



Company's Staff Housing Project

Everyone's Smart University

Final Project-PMG697-MPM

Fall-2021

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Table of Content

Content	Page Number
Introduction	6
1. Strategy	6
1.1 Mission	6
1.2 Vision	7
1.3 Identify Objectives by SMART Model	8
1.4 Performance Measurement Indicator	10
1.5 Project Charter	
2. Governance, Structure and Process	12
2.1 Project Organization Chart	13
2.2 Scientific Bases Which Adopted in Developing the Organizational	15
2.3 Project Management Office Model	
3. Compliance Standards and Regulations	17
3.1 Compliance Model In Project	17
3.2 Simplified Project Management Checklist for Each Phase	20
4. Power and Interest	24
4.1 Identify stakeholder analysis	24
4.2 stakeholder's analysis based on their strength/interest and influence/strength	29
4.3 Logical Diagram of Stakeholder Register	31
5. Culture and values	32
5.1 Identify The Culture Of Organization	33
5.2 Proposals of The Organization Values	34
6. Self-Reflection and Self-Management	37
6.1 Behaviors of The Team Member That Can Influence On The Project	37
6.2 Identify The Behaviors Reasons And How We Can Eliminate It.	38
6.3 Conducting Self-Professional Assessment by SWOT Model	40
7. Personal Integrity and Reliability	41
7.1 Three Behaviors Contradict the Moral Integrity	41
7.2 Analyze The Financial, Social, And Technical Influence	42
8. Personal Communication	43
8.1 Prepare Register of Stakeholder	43
8.2 Personal Communication and The Effective Communication	44
8.3 Identify Shapes, Models, and Channels of The Personal Communication	45
8.4 Communication Matrix	48
8.5 Wrong Scenarios of Communication	53
9. Relationships and Engagement	55
9.1 Stakeholder Engagement Assessment Matrix	55

10. Leadership	57
10.1 The Leadership Model	57
10.2 Reasons for Use Autocratic Leadership Model	57
10.3 Proposals for The Motivation Methods	59
11. Teamwork	62
11.1 RACI model for 3 administrative measures of the project	62
12. Conflict and Crisis	64
12.1 Conflict and Crisis Definition	65
12.2 Scenarios of The Conflicts Events	66
12.3 Optimal Strategies to Deal with Each Conflict, And Reason of Preference	69
12.4 Root Cause Analysis for Each Conflict	69
13. Resourcefulness	72
13.1 Distributing of The Human Resources on The Functions	72
13.2 Analyze The Influence of Conducting Crashing and Fast-Tracking Process	76
14. Negotiations	79
14.1 General Rules for The Negotiation Process	80
14.2 Negotiation Plans	82
15. Project Design	94
15.1 Identify The Triple Constraint of The Project	94
15.2 The Project Success Factors	97
15.2.1 Intelligent People	97
15.2.2 Comprehensive Planning	97
15.2.3 Open Communication	98
15.2.4 Proper Risk Management	98
15.2.5 Strong Project Closure	98
15.3 Identify Work Breakdown Structure	99
16. Requirements And Objectives	102
16.1 Identify Requirement Traceability Matrix	102
16.2 Specify The Methods Used in Requirement Collection	105
16.3 Develop The Hierarchical Structure of The Objectives Of The Project Connected To The Strategy	107
17. Scope	110
17.1 Identify The Scope Statement	110
17.2 Concepts of Scope Creep with Example	112
17.3 Product Analysis and Management	114
17.4 Transformation of Work Packages In Work Breakdown Structure to Activities	116
18. Time	118
18.1 Develop Functions List /Activities Included In Each Work Package In WBS	118
18.2 Relationships Between The Activities	120
18.3 Develop The Logical Diagram of Project Activities, Identify The Critical Path	122
18.4 Gantt Chart and Milestones Model	128
19. Quality	133

19.1 Deming Model for Quality	133
19.2 Develop SIPOC Model, And Ishikawa	137
20. Finance	141
20.1 Cost Breakdown Structure and The Project Balance in Accordance With WBS	141
20.2 Earned Value Management of The Project	143
21. Resources	144
21.1 The Concept of Resource Leveling and Smoothing	144
21.2 Training of Distributing The Project Resources of Equipment and Tools	147
22. Procurement	152
22.1 Develop The Procurement Execution Process and Contractor Selection	153
22.2 Developing the Suppliers Comparison Model and Scoring Model	156
23. Plan And Control	160
23.1 Prepare agenda- Invitation and virtual record of a virtual meeting	160
23.2 Identify Performance Measurement Course/ Submit Reports/ with Reason	163
23.3 Develop Change Request Model, Including (Impact Analysis- Alternatives Analysis- Recommendation)	168
24. Risk And Opportunities	171
24.1 Identify Risks (Threats) And Opportunities, with Examples	171
24.2 Risk Register	173
24.3 Qualitative Risk Analysis	177
24.4 Risk Response Strategies	179
25. Stakeholder	182
25.1 Stakeholder Engagement Assessment Matrix	182
❖ Lessons learned	184
❖ Recommendations	186
❖ Conclusions	187
❖ References	188
❖ Project Pictures & Lists	189
	190

Table List

Table Number	Table Description	Page Number
Table 1-1	KPI of Project objectives	9
Table 1-2	KPI End user satisfaction	10
Table 1-3	Project Charter	11
Table 3-1	Compliance Process model	19
Table 3-2	Initiation checklist	21
Table 3-3	Planning checklist	21
Table 3-4	Execution checklist	22
Table 3-5	Closure checklist	23
Table 4-1	Project Stakeholders Responsibilities	27
Table 4-2	Mapping stakeholder attitude	28
Table 4-3	stakeholder engagement assessment matrix	28
Table 6-1	SWOT analysis	40
Table 8-1	Stakeholder Register	43
Table 8-2	Communication matrix	51
Table 8-3	Communications Management Plan	52
Table 9-1	Stakeholder Engagement Assessment Matrix	56
Table 11-1	RACI model	63
Table 13-1	Distribution of Human Resources on The Functions.	74-75
Table 13-2	Crashing of functions	78
Table 14-1	Principle of Negotiation	80
Table 14-2	Rule of Negotiation	81-82
Table 16.1	Requirements Traceability Matrix 1	103
Table 16.2	Requirements Traceability Matrix 2	105

Table 18.1	Activities List- Schedule Network Diagram	123
Table 19.1	SIPOC Diagram	138
Table 20.1	Earned Value Management Calculation	143
Table 21.1	Differences Between Resource Leveling and Resource Smoothing	145
Table 21.2	Resource Leveling and Resource Smoothing comparison	146
Table 21.3	Human Resource Distribution	149
Table 22.1	Procurement Process flow	154
Table 22.2	Sample Weighted Scoring Model for Project Selection	159
Table 23.1	Virtual Meeting Invitation	161
Table 23.2	Virtual Meeting Agenda	162
Table 23.3	KPIs: Objective and Subjective Measures	163
Table 23.4	Frequency of Use of Other Criteria for Evaluating Performance by Construction	164
Table 23.5	Change Request Form	169-170
Table 24.1	Risk (Threats) and opportunities	173
Table 24.2	Risk Register Log	174-177
Table 24.3	Risk Assessment Matrix	178
Table 24.4	Risk Response Strategies	180
Table 25.1	Stakeholder Engagement Assessment Matrix	183

Exhibits List

Exhibit NO	Exhibit Description	Page Number
Exhibit 1-1	SMART Model	7
Exhibit 2-1	Organization Chart	12
Exhibit 2-2	PMO Models	15
Exhibit 3-1	Elements and tools interact to provide a holistic view of compliance for the project.	18
Exhibit 3-2	Project Compliance model before delivering of project output	20
Exhibit 4-1	External Stakeholder Map	25
Exhibit 4-2	Internal Stakeholder Map	26
Exhibit 4-3	Stakeholder Analysis	29
Exhibit 4-4	Logical Diagram of Stakeholder Register	31
Exhibit 8-1	Linear Model	46
Exhibit 8-2	Interactional Model	47
Exhibit 8-3	Transactional Model	48
Exhibit 12-1	Conflict Over cost Root analysis	70
Exhibit 12-2	Conflict Over Man Power Resource Root analysis	70
Exhibit 12-3	Conflict over technical options and Performance Root analysis	71
Exhibit 13-1	Crashing	76
Exhibit 13-2	Fast Tracking	77
Exhibit 15.1	Triple Constraint Triangle	94
Exhibit 15.2	Work Breakdown Structure	100
Exhibit 16.1	Mind Map	107
Exhibit 16.2	Hierarchical Structure of The Objectives	108
Exhibit 17.1	Product Analysis	115
Exhibit 17.2	Transformation WBS to Activities	117

Exhibit 18.1	Functions List of Activities	119
Exhibit 18.2	Relation Between Activities	121
Exhibit 18.3	Network Diagram	125
Exhibit 18.4	Critical Path	127
Exhibit 18.5	Gantt Chart	131
Exhibit 18.6	Milestone Model Chart	132
Exhibit 19.1	Plan-Do-Check-Act Cycle	133
Exhibit 19.2	Plan-Do-Check-Act Application	135
Exhibit 19.3	Ishikawa Diagram	140
Exhibit 20.1	Activity-based costing in the construction industry	141
Exhibit 20.2	Cost Breakdown Structure Accordance WBS	142
Exhibit 20.3	Earned Value Management (EVM)	143
Exhibit 21.1	Differences Between Resource Leveling and Resource Smoothing	145
Exhibit 23.1	Standard Control Chart	167
Exhibit 23.2	Change Request Process Workflow	168

Abstract

ABC Company Community of Excellence project located in Saudi Arabia is the first infrastructure project in the Middle East to earn an Envision award for sustainable infrastructure. This project is the recent recipient of the Envision Silver award—an award that signifies the project delivers a range of environmental, social, and economic benefits to the host and affected communities.

The Community of Excellence project, known locally as Home Ownership Program, includes site planning, selection, preparation, environmental monitoring, design and construction of the infrastructure for the new community. In support of the Kingdom of Saudi Arabia's 2030 Vision and Quality of Life Program, the project earned an outstanding 102 out of 124 applicable points in the Envision Quality of Life Category!

1. Strategy

1.1 Mission:

Deliver affordable homeownership program safely on schedule, within budget while maintaining high quality and integrity standards within the company's strategic objectives.

1.2 Vision:

Be a role model for executing urban development and company's homeownership projects

Strategic goals Framework:

- Optimize the design to achieve the affordability and quality balance.
- Tailored contract strategy to meet program objectives.
- Divide the program into packages to meet project schedule and to fit local contractors' capacities.
- Progressive assessment and implementation of lessons learned and adoption of best practices for improvements in design and construction processes.

1.3 Identify Objectives by SMART Model:

The Housing Program works to provide housing solutions that enable staff families to own and benefit from suitable houses based on their personal needs and financial capabilities. The program also seeks to

improve housing conditions for current and future generations through the provision of suitable and guaranteed financing solutions. This is in parallel with increasing the supply of housing units at reasonable prices within record time, and the implementation of programs specialized in securing housing. In addition, it develops and improves the legislative and regulatory environment for the housing sector.



Exhibit 1-1 SMART Model

Specific: Provide employees families with the opportunities to own suitable housing to increase the percentage of employee's ownership of housing from 15% to 50% in 2024.

Measurable: Our goal to accommodate 50 % of staff families in their Own homes within 3 years and we will measure progress through the number of homes completion which will deliver to end user by using key performance index KPI.

Attainable: Developing targets for affordable housing in order to evaluate appropriate employees grade classifications throughout the

district, with provide infrastructure, education, facilities and outreach to the community on issues associated with housing affordability.

Relevant: Employee housing is necessary to attract businesses and allows businesses to increase spends. A strong and vibrant social and business environment will allow end users to have great community and perfect society through homeownership.

Time Based: We will hire a contractor to implement infrastructure construction activities within 2 weeks to free up time, and we will start handover homes to end user by AUG 2024.

1.4 Performance measurement indicator (quantification of business goal that make them tangible):

A KPI is only as valuable as the action it inspires. Too often, our organization blindly adopt construction-recognized KPIs, one of the most important, but often overlooked, aspects of KPIs are that they are a form of communication. As such, they abide by the same rules and best-practices as any other form of communication. Succinct, clear and relevant information is much more likely to be absorbed and acted upon. In terms of developing a strategy for formulating KPIs, your team should start with the basics and understand what our organizational objectives are, how you plan on achieving them, and who can act on this information. This will be an iterative process that involves feedback from analysts,

department heads and managers. As this fact-finding mission unfolds, you will gain a better understanding of which employees get own home percentage need to be measured with KPIs and with whom that information should be shared to evaluate the Performance measurement of our program outputs and outcomes provides important, if not vital, information on current program status and how much progress is being made toward important program goals. Thus, performance measurement of an organization is a way to make an assessment of how the percentage of increasing to 50% of employee's homeownership by using **Leading Indicators** which forward-looking to measures that help predict future outcomes.

Company Objective	Goal	KPI	current	Target
Increasing Of Staff Housing	Increase The Percentage of Employee's Ownership of Housing	Percentage Of Staff Ownership of Housing	15%	50%

Table 1-1 KPI of Project objectives

Strategic Objectives	Lead Measure	Lag Measure
End user Perspective: The company seen from the End user's viewpoint. Unsatisfied customers will look for other suppliers to meet their needs. Customer satisfaction is a lead indicator that can predict potential future loss.		
Increase end user expectation	Percentage of satisfaction	Current of percentage

To receive home in signing date Dec 2024	100%	60%
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Table 1-2 KPI End user satisfaction

1.5 Project Charter:

A project charter is a central document that defines the fundamental information about a project and is used to authorize it. In a nutshell, a charter provides a picture of where you are going, why you are going there, who will be impacted, the main risks involved, and who is going to help you. It's crucial that the charter not only establishes basic information but also that it reflects the key stakeholder's common vision in project.

A project charter is typically created early in the project lifecycle, hopefully before the project is staffed and the business is running for delivery date. It is usually created collaboratively as a team and shared with stakeholders upon completion. In most cases, the charter is signed off for approval by project sponsors. It's some kind of must-have document for any project as our project (Table 1-2) which state below:

Project Name	Company's Staff Housing Project		
Project Sponsor	Head Office CEO & VP	Project Manager	SAEED
Date of project approval	20 th /09/2021	Last revision Date	1 st /09/2021
Project description	The Housing Program works to provide housing solutions that enable staff families to own and benefit from suitable houses based on their needs		
Scope	A project will be introduced to establish homes (50 villas) to company's staff in taking order and to ensure all staff have availability to get their dream homes through the project		

Business case	To increase the percentage of employee’s ownership of housing from 15% to 50% in 2024 and increase staff satisfaction.		
Constraints, Assumptions	Time	4 years	
	Budget	\$ 40 million	
	Scope	50 villas, TBD	
	Quality	Compliance with government rules, international standard	
Project deliverables	- Optimize the design to achieve the affordability and quality balance. - Tailored contract strategy to meet program objectives. - Divide the program into packages to meet project schedule		
Benefits (Measurable result)	See the KPI’s above & business case		
	KPI	Baseline	Goal
	Homes Completion	00	950
	Infrastructure completion	%50	%100
	Customer satisfaction	%20	%100
Steering Committee	CEO	Project Team	Control Manger
	Finance Director		Planning Manger
	VP Commercial		Quality Manger
Key stakeholder	Name	Success criteria	
	Project sponsor	Group oversees the day-to-day direction and management of the program team and the upgrade project. It reports to the Program Board the Project Charter, and any Change Orders or Exception reports that fall within its time and cost tolerances.	
	Staff representative		
	CEO		
	Finance Director		
Risks	Performance risk	Such a problem may lead to the additional need for financing, a likely penalty for nonperformance and it may also leverage the competitors’ performance.	
	Cost risk	A shortage or mismanagement of project funds resulting from an inflated budget constraints is a threat to the project’s completion.	
	External hazards risk	Risks manifest in various types and forms, including terrorism, storms, floods, vandalism, earthquakes and civil unrest. A project may stall or discontinue when such events occur.	
Project Milestones	Handover homes to end users		Sep 2024
	Submit final reports		Aug 2024
Signatures	PS:	PM:	VP:

Table 1-3 Project Charter

2. Governance, structure and process:

2.1 Project Organization Chart:

Project organization chart to create an organizational structure that defines the relationships between every team member on a project. This chart includes sections for a project's steering committee, sponsor(s), manager, additional team members as below.

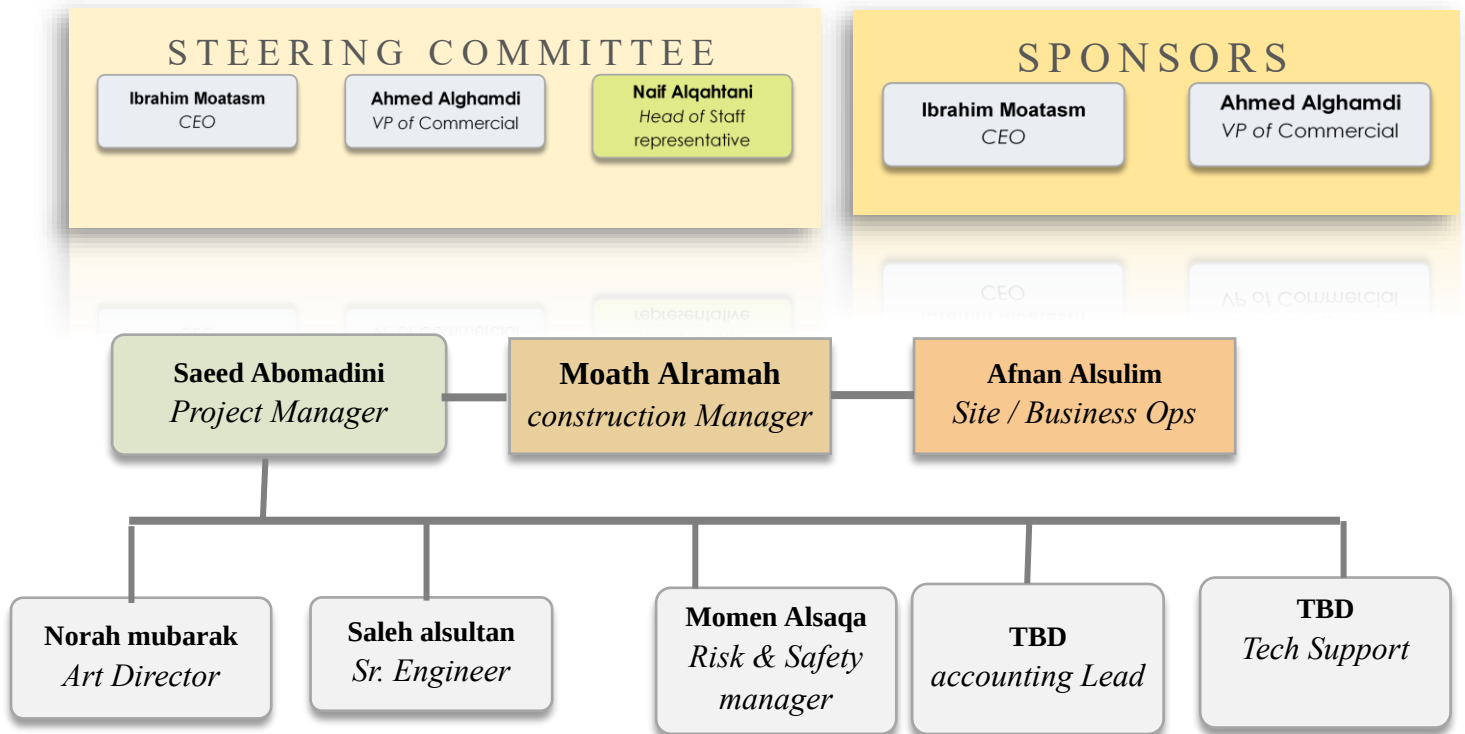


Exhibit 2-1 Organization Chart

2.2 Scientific Bases Which Adopted in Developing The Organizational Structure:

Successful project organization templates provide immediate insight into a project's personnel hierarchy. These templates also show the status of each project component and any roadblocks to achieving successful project completion.

A customizable project organization template allows you to modify the team players to fit your project's structural needs, while also giving you details about each team member, so you can clearly see who's responsible for each individual project task. While project organization templates vary, they typically include the following sections:

- **Project Title:** project name that accurately communicates the nature of the project to all team members and other stakeholders.
- **Project Manager:** the name of the project's primary manager. This person is responsible for keeping the project's logistics in line, meeting project milestones, and alerting team members to any project risks.
- **Steering Committee:** the team member(s) or managers who are overseeing and providing support for the project on behalf of key stakeholders.
- **Sponsor(s):** the names of the sponsors who own the project on behalf of the organization. The project sponsors define the project so that the project manager can deliver it.

Additionally, project organization templates frequently include the following project-organization-specific components:

- **Task ID:** Enter the unique identification number to track individual tasks.
- **Task Title:** Enter the name of the “parent” task or subtask for a team member to complete.
- **Task Owner:** Enter the name of the team member responsible for each individual project task.
- **Start Date:** Enter the date that the individual project team member must start the project task.
- **Due Date:** Enter the date that the project team member must complete the project task by.
- **Duration in Days:** Enter the duration-in-days range between the project task start and due dates.
- **Percentage of Task Complete:** Enter the percentage of task completion for each individual project task.
- **Project Phase Details:** Enter week-by-week and day-by-day phase details for each individual project task.

By defining and agreeing upon a single-source project-organization tracking system from the outset, and all additional stakeholders can rest assured that project will progress and conclude smoothly.

2.3 Project Management Office Model:

To identify project office model, we have to know that meaning of PMO which define is an office or department within an organization that defines and maintains standards for project management. The Project Management Office provides guidance and standards in the execution of projects and Its goal is to use the learnings from past projects, best practices, and case studies to improve the success rate of all future initiatives. While there are several different PMO models (which is share below), the most common approach is to use one of three models as given:

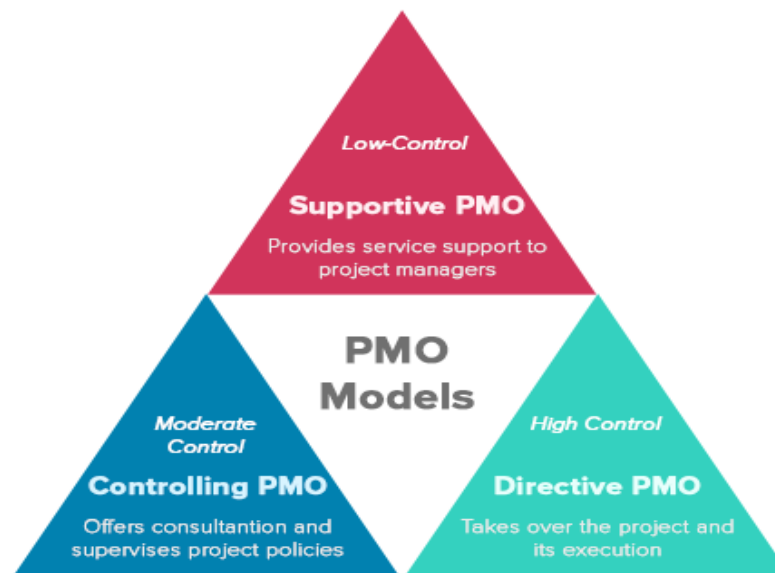


Exhibit 2-2 PMO Models

1. Supportive PMO

Low-control

A supportive PMO takes a consultative role in project management. It offers templates, best practices, training, and access to data as and when needed.

2. Controlling PMO

Moderate control

A Controlling PMO has a consultative as well as a supervisory role in project management. It not only gives project managers documentation and data, but also exerts a degree of control by directing them to use specific processes and policies.

3. Directive PMO

High control

A Directive PMO essentially takes over a project and directs all its execution. The PMO maps project requirements, assigns resources, and works directly with project managers and stakeholders to ensure smooth delivery.

For our project we are using the **Controlling PMO** model which would be suffice because it provides support and require compliance through various means. Compliance may involve adopting project management

frameworks or methodologies, using specific templates, forms, and tools, or conformance to governance. The degree of control provided by the PMO is moderate and in compliance with company policy.

3. Compliance Standards and Regulations

3.1 Compliance model in project:

One of the greatest challenges in projects is the need to comply with certain rules and regulations, both internal and external to the organization executing them. Traditionally, compliance is documented as requirements (typically non-functional) during the project planning phase.

Two practical avenues to complying with rules, regulations, or standards in projects are proposed:

Consider compliance as a requirement: this approach allows the project team to document early any element of the regulation that points to the addition of elements on the work breakdown structure (WBS). The advantage of this approach is that standard elements are incorporated into the scope of the project and therefore can be traced efficiently until completion.

Consider compliance as the process assets of the organization: the concept proposed by the **PMBOK® Guide** for organizational process assets to be

considered an input for a large majority of the 42 processes is well known to project managers.

Compliance Documentation: The proposed tool is a set of draft documents that dynamically will change in each of the stages and for each of the components. It is necessary that the documentation be aligned with the principles of quality managed by the organization (e.g., ISO 9000) and, therefore, is treated as a deliverable of the project.

Compliance Council: Although it is not likely that a functional organization provides resources in the area of control or audit to the project.

Compliance Risk: Project managers are used to handling project risks; however, compliance risks occasionally fall beyond the scope of the project itself.

Compliance Audit: Audit is one of the key elements in the framework and is reflected in the establishment of a specific audit for the project in aspects of compliance. Each project activity aimed to comply or to build the compliance objectives should be analyzed by the audit.

Compliance Responsibilities: To the extent that the various members of the team understand the importance of compliance, all activities and their corresponding compliance objectives shall be allocated as parts of the project's tasks and processes.

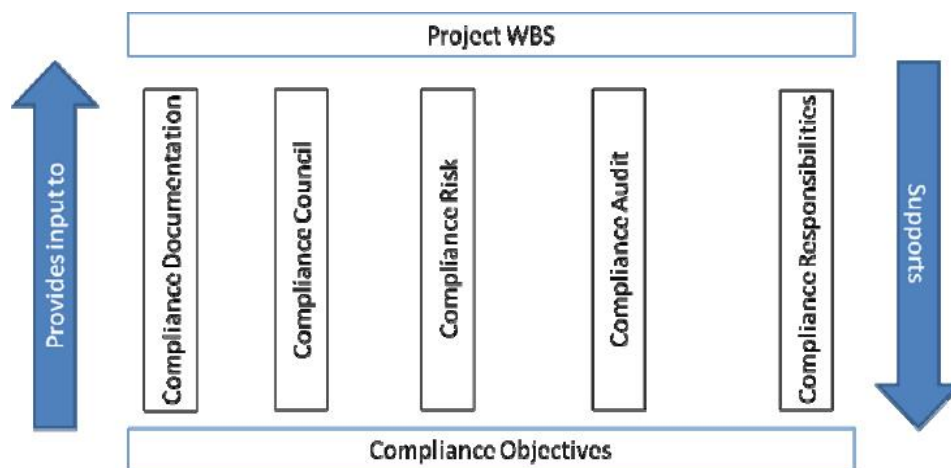


Exhibit 3-1 shows the way these elements and tools interact to provide a holistic view of compliance for the project.

As construction project and homes building, we have to complying our objectives through compliance model as:

Project name		Company's Staff Housing Project	
Owner		ABC Company	
Requirements		Compliance	
NO	Goal / Deliverable	Compliant (Yes/No/NA)	Remarks
1	Provide housing solutions that enable staff families to own and benefit from suitable houses.	Yes	
2	Accommodate 50 % of staff families in their Own homes within 3 years.	Yes	
3	Increase the Percentage of Employee's Ownership of Housing.	Yes	
4	Optimize the design to achieve the affordability and quality balance.	Yes	

Table 3-1 Compliance Process model

This compliance review process acts as a gated review. Once running, the tools should allow the iterative and interactive handling of the different components and stages of the compliance. These reviews must be formal and must be documented as parts of the project.

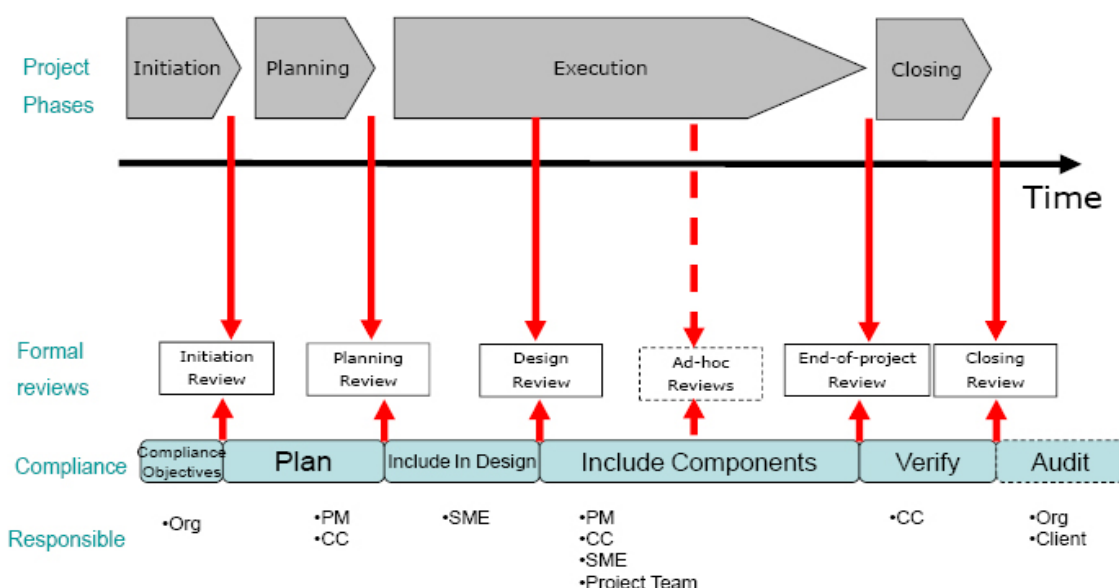


Exhibit 3-2 – Project Compliance model before delivering of project output

Finally, and as part of a closing review process, the compliance audit shall submit a formal document that authorizes the project closure. At this stage, it is expected that there will be no compliance defects, but if there are some, they must be covered later by the organization, must be clearly documented, and they must have a responsible party for follow-up.

