

(1.1) Introduction:

What is the first thing you think of when you think of a project ?

Every time you try and make a project there is always one factor that affects the project significantly which is the money, everything depends on money.

That is why it is important to manage the cost in your project.

Project Cost Management takes care of the processes involves planning, estimating, budgeting, financing, funding, managing, and controlling costs and so on so that the project can be completed within the approved budget .

Project Cost Management is primarily concerned with the cost of the resources needed to complete project activities

Because each project is unique, the project manager may need to ask himself some questions to manage the process of the cost management ; Does the organization have a formal knowledge management and financial database or not ? and Does it have existing formal or informal cost estimating and budgeting-related policies ? and if so does it use agile methodologies in managing projects? and how does this impact cost estimating at all ? And so on to manage the cost because in the end every project is different from the other and there can't be a rule that can be implied on all the projects .

Of course, Projects with no foundations like the goal and knowledge or those where the scope is not yet fully defined may not benefit from detailed cost calculations due to multiple changes happening all the time so Instead the usage of lightweight estimation methods can be used to generate a fast, high-level scope of project labor costs, which can then be easily adjusted as changes arise .

Some of the applications of the project cost management are Estimating , developing accurate cost estimates to support spending decisions , planning ,budgeting , resources management and financial control , etc.



(1.2) Plan Cost Management :

Plan Cost Management is the process of describing how the project costs will be estimated, budgeted, managed, monitored, and controlled. This process is performed once or ,if needed, at predefined points in the project

Tools and Techniques :

○ Expert Judgment :

Expertise ,are individuals that you consult ,who have specialized knowledge or training in the following Topics

- They already had Previous similar projects so you can ask the for advice
- They know their way in the industry, discipline, and application area
- Of course they have to know Cost estimating and budgeting

○ Data Analysis :

- A data analysis technique that can be used is alternative analysis .
- Alternatives analysis can include reviewing strategic funding options such as: self-funding, funding with equity, or funding with debt which can make you think in new strategies.
- It can also figure out ways to acquire project resources like making, purchasing, renting, or leasing.

○ Meetings :

Project teams may hold planning meetings to create the cost management plan.

The individuals attending the meeting may be the project manager, the project sponsor, selected project team members, stakeholders, anyone with responsibility for project costs, and other people if needed.

(1.3) Inputs :

- Project Charter :

The project charter provides the already approved financial resources from which the Project costs are developed.

- Project Management Plan :

Include but NOT LIMITED TO :

- Schedule management plan : The schedule management plan creates a schedule that contains the activities for developing, monitoring, and controlling the schedule .
- Risk management plan :The risk management plan identifies the risks and analyzes them in addition to monitoring them

- Enterprise Environmental Factors :

Include BUT NOT LIMITED TO :

- Organizational culture and structure
 - Market conditions describe what products, services, and results are available in the regional and global markets
 - Currency exchange rates
 - Published commercial information such as resource cost rate that track skills and human resource costs and provide standard costs for material and equipment.
 - Project management information system provides alternative possibilities for managing cost.
 - Productivity.
 - Organizational Process Assets :
- Include BUT ARE NOT LIMITED TO :
- Financial controls procedures (e.g., time reporting, required expenditure)
 - Historical information and lessons
 - Financial databases
 - Existing formal and informal cost estimating and budgeting-related policies

Project Charter Example			
Project Name	IVR Project		
Project Sponsor	Dave Sponsor	Project Manager	Alice Michaels
Date of Project Approval	8th Mar 2015	Last Revision Date	17th Apr 2015
Project Description	To introduce a new automated telephone system to ensure all calls get answered.		
Scope	A IVR system will be introduced to assist the sales team in taking orders, and also to ensure no orders are missed. The system is only to help the sales team at this stage, other teams such as support are out of scope.		
Business Case	To increase orders per sales team member by 20% from current levels. To reduce unhandled calls to 0%. To increase customer satisfaction by 10 points.		
Constraints (in priority order)	Time	4 months	
	Budget	4 developers + 1 sales team rep	
	Scope	TBD	
	Quality	Prioritize time & budget over quality	
Project Deliverables	An IVS system to assist the sales team + training for the sales team + support during the first operational month of the system.		
Benefits (measurable results)	See KPIs below + business case above		
	KPI	Baseline	Goal
	Orders per sales person pd	20	24
	Unhandled calls pd	11	0
	Customer satisfaction	17	27
Steering Committee	CEO	Project Team	Sales Rep
	Finance Director		4x developers TBD
	Sales Director		
Key Stateholders	Name	Success Criteria	
Risks	No team members have any previous experience of IVR setup, so there is a chance we've hugely underestimated the work involved.		



