety according to the nature of their use, as their weights range from 150 kg. to 2000kg. As project manager the main goal of projects to complete the project with success within the budget on time and meets the scope. The cost and the period for the project completion and customer requirements depends of the size and type and scope of modification. The nature of this kind of project has some uncertainty of outcomes, as marine industry it is known that such this kind of project it has uncertainties it's hard to find it out during the process of maintaining the engine or installation the new one that can affect the plan of schedule delivery to the customers, which will cost over budget. A relatively large budget of boat manufacture project and come up with visible recommendations to increase the business value. Starting with Cost optimization which is a business-focused, continuous discipline to control spending and cost reduction, while maximizing business value. It includes Obtaining the best pricing and terms for all business purchases. Standardizing, simplifying and rationalizing platforms, applications, processes, and services. Cost control is a key factor in cost optimization that must be applied in any company to ensure driving a profitable business. The main benefit of putting cost control in place is lowering company's overall expenses to maintain and run a sustainable and profitable business. Finally, project budget calculation is one of the key activities during the process of the project. Methods and approaches would be the following:

- Planning for the organization budget, objectives and targets.

- Manpower planning for better utilization and control of labor costs.
- Using appropriate purchasing and outsourcing techniques to control cost as it sources out material or goods from different reliable sources with cost-effective price.
- Using an appropriate design methodology led to reduce the product costs and increase its values.
- Continuous improvement

1. Strategy

A Mission statement defines the company's business, objectives and approach to reach those objectives. A Vision statement describes the desired future position of the company.

Refer to Table 1 shows the difference between vision and mission [1]

1.1. OUR VISION:

To be a pioneer in the production of fiberglass boats in the Kingdom of Saudi Arabia, exceeding our customers' expectations in terms of quality, delivery and cost.

1.2. OUR MISSION:

To produce a fiberglass environmental- friendly, at minimum cost and high-quality by designing and manufacturing in most recent way of technology.

1.3. SMART Objectives:

It is a compound word of the following:

Specific, Measurable, Attainable, Relevant, Timely

- **Specific:** You have a clear visualization of the goal in all its aspects.
- **Measurable:** Measuring the goal itself, or measuring the degree of achievement, that is, your goal can be measured by a quantity
- **Attainable:** It should be a logical, achievable goal
- **Relevant:** The goals must be related to your main goal, otherwise they are not smart goals
- **Timely:** Set yourself a time to start working on the goal, and a time to finish working on it to achieve the goal [2]

Our SMART Objectives:

- **Specific:**
 - a. The goal is to produce environmentally friendly glass fibers, at the lowest cost and high quality by designing and manufacturing with the latest technology
 - b. It will be accomplished in the Kingdom of Saudi Arabia
- **Measurable:**
 - a. There is an available market opportunity, and the project aims to covers 30% of imports
- **Attainable**
 - a. Establishment of a factory with an area of 3000 square meters
 - b. Promoting and advertising the services provided to target customers
- **Realistic:**
 - a. Increased demand for the product, which increases customers
 - b. Replacing boats with eco-friendly boats
- **Time Bound**
 - a. The project will last for one year, from 1-December-2021 to 1-December-2022

1.4. Key Performance Indicators (KPIs)

KPI is a quantifiable measure of performance over time for a specific objective. KPIs provide milestones to gauge progress, targets for teams to shoot for, and insights that help people across the organization make better decisions.

Refer to Table 2 Key Performance Indicators (KPIs)

1. **Project Scope Management**

Project Scope management is essential for project success, as project scope defines the boundaries of the project. Most of the project fail nowadays as they don't have a clear scope statement defined where every requirement is categorized as in project scope or out of project scope (Abdilahi et al., 2020).

One of the key constraints of managing project is Project scope, in order to ensure that the project scope remains consistent throughout the project following KPIs should be followed.

Degree of change in project scope should not vary more than 5% of the overall project requirements.

All the requirements in the scope should be documented, agreed and signed by all the relevant stakeholders.

2. Project Schedule and Cost Management

Project Schedule and Project cost will be measured by the Earned Value Analysis.

Earned Value Management (EVM) is one of the most scientific method used to track the progress of the project. EVM helps the project manager to measure the overall performance of the project in terms of cost. Project Manager can analyze the impact on cost due to any delays in the project (Colin & Vanhoucke, 2015). EVM doesn't only help in determining the current status of the project it also helps the project manager to forecast the project progress on the basis of current trend. In this scenario, it is important for the project manager to understand the EVM and foresee the possible risks that can delay the project in future.

The key terms that are used in EVM are as follows.

- **Planned value** – It is also termed as baseline cost of the work scheduled (BCWS). It denotes the cumulative baseline cost of the project up to the status date.
- **Earned value** – It is also termed as baseline cost of the work performed (BCWP). It denotes the cumulative value of the completed work multiplied by the baseline cost of the project up to the status date.
- **Actual cost** – It is also termed as actual cost of the work performed (ACWP). It denotes the actual cost of the completed work of the project up to the status date.
- **Schedule Variance** – It signifies the difference between the planned value and earned value in terms of cost up to the status date of the project. $SV = BCWP - BCWS$
- **Cost Variance** - It signifies the difference between how much it should have cost and how much it actually costs up to the status date of the project. $CV = BCWP - ACWP$

- **Schedule Performance Index** – It signifies the ratio of earned value to planned value. $SPI = (BCWP/BSWS)$. The ideal SPI value of the project should range between 0.9 to 1.10.
- **Cost Performance Index** - It signifies the ratio of earned value to actual cost. $CPI = (BCWP/ACWP)$. The ideal SPI value of the project should range between 0.9 to 1.10.
- **Expected at Completion (EAC)** – It signifies the expected cost at the time of completion for a task based on its performance up to the status date of the project.
- **Expected time at Completion (ETC)** - It signifies the expected time of completion for a task based on its performance up to the status date of the project.

3. Project Change Management

As Projects are dynamic in nature and some of the changes are bound to happen in the project, it is important for the project manager to establish an efficient project change management process that will help the project manager to cope up with the schedule and cost changes in the project (Parker et al., 2013).

The KPIs for Project Change Management are as follows:

- Any change in project schedule that is greater than 3 days must be approved by the Project Sponsor. Project schedule change should not increase more than 15 days for overall project.
- Any change in project cost that is greater than SAR 3,000 must be approved by the Project Sponsor. Project cost change should not increase more than SAR15,000 for overall project.
- All the change requests should be raised by the project manager and should be approved or rejected by the project sponsor.

4. Project Risk Management

The success of any project is highly dependent upon how the project manager manages the risks in the project. Project manager can use multiple methods like Delphi method, Probability Impact matrix etc. to manage risks in the project (Edwards & Bowen, 2013).

The KPIs for Project Risk Management are as follows.

- All the project risks should be updated in the risk register on monthly basis.

- All the obsolete risks should be removed from the risk register and new risks should be added to the risk register as per their priority in the project.
- Risk response strategies and countermeasure should be defined for each risk updated in the risk register.
- Contingency funds should be updated on monthly basis, the share of contingency funds should not increase more than 15% of overall project budget.

1.5. Project Charter

GCI, INC. addressed the project charter as *“The project charter is a stakeholder’s agreement, providing the written authorization to proceed with a project.”*

The project charter addresses the following:

- Roles, responsibilities, activities.
- Project management framework.
- Management commitments.
- Stakeholders and partners.
- Customer success criteria

The project charter provides a consolidated and summary-level overview of the project. It allows all stakeholders to agree on and document project scope, objectives, timeframe approach, and deliverables. The project charter is one of the first steps in the project planning process following completion of the project initiation phase. The project charter should not be confused with the investment business case (IBC). The IBC should already be completed, and the investment decision to proceed with a project should be taken before a project charter. [3]
Refer to *Table 3 Project Charter*

2. Governance, Structures and Processes

2.1. Organizational Structure

Refer to Figure 1 Organizational Structure

2.2. The practical and scientific basis of OBS

Organizational structure is *“the framework of the relations on jobs, systems, operating process, people and groups making efforts to achieve the goals. Organizational structure is a*

set of methods dividing the task to determined duties and coordinates them". (Monavarian, Asgari, & Ashna, 2007). **Organizational structure** is *"a method by which organizational activities are divided, organized and coordinated. The organizations create the structures to coordinate the activities of work factors and control the members' actions"* (Rezayian, 2005).

1. Strategy: the essentials of determining of processes for long term objectives, taking procedures and allocation of archived source of requirements. It refers to final's achievements and tools
2. Size: it has four elements:
 - a. physical capacity of organization (the number of beds in hospital, number of production lines, number of university classes)
 - b. Organization's Physical Capacity
 - c. Existing Employees in Firms: Most shared Criterion (Part time, type of industry)
 - d. Inputs and output of Organization (Customer's number, students & sale)
 - e. Resource of Material & financial.

The organization's size is effective on their structure.

3. Technology: It is a reference for the information, techniques, equipment & process to process the inputs to output
4. Environment: It is the effective forces on performance of organization which also has less control on or no control at all.
 - General environment: All effective conditions on organization but their dependency was not clear to organization (economic, cultural, political, social, legal conditions, etc.). All conditions that affect organization but their dependencies were not clear to organizations (cultural, economic, social, political, legal conditions, ..etc.).
 - Specific environment: It is a part of environment of organization as associated directly with organizations to achieve the goals. Specific environments of organizations are unique and are changed by changing the conditions (suppliers, customers, law making institutions, competitors, state, ...etc.) and the specific organization's environment are changed based on their selective domains.

Control power (strategic selection): with the best conditions of above four factors (strategy, size, technology, environment), only 50 - 60% of changes in structures are explained. Based on this view, the organization's structure is the organizational power owners' measurements results in selection of the structure by which their control is maximized. [4]

Refer to Table 4 OBS Divisions and Roles.

2.3. Project Management Office (PMO)

PMO model type and specific scope:

A project management office (PMO) is an organizational structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools, and techniques.

PMO types:

- **Supportive:** Provide a consultative role to projects by supplying templates, best practices, training, access to information, and lessons learned from other projects. (Low control).
- **Controlling:** Provide support and require compliance (Moderate control).
- **Directive:** Take control of the projects by directly managing the projects. Project managers are assigned by and report to the PMO. (High control)

In our project will select the **Directive PMO** type in order to deliver and to be responsible on the following:

1. Establishment of Project Management Office (PMO).
 - a. PMO shall report to the Project Lead and Sponsor.
 - b. The key members of the PMO should not have any other responsibilities other than the delivery of the initiatives and should be a dedicated function.
 - c. The PMO shall has cross-functional influence and reach.
2. PMO is established and is operating with clear business value proposition defined and the execution of the initiatives in the project.
3. PMO shall take into consideration the strategy. All initiatives shall be considered and incorporated.
4. PMO shall be responsible for detailing the initiatives. Draft the scope of work and design requirements for the "to-be" state.
5. PMO shall create business value, vendor identification and finalization through RFX processes and PoC's and awarding of contracts for all initiatives.

6. PMO shall ensure alignment with stakeholders on scope, requirements, and timelines of initiatives.
7. PMO shall facilitate stakeholder engagement in the execution of scope specific activities.
8. PMO shall effectively manage and integrate vendors and implementation partners.
9. PMO shall create metrics and KPIs for tracking progress, perform post-implementation reviews and manage business value realization. Define and implement metrics and KPIs for managing delivery quality. Conduct stage gate reviews for each stage post completion for all initiatives.
10. PMO shall maintain RAID logs, manage risks, issues, and opportunities. PMO shall effectively manage mitigation of identified risks.
11. Monitor and report budget utilization and control cost variance (budget planned vs actual expenditure).
12. PMO shall prepare detailed implementation plan. Orchestrate overall implementation of initiatives. Actively monitor and update plans based on Implementation status.
13. PMO shall establish team of Subject Matter Experts to help provide consulting services for initiatives that need support to progress forward.
14. PMO shall strategize and implement organizational change management (OCM) inclusive of conducting training/knowledge transfer sessions.
15. PMO shall manage program governance and provide management reporting on a periodical basis defined (technical and management reporting).
16. PMO shall serve as a focal point for all activities associated with initiatives. Manage cross-functional teams and track resource utilization.
17. PMO shall conduct functional and technical training sessions, set-up repository with training materials and system/process/data documentations. Perform assessment of the effectiveness of training, communication, and end-user engagement.

Key Elements of Delivery Excellence from the PMO

1. Clear Business Value Proposition.
2. Clear Scope & Deliverables.
3. Engaged Stakeholders
4. Governance-enabling decision making
5. Focused outcome management

6. Managed Risks and Opportunities
7. Smart Financing
8. Delivery Enabled Plans
9. Active Quality Management
10. Agile Change Control
11. Integrated Suppliers
12. High Performing Teams
13. Skilled SME's
14. Embedded Lifecycle assurance and learning
15. Adherence to Project Timelines.

Benefits of PMO:

There are numerous benefits of establishing a program management office but the key benefits are as follows:

- **Single Delivery Structure** – will have a single delivery structure and a single sponsor who will be responsible and accountable for achieving the PMO goals.
- **Interdependencies Management** – a PMO helps to effectively identify and manage interdependencies, conflicts of interest and resources between initiatives. Steering committee, program manager and project managers can make decisions that are in the best interest of the program instead of personal interests.
- **Resource Management** – Program Manager can effectively re-allocate resources for initiatives to improve effectiveness and efficiency of the initiatives.
- **Visibility & Transparency** – Overall financial and progress visibility and transparency on the initiatives being executed within the program for the management and steering committee.
- Help to reduce Costs on Assets
- Optimization of Assets associated Risks and
- Create Value on effective management and disposal of assets.

3. Compliance, Standards and Regulations

3.1. Check Compliance Model

Refer to Table 5 Check Compliance Model

3.2. Check Lists Models

Refer to:

- Table 6 Initiating Check List
- Table 7 Project Planning Check List
- Table 8 Project Execution Check List
- Table 9 Monitoring & Closing Check list

4. Power and Interest

4.1. Stakeholders Register & Power/Interest Grid Model (Point 11 & 12)

A stakeholder's Register is a document (Part of Stakeholder's Analysis Procedures) that show the information and how the stakeholder influence in the project and what are expected from them. The stakeholder's Register can be classified in many ways, here in our project will identify the stakeholder's register as Table 10.

4.2. Logical Diagram of Stakeholder Register [5]

Refer to Figure 2 Logical Diagram of Stakeholders Register

5. Organizational Values and Culture

5.1. Culture of Organization

Organization's culture defines as group of standards support employees and departments to achieve high targets, create helpful ideas and work together in our organization.

Our organization has 5 cultures try to spread which are:

- 1- Goal
- 2- Passion
- 3- Cooperation
- 4- Creativity
- 5- Success

Which short it by GPCCS.

5.2. Proposal of Organization's Values

We will help our employee to set goal for their self and for the company. E.g., we be happy if the one of our employees has goal for himself just like graduate from university. Also, we support the employees to set goal for his job as get high marketing score. Then, we spread the employees to have passion in their life and work. Happy person who loves his job that's the tall we believe in. made more channels between all employees and departments which help them to cooperate. All employees and departments have free to creativity in their jobs as they can reach their targets in efficiency and effectiveness. Finally, we will celebrate with all success happened for individual or groups.

6. Self-reflection and Self-management

6.1. "3" personal behaviors of the student that can influence on the project, their reasons and how to be eliminated (Point # 16 & 17)

Refer to Table 11 Personal Behaviors

6.2. Self-Professional Assessment (SWOT Model)

On 1960s, SWOT Strategy (SWOT Matrix) was credited by Albert Humphrey, even that it was still accepted universally. So, the SWOT Analysis is abbreviation for **Strengths, Weakness, Opportunities and Threats**. it is *"a business strategy tool to assess how an organization compares to its competition"* [6].

As shown in the Figure 3, it can be divided as External and Internal & Helpful and Harmful.

Our SWOT:

Strengths – we will evaluate departments by the ability to reach the targets e.g. we evaluate marketing department by their ability in using social media, promotions offer and advertising to bring more customer to us

Weakness – we will evaluate departments by evaluate staff delay, unplanned leave, miscommunication and etc. and how are they effect the department's KPI and targets.

Opportunities – we will evaluate departments by how departments can use general event or general situation e.g. Ministry of housing work during the past four years for housing distribution for citizens and more people have a new house and it is good time to buy fiber class industries (pools, vase, thermal insulator, roof and more)

Threats – Covid-19 is one of threats because it damages purchasing power

7. Personal Integrity and Reliability

7.1. Moral integrity Behaviors

- Close-mindedness which is against openness. When the staff reject changes and not open for new ideas
- Uncooperative when each department is working for its own without open channels with other departments.
- Not explicit when staff and departments are not honest and keep their own agenda to their own which will reflect on the others and in the company

7.2. Reflect the Moral Integrity Behaviors on Financial, Social, and Technical Influence

Refer to Table 12 Moral Integrity Behaviors Influences

8. Personal Communications

8.1. Stakeholder Analysis (Stakeholder Register)

Refer to Table 13 Stakeholder Analysis (Stakeholder Register)

8.2. Personal communications and effective communication:

Communication can be defined as the exchange of information between the concerned parties through a common communication system, which may be in the form of images, sound, words, pictorial material or symbols.

Effective communication is one of the most important elements and requirements for the success of any project, regardless of its objectives or the field in which it operates. Effective communication methods and tools will enhance cooperation between team members and thus facilitate the delivery of information and save time and effort in correcting errors resulting from misunderstanding or lack of information properly and required.

The effective communication process is affected by many surrounding factors and influences. The reception and understanding of information are based on the personality of the recipient and the extent of his comprehension or ability to process the information. It also depends on the ability of the sender and the tools used. Therefore, your task as a project manager is to make sure to prepare an effective communication plan that works to communicate the information to the person. The target is in the appropriate manner and time. Through the communication plan, the person responsible for the communications and the tools to be used are identified, and it specifies in detail how and what type of information will be shared, which will reduce the

possibility of spreading rumors, misconceptions and misinformation that would contribute to the failure of achieving project objectives.[7]

8.3. Shapes, Models, and Channels of the Personal Communication

There is no doubt that the process of communication between team members is one of the most important factors for the completion of the project within the plan, the specified time and the estimated cost, and the process of communication between team members is in a simple sense the process of exchanging information directly or indirectly, which takes several forms, including written or Orally pronounced, whether formal or informal.

The process of good communication between team members begins with a good plan for the communication process after looking at the project document and the project plan, the most important of which is the stakeholder engagement plan to know the strategies used for the participation of each member, and the project documents, the most important of which is the stakeholder register to know the members of the project And develop the appropriate strategy to communicate with each member of the communication plan among the project members, after using a number of tools to plan the communication process, for example (communication form / communication method / communication technique / analysis of communication requirements ... etc., this will result in a communication plan between Team members, which will be included in the project plan to be followed in the future in the process of communicating with all project members.

As for managing the process of communication between project members and as a project manager, to abide by what was stated in the communication plan between project members, which is an integral part of the entire project plan, using technology and the ideal model for communication between members and managing communication between everyone using communication skills and capturing responses from members. A number of changes or differences in the desire of the stakeholders involved after the start of the project that I must record in the log of events, lessons learned, or even the log of risks.

As for controlling the communication process, after reviewing and reviewing the project plan / communication plan / resource plan, and comparing and analyzing the initial data on the project performance, which was taken from the client of the communication department, information about the project's performance will be issued from it. Updating the plans affected by this change and making everyone aware of them so that the process of communication between the members is an integrated and updated service that serves all parties related to the project.

Refer to Table 14 Communication Process

9. Relationships and Engagement

9.1. Communication Matrix

Communication Matrix is a method to keep all relevant stakeholder in loop and it show the details of everything of the project
there are benefits of this method:

- Improved communication across departments.
- More efficient use of resources.
- Faster decision-making.

The best method is to category the information such as:

- Communication
- Purpose
- Medium
- Frequency
- Audience
- Owner
- Deliverable

Refer to Table 15 Communication Matrix

9.2. “3” Wrong Scenarios of Communication

There are no businesses that can be running with perfection but how people can be communicating and working through the problems may be a sign of the overall well-being of the organization (Abbas, Norris & Parry, 2018). Healthy communication is extremely important in an organization that is thinking about driving the results that they need and also for the creation of a work environment that is positive which is being emphasized by this study as 3 situations of wrong communication are examine.

There are many cases when there is passive-aggressive communication which is one of the poorest of practices that can be having a negative effect that is very direct on the ways in which people are feeling about their own selves along with others within a place off work. One of the

foremost examples of the same is the leaders and employees of the fiberglass organization refusing to speak to one another directly but speaking against one another to the project manager (Venkatesan, Naqvi & Patel, 2021). Refusal to be speaking to the coworker directly is regarded as behavior that is passive-aggressive and it is one of the issues that is very difficult since the negative and minimizing things that are being said or being done are very subtle and do not seem overly aggressive, confrontational or offensive but lead the person this being directed against to be feeling like they are being treated poorly and are being neglected to the point that relationships are damaged. There are times when people use memos and emails for communication without not speaking face to face within an office can be the form of a problem (Schmid et al., 2020). Passive-aggressive behavior can be in the form of avoiding someone to work with others on specific projects without giving a valid reason is called a kind of behavior that is passive-aggressive.

There may also be cases where one can feel intimidated at work due to the force of intimidation tactics which is one other form of negative communication which is quickly able to create a toxic and also fear-filled environment at work. There are bosses who bully their employees on the regular so as to get things done and are most likely to be experiencing a high rate of turnover due to the same (Tøndel et al., 2020). The intimidation is also something that occurs between people who work together and are rivals for the same title or promotion. This kind of behaviour is extremely unnerving and may often manifest itself in the ways of people's languages at work or it may also show itself in the form of actions that are threatening to people physically. Examples of such intimidation include speech that is loud and the act of taking off the workspace physically or standing too close to someone to cause them discomfort.