3.2 Simplified Project management checklist for each phase:

As the project progresses through each of its phases, it is critical that the project manager keep track of tasks to be done. Our choice of projects will thus reflect our desire to maximize the impact of certain criteria on our decision. In order to score our simplified checklist, we assign a specific mark to each of our criteria:

- **Starting: Project Initiation Checklist:**

No.	Description	Status
1	Is the scope of the project clear?	Open
2	Is the project funding approved?	Closed
3	Have all the stakeholders been identified?	Open
4	Has a sponsor been identified?	Open
5	Does the project contain 3rd Party or external resources?	Closed
6	Have you confirmed in writing the project delivery expectations (time and scope) with all the stakeholder?	Open
7	Have all the project benefits been captured and are reasonable?	Open
8	Are you aware of the process of getting the project approved?	Open
9	Does the business case cover assumptions, dependencies and constraints?	Open
10	Do you need a risk assessment to be conducted?	Open
11	Will the project costs be capitalized?	Open
12	Do you have a high-level effort estimate for the project?	Open
13	Are you supposed to use a standard template for the indication document?	Open
14	Has the project team been established or resources available to start the project?	Open
15	Does the project need an approved business case to start work?	Open

Table 3-2 Initiation checklist

- **Project Planning Checklist:**

No.	Description	Status
1	Have you organized a project kick off meeting?	Open
2	Does the project team need any training?	Open
3	Are you comfortable with the skill level of the project team?	Open
4	Do you need a project management plan?	Open
5	Do you have enough contingency or buffer in budget and	Open
6	Is there a vendor contract involved in the project?	Open
7	Have all the project components been estimated?	Open
8	Do you have a detailed project schedule drafted?	Open
9	Do you need a work breakdown structure?	Open
10	Have you created a baseline of the project plan?	Open
11	Is the project team comfortable with the project schedule?	Open
12	Do you have clearly defined the milestone for the project?	Open
13	How do you plan to track project progress?	Open
14	Have the team leave plans and public holidays been factored into the project plan?	Open
15	Do you have a resource plan for the duration of the project?	Open
16	Do you need to hire additional resources for the project? If yes, has the hiring process been kicked off?	Open

Table 3-3 Planning checklist

- **Project Execution Phase Checklist:**

No.	Checklist Item	Check
1	Is there a clear need for the project, with defined objectives and benefits?	✓
2	Does the project have a committed and available sponsor?	✓
3	Is it clear what will success look like for the project?	✓
4	Has an experienced and skilled project manager been appointed?	✓
5	Have key stakeholders been identified and are there needs being represented?	✓
6	Does the project have available and skilled resources?	×
7	Does the project team have clearly defined and agreed roles and responsibilities?	✓

8	Has a project charter been drafted and signed-off?	✓
9	Has the governance route for the project been discussed and agreed with the PMO including stage gates?	✓
10	Has a project management plan been created and signed-off?	✓
11	Have all project deliverables been identified with unambiguous completion criteria?	✓
12	Has a detailed project plan been developed, in line with known constraints and deadlines?	✓
13	Has a detailed project budget been developed?	✓
14	Has a scope, schedule, and budget baseline been set?	✓
15	Have stage gate criteria been met for each stage?	✓
16	Have project risks been identified and do they have a mitigation plan and owner?	✓
17	Have all management logs been updated regularly?	✓
18	Has project progress been monitored regularly and tasks updated?	✓
19	Have regular status and progress reports been submitted and distributed?	✓
20	Have change requests been identified, tracked and controlled?	✓
21	Have all deliverables been completed and signed-off?	×

Table 3-4 Execution checklist

- **Project Closure Checklist:**

No.	Task	Owner	Due Date	Status
1	Handover is complete for all deliverables	PM		Not Started
2	All deliverables are accepted and signed off by the client	COO		In Process
3	Final project status reports are complete	PMO		In Process
4	all financial processes and reports are complete	CFO		Not Started
5	Project review is done	PM		Not Started
6	Staff performance evaluations and reports completed	Team Leads		Not Started

7	Staff employment on project terminated (no more work is done on the project)	COO		In Process
8	All supply contracts and processes are terminated	Supply Chain VP		In Process
9	Site operations and facilities used for project closed down	COO		In Process
10	Disposal of all equipment and materials is done	PMO		Not Started
11	Communication: Announcement of completion of project (internal, external and public relations contacts)	PM		Not Started
12	Completion of storage for all the protect files	PMO		Not Started

Table 3-5 Closure checklist

All project checklist is **used to make sure that none of the items that you have included on the** project planning checklist are forgotten or left without action.

4. Power and Interest

The power/interest grid used for categorizing stakeholders during a change project to allow them to be effectively managed. Stakeholders are plotted on the grid in relation to the power and interest they have in respect of the project.

A stakeholder register is a document that describes who (individual or group) is affected by a project, and their effect and impact on the project. A stakeholder register is ideally completed early in the project to ensure

proper engagement of stakeholders. Stakeholder Register is the key output of the Identify Stakeholders process. It not only contains the names of the project stakeholders but also their *goals, expectations, concerns* and *other* such details. It should be noted that most projects succeed or fail based on how well the project manager knows and manages stakeholder expectations.

4.1 Identify stakeholder analysis:

Stakeholder Analysis is the identification of a project's key stakeholders, an assessment of their interests and the ways in which these interests affect the project and its viability. There are two groups of project stakeholders, (internal and external) to our organization. The type usually recognized are the client organization. The type most usually recognized are the external stakeholders,

- **External Stakeholders** are individuals or groups outside a business or project, but who can affect or be affected by the business or project. Arguably external stakeholders wield the most influence on the long-term success of a business or project, because they will often be the end users and customers. There are many slight variations on the definition of External stakeholders but they all agree that External Stakeholders are stakeholders that are outside of a business or project.



Exhibit 4-1 External Stakeholder Map

- **Internal Stakeholders** are groups or individuals who work within an organization or project and who can affect or are affected by an organization, strategy or project. According to *Nilson (2006: p170)*, internal stakeholders are those in the management, assembly and project team,



Exhibit 4-2 Internal Stakeholder Map

- Table of project stakeholders:

The table below lists out project stakeholders who you should consider and manage on our project.

Project Stakeholders	Why we need to consider these stakeholders?
Project Sponsor	Responsible for the success of the project and funding. The final decision maker and likely the holder of the 'purse strings'
Project Manager	Responsible for the delivery of the project to time, cost and quality/scope. Likely to be the person responsible for identifying the project stakeholders.

Project Management Office (PMO)	These are effectively the project police. PMO they will likely have some responsibility for governance of our project. This could be manifested in various ways e.g. audits, inspections, report requests written or verbal, risk reviews and so on.
Project Team	The team who will deliver our project. They may be a virtual team assembled specifically for project and they working on the project full time.
Quality Management Team	The project deliverables will be measured against specific quality criteria. Assessments may be carried out by a specialist function or to a quality management system.
Suppliers	Any subcontractors or companies providing resources for our project should be considered stakeholders. Their contribution will be vital to the project success.
Customers (END USER)	The customer seems an obvious stakeholder and may be the Sponsor or part of the Project Board. Often the customer is easily identified as the person/people providing the money. Customers will also provide the project needs.
Government & External regulators	Central and local government and their agencies have laws and regulations that impact project. Project may require insurance, it may interface with regulated systems, require permits, access to infrastructure etc. These stakeholders are often neutral when it comes to your project, but failure to meet their requirements could lead delays or cancellation.

Table 4-1 Project Stakeholders Responsibilities

Understanding whether a stakeholder feels positive, negative or neutral is useful in deciding which engagement approach will be most effective and

if the need for action is urgent. Simply assess each stakeholder's attitude to project by classifying them as an Ally (positive attitude), Neutral, or Opponent (negative attitude).

Stakeholder	Ally	Neutral	Opponent
Project sponsor	positive		
Project manager	positive		
VP commercial		Neutral	
customer	positive		
Project team	positive		
Quality team	positive		
External regulator		Neutral	
suppliers			negative

Table 4-2 Mapping stakeholder attitude

A stakeholder engagement assessment matrix consists of several rows, each of them representing one stakeholder (or a group of homogenous stakeholders, if applicable). The columns indicate the level of engagement. suggests the following classification:

Stakeholder	Strength/ Interest	Unaware	Resistant	Neutral	Supportive	Leading
Project sponsor	High/High	C			D	
Project Manager	High/High				C,D	
VP Commercial	High/High			D		
Customer	Low/Low				C	
Project Team	Low/High				D	
Suppliers	Low/Low		D		C	
Quality Team	Low/High				C	

Table 4-3 stakeholder engagement assessment matrix with desired (“D”) and current (“C”) levels of engagement per stakeholder.

4.2 Develop the stakeholder's analysis based on their strength/interest and influence/strength:

Stakeholder Analysis is a systematic way to analysis stakeholders by their power and interest. High power, high interest stakeholders are Key Players. Low power and low interest stakeholders are least important.

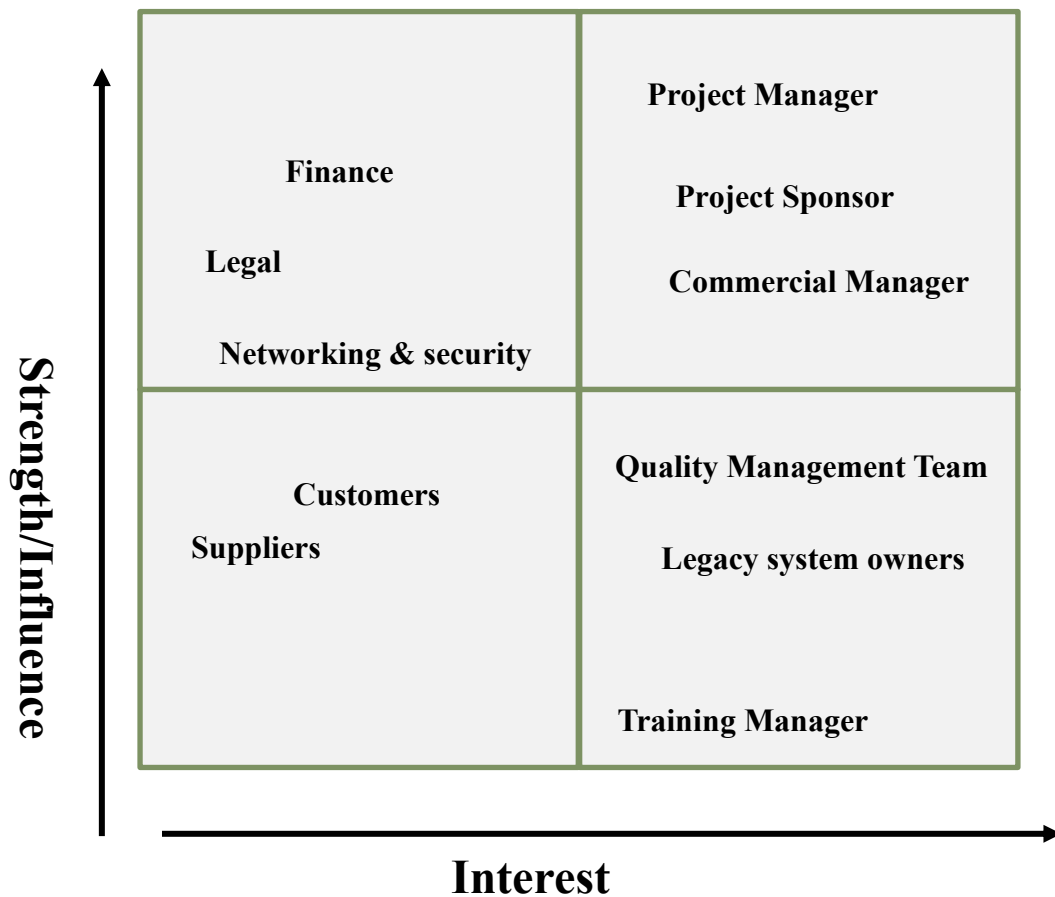


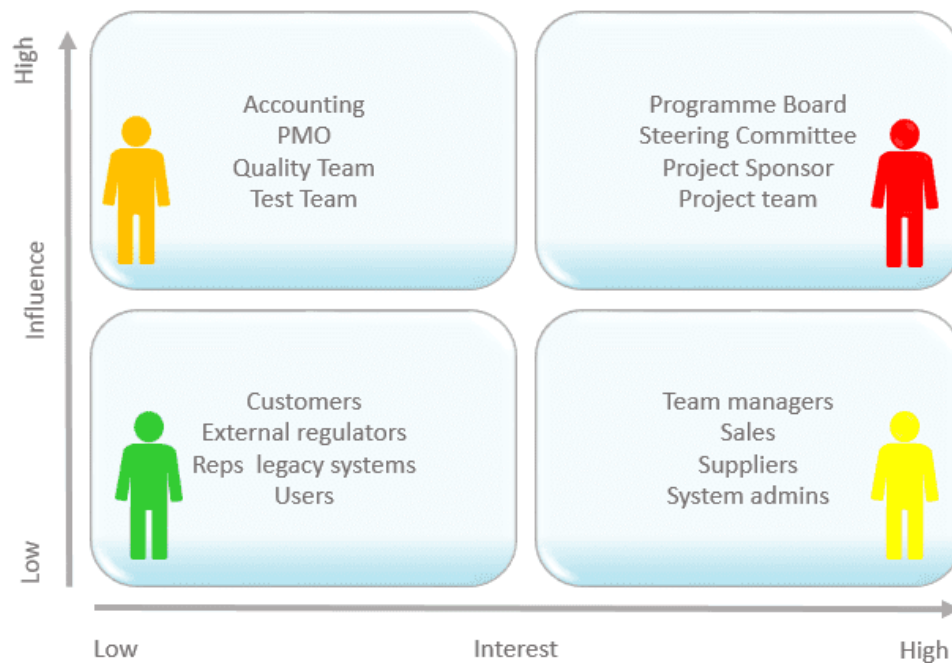
Exhibit 4-3 Stakeholder Analysis

The diagram above shows the different approach we should have for the segregated stakeholders.

- **High power – High interest:** these stakeholders are likely to be decision makers and have the biggest impact on the project success. we need to keep these stakeholders close, to manage their expectations.
- **High power – Low Interest:** these stakeholders need to be kept in the loop with what is happening on the project. Even though they may not be interested in the outcome, they yield power. These types of stakeholders should be dealt with cautiously because they could use their power in a negative way if they become unsatisfied.
- **Low power – High interest:** keep these people adequately informed, and talk to them to ensure that no major issues are arising. These people can often be very helpful with the detail of your project.
- **Low power – low interest:** monitor these people, but do not spend time and energy with excessive communication.

Once we have identified stakeholders, we may have a long list of groups and people who could be affected or affect our business. Now we need to identify who is important and who to spend most effort on managing. One of the most commonly used techniques is the interest and influence grid. This is a simple, but very powerful way of categorizing stakeholders and

developing a tailored strategy for engaging each stakeholder based on their relative interest and influence in your business or project.



4.3 Logical Diagram of Stakeholder Register:

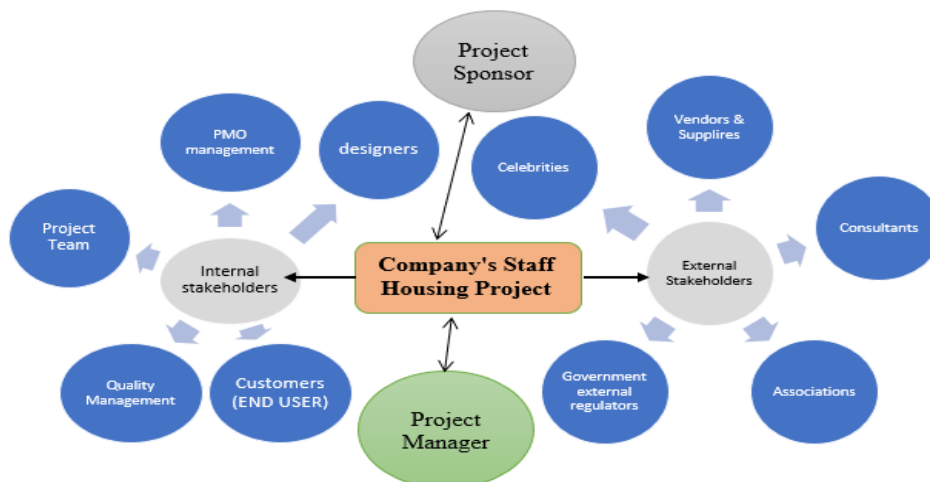


Exhibit 4-4 Logical Diagram of Stakeholder Register

5. Culture and values

An organization's culture refers to a company's mission, objectives, expectations and values that guide its people.

An organization's culture **defines the proper way to behave within the organization**. This culture consists of shared beliefs and values established by leaders and then communicated and reinforced through various methods, ultimately shaping employee perceptions, behaviors and understanding.

Organizations with health cultures tend to be more successful because they have systems and values in place that enhance trust, performance, productivity and employee engagement.

VALUES: THE FOUNDATION OF CULTURE

When our people thrive, our organization thrives. Understanding your optimal culture begins with understanding the Values of your organization. Values – conscious or unconscious – are the motivation for every decision made or action taken.

Employees have their own values when they walk in the door, and they are influenced everyday by the values they experience in the organization.

Understanding the values currently at play is essential to identify the desired culture and put it into action.

In our organization with a more or less stable set of employees, culture will be quite well entrenched deep down in the foundation of organization and will be at the core of driving actions and behaviors of the organization; not varying great deal over extended periods of time unless something catastrophic happens. In fact, people not aligning themselves with the culture may even have to leave the organization, hence the culture remaining intact most of the times, if not all. In hindsight, culture seems to be the only element in an organization that out-last most of the other elements, even the people and leaders who created the organization in the first place.

5.1 Identify The Culture Of Organization:

An employer must begin with a thorough understanding of what culture is in a general sense and what their organization's specific culture is. At the deepest level, an organization's culture is based on values derived from basic assumptions about the following:

- **Human nature.** Are people inherently good or bad, mutable or immutable, proactive or reactive? These basic assumptions lead to

beliefs about how employees, customers and suppliers should interact and how they should be managed.

- **The organization's relationship to its environment.** How does the organization define its business and its constituencies?
- **Appropriate emotions.** Which emotions should people be encouraged to express, and which ones should be suppressed?
- **Effectiveness.** What metrics show whether the organization and its individual components are doing well? An organization will be effective only when the culture is supported by an appropriate business strategy and a structure that is appropriate for both the business and the desired culture.

5.2 Proposals of The Organization Values That Can Be Adopted in project:

At the heart of organizations' cultures are commonly shared values. None is right or wrong, but organizations need to decide which values they will emphasize. These common values include:

- **Outcome orientation.** Emphasizing achievements and results.
- **People orientation.** Insisting on fairness, tolerance and respect for the individual.
- **Team orientation.** Emphasizing and rewarding collaboration.

- **Attention to detail.** Valuing precision and approaching situations and problems analytically.
- **Stability.** Providing security and following a predictable course.
- **Innovation.** Encouraging experimentation and risk-taking.
- **Aggressiveness.** Stimulating a fiercely competitive spirit.

See Trust Engenders Trust: A Q&A with Paul J. Zak.

DEGREE OF HIERARCHY

The degree of hierarchy is the extent to which the organization values traditional channels of authority. The three distinct levels of hierarchy are "high"—having a well-defined organizational structure and an expectation that people will work through official channels; "moderate"—having a defined structure but an acceptance that people often work outside formal channels; and "low"—having loosely defined job descriptions and accepting that people challenge authority.

An organization with a high level of hierarchy tends to be more formal and moves more slowly than an organization with a low level of hierarchy.

DEGREE OF URGENCY

The degree of urgency defines how quickly the organization wants or needs to drive decision-making and innovation. Some organizations choose their degree of urgency, but others have it thrust on them by the

marketplace. A culture with high levels of urgency has a need to push projects through quickly and a high need to respond to a changing marketplace. A moderate level of urgency moves projects at a reasonable pace. A low level of urgency means people work slowly and consistently, valuing quality over efficiency. An organization with high urgency tends to be fast-paced and supports a decisive management style. An organization with low urgency tends to be more methodical and supports a more considered management style.

PEOPLE ORIENTATION OR TASK ORIENTATION

Organizations usually have a dominant way of valuing people and tasks. An organization with a strong people orientation tends to put people first when making decisions and believes that people drive the organization's performance and productivity.

FUNCTIONAL ORIENTATION

Every organization puts an emphasis on certain functional areas. Examples of functional orientations may include marketing, operations, research and development, engineering or service. For example, an innovative organization known for its research and development may have at its core a functional orientation toward R&D.

6. Self-Reflection and Self-Management

Self-management is really about controlling our reactions. Things happen all the time and many of them are outside of our control — but what is in our control is how we react! Our self-management (reactions) can be improved by reflecting.

Reflection is a dynamic process. It is not about being passive, staying where you are and looking back – but an active engagement with knowledge and experience. So, in reflecting you are able to construct new and deeper understanding and to articulate knowledge in a more meaningful way.

6.1 Behaviors Of The Team Member That Can Influence On The Project:

- **Level of Engagement:**

Engaging team members in a project is critical to its success. However, this too depends on the nature of employees in your team. Every person has a unique personality and different ways of engaging with people. It's possible that they don't feel comfortable with the level of input you want from them. Other times, they may engage much more than others, and even speak over some team members. Therefore, project managers have to balance both sides of the coin effectively.

- **The Level of Motivation**

Each one of us is driven by our emotions. While we expect people to keep their emotions at bay in a professional environment, it can be hard for people to do that on certain occasions.

- **Communication**

In most cases, planning tasks might not be the biggest problem for project managers. Instead, the greatest challenge for managers is how to communicate what they want from their team. During a project, there are hundreds of open communication channels between project team members and stakeholders.

6.2 Identify The Behaviors Reasons And How We Can Eliminate It:

- **Level of Engagement:**

it is extremely important for project managers to lay the groundwork to engage team members and stakeholders. This will help them maintain a good relationship with all members and stakeholders in both the short and the long term. We must monitor the level of engagement of individual team members across the life cycle of the project. we should also address

their emotional and personal expectations to bring about their best performance. If we don't address these issues yourself, it would be extremely difficult to create a good working environment among our team. Consequently, it would affect the performance of team and make it harder for them to achieve the targets set for them.

- **The Level of Motivation**

The reason is that our emotions have a huge effect on our level of motivation. A person's level of motivation is directly proportional to how successful they will be in tackling challenges head-on and overcoming the adversities they face. Regardless of how talented people are, it's difficult for them to work in an environment where they don't feel motivated. Keeping the team motivated has always been a long-standing challenge for most project managers. Therefore, to be a good project manager, we should have the expertise to manage both the technical and the emotional aspects of your team. Negligence in this matter can also cause a high performing and strongly skilled employee to exhibit negative attitudes due to their lack of motivation. If we don't manage both factors simultaneously, you'll delay important projects that will end up costing much higher than what expected.

- **Communication**

As project manager, we need to establish a conducive environment for nurturing positive interactions between team members. Doing so clears out any confusion and allows your team to work in cohesion and produce better results. Proficient project management is no easy feat, especially if we're working with a complex team of individuals, and firefighting problems to keep the project on track. However, if we manage team effectively, we can transform team into greatest strength.

6.3 Conducting Self-Professional Assessment by SWOT Model:

A SWOT analysis is a tried-and-true method businesses use to identify internal strengths and weaknesses and external opportunities and threats. The assessment is included in any business worth because it provides critical information needed to create a strategic plan for growth.

Strengths	Threats
• Efficiency reduces expenses. • Experience / Skills. • Customer Service. • Working Relationship with Material Suppliers. • Knowledge of your Subcontractors.	• Inclement Weather. • Quarantine. • Economic Factors. • Small Area for Storage and Manipulation on the Construction Site.
Opportunities	Weaknesses

• Possibilities of Working on Future Projects. • Knowledge of Developing Trends. • Favorable Contract Terms. • The Possibility of Working on Future Projects.	• Inexperienced Workers. • Lack of Coordination. • Possibility of Injury at Work. • Resistance to New Methods of Working.
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Table 6-1 SWOT analysis

CONCLUSIONS: Performing a SWOT analysis for our project is critical. By identifying our Strengths, Weaknesses, Opportunities, and Threats, we can have an adequate assessment of where we stand, what we need to improve.

7. Personal Integrity and Reliability

Integrity in the workplace comes in many forms, but above all refers to having upstanding character traits and work ethics including sound judgement, honesty, dependability, and loyalty. A well-known definition is: *Integrity is doing the right thing (through your words, actions and beliefs) when no one is watching.* Having a high degree of integrity at work means that:

- Trustworthy and reliable.
- Practice and encourage open and honest communication.
- Responsible for actions.

7.1 Three Behaviors Contradict the Moral Integrity:

- Fake qualification & experiences.
- Lack of familiarity with professional standards.
- Time un-punctuality.

7.2 Analyze The Financial, Social, And Technical Influence, Of Such Above Behaviors:

- **Fake qualification & experiences:** Hiring those who have falsified their qualifications or lied on their CVs can lead to costly exposure to legal action, high staff turnover, lost revenue and public reputational damage which may take years to repair.
- **Lack of familiarity with professional standards:** With lack of familiar with standards will leads to low quality which lead to more cost for repair, to ensure that not happens again we have to perform courses learning for worker and all staff about standards to avoid loses.
- **Time un-punctuality:** The employee who is not have time punctual will lead to delay project tasks which will increase time & cost for each activity and delay project which can't reach millstone.

8. Personal Communication

Personal communications include emails, text messages, online chats or direct messages, personal interviews, telephone conversations, live speeches, unrecorded classroom lectures, memos, letters, messages from nonarchival discussion groups or online bulletin boards.

8.1 Prepare Register of Stakeholder:

The **Stakeholder Register** differs from Stakeholder Analysis as it is focused on each stakeholder's name and contact details rather than their power and interest or the engagement strategy to be used for that stakeholder.

Stakeholder Register						
Stakeholder Name	Category	Organization	Role or Job title	Phone numbers	Email address	Address
Ibrahim Moatsim	Internal	CEO	Project Sponsor	05678747		Heard Office
SAEED	Internal	Project Management	Project Manager	05678502		Site Office
End User	External	Customer sponsor	customer	0578952		Khobar city
Ahmed Alghamdi	Internal	Head management	VP of commercial	0135854		Head office
Suppliers	External	Procurement	Supplier	01245785		Head Office

Table 8-1 Stakeholder Register

8.2 Identify The Personal Communication and The Effective Communication:

Communication is one key element which has to be applied effectively throughout a project's life cycle from the beginning till the end. Hence, why is it that Project Managers are not communicating effectively?

Examples of **personal communication** include conversations, email, text messages, online chats or direct messages, personal interviews, telephone conversations, live speeches, unrecorded course lectures, memos, letters, messages from non-archived discussion groups or online bulletin boards, social media shared with "team" only.

By observing some relatively easy to remember questions and concerns related to communication, a project team can be more effective in communicating with their project stakeholders. **Effective communication** will generally lead to better outcomes and, therefore, a higher likelihood for overall project success.

The challenges a Project Manager has may include the following:

Stakeholders: A modest project will tend to have a number of people who need to know its progress and about any issues which crops up during execution.

Team Members: A project team is generally quite a diverse group of people. Project teams are usually thrust together to deliver a customized and unique benefit to an organization.

Ever Changing Situation: All projects are by nature fluid and ever changing. Hence a project manager has to consider the changes and challenges all the way until the end of the project and ensure that the team and stakeholders are fully up to date with issues and progress so that there will be no nasty surprises for them to discover later on.

Effective communication means that the information is provided in the right format, at the right time, to the right audience, and with the right impact. Efficient communication means providing only the information that is needed' Hence, the project manager has to tailor the communication plan accordingly for each project. The plan should be maintained and updated throughout the project life cycle if there are any changes.

- Make use of technology.
- Keep cultural and language barriers in mind
- Understand who should get what information and how.

8.3 Identify Shapes, Models, and Channels of The Personal Communication.

Communication is the process of creating, interpreting, and negotiating meaning. Communication can be verbal, nonverbal, or textual. It can be aural, visual, or even physical. Although communication occurs in a variety of different ways, it is always a learned behavior.

Models of Communication

In order to explain the social process of communication, scholars have developed several models. The three most well-known models for communication are Linear, Interactional, and Transactional.

- **Linear Models**

Originally developed by (*Shannon & Weaver in 1948*), this model describes communication as a linear process. (See Exhibit) This model describes how a sender, or speaker, transmits a message to a receiver, or listener. More specifically, the sender is the source of the message.

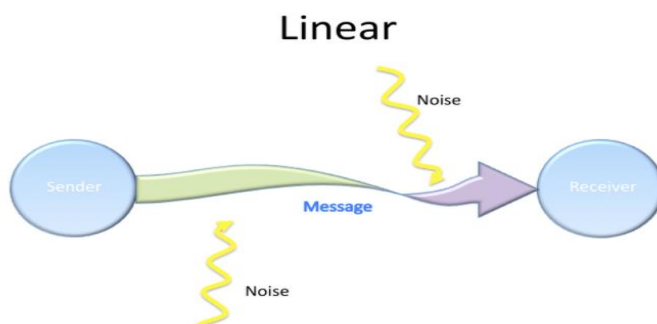


Exhibit 8-1 Linear Model

While the linear model was highly influential during the mid-20th century, this model is perhaps too simple. Its limitations are easy to see if you pause to think about the beliefs about communication, or assumptions, made in this model. First, this model assumes that communication only goes in one direction.

- **Interactional Models**

In the move to a more dynamic view of communication, interactional models follow two channels in which communication and feedback flow between sender and receiver. *Feedback* is simply a response that a receiver gives to a sender. (See Exhibit) Feedback can be verbal (i.e. “yes”) or nonverbal (i.e. a nod or smile).

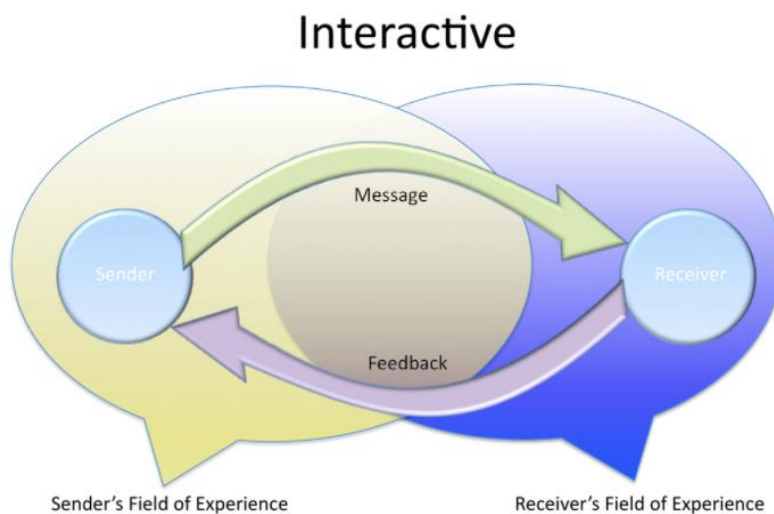


Exhibit 8-2 Interactional Model

The final feature of this model is the field of experience. The *field of experience* refers to how environment, experiences, culture, and even heredity can influence how a sender constructs a message. Keep in mind that each person brings a unique field of experience to an interaction. Likewise, each communication interaction is unique. While the interactional model is more dynamic than the linear model, it still contains some limitations. For instance, this model implies that while people can be both senders and receivers, they cannot do so simultaneously. In lived communication, roles are not quite so clear-cut and in fact are much fluid.