Outputs :

- Cost Management Plan :

The cost management plan is a component of the project management plan and describes how the project costs will be planned

The cost management processes, and their associated tools and techniques are documented in the cost management plan.

For example, the cost management plan can establish the following:

- Units of measure where Each unit used in measurements (like staff hours, staff days) is defined for all of the resources
- Level of precision where the money is rounded up according to the project and resources
- Control thresholds
- Reporting formats : The formats for the reports are defined



(2.1) Introduction :

After a lot of thinking and digging in the internet for a three phases industrial project , turns out that the solution was Infront of me all along , which is the manufacture of buildings and homes like it's one of the most important projects so I chose it to be my project .

Buildings serve several societal needs – primarily as shelter from weather, security, living space, privacy, to store belongings, and to comfortably live and work. A building as a shelter represents a physical division of the human habitat (a place of comfort and safety) and the outside (a place that at times may be harsh and harmful).

Ever since the first cave paintings, buildings have also become objects or canvasses of much artistic expression. In recent years, interest in sustainable planning and building practices has also become an intentional part of the design process of many new buildings.

The practice of designing, constructing, and operating buildings is most usually a collective effort of different groups of professionals and trades. Depending on the size, complexity, and purpose of a particular building project .

Objective :

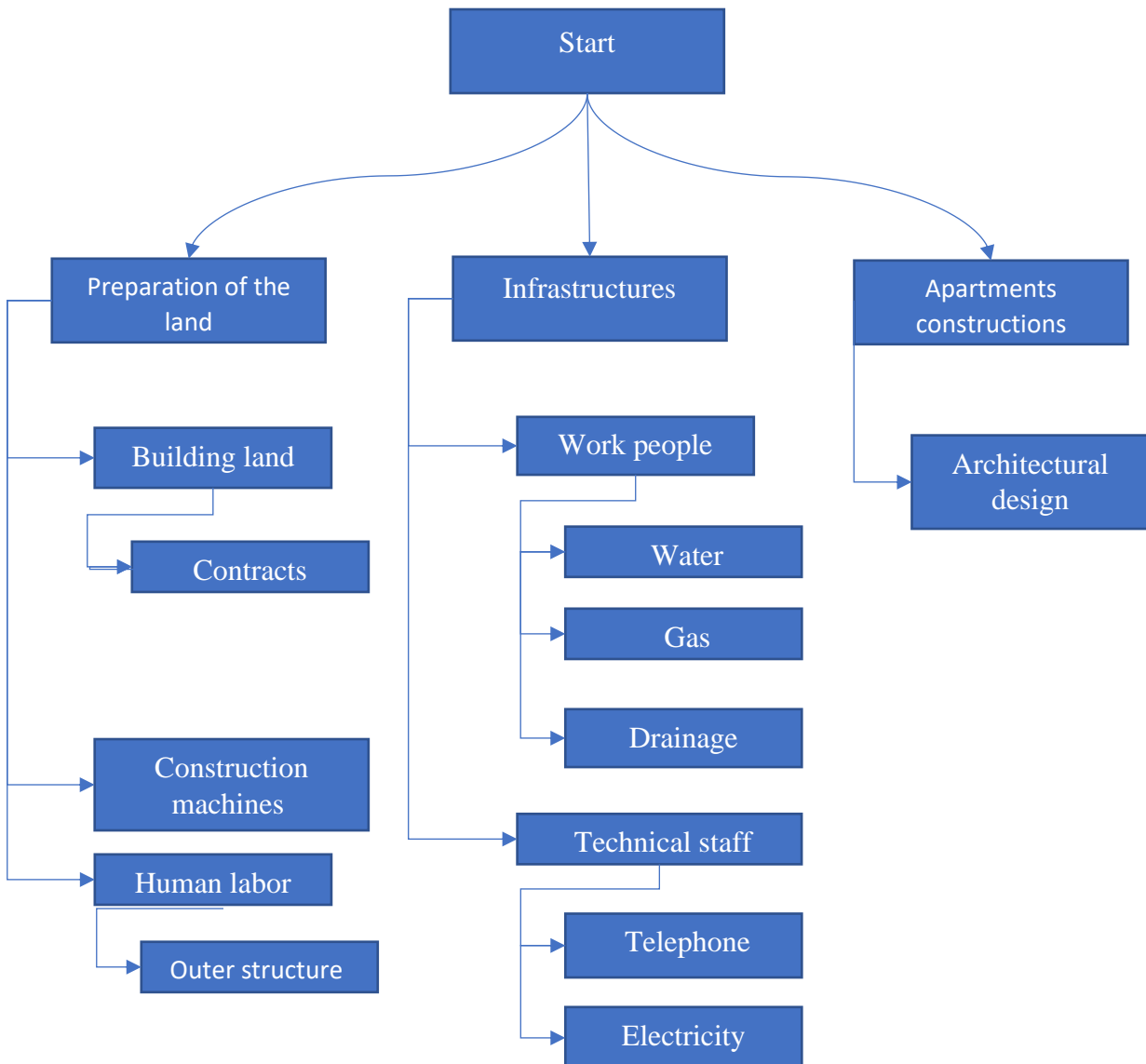
The objective is building a land and constructing its apartments and I assume it's going to be habitable for people in the end to live in them.