There are many other versions of bad or poor communication but the worst of them all is the playing of the blame game. There are some major examples of communication that are poor and are linked very closely to responsibility and ethics (Saunderson & Nejat, 2019). The failure of people to not own up to the mistakes that they make or to be able to accept responsibility for missing the deadline shows that they are not capable of handling responsibilities. Blaming people is extremely counterproductive and is not going to work towards a positive outcome that is for the betterment of everyone involved. The part where people are learning to be accepting responsibilities and also moving forward is one of the positive solutions. However, the ones who continue to be blaming others for the sake of their own mistakes shall be damaging the working relationship and will be finding themselves to be in a position where they are ostracised or shunned. There are however many other scenarios where people are unable to be comprehending what the other person is saying and may react in a belligerent way without

meaning to. There are also other times when people are unable to actively listen to what another person has to say and work in a siloed environment which is the opposite of being productive. Healthy communication is something that drives a place of work most of the time as one can see or tell and is also crucial for driving the required results while making sure that the work environment is positive. Bad communication is something that festers and threatens to cripple a company no matter what kind it is so the problems need to be addressed before things spin out of control.[8,9,10,11 &12]

9.3. Stakeholder Assessment Matrix

Managing stakeholder involvement is one the most task which the project manager is challenging. However, the tools and techniques which is the stakeholder engagement matrix, facilitate and improve a project's stakeholder management significantly.

“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.”
<https://project-management.info>

As Project Management Institute (PMI) classified the stakeholder assessment matrix in their book The Project Management Body of Knowledge (PMBOK®, 6th ed., ch.13.2.2.5) as:

- Unaware,
- Resistant,
- Neutral,
- Supportive,
- Leading.

As the PMI's taxonomy, the current level of engagement is labeled as “C”. The desired level engagement is labeled as “D”.

A “C” may be any one in columns. but, a “D” might not applicable for the “unaware” or “resistant” columns for obvious reasons (because no one wants stakeholder in project to be a resistant or unaware).[13]

Refer to Table 16 Stakeholder Assessment Matrix (Current)

When monitoring the actual stakeholder engagement, the project manager may update the observed current level (“C”) of engagement for each stakeholder

Refer to Table 17 Stakeholder Assessment Matrix (Desired)

10. Leadership

10.1. Leadership Models.

As a team we consider that each other's has a different style which is very valuable and helpful to think out of the box.

From the leadership styles, we explored and gained a very valuable information such as:

How we know ourselves:

We started by raising our awareness of our dominant leadership style. We can do this by asking trusted colleagues to describe the strengths of our leadership style. We can also take a leadership style assessment.

Understand the different styles:

The differences between us were influentially positive, and it made some decisions for us that had a strong impact on our teamwork. We got familiar with the repertoire of leadership styles that can work best for a given situation.

Practice explores a leader:

From doing practices with our real characters, we see that moving from a dominant leadership style to a different one may be challenging but to be real leaders sometimes we need to accept these challenges and reflect that into our working life.

10.2. Reasons of Choosing Dominant Leadership?

- Integrity
- Clear goals
- Good example
- Vision
- Clear communication
- Expects the best
- Support
- Encouragement
- Recognition
- Stimulating work
- Focus on team interests and needs
- Inspiration

10.3. “5” proposals for the motivation methods that are compatible with the nature of the project

1. Show gratitude to employees:

- Appreciating employees and not underestimating their achievements
- Granting employees job security and providing them with services and amenities

2. Helping employees to advance career

- Providing courses for employees that fit their career field to develop them in their career responsibilities

3. Offer Rewards

- Offer a reward to employees when completing work ahead of time or when presenting a new idea that benefits the project, which motivates the employee to work more

4. Flexibility in working times

- Making work times more flexible and paying attention to achievement

5. Create a family atmosphere in the workplace

- A friendly atmosphere, accompanying social facilities and activities, and a tour program, making the workplace an environment friendly to the family atmosphere.

11. Teamwork

11.1. RACI Model

What does RACI stand for?

RACI stands for **R**esponsible, **A**ccountable, **C**onsulted, and **I**nformed. Where each word represents the role of the person.

The **Responsible** is the person who must finish a given project, process, or element of a project.

The **Accountable** is the person who must be accountable for the completion of the task. This person serves as all stakeholders' point of contact throughout the project.

The **Consulted** is the person who must provide information to stakeholders. If stakeholders have suggestions about changes that need to be made, or if they encounter issues, they report to the Consulted.

The **Informed** person is the person who must be kept informed of progress. His role is not necessary to provide feedback or suggest changes. However, we should keep him apprised of any changes, roadblocks, problems, or milestones.

Refer to *Table 18* RACI Model.

12. Conflict and Crisis

12.1. Identify Conflicts and Crisis

Conflict in this particular scenario focuses on the clash of interests. The base of competition focuses on the part of the community through which the conflict may be personal, racial, political, and interracial. In this particular scenario, conflict in different types of courses or groups is followed through interaction through is a disruption in initial conflict or caused by disagreements, differentiation of orientation and opinions, and a scarcity of different types of resources in different scenarios (Otegi-Olaso et al., 2019). The conflict in poor project management and this particular scenario focusing on split into percolation and also the conflict escalation focuses on the mediation and resolution of the conflict through which for this specific scenario different types of factors related with the industry has been seen.

For identifying and looking forward to the conflict and crisis in this scenario convincing that the fiberglass industry in the recent industries of Arab countries is developing different types of products and services through various aspects of usage, but certain types of specific specialization has to be done for beating the polyester material until the factor of project management the relevant environmental factors in purposes of service shops and purpose of fishing different types of budgets in manufacturing project are going through the increasing of business value and uncertainties are also coming through which the misperceiving of conflict and crisis in the project management business has been seen (Mundy, 2020). Struggle in this specific situation centers around the conflict of interest just as the foundation of contention centers around the piece of the local area through which the contention might be close to home racial political and interracial.

In this specific situation, struggle in various kinds of courses or gatherings are finished cooperation through is an interruption in beginning clash or causes by conflicts separation of direction and suppositions just as shortage of various sorts of assets in multiple situations (Mundy, 2020). The contention in the helpless venture the board and this specific situation is

zeroing in on split into permeation and the contention acceleration centers around the intercession and goal of the contention through which at this particular situation various kinds of components related with the business has been seen (Mundy, 2020).

For recognizing and anticipating the contention and emergency in this situation persuading that the fiberglass business in the new ventures of Arab nations is creating various kinds of items and administrations through different parts of use, however, particular sorts of explicit specialization must be accomplished for beating the polyester material until the factor of task the executives the appropriate natural components in reasons for administration shops and motivation behind fishing various sorts of financial plans in assembling project are going through the expanding of business worth and vulnerabilities are additionally coming through which the misperceiving of contention and emergency in the undertaking the board business has been seen.

12.2. “3” expected scenarios of the conflict’s events in the project

Scenario 1- The first scenario of conflict is related to motivational and industrial practice. Practice related to this scenario is also focusing on different types of conflicts and crises that have been occurred because the connection of conflict in this particular factor is disagreeing with varying types of businesses and also manufacturing aspects for dealing with a certain issue, and this potential is also stimulated to discuss and increase different types of the motivation behind the industrial performance. One of the most critical factors in spell planning the objectives and targets of the organization and in this scenario, the target of the organization is all the people who are using fiberglass in the manufacturing aspects and also the businesses or people who are related with boat yachts and also different types of business material (Nassereddine et al., 2021).

Scenario 2- The second scenario of conflict and crisis is related to power utilization and costs of labor and organizational budget. After that, it can also be seen the demand power utilization in this particular scenario controls different types of cost of the labor, and also appropriate purchasing and outsourcing of the technologies and techniques for using the source materials for reliable sources with courts effective price is essential. The design methodology in this scenario will focus on the primary data. Continuous improvement can be gathered if the process is an application of the optimization is caused can be seen to control the spending with cost reduction and maximizing different sets of values of the industry and the business (Nassereddine et al., 2021). Practice identified with this situation is additionally zeroing in on various sorts of contentions and emergencies that have been happened because the association

of contention in this specific factor is contradicting various kinds of organizations and fabricating viewpoints for managing a specific issue and this potential is likewise animated to talk about and increment various kinds of inspiration driving the modern exhibition.

Scenario 3- The third scenario is related to organizational objectives and aims. One of the main elements in spell arranging the destinations and focuses of the association and in this situation, the objective of the association is every one individual who is utilizing fiberglass in the assembling angles and the organizations or individuals who are connected with boat yachts and various kinds of business material (Nassereddine et al., 2021). After that it can likewise be seen the interest power used in this specific situation controls various kinds of cost of the work and proper buying and re-appropriating of the advances and strategies for utilizing the source materials for dependable sources with courts successful cost is very important and the plan procedure in this situation will zero in on the essential information and consistent improvement can be assembled if the interaction is a utilization of the enhancement is caused can be believed to control the going through with cost decrease and furthermore expanding various arrangements of upsides of the business and the business.[14,15,16,17 & 18]

12.3. The optimal strategies to deal Conflicts and Reasons

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. [19]

In Scenario one we will use collaborating strategy by giving the works incentive depends on their KPIs e.g. bonus, overtime, extra day off.

In scenario two we will use compromising strategies because we have a more than one conflict in one e.g. budget, commitments, bills, salaries. So, we have to give as much as less and take as much as match we can.

In scenario three we will use competing strategies as there are other competitors who tries to buy more and earn more customers meanwhile, they still have conflict like we have.

12.4. Root Causes Analysis

Root Cause Analysis, RCA.

This article provides a framework for analyzing the performance of three popular root cause analysis tools: the cause-and-effect diagram, the interrelationship diagram, and the current reality tree. The literature confirmed that these tools have the capacity to find root causes with varying degrees of accuracy and quality. The literature, however, lacks a means for selecting the appropriate root cause analysis tool based upon objective performance criteria. Some of the important performance characteristics of root cause analysis tools include the ability to find root causes, causal interdependencies, factor relationships, and cause categories. Root cause analysis tools must also promote focus, stimulate discussion, be readable when complete, and have mechanisms for evaluating the integrity of group findings. This analysis found that each tool has advantages and disadvantages, with varying levels of causal yield and selected causal factor integrity. This framework provides decision makers with the knowledge of root cause analysis performance characteristics so they can better understand the underlying assumptions of a recommended solution

The five Whys Technique.

When eager to unravel a drag, it helps to start at the tip result, replicate what caused that, and question the answer five times. This elementary and generally effective approach to problem-solving promotes deep thinking through questioning and could be tailor-made quickly and applied to most problems. Most clearly and directly, the Five Whys technique relates to the principle of systematic problem-solving: whereas not the intent of the principle, the technique can exclusively be a shell of the strategy. Hence, there are unit three key components to effective use of the Five Whys technique, correct and complete statements of problems, complete honesty in responsive the queries, the determination to induce to an all-time low of problems and resolve them. The technique was developed by Saki chi Toyoda for the Toyota Industries Corporation Process.

The 5-Why exercise is immensely improved once applied by a team and their area unit five basic steps to conducting it:

- Gather a team and develop the matter stated in agreement. once this can be done, decide whether or not or not further people area unit required to resolve the matter.
- Ask the primary “why” of the team: why is that this or that downside taking place? there’ll most likely be 3 or four wise answers: record all of them on a chart or whiteboard, or use index cards taped to a wall.
- Ask four additional serial “whys,” continuing the method for each statement on the chart, whiteboard, or index cards. Post every answer close to its “parent”. Follow informed all plausible answers. you may have known the basis cause once asking “why” yields no more helpful info. (If necessary, still raise queries on the far side of the arbitrary 5 layers to urge to the basis cause.)
- Among the dozen close to answers to the last asked “why” seek for general causes of the matter. Discuss these and choose the foremost possible general cause. Follow the team session with a report and show the merchandise to others to verify that they see logic within the analysis.
- After selecting the foremost probable root reason for the matter and getting confirmation of the logic behind the analysis, develop acceptable corrective actions to get rid of the basis cause from the system. The actions will (as the case demands) be undertaken by others however designing and implementation can be like team inputs.
- Five maybe a smart rule of thumb. By asking “why” 5 times, one will sometimes peel away the layers of symptoms that hide the reason for a drag. however, one can also realize one has to raise “why” fewer times, or conversely additional.
- Root cause analysis is that the generic name of problem-solving techniques. the essential components of root causes are materials, equipment, artificial or natural surroundings, data, mensuration, ways and procedures, people, management, and management systems. alternative tools are often used if the 5 Whys technique doesn't intuitively direct attention to 1 of those. They embody barrier analysis, amendment analysis, determining factor tree analysis, and also the Ishikawa (or fishbone) diagram.

By repetition “why” 5 times, the character of the matter also as its answer becomes clear. [20]

Refer to Figure 4 Five Whys?

13. Resourcefulness

13.1. Distribute the Human Resources on the Functions

The process of assigning tasks to human resources may seem very simple while the project manager needs to allocate tasks according to the skills, abilities, workload and duties of the employees. In fact, realizing this idea may become somewhat of a challenge because the project manager needs to know the real skills of the employees, clearly understand their capabilities, estimate the workload and consider current duties in order to appropriately allocate and assign tasks.

This process can be managed using task management software that helps create graphs, prepare complete task presentations, and make important selections.

The process of distribution consists of the following phases:

Selection – The task selection phase results in creation of tasks, to-do lists and job lists.

Presentation – The purpose of the presentation phase is to show and explain employees what they are expected to do, what tasks and jobs are selected, and within what timeframes the work is planned being accomplished. The task presentation phase is very important for team building, and you as a project manager will pass through this phase when running the project keep-off meeting.

Dispatching – This phase is critical to defining internal/external duties of employees and delegating tasks. After tasks and jobs have been presented to employees involved in your project, you need to dispatch descriptions of the project work to project resources. During the task dispatching phase, you take care of timely sending and delivering of tasks and jobs, and task management software will be helpful as it supports collaboration between users, immediate information exchange, and secure project data sharing.

Play Demo (authorization) – Once all assigned resources have received descriptions of the project work and tasks have been dispatched, your next step is to authorize tasks. The task authorization phase means local managers and team leaders make sure that all tasks and jobs are assigned to appropriate resources.

13.2. Crashing and Fast-tracking process Influence

The project manager may need to shorten the duration of the project without changing the scope of the project. For example, when a project falls behind schedule and needs to catch up with the project or finish it sooner than originally planned, there are two methods that can be used in this case: Crashing or Fast-tracking.

The differences between fast tracking & crashing are:

Crashing is the technique used when there is not enough time in the project schedule. To apply this technology, we add resources to the project.

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.

In **fast tracking**, there is increased risk, whereas in **crashing** there is increased cost.

Refer to *Figure 5 Crashing & Fast-Tracking Process*

14. Negotiation

14.1. Develop General Rules for the Negotiation Process.

Negotiation is defined as the process in which two or more people or parties are getting involved so that better outcomes can be developed. In this case, the negotiation process is identified and evaluated for the manufacturing of fiberglass boats which is suitable for environmentally friendly fishing, boating, and arranging picnics as well as the service job inside the ports and the others (Kang et al. 2020). The general rules of the process to the negotiation are given below

Process 1 Preparation

This is the first process where the manufacturer who is Fibre Glass Factor making all the preparation for the manufacturing of fiberglass boats for the different purposes such as fishing, sports or picnic and for the service job inside the ports and others (Kang et al. 2020). The manufacturer has been researching the requirements of making the fiberglass boats regarding the materials, how to develop, labor, equipment, etc. are to be done (Kang et al. 2020). The manufacturer should be preparing to be planning of all the requirements for the manufacturing process to be beginning, planning to consult with the different suppliers and the other vendors who will be supplying the raw materials for the manufacturing of the fiberglass boats (Kang et al. 2020). There would be negotiations with the distributors who will be distributing the fiberglass boats to the end-users who are the customers. There would be a negotiation to be done with the marketing managers who will be doing the promotions both offline so that the proper marketing of the products can be done (Kang et al. 2020).

Process 2 Exchange Information

This is one of the general rules of negotiations when both sides such as the manufacturers and the other stakeholders of the fiberglass Factory would be exchanging important information such as the developing the budgets as well the manufacturing requirements of fiberglass boats (Robinson 2019). They should be agreeing and disagreeing on certain terms and at last, they should be both agreeing with them to complete the negotiations.

Process 3 Clarification

In this process of clarification, both the parties which are the fiberglass Factory who is the manufacturer of fiberglass boats, and the other stakeholders should be continuing the discussion which they have started when exchanging information by doing the justification and bolstering of their claim. It is seen that if one side says that they have disagreed with any claim then the other should be discussing that disagreement at ease so that they can reach a proper point of understanding.

Process 4 Bargaining and Problem Solving

This is one of the most vital rules of the negotiation process during which both parties should be either giving or taking the ones. It is seen that after the first offer given by the manufacturer each of the negotiation parties such as the suppliers, distributors, and the laborers of employees should be rising different views for the issue which is done by managing and making their concessions. In this process, a win-win situation is to be developed (Tomić 2021).

Process 5 Conclude and Implement

This is the last general rule for negotiation. In this last step, once the solution is agreed by both parties the negotiations have become successful by the development of successful negotiations (Tomić 2021). In this process, the written contract is developed and a follow-up is made for confirming it smoothly for Fiberglass Factory.

14.2. Development of “2” Negotiation Plans

Two negotiation plans in detail are to be evaluated for the manufacturing of fiberglass boats for fishing or sporting and doing service jobs inside ports or others have been explained below:

Negotiation Plan 1

Step 1 Development of project budget

It is seen that for the negotiation to be done the first plan is to develop and plan for the total budget required for the manufacturing of fiberglass boats by Fiberglass Factory. The manufacturer must be allocating the costs of each of the materials which are required for the

development of fiberglass boats along with the additional purchasing costs and the other expenses required (Robinson 2019).

Step 2 Planning for purchasing

It is the responsibility of the purchasing department of this Fiberglass Factory to be analyzing the purchasing cost of the materials from the suppliers, the purchasing of the other things as well the purchasing of the outsourced parts effective for the manufacturing of fiberglass boats (Robinson 2019).

Step 3 Planning for the designing and finishing of products

It is seen that the fiberglass boats should be made with innovative and attractive designs so that it should be delivered it to the customers across the Arab counties in this world. The manufacturer should be consulting with the designer who will be making the designs of the fiberglass boats and plan the finishing of the products (Robinson 2019).

Negotiation Plan 2

Stage 1 Planning for the organization budget, objectives, and targets

During the negotiation process, there is the planning for the organization budget, the objectives, and the targets are to be identified and evaluated so that the manufacturer can make this research project to be successful for the manufacturer of fiberglass boats (Robinson 2019).

Stage 2 Manpower Planning

The manpower is important for any project to be completed within the time and dealing. In this case, the manpower planning is required so that the labor costs can be reduced and controlled by the manufacturer (Перевозчикова and Катекина 2020). The manufacturer should be developing the manpower planning so that they can understand the amount of labor required for the manufacturing of fiberglass boats.

Stage 3 Outsourcing and purchasing of materials

It is seen that there has been planning for how to outsource the process, selection of the outsourcing organizations so that the manufacturer can develop the boats (Перевозчикова and Катекина 2020). The selection of the purchasing of the materials is required to be done by the manufacturer.

Stage 4 Developments of Quotations

In this stage, the manufacturer has been developing the quotations where the quotation in the purchasing has been given to the suppliers and the distributors as well the outsourcing organizations (Tomić 2021). They have been observing the quotation and provide their quotes and if all goes well the tender will get by others.

Stage 5 Continuous Improvement of quality

In this stage, the process will be monitored so that the manufacturer can be able to negotiate with the others and the project will become successful (Tomić 2021). [21,22,23. & 24]

15. Project Design

Triple Constraint of the Project

The triple constraint can stifle a project manager.

It has been given names – the Project Management Triangle, Iron Triangle and Project Triangle – to be giving you an idea of how important it is the Triple Constraint is when managing a project. If you run a project, you work with the Triple Constraint.

Therefore, the triple constraint can easily be said to be the most important concept in the history of project management. The genius who invented this model is on a par with the person who first invented the calf.

Well, maybe that's kind of an exaggeration, but in the world of project management, the triple constraint is like inventing the wheel. When used with effective project management software, it can give you the power to propel your projects to success.

15.1. The Triple Constraint Defined

That, what is the Triple Constraint? This model is easy, typical of the limitations inherent in project management. Those constraints are threefold:

1. Cost: Project financial constraints, also processing in the name of the project budget
2. Scope: Tasks required to achieve project objectives
3. Time: Project schedule to reach completion

Essentially, the triple constraint states that the success of a project is affected by its budget, deadlines, and features. As the manager of this project, you can trade between these three limitations; However, changing the limitations of one meant that the other two would suffer somewhat.

Let's take a deeper look at the triple constraint. The triple constraint sounds simple, but that's only on the surface. Each of the three points in this triangle can be disassembled to reveal a deeper meaning.

1. Cost

The financial commitment of the project depends on several variables. There are the resources involved, from materials to people, which includes labor costs. There are other external forces that can affect the project, which must be taken into account in the cost of work.

There are also the fixed and variable costs inherent in any project, such as the economic cost of teams with varying skills and productivity that must be accounted for. This can play dangerously with the use of contract workers or outsourcing.

Costing processes include cost estimation to find out the financial commitment required for all the resources needed to complete the job. Create a cost basis cost budget. Cost control works to manage cost fluctuations throughout the project.

There are several ways to estimate the cost of a project:

- Historic Data: Using project costs and derivatives
- Resource Costs: Determining the average cost of goods and labor by unit
- Bottom Up: Estimate the work package from the lowest level to the highest
- Parametric: Measuring the statistical relationship between historical data and other variables
- Vendor Bid: Average some vendor bids on the project
- Reserve: Total cost of activities
- Quality Analysis: Cost estimation with the highest quality of activities

It is one of the more complex points in the triple entry triangle. Caesar your assessment of the account.

2. Scope

Project work is the task to complete the project. Scope is important to management on any project, whether it's agile software projects or well-planned waterfall projects, because if you can't control the scope of the project, you're not likely to deliver on time or within budget!

When defining scope, it is critical to prioritize your tasks, allowing you to plan them out and set them in their goals. Without creating a sense of order, it is easy to overwhelm yourself, leading to scope creep. Required procedures for employment

ProjectManager.com has task management features that make it easy to assign, sort, and prioritize tasks. This way you can delegate all important project tasks to the right people, preventing dreaded scope creep. Additionally, by offering file sharing and task feedback, we enable task-level collaboration.

Another key factor in managing and creating a scope is dealing with stakeholder expectations. Stakeholders often have new demands that pop up during a project, and you need to be able to temper their expectations. This can be particularly the case in long-term projects where there may be new stakeholders being introduced in the middle of the project.