- **Transactional Models**

The transactional is the most dynamic of communication models. One notable feature of this model is the move from referring to people as senders and receivers to referring to people as communicators. This implies that communication is achieved as people both send and receive messages. (See Exhibit) Fundamentally,

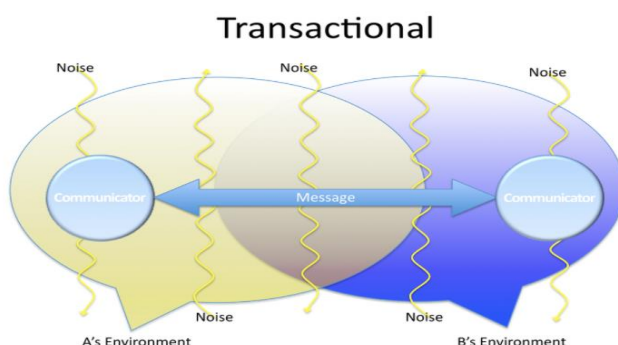


Exhibit 8-3 Transactional Model

This model also places more emphasis on the field of experience. While each communicator has a unique field of experience, they must also inhabit a shared field of experience. In other words, communicators must share at least some degree of overlap in culture, language, or environment if people are to communicate at all. This model also recognizes that messages will influence the responses, or subsequent messages, produced in the communication interaction. This means that messages do not stand alone, but instead are interrelated. The principle of interrelation states that messages are connected to and build upon one another. The transactional model forms the basis for much communication theory because (1) people are viewed as dynamic communicators rather than simple senders or receivers, (2) there must be some overlap in fields of experience in order to build shared meaning, and (3) messages are interdependent.

- **Communication Channels**

Communication channels show the way information flows between stakeholders. Based on the number of people that talk to each other in a project, you calculate the number of communication channels.

We can represent it numerically using **$n(n - 1) / 2$ formula.**

Not every communication channel is made equally. While each one has its own benefits, there are some forms of communication that are naturally

richer and allow you to have deeper conversations, and others that make room for productivity-increasing tools. Below, we'll give you a thorough look at seven strong channels for business communication and how they can best be utilized.

1. Face-to-face communication

2. Video conferencing

3. Phone calls

4. Emails

5. Text messages

6. Online messaging platforms

7. social media

Customer communications can include letters, catalogues, direct mail, emails, text messages, and telemarketing messages. Some receivers automatically filter bulk messages like these.

Conclusion:

Different communication channels are more or less effective at transmitting different kinds of information. Some types of communication range from high richness in information to medium and low richness. In addition, communications flow in different directions within

organizations. A major internal communication channel is email, which is convenient but needs to be handled carefully. External communication channels include PR/press releases, ads, websites, and customer communications such as letters and catalogues.

8.4 Communication Matrix:

A **communication matrix** is a document summarizing the communication management plan for a project. To remain effective, the communication matrix must be accessible to all stakeholders and updated throughout the project. Let's look at one way a matrix can be formatted.

Communication	Format	Frequency	Owner	Distribution	Escalation
Weekly Status update	E-mail	Once a week	PM	All project team	CEO
Action items	Video conference	Once every 2 weeks	PMO	Concern team	PM
Budget usage	Face to face & email	weekly	Finance manager	CEO, VP & PM	CEO
Risk register update	Face to face & conference	monthly	Risk Manager	All project team	PM & CEO
Kickoff meeting	Face to face	once	PM	Project team Project sponsor Stakeholders	CEO
Project team meeting	Face to face & conference	weekly	PM	Project team	PM

Technical & Creative Design Meetings	In person / Face-to-face	As needed	Technical lead	Technical team	PM
Monthly Project Status Meetings	Face-to-face /Conference call	Monthly	Project manager	Project manager & Stakeholders	PMO
Project Status Reports	Email	Monthly	Project manager	Project manager & Stakeholders	PMO & CEO

Table 8-2 Communication matrix

In project management, a **communication plan** is an outline of how we are going to communicate important, ongoing project information to key stakeholders. Your communication plan will help your team understand who should be getting which notifications and when to loop in project stakeholders. As part of our communication plan, you'll clarify which channel stakeholders should use and when, how frequently different details should be communicated, and who is responsible for each of the different channels.

Sharing a communication plan can give our team clarity about which tools to use when and who to contact with each of those tools. Without a communication plan, you might have one team member trying to ask questions about work in a tool that another team member rarely checks.

COMMUNICATIONS MANAGEMENT PLAN					
Stakeholder	Communication type	Method	Timing Or Frequency	Sender/owner	Agenda
Customers	Update meeting	Email and on website platform	End of year	Project manager	Update what was done last year.
Project team	Project team meeting	Face to face & email	Weekly	Project manager	Update what was done last week? Update what is plan for next week?
Project Manager	PMO	Email and on website platform	Weekly	SR. Engineer	Update what was done last week.
Project Sponsor	CEO Meeting	Email and on website platform	Monthly	Project Manager	Update what was done last month.

Table 8-3 Communications Management Plan

8.5 Wrong Scenarios of Communication:

A common denominator in challenged projects is poor communication. What are the results? Stakeholders make bad assumptions. Team members don't trust one another. Work has to be redone. Example of wrong communications:

- **Giving stakeholders irrelevant information.**

Some project managers email the project documents to all stakeholders including the project schedule, budget, process improvement plans, weekly status reports, project risks, and stakeholder analysis, to name a few. What do you think the stakeholders do? Yes, most ignore the email and miss critical information.

- **Not planning project meetings.**

How often have we attended a project meeting and left mumbling—what's was that all about? **Many meetings are a complete waste of time.** Why? Little thought in the planning.

- **Assuming That Your Message Has Been Understood.**

Always take time to check that people have understood your message. For example, when you send out an email, could encourage people to respond with questions or to reply, if they haven't understood part of your message. Or, if you've given a presentation, build in time for people to discuss your main points or leave time for questions at the end.

- **Avoiding Difficult Conversations**

At some point will need to give negative feedback. It's tempting to try to avoid these conversations, but this can cause further problems. Preparation is the key to handling difficult conversations. Learn to give clear, actionable feedback, and use tools such as the Situation – Behavior – Impact technique to encourage people to reflect on their behavior.

- **Delivering Bad News by Email**

Would you announce layoffs to team by email or IM? If you did, you could upset everyone! Written communication channels don't allow you to soften difficult messages with nonverbal cues (such as body language), and they don't allow you to deal immediately with intense emotions.

9. Relationships and Engagement

Project relationships are those relationships that occur between the project manager and the project's stakeholders as well as those that occur among the project stakeholders themselves.

The goal of stakeholder relationship and the management of those relationship is to try to get individuals who are committed to the outcome, rather than people who are merely compliant with your goals.

In other words, we don't want people who will just be there to be there. We want people who will help champion the effort. We really want to focus on the outcome.

9.1 Stakeholder Engagement Assessment Matrix:

Consists of several rows, each of them representing one stakeholder (or a group of homogenous stakeholders, if applicable). The columns indicate the level of engagement. suggests the following classification:

Each stakeholder falls under one of the following five categories, depending on the level of support for the project:

- **Unaware:** Stakeholders are unaware of the project and its potential impacts.

- **Resistant:** Stakeholders are aware of but not supportive of the project.
- **Neutral:** Stakeholders are aware of the project but they don't have an opinion regarding their support for it.
- **Supportive:** Stakeholders are supportive of the project & wish it to succeed.
- **Leading:** Stakeholders are actively engaged in project success and are willing to lend assistance to help it succeed.

Stakeholder	Strength/Interest	Unaware	Resistant	Neutral	Supportive	Leading
Project Sponsor	High/High				C	
Project Manager	High/High				C	C
VP Commercial	Low/High			D		
Customer	Low/Low				C	
Project Team	Low/High		D		C	
Suppliers	Low/Low		D		C	
Quality Team	Low/High				C	

Table 9-1 Stakeholder Engagement Assessment Matrix with Desired ("D") And Current ("C") Levels of Engagement Per Stakeholder.

10. Leadership

Leadership in project management is an essential skill for steering the project to a successful completion. Like leadership in other areas of business, leadership in a project context require to demonstrate a range of competencies and behaviors. From directing the team to project governance, leadership is fundamental to ensuring your projects deliver a great result.

Leadership may be a concept, which is put into operation by the individuals in their personal and professional lives. so as to implement this idea in an efficient and worthwhile manner, the individuals have to acquire an understanding in terms of meaning and significance of leadership.

10.1 The Leadership Model:

In our project we prefer to use **Autocratic leadership** which will be a style of project management during project which one leader or member of the organization takes decisions on behalf of the corporate. this sort of leadership style is seen mostly in businesses which are relatively small with fewer employees. this kind of leadership style is effective in our organizations where the character of labor requires quick decision-making.

10.2 Reasons for Use Autocratic Leadership Model:

Autocratic leaderships are helpful in situations where a business faces constant change or a crisis. It'll be ready to react to matters promptly compared to other leadership styles, thanks to streamlined organizational structure and quick decision-making ability. The purpose of leadership is to guide the people in a very corporation to work towards the attainment of common organizational goals. The leader brings the people and their efforts together to achieve common goals. Leadership can be endless process. A pacesetter possesses to guide his employees anytime and also monitor them to make sure that their efforts have gotten within the identical direction which they are not deviating from their goals.

Autocratic style effects Also known as authoritarian leadership, *Milgron* said autocratic style clearly defines the division between leaders and workers. Autocratic leaders make decision with little or no involvement from employees. These types of leaders are more confident about and comfortable with the decision-making responsibility for the strategy plans and company operating. Although research indicates that autocratic leaders display less creativity than more contemporary (new) styles.

(The autocratic style is adequate) When new employees are not familiar and don't have sufficient to know the way about their jobs responsibilities
If the worker constantly misusing their authority When company rules are

violated by employees When the sole real person who wrote it for a decision-making and implementing.

Advantages of Autocratic Leadership:

- It allows for fast decisions to be made
- It improves overall communication.
- It improves productivity
- It handles crisis situations effectively.
- It reduces employee stress
- It counters team inexperience

10.3 Proposals for The Motivation Methods That Are Compatible with The Nature of The Project:

Our people may have all the expertise in the world but, if they're not motivated, it's unlikely that they'll achieve their true potential. On the other hand, work seems easy when people are motivated. Motivated people have a positive outlook, they're excited about what they're doing, and they know that they're investing their time in something that's truly worthwhile. In short, motivated people enjoy their jobs and perform well. All effective leaders want their organizations to be filled with people in this state of mind. That's why it's vital that you, as a leader and manager,

keep our team feeling motivated and inspired. But of course, this can be easier said than done!

There are two main types of motivation – extrinsic and intrinsic.

1) Extrinsic motivation is when you use external factors to encourage your team to do what you want. Pay raises, time off, bonus checks, and the threat of job loss are all extrinsic motivators – some positive,

- **Money / Power**

Want to ‘move up’ in the organization or earn higher wages.

- **Recognition**

Often motivated most by acknowledgement of those in power.

- **Interpersonal Relationships**

Relationships with co-workers and a cooperative atmosphere are valued.

2) Intrinsic motivation is internal. It's about having a personal desire to overcome a challenge, to produce high-quality work, or to interact with team members you like and trust.

- **Autonomy / Interesting Work**

Prefer the excitement of new and innovative endeavors.

- **Purpose**

Need to feel that their work is beneficial to the causes they care about.

- **Mastery / Exploration**

Personal achievement, problem solving opportunities, and creative endeavors are sought.

❖ **Proposal to motive project team:**

1. Set Clear & Realistic Project Goals.
2. Direct with Your Team Members.
3. Positive in Meetings.
4. Conduct Regular Reviews.
5. Encourage Team Interactions.
6. Respect their time.

11. Teamwork

Great teamwork in project management achieves three very important goals:

- Projects are completed on time and in full
- Individual team members feel more satisfied with their roles which gives them extra motivation to perform
- A well-oiled team contributes to a healthy work environment.

And when you combine all three, you get a recipe for long-term success.

A great team is especially important can help us to work through the process and bring home a successful project.

11.1 RACI model for 3 administrative measures of the project:

A RACI chart, is a type of responsibility assignment matrix (RAM) in project management. In practice, table that lists all stakeholders on a project and their level involvement in each task, denoted with the letters R, A, C or I. Once these roles are defined, assignments can be attributed to the roles and work can begin.

- **Responsible:** People or stakeholders who do the work. They must complete the task or objective or make the decision.

- **Accountable:** Person or stakeholder who is the "owner" of the work. He or she must sign off or approve when the task, objective or decision is complete.
- **Consulted:** People or stakeholders who need to give input before the work can be done and signed-off on. These people are "in the loop" and active participants.
- **Informed:** People or stakeholders who need to be kept "in the picture." They need updates on progress or decisions.

Task	Project sponsor	Project Manager	VP Commercial	Project Team	Supplier
Feasibility study	R	R	A	I	
Financial Plan (Fund)	R	A	A		
Project Design	C	R	A	C	I
Assign Contactors	A	R	A	I	I
Test verifying		R	C	C	I
Closure Report	I	R	A	R	I

Table 11-1 RACI model

12. Conflict and Crisis

12.1 Conflict and Crisis Definition:

Conflict is when two perspectives, personalities, values or opinions contradict each other. In some cases, it is a natural contradiction. Crisis management is the process by which an organization deals with a major event that threatens to harm the organization, its stakeholders, or the general public. Conflicts are natural to human nature and they can be constructive and promote better performance among individuals.

Crisis in business organizations results to the arousal of two or more strong motives that cannot be solved together.

This type of situation is termed an approach-avoidance crisis.

Organizationally, crisis exists when the reduction

of one motivating incentive involves an increase in another, so that a new adjustment is demanded. According to

Amesi (Forthcoming), crisis are not all equally severe.

Conflict is a natural ingredient in every organization. And to understanding the conflict:

- Conflict is normal and healthy (if managed appropriately).
- Conflict arises from differences.

- Conflict can either stimulate or hinder progress, growth, and productivity.
- Conflict that is mismanaged can derail leaders and limit their efficacy.
- Conflict cannot and should not be avoided forever.
- Leaders have ways in which they prefer to handle or resolve conflict.

12.2 Scenarios of The Conflicts Events in May Happen In The Project:

Conflicts between coworkers or suppliers & client or vendors may arise because of different work styles and personal habits. They can also arise from personal prejudices and cultural differences.

- 1. Conflict over cost** is conflict over cost estimates from support areas regarding work breakdown
- 2. Conflict over man power resources** is Conflicts concerning staffing of project team with personnel from other areas.
- 3. Conflict over technical options and Performance** is Disagreements over the technical issues, performance specifications and trade-offs.

4. **Conflict over administrative procedures** is Managerial and Administrative oriented conflict over how the project will be managed.
5. **Conflict over project priorities** is View of project participants will differ over sequence of activities and tasks.

12.3 Optimal Strategies to Deal with Each Conflict, And Reason of Preference:

Conflict resolution is a daily occurrence at work that can either propel or disrupt the momentum for a leader, a team or the entire organization. The workplace can become a toxic environment when leaders allow conflict to fester rather than confront it head-on. Managing conflict can be a tricky thing – especially when we are not familiar with the larger ecosystem in which the particular individual or department creating the conflict, and how efforts to resolve conflict will reverberate throughout that ecosystem. There are five general techniques for resolving conflict. Each technique has its place and use:

- **Withdraw/avoid.** Retreating from an actual or potential conflict situation; postponing the issue to be better prepared or to be resolved by others.

- **Smooth/accommodate.** Emphasizing areas of agreement rather than areas of difference; conceding one's position to the needs of others to maintain harmony and relationships.
- **Compromise/reconcile.** Searching for solutions that bring some degree of satisfaction to all parties in to temporarily or partially resolve the conflict. This approach occasionally results in a lose-lose situation.
- **Force/direct.** Pushing one's viewpoint at the expense of others; offering only win-lose solutions, usually enforced through a power position to resolve an emergency. This approach often results to a win-lose situation.
- **Collaborate/problem solve.** Incorporating multiple viewpoints and insights from differing perspectives; requires a cooperative attitude and open dialogue that typically leads to consensus and commitment. This approach can result in a win-win situation.

The optimal strategies to deal with each conflict, and the reason of preference.

1	Conflict over cost is conflict over cost estimates from support areas regarding work breakdown.		
	Style	Description	Effects
	Confronting/ Problem Solving	Treats conflict of over cost as a problem to be	Provides ultimate resolution

	solved by examining alternatives.	
We use solving here <u>because</u> it provides final solutions by ultimately resolving the underlying problems. In most cases, confronting or problem-solving may take longer than other techniques.		

2	Conflict over man power resources is Conflicts concerning staffing of project team with personnel from other areas.		
	Style	Description	Effects
	Collaborating	Incorporates multiple viewpoints and insights from differing perspectives leads to consensus and commitment	Provides long-term resolution
We are use collaborating here because it offers a good opportunity to learn from others. Active collaboration by both parties in contributing to the resolution makes it easier to get their consensus and commitment.			

3	Conflict over technical options and Performance between quality & execution team is Disagreements over the technical issues, performance specifications and trade-offs.		
Style		Description	Effects
Forcing		Pushes one view-point at the expense of others; offers only win-lose solutions	Hard feelings may come back in other forms
We use forcing because it takes less time than compromise and negotiation but it leaves hard feelings because people dislike having others' views imposed on them. Conflict resolved by force may develop again and haunt the enforcers at a later date. Although forcing definitely resolves the conflict quickly.			

4	Conflict over administrative procedures is Managerial and Administrative oriented conflict over how the project will be managed.	
Style	Description	Effects
Compromising	Searches for the bargains for solutions that bring some degree of satisfaction to all parties	Does provides definitive resolution
We use compromising because it involves considering various issues, bargaining, using tradeoff negotiations and searching for solutions that bring some degree of satisfaction to both parties involved in the conflict. In this mode, neither party wins but both get some degree of satisfaction out of the situation.		

5	Conflict over project priorities is View of project participants will differ over sequence of activities and tasks.	
Style	Description	Effects
Forcing	Pushes one view-point at the expense of others; offers only win-lose solutions	Hard feelings may come back in other forms
We use forcing because it takes less time than compromise and negotiation but it leaves hard feelings because people dislike having others' views imposed on them. Conflict resolved by force may develop again and haunt the enforcers at a later date. Although forcing definitely resolves the conflict quickly.		

Factors that influence conflict resolution methods include:

1. Importance and intensity of the conflict,
2. Time pressure for resolving the conflict,
3. Relative power of the people involved in the conflict,
4. Importance of maintaining a good relationship, and
5. Motivation to resolve conflict on a long-term or short-term basis.

12.4 Root Cause Analysis For Each Conflict:

Root cause analysis is a structured team process that assists in identifying underlying factors or causes of an adverse event or near-miss. Understanding the contributing factors or causes of a system failure can help develop actions that sustain the correction.

A cause-and-effect diagram, often called a “**fishbone**” diagram, can help in brainstorming to identify possible causes of a problem and in sorting ideas into useful categories. A fishbone diagram is a visual way to look at cause and effect.

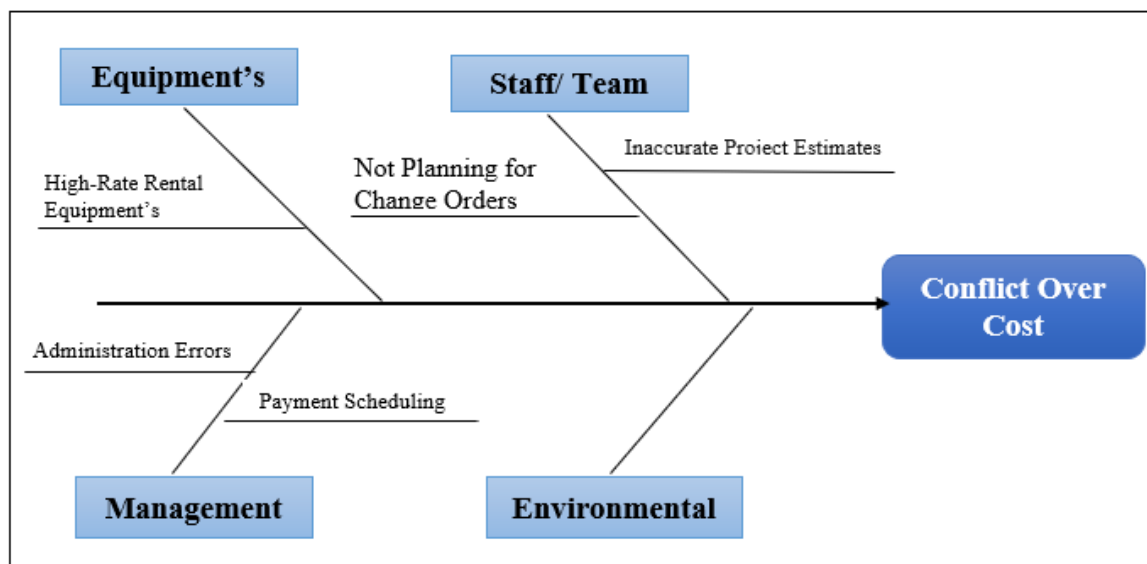


Exhibit 12-1 Conflict Over cost Root analysis

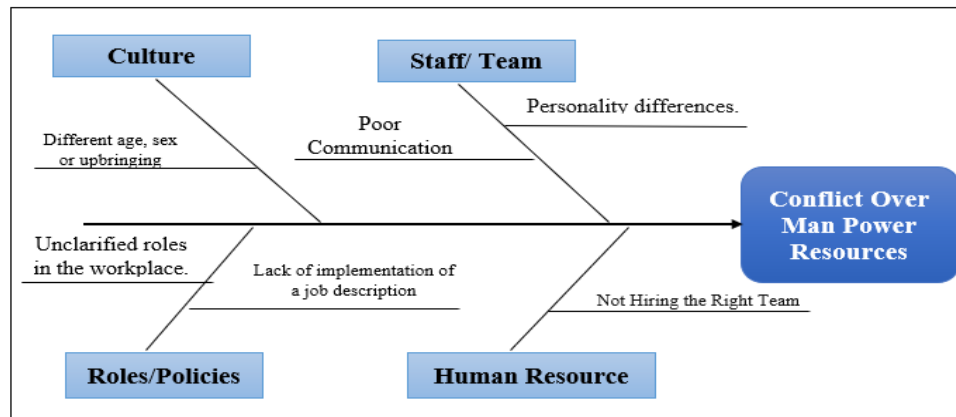


Exhibit 12-2 Conflict Over Man Power Resource Root analysis

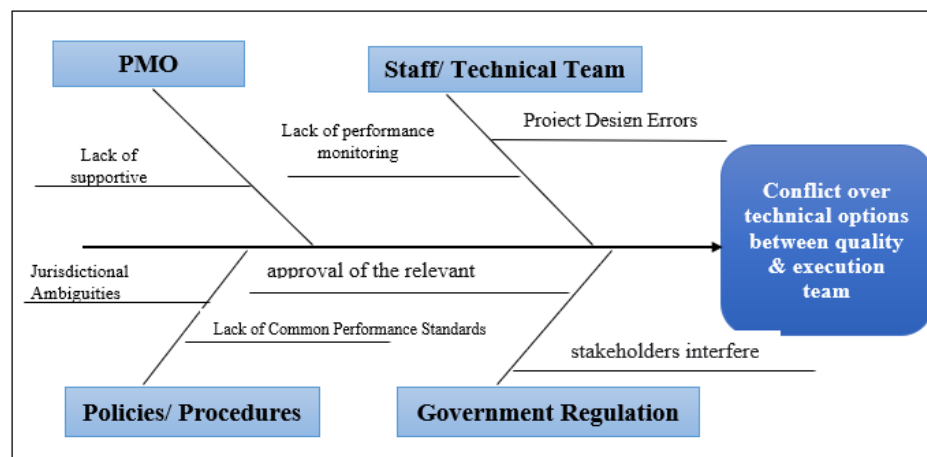


Exhibit 12-3 Conflict over technical options and Performance Root analysis

Now: Analyze our Diagrams

By this stage we should have a diagram showing all of the possible causes of the problem that we can think of. Depending on the complexity and importance of the problem, we can now investigate the most likely causes further. This may involve setting up investigations, carrying out surveys, and so on. These will be designed to test which of these possible causes is actually contributing to the problems.

13. Resourcefulness

Resourcefulness is defined as the ability to apply various techniques and ways of thinking to defining, analyzing, prioritizing, finding alternatives for and dealing with or solving challenges and problems.

13.1 Distributing of The Human Resources on The Functions:

Human Resources in Project Management focus on Project Team recruitment, organization and management until the end of a given project. Its role starts from defining core competencies which are going to be needed, to team building and motivation. The interest is to understand how an executive function can impact Project Management. It is as interesting as Human Resource is a function for which I feel a particular affection.

- **Allocating of tasks to human resources:**

Allocating resources is scheduling and coordinating of resources so that they arrive on-site as needed and are removed or transported out of the working location when not needed. Also included with it is the way of transportation if the company decide to give daily transportation to its labor. When performed properly, it is the effective and efficient utilization of all resources that will make sure the resources usage to the maximum possible to gain the results intended as saving the time, cost and cost of quality will be great if the right resources are allocated correctly on the

right time and to the strength of the individuals and their capabilities. It is the most important goal of resource allocation is to maintain sufficient allocation for the tasks to go in a smooth matter with as less cost and waste as possible and ways to cause delays to tasks which by human resources allocated are:

- **Allocating more resources:** allocating more people than needed to a task will result in less utilized resources which will increase the costs for the task per unit of time and in some extreme scenarios will cause delays due to lack of performance from some workers.
- **Allocating less resources:** allocating less resources than needed to a task will result on low amount of production for the workers which means less being produced per unit of time.
- **Allocating new resources:** some time higher management or the client demands to increase resources to achieve a dead line or a milestone but that is not the case sometimes, as allocating new people especially in time constrained tasks will cause delays as the old crew will take of their valued time to teach the new workers and allocate them, that will cause delays to the intended deadline plus additional costs of the new allocated resources.

escription of the project team roles and their responsibilities due to project:

Role	Responsibility	Period
Project Sponsor	Provides funding for the project (initial funding, additional funds)	Week 1
	Approves changes to scope, as required.	Week 2
	Approves Project Charter and subsequent documentation	Week 3
Steering Team	Provides high-level direction and input	Week 4
	Helps support the resource needs	Week 5
Project Manager	Facilitates the development of the Project Charter and any other documentation in collaboration with the project team and resource managers.	Week 6
	Facilitates the identification of project resource requirements and works with resource managers and the project leader to construct project teams	Week 7
	Facilitates regular core team meetings to review issues, project risks, and monitor project progress.	Week 8
	Creates regular status reports and distributes to project team.	Week 9
Team Member	Performs assigned activities once the schedule is approved	Week 10
	Communicates project risks and escalates issues to team lead	Week 11
	Attends and actively participates in team meetings.	Week 12
Quality Manager	Meeting with clients to understand their business needs	Week 13
	Developing company quality procedures, standards, and specifications	Week 14
	Matching processes with standards	Week 15
	Coordinating activity required to meet quality standards	Week 16

	Conducting internal audits and inspections	Week 17
Site Engineer	checking technical designs and drawings to ensure that they are followed correctly.	Week 18
	Supervising Contracted Staff.	Week 19
QA/QC Test engineers	Gather product requirements (functionalities, speed, safety standards)	Week 20
	Inspect raw materials and machinery to identify defects and malfunctions	Week 21
	Run quality controls on components and final products	Week 22
	Analyze test results, detect issues and track root causes	Week 23
Cost Manager	Provide cost information to support decision and alternative selection	Week 24
	Evaluate contractor invoices prior to submission into Finance for pre-approval	Week 25
	Provide forecasts and cash flow analysis	Week 26
	Maintain and manage the cost report and provide regular updates on financial position	Week 27
Procurement manager	Procurement process optimization.	Week 28
	RFP management.	Week 29
	ROI analysis.	Week 30
	Supplier evaluation and selection.	Week 31

Table 13-1 Distribution of Human Resources on The Functions.

13.2 Analyze The Influence Of Conducting Crashing and Fast-Tracking Process:

❖ Crashing

The PMBOK Guide, 6th edition, defines crashing as a technique used to shorten the schedule duration for the lowest incremental cost by adding resources.

In crashing, we review the critical path activities and find ones that can be completed early with extra resources, providing the highest compression with the least cost. In other words, we add labor, resources, anything you can to speed up the process, crashing the activities. Financial Cost, A few examples of crashing techniques are:

- Overtime
- More resources
- Monetary rewards

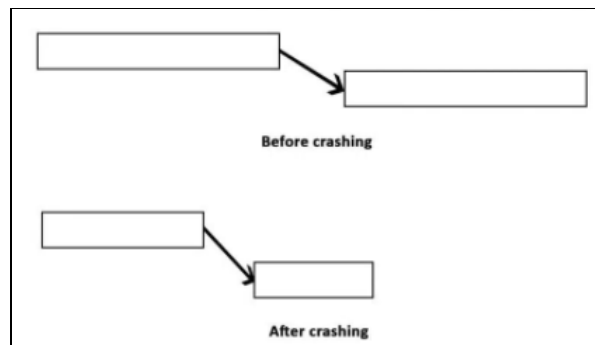


Exhibit 13-1 Crashing

❖ Fast-Tracking

The PMBOK Guide, 6th edition, defines fast-tracking as a schedule compression technique in which activities or phases normally performed in a sequence are done in parallel for at least a portion of their duration.

In fast-tracking, we review the critical path and list all vital activities. Then you analyze and determine which ones can be performed partially or fully parallel with other activities. To compress the schedule, project managers start with fast-tracking because it does not cost more. However, it increases risk as activities are overlapping.