It could be residential building where families could live or a complex building foe example educational complex or housing complex



(2.2)

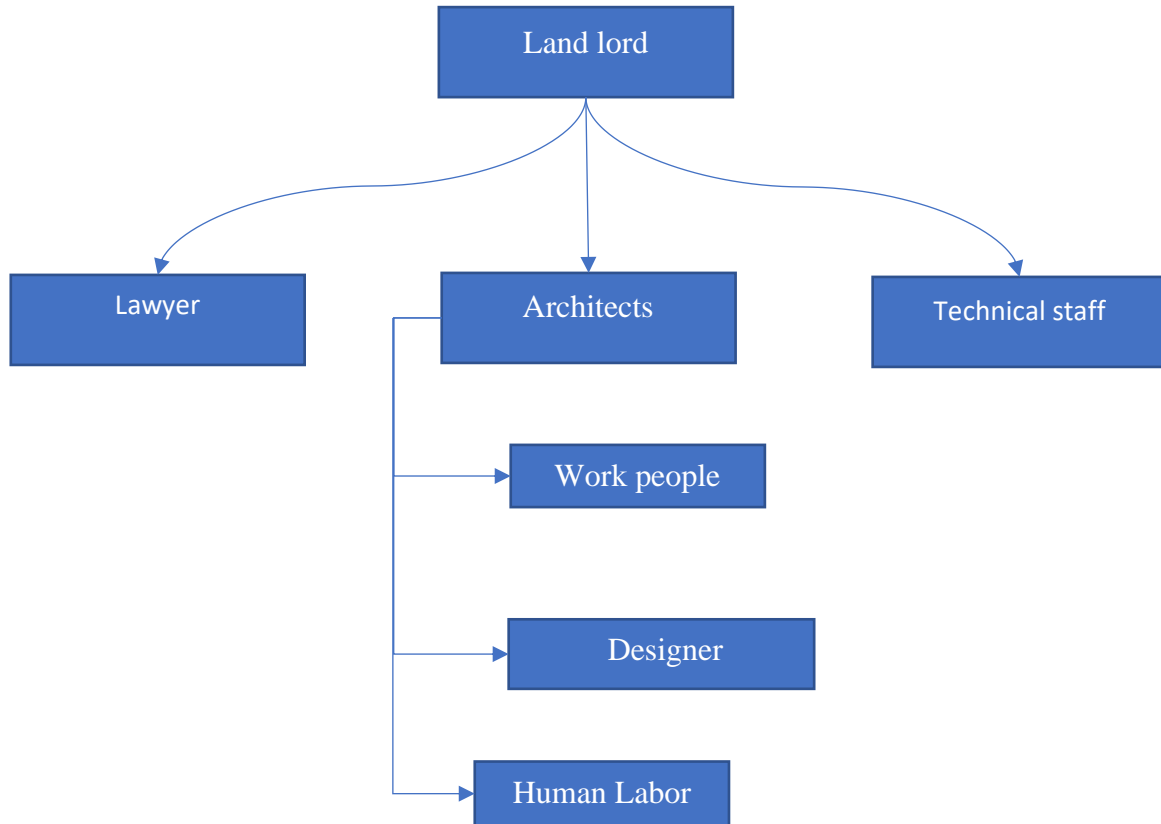
	WBS	Dictionary
1-	Preparation of the land	in this step we prepare the land for building
1-1-	Building land	it is a needed resource
1-1-1-	Contracts of the land	contracts for legalization
1-1-2-	lawyers	for handling the contracts to buyers
1-2-	Construction machines	for digging the base of the building
1-3-	Skilled human labor	for handling the machines
1-3-1-	Outer structure	Building the outer structure of the building
2-	infrastructures	connecting the land to infrastructures
2-1-	work people	responsible for physical human work
2-1-1-	water	connecting water to the land
2-1-2-	gas	connecting gas to the land
2-1-3-	drainage	connecting drainage to the building
2-2-	specialized technical staff	for connecting more difficult things
2-2-1-	telephone cables	connecting cables to the building
2-2-2-	electricity	connecting electricity to the building
3-	apartments construction	construction of the apartments or facilities
3-1-	architectural design	for designing the interior of the apartment
3-1-1-	Designers	for applying the interior design





(2.3) Functional organizational structure :

I chose the Functional organizational structure because it allows employees to focus on their role and is easily scalable in any sized company and employees are organized according to their specific skills and function in the project .