Scheduled to be an appointment on Change Management. This can include managing change requests. When managing change requests, be sure to accommodate only those goals and deliverables.

These title steps are all a lot, because the time you take it is the time. This could be a great deal of event.

3. Time

Project creation project. Usually, this is defined by the various sections to go from the beginning of the project to its end.

Use a Work Structure (WBS) to take a project objective and break it down into a more manageable series of tasks. Arrange dependencies in the organization schema.

A Gantt chart is one way to visualize the project schedule, with each task a point in that schedule, linking task dependencies, and specifying durations. Obtaining historical data can help make more accurate estimates. ProjectManager.com features an online Gantt chart that updates automatically when your team completes project tasks, so data is always accurate.

According to the Project Management Body of Knowledge (PMBOK), the schedule can be managed through the time management process. These steps are as follows:

1. Plan Schedule Management: Develop project schedule and plans
2. Define Activities: Define and document actions to be taken to produce project outputs
3. Sequence Activities: Define and document the logical order of work to be more efficient
4. Estimate Activity Resources: What type and number of materials, people, equipment, supplies, etc. are needed to perform each activity
5. Estimate Activity Durations: How long will it take to complete each activity with the estimated resources
6. Develop Schedule: Analyze activity, duration, resources, and schedule to develop a schedule
7. Control Schedule: Compare the planned schedule with actual progress to determine if your project is on the right track

Time management is also important at the level of team members as well. Project managers look forward to the support of their team in this area, with collaborative time management tools and processes so that the project collectively can stay on track.

How to Use the Triple Constraint?

When you're running a project, some variables can change. Others can't. The triple constraint gives you a solid sense of what can and cannot be modified throughout the life of the project.

For example, if you are behind schedule, you can work to reduce project features. This reduces the range. Then you can allocate more resources to move the timeline forward. This is the increased cost. You can also, if possible, change the due date to give you more time. All of these scenarios apply the triple constraint of project management.

Basically, the Triple Constraint is really a balancing act. It's like juggling. It seems easy until you try it. And just like juggling games, it takes practice. For a project manager, that means spending time understanding the triple constraint as it applies to the project and doing the due diligence beforehand, so that if you must adapt, you do it from a place of knowledge.

While it is true that the triple constraint is an important part of a successful venture. Made up of several parts, made up of a three-part set. Sometimes you can play in the houses that play a role in the project.

Why Is the Triple Constraint Important?

Think of the triple constraint as the limits on which you can work. Just as constraints promote creativity, the triple constraint provides a framework that everyone in the project can agree on. These metrics move the project forward while allowing adjustments to be made as needed when issues arise.

Project management is often a series of trade-offs and compromises to keep things moving toward successful completion. The triple constraint is a model that helps managers see which trade-offs will work and the impact they will have on other aspects of the project.

Using the project management dashboard, the manager can monitor the project as it progresses. It's easy to keep track of metrics like schedule, cost, and project scope. With this information, the manager can identify issues and modify the triple constraint to prevent these issues from developing into problems. ProjectManager.com features a real-time dashboard that presents all critical project data affecting the triple constraint.[25]

15.2. List of the Project Success Factors

Success does not happen by chance. If you take a look at the large body of research that has been done on project management success in the past decades, you will discover recurring charts. We provide an overview of the seven commonly identified success factors. Use our list to review your management style and follow the principles to improve the performance of your business.

What is project success?

Before we get to the success factors, let's start with a short definition of what success actually is?

At first glance, the answer is easy: a project is considered successful if the project goal is achieved. This assumes that you have set measurable goals. A lot of project managers are already failing here. They do not set clear goals for the project or create goals that can only be reviewed after several years. Sales, for example, there is no proper metric to measure the success of a project because markets change and besides, sales cannot be measured right after the project is completed.

But even if you have set measurable goals for the project. If you take a closer look, you will realize that achieving your project goals is not enough to consider the project a success. It may happen that you reach the goals of your project but fail to fulfill many other expectations that were associated with the completion of the project. Your client may have been satisfied but you expected to attract more projects because of this latest success and that didn't happen. Success is a matter of perspective. Depending on the stakeholder you ask, you will get a different answer.

To get a more discerning judgment about the success of your project, you use time, cost, and quality as metrics. Assess whether you can complete the project on time and budget and if all quality requirements are met. However, meeting the requirements does not necessarily lead to your own personal sense of success. Perhaps the client is satisfied with the end result even though it does not meet the pre-set quality standards or maybe the project took longer as planned but you consider it a success because in hindsight the delay was worse while it was happening.

Success Factors

There are a lot of studies on the success factors in project management. Depending on the participants, study size and industry, results vary. However, there are some recurring factors that appear to play a critical role regardless of the project context.

Risks and uncertainties are part of project management. However, success does not happen by chance but can be planned - at least to a high degree. If you consider the seven factors

mentioned in your management style, it is very likely that they fit into your own definition of project success.[26]

Refer to *Table 19* Success Factors

15.3. Work Breakdown Structures (WBS)

A Work Breakdown Structure (WBS) may be an elementary project management technique for outlining and organizing the full scope of a project, employing a hierarchical tree structure. the primary 2 levels of the WBS (the root node and Level 2) outline a collection of planned outcomes that are put together and solely represent 100% of the project scope. At every resultant level, the youngsters of a parent node are put together and solely represent 100% of the scope of their parent node *Figure 7*.

A well-designed WBS describes planned outcomes rather than planned actions. Outcomes are the specified ends of the project, as a product, result, or service, and might be foreseen accurately. Actions, on the opposite hand, are perhaps troublesome to predict accurately. A well-designed WBS makes it straightforward to assign any project activity to at least one and just one terminal component of the WBS.

Refer to *Table 20* Types of WBS

15.4. WBS style PRINCIPLES

The 100% Rule

One of the foremost necessary WBS style principles is termed the 100% Rule. The apply commonplace for Work Breakdown Structures (Second Edition), revealed by the **Project Management Institute (PMI)** defines the 100% Rule as follows:

The 100% Rule...states that the WBS includes 100% of the work outlined by the project scope and captures ALL deliverables –internal, external, and interim – in terms of the work to be completed, as well as project management. The 100% rule is one among the foremost necessary principles guiding the event, decomposition, and analysis of the WBS. The rule applies in the slightest degree levels among the hierarchy: the total of the work on the “child” level should equal 100% of the work described by the “parent” and also the WBS shouldn't embrace any work that falls outside the particular scope of the project, that is, it cannot embrace over 100% of the work... it's necessary to recollect that the 100% rule additionally applies to the activity level. The work described by the activities in every work package should add up to 100% of the work necessary to finish the work package.

15.5. Planned Outcomes, Not Planned Actions

If the WBS designer attempts to capture any action-oriented details within the WBS, he/she can embrace either too several actions or too few actions. Too several actions can exceed 100% of the parent's scope and too few can let down 100% of the parent's scope. the simplest thanks to adhering to the 100% Rule is to outline WBS parts in terms of outcomes or results. This additionally ensures that the WBS isn't too prescriptive of strategies, providing bigger ingenuity and artistic thinking on the part of the project participants. for brand spanking new development comes, the foremost common technique to assure Associate in Nursing outcome-oriented WBS is to use a product breakdown structure (PBS).

The best way to adhere to the 100% Rule is to define WBS elements in terms of outcome or results.

Feature-driven computer code comes could use an identical technique that is to use a feature breakdown structure. once a project provides skilled services, a typical technique is to capture all planned deliverables to form a deliverable-oriented WBS. Work breakdown structures that subdivide work by project phases (e.g. Preliminary style part, essential style Phase) should make sure that phases are separated by a deliverable (e.g. Associate in Nursing approved Preliminary style Review document, or Associate in Nursing approved essential style Review document).

15.6. Level a pair of is that the most vital

Of all the degrees on a WBS, Level-2 is usually the foremost necessary as a result of it determines however actual prices and schedule knowledge are sorted for future project price and schedule estimates. A project manager could realize it helps to grasp what quantity it took to style (major work element) a product when it had been completed so that the info will be used for future analogous estimating. In different cases, the project manager might want to grasp what quantity is a significant part of the merchandise price when the project was completed. For this, a PBS would be used. Level-2 is so accustomed capture “actuals” from a project for future estimating functions.

15.7. The Four parts in every WBS component

Each WBS component once completed ought to contain the subsequent four items:

- The scope of labor, as well as any “deliverables.”
- The start and finish dates for the scope of labor.
- Take into account the scope of labor.
- The name of the person behind the scope of labor.

By employing a WBS during this manner the project manager will approach a posh project and decompose it into manageable, conveyable parts. there's tokenish confusion among project members once this method is employed.

15.8. Mutually-exclusive parts

In addition to the 100% Rule, there should be no overlap in scope definition between 2 parts of a WBS. This ambiguity might end in duplicated work or miscommunications regarding responsibility and authority. Likewise, such overlap is probably going to confuse project accounting. If the WBS component names are ambiguous, a WBS wordbook will facilitate clarifying the distinctions between WBS parts.

It is important that there is no overlap in scope definition between two elements of a WBS

15.9. How Far Down?

The WBS is rotten down to the work package level. a piece package is that the lowest level within the WBS and is that the purpose at that the value and schedule for the work will be faithfully calculable.

A question to be answered within the style of any WBS is once to prevent dividing work into smaller parts. If WBS terminal parts are outlined too generally, it's going to not be doable to trace project performance effectively. If WBS terminal parts are too granular, it's going to be inefficient to stay track of such a large amount of terminal parts, particularly if the planned work is within the distant future. A satisfactory exchange is also found within the construct of progressive elaboration that permits WBS details to be increasingly refined before work begins on a component of labor.

An effective limit of WBS granularity may be reached when it is no longer possible to define planned outcome, and the only details remaining are

One variety of progressive elaboration in giant comes is termed wave coming up with that establishes a daily schedule for progressive elaboration. In reality, a good limit of WBS coarseness is also reached once it's not doable to outline planned outcomes, and also the solely details remaining are actions. Unless these actions will be outlined to stick to the 100% Rule, the WBS shouldn't be more divided.

15.10. WBS Identification list

It is common for WBS parts to be numbered consecutively to reveal the data structure. for instance, 1.3.2 Rear Wheel identifies this item as A level three WBS component, since there are 3 numbers separated decimal points. A cryptography theme additionally helps WBS parts to be recognized in any written context.

WBS list

- the highest component of the WBS is that the overall deliverable of the project and every one stakeholder trust it.
- the primary 2 levels of the WBS (the root node and Level 2) outline a collection of planned outcomes that are put together and solely represent 100% of the project scope.
- The WBS parts are outlined in terms of outcomes or results. (Outcomes are the specified ends of the project, and might be foreseen accurately).
- every WBS component has an Associate in Nursing identification assigned that identifies its relative position among the structure.
- The WBS encompasses everything which will ultimately comprise the project deliverable, and every one deliverable within the project are enclosed.
- The WBS isn't a project setup or a project schedule, and it's not a written account listing.
- The WBS isn't Associate in Nursing thorough list of labor. it's instead a comprehensive classification of project scope.
- The WBS isn't Associate in Nursing structure hierarchy.
- within the judgment of all parties concerned, the WBS is neither over-simplified nor too advanced. It provides Associate in Nursing with adequate graphical or define kind for viewing the general scope of the project. [27]

16. Requirements & Objectives

16.1. Demand Traceability Matrix.

The requirement traceability matrix could be a table that captures the whole user and system needs for the system. It helps to trace from demand to testing to verify that the necessity is consummated. In development methodology, a demand traceability matrix is employed to capture the linkage of user stories between product backlog and sprint backlog. The linkages between the necessities square measure retrieved through these 2 documents. However, the unstructured format of each document doesn't facilitate obtaining the necessary traceability. [28]

Requirement's traceability is that the ability to follow the life of demand i.e. from its origin to its refinement and inclusion within the demand specification document, and from there to its sequent readying in writing, testing, and validation.

Pre-Requirement Traceability cares with the demand's life before its inclusion within the requirement specification, whereas Post demand Traceability cares with the demand's life when its inclusion is within the requirement specification.

Pre-Requirement Traceability is often not lined by existing tools as a result of it's tough to trace the origin of needs to the people United Nations agency initiate, attest, and document the user needs. This analysis indicates that the performance of those tools will be considerably improved by as well as Pre-Requirement Traceability in their traceability frameworks. Contribution structures specify relationships between the user needs and their initiators throughout pre-requirement traceability. Traceability matrix could be a structure typically employed by tools and techniques covering Post-Requirement Traceability. The thesis of this analysis is that the mixing of contribution structures with the traceability matrix extends the traceability to each of the pre and post-requirement traceability phases and provides end-to-end coverage. This integration becomes potential once components of a contribution structure square measure mapped to the weather of a demand traceability matrix. The entity-relationship diagram may be reborn into an electronic database for its additional utilization. the utilization of contribution structures in conjunction with the necessity traceability matrix helps in characteristic relevant info concerning the supply of user needs, documenting during a reusable kind to suit the wants of end-users, and facultative them to outline their needs. [29&30]

16.2. Methods Used in Requirement Collection

Requirement's collection is the process of identifying, documenting, and managing stakeholder needs and requirements to achieve project objectives, the primary advantage of this

process is that it provides the basis for defining and managing the project scope including the product scope, below shows the inputs, tools, methods and outputs of this process. *Table 21* Methods Used in Requirement Collection

16.3. Hierarchical Structure of the Objectives

Refer to *Figure 8* Hierarchical Structure of the Objectives

17. Scope

17.1. Scope Statement

Regarding to Brain Eastwood who sort the develop the scope statement to 8 steps as following we identify each step

1. Understand why the project was initiated

We started our project to serve the market with high quality fiberglass as it is unique business with high demand and needed. Many individual customer and companies need fiberglass in different fields.

2. Define the key objectives of the project.

We aim to satisfy market's demands, diversity products, company's reputation and get first company in the business

3. Outline the project statement of work.

The company will produce fiberglass for insulation, home décor, protection for mobile and sensitive devices, protect cables and more.,

4. Identify major deliverables

Project manager and stakeholders will express the deliverables as nouns and adjectives e.g., protect ip11 for protect iPhone 11 and pool7X5 for pool with size 7m x 5 m etc. while work details as worker's missions e.g., storage for take the finished fiberglass product and put it in warehouse and heating for heating raw fiberglass to use it in productions.

5. Select key milestones

After we set our goals of being in business, we need to set target time for each goal. E.g., we satisfy marketing demand at the end of the year, diversity products in 6 months. Etc.

6. Identify major constraints

When we write the scope statement, we will try to write down all limitation that will face during the project e.g.

- Staff - their salary, right, duties, needs career paths
- Marketing - size of marketing, competitors, supply and demand, Quotes
- Stakeholders – order, requires, profits
- Environments – weathers, social situation, political situation, security situation

7. List scope exclusions

During we produce and serve the marketing, we may or may not get some of benefits or incoming which is not guaranteed e.g., Government facilities, experience certificates and competencies standards, entering international markets etc.

8. Obtain sign-off

Project manager and the organization will end the project to saving frustration, time, and money. So, when they find the project is not bring benefits to them and they just waste time and effort or losing money, they will start to think to close the project of all. That's what will happen with our project when we can't earn profits in specific time.[30]

17.2. Scope Creep

Scope Creep's Definition

Scope creep is when a project's requirements and amusement extend beyond the initial vision. In project management, scope creep is one of the main causes of failure. It occurs when new orders flow in which involves additional revisions, redesigns, redesigns, and additional requirements.

There are many reasons for the emergence of scope creep, most notably poor communication between project stakeholders, and a lack of initial identification of what is required to secure project objectives.

Development

- The requirements and expectations of the customer must be known in detail.
- Anticipate all possible objections from the client and prepare responses to them before discussing the scope of work with him.
- Study and analyze the impact of the required change and its consequences on the aspects of the project.
- Analyze and evaluate the impact of the change and its consequences with the work team.
- Informing the project sponsor and the client of the impact that will occur as a result of the change before implementing it and taking their opinion on it.

Example

If you are implementing a project centered around the design of a new product and your client has the changes they want to make according to their requirements, you as the project manager or your project team will know how to handle the required change or where to start in terms of implementing it in the project plan. Always define and document your project scope fully, meet stakeholders often to confirm that you have a common understanding of the scope. You have a change control system that includes change request forms and the change request impact analysis process, a change control panel, a clear communication plan for change requests, and a procedure to follow when incorporating change. Document the scope, including Project Scope Statement. Get final approval for scope. Use the change control system you created to keep up with any project documentation.[31]

17.3. Product Analysis Management

Developing and selling a product requires extensive research. Although expenses, supply chain capabilities, and other internal factors are important, companies also need to consider their competitors. Comprehensive product analysis examines the functionality, customer perception, and cost of competitors' products, enabling organizations to improve their product development.

What is Product Analysis?

Product analysis seeks to identify every part of a product so that companies can better understand how to manage their profitability and customer attractiveness. Covers analysis, but not limited to:

- Items

- Mission
- Technique
- Designs
- Costs
- Availability
- Customer Request
- Materials
- Marketing Approach
- Market competition
- Similar products
- Average Sales
- Profit margin
- Quality
- Customer Reviews

While the product analysis is lengthy, it provides all the information needed to determine if the inventory meets the company's standards and customer preferences. If the evaluation yields insufficient results, companies can decide whether to remove the item from their list or try alternative designs.

This process is also great for determining if the output from each product is worth the initial investment, also known as return on investment (ROI).

Product analysis can be done to gain insight into manufacturing, logistics, sales and product development. By outlining all the finer details of an item, companies understand the type of patent they need and the target market.

Five Steps for Product Analysis

Although the product analysis process is extensive, the actual stages are comprehensive and can be customized for any type of organization.

1. Learn the Competition

First, companies need to understand their competition before they start looking. Competitors can be both inside and outside the target market, known as direct and indirect competition. Organizations should consider anyone who offers similar products and services, is in the same area and attracts the same customers.

2. Conduct Research

Once the competitors are identified, management can conduct a competitive analysis of the product by studying the companies' market history. By tailoring corporate models, owners can differentiate their own approach to improving customer reach and fulfillment. Management can start by identifying competitors'

- Pricing strategies
- Customer demographics
- Negatives
- Marketing techniques
- Expansion over the years

3. Analyze Product Information

To get a better look at competitors' products, project managers should consider reading marketing flyers, brochures, emails, product websites, and public annual reports. These resources help owners gauge other companies' pricing, marketing, and sales strategies. Through further evaluation, companies can determine competitors' goals, performance against other organizations, and market foothold. Surrounding companies may try to increase their stakes, long-term profits and market growth.

4. Create a Competitive Strategy

By understanding competitors' goals and strategies, organizations can determine what sets them apart and how they can create an advantage. Based on competitor analysis, owners may realize that they need to adjust

- Pricing strategies
- Quality
- Marketing approaches
- Customer support
- Sales Channels
- Product descriptions

This data provides insight into a company's performance and how it can achieve goals, such as sales and financial goals. For example, if competitors neglect online sales marketing, the company can use this weakness to their advantage by establishing a foothold in the e-commerce market.

5. Continuous Research

Some companies may find that analyzing a single competitive product does not provide sufficient insight. In this case, managers should update their ratings regularly to monitor market changes. This also gives organizations the possibility to adapt their business strategies according to emerging and competing trends.

Tips for Product Analysis

From the market to competition patterns, there are many elements involved in product analysis.

1. Begin with a Flagship Product

The flagship product is the first ingredient or core solution that a company launches. Managers should start their analysis with the main products and branch out slowly, because these goods usually generate the most sales and revenue.

2. Benchmark Products

While the performance of competitors' products is closely related to the analysis process, companies must also set goals for themselves. By creating standards, companies can see where they stand within the market and against competition. It also makes it easy to identify strengths and weaknesses.

3. Analyze Product Pages

Product pages contain valuable details about item functionality, ordering, customer reviews, and frequently asked questions. These insights provide a more detailed analysis by allowing managers to learn about products.

4. Consider Product Videos

Many retailers post product videos that show how their items are used, allowing customers to virtually interact with merchandise before making a purchase. However, companies can also use these demos to measure user experience and identify potential issues.

5. Reference Customer Feedback

To get a true sense of product quality, companies need to refer to customer feedback because they provide honest and unbiased views. Some companies prefer to contact customers in person and take a survey, while others audit review sites.

6. Evaluate Marketing Strategies

How the product is presented and explained gives insight into a business's marketing strategy and customer reach. Therefore, companies should focus on how their competitors portray items, list benefits, and run ads.

7. Monitor Product Changes

By performing routine product analyzes, organizations can detect when competitors are changing the features, functionality, and designs of their products. This is a great indication of their strategies and emerging demand trends that may affect the entire market [32]

17.4. Transformation of the Work Packages in Work Breakdown Structure to Activities

You might be looking for the difference between a work package and an activity. It's very difficult to compare a work package versus an activity just by looking at their definitions. In this article you will find explanations and examples of these terms that will help you understand the difference.

The main difference between work package and activity is that work packages are at a higher level in the work organization structure (WBS) than activities. A work package consists of a series of activities that culminate in a delivery. Practically speaking, it doesn't matter whether you call the "work pack" an activity or vice versa. At the end of the day, you have to complete your project. The work of the project will not change due to the naming. However, if you are preparing for the PMP exam, it is important to distinguish between a work package and an activity *Figure 9*.

Work Package Definition

“The work defined at the lowest level of the work breakdown structure for which cost and duration can be estimated and managed”. **PMBOK® Guide**

WBS is a delivery-oriented architecture. An output is a tangible outcome that satisfies one or more project stakeholders. Work packages are the smallest that can be delivered on a project. They reside at the lowest level of the WBS.

Activity Definition

“A distinct, scheduled portion of work performed during the course of a project”

PMBOK® Guide

The work package is divided into a series of activities. The activity itself does not produce a result but a series of activities that culminate in an output. The above definitions are somewhat confusing. Although the definitions are quite correct, it is impossible to distinguish between a work package and an activity just by looking at these definitions.

Explanation and Examples of Work Package and Activity

In simple terms, we can say that a work package is the result of an endeavor, or a series of actions leads to (create) a work package.

Let's explore it more.