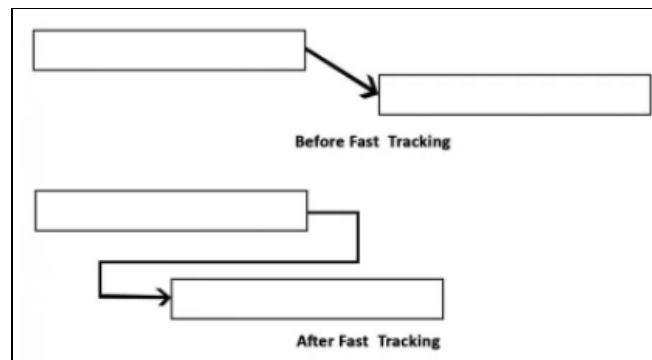


Exhibit 13-2 **Fast Tracking**

To analyze the influence of conducting **Crashing by adding resourcing** (Over Time) + (Adding Manpower) process to faster the functions we have result as below table:

	Project Sponsor			Steering Team	Project Manager			Team Member		Quality Manager				Site Engineer	QA/QC Test engineers			Cost Manager	Procurement manager																							
	Provides funding for the project (initial funding, additional funds)			Approves changes to scope, as required	Approves Project Charter and subsequent documentation	Provides high-level direction and input			Helps support the resource needs		Facilitates regular core team meetings to review issues, project risks, and monitor project progress		Creates regular status reports and distributes to project team	Performs assigned activities once the schedule is approved	Communicates project risks and resolves issues to team lead		Attends and actively participates in team meetings	Meeting with clients to understand their business needs	Developing company quality procedures, standards, and specifications		Matching processes with standards		Coordinating activity required to meet quality standards		Conducting internal audits and inspections		Checking technical designs and drawings to ensure that they are followed correctly.	Supervising Contracted Staff.	Analyze test results, detect issues and track root causes		Run quality controls on components and final products	Inspect raw materials and machinery to identify defects and malfunctions	Carlier product requirements (functionalities, speed, safety standards)	Provide cost information to support decision and alternative selection	Evaluate contractor invoices prior to submission into Finance for pre-approval	Provide forecasts and cash flow analysis	Maintain and manage the cost report and provide regular updates on financial position	Procurement process optimization.		RFP management.	ROI analysis.	Supplier evaluation and selection.
Function	1			2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	19	2	2	2	2	2	2	2	2	2	2	2	3	3	3
Week	1			2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	2	2	2	2	2	2	2	2	2	2	3	3	3	
Normal	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Crashing	3			2	4	3	5	2	4	4	4																															

Table 13-2 Crashing of functions

Crashing typically increases project costs as additional resources are used while fast tracking increases the risk of rework as activities are started before their predecessors are completed. Using crashing because we need to meet fixing handover homes to end-user. The reason to have crashing cause of pandemic of COVID-19 which is delay the work.

14. Negotiations

Negotiation is a field of knowledge that focuses on gaining the favor of people from whom we want things, Negotiation is a process for resolving conflict & Negotiation takes place when two or more people, with differing views, come together to attempt to reach agreement on an issue.

“Negotiation is about getting the best possible deal in the best possible way.”

Negotiations can take place at any time in the project lifecycle and may be formal or non-formal.

Formal negotiation implies an agreement through contracts and formal documents, while **informal negotiations** include debates to resolve a conflict between team members, for instance.

In project management, the **negotiation process** is divided into phases and include:

- **Planning:** the preparation of all relevant information necessary for the discussion.
- **Debate:** here the key issues are examined and discussed.

- **Proposal:** the creation of the proposal as a way of solving the problem presented.
- **Revision:** this can include negotiating compromises before an agreement is formalized and before the information is shared throughout the organization.

14.1 General Rules for The Negotiation Process:

As project we have to following clear rules of negotiation based on clear principle of negotiation which is defined by four points:

Principle of Negotiation	
1. Separate people from problem	• Remember that people are human. • Emotions can become entangled with the problem and can set 'positions. • Try to understand their perceptions. • Don't assume you know how they feel. • Be able to see it from their side. • Openly discuss different perceptions. • Don't blame people for problems.
2. Focus on interests, not positions	• Interests can inform positions. • Look at interest from their perspective. • Sharing interests can show both sides not as opposed as initially thought. • Seek to understand their needs and wants. • Money is NOT the most important driver, sometimes there are human needs. • Openly discuss and understand interests.
3. Invent options for mutual gain	• When stuck, sit back and be creative in generate new ideas. • Encourage looking at the bigger picture. • Don't think your offer or view is the only solution. • Step back from positions and refocus on interests.

	• Try and solve each other's' problems. • Be prepared to lead and encourage brainstorming
4. Insist on using objective criteria	• Bring standards of fairness or scientific merit to problems. • Use recent comparisons or guides. • Be specific with facts. • Refer to original aims and ideal outcomes. • Review limitations, scope or authority and autonomy. • Develop specific criteria where needed.

Table 14-1 Principle of Negotiation

The rules are adopted into a belief system and the more they are practiced, the more readily they become internalized and result in natural action. Now we have rule of negotiation due to project as below:

Rule	Project Management Example
Be patient	Dealing with a team member who is underperforming—and perhaps defensive—may be uncomfortable for a project manager, so the tendency is to get the encounter over with as quickly as possible
. Be positive	A principle of persuasive influence is to deal with people you like. A positive attitude with project sponsors helps build confidence and credibility in their minds.
Gather information	Clients or customers have challenges that may be addressed by the outcome of your project. Ask probing questions about what they are doing...and listen to the answers.
Know the status	Project managers are closest to the action on most projects and have significant status attributable to the information they

	possess. Other stakeholders have status via the authority they have to allocate resources or dispense funds.
Limit your authority	Try to negotiate with the decision-maker so you deal with them directly and get agreement quickly. When you are the decision-maker, have someone else negotiate on your behalf so you cannot be pinned down by hard core negotiating tactics.
Know your bottom line	Negotiations with the higher priced vendor proceed in order to get a lower price or arrange terms that fall within the budget limit. Use the limit to stand firm, negotiate with due diligence, and fall back on the other vendor if not successful.
Be prepared	Have a risk management plan that provides advance notice of technology that may not work or tasks that take longer than planned. Clear trigger points invoke contingency plans calling for negotiations on the pros and cons of various options, leading to quick resolution.

Table 14-2 Rule of Negotiation

14.2 Negotiation Plans:

Negotiation planning and preparation for a major contract negotiation means Prepare thoroughly. One of the most basic mistakes you can make when negotiating is to come to the negotiations without adequate preparations, set clear goals, understand how the other party operates, choose when and to negotiate, know what you want to negotiate and get everything in writing.

- **Negotiation Plan 1 (Negotiate the right deal with suppliers)**

Negotiating the right deal with suppliers doesn't necessarily mean getting what we want at the cheapest possible price. Both sides should conclude a negotiation feeling comfortable and happy with the agreement. Negotiations can be unsuccessful if either side feels forced into a corner.

This guide sets out how to negotiate a deal, including setting your objectives, understanding your supplier's position and using the right tactics.

- Setting Objectives When Negotiating with Suppliers:

There's a range of key considerations you need to bear in mind when setting objectives for purchase negotiations. These might include:

- price
- value for money
- delivery
- payment terms
- after-sales service and maintenance arrangements
- quality

- Understand Supplier:

By conducting some basic research into a potential supplier, we can work out how valuable business is to them. bargaining power increases in direct proportion to your potential supplier's need for business.

If the supplier runs a near, it is likely to have the upper hand because:

- It has enough business already
- only have a few other sources to select from

➤ Developing A Negotiating Strategy:

It's essential to plan your strategy in writing before beginning negotiations. This will help you set clear goals and work out where you will draw the line and walk away from the deal.

Start by defining what your priorities are, such as low price, high specification goods or a specific delivery schedule.

➤ Negotiating Team:

Once we've set out our strategy, it is also essential to get your negotiating team right. Make sure it has skills in all the necessary areas.

➤ Conduct Negotiations:

Before we start negotiating, state the aspects of the deal you're happy with and the points we want to discuss. Ask the supplier to do the same.

Make sure both sides are satisfied with what is being negotiated. Get the supplier to restate any discounts offered and payment terms. Keep these key bits of information to hand.

➤ Negotiating on Price:

Some price negotiating techniques will be familiar if you've ever bartered at a market.

Never accept the first offer - make a low **counter-offer** in return. The other party is likely to come back with a revised figure. Always ask what else they can include at the given price.

If the price is suspiciously low, ask yourself why. Are the goods of sufficiently high quality? Do they really offer value for money? What will after-sales service be like?

We can also try to make the asking price look high by exposing any ongoing costs. Ask about repair costs, consumables and other expenses. If the current state of the supplier's market means prices are falling, point this out.

- **Negotiation Plan 2 (Negotiate to hiring Construction Contractor)**

Negotiating during the contract phase can be a bit nerve-wracking. In most cases, the owner already has what they say they're willing to offer clearly outlined, and they're attempting not to show a soft spot in the armor. But, just the mere act of pushing back can be enough to open some discussion. utilizing the following tips will help us negotiate our future construction contracts.

- Know the state laws:

Many times, just having more knowledge of the state laws than the owner can give us a significant boost in negotiation juice. If an owner isn't aware of the laws governing contract language in state.

➤ Be honest about the risk

Risks abound on typical construction projects. Owners like to manage that risk by shifting as much of it as possible. And neither the owner wants to pay the sub for that risk their taking.

➤ Clarify the change order process

Change orders can be a point of contention, especially for inexperienced or owners who don't understand how they work. If the contract doesn't explicitly state the change order process, it's best to nail it down in a contract revision.

➤ Decide On What Techniques to Use:

Review what techniques would be useful in this negotiation. This involves planning a great location for the discussion: a noisy open office isn't the best place to be asking for a pay increase.

➤ Make the process feel collaborative:

A successful negotiation is not about winning and losing. It's about both parties walking away from the table feeling good about the deal. The best way to ensure the owner feels good is by making the process feel as collaborative as possible.

Conclusions

Ultimately, negotiation is an excellent project management tool and is critical to getting the best out of any situation.

Negotiation goes beyond reducing or increasing the price of an offer and is a necessary tool in the daily activities of the project manager.

Like all soft skills, knowing how to hold engaging conversations that translate into good results for both parties is something that can always be improved over time.

With the right knowledge, structures and techniques, any project manager will be able to approach negotiations knowing how best to target the project and the organization in general.

15. Project Design

Project design is an early phase of the project where a project's key features, structure, criteria for success, and major deliverables are all planned out. The aim is to develop one or more designs that can be used to achieve the desired project goals. Its help project team understand how to move through a project in the correct way. They help team to avoid omitting important steps or items and look more professional.

15.1 Identify The Triple Constraint of The Project.

The triple constraint theory in project management says every project operates within the boundaries of **scope, time, and cost**. A change in one factor will invariably affect the other two. For example, if we want to add a bunch of new features to the project's scope, we will have to budget more time and money to get 'er done. Or if CEO slashes your project budget, we will need to scale back the project requirements. In other words, it's all about trade-offs.

Exhibit 15.1 Triple Constraint Triangle



- Triple constraint: **Scope**

Since a project scope is not an estimate but a guaranteed set of deliverables, it's difficult to imagine creating a range for this project constraint. However, you can consider that stakeholders may be invested in scope risk and scope tolerance ranges.

For example, we may list a set of deliverables that could be created if budget and schedule allow, a wish list that your stakeholders can choose from if there's money and time left over after mandatory deliverables are completed.

Adding more features can stretch a project's time and budget constraints. We'll either need to extend the deadline or assign more people to the work, increasing project costs. Monitoring scope changes enables you to discuss trade-offs early and make necessary adjustments before your project gets off course.

- Triple constraint: **Time (schedule)**

One of the most important stakeholder considerations, project time (how long it will take to deliver), is a vital measure of project success. Our task is to estimate project time as accurately as possible, which requires a blend of research and experience.

If newer project manager, will rely more heavily on past projects for precedent, and use their data to give you a sense of appropriate scheduling

for our project. Look over completed projects' closing documents and schedules to gain a sense of how long certain work packages typically take. And be sure to study how change orders affect delivery schedules.

- Triple constraint: **Cost (budget)**

Estimating a project's time and effort also forms the basis for your project budget. Here are a few costs to consider when formulating a project budget:

- Resource costs, based on estimated hours.
- Materials
- Equipment

When it comes to budget constraints, remember, it's best to communicate early and often. No one likes being surprised by a big bill.

Equally important to stakeholders is how much a project will cost. As with time constraints, our budget estimates need to be presented in a range. Some key research will lead you to accurate numbers:

- Estimate costs with thoroughly researched market rates.
- Estimate costs with vendor bids and ranges.
- If providing hourly cost estimates.
- Estimate our budget by considering all costs: labor, material, factory, equipment, administrative, software, contractors.
- Look at costs and budgets for similar past projects.

- Look carefully at change orders that affected past project budgets.

Cost management will be an ongoing project management task. We'll want to stick very closely to your proposed budget, while keeping an open mind about changes that may affect costs.

15.2 The Project Success Factors:

Prior to understanding what are the factors leading to successful project completion, let's understand what a successful project is.

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

At times you might reach your project goals but may fail to meet other criteria associated with successful project completion.

- Most Important Factors for Project Success:

15.2.1 Intelligent People

To make a project a success, you need capable people in your team. A project can derail at any point in time. For this, the project staff and all the stakeholders of the project must share their enthusiasm and commitment with the group. The team should share similar visions for the project and aim for success.

15.2.2 Comprehensive Planning

Having a detailed plan sets the ball rolling in favor of project success from the start. The team and the stakeholders of the project should always

know from the beginning in which direction the project is heading. Comprehensive planning can help the team to meet crucial deadlines and stay well organized. There are many benefits of smart planning. This starting step in the project allows a realistic time frame to be created. It gives accurate time for cost estimations to be produced and also helps in clear documentation of milestones and deliverables, which will make things much easier as the project progresses.

15.2.3 Open Communication

An open communication channel is very important in a project for it to be a success. When the team is working on a specific schedule, it is important that the team remains well-informed in every aspect of the project. Also, learn when to say no. One should not make promises which they cannot deliver. As a project manager, be honest in what can be delivered and when that can be delivered.

15.2.4 Proper Risk Management

It is a known fact that projects do not go exactly as planned. Some projects fail and some fail spectacularly due to risks that arise during a project. Create a risk log with an action plan to tackle those risks that arise during the project.

15.2.5 Strong Project Closure

It is essential for a project to have a strong closure. As a project manager, you should be firm and agree with the client that all the critical success factors have been met. Project delivery, testing, and release confirmation must be agreed upon and signed off. Along with all the above-mentioned points, organizations have also found that having certified project managers on board is an important driver of project success.

Conclusion

Implementing the above-mentioned factors will lead to a successful project and develops a good rapport with customers and stakeholders. These factors also help you to avoid intricacies faced by the project managers during the project development process.

15.3 Identify Work Breakdown Structure:

A Work Breakdown Structure (WBS) is a deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables. A WBS is the cornerstone of effective project planning, execution, controlling, monitoring, and reporting. All the work contained within the WBS is to be identified, estimated, scheduled, and budgeted.

○ Housing & Infrastructure Project Work Breakdown Structure

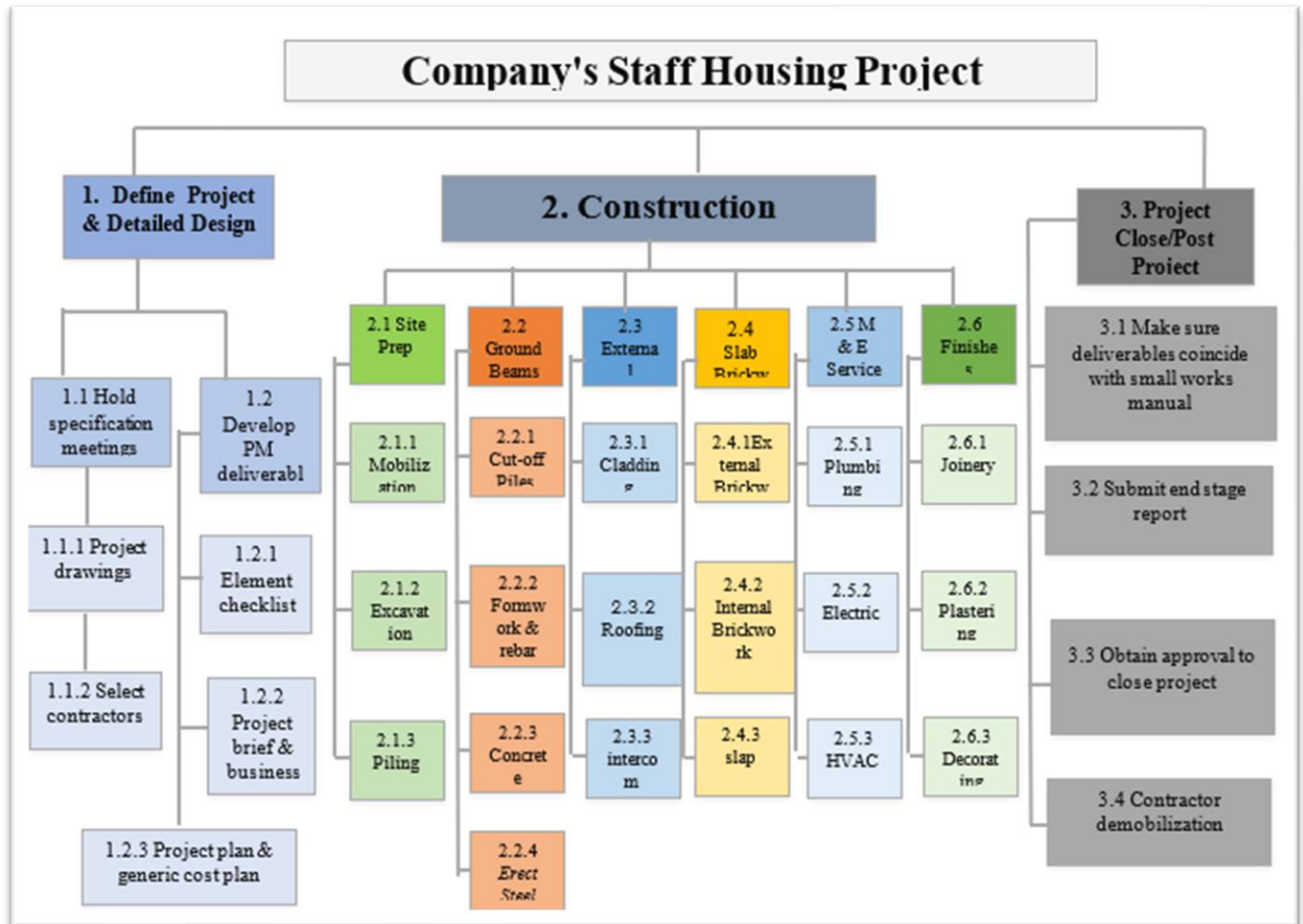


Exhibit 15.2 Work Breakdown Structure

● Guide of Work Breakdown Structure

1. Define Project & Detailed Design

1.1 Hold specification meetings

1.1.1 Project drawings

1.1.2 Select contractors

1.2 Develop PM deliverables

1.2.1 Element checklist

1.2.2 Project brief & business case

1.2.3 Project plan & generic cost plan

2. Construction 2.1 Site Prep 2.1.1 Mobilization 2.1.2 Excavation 2.1.3 Piling 2.2 Ground Beams 2.2.1 Cut-off Piles and Blinding 2.2.2 Formwork & rebar 2.2.3 Concrete 2.2.4 Erect Steel Frame 2.3 External 2.3.1 Cladding 2.3.2 Roofing 2.3.3 intercom 2.4 Slab Brickwork 2.4.1 External Brickwork 2.4.2 Internal Brickwork 2.4.3 slap 2.5 M & E Services 2.5.1 Plumbing 2.5.2 Electric 2.5.3 HVAC 2.6 Finishes 2.6.1 Joinery 2.6.2 Plastering 2.6.3 Decorating	3. Project Close/Post Project 3.1 Make sure deliverables coincide with small works manual 3.2 Submit end stage report 3.3 Obtain approval to close project 3.4 Contractor demobilization
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16. Requirements And Objectives

Project requirements are derived and created from product requirements. It is all required to complete the project scope. Project objectives are things you have to achieve to consider the project successful. Project objectives related to scope, time, quality and cost will address the project requirements.

Project objectives are what you plan to achieve by the end of your project. This might include deliverables and assets, or more intangible objectives like increasing productivity or motivation. Our project objectives should be attainable, time-bound, specific goals you can measure at the end of your project.

16.1 Identify Requirement Traceability Matrix:

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

RTM in Project Management should be created at the very start of a project or a venture because it forms and articulates the basis of the project's scope and incorporates the specific requirements and deliverables that will be produced by undertaking this project or venture,

value if completed can be measured by seeing if the following have values to the project:

- Track all the requirements and whether they are meeting or not meeting the current established process and design.
- Assist in the creation of the RFP, Project Plan Tasks, Tracking and Close-Out Documents.
- Help ensure that all of the project requirements have been met during the established QA/QC procedures.

Below is a table containing the initial requirements, this will be updated regularly to take into account the company and its employee's requirements:

	affordable homeownership for employees	Quality life community	Monitor of construction progress	Contractor performance	Community environment & safety	ability of Services & utilities
Project control test				×		×
Quality monitoring			×			
Progress audit			×			
Planning control check			×		×	
CEO vision		×				
Customer satisfaction	×					

Table 16.1 Requirements Traceability Matrix 1

REQUIREMENTS TRACEABILITY MATRIX								
Project Manager:	Saeed Abomadini			Project Id:	2021-SH-001			
Project Sponsor:	Head Office CEO & VP			Project Title:	Company’s Staff Housing Project			
REQUIREMENT INFORMATION					RELATIONSHIP TRACEABILITY			
Id	Category	Requirement	Priority	Source	Business Objective	Deliverable	Verification	Validation
REQ-001	Mandatory	Ability for employees to have a livable housing that is in a good location near services and the company	High	DT	Make sure the company meets the requirement by 65% at least	Good quality housing with good proximity	Achievement of business objective within 10 years by saving of the housing allowance given to employees	Staff satisfaction
REQ-002	Should have	Good looking finish to the outside of the housing with some healthy facilities	Medium	CCO	To have a healthy and happy employee	Pathways, cycle lanes and other exercise activities	Achievement of business objective.	Staff embracing the facilities
REQ-003	Should have	Modern urban design	Medium	DD	To have a state of the art looking facilities that meets the world’s general standard	Good quality housing that is not going to be difficult for the company to market if the company needed to	Achievement of business objective.	The staff to live on those houses
REQ-004	Should have	Sufficient playground area for children	Medium	PM	To have a state of the art facilities	To have a safe playground area for the children and	QA/QC team	The staff families to regularly use those facilities

					that are also safe	for their families		
REQ-005	Nice to have	A good swimming pool that have section for adult and section for children	Low	DT	To have a good source of engagem ent between the employee and their families to create a sense of family	A swimming pool with accessories	QA/QC team	Staff and their families embracing the facility
REQ-006	Nice to have	A small grocery shop	Low	Proc M	To have a small shop that sells essential products to give an advantag e for the housing	A good shop with sufficient goods that may also be considered as a small source off income	Procureme nt Team/QA	Goods are being sold and replenishe d regularly

Table 16.2 Requirements Traceability Matrix 2

16.2 Specify The Methods Used in Requirement Collection:

This section outlines some of key techniques and methods that can be employed for gathering and capturing requirements on a project. It includes suggestions and ideas for ways to best capture the different types of requirements (functional, system, technical, etc.) during the gathering process. In our project requirements gathering we are using some of technical methos to collect requirements as following:

1. **Interviews** - These are an invaluable tool at the beginning of the process for getting background information on the business problems and understanding a current-world perspective of what the system being proposed needs to do.
2. **Questionnaires** - One of the challenges with interviews is that you will only get the information that the person is consciously aware of. Sometimes there are latent requirements and features that are better obtained through questionnaires.
3. **Brainstorming** - This is a powerful activity, which can be performed either in the context of a workshop or on its own. By considering different parts of the system and considering 'what-if' scenarios, we can break out of the context of the current-state and consider visionary ideas for the future.

One useful method for capturing the requirements is to use a **mind-map**. In this type of diagram, we start with the main concept and draw lines to smaller and smaller items as we break down each idea and concept into smaller parts.

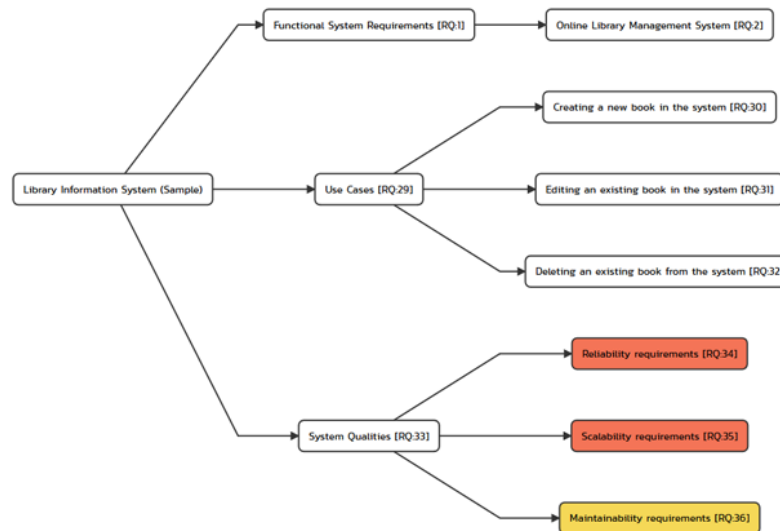


Exhibit 16.1 Mind Map

The nice thing with a mind-map is that we can create it initially on a whiteboard and then once there is consensus, recreate it in a mind mapping tool.

16.3 Develop The Hierarchical Structure of The Objectives Of The Project Connected To The Strategy:

The hierarchy of objectives indicates that managers at different levels in the hierarchy of the organization are concerned with different kinds of objectives according to the authority they are delegated with.

As the figure below indicates, managers at different levels in the hierarchy are concerned with different kinds of objectives.

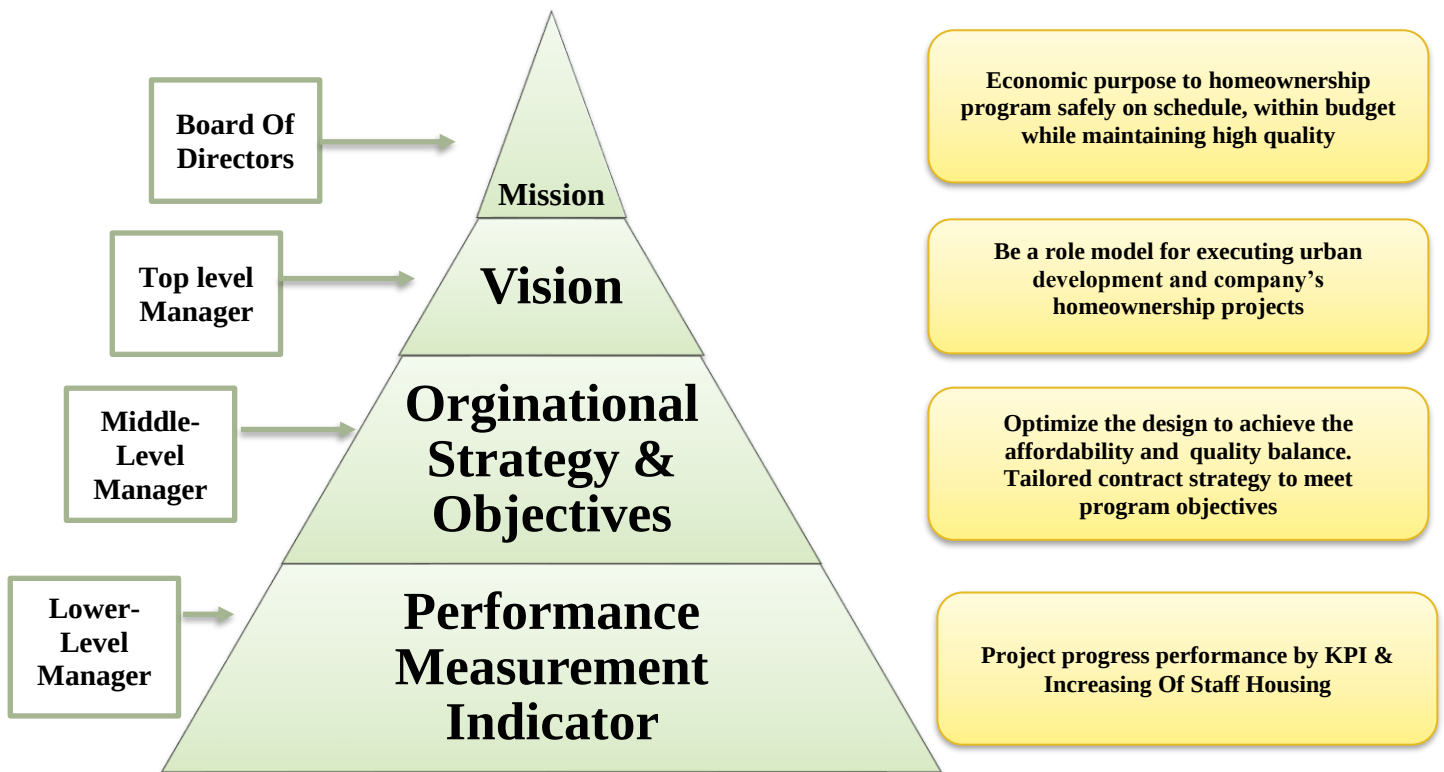


Exhibit 16.2 Hierarchical Structure of The Objectives

The directors and managers at the top level are involved in determining the purpose, the mission and the overall objectives of the company, as well.

Middle-level managers are involved in the setting of key-result-area objectives and division objectives. The concern of lower-level managers is setting objectives of departments and units as well as of their subordinates (i.e., individual objectives).

There is a controversy about whether the top-down or the bottom-up approach in setting objectives should be followed.

Proponents of the top-down approach suggest that the total organization needs direction through corporate objectives provided by the top-level managers.

Advocates of the bottom-up approach, on the other hand, argue that top management needs to have information, from lower levels in the form of objectives.

In addition, subordinates are likely to be highly motivated by and committed to, goals that they initiate.

17.Scope

Project scope is the part of project planning that involves determining and documenting a list of specific project goals, deliverables, tasks, costs and deadlines. The documentation of a project's scope is called a *scope statement* or *terms of reference*. It explains the boundaries of the project, establishes responsibilities for each team member and sets up procedures for how completed work will be verified and approved.

17.1 Identify The Scope Statement:

Defining project scope requires input from the project stakeholders. They work with project managers to establish the key elements of budget, objectives, quality and timeline.

To determine scope, project managers must collect requirements for what the stakeholders need from the project. This includes the following elements:

- the project's objective and deliverables;
- when the project must be completed; and
- how much the stakeholders can pay for it.

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

Project Scope of Statement

This is a Fixed-Price Contract

Contractor commitment estimate is U.S. \$40.000.000

Upon completion, the new property will include the following as described in the detailed specifications and blueprint:

- Building 50 villas including fences.
- Landscaping
- Foundation (with basement)—poured concrete and concrete block
- Driveway- 3000 meters, concrete with brick inlay
- Main home- 10.000 square meter, brick/stucco
- Deck / Patio / Screen Room
- Garage- 10.000 square feet, two story

PROJECT MILESTONES

As described in scope of statements above, completion of the project must be achieved by Augusts 31, 2024. Progress milestones associated with the project are as follows:

1. Architectural drawings complete and approved
2. Building permit approved
3. Lot preparation and clearing complete
4. Foundation excavation complete
5. Footings poured and set

6. Foundation poured, block construction complete, foundation set
7. Home and garage exterior closed to weather
8. Driveway and landscape complete
9. Interior wiring complete
10. Exterior wiring complete
11. HVAC complete
12. Interior plumbing complete
13. Exterior plumbing complete
14. Interior finish complete
15. Exterior finish complete

Scope that excluded with contractor as below:

- Existing asphalt which connected to new district
- Lighting pole which will provide by electrical company
- Main water pipe supply.
- Civil defense building.
- Elementary school which will build in future.