(2.4)

Linear Responsibility chart	Lawyers	Human labor	Work people	Desginers	Architect	Techs	land lord
1-1- getting contracts	1				2		3
1-2- construction machines		1	4		2		3
1-3- hiring human labor	2	6		4	1		3
1-3-1- outer design	4	1	4	2	3		6
2-1- hiring work people	2	4	6	4	1		1
2-1-1- connecting water		2	1	5	3		3
2-1-2- connecting gas		2	1	5	3		3
2-1-3- connecting drainage		2	1	6	3		3
2-2- hiring technicians	2	4	4	5	1	6	1
2-2-1- telephone cables			2	6		1	
2-2-2- electricity			2	6		1	
3-1- interior desgin	6			2	1	3	

1- Primary responsibility

2- Support

3- Must be consulted

4- May be consulted

5- Review

6- Final Approval

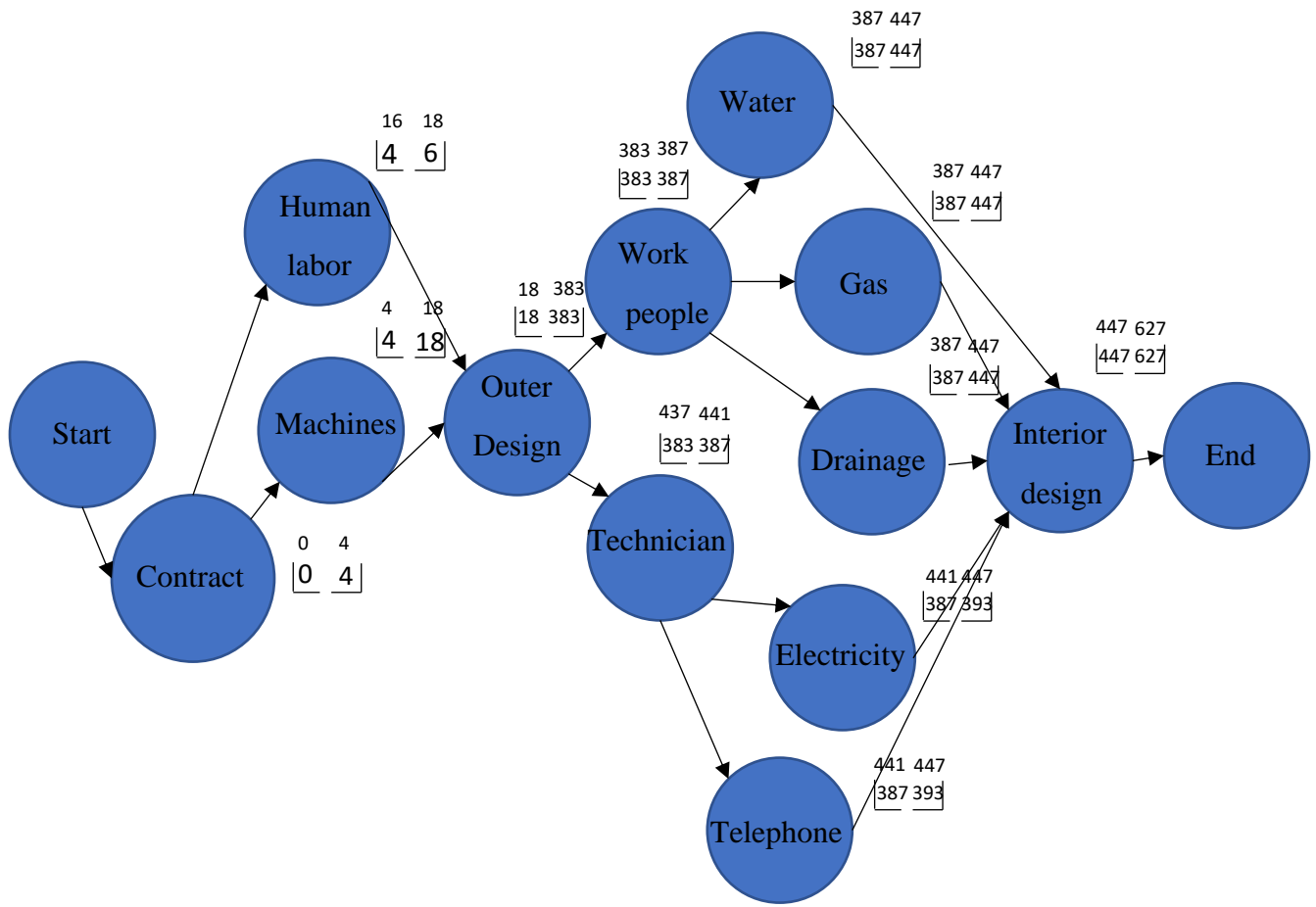
(2.5)