A work package is the smallest delivery level and is the smallest component of WBS. It cannot be divided further. It cannot be decomposed into a smaller deliverable level. It provides some tangible value to the project stakeholders and is recognized, demanded and valued by the project stakeholders(s). It gives a sense of accomplishment and accomplishment to the project team and provides satisfaction to the stakeholders (stakeholders) of the project. It is handed over to project stakeholders as soon as it is established. These actions are, in fact, the activities carried out by the project team. In simple terms, we can say that a chain of activities creates a work package. An activity, by itself, may not produce any tangible result but a series of activities may lead to a result.

Examples

Let us take a look at two examples to understand the difference further.

1. Software development project - Let's say the project team has created a WBS with modules as work packages. The integration of all modules will complete the software product. One of these could be "Module X" - it would be a work package. The project team will have to carry out a series of activities to create 'Unit X'. These activities may include algorithm writing, database setup, coding, testing, integration, etc. The project team may have to repeat these activities until the turnkey 'Unit X' is built.
2. Building Construction Project - Let's say the project team has created a WBS with building floors as work packages. Completion of all floors will lead to the completion of the building. One of these decks could be "Floor N" - it would be a work package. The project team will have to carry out a series of activities to build the "N Floor". These

activities may include laying floors, wiring, painting, checking, etc. The project team may have to repeat these activities until the turnkey "Floor N" is completed.

The difference between work package vs activity is summarized in the table below.

Refer to *Table 22* Difference between Work Package VS Activity

- **Can one person's Work Package be another person's complete Project?**

Yes really. The project team is free to create their own WBS and define work packages (lower-level deliverables). Some of these lower-level outputs may be outsourced. The seller can treat these external deliverables as a complete project. For example, if 'Unit X' is outsourced to a supplier, the implementing organization will treat 'Module X' as a work package while the vendor will treat it as a complete project.

- **Can one person's Work Package be another person's Activity?**

Yes really. It depends on the level of decomposition. Different people tend to think differently. Different project managers may define WBS differently for the same project.

- **Are there any hard rules for creating a WBS?**

No, it depends on organizational guidelines, stakeholder preferences, environment, type of project, project manager bias, and many other miscellaneous factors. WBS is fine, as long as it includes the overall scope of the work.[33]

18. Time

18.1. Functions List of WBS

Refer to *Figure 10* Function List and Network Diagram of WBS

18.2. Relationship Between the Activities

An activity is the scheduled phase in a project plan with a single beginning and end. An activity typically comprises of multiple tasks and upon completion, the entire activity is completed. Many activities can be combined leading to the summary activity. The duration of an activity can be figured out considering the effort it takes to complete the designated tasks. The beginning and end of activity are also determined by limitations commonly known as dependencies. In addition to that, the milestone is another determining factor. These

dependencies between activities and other planning factors are visualized and estimated in a Gantt diagram. This is often used by project managers to plan tasks and monitor their progress.

The work packages are disintegrated into schedule activities to create an activity list. This activity list is used in developing the project schedule. An activity has an anticipated duration. In case an event has no time period, it is referred to as a milestone. The work package is the lowest level of deliverables in a project. It's an outcome of an endeavor.

They are an important part of the project satisfying the tasks and offering value to the stakeholders. On the other hand, a series of activities result in the work package. It's one imperative step of the endeavor. An activity neither provides value to the stakeholders nor handed over to the project stakeholders

We will use WBS Dictionary table and show the dependencies between the activities.
Table 23 WBS and Relationship between the activities.

18.3. Logical Diagram of the Project Activities and the Critical Path

Refer to *Figure 11* Logical Diagram of the Project Activities and the Critical Path.

18.4. Gantt Chart and Milestones Model

Refer to *Figure 12* Gantt Chart and Milestones Model

19. Quality

19.1. Deming Model of the Project

“The PDSA Cycle (Plan-Do-Study-Act) is a systematic process for gaining valuable learning and knowledge for the continual improvement of a product, process, or service”
Deming.org

Dr Deming has created this cycle and from that the name called, also called Deming Wheel or Deming Cycle. The process is as tool to continuously improvement of the any product, process or services:

Plan: Identify and plan for the goal or purpose, success metrics, theories to be done.

Do: where to implement and execute the plan in previous step

Study: in this step, they monitor and test the outcomes for validity and check the problems and where they should be improved

Act: to close the cycle, archive lessons learned, and also you can adjust the correction actions, Risks may be re-evaluated here. [34]

Figure 13 PDSA Cycle

19.2. SIPOC model, and Ishikawa for one of the issues of the project outputs

Ishikawa Diagram (Fishbone, Cause-Effect Diagram) is a diagram that show the potential causes of an event in process.

How can create Ishikawa Diagram?

Materials needed: marking pens and flipchart or whiteboard.

1. Specify problem or effect and draw lines and boxes as shown the figure below
2. Gather the causes from Brainstorming and classify that as:
 - Machines (equipment)
 - People (manpower)
 - Materials
 - Measurement
 - Environment
3. Write those classification of causes as branches from the main arrow.
4. Ask and down write "Why does this happen?" and relate each answer under the classification
5. Ask also and answer "Why does this happen?" for each cause. And continue ask "Why", and this is also called "Why-Why" Diagram
6. Rearrange the causes until end.[35]

One issue of the project is to **miss the deadline**, and Ishikawa models for that, *Figure 14* Ishikawa Diagram of Missed Deadlines Issue.

SIPOC Model

SIPOC Model is a methodology used in Management and Improvement of process or Project, Products and services. It means

- Suppliers
- Inputs
- Processes
- Outputs
- Customers

Benefits of SIPOC are:

- Gives a high-level overview for persons unaware with some business processes
- Reacquainting for persons who faded or have been out of date with familiarity of a process
- assist to show a new process
- Identifies the suppliers or customers internally or externally to the organization
- Emphasizes the inputs and outputs of the business or project process or phases.[36]

Refer to *Table 24* SIPOC of One Process Boat Manufacturing

20. Finance

20.1. Cost Breakdown Structure, and the project balance in accordance with WBS

Refer to *Table 25* Cost Breakdown Structure

20.2. Earned Value Management of the Project After Ending of 20% of its Period and Completion of 50% of the Outputs Case-by-Case Basis.

21. Resources

21.1. Resource Leveling and Smoothing

If you're having scheduling issues, you'll need to use resource normalization or normalization to fix the problem. But how do you use it? You are a project manager, and you stand in front of your production schedule. You realize, with the processes you have selected, you cannot finish production



within the current time frame you have chosen. When such issues arise, there are two solutions that you can adopt to fix scheduling issues:

Resource leveling vs. Smoothing.

Project management techniques will help you compress your schedule, so you can finish your orders without burdening your resources.

What is the resource level?

Resource leveling ignores resource allocation and solves any problems of over or under-allocating resources to new projects.

What is resource smoothing?

Resource smoothing is another project management tool for optimizing your resources by adjusting your schedule activities, so that resources do not exceed pre-set limits during planning. So, without further ado, we'll look at the two techniques (mostly focused on resource leveling) and how you can start using them.

The difference between resource leveling vs smoothing

The difference between resource leveling vs smoothing can be broken down to this:

- **Resource leveling** – This is used when the production scheduling of available resources is limited and needs to be used optimally.
- **Resource smoothing** – This is used when time constraints are the biggest factor preventing production. The idea is to finish the project on time while avoiding peaks and dips in the demand for resources.



**RESOURCE
LEVELING
VS
RESOURCE
SMOOTHING**

You can identify the differences by their traits and decide where you should hedge your bets when it comes to resource leveling vs resource smoothing, Table 25 Resource Leveling vs Resource Smoothing.

Resource normalization is usually performed before resource smoothing when trying to compress your schedule. That's why we'll look further into resource leveling, starting with the two basic components of this planning tactic.

The two key elements of resource leveling

The main goal of leveling is to allocate resources efficiently, so that you can finish production within a certain period. As you begin to level out resources, there are two main elements that you will need to focus on. These two elements of resource leveling serve to define projects:

- It can be completed using all available resources
- Can be completed with limited resources

Manufacturing orders that use a limited number of resources can be extended over a period until the resources become available. However, if the number of orders you need to fulfill exceeds the number of resources you have available, deferring manufacturing orders to a later date may be the wiser decision.

The structure of resource leveling

Manufacturers build their resource leveling by following these steps when doing their project management:

- The stage
- Phase
- Mission / Delivery

The above steps will help you define the project scope of your manufacturing orders, and find ways to organize your team members, making it easier for you when planning your production. However, when you're managing your projects, the level of resources needed for each of these three parameters may vary (depending on your seniority, experience, and skill level of your staff). This means that resource requirements between projects differ when production is planned in these three areas. This is the reason why many manufacturers turn to the manufacture of execution systems to help them organize their production.

The purpose of resource leveling

Resource leveling is a response to a production schedule poorly put together, to reallocate resources, focus, and time to achieve production within a given time frame. You will do this by specifying:

1. Dependencies

Dependencies are the relationships between your tasks, which ones come first and which ones come after.

2. Resource conflicts

Resources for several projects started at the same time. For example, maybe you have a worker doing the engraving but he has two orders arriving at his work station. The other thing that you will need to specify is the constraints that affect production, these constraints could be:

3. Mandatory

Limitations are caused by physical limitations such as experiences.

4. Discretionary

Restrictions based on team member preferences and actions.

5. External

Restrictions are often imposed due to the needs or desires of a third party.

Knowing about dependencies, resource conflicts, and constraints will be essential to help you compile later production schedules.

The resource leveling techniques

So, that's the basics of resource leveling, but what are the techniques that you can adopt into your business to get you started with project management.

1. Critical path analysis

The critical path analysis/method is a production scheduling algorithm. It is the most common type of approach that involves looking at the longest and shortest paths in the network diagram to complete the project. This is done by looking at your resource dependencies to understand the realistic time frame in which a manufacturing order can be completed. With this resource leveling technique, the critical path tasks are the ones that are very important, and the analysis of these paths will show interdependence between the activities, which will highlight the resources needed to collaborate on them.

Critical path analysis is a resource leveling technique that is widely used in industries that have complex production processes. But today, most companies use production scheduling software that automatically calculates the time to complete their operations.

2. Fast tracking

Fast Track is a resource leveling planning technique to buy more time, by completing tasks in parallel, which you wouldn't normally do. This approach to resource leveling can only be completed if activities overlap, which allows you to finish production on time and without additional costs. An example of this could be building prototypes of a new product prior to approving the design. The purpose of this approach is to compress your schedule if following the usual steps one by one will put you on the deadline. However, fast tracking can have the big bonus of completing tasks sooner or getting a product to market faster, it also comes with higher risks, and can be prone to problems like having to rework what you've already done due to mistakes.

3. Crashing

If you gamble with Fast Track and find a default, another resource leveling technique you can implement when you schedule stress is crashing. The purpose of the breakdown is to

shorten the duration by adding more resources to the manufacturing order at the lowest possible cost. When adopting downtime, you will prioritize based on the lowest downtime cost per unit team, and this focus will allow your team members to identify the activities that deliver the most value to your business.

By understanding which projects are in and out of the critical path, it allows you to see which tasks benefit from additional resources, which means you can prioritize and rearrange schedules in advance for future projects. So here we have it, the various resource leveling techniques that you can adopt when addressing your planning and scheduling issues for production. However, when researching on the internet, there is some confusion between resolving resources versus fast tracking, so let's quickly look into this matter.

Fast Tracking and Crashing

As mentioned earlier, when it comes to resource leveling vs Fast Tracking, you shouldn't really distinguish the difference between the two, because Fast Tracking is an approach that exists in the resource leveling world. Realistically, when you're scheduling production, and the biggest manufacturing constraint is time or resource availability, you're probably more concerned with choosing between **fast-track vs crashing**.

Using the *Table 26 Fast Tracking vs Crashing* to help you decide which is best for your business.

So, that's everything you need to know about resource leveling, resource smoothing, and the different techniques. Let's now look at the advantages of using these scheduling pressure plans.

Advantages of using resource leveling

Resource leveling is going to help you understand imbalances with your resource allocation, and avoid those resources becoming over-burdened. And this is, of course, the biggest advantage because if you can avoid over-allocating resources, you're going to increase productivity.

But other advantages you'll experience are:

- Minimizing production delays
- Identifying and utilizing downtime
- Team members can better prepare for tasks with more time to adjust between activities
- Team members aren't working on projects they aren't trained for
- Better resource allocation.[37]

21.2. Training on Distributing the Project Resources of Equipment and Tools.

Types of Resources

- Labor: Labor includes all the people who work for the project, and nature of their job.
- Management.
- Expertise
- Equipment: whether it's special hardware, a unique piece of software, or a machine designed to do a certain task.
- Finances: This can include: the payment of wages, the purchase of equipment, or the renting of a workspace.
- Energy: whether it comes in the form of gasoline to power a fleet of trucks, or electricity to keep an office full of computers up and running.
- Land
- Time: time often needs to be considered alongside resources such as labor, energy, and land.

Resource allocation is a plan that you develop with the aim of making the most of the available resources at your disposal in a project.

- Manpower:

Refer to *Table 27* Roles of Organization Staff, *Figure 15* Hierarchical of Organization Breakdown Structure

22. Procurement

22.1. Procurement Execution Process, and Contractor Selection.

Procurement Execution Process

Procurement Execution is a technical and critical action to be considered by the business which includes multiple steps and actions. The execution of the concerned action if not planned effectively then it impacts the final goods and services and thus the business gets impacted financially too. The sensitivity and critical aspect could be acknowledged through gaining insight into the Fiberglass procurement execution process through the following steps:

1. Step 0: Needs Recognition

For the Fiberglass project, step 1 action could be taken through creating a well-structured plan for procuring the goods and services within specific timeframes and at affordable cost. Cost management is to be done accurately through costs cutting on the other actions of the concerned project (Kniaz et al. 2019). The frameup of the plan needs to include all the aspects of the project and Fiberglass requirements along with the prospect's consideration is to be made.

2. Step 1: Purchase Requisition

Purchase recognition is the identification of the key elements to be purchased for the project. In the case of the Fiberglass project, the purchase recognition needs to be maintained on an electronic page which would be raised internally by the users. The requirement of the customers could be fulfilled through this document as it includes the key information which accelerates the procurement requirement. The fiberglass would inculcate this document as an important factor.

3. Step 2: Requisition review

This step is one of the monitoring tools which reviews the requisition and aligns it with the budget availability. The approval of the requisition leads to the processing of the procurement and thus leads to an effective consequence (Matto, 2021). For Fiberglass, this step would be strictly maintained as the budget factor is quite sensitive in the project and it needs some corrections too. In the review stage, functional managers or department heads review the requisition package and double-check if there is a genuine need for the requested goods or service, and also verify whether necessary funding is available.

4. Step 3: Solicitation Process

The approval of the requisition is one of the chief actions in the procurement and for Fiberglass this would be executed more sensitively due to the budget constraint. The approval is followed by the generation of the procurement and thus each team of the procurement will develop a plan against a solicitation process (Gisip, 2020). The opportunity of the particular solicitation plan rests on the ultimate difficulty of the requirement. Fiberglass would share multiple quotations with the vendors and thus the selection would be made based on the best and cheap quotation. The approval of the budget leads to multiple actions by the procurement

team on sharing quotations to various vendors with an intention to receive and compare bids to shortlist the perfect vendor.

5. Step 4: Evaluation and contract

As the solicitation gets closed on official grounds, the procurement team of the Fiberglass would review and evaluate the supplier's quotation along with the evaluation committee and thus lead to the decision of the supplier selection. The selection of the supplier would lead to the completion of the contract negotiation and signing is done followed by sharing of the purchase order with the selected vendor. An officially binding contract triggers right after a supplier accepts a PO and recognizes it.

6. Step 5: Order management

The delivery of the goods and services would be made by the selected supplier by Fiberglass within the specified timeframe (El-Sayegh et al. 2019). This is followed by an investigation of the order delivered and if any issues would be recognized by Fiberglass, then it would be shared with the supplier for improvement.

7. Step 6: Invoice approvals and disputes

This is the critical step, and it requires a highly technical tool for verifying the three-way aspect of the invoice. The matching of the GRN, supplier invoice and PO is to be made and, on its approval, the invoice is shared for being processed.

8. Step 7: Record Keeping

Record is maintained by the buyers that are by the Fiberglass for bookkeeping and financial auditing. All appropriate documents right from purchase requests to approved invoices are stored in a centralized location.

Contractor Selection

Fiberglass is restricted with the budget and financial aid needs to select the contractors through a low budget and selection tool. The contractors of the concerned project would be selected through the Informal Competitive Bidding Procedure. The concerned tool would help in gaining effective contractors through its accuracy and trial tests (Awwad and Ammoury, 2019). The procedure is the simplest form of bidding with a feature of being direct bid

solicitation to 3 or more contractors able to accomplish the applicable work. The agreement is awarded to the bottommost responsible bidder submitting a reactive bid, or all bids are rejected. The contractor is selected through a regressive analysis of the bidding and the quotations are also cross verified through the past experiences of the contractor on the quality delivery. The experiences of the contractor are verified and checked through two step verification process which helped in gaining authentic and productive suppliers. Fiberglass included the contractors with effective and well-known service providers with a minimal experience of 5 years in the industry This added on to the assurance of the quality and thus the services are expected to be highly efficient. [38,39,40,41,42,43&44]

22.2. Scoring Model

Making Decisions are the tool to manage projects. Projects have multiple decision from initiation to closure. Some of the decisions to make are Vendor selection, resource assignment, allocation of tasks, representatives of projects.

“A weighted scoring model, also known as a decision matrix, is an analysis tool that provides a systematic, structured process for selecting options based on multiple criteria”. [45]

It allows us to decide based on deferent important factors. It simplifies, and quantifies, what regularly starts out as a complicated question in order to arrive at an objective answer.

To create a weighted scoring model, the following steps are applied:

- Identify the criteria designated to the decision process
- Apply a weight to each criterion based on its relative importance in the decision (ideally, added to 100%)
- Assign numerical scores to each criterion for all of the options being considered.
- Calculate the weighted scores by multiplying the weight for each criterion by its score and adding the resulting values. [45]

Here is the model that we will use to be clear and easy make a decision for the project or service required, *Table 28 Scoring Model*.

23. Plan and Control

23.1. Agenda of Invitation and Virtual Record of a Virtual Meeting.

Refer to *Table 29 Agenda Invitation*.

Virtual Record

Project Manager: Hello everyone, the project on Fiber Glass is to be headed by me and I carry an open vision for bringing in new approaches and aspects that could be used for making the project highly productive. I would like to present you with the project strategy chosen, which is an Agile project management tool. The tool is selected on regressive experiments and investigation and I would like to know your views and aspects on the same. Kindly share your views on the same and provide with improvement suggestions too.

Sponsors: We would like to know in detail what are your plans, and the risk analysis is also required to be discussed. The mitigating plans are also to be discussed and overviewed.

Executive Officers: The project strategies appear to be quite well versed with the requirements. An in-depth acknowledgment would make things clearer and more justified

Project Manager: Definitely, I would like you all to go through the shared slides. This would help you relate to my words and hence a better understanding could be given.

Sponsors: You have displayed an amount to be kept as reserves for the project through cutting on the other expenses of the organization How would you justify the data and the numbers?

Executive Officers: Yes, this needs to be explained with justifying data.

Project Manager: Surely Sir, you can find all the processing and working of the data in the coming up slides where the budget has been provided with break-ups on its investment and the returns side by side. The reserve would be maintained only for emergency concerns and if it is unused by the end of the project it would be re-allocated to the different departments of the organization.

Sponsors: The overall project plan and execution appear to be quite well structured with a detailed report on each task. Wish you good luck.

Executive Officers: You have done good work so far, hope it executes in the same manner. Best of Luck.

23.2. Performance Measurement Cycle and Submitting Reports, and Explaining the Reason.

Our organization as others requires KPIs which inflect in our product, customer's satisfaction, reputation, quality and market share. We will measure each department and steps to reach the highest performance that we could. Every high-class organization should use global performance measurement framework, See *Figure 16* Performance Measurement Cycle.

We ask every department head manager in meeting to set our performance measurement using Earned value calculations which are;

- 1- Schedule Variance (SV): which sets as EV (earned value) - PV (planned value).
Example production department achieve 25% of this month in two weeks that's mean -75%. We late and we need to take an action to speed our process
- 2- Cost Variance (CV): the same (SV) but it focuses in cost of each department to monitor and decrease the spend early. We use EV (earned value) - AC (actual cost) to calculate Cost Variance.
- 3- Schedule Performance Index (SPI): here we can transfer number to value. We can use EV (earned value) / PV (planned value) to calculate Schedule Performance Index then if the result is 1 above that means we are on schedule but if the result is below 1 that means we are late and we need to take action.
- 4- Cost Performance Index (CPI): this one will show us where are we in spending in our budget. We will use EV (earn value) / AC (actual value). If the result is 1 or above that means we are under budget (save). If the result is below 1 that means overspending and we need to cut cost.

Beside the Earned Value, we will require from each department to submit to the administration their performance report (According to KPIs) and the manager will measure the report comparing to the targets e.g. the production department will submit their report how much product did they produce and their product quality, then the managers will compare with productions with targets.

There are three durations for measure daily, weekly and monthly.

The daily will be handled by departments supervisors

The weekly will be handled in meeting between supervisors and department's managers and in case the department has bad result, the head manager and project manager will join the meeting. sometime other department's manager will join if they including. Example if the production department complain their low target number because the warehouse has less space, so the warehouse manager will join the meeting.

The monthly meeting is between the supervisors, managers, head managers and project manager, *Table 30, Table 31 and Table 32.*

23.3. Change Request Model (Impact Analysis - Alternatives Analysis - Recommendations)

Refer to *Table 33* Change Request Form.

24. Risks & Opportunities

24.1. Risks (Threats) and Opportunities (with Examples).

- **Negative Risks**

Negative risk or "threat" is named after it has negative consequences for the project. It is unpopular with project managers and stakeholders, and they are trying very hard to avoid it.

Example of Negative Risk: Project delivery delays, project outages, or anything that could affect project objectives is considered a negative risk or 'threat.'

- **Positive Risks**

Positive risk or "opportunity" carries positive results on the project, and it is a preferred risk among project managers and stakeholders, and even seeks to achieve.