17.2 Concepts of Scope Creep with Example:

Scope creep is when more work is tacked onto a project while it is underway. It can add costs and unnecessary work, while distracting from the objectives and threatening the quality of the intended deliverables. Scope creep refers to how a project's requirements tend to increase over

a project lifecycle, e.g., what once started as a single deliverable becomes five; or a product that began with three essential features, now must have ten; or midway through a project, the customer's needs change, prompting a reassessment of the project requirements. Scope creep is typically caused by key project stakeholders changing requirements or sometimes by internal miscommunication and disagreements.

Scope creep Examples:

- **Lack of change control:** lack of change control would be if you are carrying out a project centered around designing a new product and your client has changes, they wish to make to their requirements, neither you as the project manager or your project team would know how to deal with the change needed or where to start in terms of implementing it into the project plan.
- **Poor communication:** If you are completing program development for a client and you fail to communicate effectively with them throughout the course of the project, what could result is various misinterpretations of what is required and a program that is unsuitable to their requests. Dealing with scope creep in this example could prove very difficult. Always keep communication lines open and consistent with clients and stakeholders.

- **Lack of understanding project objectives:** If we are involved in a marketing campaign project, for example, and you fail to plan carefully the various tasks that need to be completed as part of the project.

17.3 Product Analysis and Management:

Product Analysis is a tool that is used to Define Scope. It generally involves asking questions about a product and forming answers to describe the use, characteristics, and other relevant aspects of what is going to be delivered at the end. With product analysis, the **objectives and description of the product stated by the customer or sponsor are analyzed, to turn them into tangible deliverables.**

There are many different approaches to production management in design and construction each with its own processes and terminology. But underpinning all of them are three principles that define production management:

- **Collaboration** – production management is done with the companies, their supervisors and the people who will execute the work in the design office and on site.
- **Transparency** – the processes and outputs are transparent and made available to everybody involved in the project through the use of visible planning methods and performance metrics.

- **Improvement** – production management engages the workforce in resolving problems and improving performance

In the following sections we describe the five basic steps of production management in design and construction and make some practical suggestions as to how we can get started.

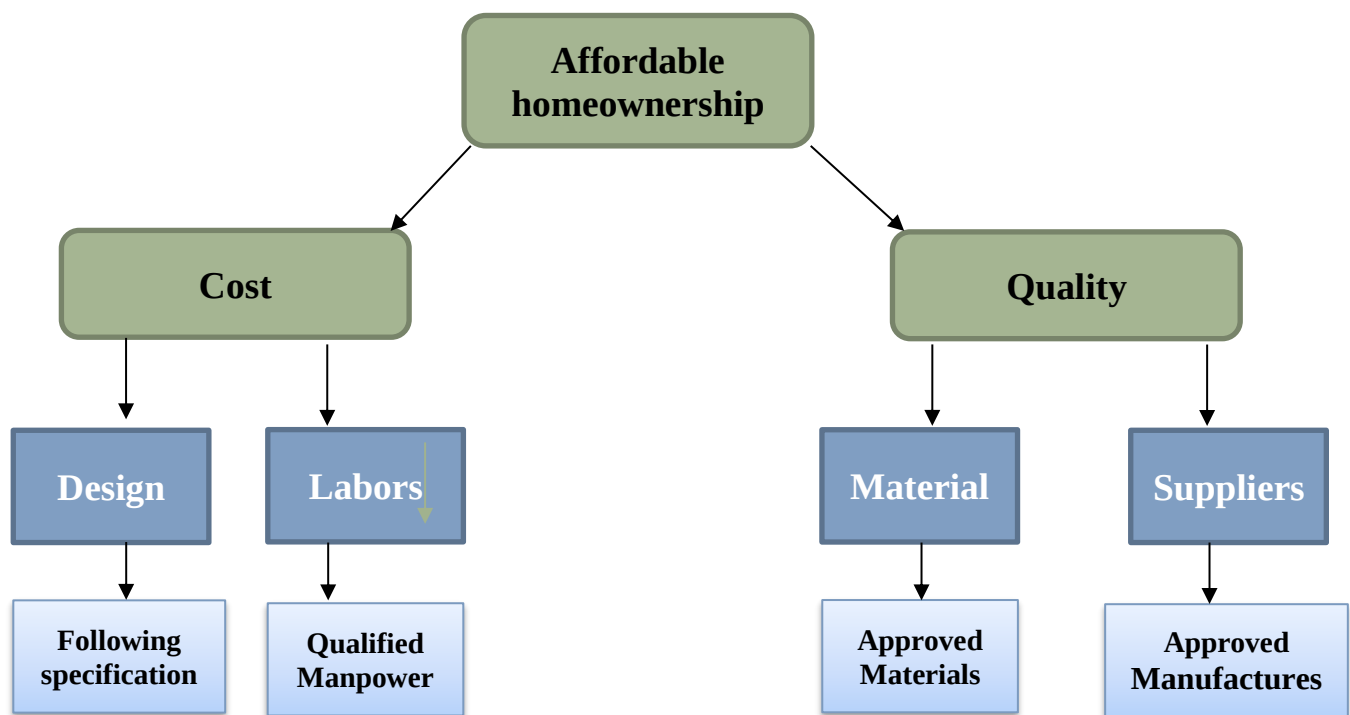


Exhibit 17.1 Product Analysis

- **Design Question:** How do we build the best homes?

We can build best homes by following internal specification- drawing which need qualified labors to avoid any re-work and modifying drawing which will save cost as applied.

- Feasibility Question: Can we build this particular homes?

Now suppose we are in planning to make design as per approved cost by CEO which need to be finished project at boundary of cost. Thas will let us to use approved material which supplies by approved manufactures for each material will be installed.

17.4 Transformation of The Work Packages In Work Breakdown Structure to Activities.

An activity is referred to as the scheduled phase in a project plan with an individual 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.

ID	Task Mode	اسم المهمة	Duration
1		SCHEDULE TIME OF PORJECT	270 days
2		DESIGN STAGE	65 days
3		Soil Report	6 days
4		Structural Drawings	15 days
5		Foundation Drawing	9 days
6		Column Drawing	4 days
7		Slab & Beam Drawing	2 days
8		Architectural Drawings	47 days
9		Block, Doors & Windows Drawing	6 days
10		Furniture Drawing	8 days
11		Stair Drawings	2 days
12		Flooring Drawing	6 days
13		Ceiling Drawing	6 days
14		Elevation Drawing	27 days
15		Electrical Drawings	32 days
16		Power Drawing	3 days
17		Lighting Drawing	5 days
18		Mechanical Drawings	4 days
19		Sanitation Drawing	4 days
20		Water Supply Drawing	4 days
21		A/C Drawing	3 days
22		Firefighting System Drawing	4 days
23		Qouantity Survey	44 days
24		Structural	7 days
25		Arch	18 days
26		Electrical	8 days
27		Mechanical	10 days
28		OPERATION STAGE	255 days
29		GENERAL SITE WORK - GSW	66 days
30		Excavation Works	23 days
31		Fence Works	17 days
32		Electrecal Work for Fence	6 days
33		Plaster Works for Fence	15 days
34		Paint Works for Fence	5 days
35		Backfilling Works	6 days
36		Green cover including the plants	8 days
37		Pave from Interlock Concrete tiles	7 days
38		TANKS WORKS	40 days
39		SEWAGE WORKS	23 days
40		CONCRETE WORK OF BASEMENT	41 days
41		Termite Control Under Lean Concrete	3 days
42		Polyethelen Sheet layer	2 days
43		Lean Concrete	2 days
44		Foundation	7 days
45		Concrete Walls	9 days
46		Columns of Basement	5 days
47		Concrete Solid Slab of Basement	13 days
48		FINISHING WORKS OF BASEMENT	79 days
49		Block Works	14 days
50		Mechanical Works	18 days
51		Electrical Works	18 days
52		Plaster Works	22 days
53		Paint Works	19 days
54		Doors	8 days
55		Moisture-Proofing Works	20 days
56		Tiles Works	15 days
57		Granite & Marble Works	10 days
58		Gypsum Ceiling Works	18 days
59		BUILDING WORKS	188 days
60		CONCRETE WORK OF GROUND FLOOR	42 days
61		Columns of Works	8 days
62		Concrete Solid Slab	14 days
63		Mechanical Works	20 days
64		Electrical Works	20 days
65		FINISHING WORKS OF GROUND FLOOR	57 days
66		Block Works	6 days
67		Mechanical Works	8 days
68		Electrical Works	8 days
69		Plaster Works	12 days
70		Moisture-Proofing Works	5 days
71		Gypsum Ceiling Works	14 days
72		Paint Works	8 days
73		Doors & Windows	9 days
74		Tiles Works	13 days
75		Granite & Marble Works	5 days
76		CONCRETE WORK OF FIRST FLOOR	62 days
77		Columns of Works	8 days
78		Concrete Solid Slab	14 days
79		Mechanical Works	20 days
80		Electrical Works	20 days
81		FINISHING WORKS OF FIRST FLOOR	57 days
82		Block Works	6 days
83		Mechanical Works	8 days
84		Electrical Works	8 days
85		Plaster Works	12 days

Exhibit 17.2 Transformation WBS to Activities

18 Time

Time management is the process of organizing and implementing a strategy related to the time required for work activities on a project. Effective time management is essential to successfully and efficiently meeting budget and program targets, as well as achieving profitability. Projects can risk incurring unnecessary costs and delays as a result of ineffective time management, either by failing to allow for the full complexity of a project, or by failing to effectively manage scheduled work or unexpected events.

18.1 Develop The Functions List or The Activities Included In Each Work Package In WBS

A work breakdown structure is an essential planning tool. Having construction to assist make the whole process easier and quicker. It also can connect the work to larger project planning, execution and more.

- Organize Deliverables and Tasks
- Set Schedule Baselines
- Visualize Project Schedule
- List Subtasks and Dependencies
- Estimate Each Task Duration
- Identify Project Phases

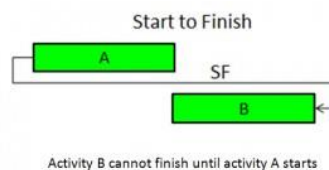
ID	Task Mode	اسم المهمة	Duration	Start	Finish	Predecessors
1		SCHEDULE TIME OF PORJECT	270 days	Sat 16-10-21	Thu 25-08-22	
2		DESIGN STAGE	65 days	Sat 16-10-21	Wed 29-12-21	
3		Soil Report	6 days	Sat 16-10-21	Thu 21-10-21	
4		Structural Drawings	15 days	Sat 23-10-21	Mon 08-11-21	
5		Foundation Drawing	9 days	Sat 23-10-21	Mon 01-11-21	3,9
6		Column Drawing	4 days	Tue 02-11-21	Sat 06-11-21	5
7		Slab & Beam Drawing	2 days	Sun 07-11-21	Mon 08-11-21	6
8		Architectural Drawings	47 days	Sat 16-10-21	Wed 08-12-21	
9		Block, Doors & Windows Drawing	6 days	Sat 16-10-21	Thu 21-10-21	
10		Furniture Drawing	8 days	Sat 23-10-21	Sun 31-10-21	9
11		Stair Drawings	2 days	Sat 23-10-21	Sun 24-10-21	9
12		Flooring Drawing	6 days	Mon 25-10-21	Sun 31-10-21	11
13		Ceiling Drawing	6 days	Mon 01-11-21	Sun 07-11-21	12
14		Elevation Drawing	27 days	Mon 08-11-21	Wed 08-12-21	13
15		Electrical Drawings	32 days	Mon 08-11-21	Tue 14-12-21	
16		Power Drawing	3 days	Mon 08-11-21	Wed 10-11-21	13
17		Lighting Drawing	5 days	Thu 09-12-21	Tue 14-12-21	14
18		Mechanical Drawings	4 days	Mon 08-11-21	Thu 11-11-21	
19		Sanitation Drawing	4 days	Mon 08-11-21	Thu 11-11-21	13
20		Water Supply Drawing	4 days	Mon 08-11-21	Thu 11-11-21	13
21		A/C Drawing	3 days	Mon 08-11-21	Wed 10-11-21	13
22		Firefighting System Drawing	4 days	Mon 08-11-21	Thu 11-11-21	13
23		Qouantity Survey	44 days	Tue 09-11-21	Wed 29-12-21	
24		Structural	7 days	Tue 09-11-21	Tue 16-11-21	7
25		Arch	18 days	Thu 09-12-21	Wed 29-12-21	14
26		Electrical	8 days	Wed 15-12-21	Thu 23-12-21	17
27		Mechanical	10 days	Sat 13-11-21	Tue 23-11-21	22
28		OPERATION STAGE	255 days	Tue 02-11-21	Thu 25-08-22	
29		GENERAL SITE WORK - GSW	66 days	Tue 02-11-21	Mon 17-01-22	
30		Excavation Works	23 days	Tue 02-11-21	Sun 28-11-21	5
31		Fence Works	17 days	Mon 29-11-21	Sat 18-12-21	30
32		Electrecal Work for Fence	6 days	Sun 19-12-21	Sat 25-12-21	31
33		Plaster Works for Fence	15 days	Sun 26-12-21	Tue 11-01-22	32
34		Paint Works for Fence	5 days	Wed 12-01-22	Mon 17-01-22	33
35		Backfilling Works	6 days	Sun 19-12-21	Sat 25-12-21	31
36		Green cover including the plants	8 days	Sun 26-12-21	Mon 03-01-22	35
37		Pave from Interlock Concrete tiles	7 days	Sun 26-12-21	Sun 02-01-22	35
38		TANKS WORKS	40 days	Mon 29-11-21	Thu 13-01-22	30
39		SEWAGE WORKS	23 days	Mon 29-11-21	Sat 25-12-21	30
40		CONCRETE WORK OF BASEMENT	41 days	Mon 29-11-21	Sat 15-01-22	
41		Termite Control Under Lean Concrete	3 days	Mon 29-11-21	Wed 01-12-21	30
42		Polyethelen Sheet layer	2 days	Thu 02-12-21	Sat 04-12-21	41
43		Lean Concrete	2 days	Sun 05-12-21	Mon 06-12-21	42
44		Foundation	7 days	Tue 07-12-21	Tue 14-12-21	43
46		Columns of Basement	5 days	Sun 26-12-21	Thu 30-12-21	45
47		Concrete Solid Slab of Basement	13 days	Sat 01-01-22	Sat 15-01-22	46
48		FINISHING WORKS OF BASEMENT	79 days	Tue 01-02-22	Tue 03-05-22	
49		Block Works	14 days	Tue 01-02-22	Wed 16-02-22	47FS+14 days
50		Mechanical Works	18 days	Thu 17-02-22	Wed 09-03-22	49
51		Electrical Works	18 days	Thu 17-02-22	Wed 09-03-22	49
52		Plaster Works	22 days	Thu 10-03-22	Mon 04-04-22	50,51
53		Paint Works	19 days	Tue 05-04-22	Tue 26-04-22	52
54		Doors	8 days	Tue 05-04-22	Wed 13-04-22	52
55		Moisture-Proofing Works	20 days	Tue 05-04-22	Wed 27-04-22	52
56		Tiles Works	15 days	Tue 05-04-22	Thu 21-04-22	52
57		Granite & Marble Works	10 days	Sat 23-04-22	Tue 03-05-22	56
58		Gypsum Ceiling Works	18 days	Tue 05-04-22	Mon 25-04-22	52
59		BUILDING WORKS	188 days	Wed 19-01-22	Thu 25-08-22	
60		CONCRETE WORK OF GROUND FLOOR	42 days	Wed 19-01-22	Tue 08-03-22	
61		Columns of Works	8 days	Wed 19-01-22	Thu 27-01-22	47FS+3 days
62		Concrete Solid Slab	14 days	Sat 29-01-22	Sun 13-02-22	61
63		Mechanical Works	20 days	Mon 14-02-22	Tue 08-03-22	62
64		Electrical Works	20 days	Mon 14-02-22	Tue 08-03-22	62
65		FINISHING WORKS OF GROUND FLOOR	57 days	Wed 02-03-22	Sat 07-05-22	
66		Block Works	6 days	Wed 02-03-22	Tue 08-03-22	62FS+14 days
67		Mechanical Works	8 days	Wed 09-03-22	Thu 17-03-22	66
68		Electrical Works	8 days	Wed 09-03-22	Thu 17-03-22	66
69		Plaster Works	12 days	Sat 19-03-22	Thu 31-03-22	67,68
70		Moisture-Proofing Works	5 days	Sat 02-04-22	Wed 06-04-22	69
71		Gypsum Ceiling Works	14 days	Sat 02-04-22	Sun 17-04-22	69
72		Paint Works	8 days	Mon 18-04-22	Tue 26-04-22	69,71
73		Doors & Windows	9 days	Wed 27-04-22	Sat 07-05-22	72
74		Tiles Works	13 days	Thu 07-04-22	Thu 21-04-22	70
75		Granite & Marble Works	5 days	Thu 07-04-22	Tue 12-04-22	70
76		CONCRETE WORK OF FIRST FLOOR	62 days	Thu 17-02-22	Sat 30-04-22	
77		Columns of Works	8 days	Thu 17-02-22	Sat 26-02-22	62FS+3 days
78		Concrete Solid Slab	14 days	Sun 27-02-22	Mon 14-03-22	77
79		Mechanical Works	20 days	Tue 15-03-22	Wed 06-04-22	78
80		Electrical Works	20 days	Thu 07-04-22	Sat 30-04-22	79
81		FINISHING WORKS OF FIRST FLOOR	57 days	Thu 31-03-22	Sun 05-06-22	
82		Block Works	6 days	Thu 31-03-22	Wed 06-04-22	78FS+14 days
83		Mechanical Works	8 days	Thu 07-04-22	Sat 16-04-22	82
84		Electrical Works	8 days	Thu 07-04-22	Sat 16-04-22	82
85		Plaster Works	12 days	Sun 17-04-22	Sat 30-04-22	83,84
86		Moisture-Proofing Works	5 days	Sun 01-05-22	Thu 05-05-22	85
87		Gypsum Ceiling Works	14 days	Sun 01-05-22	Mon 16-05-22	85
88		Paint Works	8 days	Tue 17-05-22	Wed 25-05-22	87,85
89		Doors & Windows	9 days	Thu 26-05-22	Sun 05-06-22	88
90		Tiles Works	13 days	Sat 07-05-22	Sat 21-05-22	86
91		Granite & Marble Works	5 days	Sat 07-05-22	Wed 11-05-22	86

Exhibit 18.1 Functions List of Activities

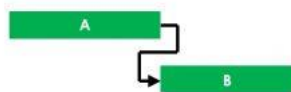
18.2 Relationships Between The Activities:

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. For those not familiar with the Start to Finish or SF relationship type, here's the definition, plucked directly from our very Professional training manual:

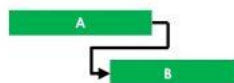


In finish to start relationship, start of successor activity is controlled by finish of predecessor activity. For ex. we can build foundations of a building after we have done excavations. In Finish to Start, relationship arrow originates from finish of the predecessor and finishes at start of the successor.



Finish to Start (FS)

In FS relationship, successor activity can start before the finish of predecessor activity if lead is applied to successor. For example, we can start building foundations when 75% of excavations are completed. we don't have to wait for complete excavation to start foundations. This type of relationship is mostly used in the schedule. If we are confused about exact relationship between activities then go for FS relationship.



Finish to Start (FS) with Lead

This is our applied in project activities during implementation

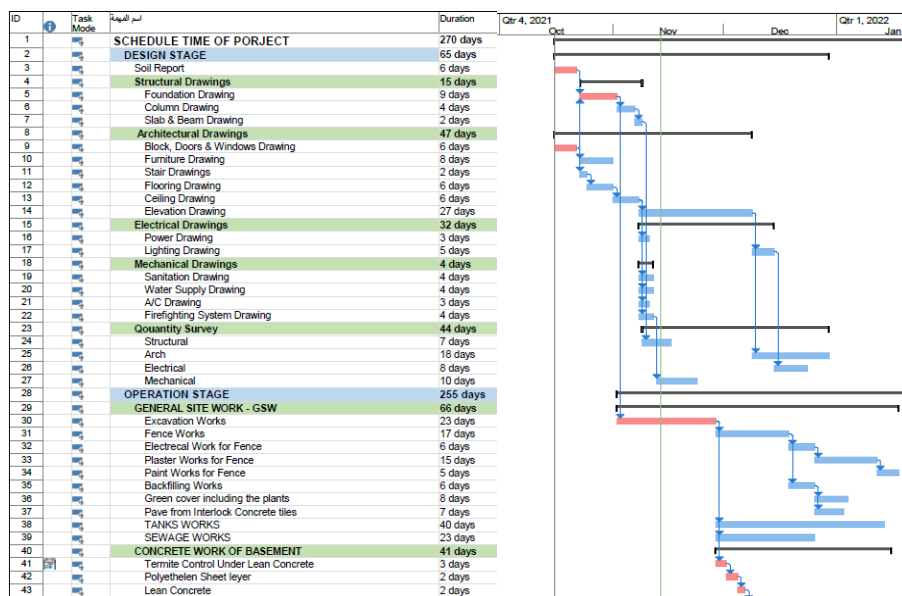


Exhibit 18.2 Relation Between Activities

18.3 Develop The Logical Diagram of The Project Activities, And Identify The Critical Path:

A project network diagram is an important tool because it helps teams visualize the activities that need to be completed over the duration of a project. It also gives crucial context like task duration, sequence, and dependency. A project network is a graph that shows the activities, duration, and interdependencies of tasks within our project. A project schedule network diagram visualizes the sequential and logical relationship between tasks in a project setting.

ID		Name Task	Duration	Start	Finish	Predecessors	Successors
3	A	Soil Report	6 days	10/16/2021	10/21/2021		5
5	B	Foundation Drawing	9 days	10/23/2021	11/1/2021	3,9	6,30
6	C	Column Drawing	4 days	11/2/2021	11/6/2021	5	7
9	D	Block, Doors & Windows Drawing	6 days	10/16/2021	10/21/2021		10,5,11
30	E	Excavation Works	23 days	11/2/2021	11/28/2021	5	31,38,39,41
41	F	Termite Control Under Lean Concrete	3 days	11/29/2021	12/1/2021	30	42
42	G	Polyethylene Sheet layer	2 days	12/2/2021	12/4/2021	41	43
43	H	Lean Concrete	2 days	12/5/2021	12/6/2021	42	44
44	I	Foundation	7 days	12/7/2021	12/14/2021	43	45
45	J	Concrete Walls	9 days	12/15/2021	12/25/2021	44	46

46	K	Columns of Basement	5 days	12/26/2021	12/30/2021	45	47
47	L	Concrete Solid Slab of Basement	13 days	1/1/2022	1/15/2022	46	49FS+14 days,61F S+3 days
61	M	Columns of Works	8 days	1/19/2022	1/27/2022	47FS+3 days	62
62	N	Concrete Solid Slab	14 days	1/29/2022	2/13/2022	61	63,64,66 FS+14 days,77F S+3 days
77	O	Columns of Works	8 days	2/17/2022	2/26/2022	62FS+3 days	78
78	P	Concrete Solid Slab	14 days	2/27/2022	3/14/2022	77	79,82FS+14 days,93F S+3 days
93	Q	Columns of Works	8 days	3/19/2022	3/27/2022	78FS+3 days	94
94	R	Concrete Solid Slab	14 days	3/28/2022	4/12/2022	93	95,98FS+14 days,109 FS+3 days
109	S	Columns of Works	8 days	4/17/2022	4/25/2022	94FS+3 days	110
110	T	Concrete Solid Slab	14 days	4/26/2022	5/11/2022	109	111,114F S+14 days
114	U	Block Works	6 days	5/29/2022	6/4/2022	110FS+14 days	115,116, 125
125	V	Electrical Works	7 days	6/5/2022	6/12/2022	114	126
126	W	Plaster Works for Elevation, Wall of Roof, Ceiling & Shaft	14 days	6/13/2022	6/28/2022	125	127SS+4 days,128
128	X	Painting Works	25 days	6/29/2022	7/27/2022	126	129
129	Y	Lighting Works	25 days	7/28/2022	8/25/2022	128	

Table 18.1 Activities List- Schedule Network Diagram

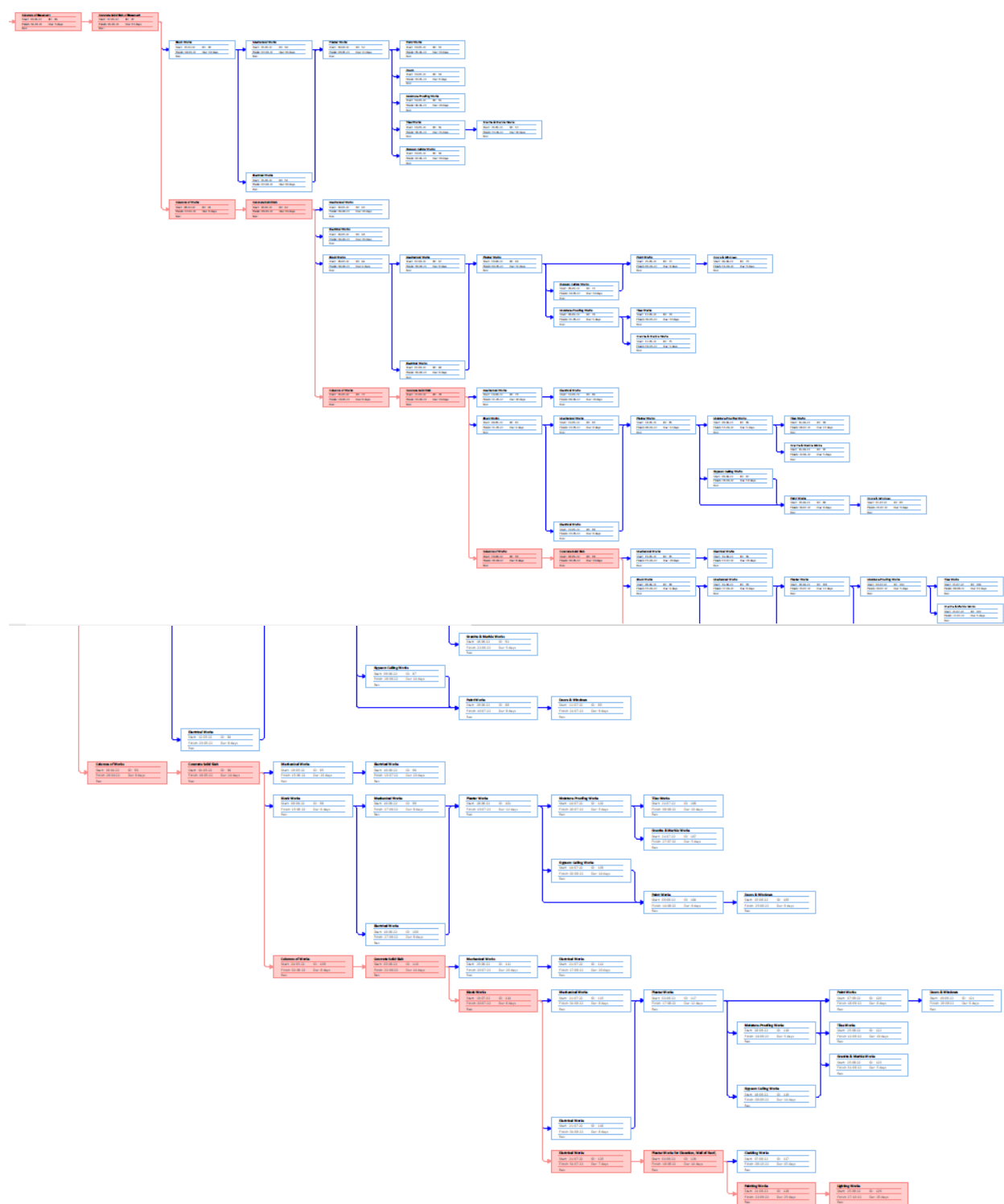
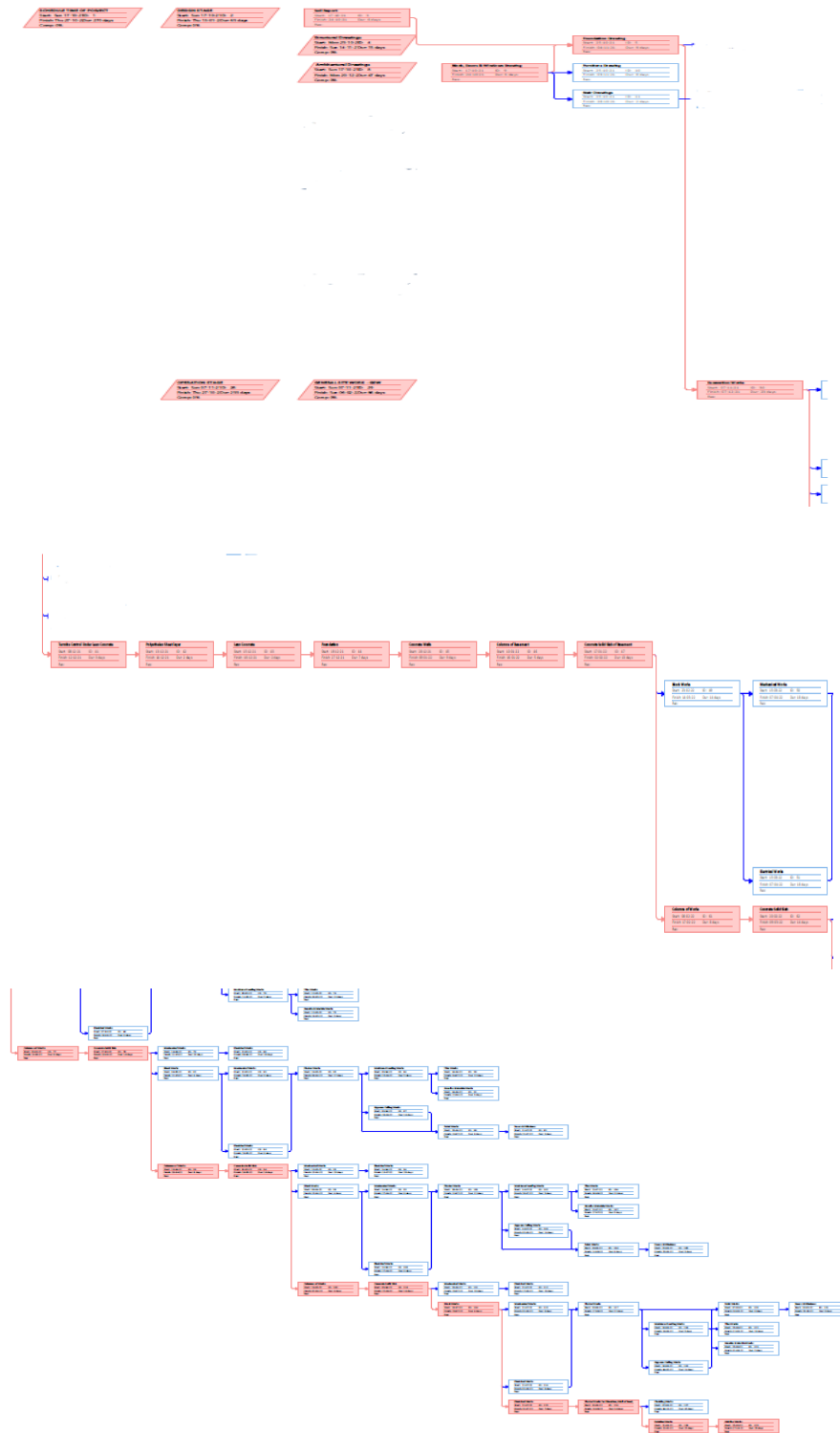