Tasks	Duration	Effort
1-1- getting contracts	4 days	2 days
1-2- construction machines	14 days	7 days
1-3- hiring human labor	2 days	1 day
1-3-1- outer design	1 year	6 months
2-1- hiring work people	4 days	2 days
2-1-1- connecting water	2 months	1 month
2-1-2- connecting gas	2 months	1 month
2-1-3- connecting drainage	2 months	1 month
2-2- hiring technicians	4 days	2 days
2-2-1- telephone cables	6 days	3 days
2-2-2- electricity	6 days	3 days
3-1- interior desgin	6 months	3 months

$$E = 0.75 D - (0.33) 0.75 D \approx 0.50 D$$

I estimated the time in case there were some unplanned interruptions , of course I already assumed that the worker may be interrupted by calls , breaks , etc.

(2.6)



Task	Length	Slack
contract	4	0
machines	14	0
human labor	2	12
outer design	365	0
work people	4	0
technician	4	54
water	60	0
gas	60	0
drainage	60	0
telephone	6	54
electricity	6	54
interior design	180	0

Critical paths are (contract – machines – outer design – work people -gas – interior design),
(contract – machines – outer design – work people -water – interior design),
(contract – machines – outer design – work people -drainage – interior design).



(2.7)

Task	Duration	Start date	Resources (Man power)	kind of resources
contract	4	1-Jan	1	lawyer
machines	14	7-Jan	10	human labor
human labor	2	7-Jan	4	lawyer and land lord
outer design	365	27-Jan	30	human labor
work people	4	22-Jun	2	Architects
technician	4	23-Jun	2	land lord
water	60	28-Jun	10	work people
gas	60	28-Jun	10	work people
drainage	60	28-Jun	6	work people
telephone	6	29-Jun	3	technician
electricity	6	29-Jun	5	technician
interior design	180	20-Sep	20	desginers and work people

Resources sheet :

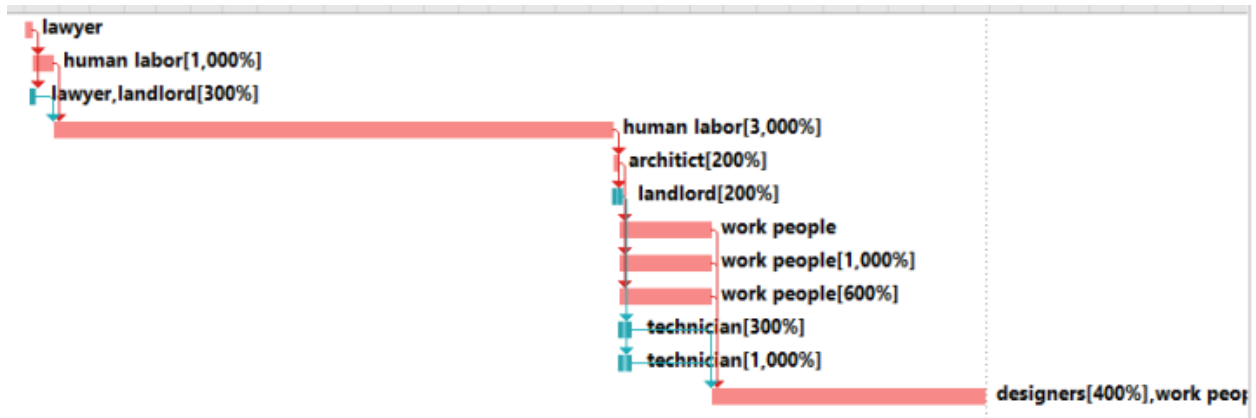
	Resource Name	Type	Max.	Std. Rate	Accrue	Base	C
	lawyer	Work	100%	\$50.00/hr	Prorated	Standard	
	human labor	Work	3,000%	\$17.00/hr	Prorated	Standard	
	architict	Work	200%	\$35.00/hr	Prorated	Standard	
	work people	Work	1,600%	\$25.00/hr	Prorated	Standard	
	technician	Work	500%	\$27.00/hr	Prorated	Standard	
	designers	Work	400%	\$36.00/hr	Prorated	Standard	
	landlord	Work	300%	\$0.00/hr	Prorated	Standard	