Example of a positive risk: early completion of the project or an increase in investment returns.

24.2. Risk Register

“Risk Register (or Risk Log) is a document that contains all the results of risk analysis and where risk response plans are recorded” PMBOK, pmi.org

The first step in Risk Register is to identify the Risks as *Table 34*, *Table 35*, *Table 36* and *Table 37*.

24.3. Qualitative Risk Analysis

Risk analysis

We can define risk analysis is the integrate of the estimate and evaluate sub-phases within the process phase as shown in *Figure 17*.

This stage of the process is also divided into two sub-stages:

- 1- Qualitative analysis: identification and subjective assessment of risks.
- 2- Quantitative analysis: objective assessment of the risks.

Qualitative analysis

In this substage, risk sources and factors are identified. For example: aid of checklists, interviews or brainstorming sessions. It is usually related to the form of assessment that

describes each risk and its impacts or a subjective labelling of each risk (such as, high/medium/low) in terms of both its impact and its probability of occurrence.

Quantitative analysis

A quantitative analysis mostly needs more sophisticated techniques, usually requiring computer software. Mostly, this is the formal aspect of the whole process requiring:

- Measurement of uncertainty in estimates of cost and time;
- Combination of Probabilistic of individual uncertainties.

How to analyze Risks Qualitatively and Quantitatively

Qualitative risk analysis: identification is the first phase of the qualitative analysis. This is the most important element of the process, since once risks have been identified, it is possible to put the responses about them. Identification can be achieved by:

1. Interviewing members of the project team.
2. Brainstorming meetings.
3. By using the expertise of the risk analyst.
4. Reviewing lesson learned if exist.

Quantitative risk analysis: *It is out of project due.*

It can be calculated from Expected Monetary Value (EMV) which is a statistical technique in risk management used to quantify risks and calculate the contingency reserve. It calculates the average outcome of all future risks that may or may not happen. We can get the results of EMV by multiplying the probability with the impact of the identified risk.

$$\text{Expected Monetary Value (EMV)} = \text{Probability} * \text{Impact}$$

Risk Management

The risk management begins right after completing the Qualitative analysis and continue its process during whole Project life cycle. The information obtained during the quantitative analysis allows the project manager to trade off taking actions against the likelihood and impact of risks occurring. [46,47&48]

Refer to *Table 38, Table 39, Table 40 and Table 41.*

24.4. Risk Response Strategies.

Responses to risk can do one or combination of the following: Refer to *Table 42*, *Table 43*, *Table 44*, *Table 45* and *Table 46*.

25. Stakeholders

25.1. Stakeholder Engagement Assessment Matrix

Refer to *Table 47* Stakeholder Engagement Assessment Matrix

When monitoring the actual stakeholder engagement, the project manager may update the observed current level (“C”) of engagement for each stakeholder, *Table 48* Stakeholder Engagement Assessment Matrix (Desired)

Recommendations

- Project management is a science commensurate with all areas of life, as our life is a set of projects that we have to work diligently, plan, organize, monitor and develop ourselves until we reach success.
- The project manager is primarily responsible for the success or failure of the project, so we must choose it carefully.
- The need to improve and develop competitive capabilities at all levels, and pay attention to ethical aspects.
- Increasing awareness of contemporary environmental design trends and their incorporation into projects.
- Give support to the team work to contact with actual organization so they can do live survey and actual work process.
- Working to develop the services provided to the client on a permanent basis to meet their needs
- Refining the talents of project workers in a manner befitting the quality of the project

Conclusion

In order to foster the development within an organization, a strategic initiative must be set by the senior management and the motivating factors driving the company's move in this direction must be well understood by all stakeholders.

Clear communication throughout all levels of the organization will lead to awareness mindset across departments. Leaders must inspire ownership of the new spend culture, by taking the initiative seriously and setting an example for others to follow through their own actions.

Appendices

Appendix 1: Tables

Table 1: Difference between Mission & Vision

Item	Vision	Mission
About	It is a brief to How to want to be. Purpose of the organization and their Objectives related to customer needs are clearly expressed	It shows a summary WHERE the organization want to be. It must explain the values and purposes of their business
Answer	It responds to the question "What does the Organization do? What Make the organization different from the other?"	It responds to the question "Where does the organization aim to be?"
Time	It talks the current heading to the Future	It talks about the Future
Function	Goals for the Organization's establishment are Outlined. The principal functions are internal, that express measures of the organization success. The leadership, team and stockholder are the principal audience	It should outline Where the organization show themselves after some years. It motivates the organization to work hard for the best. It explains the purpose of the organization being existing
Change	It could changeable, however, it must meet the core values, vision of the organization and customer needs	It also changeable, but the changes should be as minimum as could be
Developing	What the organization is doing now? For whom? And the what are the benefits? And why does the organization do that?	that is to ask Where the organization are going to? And when will achieve that? How it will do it
Feature of an Effective Statement	Reasons and Ethics of the organization: Who are the stakeholders "Client? And what are their duties?	It should be very clear, focus and far away from ambiguous. Describes the future in aspiration way and how values and culture should be altered.

Table 2: Key Performance Indicators (KPIs)

NO	KPI #	KPI Category	Strategic Objectives	Lead Measure	Lag Measure	Monitoring Method	Target Value
1	EOK-1	Operational KPIS	Capacity Utilization	Develop Product Output	Maximizing Capacity Utilization	Random Inspection	90%
2	EOK-2	Operational KPIS	Overall Equipment Effectiveness	Optimizing Equipment Planning Activities	Maximize Workforce Productivity	Random Inspection	85%
3	EOK-3	Operational KPIS	Machine Downtime	Reduced Machine Downtime	Maintain Accurately and Updated Machine Downtime Reports	Random Inspection	90%
4	EOK-4	Operational KPIS	Unscheduled Down Time	Machine Utilization	Maintain Accurately and Updated Machine Downtime Reports with Drill-Down Capability	Random Inspection	90%
5	ESK-5	Satisfaction KPIS	Customer Expectations	Scope Out Competitors	Successfully Maintaining a Customer Satisfaction Survey	Customer Satisfaction Surveys	95%
6	ESK-6	Satisfaction KPIS	Customer Satisfaction with The Buying Process	Develop A Customer-Centric Culture	Successfully Maintaining a Customer Satisfaction Rating Of 95% For Buying Process	Customer Satisfaction Surveys	95%
7	EEK-7	Employment KPIs	Services Staff	Employee Loyalty	No Key Position vacant for more than 45 days (pass or fail)	Random Inspection	80%

NO	KPI #	KPI Category	Strategic Objectives	Lead Measure	Lag Measure	Monitoring Method	Target Value
8	EEK-8	Employment KPIs	Personnel Training and Development Plan	Employee Efficiency	Timely implementation of the Personnel Training and Development Plan.	Random Inspection	85%
9	ECK-9	Cost KPIs	Unit Costs	Optimize To Decrease Unit Costs Over Time	Maintain Accurate and Updated Unit Costs Over Time Report	Random Inspection	90%
10	ECK-10	Cost KPIs	Maintenance Costs	Optimize Maintenance Costs Over Time and Adjust Your Target Accordingly	Maintain Accurate Reports for Evaluate Equipment Costs In The Long Run	Random Inspection	90%

Project Charter								
Project Title		Fiberglass Factory		Project Manager		Enas Nassif		
Start Date		1-Dec-21	End Date		1-Dec-22	Project Sponsor		ESU
Business Need					Deliverables			
The shortage of Fiberglass produced in Saudi Arabia led the organizations to import the demands of fiberglass outside Saudi Arabi, especially for manufacturing the boats. Generally, the import of fiberglass boats is around 1500, so by building national fiberglass plant, it could build 300 boats annually. This business also will establish hundreds of jobs for Saudis.					-Issue the Feasibility Case - Design the plant - Project Kick Off - Quarterly Review (1, 2, 3 & 4) - Completed the Plant project - Hire the Operation Staff - Import the Machines and Tools needed - Hire the Operation Labors - Initiate Plant			
Risk & Issues								
Type		Description						
Health		Respiratory congestion, infection from epidemics and their spread, public health risks, chronic diseases, and food poisoning.						
General Safety		1-Chemical: Chemical spillage, fire resulting from the ignition of chemical substances, throwing chemical waste into sewage basins, compressed gases, mixing incompatible chemicals during transportation, handling, storage and final disposal.						
		2-Fire: A fire resulting from the storage of flammable materials/liquids, a fire resulting from the storage of dangerous materials, a fire resulting from the absence of safety requirements.						
		3-Natural: Storms and dust, rain and torrential rain						
Information		Hacking, Viruses, Access Unauthorized, Use of non-genuine copies of software, Hardware or major system failures.						
Legal		Filing cases against the factory, the risk of concluding contracts and agreements without the approval of the relevant departments, the risk of losing document especially confidential ones.						
Human resources		Abstaining from work and disrupting work, risk of neglect, random and unplanned recruitment.						

Financial	Risk of low stakeholder support, low financial resources, financial and administrative operational risks.
Reputation	Risks related to administrative reputation, risks related to factory reputation and production quality, marketing risks.
Buildings and facilities	Risks related to power outages, risks related to water, risks related to electric elevators, risks related to electric shock, risks related to air conditioning failures.

Assumptions/Dependencies

- Project Cost within 4 million SAR include all expenses.
- Complete the project within 12 months.
- Using 100% local material.
- Planning of manpower: effective recruitment, and selection, proper methods of
- Performance management (KPI's), optimum productivity, reduction in labor cost.
- Product Design: Design is the first stage of a product, once a product is designed and
- Produced there is a little possibility to change it.
- Innovation & Technology: technology can improve the manufacturing facility to produce
- Finished good or a product, automation and CNC's machines can be used to
- Manufacture a product with less cost, time and reduce/optimize the labor cost.
- Action plan: A clear action plan & strategy needs to consider all challenges and issues
- Related to the business to ensure to maintain the value.
- FRP boats should comply with national safety legislation.
- Personal and environmental safety when working with FRP.

Project Objectives		Project Outputs	
1- The goal is to produce environmentally friendly glass fibers, at the lowest cost and high quality by designing and manufacturing with the latest technology		1- Project Plans	
2- To cover most of the demands of Fiberglass in the Saudi Arabia.		2- Project Deliverables	
		3- Customer Satisfaction	
		4- Establishment of a factory with an area of 3000 square meters	
Milestone			
Milestone		Target Date	Actual Date
Issue the Feasibility Case		1-1-2022	

Design the plant	1-2-2022	
Project Kick Off	10-2-2022	
Quarterly Review (1, 2, 3 & 4)	30-2-2022	
Completed the Plant project	30-3-2022	
Hire the Operation Staff	1-8-2022	
Import the Machines and Tools needed	1-7-2022	
Hire the Operation Labors	1-9-2022	
Initiate the Plant	1-12-2022	
Project Team		
Project Manager	Enas Nassif	
Team Member	Mahmoud Alashour Farah Alshoaibi Omar Aldokhi Waseem Tabbaa Mohanad Abdulkhaleq Husam Bashwieh Mohammad Aldelihan Mazin Mohamed	

Table 4: OBS Divisions & Roles

Project manager	the responsible person of the fiber glass Project
Factory manager	the head management of the factory building and operation process
Maintenance & Operation	the vice management of operation of the fiberglass
Mechanical Department	the dedicated team works on mechanic phase of operation
Electrical Department	the dedicated team works on electric phase of operation
General Maintenance	the dedicated team maintains all machines.
Production Management	the vice management of items which we produced
Production Workers	the team responses of operation process from input items in to items out
workers assembly	the team responses of items which we produced before we ship
Equipment Operator	operates the machine
Production Line Monitor	responsible of quantity of production

Monitor Quality	responsible of quality of production
Warehouses	the department who responsible of items before use or products before shipment
Warehouse Supervisor	shifts team who response of items and products inside the warehouse
Shipping and receiving	response of shipping product and receiving items
Loading workers	workers team who loading in or up trucks
Financial Management	vice management of financial department
Finance Manager	vice manager of financial department
Senior Accountant	account team who response of any financial structure in the project
Cashier	the responsible of giving or taking pair money
HR department	This department's duties include hiring, training, and assisting with specific performance issues, as well as setting employee salaries, and ensuring compliance with labor law.
Director of Human Resources	senior of HR department Forming a link between company management, employees, employee performance evaluation, developing and directing strategies and administrative services
Personnel Affairs	Responsible for strengthening relationships between employer and employees
Employment Department	Responsible for announcing vacancies, selecting from among applicants, and conducting preliminary interviews with them
Training Department	Provides comprehensive training to help them understand new work and be able to develop performance and skills.
Government Relations Officer Department	responsible for legal transactions and insurances
Marketing Department	Determines the areas and markets that fit the nature of the product and where the company should focus its marketing strategy
Sales Manager	the person responsible for following up and evaluating sales, as well as supervising the sales representatives in the company and directing them to carry out their tasks
Sales Officer The sales employee	the person concerned with implementing the sales goals within the company and receiving all directions from the supervisor or his direct manager and working to implement them accurately

Director of Marketing	Responsible for preparing and setting marketing and sales plans, organizing sales activity, and monitoring and evaluating sales and marketing activities.
Marketing Officer	Planning advertising and promotional campaigns for products and services on a variety of digital and print media.

Table 5: Check Compliance Model

Project Title		Data Prepared by				
ID	Requirement	Verification Method	Validation Method	Acceptance Criteria	Status	Sign-off

Table 6: Project Initiation Check List

No	Description	Status	Assigned to	Start Date	End Date	Comments
1	Project Charter					
	- Business Needs					
	- Deliverables					
	- Risk & Issues					
	- Assumptions & Constraints					
	- High Level Scope					
	- Deliverables, Milestone					
	- Project Team					
2	Stakeholder Analysis					
3	PMO					
4	OBS					
5	Kick off Meeting					

Table 7: Project Planning Check List

No	Description	Status	Assigned to	Start Date	End Date	Comments
1	Scope of work					
2	WBS					
3	Project Schedule					
4	Project Budget					
5	Risks Management					
6	Quality Management					
7	KPIs					
8	Human Resource Management					
9	Procurement Management					
10	Communication Management					

Table 8: Project Execution Check List

No	Description	Status	Assigned to	Start Date	End Date	Comments
1	Execution Checklists					
2	Project Planning Documents					
	- Project templates					
	- Change updates					
	- Status and Tracking of Project progress					

Table 9: Monitoring & Closing Check List

No	Description	Status	Assigned to	Start Date	End Date	Comments
1	Change Management Documents					
2	Project Management Software					
3	Validation Scope & Acceptance Form					
4	Project Performance					
5	Cost Tracking					
6	Customer Satisfaction Response					

Table 10: Stakeholders Register

S/N	Stakeholders	Impact	Interest
1	Ministry of Commerce (MOC)	High	Low
2	Chamber of Commerce	High	Low
3	Ministry of Labor (MOL)	High	Low
4	General Organization for Social Insurance (GOSI)	High	Low
5	General Authority of Zakat & Tax	High	Low
6	Civil Defense	High	Low
7	Ministry of Municipal & Rural Affairs (MOMRA)	High	Low
8	Competitors	High	Moderate
9	Suppliers	High	High
10	Customers	High	High
11	Neighbors	Low	Low
12	Shareholders	High	High
S/N	Stakeholders	Power	Interest
1	Project Owner	High	High
2	Sponsor	High	High
3	Project manager	High	High
4	PMO	High	High
5	Functional Mangers	Low	High
6	Department Staff	Low	High

Table 11: Personal Behaviors

No	Behavior Description	Causes	How to be eliminated
1	Failure to attend work hours; Frequent absences and delays in coming to the workplace	Being late for work due to non-compliance or lack of transportation	• Non-compliance: giving a warning to the worker and in case the act is repeated, a deduction from the salary • Delays from work: by providing transportation for workers, which helps reduce delays
2	Laziness and not getting work done; Late production and completion of work on time	Low level of satisfaction of employees in the organization	Motivating employees and offering bonuses and rewards
3	Disputes and conflicts between employees Disagreements between colleagues, or problems that occur between the worker and the manager at work	Differences in cultures and environment among employees, different work experience, and struggles to obtain a position	• Attempting to resolve disputes by satisfying the parties or transferring one of the parties to other departments • Ignore minor conflicts that do not affect the workflow

Table 12: Moral Integrity Behaviors Influences

Moral Integrity	Finance	Social	Technical
Close-Mindedness	Rejection new request to decrease cost or increase income will let the company go no where	Rejection new staff in the group or rejection new position make hole between the employees which damage the communication and goals	Rejection new tools or machine can cost the company saving money and effort

Uncooperative	Not cooperate and update the statements with finance department reflect badly the finance statement monthly and annual	The staff will work only from Horizontal requests which damage processes	e.g., if maintenance department isn't cooperative with operation department will delay the orders and get customers dissatisfaction
Not Explicit	Not be honest with finance department regarding all cost and bills will affect the finance strategy and view of cost	e.g., if the one staff is not honest about his ability to work that will affect the operation and procedure	The trainer should be honest, and his training content should be full of required information otherwise the trainees will use the machine less efficient and effective

Table 13: Stakeholders Analysis (Stakeholders Register)

S/N	Stakeholders	Impact	Interest	Expectations
1	Ministry of Commerce (MOC)	High	Low	Organization activities are central to the success of the economy (providing jobs and paying taxes)
2	Chamber of Commerce	High	Low	Register the company, and follow their rules and regulations
3	Ministry of Labor (MOL)	High	Low	Legislation such as safety rules, must be met by the company
4	General Organization for Social Insurance (GOSI)	High	Low	Register the employees, assure them in their system, pay the fees monthly.
5	General Authority of Zakat & Tax	High	Low	Paying Zakat and Taxes annually

S/N	Stakeholders	Impact	Interest	Expectations
6	Civil Defense	High	Low	Follow the safety rules
7	Ministry of Municipal & Rural Affairs (MOMRA)	High	Low	Follow regulations of street, buildings and fees payments.
8	Competitors	High	Moderate	Ethical behavior, fair competitions, zero ethical faults
9	Suppliers	High	High	Ease Payment Prompt
10	Customers	High	High	Satisfaction, Quality Applied, Cost Saving, Good performance.
11	Neighbors	Low	Low	Respect the working, and the shared facilities
12	Shareholders	High	High	Steady Flow of income, possible capital growth and Continuation of the business
1	Project Owner	High	High	High Level of Milestones, Deliverables, Stratified, Meet Expectations
2	Sponsor	High	High	Details of everything must be provided to him, Validate Scope Approval
3	Project manager	High	High	Functional Mangers report to him, Approval of Project Documents, Monitor the progress of the project
4	PMO	High	High	Direct the project
5	Functional Mangers	Low	High	Monitor the area work, department staff report to them, approval of work done

S/N	Stakeholders	Impact	Interest	Expectations
6	Department Staff	Low	High	Keep them updated of what are required, progress report sending periodically to their managers, Job Security, Rewards and Recognitions.

Table 14: Communication Process

Input	Tools and techniques	Output
- Communications management plan - Work performance reports - Environmental factors of the organization - Origins of the organizational process	- Communication Technology - Communication Forms - Communication methods - Communication management systems - Performance reports	- Project communication - Project management plan updates - Project documentation updates - Origins of the organizational process

Table 15: 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	Project manager	Agenda

				sponsor Stakeholders		
Project Team Meetings	Review status of project	Face-to-face or Conference call	Weekly	Project team	Project manager	Agenda Project schedule
Technical & Creative Design Meetings	Discuss, review technical & design problems and solutions.	In person / Face-to-face	As needed	Technical team Creative team	Technical lead Creative lead	Agenda
Monthly Project Status Meetings	Update leadership on project status.	Face-to-face or Conference call	Monthly	Project manager Stakeholders	Project manager	Slide presentation Project schedule
Project Status Reports	Detailed report on project status including progress, costs, and problems.	Email	Monthly	Project manager Stakeholders	Project manager	Project status report Project schedule

Table 16: Stakeholder Assessment Matrix (Current)

S/N	Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
1	Ministry of Commerce (MOC)			C		
2	Chamber of Commerce			C		
3	Ministry of Labor (MOL)			C		

S/N	Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
4	General Organization for Social Insurance (GOSI)			C		
5	General Authority of Zakat & Tax			C		
6	Civil Defense			C		
7	Ministry of Municipal & Rural Affairs (MOMRA)			C		
8	Competitors		C			
9	Suppliers				C	
10	Customers				C	
11	Neighbors			C		
12	Shareholders				C	
1	Project Owner					C
2	Sponsor				C	
3	Project manager				C	
4	PMO					C
5	Functional Mangers				C	
6	Department Staff				C	

Table 17: Stakeholders Assessment Matrix (Desired)

S/N	Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
1	Ministry of Commerce (MOC)			C		

S/N	Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
2	Chamber of Commerce			C		
3	Ministry of Labor (MOL)			C		
4	General Organization for Social Insurance (GOSI)			C		
5	General Authority of Zakat & Tax			C		
6	Civil Defense			C		
7	Ministry of Municipal & Rural Affairs (MOMRA)			C		
8	Competitors		C			
9	Suppliers				C	
10	Customers				C	
11	Neighbors			C		
12	Shareholders				C	
1	Project Owner					CD
2	Sponsor				C	D
3	Project manager				C	D
4	PMO					CD
5	Functional Mangers				C	
6	Department Staff				C	

Table 18: RACI Model

Tasks	Sponsor	Project Manager	Team Members
Create Project Charter	C	R/A	C
Create Status Report	I	R/A	
Perform Change Management	C	R	

Table 19: Success Factors

1. Experienced project managers & skilled project team	You can learn project management theory and techniques but, in the end, success comes with experience. The more experienced the project manager is, the more confidence and skill he will have to overcome in the day-to-day business challenges of the project. Consider clear roles and responsibilities to prevent misunderstanding and mismanagement. Successful project managers are admired not only for technical expertise, but also for leadership. Without a professional and skilled project team, you can be a prolific leader and use as many advanced methods as you want, your project will not be successful. Ensure that your team members have the skills to deliver the required results and have a positive attitude towards the project. Also, the team must work as a whole. It is therefore important to build a team that is motivated to work together towards a common goal.
2. Methodical approach	Choosing an appropriate project management methodology is critical to success. Follow the tools and techniques of your chosen framework to make sure your process is clear, reliable, and efficient. As mentioned above, invest time in defining a clear project goal that all stakeholders understand and agree on.
3. Planning	Many project managers rush into the project implementation phase and don't take enough time for solid planning. Don't make this mistake. Invest enough time and resources in overall planning. As Benjamin Franklin quote says: "If you fail to plan, you plan to fail." Later you will work more effectively and more goal oriented.