Exhibit 18.3 Network Diagram

Critical Path



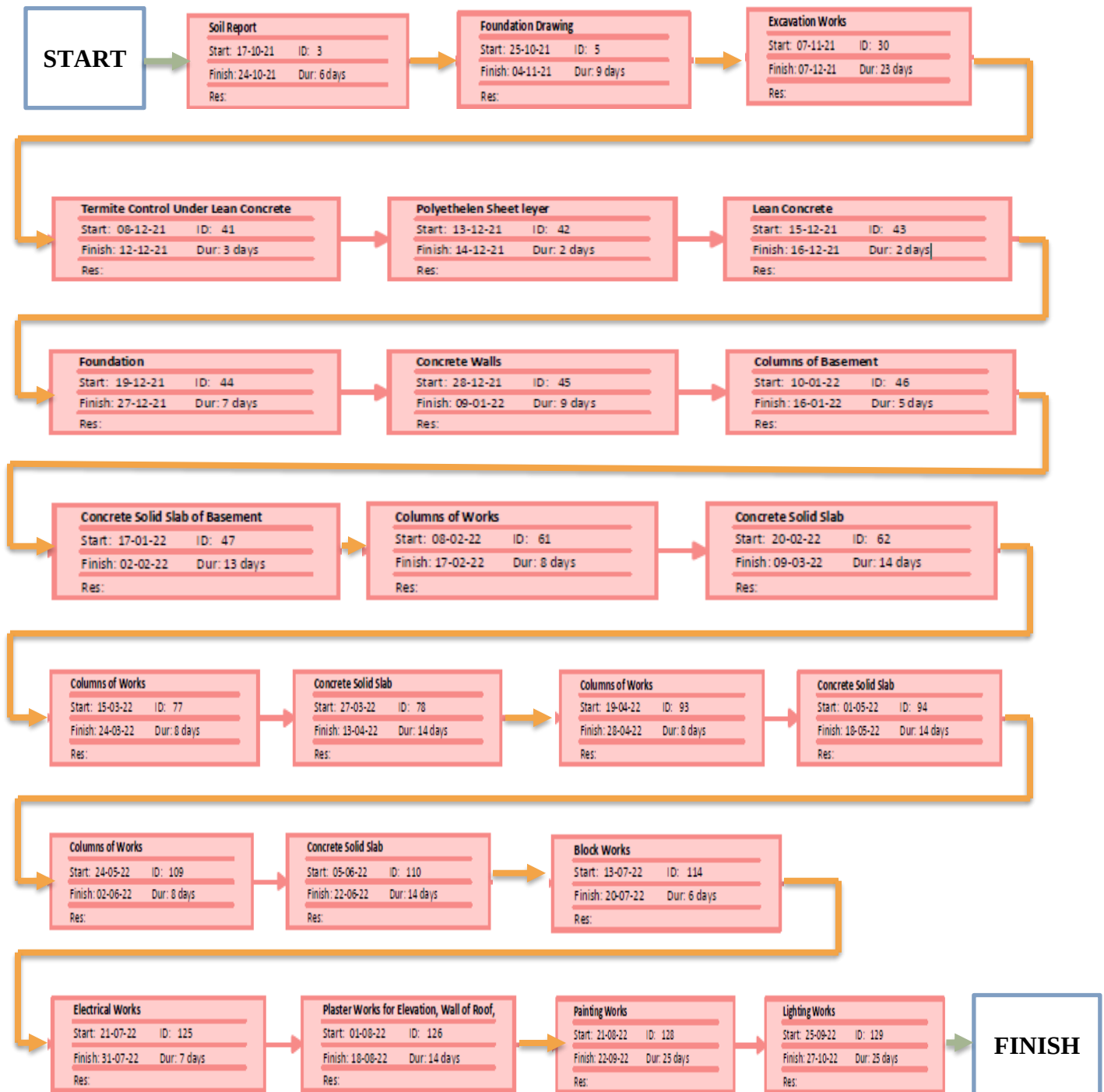
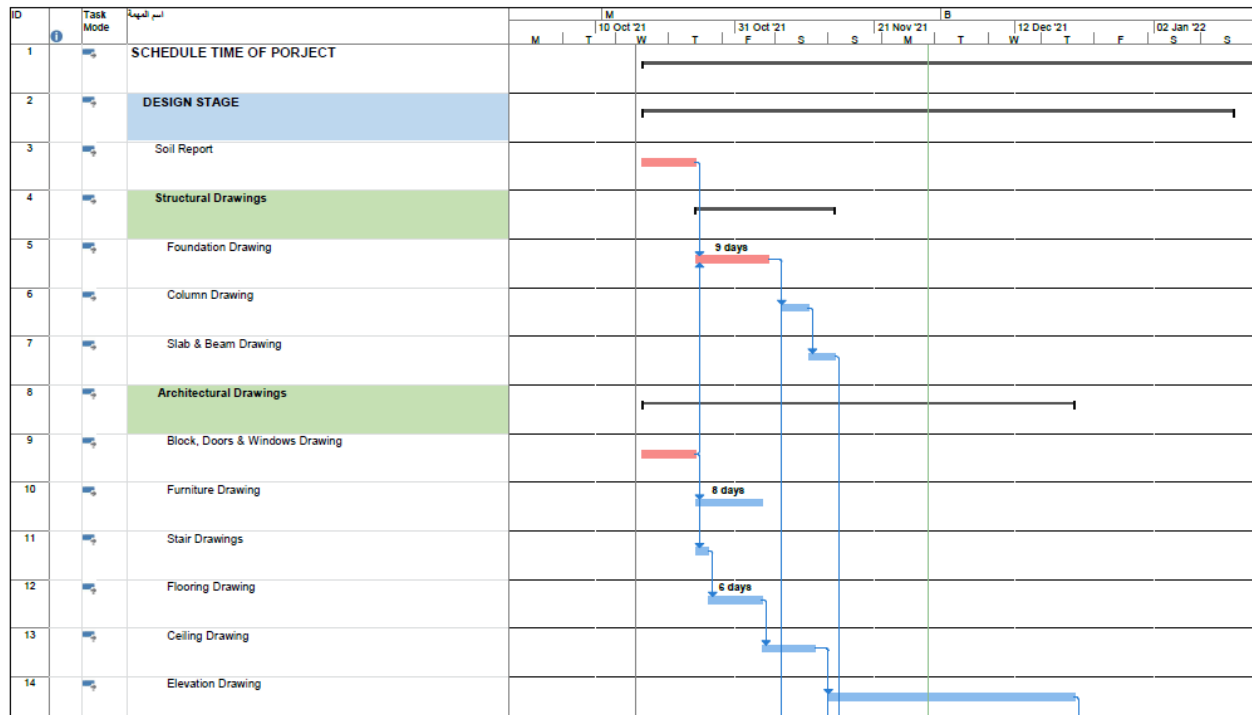
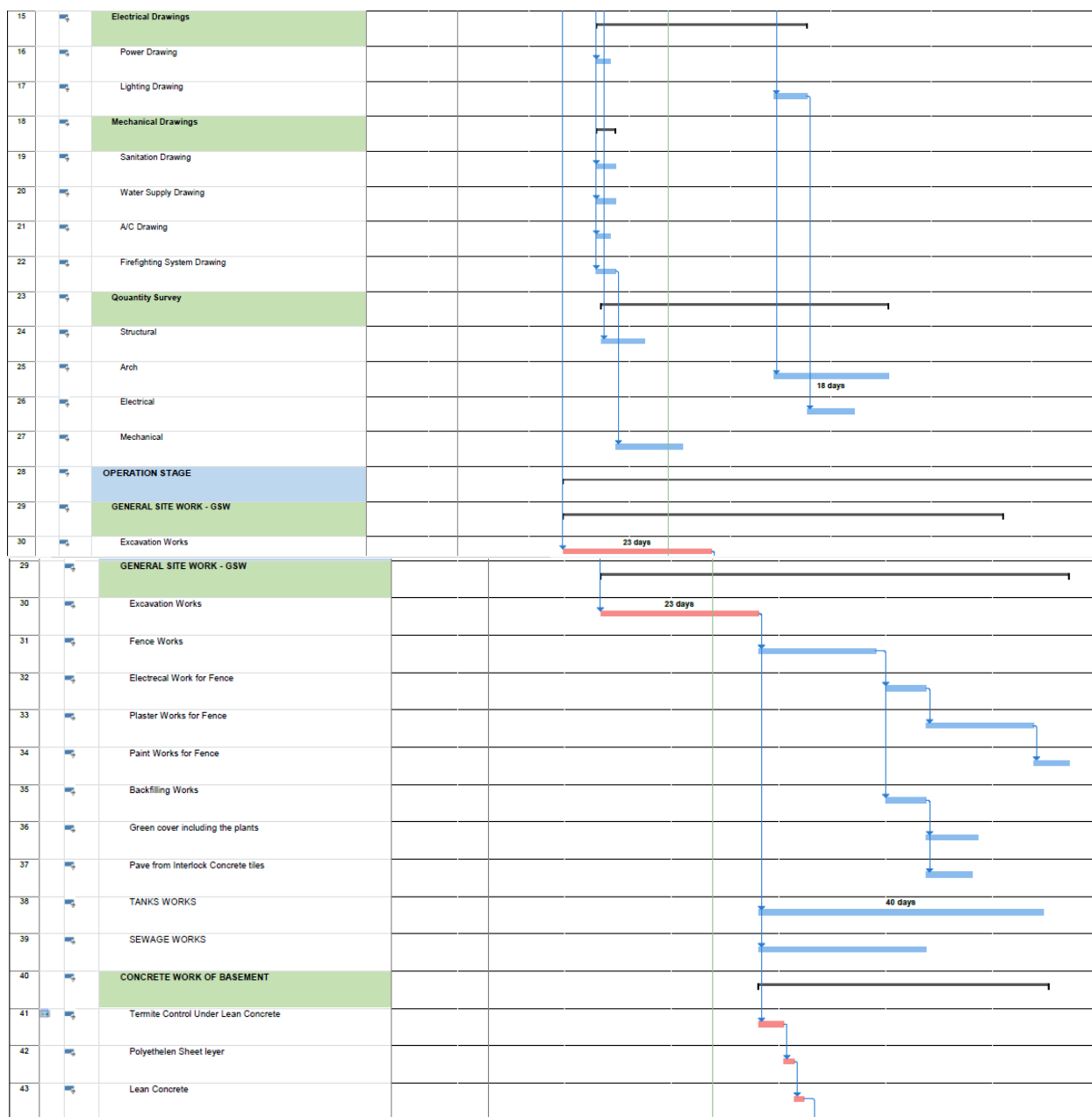


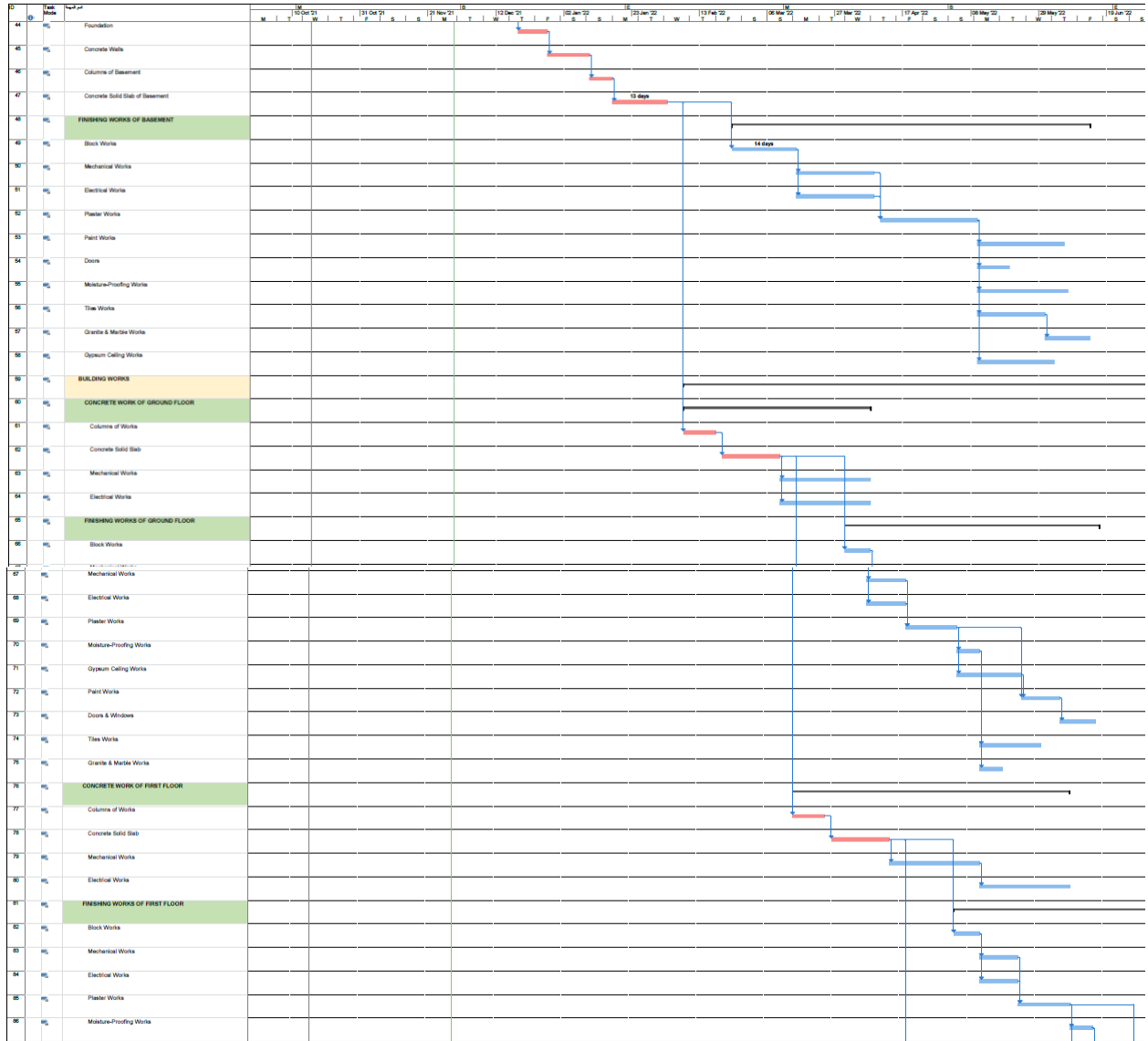
Exhibit 18.4 Critical Path

18.4 Gantt Chart and Milestones Model:

A Gantt chart is a project management tool assisting in the planning and scheduling of projects of all sizes, although they are particularly useful for simplifying our project.







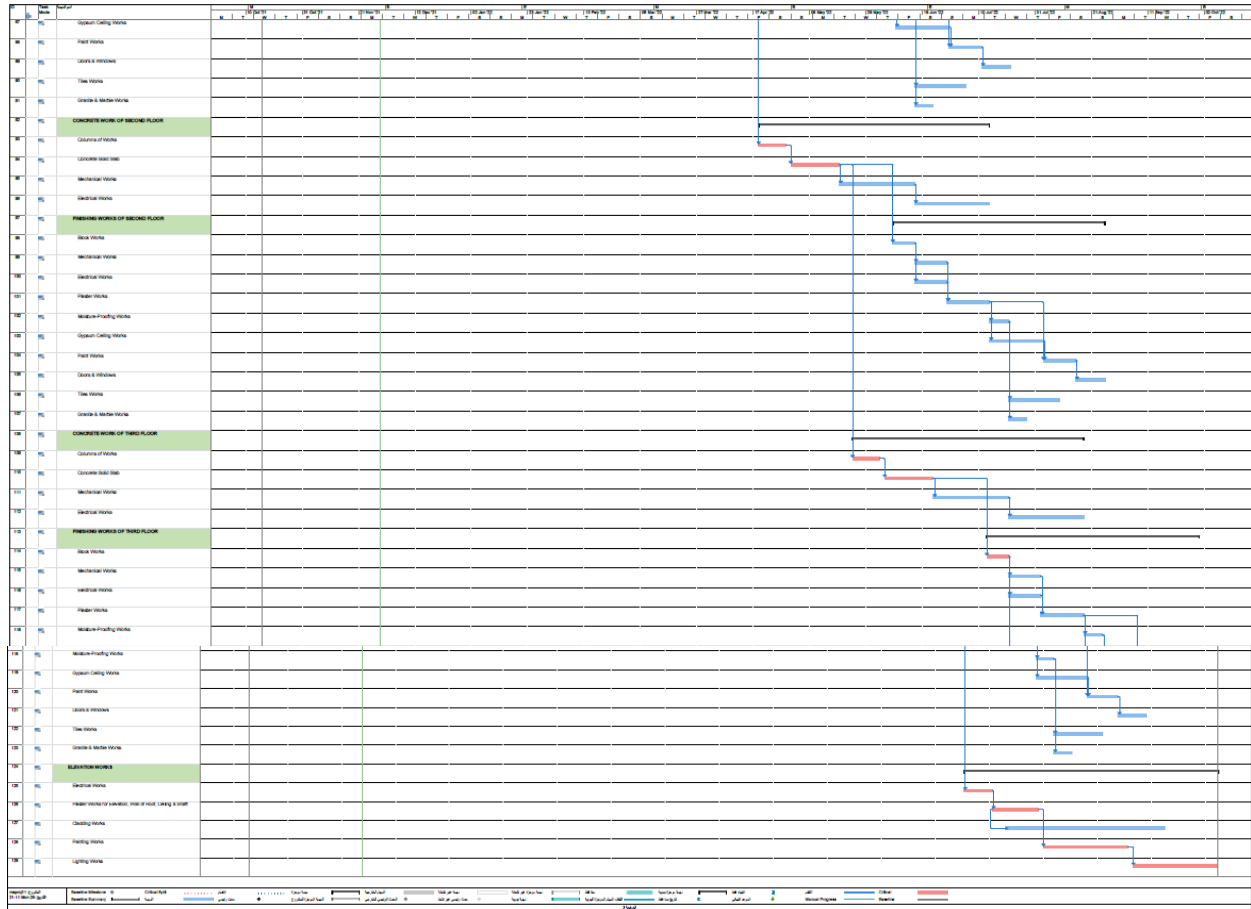


Exhibit 18.5 Gantt Chart

A Milestone Chart model focuses on planned significant events scheduled to occur at specific times in the project. Such events could be the initiation or completion of a particularly important or critical activity, equipment deliveries, reviews, or approval dates. Like the Gantt Chart, the milestone chart uses symbols imposed on a calendar to provide information about planned and actual completion dates and any revisions to the milestone schedule. There is no standard set of symbols for milestone charts.

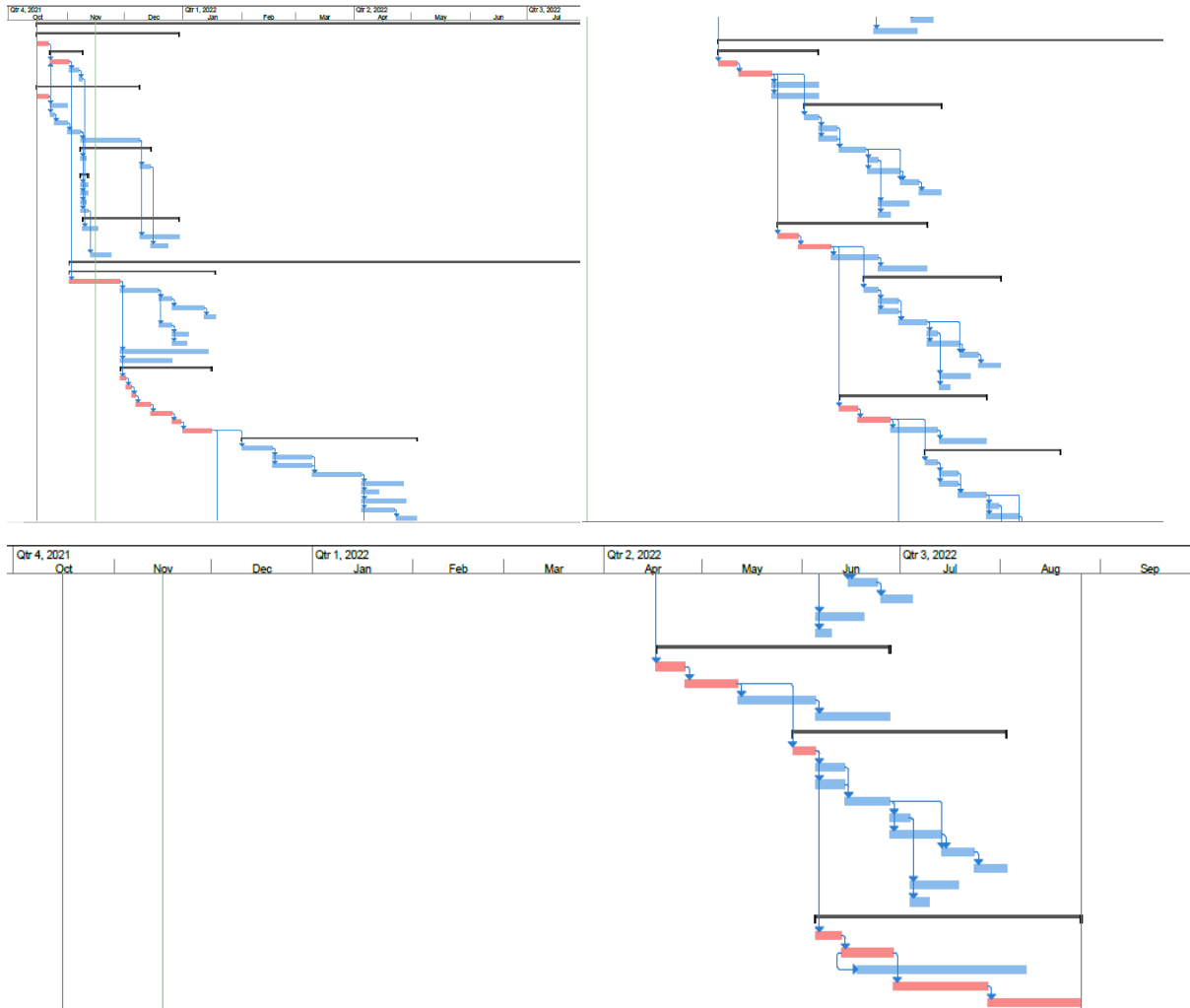


Exhibit 18.6 Milestone Model Chart

The Advantages of Gantt Charts & millstone chart. A Gantt chart gives managers and workers a high-level overview of the project tasks they must complete, along with a timetable to finish their work. The chart helps you monitor the project's progress by showing how tasks relate to each other.

19 Quality

Quality in construction means that a project is completed within the defined guidelines set out in the Scope of Work. This document serves as a set of guardrails for the project based on the owner's expectations, and sheds light on how to execute the project in a way that meets these standards.

19.1 Deming Model for Quality:

The Deming cycle is a continuous quality improvement model which consists of a logical sequence of four key stages: Plan, Do, Check, and Act.

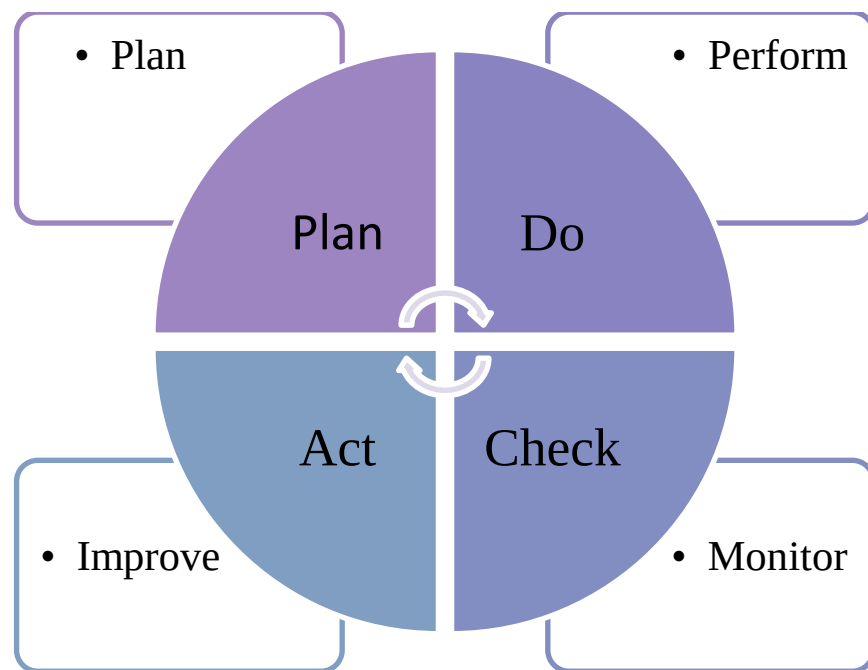


Exhibit 19.1 Plan-Do-Check-Act Cycle

Use the PDCA cycle when:

- Starting a new improvement project
- Developing a new or improved design of a process, product, or service
- Defining a repetitive work process
- Planning data collection and analysis in order to verify and prioritize problems or root causes
- Implementing any change
- Working toward continuous improvement

The Plan-do-check-act Procedure

1. **Plan:** Recognize an opportunity and plan a change.
2. **Do:** Test the change. Carry out a small-scale study.
3. **Check:** Review the test, analyze the results, and identify what you've learned.
4. **Act:** Take action based on what you learned in the study step. If the change did not work, go through the cycle again with a different plan. If you were successful, incorporate what you learned from the test into wider changes. Use what you learned to plan new improvements, beginning the cycle again.

To use the PDCA cycle as a model for defining most of work processes, from the site preparation to the handover the villas. The PDCA model was the basic structure for the district's:

- Overall strategic planning
- Needs analysis
- Curriculum design and delivery
- Team goal-setting and evaluation
- Provision of resident services and support.

Exhibit shows their " Approach to homes Success." This is a continuous cycle of designing, drawing and delivering villas. Improvement is not a separate activity—it is built into the work process

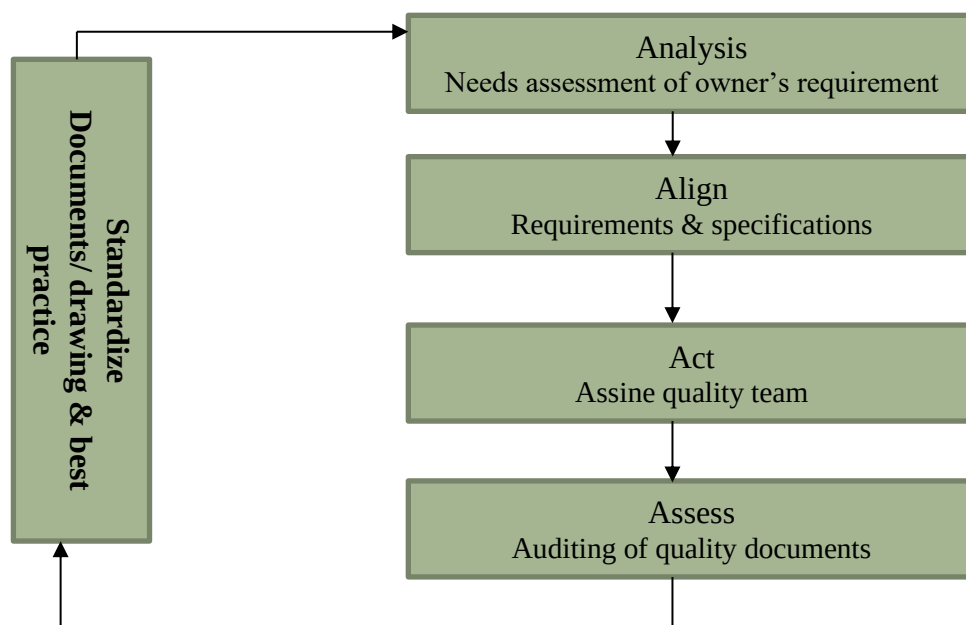


Exhibit 19.2 **Plan-do-check-act Application**

Plan

The Approach begins with a "plan" step, which the homes district calls "analyze." In this step, Residents' needs are analyzed by examining a

range of data available in an electronic data "warehouse." The data reviewed includes everything from grades to performance on standardized tests. Data can be analyzed for resents and end users. Because PDCA does not specify how to analyze data, a separate data analysis process is used here as well as in other processes throughout the organization.

Do

The Approach continues with two "do" steps:

- The "align" step asks what the international and state standards require and how they will be assessed. Coaching team also plans build by looking at what is taught at earlier and later construction levels and in other disciplines to ensure a clear continuity of progress throughout the construction process. Leaders develop individual goals to improve their instruction where the "analyze" step showed any gaps.
- The "act" step is where instruction is provided, following the specification and project goals. Within set parameters, leaders vary the delivery of instruction based on each team members learning rates and styles.

Check

Formal and informal assessments take place continually, from daily leader assessments to six-week progress reports to quality standardized tests.

Leaders also can access comparative data on the electronic database to identify trends. High-need members are monitored by a special auditing team.

Throughout the project, if assessments show members are not learning as expected, mid-tasks corrections are made (such as re-instruction, changing coach methods, and more direct leader mentoring). Assessment data become input for the next step in the cycle.

Act

In this example, the "act" step is "standardization." When goals are met, the specification design and teaching methods are considered standardized. Leaders share best practices in formal and informal settings. Results from this cycle become input for the "analyze" phase of the next Approach cycle.

19.2 Develop SIPOC Model, And Ishikawa for One of The Issues of The Project Outputs:

SIPOC model summarizes the transformation processes and lists influence factors and involved parties. Stands for Suppliers, Inputs, Process, Outputs, and Customers. Organizations use SIPOC to capture, at a high-level, all the critical parts of a process.

- **Suppliers:** Any role, system, or inter-process connection that provides inputs to the process

- **Inputs:** An input is a trigger for the process. Inputs are something transformed, consumed, used, or processed. They can sometimes be the output of another process.
- **Process:** a list of the high-level steps of the process
- **Outputs:** An output is a value-added result produced by the process. They can sometimes be the input into another process.
- **Customers:** Any role, system, or inter-process connection that receives outputs from the process.

Let's go ahead define the five pieces of a SIPOC diagram.