Note:

We considered that the employees take a 2-day vacation each week and take a vacation in the holidays

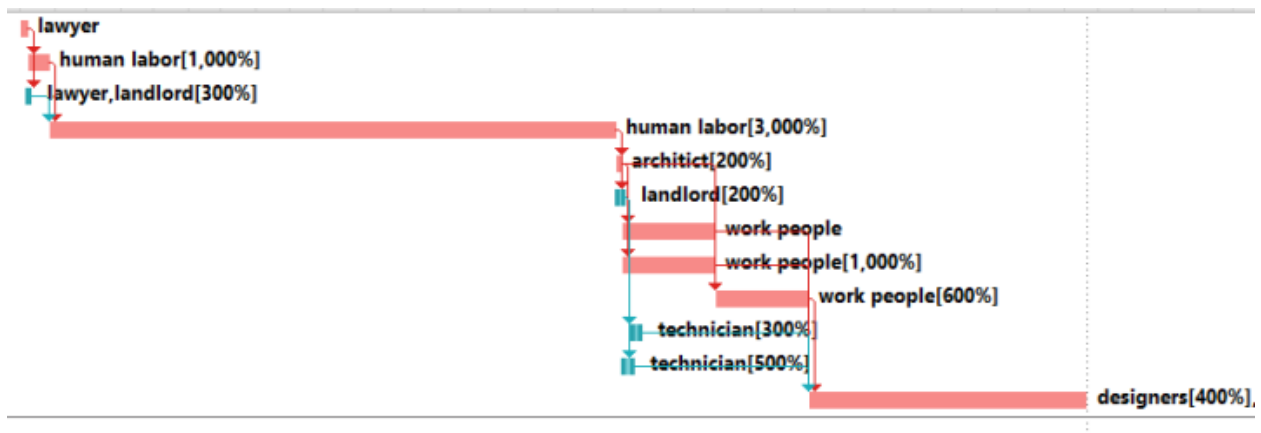


Before leveling :



The end date for the project is 29/5/2023

After leveling :



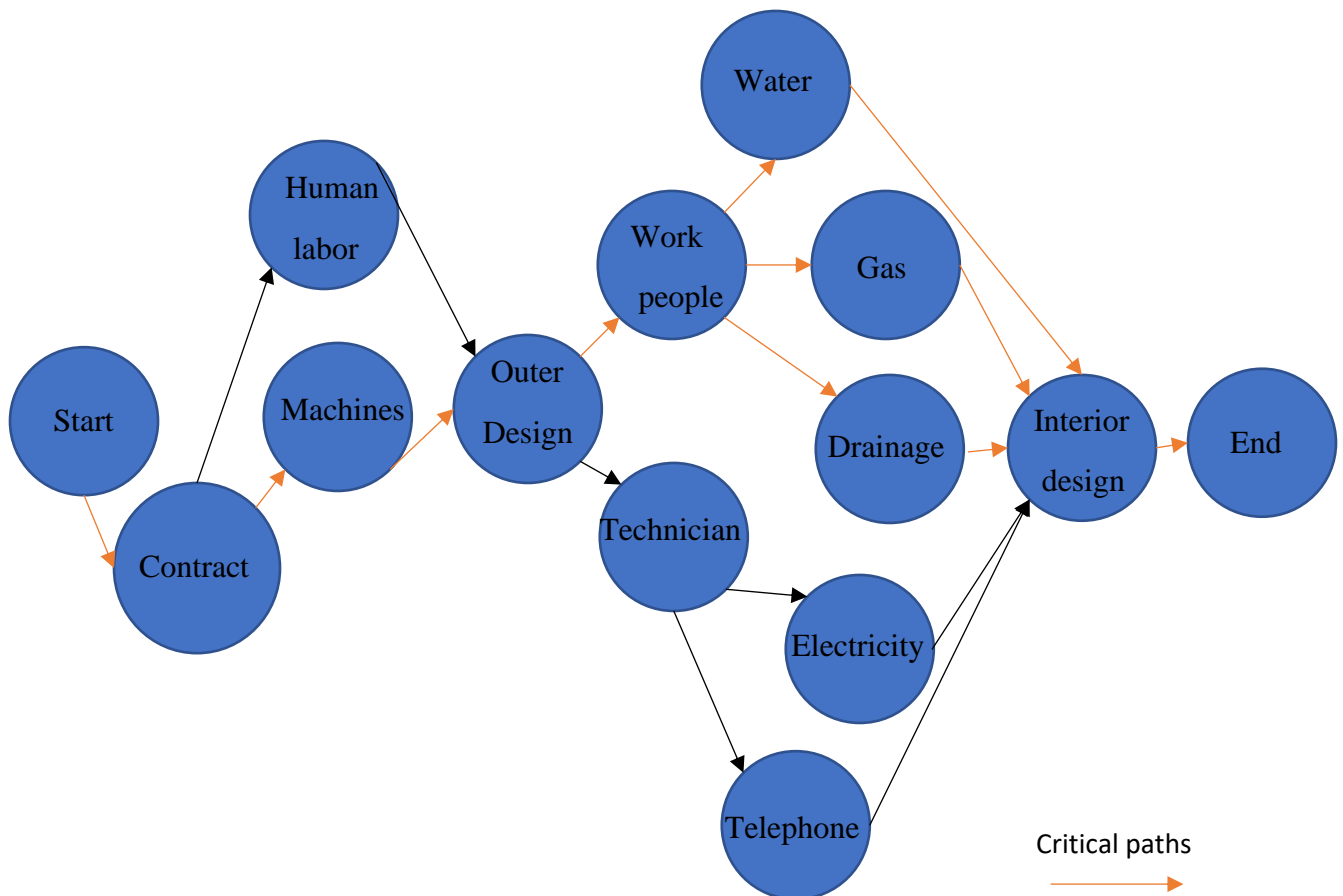
The end date for the project is 21/8/2023