4. Follow best practices	You don't need to reinvent the wheel: Project management is enough of a challenge. Use where possible frameworks and best practices. Take advantage of the experience of past successes and adapt proven strategies to your individual case rather than building everything from the ground up. This allows you to focus your resources on the truly unique aspects of your project that will make the most difference.
5. Controlling	Check your progress and rate the results on a regular basis. Define key performance indicators (KPIs) and use reports to quickly understand whether a project is on the right track. If things go sideways, you will recognize early and be able to take countermeasures before more damage is done.
6. Software	The role of project management software is often underestimated even though the quality of the tools you have chosen has a direct impact on the quality of your management. The professional and intuitive software reduces the risk of errors and miscalculations, creates the best possible overview of all relevant KPIs, and reliably displays critical data on all required devices. The software supports safe and easy team collaboration and is the basis for giving each team member access to the required information. Instead of working with Excel or other spreadsheet programs that weren't built for project management needs, invest in a professional and specific tool. It will simplify your work and affect the success of your project.
7. Communication	Many undesirable developments in projects can be prevented or at least caught early with proper communication. Ensure the implementation and use of formal communication processes (meetings and documents) as well as informal processes. Communication between team member plays and the important part. Offer possibilities for your employees to meet outside of formal meetings, for example in a coffee corner in your offices or in a chat widget.

Table 20: Types of WBS

No	Type of WBS	Description
1	Verb-oriented WBS	a task-oriented WBS defines the deliverable of the project adds terms to the actions that have to be done to supply the deliverable. the primary word during a given WBS component typically may be a verb, like style, develop, optimize, transfer, test, etc.
2	Noun-oriented WBS	a deliverable-oriented WBS defines project add terms of the elements (physical or functional) that form up the deliverable. during this case, the primary word during a given WBS component may be a noun, like Module A, system A, engine, Antenna, etc. Since the nouns are typically components of a product, this WBS sort is usually referred to as a “Product Breakdown Structure (PBS). Deliverable-oriented WBS structures are the popular sort per PMI’s definition
3	Time-phased WBS	a “time-phased” WBS is employed on terribly long comes. It breaks the project into major phases rather than tasks. during this sort, a “rolling wave” approach is adopted, and solely the near-term part is planned very well. different WBS sorts could embrace organization-types, geographical-types, price breakdown sorts, and profit-center sorts.

Table 21: Methods Used in Requirement Collection

Input	Methods	Output
1. Scope management plan 2. Requirements management plan 3. Stakeholder management plan 4. Project charter 5. Register of stakeholders	1. Personal Interviews 2. Specialty Groups 3. Facilitated workshops 4. Techniques of collective creativity 5. Group decision-making methods 6. Questionnaires and surveys 7. Observation operations 8. Prototypes 9. Performance Tests 10. Context Diagrams	1. Documentation of requirements 2. Requirement's traceability matrix

Table 22: Difference between Work Package VS Activity

Work Package	Activity
It is one of the lowest level of deliverables in a project.	It is a means to create a deliverable. A series of activities results in a lowest level of deliverable.
It is the result or outcome of an endeavor.	It is one step of the endeavor.
It fulfills a portion of project and provides part satisfaction and some value to the project stakeholders.	An activity, in itself, does not provide any value to the project stakeholders.
A deliverable has a tangible value and it is generally handed over to the project stakeholders.	It cannot be handed over to the project stakeholders.
It is generally defined using a noun (outcome) e.g., 'Module X'.	It is generally defined using a verb (work to be done) e.g., 'testing'.

Table 23: WBS and Relationship between the activities

Activity	Work Package	Description	Time (DAY)	Dependencies	Start Date	Due Date
A	1.1.	Brand & Logo	40	-	01/01/2022	02/10/2022
B	1.2.	Media Sponsor	15	A	02/10/2022	02/20/2022
C	1.3.	Social Media	30	A	02/10/2022	03/10/2022
D	2.1	Select Location	15	A	02/10/2022	02/25/2022
E	2.2.1.	Civil defense requirement	15	B	02/20/2022	03/07/2022
F	2.2.2.	Government permits	60	C	03/10/2022	05/10/2022
G	2.2.3.	Insurance	40	F	05/10/2022	06/20/2022
H	2.3.	Layout Design	10	E,D	03/07/2022	04/01/2022
I	2.4.	Prepare Site	50	G	06/20/2022	08/10/2022
J	2.5.	Install & test security System	10	H	04/01/2022	04/06/2022
K	3.1.	Supplier agreements	15	F	06/14/2022	06/24/2022
L	3.2.	Equipment installation	25	I,K	08/10/2022	09/05/2022
M	3.3.	Material supply	15	J	04/06/2022	04/26/2022
N	4.1.	Packaging style	20	B	03/06/2022	03/21/2022
O	4.2.	Packaging tools & materials	15	N,E	03/07/2022	03/17/2022
P	5.1.	Identifying categories	15	O	03/17/2022	03/27/2022
Q	5.2.	Interviews	40	M,L	09/05/2022	10/15/2022
R	5.3.	Candidacy	10	P,M	05/01/2022	05/26/2022
S	5.4.	Hiring	15	M	06/18/2022	07/08/2022
T	5.5.	Training	40	Q	10/15/2022	11/25/2022
U	6.1.	Equipment test	15	X,R	04/21/2022	05/01/2022
V	6.2.	Material test	10	U	06/29/2022	07/09/2022
W	6.3.	Product test	20	S,T	11/25/2022	12/15/2022
X	6.4.	Packaging test	25	P	03/27/2022	04/01/2022
Y	6.5.	Quality & safety test	20	V,W	12/15/2022	12/31/2022

Table 24: SIPOC of One Process Boat Manufacturing

Suppliers	Inputs	Process	Output	Customers
Supplier who will deliver the raw material of fiberglass (Fiberglass Roll)	Machine spray of Fiberglass Roll	Mold the boat - Castin the fiber glass by the machine - Burn the stretch - Roll every point along the boat	Boat covered by fiberglass	Next Process (Roll of Coving)

Table 25: Cost Breakdown Structure

Activity	Work Package	Description	Time (DAY)	Dependencies	Cost
A	1.1.	Brand & Logo	40	-	10,000
B	1.2.	Media Sponsor	15	A	150,000
C	1.3.	Social Media	30	A	50,000
D	2.1	Select Location	15	A	5,000
E	2.2.1.	Civil defense requirement	15	B	20,000
F	2.2.2.	Government permits	60	C	5,000
G	2.2.3.	Insurance	40	F	1,000,000
H	2.3.	Layout Design	10	E,D	150,000
I	2.4.	Prepare Site	50	G	100,000
J	2.5.	Install & test security System	10	H	60,000
K	3.1.	Supplier agreements	15	F	250,000
L	3.2.	Equipment installation	25	I,K	600,000
M	3.3.	Material supply	15	J	120,000

N	4.1.	Packaging style	20	B	5,000
O	4.2.	Packaging tools & materials	15	N,E	100,000
P	5.1.	Identifying categories	15	O	1,000
Q	5.2.	Interviews	40	M,L	1,000
R	5.3.	Candidacy	10	P,M	1,000
S	5.4.	Hiring	15	M	100,000
T	5.5.	Training	40	Q	120,000
U	6.1.	Equipment test	15	X,R	1,000
V	6.2.	Material test	10	U	5,000
W	6.3.	Product test	20	S,T	2,000
X	6.4.	Packaging test	25	P	1,000
Y	6.5.	Quality & safety test	20	V,W	1,000
TOTAL COST					2,858,000

Table 26: Resource Leveling vs Resource Smoothing

Resource leveling	Resource smoothing
The finish dates of the project can change.	The finish dates of the product stay the same.
Critical paths change, mostly increasing.	You can pause activities within its float boundaries.
Scheduling when resources are under or over-allocated.	Scheduling is based when resources are unevenly allocated.
The main constraint is your resources.	The main constraint is your project end date
Resource leveling can be implemented for tasks on the critical path.	With resource smoothing, you don't alter the critical path.

Resource leveling is usually scheduled first	Resource smoothing is often performed after resource leveling.
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Table 27: Fast Tracking vs Crashing

Fast Tracking	Crashing
Complete tasks at the same time to compress your schedule.	Add more resources to finish tasks to compress your schedule.
Increases risks and the chance to rework projects.	Increases risks, but also increases costs.
Only works if your tasks can be overlapped.	Only works when more resources will shorten the project duration.
Should always be tried first.	Should be tried when fast tracking hasn't compressed your schedule.
Can only work on activities on the critical path.	Can only work on activities on the critical path.

Table 28: Roles of Organization Staff

Project Manager	the responsible person of the fiber glass Project
Factory Manager	the head management of the factory building and operation process
Maintenance & Operation	the vice management of operation of the fiberglass
Mechanical Department	the dedicated team works on mechanic phase of operation
Electrical Department	the dedicated team works on electric phase of operation
General Maintenance	the dedicated team maintains all machines.
Production Management	the vice management of items which we produced
Production Workers	the team responses of operation process from input items in to items out
workers assembly	the team responses of items which we produced before we ship
	Equipment Operator operates the machine
Production Line	Monitor responsible of quantity of production
Monitor Quality	responsible of quality of production

Warehouses	the department who responsible of items before use or products before shipment
Warehouse Supervisor	shifts team who response of items and products inside the warehouse
Financial Management	vice management of financial department
Finance Manager	vice manager of financial department
	-senior of HR department Forming a link between company management, employees, employee performance evaluation,
Director of Human Resources	-developing and directing strategies and administrative services -Personnel Affairs -Responsible for strengthening relationships between employer and employees
Marketing Department	Determines the areas and markets that fit the nature of the product and where the company should focus its marketing strategy
Sales Manager	the person responsible for following up and evaluating sales, as well as supervising the sales representatives in the company and directing them to carry out their tasks
Marketing Officer	Planning advertising and promotional campaigns for products and services on a variety of digital and print media.--

Table 29: Scoring Model

Criteria	Weight	Weighted Scores		
		Vendor A	Vendor B	Vendor C
Compliance Criteria				
Experience History	20			
Are Customers and Key personnel are known well?	15			
are they well trained?	15			

Capabilities of development	10			
Align with Policy/culture/philosophy	15			
Follows Ethical and Legal Standards	10			
Understanding Business Drivers	15			
Total	100			
Capacities				
Ability to meet target goals	20			
Are Current Capacity is met to target operation?	20			
Operational Statistics and Historical Quality Data	15			
Ready Resource	15			
Skilled Personnel	15			
Ability to increase capacity of manpower	15			
Total	100			
Commitment to Quality and Schedule				
Ability to finish the sub-project, service or Product within Schedule	30			
Quality Management	20			
Continuous Improvement	15			
Reputation based on performance on past	15			
Ability to improve quality	20			
Total	100			
Cost and Finance				
Cost History of Previous Projects	20			
Ability to deliver on or below targets price (Price)	50			
Ability to submit Regular Project Status of cost	15			
Financial Reputation	15			
Total	100			

Communication				
How easily reach to Customers and key personnel?	30			
How Appropriate Channels of Communication are easily used?	30			
Are they using modern software to share the information such as cloud?	40			
Total	100			
Control of Project or Service				
Quality	20			
Schedule	20			
Cost	20			
Procurement	20			
Health, Safety and Environment (HSE)	20			
Total	100			

Table 30: Agenda Invitation

MEETING DETAILS	Project Name:	Fiberglass Factory
	Date:	Wednesday, December 1, 2021
	Time:	10:00 AM-1:30 PM
INVITEES:	Project Manager, Sponsors, Executive Officers	
TIME	AGENDA ITEMS	
10:00 AM	Arrival and Networking.	
10:30 AM	Opening speech by the owner of Fiber Glass and Project Manager.	
11:00 AM	Objective and scope of the project to be shared along with deliverables.	
11:30 AM	Presentation on Fiber Glass Project requirements and procedure of working	
12:30 PM	Resolving Questions and queries of the audience with clarity on project deliverables and requirements.	
01:00 PM	Financial plan of the project to be disclosed.	
01:30 PM	Networking and Closing	

Table 31: The KPI form used in Daily

Type	KPI	Distribution	Target	Achieve
Quantity	Small Product	Numbers of Small Products	500	
	Medial Product	Numbers of Medium Products	250	
	Large Product	Numbers of Large Products	100	
Quality	Small Product	Test Two Products	Good	
	Medial Product	Test Two Products	Good	
	Large Product	One Two Product	Good	

Table 32: The KPI Used for Week

Type	KPI	Distribution	Target	Achieve
Quantity	Small Product	Numbers of Small Products	3500	

	Medial Product	Numbers of Medium Products	1750	
	Large Product	Numbers of Large Products	700	
	Small Product	Test Two Products	Good	
	Medial Product	Test Two Products	Good	
	Large Product	One Two Product	Good	

Table 33: The KPI Form used for Month

Type	KPI	Distribution	Target	Achieve
Quantity	Small Product	Numbers of Small Products	15000	
	Medial Product	Numbers of Medium Products	7500	
	Large Product	Numbers of Large Products	3000	
Qn Per day	Small Product	Numbers of Large Products	80%	
	Medial Product	Numbers of Large Products	80%	
	Large Product	Numbers of Large Products	80%	
Quality	Small Product	Test Two Products	Good	
	Medial Product	Test Two Products	Good	
	Large Product	One Two Product	Good	
Ql Per Day	Small Product	How much Day we reach the target	80%	
	Medial Product	How much Day we reach the target	80%	
	Large Product	How much Day we reach the target	80%	

Table 34: Change Request Form

Change Request Form (CRF)			
Project Name			
Requested By		Date Submitted	
Request No		Date Required	
Type of CR	☐ Enhancement ☐ Defect		
Change Description			
Change Reason and Justification			
Affected Area			
Proposed Action			
Impact of Change Assessment and Alternative Analysis			
Technical Impact	☐ Low	☐ Medium	☐ High
Quality Impact	☐ Low	☐ Medium	☐ High
Scope Impact	☐ Low	☐ Medium	☐ High
Cost Impact	☐ Low	☐ Medium	☐ High
Schedule Impact	☐ Low	☐ Medium	☐ High
Priority	☐ Low	☐ Medium	☐ High ☐ Critical
Assumptions			
Alternative Actions (Resources, Machines, Make or Bu, etc.)			
Duration of Change Implementation			
Recommendations			

Project Manager Point of View	
Client Point of View	
Final Decision	
Decision Status	☐ In Review ☐ Approved ☐ Approved with Conditions ☐ Rejected
Decision Date	
Approved By	
Signature	

Table 35: Risks related to Compliance

NO.	Risks Identification	Owner
1	Using a prohibited material in Boat Manufacturing	Technical Staff
2	Not following the cods of the hazard material	Technical Staff
3	Not using the standards of Factory Building in Saudi Arabia	Technical Staff
4	Not Following the rules and regulation of Office Labors of Saudi Arabi	HR Specialist

Table 36: Risks related to Opportunity

NO.	Risks Identification	Owner
1	Build a new business to manufacture Fiberglass Boat in Saudi Arabia	Senior Manager
2	The place that would be suitable for a Factory for low cost	Technical Staff
3	Fiberglass Boat are less Damaging than other such as wooden ones, so it gives the customer higher opportunity to choose our Boats than other types	Marketing Staff

4	There some issues in Fiberglass boats, like Delamination, Blister, fatigue, Warping or Stringer Damage, so it could be a good to also provide a periodical maintenance	Maintenance Department
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Table 37: Risks related to Hazard

NO.	Risk Identification	Owner
1	Human health hazards arise from chemicals or materials used in the boat: rubber, plastic, wood, metal, textiles and of course oil. lead and mercury are recognized as neurotoxin	Safety Manger
2	Suffocation caused by: 1. Chemical reactions that did not take place in their designated places. 2. Unfamiliarity of workers with chemical and physical information causing these suffocations. 3. Leakage of harmful gases from unmaintained pipes rotating. 4. Fires.	Safety Officer
3	Injuries During Works	Safety Officer

Table 38: Risks related to Project

No.	Risk description	Owner
1	Defining Project Schedule not done clearly	Project Team
2	Accommodation of unplanned work	Project Team
3	Incompletion of Project Design and Deliverable Definition	Project Manager
4	Project Purpose not well defined	Project Manager
5	Make a strong communication	Project Manager
6	Staff priorities are not well controlled	Project Manager

No.	Risk description	Owner
7	Delays of Consultant or contractor	Project Manager
8	Estimating errors of scheduling	Project Team
9	Scope creep	Project Team
10	Delays or pauses project due to legal requirements.	HR Manger
11	Lack of communication, causing lack of clarity and confusion.	Project Manager
12	Delays of Customer approval	Project Manager
13	Additional workload or time requirements because of new direction, policy, or statute appears.	Project Manager
14	Materials, properties or equipment may be stolen	Security Guards
15	Escalation of unresolved conflicts in timely manner	Change Control Department
16	Customer testing done inadequately	Project Manager
17	Delays due to weather, loss of resources, materials, premises and even electricity.	Safety Officer
18	Delays due to stakeholders' actions	Project Manager

Table 39: Qualitative Risks Analysis related to Compliance

NO.	Risks Identification	Probability	Impact	Severity
1	Using a prohibited material in Boat Manufacturing	Low	High	Medium
2	Not following the cods of the hazard material	Low	High	Medium
3	Not using the standards of Factory Building in Saudi Arabia	Low	High	Medium

4	Not Following the rules and regulation of Office Labors of Saudi Arabi	Low	High	Medium
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Table 40: Qualitative Risks Analysis related to Opportunity

NO.	Risks Identification	Probability	Impact	Severity
1	Build a new business to manufacture Fiberglass Boat in Saudi Arabi	High	High	High
2	The place that would be suitable for a Factory for low cost	Medium	Medium	Medium
3	Fiberglass Boat are less Damaging than other such as wooden ones, so it gives the customer higher opportunity to choose our Boats than other types	High	High	High
4	There some issues in Fiberglass boats, like Delamination, Blister, fatigue, Warping or Stringer Damage	Low	High	Medium

Table 41: Qualitative Risks Analysis related to Hazards

NO.	Risk Identification	Probability	Impact	Severity
1	Human health hazards arise from chemicals or materials used in the boat: rubber, plastic, wood, metal, textiles and of course oil. lead and mercury are recognized as neurotoxin	Medium	High	High
2	Suffocation caused by: 1. Chemical reactions that did not take place in their designated places. 2. Unfamiliarity of workers with chemical and physical information causing these suffocations. 3. Leakage of harmful gases from unmaintained pipes rotating.	Medium	High	High

3	4. Fires. Injuries During Works			
		Low	High	Medium

Table 42: Qualitative Risks Analysis related to Projects

No.	Risk Description	Probability	Impact	Severity
1	Defining Project Schedule not done clearly	Low	Medium	Medium
2	Accommodation of unplanned work	Low	High	Medium
3	Incompletion of Project Design and Deliverable Definition	Low	High	High
4	Project Purpose not well defined	Medium	High	High
5	Make a strong communication	Low	High	Medium
6	Staff priorities are not well controlled	Medium	Medium	Medium
7	Delays of Consultant or contractor	Medium	High	High
8	Estimating errors of scheduling	Medium	High	High
9	Scope creep	Medium	High	High
10	Delays or pauses project due to legal requirements.	Low	Medium	Medium
11	Lack of communication, causing lack of clarity and confusion.	Medium	Medium	Medium

12	Delays of Customer approval	Medium	Medium	Medium
13	additional workload or time requirements because of new direction, policy, or statute appears.	Low	Medium	Medium
14	Materials, properties or equipment may be stolen	Low	High	High
15	Escalation of unresolved conflicts in timely manner	Low	Medium	Medium
16	Customer testing done inadequately	High	High	High
17	Delays due to weather, loss of resources, materials, premises and even electricity.	Low	High	High
18	Delays due to stakeholders' actions	Low	High	High

Table 43: Responses to Risks

Avoid	risks that can be eliminated from the project and so it become no longer forming a threat.
Reduce	the impact probability of risks that can be reduced by implementing certain actions
Transfer	risks can be transfer to other parties who may be better placed to manage the risks or prepared to insure against their impacts. Unfortunately, this does not remove risks or change the ownership of risks.
Accept	the benefits that can be gained from taking the risk should be balanced against the penalties.

Table 44: Risks Response Strategies related to Compliance

NO.	Risks Identification	Risk Response
1	Using a prohibited material in Boat Manufacturing	Avoid the prohibited Materials
2	Not following the cods of the hazard material	The safety codes of standard Boats should be followed

NO.	Risks Identification	Risk Response
3	Not using the standards of Factory Building in Saudi Arabia	Follow the Safety Standard as launched from modon.gov.sa
4	Not Following the rules and regulation of Office Labors of Saudi Arabi	Hire an Expert Matter in HR Specialization

Table 45: Risks Response Strategies related to Opportunity

NO.	Risks Identification	Risk Response
1	Build a new business to manufacture Fiberglass Boat in Saudi Arabi	Exploit
2	The place that would be suitable for a Factory for low cost	Enhance
3	Fiberglass Boat are less Damaging than other such as wooden ones, so it gives the customer higher opportunity to choose our Boats than other types	Share with other Factory like us to advertise about out type of Boats, so the people will be aware about our Fiberglass Boats
4	There some issues in Fiberglass boats, like Delamination, Blister, fatigue, Warping or Stringer Damage	Provide a periodical maintenance for the customers

Table 46: Risks Response Strategies Related to Hazard

NO.	Risk Identification	Risk Response
1	Human health hazards arise from chemicals or materials used in the boat: rubber, plastic, wood, metal, textiles and of course oil. lead and mercury are recognized as neurotoxin	asbestos will be employed extensively as an insulator on exhausts and leaded paints will be used as a corrosion inhibitor, alongside mercury-based compounds and tributyltin (TBT) as antifouling agents. These are not recognized to be harmful.