Suppliers	Inputs	Process	Outputs	Customers
• Raw Materials • Sources • Manufactures • QC quality Team	• Manpower • Quality control plan • Recourses • Equipment's • Measurement equipment • Internal audit date	• Internal audit • Advance quality planning • Control plan • Continuous improvements	• Monthly quality report • Corrective actions • Inspection and traceability records	• Site Management • End users (Owners)

Table 19.1 SIPOC Diagram

Before we go any further, what do we mean by process?

Table is defining a process as “A set of interrelated or interacting activities that transform inputs into outputs. A process takes one or more defined

inputs and turns them into defined outputs. Processes define the sequence of actions and their dependencies.”

I would go one step further as and say, “a process is a set of activities that transforms inputs into **value-added** outputs.” There is no point in having a process if it doesn’t add value.

For example, **suppliers** such as engineers and designers use the **inputs** of silicone, metal, glass, and plastic, in the **multi-step manufacturing process**, to deliver the **output** of a cell phone for **customers** consisting of consumers and businesses.

A SIPOC diagram puts everything on one page, allowing you to create a more detailed process or to decompose a process for improvement.

Ishikawa Diagram of Output of Project (Poor Quality Villas):

Fishbone (Ishikawa) diagrams are great for analyzing processes and identifying defects in them. They are a great way to visualize causes and their effects. Fishbone diagrams are used in many industries but primarily they're used in manufacturing, construction, and marketing.

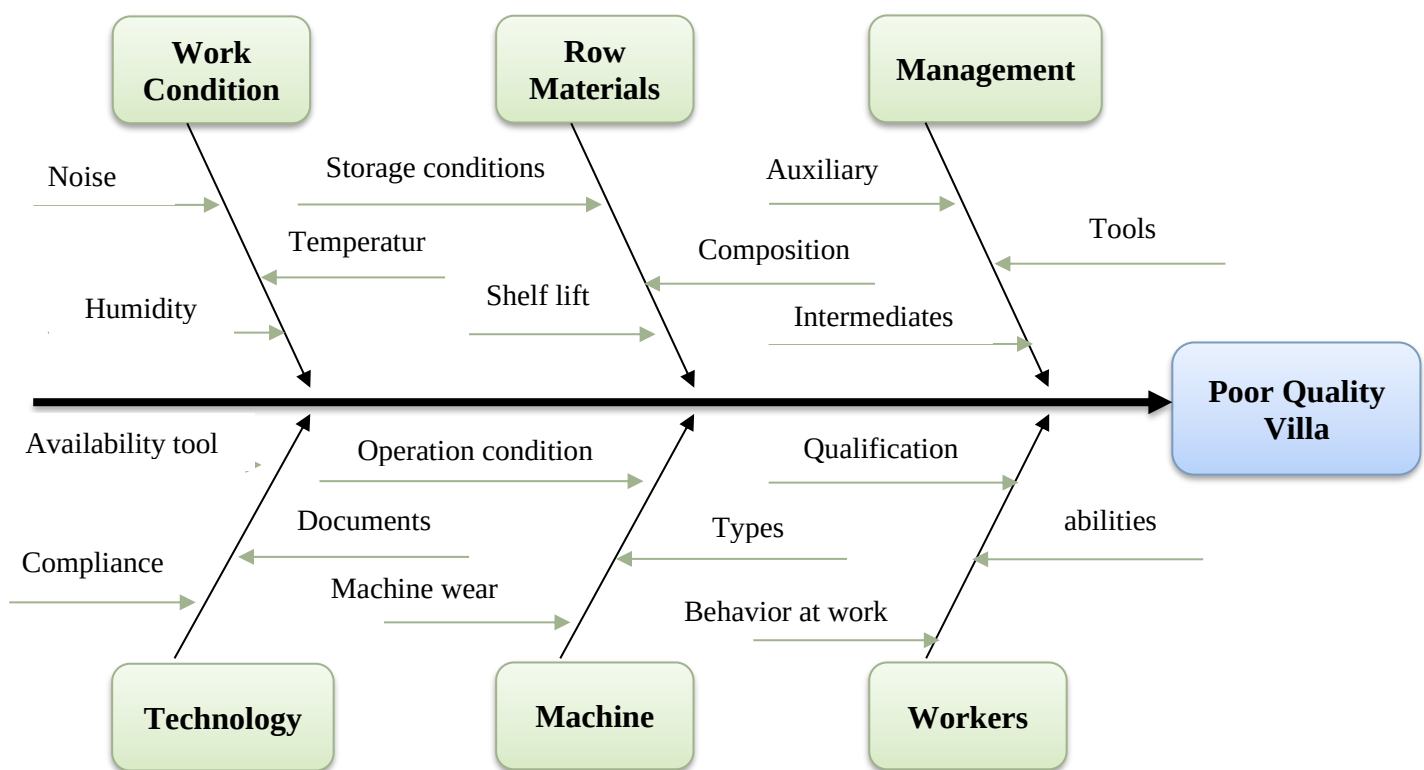


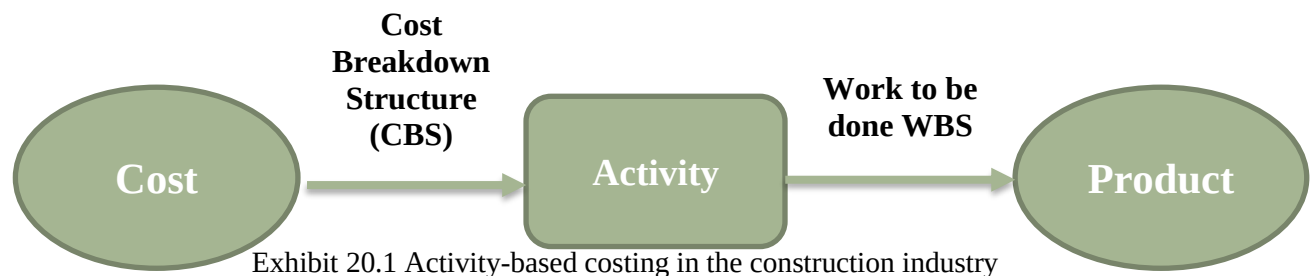
Exhibit 19.3 Ishikawa diagram

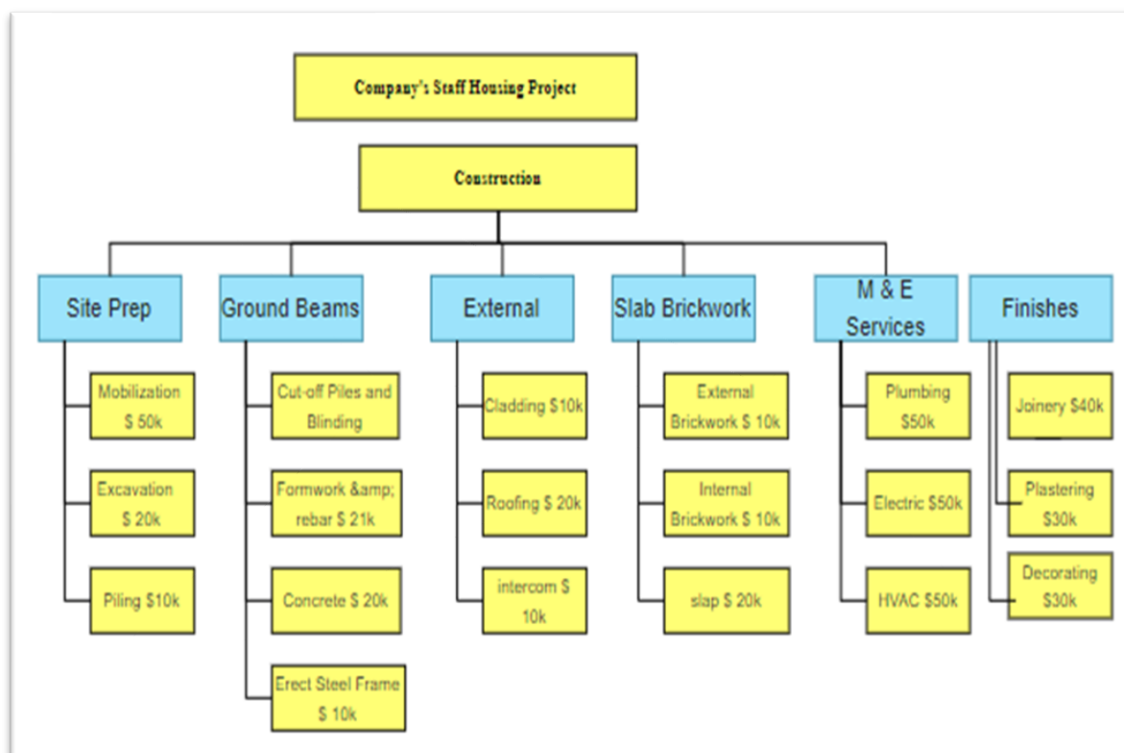
20 Finance

Construction finance refers to the variety of options available to contractors, suppliers, and other construction businesses to access capital (i.e., money) when they need it. We will provide an overview of the financing options available to construction businesses looking for additional sources of cash.

20.1 Cost Breakdown Structure and The Project Balance in Accordance With WBS:

The activity-based costing system (ABC) is a method that allows the allocation and distribution of indirect costs according to the activities carried out (direct costs). This, with the intention of being faithful to the added value chain and to determine the cost. **A Cost Breakdown Structure (CBS)** is a breakdown or hierarchical representation of the various costs in a project. The Cost Breakdown Structure represents the costs of the components in the Work Breakdown Structure (WBS). The CBS is a critical tool in managing and the financial aspects of any project and creates a structure for applying measurable cost controls





ID	اسم المهمة	unit	Duration	Start	Finish	Predecessors	Cost
1	SCHEDULE TIME OF PROJECT		270 days	Sat 16-10-21	Thu 25-08-22		646,863.00
2	DESIGN STAGE		65 days	Sat 16-10-21	Wed 29-12-21		71,017.00
3	Soil Report	L.S	6 days	Sat 16-10-21	Thu 21-10-21		17.00
4	Structural Drawings		15 days	Sat 23-10-21	Mon 08-11-21		18,000.00
5	Foundation Drawing	DWG.	9 days	Sat 23-10-21	Mon 01-11-21	3,9	6,000.00
6	Column Drawing	DWG.	4 days	Tue 02-11-21	Sat 06-11-21	5	6,000.00
7	Slab & Beam Drawing	DWG.	2 days	Sun 07-11-21	Mon 08-11-21	6	6,000.00
8	Architectural Drawings		47 days	Sat 16-10-21	Wed 08-12-21		26,600.00
9	Block, Doors & Windows Drawing	DWG.	6 days	Sat 16-10-21	Thu 21-10-21		4,300.00
10	Furniture Drawing	DWG.	8 days	Sat 23-10-21	Sun 31-10-21	9	5,200.00
11	Stair Drawings	DWG.	2 days	Sat 23-10-21	Sun 24-10-21	9	2,500.00
12	Flooring Drawing	DWG.	8 days	Mon 25-10-21	Sun 31-10-21	11	4,300.00
13	Ceiling Drawing	DWG.	6 days	Mon 01-11-21	Sun 07-11-21	12	4,300.00
14	Elevation Drawing	DWG.	27 days	Mon 08-11-21	Wed 08-12-21	13	6,000.00
15	Electrical Drawings		32 days	Mon 08-11-21	Tue 14-12-21		12,400.00
16	Power Drawing	DWG.	3 days	Mon 08-11-21	Wed 10-11-21	13	6,200.00
17	Lighting Drawing	DWG.	5 days	Thu 09-12-21	Tue 14-12-21	14	6,200.00
18	Mechanical Drawings		4 days	Mon 08-11-21	Thu 11-11-21		10,000.00
19	Sanitation Drawing	DWG.	4 days	Mon 08-11-21	Thu 11-11-21	13	2,500.00
20	Water Supply Drawing	DWG.	4 days	Mon 08-11-21	Thu 11-11-21	13	2,500.00
21	A/C Drawing	DWG.	3 days	Mon 08-11-21	Wed 10-11-21	13	2,500.00
22	Firefighting System Drawing	DWG.	4 days	Mon 08-11-21	Thu 11-11-21	13	2,500.00
23	Quantity Survey		44 days	Tue 09-11-21	Wed 29-12-21		4,000.00
24	Structural	L.S	7 days	Tue 09-11-21	Tue 16-11-21	7	1,000.00
25	Arch	L.S	18 days	Thu 09-12-21	Wed 29-12-21	14	1,000.00
26	Electrical	L.S	8 days	Wed 15-12-21	Thu 23-12-21	17	1,000.00
27	Mechanical	L.S	10 days	Sat 13-11-21	Tue 23-11-21	22	1,000.00
28	OPERATION STAGE		255 days	Tue 02-11-21	Thu 26-08-22		575,846.00
29	GENERAL SITE WORK - GSW		66 days	Tue 02-11-21	Mon 17-01-22		1,960.00
30	Excavation Works	M3	23 days	Tue 02-11-21	Sun 28-11-21	5	17.00
31	Fence Works	L.M	17 days	Mon 29-11-21	Sat 18-12-21	30	460.00
32	Electrical Work for Fence	L.M	6 days	Sun 19-12-21	Sat 25-12-21	31	65.00
33	Plaster Works for Fence	M2	15 days	Sun 26-12-21	Tue 11-01-22	32	34.00
34	Paint Works for Fence	M2	5 days	Wed 12-01-22	Mon 17-01-22	33	22.00
35	Backfilling Works	M3	6 days	Sun 19-12-21	Sat 25-12-21	31	14.00
36	Green cover including the plants	M2	8 days	Sun 26-12-21	Mon 03-01-22	35	33.00
37	Pave from interlock Concrete tiles	M2	7 days	Sun 26-12-21	Sun 02-01-22	35	45.00
38	TANKS WORKS		40 days	Mon 29-11-21	Thu 13-01-22	30	750.00
39	SEWAGE WORKS		23 days	Mon 29-11-21	Sat 25-12-21	30	500.00
40	CONCRETE WORK OF BASEMENT		41 days	Mon 29-11-21	Sat 15-01-22		2,087.00
41	Termite Control Under Lean Concrete	M2	3 days	Mon 29-11-21	Wed 01-12-21	30	6.00
42	Polyethelien Sheet layer	M2	2 days	Thu 02-12-21	Sat 04-12-21	41	1.00
43	Lean Concrete	M2	2 days	Sun 05-12-21	Mon 06-12-21	42	65.00
44	Foundation	M2	7 days	Tue 07-12-21	Tue 14-12-21	43	430.00
45	Concrete Walls	M2	9 days	Wed 15-12-21	Sat 25-12-21	44	500.00
46	Columns of Basement	M3	5 days	Sun 26-12-21	Thu 30-12-21	45	690.00
47	Concrete Solid Slab of Basement	M2	13 days	Sat 01-01-22	Sat 15-01-22	46	395.00
48	FINISHING WORKS OF BASEMENT		79 days	Tue 01-02-22	Tue 03-05-22		58,161.00
49	Block Works	M2	14 days	Tue 01-02-22	Wed 16-02-22	47FS+14 days	95.00
50	Mechanical Works	L.S	18 days	Thu 17-02-22	Wed 09-03-22	49	24,000.00
51	Electrical Works	L.S	16 days	Thu 17-02-22	Wed 09-03-22	49	32,000.00
52	Plaster Works	M2	22 days	Thu 10-03-22	Mon 04-04-22	50,51	34.00
53	Paint Works	M2	19 days	Tue 05-04-22	Tue 26-04-22	52	22.00
54	Doors	NO.	8 days	Tue 05-04-22	Wed 13-04-22	52	1,250.00
55	Moisture-Proofing Works	M2	20 days	Tue 05-04-22	Wed 27-04-22	52	63.00
56	Tiles Works	M2	15 days	Tue 05-04-22	Thu 21-04-22	52	117.00

Exhibit 20.2 Cost Breakdown Structure Accordance WBS

20.2 Earned Value Management of The Project:

Earned value management (EVM) is a project management methodology that integrates schedule, costs, and scope to measure project performance. Based on planned and actual values, EVM predicts the future and enables project managers to adjust accordingly.

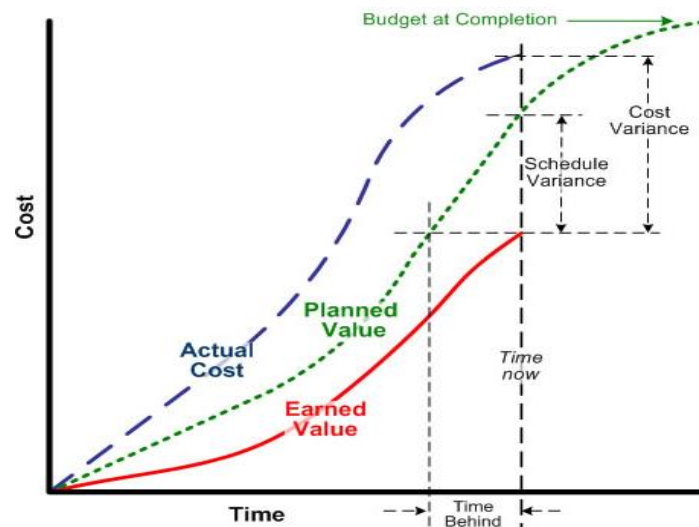


Exhibit 20.3 Earned Value Management (EVM)

Ending 20% of Project Period	Completion 50% of the outputs
Project duration: 48 months Project cost (BAC): 40,000,000 USD Time elapsed: 9 months Percent complete: 20% (as per the schedule) Planed Value PV = 20%BAC = 8,000,000 USD Actual Cost AC = 8,000,000 USD EVM = Total project cost *20 % of actual work = 40,000,000\$* 20% = \$8,000,000	Project duration: 48 months Project cost (BAC): 40,000,000 USD Time elapsed: 24 months Percent complete: 50% (as per the schedule) Planed Value PV = 50%BAC = 20,000,000 USD Actual Cost AC = 20,000,000 USD EVM = Total project cost *50 % of actual work = 40,000,000\$* 50% = \$20,000,000

Table 20.1 Earned Value Management Calculation

21 Resources

A resource is a necessary asset whose main role is to help carry out a certain task or project. A resource can be a person, a team, a tool, finances, and time. Most projects require many different resources to be completed. Resources should be assessed and allocated before a project begins.

21.1 The Concept of Resource Leveling and Smoothing.

Resource smoothing is used when the time constraint takes priority. The objective is to complete the work by the required date while avoiding peaks and troughs of resource demand. **Resource levelling** is used when limits on the availability of resources are paramount. It simply answers the question ‘With the resources available, when will the work be finished?’. Few re-usable resources are limitless, so the time schedule has to be adjusted to take into account the limited availability of resources over time. There are two approaches to reconciling resource limits and time constraints; resource smoothing (or time limited resource scheduling) and resource levelling (or resource limited scheduling).

Resource smoothing is used when the time constraint takes priority. The objective is to complete the work by the required date while avoiding peaks and troughs of resource demand.

A smoothed resource profile will be achieved by delaying some work. This will remove some flexibility from the schedule and its ability to deal

with unavoidable delays, but the advantage is usually a more efficient and cost-effective use of resources.

Resource levelling is used when limits on the availability of resources are paramount. It simply answers the question ‘With the resources available, when will the work be finished?’

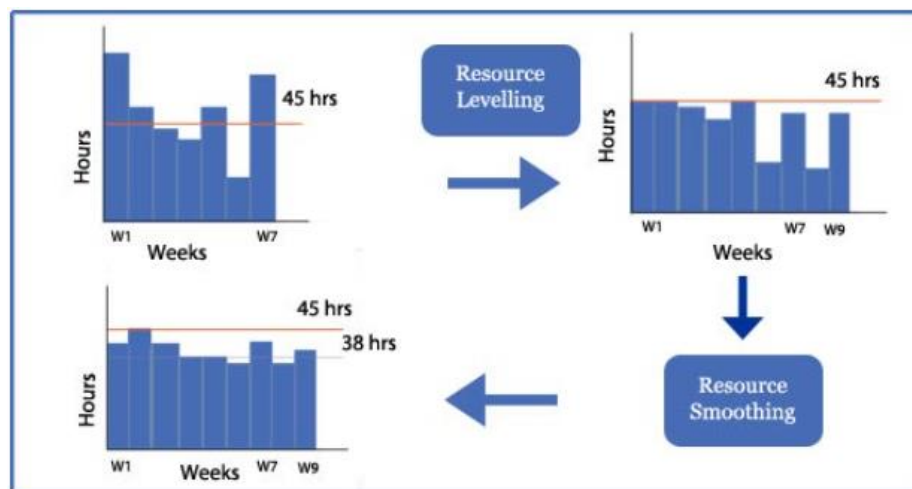


Exhibit 21.1 Differences Between Resource Leveling and Resource Smoothing

❖ **Summarize Differences Between Resource Leveling and Resource Smoothing:**

Resource Leveling	Resource Smoothing
It applies the resource constraints to the project and may result in a change in project duration	We apply resource smoothing after doing resource-leveling. Since we need to first accommodate the resource constraints before we can optimize it.
Resource Leveling is primarily driven by resource constraints like you do not have more than 45 hours of the given resource for a week.	Resource smoothing is more to do with desired limits like we do have 45 hours available for a given resource but we wish that we allocate 38 hours per week so we have some breathing space.
The allocation limits identified in resource leveling must be applied.	The desired limit identified in resource smoothing may not be applied in some cases.

Table 21.1 Differences Between Resource Leveling and Resource Smoothing

Example:

We have 10 days to complete our project, and we require 10 resources working full time for 10 days to complete the project. But we have only 6 resources available. What will you do?

Resource Leveling, we extend the project schedule. our 6 resources will work for the first 10 days, and then these 6 resources are again employed to work on the remaining work to complete the work. So, in this process, no additional resources are not used, Project is completed and schedule is extended. In Resource Smoothing may not be able to optimize all the resources, because the activities on the critical path do not have a float, so Resource Smoothing cannot be done on activities on CP. Time is the main constraint here, and we have to optimize our resource within the available duration. That is why Resource Smoothing is called **Time Constrained Scheduling (TCS)**.

Resource Leveling vs Resource Smoothing	
Resource Leveling	Resource Smoothing
• Main constraint is resource availability. You extend the project duration as required. • Project End date may change. • Overall Project can be delayed. Consequently, costs may be increased. • Can be done to activities on the critical path. • Changes are allowed to critical path. • Used when resources are over-allocated. • Resource Constrained Scheduling (RCS)	• Main constraint is time. Project Duration is fixed. • Project End date will not change. • Overall project will not be delayed, but Activities may only be delayed with in their free or total float. • Cannot be done to activities on the critical path. • changes are not allowed to critical path. • Used when resources are unevenly allocated. • Time Constrained Scheduling (TCS)

Table 21.2 Resource Leveling and Resource Smoothing comparison

21.2 Training of Distributing The Project Resources of Equipment and Tools:

Resource allocation, also known as resource scheduling, involves identifying and assigning resources to various activities for a specific period. It also monitors the resource's workload throughout the project life cycle and reassigns them if necessary.

Types of Resources: On an enterprise level, resources can be human and non-human. Some examples of resources for the projects are:

- ❖ **Labor:** They constitute team members or employees and contingent staff with different skill sets and form the backbone of any project.
- ❖ **Equipment/Tools:** It includes everything from software to hardware, depending on the organization's type.
- ❖ **Facilities:** It comprises the environment needed for executing a project, such as a conference room or office space.
- ❖ **Materials:** These are the consumables required to generate outputs. For example, office stationery, raw materials to build a house.
- ❖ **Budget:** Finance needed to purchase any of the above resources.

Indirect costs are all costs that qualify as such but cannot be identified from the beneficiaries despite their direct association with the project, but through their own accounting system their relationship to the direct costs of the project can be determined.

❖ Specific types of projects resources:

➤ **Human resources**

Human resources specialists are responsible for recruiting, screening, interviewing and placing workers. They may also handle employee relations, payroll, benefits, and training. They oversee specialists in their duties; consult with executives on strategic planning, and link a company's management with its employees.

💡 **Example of human resources** as per organization chart:

Human Resource	Job Description
CEO	Managing a company's overall operations. This may include delegating and directing agendas, driving profitability, managing company organizational structure, strategy, and communicating with the board
VP Commercial	oversee the handling of commercial loans. You work in a bank or other financial institution and focus on both customer service and financial tasks.
Project Manager	Planning and overseeing projects to ensure they are completed in a timely fashion and within budget. Designate project resources, prepare budgets, monitor progress, and keep stakeholders informed the entire way.
Construction Manager	coordinate and supervise the building of residential, commercial, and civic structures—from roads to bridges, and office buildings. Depending on the scope of the project, a

	construction manager may work in conjunction with other managers, focusing on a specific element of the project
Site/business operation	Help various departments within a company coordinate to meet the end goal. They also make strategic decisions about what customers are likely to buy and create company policies that help the staff operate efficiently.
Art Director	The overall visual aspects of an advertising or media campaign and coordinate the work of other artistic or design staff, such as graphic designers. ... They hire and supervise a staff of assistant art directors or set designers to complete designs.
Sr. Engineer	Takes charge of an entire engineering department, leading a team as they complete various projects. ... Sr. engineer work alongside other engineers and technicians, approving designs, calculating costs, negotiating contracts, and executing plans safely and efficiently.
Risk & Safety Manager	Examines, designs, and implements alternative risk management and mitigation techniques, strategies, and measures. Monitors the effectiveness of techniques and makes changes as required. Directs and participates in the development of new programs, initiatives, and incentives to improve workplace safety.

Table 21.3 Human Resource Distribution

➤ **Material Resources**

Material resources include raw materials and machines, tools, equipment, software, premises, etc. They include both resources that the company already possesses and those that it purchases or leases to carry out the project.

They can be goods that are temporarily made available for the project, which can be used again later, but also consumables that can be used in a given quantity and that have a unit cost.

💡 **for example, the goods consumed or the raw materials processed** will not be available for new use. The investment in these resources must be determined in terms of budget, time, and desired quality.

➤ **Financial Resources**

The financial resources correspond to the project budget, which will be defined prior to the launch by the project sponsor. They are used to finance: the human and material resources of the project, such as travel expenses for example.

💡 **Example of financial resources:**

- finance funds,
- project budgets,
- project grants.

➤ **Time Resources**

Time resources are the periods of time available and used for the completion of each task. The duration of a task will depend on the planned and available human resources. These resources are not inexhaustible: they have limits.

💡 **Example of time resources:**

- project plan,
- project schedule,
- time invested.

22 Procurement

Procurement Project Management is a structured process that is used to define, plan, implement, control and transition an activity from a current to a future state.

Project Management is derived from the realization a project needs to be carried out. This realization could be generated from a macro or a micro factor. The management of the procurement project requires a range of skills and competencies, knowledge, processes, methods and clearly outlined objectives, if the outcome is to be as desired and in accordance with stakeholders' needs.

Project Management incorporates the understanding of the required outcomes, being able to communicate effectively, being aware of associated budgetary constraints as well challenges associated with people and resources. Technical aspects and team management are also of key importance.

Project Management is an all-encompassing activity which requires careful planning from procurement professionals with a high level of business acumen to ensure the end goal is achieved. Once the need for a project has been realized the project management process should start without effective project management the optimum outcome of a project is unlikely to be achieved.

22.1 Develop The Procurement Execution Process and Contractor Selection:

The project procurement cycle reflects the procurement activities from the decision to purchase the material or service through to the payment of bills and closing of procurement contracts. After the decision has been made to purchase goods or outsource services, the procurement team develops a plan that includes the following:

- Selecting the appropriate relationships and contract approaches for each type of purchased goods or outsourced service
- Preparing requests for quotes (RFQs) and requests for proposals (RFPs) and evaluating partnership opportunities
- Evaluating RFQs, RFPs, and partnerships
- Awarding and signing contracts
- Managing quality and timely performance
- Managing contract changes
- Closing contracts

The supplier of the core product will be chosen via a tendering process. The requirements will form the backbone of an RFP, which will be sent to suppliers recommended by Gartner. The successful response will move to a SOW with time and material being the preferred contract type. Wherever possible internal resources will be used. Credit cards can be

used for one off items below 1.5k e.g., venues, printing. One month post project go live the supplier and product will move with performance any non-compliance issues managed by the Contract and Supplier Management team.

Procurement Process	
NEED	- Needs analysis sent to procurement team. - Purchases over 1m to COO office approve
REQUIREMENTS	Develop requirements in as much details as possible.
SELECT	Select vendor list to move to bid stage.
BID	- Agree process and timeline with bid manager. - Send out RFPs
EVALUATE	- Review and evaluate RFP responses. - Ask follow ups and select successful bid.
SOW	Write Statement of work. Work with vendor to agree project approach payment terms.
CONTRACT	- Contract Managers negotiate terms and conditions. - Contracts signed and paperwork completed.

Table 22.1 Procurement Process flow

Selecting the Contract Approach

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

- Is the required work or materials a commodity, customized product or service, or unique skill or relationship?
- What type of relationship is needed: supplier, vendor, or partnership?

- How should the supplier, vendor, or potential partner be approached: RFQ, RFP, or personal contact?
- How well known is the scope of work?
- What are the risks and which party should assume which types of risk?
- Does the procurement of the service or goods affect activities on the project schedule's critical path and how much float is there on those activities?
- How important is it to be sure of the cost in advance?

Soliciting Bids

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

Qualifying Bidders

Potential bidders are people or organizations capable of providing the materials or performing the work required for the project.

Request for Quote

An RFQ focuses on price. The type of materials or service is well defined and can be obtained from several sources.

Request for Proposal

An RFP accounts for price but focuses on meeting the project quality or schedule requirements.

Evaluating Bids

Evaluation of bids in response to RFQs for commodity items and services is heavily graded for price. In most cases, the lowest total price will win the contract

22.2 Developing the Suppliers Comparison Model and Scoring Model:

We are going to take that one step further by actually comparing how a scoring model can be used to help our organization select the best vendor. Just to recap, the eight collaboration variables that all vendors compete against are:

- Ease of use and intuitiveness
- Price
- Features
- Technology and security
- Customization and integration
- People
- Support and maintenance

- Vertical expertise

We are looking at three criteria with different levels of importance – or weight – in making your decision. 40% of the decision is based on price, 30% is based on reputation, and 30% based on sustainability. With this information, the first two steps in the process would look something like this table below.

Criteria	Weight
Ability to deliver on or below target price (<i>price</i>)	40%
Reputation based on performance on past projects (<i>reputation</i>)	30%
Ability to meet sustainability target goals (<i>sustainability</i>)	30%

Now contractors are also very interested in sustainability and are able to meet our requirements in this area at 100%. Rated on a scale of 1-10, score contractor C as follows: Price: 8.5, Reputation: 9, Sustainability: 10. Assembled as a table, the scores for each contractor are shown below.

	Vendor A	Vendor B	Vendor C
Price	10	10	8.5
Reputation	10	6	9
Sustainability	5	10	10

The final step in the process is to calculate the weighted scores by multiplying the weight for each criterion by its score and adding the resulting values.