(2.8)

Task	to	tm	tp	te	σ^2	σ
contract	1	4	7	4	1	1
machines	2	14	26	14	16	4
human labor	1	2	3	2	0.1111	0.3333
outer design	200	365	530	365	3025	55
work people	1	4	7	4	1	1
technician	1	4	7	4	1	1
water	30	60	90	60	100	10
gas	30	60	90	60	100	10
drainage	30	60	90	60	100	10
telephone	3	6	9	6	1	1
electricity	3	6	9	6	1	1
interior design	90	180	270	180	900	30

Expected time: $t = (a + 4m + b)/6$ (unit: days)

Variance of times: $v = ((b - a) / 6)^2$ (unit: days)





(2.9)

Task	Normal date	Crash date	Normal cost	Crash cost
contract	4	2	1600	4000
machines	14	2	19000	30000
human labor	2	2	800	800
outer design	365	200	1500000	3000000
work people	4	2	3000	6000
technician	4	4	1000	1000
water	60	30	12000	30000
gas	60	30	10000	25000
drainage	60	30	10000	20000
telephone	6	6	4000	4000
electricity	6	6	15000	15000
interior design	180	140	500000	1500000

- I decreased the time of contract since it is in the critical path , I decreased it by 2 days and increased its cost
- I decreased the time of machines since it is in the critical path , I decreased it by 12 days and increased its cost , I couldn't crash the duration more because of the non-critical task
- I decreased the time of outer design since it lies in the critical path , I decreased it by 165 days and increased its cost
- I decreased the time of work people since it lies in the critical path , I decreased it by 2 days and increased its cost
- I decreased the time of water since it lies in the critical path , I decreased it by 30 days and increased its cost
- I decreased the time of gas since it lies in the critical path , I decreased it by 30 days and increased its cost
- I decreased the time of drainage since it lies in the critical path , I decreased it by 30 days and increased its cost
- I decreased the time of interior design since it lies in the critical path , I decreased it by 40 days and increased its cost

The Final deadline is 26/6/2023 after crashing

(2.10)

Observe the construction work and establish its level of completion , know who you are choosing to work for you , make sure of the quality of the material you buy and use , Verify quality control measures by applicable agencies, architect and engineers, material testing laboratories, and qualified construction inspectors.