2	Suffocation caused by:	1. Use the appropriate place prepared for these interactions hazardous chemicals.
	1. Chemical reactions that did not take place in their designated places.	2. Ensure the training of all employee handling of chemical materials.
3	2. Unfamiliarity of workers with chemical and physical information causing these suffocations.	3. Quick and orderly disposal of any spent gas pipelines, with a commitment to maintain it periodically.
	3. Leakage of harmful gases from unmaintained pipes rotating.	4. Prepare a good Ventilation
3	4. Fires.	
	Injuries During Works	Using a good PPE, Strong Training for workers, and assign a safety officer.

Table 47: Risks Response Strategies Related to Project

NO.	Risk description	Response and Mitigating actions
1	Defining Project Schedule not done clearly	meet project team and clearly inform them to be aware to reduce the plan and likelihood of missed tasks.
2	Accommodation of unplanned work	Attend project scheduling workshop.
		Benchmark your project, for actual work and costs.
		Check all plans.
		Before kick off the project, document all assumptions made in planning and communicate to the project manager.
3	Incompletion of Project Design and Deliverable Definition	Get help from Subject Matter Experts and define Scope in details

NO.	Risk description	Response and Mitigating actions
4	Project Purpose not well defined	If not provided, do actions to complete it and ensure is well defined according on Project charter and PID
4	Make a strong communication	Identify stakeholders in initiation phase and inform them and ensure all are aware of their interests. Use most appropriate channel of communication for audience.
6	Staff priorities are not well controlled	The Project Sponsor should inform team managers on the importance of the project. Resources should be soft booked as early as possible and then communicate final booking dates as soon as after the scheduling workshops. recognize backups for each human resource on the project.
7	Delays of Consultant or contractor	Late penalties should be included in contracts.
		Keep on lead time in the schedule.
		Communicate schedule early.
		Check in with suppliers regularly.
8	Estimating errors of scheduling	Divide this risk into two: 'cost estimating' and 'scheduling errors'.
		Use methods of cost estimation, and carefully track costs and forecast cost at completion and do adjustments if necessary.
		keep in 10% contingency plan for cost and scheduling.
		Track schedules daily and include schedule review in every meeting.
		Flag forecast errors delays early into the Project Board.

NO.	Risk description	Response and Mitigating actions
9	Scope creep	Document the project scope in a Project Initiation Document or Project Charter and get it authorized by the Project Board. Refer to it throughout the project and assess all changes against it also ensuring alignment of any changes with the Business Case.
10	Delays or pauses project due to legal requirements.	Ensure all contracts signed before initiating the project. All regulatory requirements and complete stakeholder management plan must be met.
11	Lack of communication, causing lack of clarity and confusion.	Write a communication plan well.
12	Delays of Customer approval	Make sure decision making of customer are with budgetary authority and is identified before project initiating and is part of the project board. Communicate dates for sign-off points up in advanced.
13	Additional workload or time requirements because of new direction, policy, or statute appears.	No way to reduce likelihood of this risk.
14	Materials, properties or equipment may be stolen	Put security Guardian and cameras, and make sure Non-Disclosure Agreements (NDAs), & compliance certificates are in place. If possible, make insurance against theft
15	Escalation of unresolved conflicts in timely manner	meet project team regularly, and look at the conflicts. Compare the conflicts the project plan and stakeholder engagement plan for getting the right action
16	Customer testing done inadequately	Make sure customer prepares test cases, quality checks and protect testing, and quality assurance.

NO.	Risk description	Response and Mitigating actions
17	Delays due to weather, loss of resources, materials, premises and even electricity.	Chose the suitable insurance to cover this risk, make emergency plan and inform the team work. Make the standup equipment in standby such as generators
18	Delays due to stakeholders' actions	use RACI tools, plan well stakeholder engagement, analyze them as interests/power, review communication plan to ensure the stakeholder's engagement

Table 48: Stakeholder Engagement Assessment Matrix (Current)

External Stakeholders						
S/N	Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
1	Ministry of Commerce (MOC)			C		
2	Chamber of Commerce			C		
3	Ministry of Labor (MOL)			C		
4	General Organization for Social Insurance (GOSI)			C		
5	General Authority of Zakat & Tax			C		
6	Civil Defense			C		
7	Ministry of Municipal & Rural Affairs (MOMRA)			C		
8	Competitors		C			
9	Suppliers				C	

10	Customers				C	
11	Neighbors			C		
12	Shareholders				C	
Internal Stakeholders						
S/N	Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
1	Project Owner					C
2	Sponsor				C	
3	Project manager				C	
4	PMO					C
5	Functional Mangers				C	
6	Department Staff				C	

Table 49: Stakeholder Engagement Assessment Matrix (Desired)

External Stakeholders						
S/N	Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
1	Ministry of Commerce (MOC)			C		
2	Chamber of Commerce			C		
3	Ministry of Labor (MOL)			C		
4	General Organization for Social Insurance (GOSI)			C		
5	General Authority of Zakat & Tax			C		

6	Civil Defense			C		
7	Ministry of Municipal & Rural Affairs (MOMRA)			C		
8	Competitors		C			
9	Suppliers				C	
10	Customers				C	
11	Neighbors			C		
12	Shareholders				C	
Internal Stakeholders						
S/N	Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
1	Project Owner					CD
2	Sponsor				C	D
3	Project manager				C	D
4	PMO					CD
5	Functional Mangers				C	
6	Department Staff				C	

Appendix 2: Figures

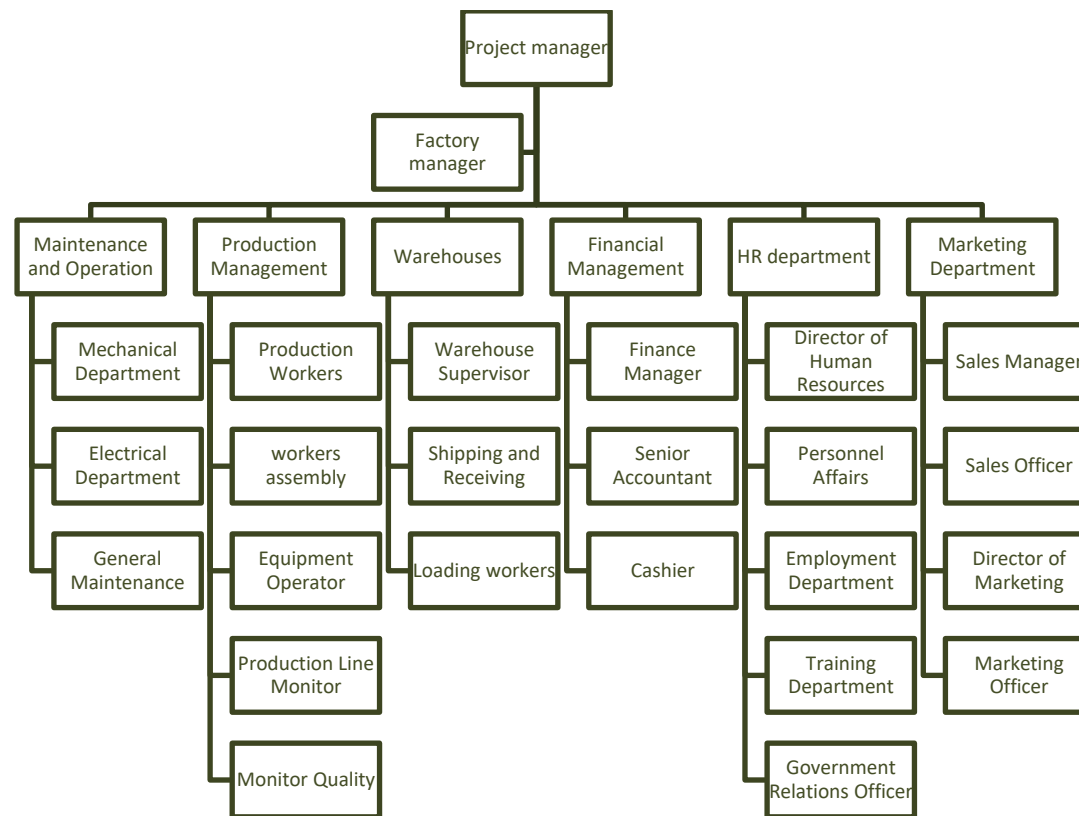


Figure 1: Organizational Structure

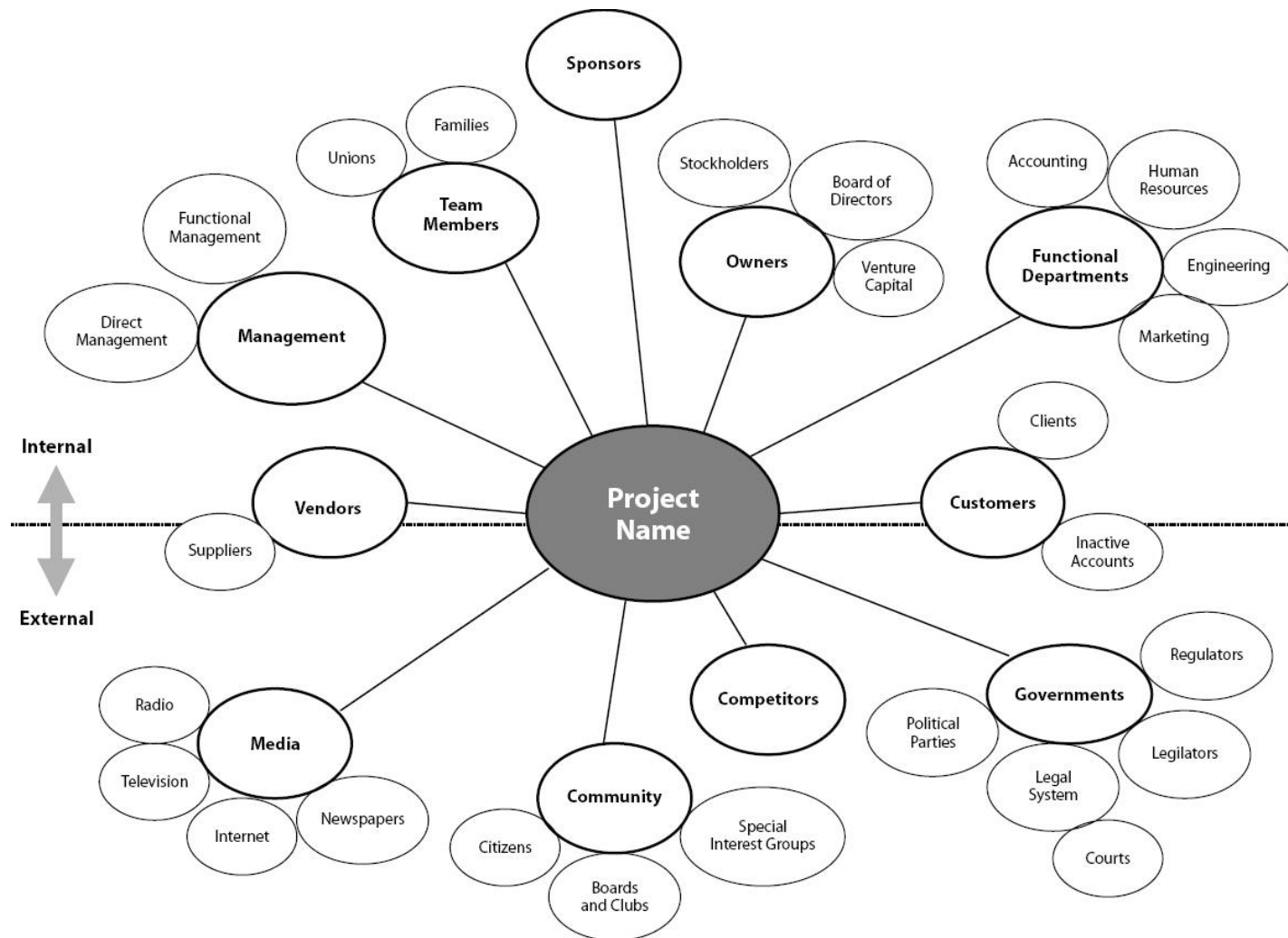


Figure 2: Logical Diagram of Stakeholders Register

	Helpful	Harmful
Internal Origin	Strengths	Weakness
External Origin	Opportunities	Threats

Figure 3: SWOT External & Internal, Helpful & Harmful

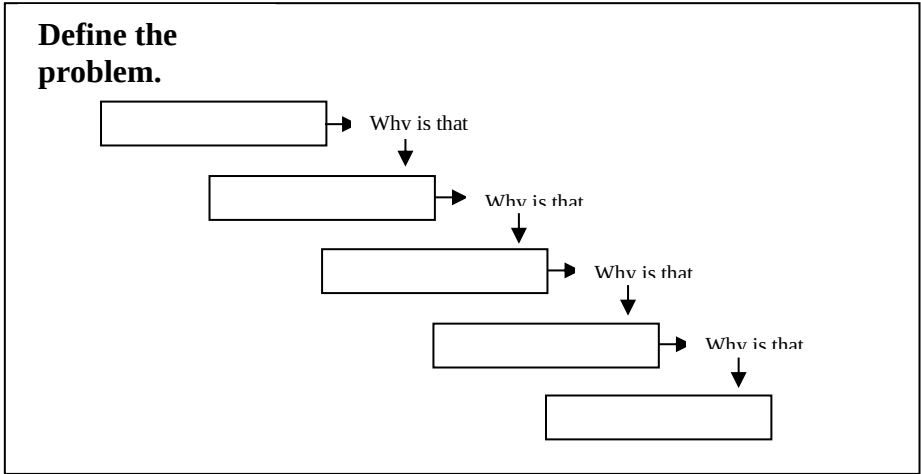


Figure 4: Five Whys?