	Weight	Raw Scores			Weighted Scores		
		Vendor A	Vendor B	Vendor C	Vendor A	Vendor B	Vendor C
Price	40%	10	10	8.5	4	4	3.4
Reputation	30%	10	6	9	3	1.8	2.7
Sustainability	30%	5	10	10	1.5	3	3
Total Weighted Score					8.5	8.8	9.1

As seen here from the table, based on the combination of the raw scores for each criteria area and the relative importance of each criterion, Vendor C has the highest weighted score (9.1), followed by Vendor B (8.8), and Vendor A (8.5). While the weighted scoring model aids to assess and quantify a decision process such as this, some qualitative and subjective judgement can also be helpful. For example, if the decision were only between vendors A (8.5) and B (8.8), you might decide at the start of the process that each vendor needs to have a minimum reputation score of 8 in order to be considered, taking Vendor B out of the running. Or, a minimum score of 7 might be required for sustainability, eliminating Vendor A. The use of minimum value criteria, when appropriate, can help to increase the usefulness of the tool.

There are many other things we can do with this model like stating acceptable thresholds for a specific criterion. For example, we may choose to not accept a project that has a score of less than 50 for

availability of resources. As we can see, weighted scoring model can be an important tool in aiding organization in project selection decisions.

	A	B	C	D	E
1	Criteria	Weight (%)	Project 1 Scores	Project 2 Scores	Project 3 Scores
3	Supports business objectives	10%	80	90	50
4	Availability of resources	10%	70	70	50
5	Strong sponsor & customer support	10%	70	90	50
6	Low risk	5%	50	50	50
7	High probability of Success	15%	90	90	50
8	IRR	50%	80	90	50
9	Weighed Project Scores	100%	78	86	50

Table 22.2 Sample Weighted Scoring Model for Project Selection

Conclusion:

A balance scorecard is a strategic planning and management system that helps organizations align business activities to their strategy and goals. This scorecard has evolved over time, and the group estimates that over half of large Organizations use this approach.

23 Plan And Control

The approaches and techniques used to plan and close a project. The scheduling techniques and appropriate presentation of the outputs. The management of risk in the planning, execution and evaluation of a project. The practices and data used for rigorous monitoring to enable proactive control of the project

23.1 Prepare agenda- Invitation and virtual record of a virtual meeting:

In recent months, virtual meetings have become a necessity for organizations of every type because of COVID-19. If virtual meetings are new for our organization, we're probably learning some of the nuances that make virtual meetings different from in-person meetings. Regardless of the type of meeting we're hosting, we'll want to do all that we can to ensure that the participants have the proper notice of your meeting and that they're prepared to present and discuss all topics when they log in. As a virtual meeting presenter, you'll also want to be sure that the participants are actively engaged during the meeting. Virtual meetings give you much control over your meeting time which makes it easier to adhere to designated time allotments. A virtual meeting agenda template will help you to be sure that we are starting and stopping your meetings on time and that they're productive.

Whether we continue using virtual meetings after the pandemic is under control or whether we continue them as a matter of course, this is the time to sharpen skills for hosting virtual meetings.

Here's a virtual meeting agenda to help us to make the transition to a virtual meeting agenda.

For Getting the Most from Our Virtual Meeting Agenda:

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

The invitation has been sent to concern people for attendance.

Virtual Monthly Meeting Agenda For [ABC Company]				
Date:	11/11/2021	Time:	09:00 AM	Link to virtual meeting by ZOOM Meeting: https://explore.zoom.us/en/products/meetings/
For people having questions or having trouble logging in call: Manoj IT 056741522			WEEK NUMBER: 65 Project Progress: 20%	
ATTENDEES				
Name		Position	Email	Phone Number
Saeed Abomadini		Project Manager	S3eed.madini@hotmail.com	0567850233
Ahmed Alghamdi		VP commercial	a.alghamdi@gmail.com	0567776364
Naif Alqahtani		Head of staff	Naif.dh@gmail.com	0551775233

Ibrahim Motasem	Project Sponsor	Ibrahim.mot@gmail.com	0566985410
Moath Alramah	Construction Manger	Moath.Alramah@gmail.com	0556407062
Afnan Alsulim	Business Operation	Afnan.mhj@gmail.com	0567446232
Norah Al mubark	Art director	Norah.mubark@gmail.com	0545000518
Saleh alsultan	Sr. Engineer	Saleh.als@gmail.com	0555148090

Table 23.1 Virtual Meeting Invitation

Agenda	
Subject	Monthly Progress Meeting
Previous Meeting Follow up	• Make sure material has been arrived to warehouse. • Make sure contractor labors familiars with safety regulation
Action Items	• Attendance of new construction manager • Assign project teams to site through disciplines
Next Meeting Agenda	• Mobilization of HVAC sub-contractor • Toolbox meeting for new activities • Vendor approvals for all new materials • Provide Vendor qualification certificate
Announcements	Minutes of meeting will send to all concern staff for information, CC Project manager

Table 23.2 Virtual Meeting Agenda

Attendance sheet will take by attended virtual and opening of system.

23.2 Identify Performance Measurement Course And Submit Reports, In Addition To Explaining The Reason.

Performance measurement is a process by which an organization monitors important aspects of its programs, systems, and care processes. Data is collected to reflect how its processes are working, and that information is used to drive an organization's decisions over time. Typically, performance is measured and compared to organizational goals and objectives. Results of performance measurement provide information on how an organization's current programs are working and how its resources can be allocated to optimize the programs' efficiencies and effectiveness. Many companies in the construction industry to-date rely on traditional performance measures such as Profitability, Return on Investment (ROI), Utilization.

Objective Measures	Subjective Measures
• Construction time • Speed of construction • Time variation • Unit cost • Percentage net variation over final cost • Net present value • Accident rate	• Quality • Functionality • End-user's satisfaction • Client's satisfaction • Design team's satisfaction • Construction team's satisfaction

Table 23.3 KPIs: Objective and Subjective Measures

Table 23.4 below Indicate the Frequency of Use of Other Criteria for Evaluating Performance by Construction

S/N	Criteria for evaluating performance	A	B	C	D	E	Frequency
1	Cost	×	×	×	×	×	5
2	Time	×	×	×	×	×	5
3	Quality	×	×	×	×	×	5
4	Customer satisfaction	×	×	×	×	×	5
5	Safety	-	-	×	×	×	3
6	Profit on project	×	×	×	×	×	5
7	Employee satisfaction	-	-	-	-	-	
8	Supply chain management	-	-	-	-	-	
9	Labor productivity	-	×	×	×	×	4
10	Team work	-	-	-	×	×	2

Table 23.4 Frequency of Use of Other Criteria for Evaluating Performance by Construction

Table 23.4 reveals that the most frequently used criteria for evaluating performance in construction are cost, time, quality, customer satisfaction and profit on project. The table also reveals that construction do not consider employee satisfaction and supply chain management as criteria for evaluating performance of construction.

For Example:

Assume in a project to deliver 10 villas in 10 months at an estimated project cost of \$10,000,000. It is assumed that budget usage and widget production are expected to proceed uniformly over the duration of the project. Also assume that, to **measure project performance**, the EVM index is calculated at the third and seventh months of the project.

On the third month, the project status is as follows:

- Expected number of villas to be delivered = 3 (one villa per month over the course of the 10 months of the project)
- Actual number of the villas delivered = 2
- Actual cost = \$4,000,000

The planned value is calculated as:

- $PV = (\text{total cost of the project apportioned equally over the project duration}) * (\text{actual duration of project to date}) = (\$10,000,000 / 10) * 3 = \$ 3,000,000$

Thus, the actual amount of work delivered (expressed in dollars) is:

- $EV = (\text{number of widgets delivered} / \text{total number villa to be delivered}) * (\text{total cost of the project}) = (2 / 10) \$ 10,000,000 = \$ 2,000,000$

On the seventh month, the project status is as follows:

- Expected number of villas to be delivered = 7
- Actual number of the villas delivered = 8
- Actual cost = \$6,000,000
- $PV = (\$10,000,000 / 10) * 7 = \$ 7,000,000$

The actual amount of work delivered (expressed in dollars) is:

- $EV = (8 / 10) * \$10,000,000 = \$8,000,000$

The table below summarizes these calculations, as well as provides the SPI, CPI and CR for the project.

Project Performance Snapshot							
Month	PV	EV	AC	SPI = (EV / PV)	CPI = (EV / AC)	CR = (SPI * CPI)	Project Performance
Three	3 M\$	2 M\$	4 M\$	0.66	0.5	0.33	Bad
Seven	7 M\$	8 M\$	6 M\$	1.14	1.33	1.52	Good

In contrast to EVM indexes, control charts display process data over time against process control limits. Control limits define the area of three standard deviations on either side of the centerline, or mean, of data plotted on a control chart wherein expected variation is observed. There are three basic components of control charts:

- A centerline representing the mean value of the data points
- Horizontal border lines – upper control limits (UCL) and lower control limits (LCL) – that define limits of common cause variations
- Data points plotted over time

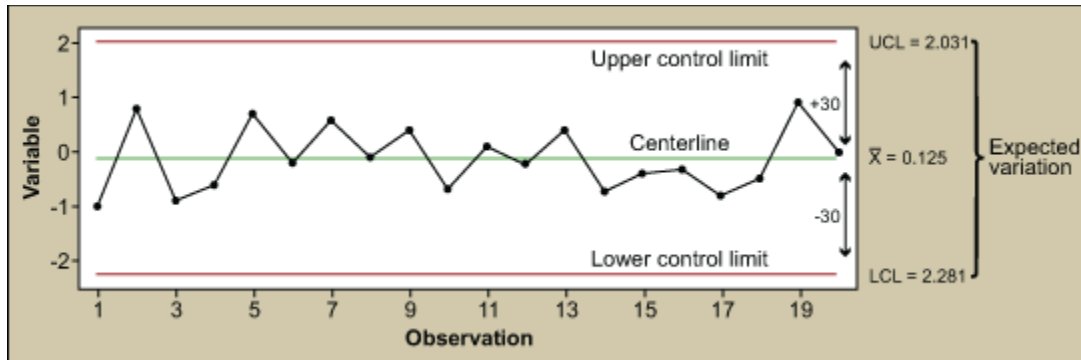


Exhibit 23.1 Standard Control Chart

A control chart is used to determine whether a process is stable. Common cause variation is the predictable and expected variation present in the process due to its inherent nature. Special cause variation is variation introduced in the process by nonrandom events or factors external to the process.

Conclusion:

Constructions are more oriented towards the use of cost, time, quality, customer satisfaction, project profitability, productivity and team work as measures of performance.

23.3 Develop Change Request Model, Including (Impact Analysis- Alternatives Analysis- Recommendation)

Project is all about change and at some point, during the project lifecycle it is highly likely that something in the project plan, business case or project deliverables will need to change. It might be that a change is needed to add a feature to a product, to fix a defect or a mitigating action to manage a risk might require a change to the project approach. Change can happen for many reasons and it is ok for things to change, even with the best laid plans.

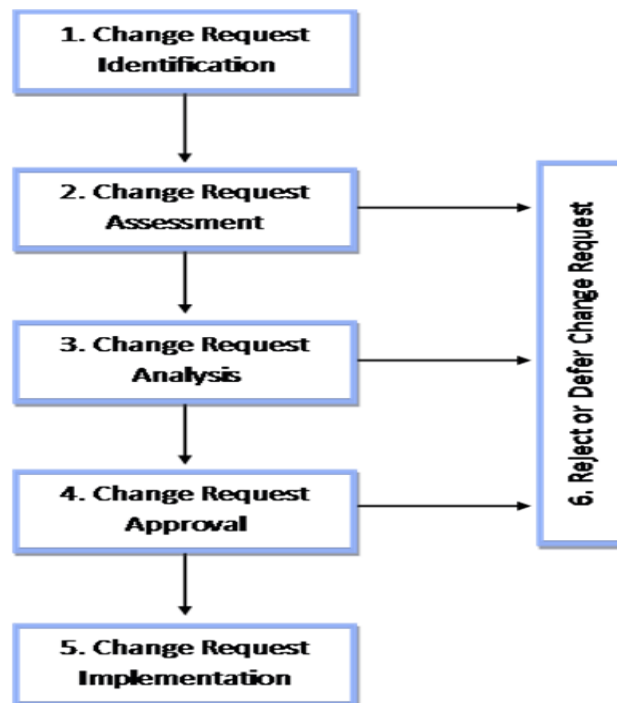


Exhibit 23.1 Change Request Process Workflow

We have approved change request model form below which is using due to change management process as needed.

Change Request

Project Details:		
Project Name: Company's Staff Housing Project reference ID. 5187		
Request: Brown house paint change	Date of Request: 18/11/2021.	Requested By: Project Manager.
Request Description:		
Changing the exterior paint to brown to give a more beautiful view, as well as to show the distinctive features in the buildings. From the perspective of psychology, the brown color, or the color of dirt as many describe it, is a true and stable color, just like the stability of the earth, and it indicates support with a strong sense of duty, responsibility and commitment.		
Reasons for this Change Request:		
The reasons for requesting the change are as follows - Brown paint is not expensive - The remaining paint can be used in more than one location (such as the interior walls of some buildings). - On the aesthetic side, it has a high impact on the souls of the owners. It is widely available and it is not difficult to find it.		
Options Considered To Implement The Change:		
paint type: 1. Glossy exterior paint 2. Flat paint used on exterior walls of the house 3. Satin exterior paints		
Impact of each option (Cost, Scope, Schedule, Quality):		
- The quality will be high, by choosing a paint that is highly resistant to sunlight, humidity and various weather factors. - In terms of time, it takes a week from the request for painting, followed by 15 days to complete the painting process. - The purchase price of the product and the costs of delivery and completion of the process will reach \$ 5000		

Chosen Solution & Recommendation:									
Glossy exterior paints are the most suitable choice Glossy paint finish is the hardest and easiest to clean, but it should be used sparingly, as glossy paint used to cover the entire body of the house would be very good and make your house look like plastic. Moreover, these glossy houses reflect light and will magnify every small flaw in the surface ten times, so it is best to use this heavy-duty paint in places that really need it, such as doors, door frames, windows, handrails, outdoor furniture, etc. Because these paint ends are very smooth, they can be slippery, so if you need to paint floors and steps we can use a floor paint in the finish of choice, at the very least, you should mix some sand into regular glossy paint to add some grit to it (for purposes of safety).									
Approval Signature(s) and Date(s):									
List the Change Request Approvers including name, job title, signature and date. Typically the change approvers will include the: <table border="0"> <tr> <td>• Change Manager:</td> <td>signature and date:</td> </tr> <tr> <td>• Project Sponsor:</td> <td>signature and date:</td> </tr> <tr> <td>• Project Manager:</td> <td>signature and date:</td> </tr> <tr> <td>• Risk Manager:</td> <td>signature and date:</td> </tr> </table>		• Change Manager:	signature and date:	• Project Sponsor:	signature and date:	• Project Manager:	signature and date:	• Risk Manager:	signature and date:
• Change Manager:	signature and date:								
• Project Sponsor:	signature and date:								
• Project Manager:	signature and date:								
• Risk Manager:	signature and date:								

Table 23.5 Change Request Form

• Conclusion

Change management is used for one reason: To ensure business success. Without change management, the risks of missing project objectives, losing productivity, or complete project failure all increase and threaten a business's future. Lacking effective, thorough, and timely change management is extremely hazardous to an organization.

24 Risk And Opportunities

A Risk and Opportunity Register is part of the overall strategy of building a visual workspace. It allows risks and opportunities to be identified and assessed early, and allows the team to apply intellectual capital rather than financial capital to mitigate or avoid risks.

Risk appetite is the amount of risk an organization is willing to take in pursuit of objectives it deems have value. **Our organization states that it will not accept risks that could result in a significant loss of its revenue base.**

Risk tolerance is the amount of deviation from its risk appetite that an organization is willing to accept to achieve a specific objective, based on parameters that include industry and vertical standards. **Our organization risk tolerance is low which will be made conservatively** and will include more low-risk investments and less high-risk investment.

24.1 Identify Risks (Threats) And Opportunities, with Examples:

The Concept of Risk is Although the concept of risk adopted by most authors considers the positive or negative effects of risk on project objectives, most of the tools developed to date are used only to measure and assess threats (negative effects); opportunities (positive effects) are generally not covered by these tools.

We have Six (6) Simple questions to identify risks

Perhaps the simplest and fastest way to identify risks is to ask your stakeholders, project team, Project Board, operations team etc. some simple, open questions:

- What could go wrong?
- What could prevent this from happening?
- What can harm us?
- What is the worst-case scenario?
- What threats do we face?
- What opportunities could we find?

It is worth asking these questions:

- before, during and after the project or initiative
- while reviewing each stage of the project life-cycle
- while reviewing key project documentation:
 - Communication Plan
 - Business Case
 - Project Plan
 - Project Initiation Documentation
 - Requirements

At the start of each project stage or phase.

Use **PESTLE** to find risks Once you have answered the six (6) questions review the headings below and ask "what threats or opportunities could we face?" (Political, Economic, Soci-cultural, Technological, Legal & Environmental).

Common examples of risk (Threats) and opportunities during construction and project management:

Threats	Opportunities
Project purpose and need is not well-defined.	Active Construction Market
Project design and deliverable definition is incomplete.	Closed Management to Construction Site
Project schedule is not clearly defined or understood	Rapid Economic Development
No control over staff priorities	Make Contingency Plan

Table 24.1 Risk (Threats) and opportunities

24.2 Risk Register:

Construction projects are risky business. There are a number of internal risks which can be mostly controlled for; external party risks associated with other stakeholders and companies on projects; and external uncontrollable risks such as market fluctuations which are largely out of your control but can still be mitigated through smart management and planning.

The mechanism or 'form' for managing construction project risks is the risk register. Construction companies and teams outline the risks

associated with a particular project before and during the life of a project in a risk register. The risk register documents the types of risk - along with important accompanying information and data such as:

- The likelihood of the risk eventuating
- The impact of the risk if it does occur

So that you can allocate resources effectively to best manage, mitigate and take preventative measures on these risks.

Risk Register Log:

i d	Risk description	Likeli- hood of the risk occuri- ng	Impact if the risk occurs	Severit- y Rating	Owner Person who will manag- e the risk.	Mitigating action Actions to mitigate the risk e.g. reduce the likelihood.	Contingent action Action to be taken if the risk happens.	Progress on actions	Status
1	Project purpose and need is not well- defined.	Mediu- m	High	High	Project Sponso- r	Complete a business case if not already provided and ensure purpose is well defined on Project Charter.	Escalate to the Project Board with an assessment of the risk of runaway costs/never- ending project.	Business case re- written with clear deliverable s and submitted to the project board for approval.	Open
2	Project design and deliverable definition is incomplete.	Low	High	High	Project Sponso- r	Define the scope in detail via design workshops with input from subject matter experts.	Document assumptions made and associated risks. Request high risk items that are ill- defined are removed from scope.	Design workshops scheduled.	Open

3	Project schedule is not clearly defined or understood	Low	Medium	Medium	Project Manager	Hold scheduling workshops with the project team so they understand the plan and likelihood of missed tasks is reduced.	Share the plan and go through upcoming tasks at each weekly project progress meeting.	Workshops scheduled.	Open
4	No control over staff priorities	Medium	Medium	Medium	Project Manager	The Project Sponsor will brief team managers on the importance of the project. Soft book resources as early as possible and then communicate final booking dates asap after the scheduling	Escalate to the Project Sponsor and bring in back up resource.	Project Sponsor has agreed to hold briefing. Now making arrangements for a meeting	Open
5	Consultant or contractor delays	Medium	High	High	Project Manager	Include late penalties in contracts. Build in and protect lead time in the schedule. Communicate schedule early. Check in with suppliers regularly. Query '90% done'. Ask again and again if they need anything else.	Escalate to Project Sponsor and Contracts Manager. Implement late clauses.	Lead time from each contractor built into the project schedule. Late penalties agreed to and contracts signed.	Open
6	Estimating and/or scheduling errors	Medium	High	High	Project Manager	Break this risk into two: 'cost estimating' and 'scheduling errors'. Use two methods of cost estimation, and carefully track costs and forecast cost at completion making adjustments as necessary. Build in 10% contingency on cost and scheduling. Track schedules daily and include schedule review as an agenda item in every project team meeting.	Escalate to project sponsor and project board. Raise change request for change to budget or schedule. Pull down contingency.	Contingency agreed by Project Board.	Open

						Flag forecast errors and/or delays to the Project Board early.			
7	Unplanned work that must be accommodated	Low	High	Medium	Team Manager	Attend project scheduling workshops. Check previous projects, for actual work and costs. Check all plans and quantity surveys. Document all assumptions made in planning and communicate to the project manager	Escalate to the Project Manager with plan of action, including impact on time, cost and quality.	Team managers attending scheduling workshops.	Open
8	Lack of communication, causing lack of clarity and confusion.	Medium	Medium	Medium	Project Manager	Write a communication plan which includes frequency, goal, and audience of each communication. Identify stakeholders early and make sure they are considered in the communication plan. Use most appropriate channel of communication for audience e.g. don't send 3 paragraph email to Developers, have a call instead.	Correct misunderstandings immediately. Clarify areas that are not clear swiftly using assistance from Project Sponsor if needed.	Communication plan in progress.	Open

9	Scope creep	High	High	High	Project Manager	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.	Document each and every example of scope creep NO MATTER HOW SMALL in a change order and get authorization from the project board BEFORE STARTING WORK.	Scope clearly defined in PID.	Open
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Table 24.2 Risk Register Log

Risk identification is an **iterative** process. As the program progresses, more information will be gained about the program (e.g., specific design), and the risk statement will be adjusted to reflect the current understanding. New risks will be identified as the project progresses **through the life cycle**.

24.3 Qualitative Risk Analysis:

The process of prioritizing risks for subsequent further analysis or action by assessing and combining their probability of occurrence and impact. Qualitative risk assessments express likelihood estimates in nonnumerical terms such as high, medium, low, or negligible. This approach is suitable for the majority of risk assessments, and is routinely used for decision making.

Once we've identified possible risks, the next step is to consider their potential impact.

- Segregate the risks into threats and opportunities.
- Using qualitative risk analysis, estimate the impact of each risk on a scale (low/medium/high).
- Next, estimate the probability of each risk occurring, using a similar scale.
- Finally, take those scores and combine them to create a total risk ranking.

Likelihood	Highly Likely	Risk 5	Risk 1	Risk 9
	Likely	Risk 3	Risk 4	Risk 8
	Unlikely	Risk 7	Risk 2	Risk 6
		LOW	MEDIUM	HIGH

IMPACT (Consequences)

Table 24.3 Risk Assessment Matrix

Qualitative tools and techniques

Expert judgment, data gathering, and data analysis are just some of the qualitative risk analysis tools teams can use. Each has its benefits and drawbacks. Expert judgment provides insight based on similar experiences and is somewhat subjective, while data gathering provides information from stakeholder interviews. Data analysis involves risk

probability (likelihood) and impact, as seen above. Performing a thorough qualitative risk analysis to isolate and prioritize risks, develop strategies to address, monitor, and re-evaluate them, provides our team the confidence. Finally, the qualitative risk analysis helps to identify the main areas of risk exposure.

24.4 Risk Response Strategies:

Risk Response Strategy is an action plan on what we will do a Risk on our project. The main risk **response strategies for threats are Mitigate, Avoid, Transfer, Actively Accept, Passively Accept, and Escalate** a Risk.

- 1. Avoid Risk Response Strategy:** need to do something to eliminate the cause of the threat.
- 2. Mitigate Risk Response Strategy:** do something to reduce the impact or the probability of a threat.
- 3. Transfer Risk Response Strategy:** need to take action to make another party responsible for the risk.
- 4. Accept Risk Response Strategy:** need to develop a (contingency) plan and make reserves for a risk.
- 5. Escalate Risk Response Strategy:** do something to get engagement from a stakeholder who can eliminate or mitigate risk.

ID	Risk Register disc.	Risk Response Strategy	Required Action through Strategy
1	Project purpose is not well defined.	Mitigate	Complete a business case if not already provided and ensure purpose is well defined on Project Charter
2	Project design and deliverable definition is incomplete.	Mitigate	Define the scope in detail via design workshops with input from subject matter experts.
3	Project schedule is not clearly defined or understood	Mitigate	Hold scheduling workshops with the project team so they understand the plan and likelihood of missed tasks is reduced.
4	No control over staff priorities	Escalate	The Project Sponsor will brief team managers on the importance of the project. Soft book resources as early as possible and then communicate final booking dates asap after the scheduling
5	Consultant or contractor delays	Transfer	Include late penalties in contracts. Build in and protect lead time in the schedule. Communicate schedule early. Check in with suppliers regularly. Query '90% done'. Ask again and again if they need anything else.
6	Estimating and/or scheduling errors	Transfer	Break this risk into two: 'cost estimating' and 'scheduling errors'. Assign third party consultant estimator. Use two methods of cost estimation, and carefully track costs and forecast cost at completion making adjustments as necessary. Build in 10% contingency on cost and scheduling. Track schedules daily and include schedule review as an agenda item in every project team meeting.
7	Unplanned work that must be accommodated	Transfer	Attend project scheduling workshops. Assign consultant. Check previous projects, for actual work and costs. Check all plans and quantity surveys. Document all assumptions made in planning and communicate to the project manager.
8	Lack of communication, causing lack of clarity and confusion.	Mitigate	Write a communication plan which includes frequency, goal, and audience of each communication. Identify stakeholders early and make sure they are considered I the communication plan. Use most appropriate channel of communication for audience e.g., don't send 3 paragraph emails to Developers, have a call instead.
9	Scope creep	Avoid	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.

Table 24.4 Risk Response Strategies

What's next? Monitoring Risk.

Once we've identified our risk strategies, we're ready to move forward with project. As the project unfolds, we might discover that we underestimated certain risks and over-estimated others, so don't be afraid to change your assessment and make adjustments as we go. That might include additional risk-reduction measures, or it might involve notifying executives and key stakeholders of risks we didn't anticipate.

Conclusion:

It's okay to make mistakes. Failing to document our mistakes and learn from them, however, is a fatal flaw. The project we implement will provide valuable data and powerful lessons, so be sure to document our findings and communicate them to our team, executive sponsors, and any other departments involved.

25 Stakeholder

A stakeholder is a party that has an interest in a company and can either affect or be affected by the business. The primary stakeholders in a typical corporation are its investors, employees, customers, and suppliers. However, with the increasing attention on corporate social responsibility, the concept has been extended to include communities, governments, and trade associations.

KEY TAKEAWAYS:

- A stakeholder has a vested interest in a company and can either affect or be affected by a business' operations and performance.
- Typical stakeholders are investors, employees, customers, suppliers, communities, governments, or trade associations.
- An entity's stakeholders can be both internal or external to the organization.

25.1 Stakeholder Engagement Assessment Matrix.

Consists of several rows, each of them representing one stakeholder (or a group of homogenous stakeholders, if applicable). The columns indicate the level of engagement. suggests the following classification:

Each stakeholder falls under one of the following five categories, depending on the level of support for the project:

- **Unaware:** Stakeholders are unaware of the project and its potential impacts.
- **Resistant:** Stakeholders are aware of but not supportive of the project.
- **Neutral:** Stakeholders are aware of the project but they don't have an opinion regarding their support for it.
- **Supportive:** Stakeholders are supportive of the project & wish it to succeed.
- **Leading:** Stakeholders are actively engaged in project success and are willing to lend assistance to help it succeed.

Stakeholder	Strength/Interest	Unaware	Resistant	Neutral	Supportive	Leading
Project Sponsor	High/High				C	
Project Manager	High/High				C	C
VP Commercial	Low/High			D		
Customer	Low/Low				C	
Project Team	Low/High		D		C	
Suppliers	Low/Low		D		C	
Quality Team	Low/High				C	

Table 25.1 Stakeholder Engagement Assessment Matrix with Desired (“D”) And Current (“C”) Levels of Engagement Per Stakeholder.

Lessons learned & Recommendation:

Design and construction project for large operating facilities typically include up to types of stakeholders: Project managers and site engineers. Bear in mind that these are project roles and not necessarily titles. Depending on the facility and its size, as well as the complexity of the project, one person might wear multiple hats.

- Project managers (PMs) hire the firm. The project manager may or may not be an engineer or even have a technical background. The PM manages a construction project at the site and is responsible for completing the project on time and under budget. The PM also must control the scope of the project. It is up to the firm to keep the PM aware of design developments or discoveries that could dramatically increase scope.
- Site engineer(s) usually interface most frequently with the firm. These engineers generally identify the need for a project in the first place and provide to the firm a general concept of what the project design will entail.

To execute a successful project, at the very least, all stakeholders must communicate and understand each other and their relative expectations.

Challenges of integrating input from multiple stakeholders into a design can include the following:

- Important stakeholders might not participate at all or might not provide input until very late during design development. The PM must make sure that all pertinent stakeholders take part in the process at the onset of design development.
- Stakeholder review can be perceived by the designers as tacit engineering or design acceptance, or proof of constructability.
- Stakeholders may attempt to add either design or construction scope not within the mandate of the project.
- Stakeholders can change their minds or be replaced between design and construction, making it crucial that input is documented.
- Taking the time to obtain input can be time consuming for both the firm and for the various stakeholders. The PM must also ensure that all pertinent stakeholders participate in the design development process.

Recommendations

The recommendations in this project are summarized as follows:

- **Coordination With Ministry of Housing:** Ministry of housing has plan for widening of homeownership for all citizens and the construction plan needs to be in accordance with the plans of housing owners.
- **Steady and Progressive:** Implementation of Environmental and Social Considerations and the environmental and social requirements to realize ministry of housing support.
- **Construction Safety:** Since the Lake water Portion is located in an area, safety measures should be taken.
- **Operation and Maintenance:** The road of the Project is like an “Industrial Road” with busy freight transport between villas.
- **Risks of Delay and Countermeasures:** Since there are several “Delay Risks”, progress of the works and related activities should be officially monitored and appropriate countermeasure should be taken to avoid or reduce further delay and take the anticipated measures for risks on any delay.

Conclusions

- Design Management is an area of engineering and project management that needs urgent attention, especially when global collaborative projects are to be executed.
- Emergent Changes and Internal Changes were the main causes of design changes on the pre-cast component of the housing project. These were changes made to achieve project objectives, fix deficiencies, to correct errors, and to leverage misunderstandings between different design domains.
- The magnitude of design changes that occurred on the housing pre-cast could not have been expected and planned.
- A design management tool/method would have effectively managed the magnitude of design changes that occurred on housing.
- A design management tool/method could have reduced the likelihood of disputes over design changes.
- Global Collaboration had a big impact on the magnitude of design changes that occurred on houses.
- The Web-based Interface System was the tool most likely to effectively manage design changes on a global collaborative projects like housing other similar global collaborative projects.

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Project Pictures & Lists



Aerial Rendering of ABC Company Housing



Street View along 18m Road Highlighting Pedestrian Amenities



**Aerial View of Neighborhood Clusters with Amenities within
Walking Distance**