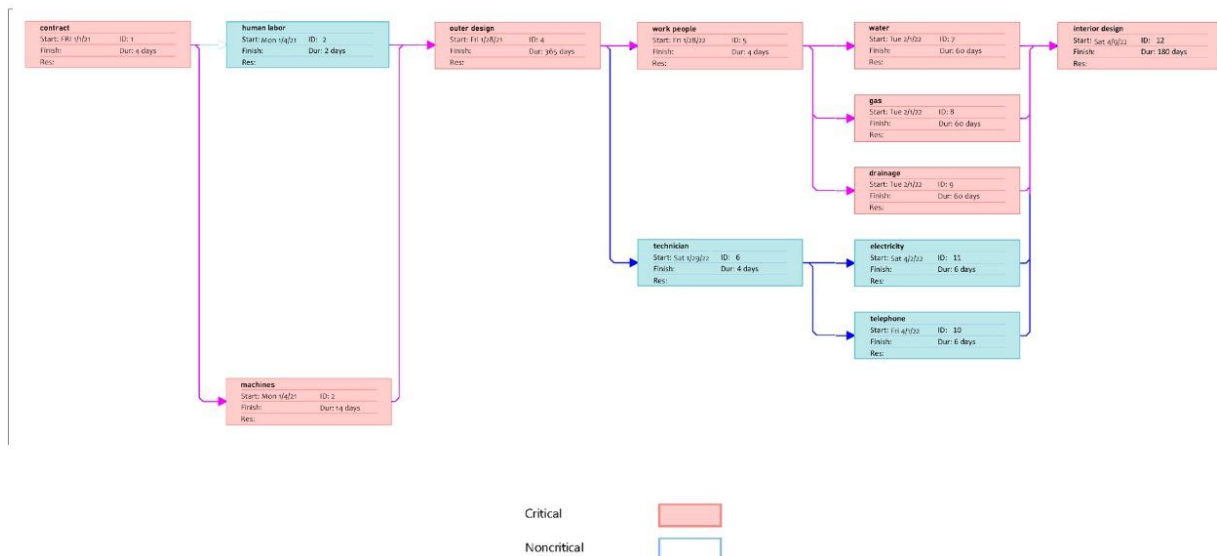
(2.11)

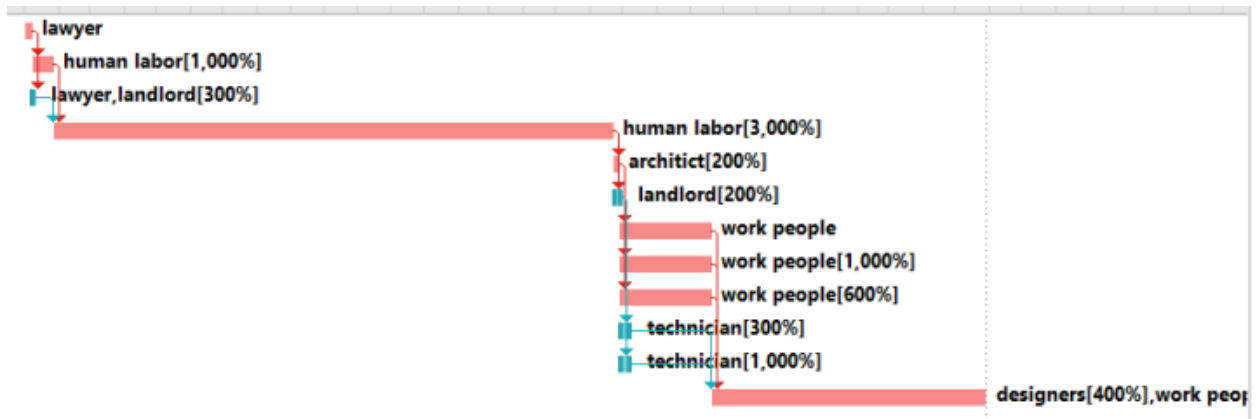
Some problems could happen

An example is what is happening currently which is the virus and the drastic change in weather that used to happen

Of course the known problem for this project in our country and the reason why constructions take so much time is because of the human labor , they take a lot of breaks and they don't go to work in time and so on , and that's is the main reason the construction in our country takes so much time

(2.12)





Task Mode ▾	Task Name ▾	Duration ▾	Start ▾	Finish ▾	Predecessors ▾
★	contract	4 days	Fri 1/1/21		
★	machines	14 days	Mon 1/4/21		1
★	human labor	2 days	Mon 1/4/21		1
★	outer design	365 days	Fri 1/28/22		2,3
★	work people	4 days	Fri 1/28/22		4
★	technician	4 days	Sat 1/29/22		4
★	water	60 days	Tue 2/1/22		5
★	gas	60 days	Tue 2/1/22		5
★	drainage	60 days	Tue 2/1/22		5
★	telephone	6 days	Fri 4/1/22		6
★	electricity	6 days	Sat 4/2/22		6
★	interior design	180 days	Sat 4/9/22		7,8,9,11,10
★?					

references:

- Project management book of knowledge (PMBOK)