Crashing vs Fast Tracking

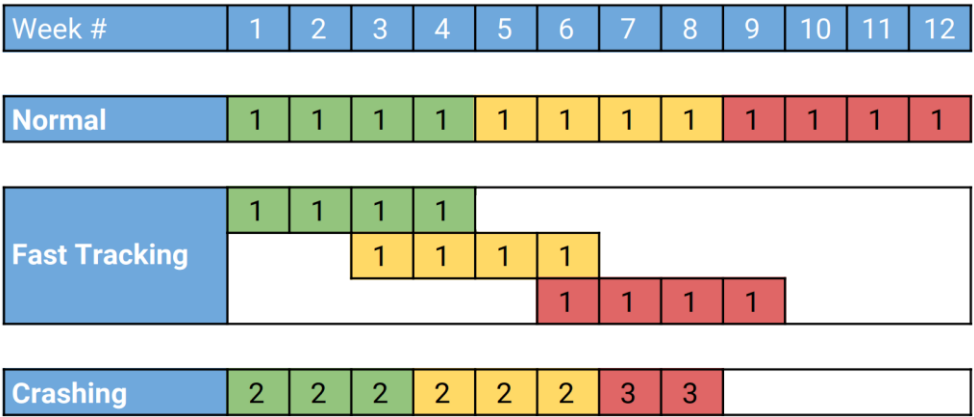


Figure 5: Crashing & Fast-Tracking Process

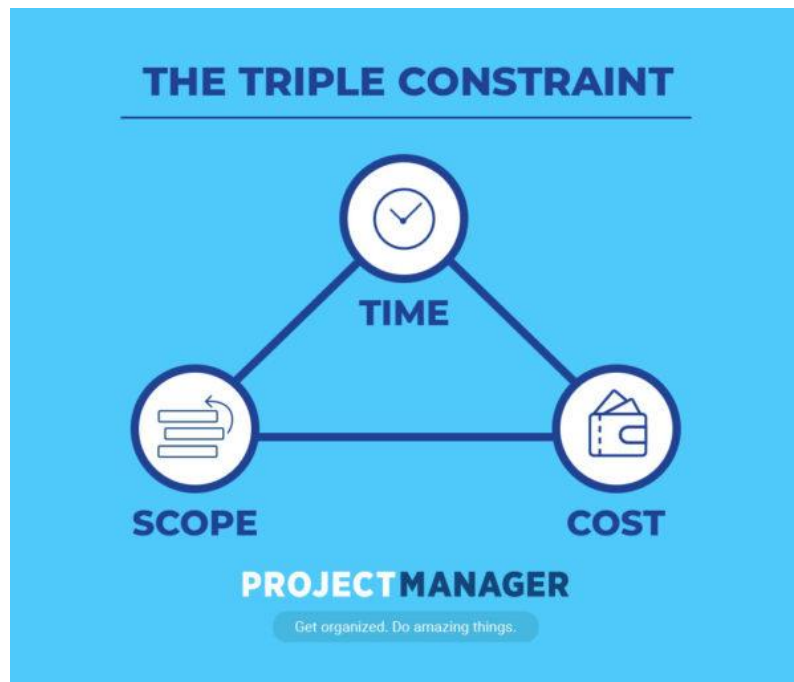


Figure 6: The Triple Constraint of the Project

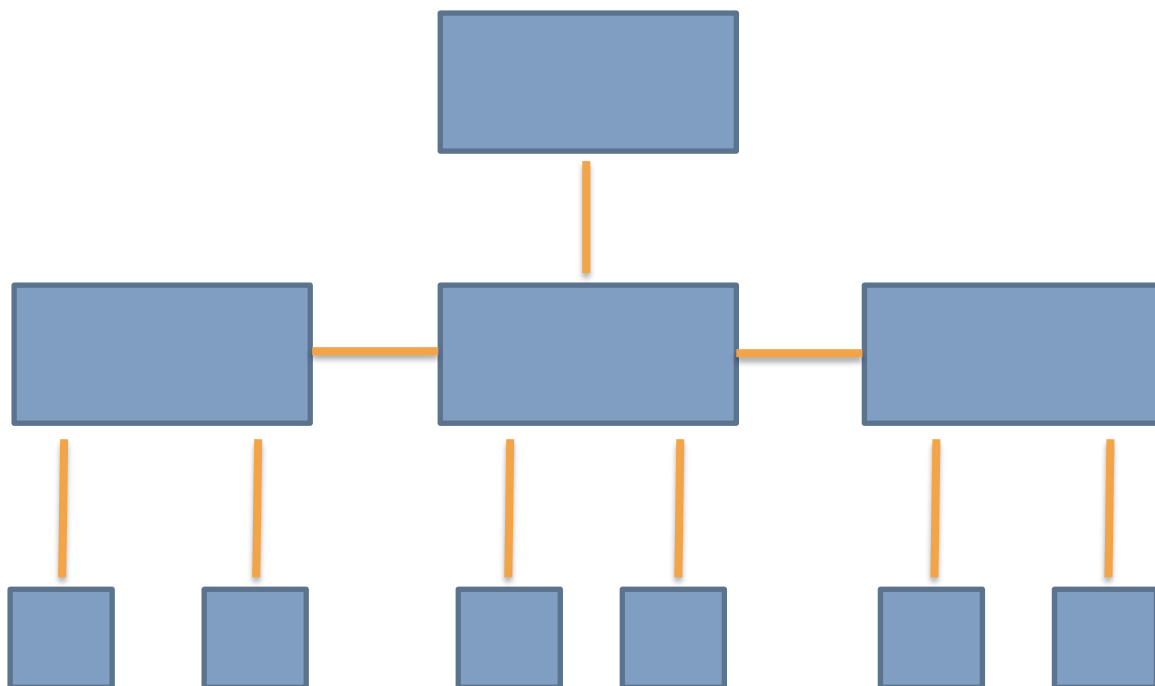


Figure 7: Hierarchical of WBS

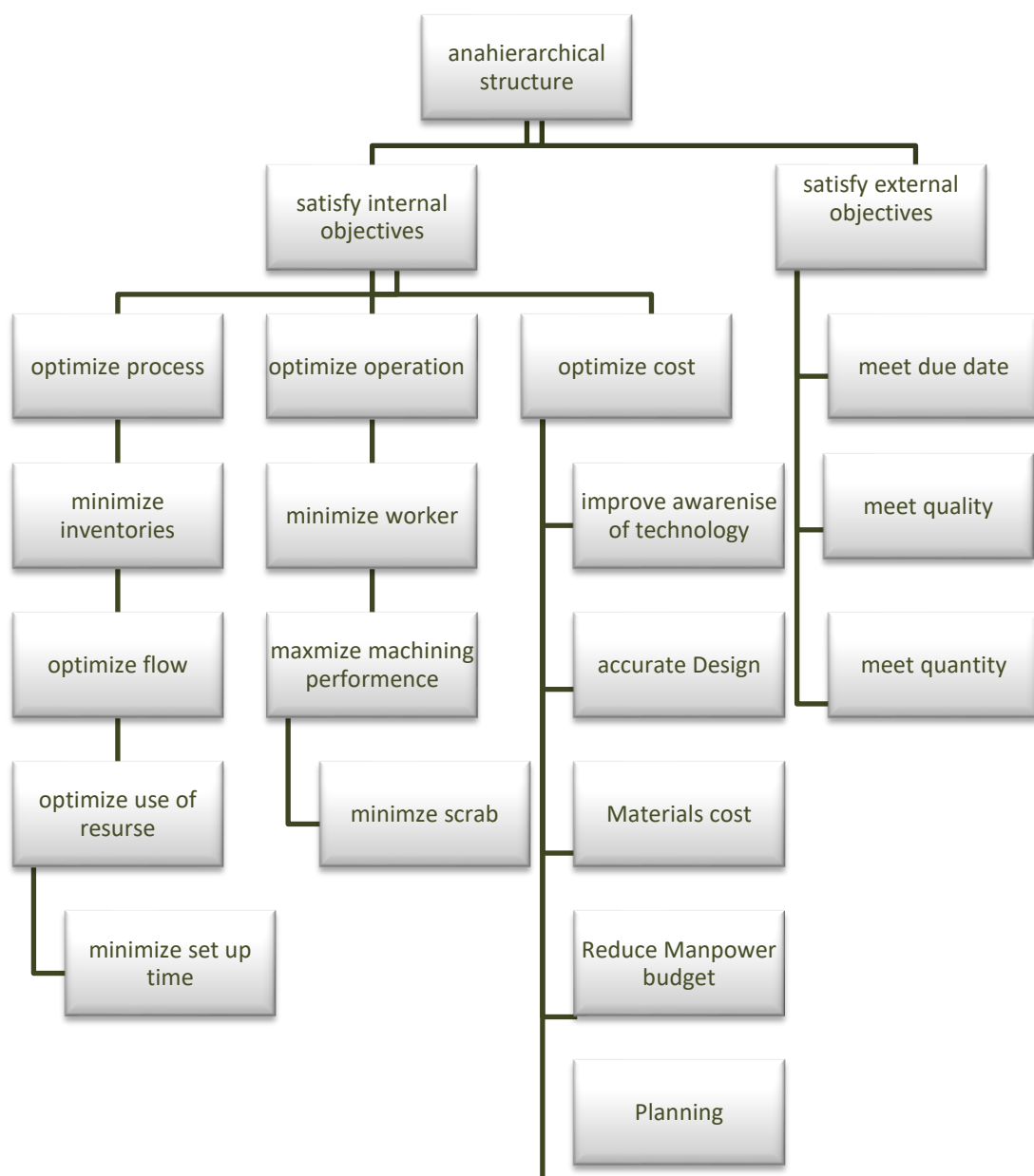


Figure 8: Hierarchical Structure of the Objectives

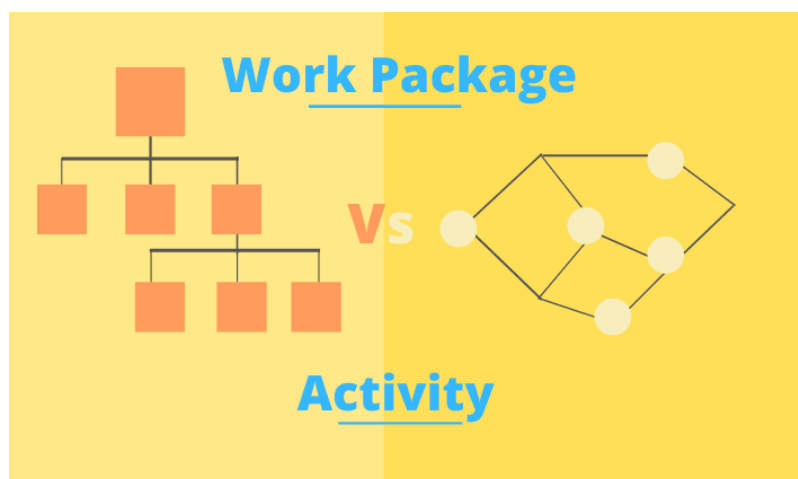


Figure 9: Transformation WBS to Activities

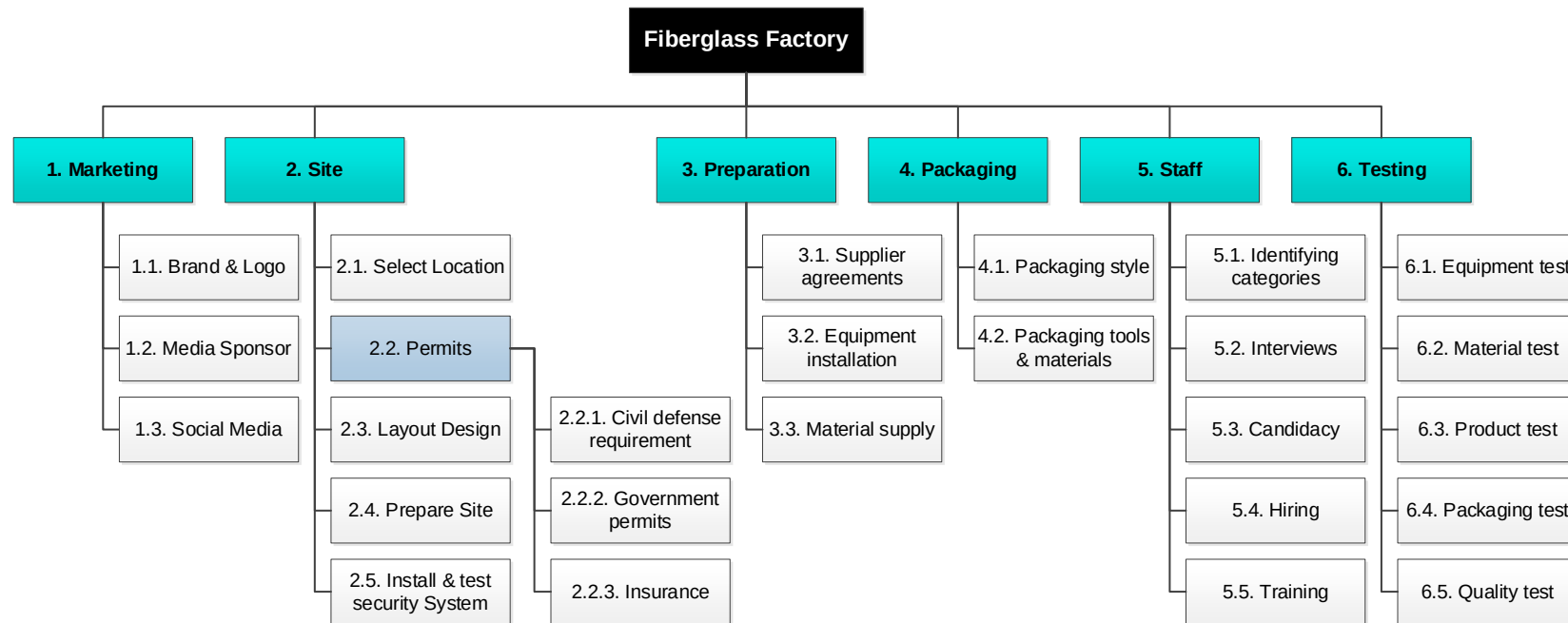


Figure 10: Function List and Network Diagram of WBS

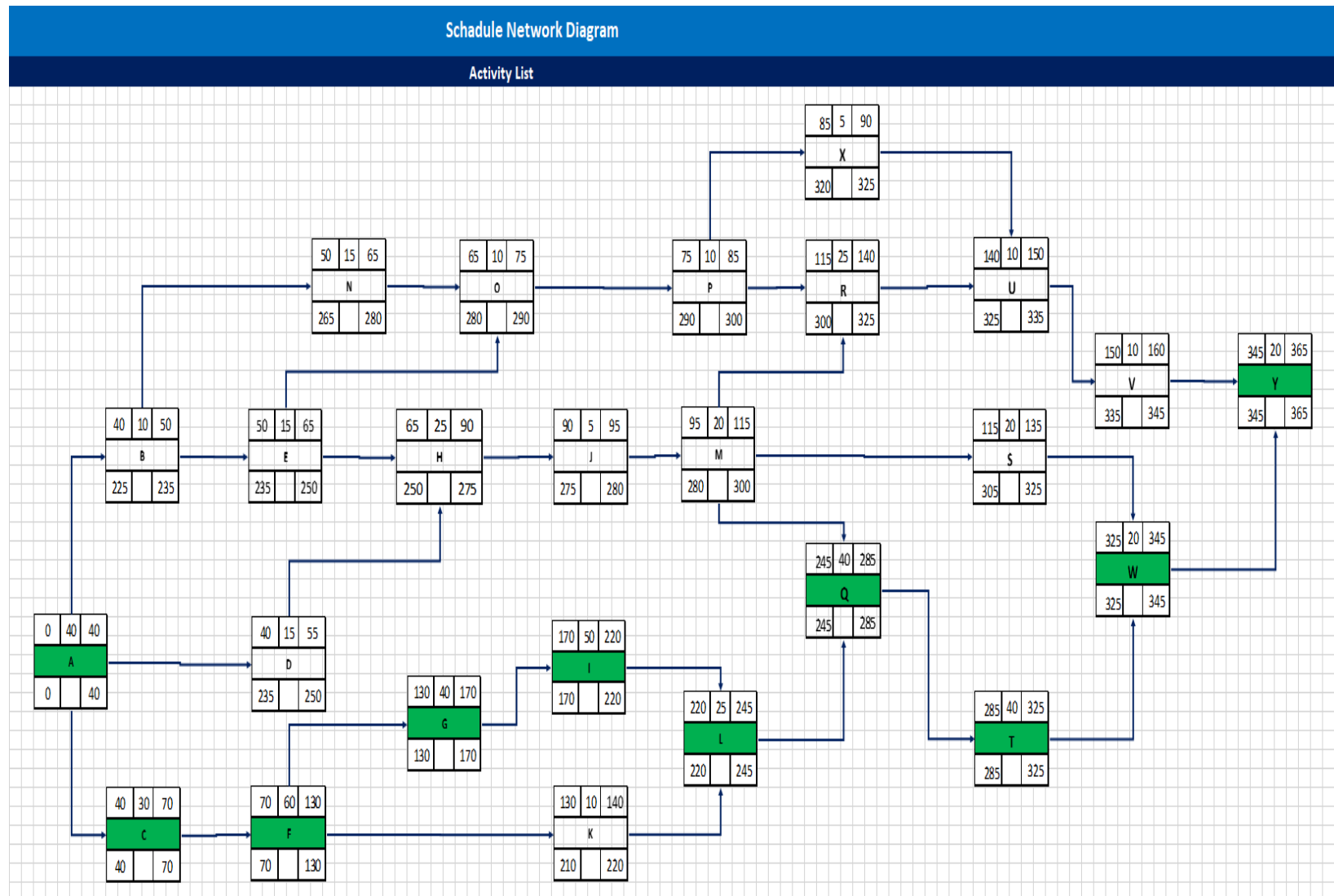


Figure 11: Logical Diagram of the Project Activities and the Critical Path

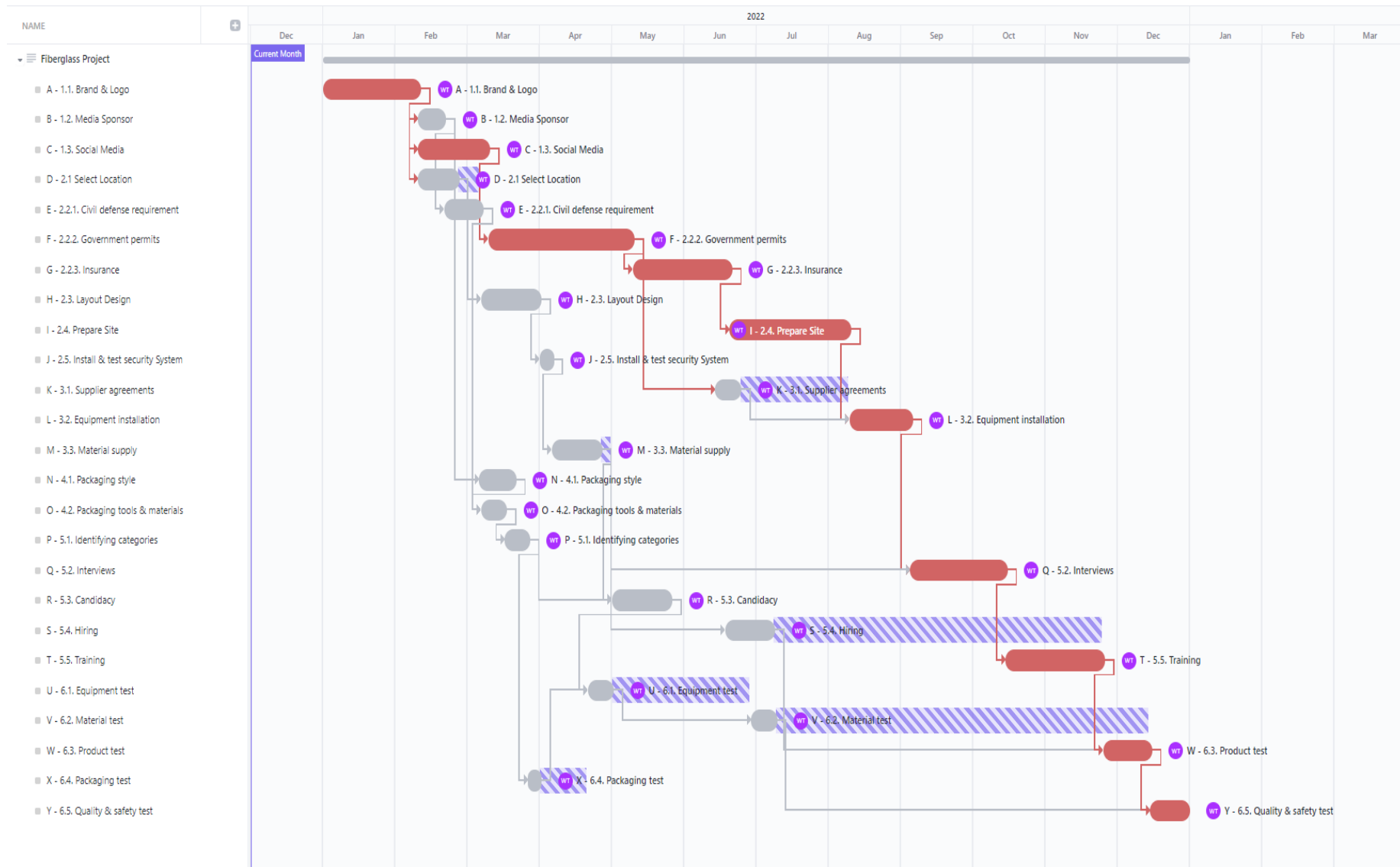


Figure 12: Gantt Chart and Milestones Model

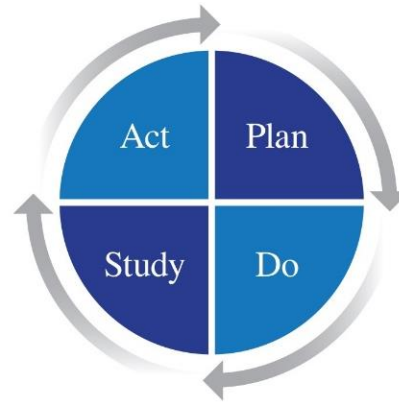


Figure 13: PDSA Cycle

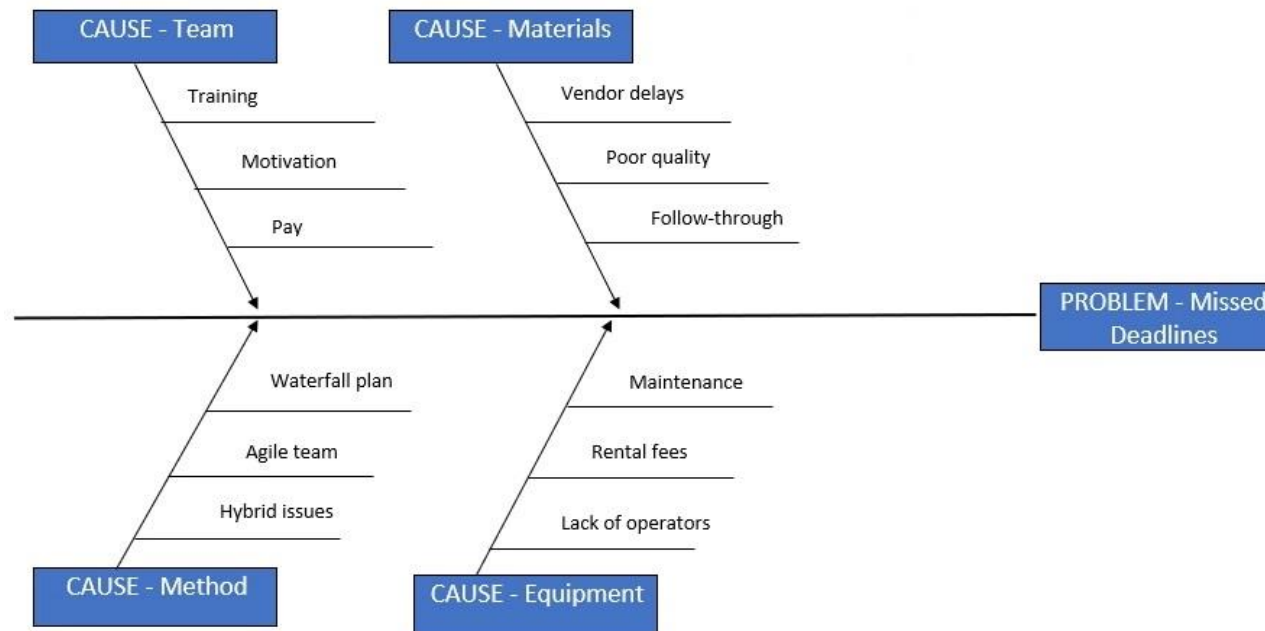


Figure 14: Ishikawa Diagram of Missed Deadlines Issue

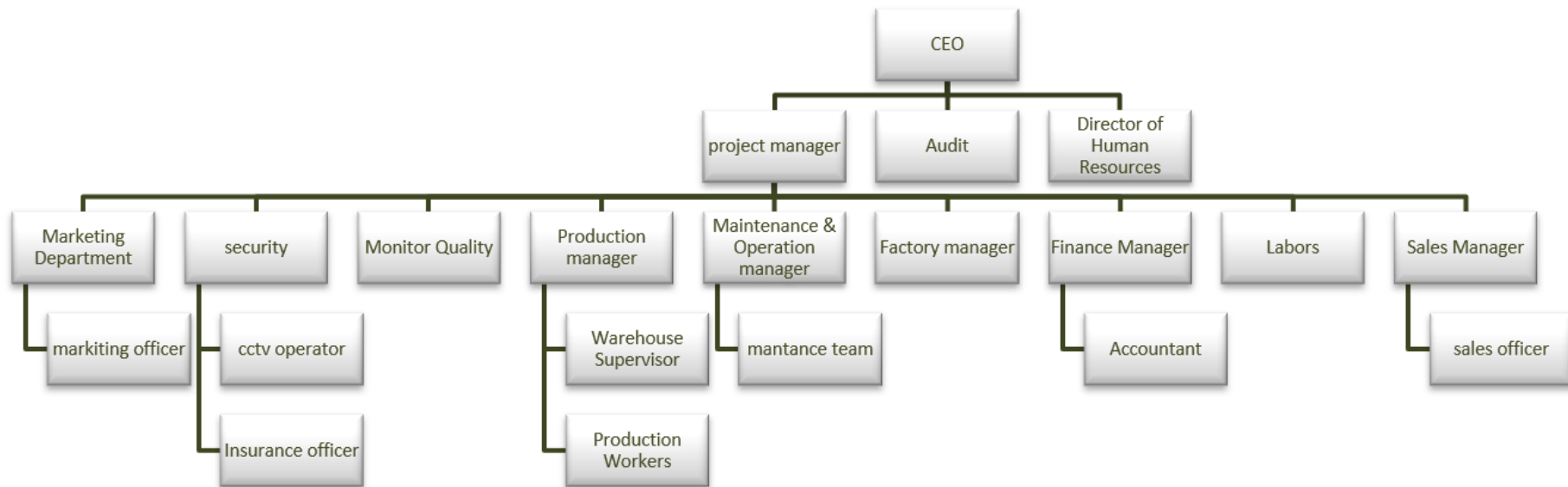


Figure 15: Hierarchical of Organization Breakdown Structure

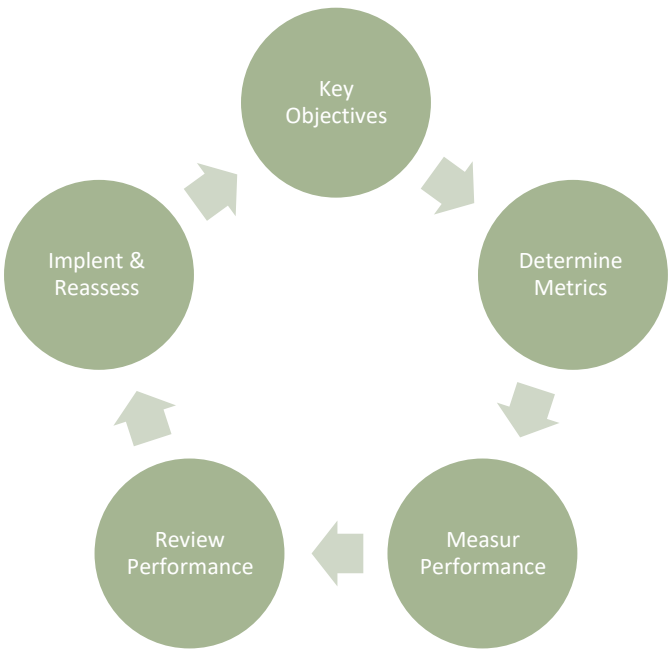


Figure 16: Performance Measurement Cycle

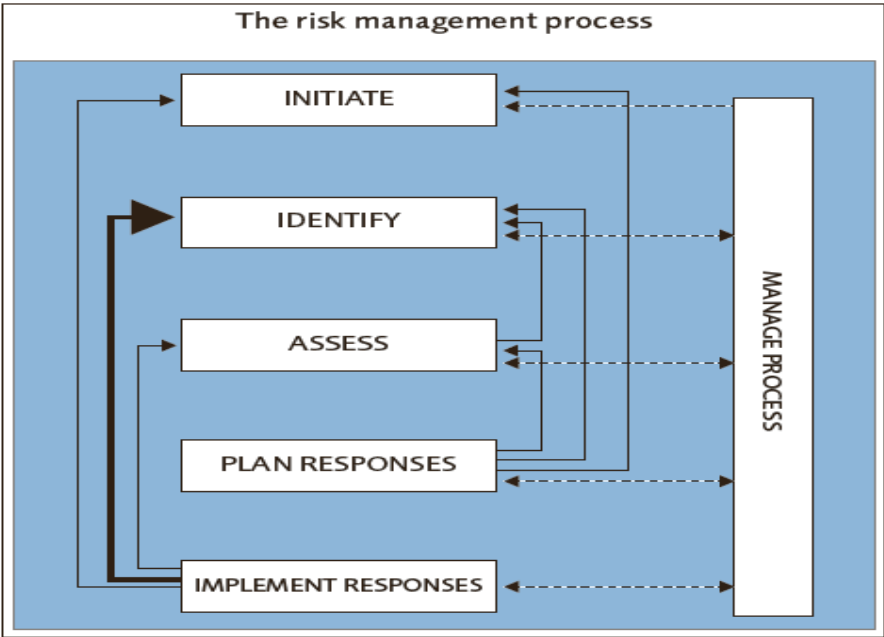


Figure 17: Risk management process

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