



جامعة الجميع الذكية
EVERYONE'S SMART UNIVERSITY

Everyone's Smart University

Project (Spring 2021)

Student Name	Ahmed Ali Ahmed Asiri	اسم الطالب
Students I. D	2021201086	الرقم الجامعي

Section
Course Code

Master
(PMG506)

Date/
Thursday
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Advanced project management

Instructor's Name:
Eng. Dr. Akram M. S. A

Project:

You are required to document your role in administering a project. The project may be set in a business, social, sporting, or family environment but must be of significant size and scale. If you do not have an actual project to write about you may complete the project hypothetically. **This report will be between three to six pages in length.** This is a significant research project.

Your report must address ~~each~~ **ONE** of the following issues:

- 1. Identify and describe the purpose, scope, and objectives of the project. Display this information using an appropriate tool.**
2. Describe how the team is given an outline of the project.
3. Describe the strategies that are going to be set up to maintain communication with the team members.
4. Describe the tools that are going to be used to monitor the goals, time frames, or milestones.
- 5. Identify project milestones and activities. Display this information using an appropriate tool.**
- 6. Create a budget and link the costs to the key milestones for a project.**
7. Describe how you are going to divide tasks and resources amongst a project team. **Display this information using an appropriate tool.**
8. Briefly describe how the progress will be monitored.
9. How are current project records maintained? Who has responsibility for this? provide some recommendations on how this process could be improved.
10. Describe the current procedure for finalizing projects. Create your procedure and identify how you will evaluate the success of the project.
11. Legislation that may affect the project including health and safety, and anti-discrimination legislation.

Best of luck...

Project Title / Build a private residence villa

Abstract:

Building a house is an obsession for many citizens and owning a home is considered an urgent need, although the state provides several facilities, there is still a shortage of land near the urban area that provides very few services, in exchange for high prices, building materials and labor wages, which represent A burden on everyone who wants to build a home.

The research aims to show the skills of the professional project manager on how to use the project management constraints known as the project management triangle (quality, time, and cost) and project them onto a private villa building project to obtain the best possible results for everyone who wants to build a private villa.

Three practical models were presented to get the best benefit for the applicant on building a private villa consisting of two floors and an extension on a total area of 280 square meters deluxe finishing, where the first model is the application of the schedule and an overview of the differences between the available options, which allowed to reduce the time up to 30 % After determining the stages of construction and how much each stage requires a given time. The second model was to control between the level of quality and cost, as decisions depend on the goal of the beneficiary, the required specifications, and any of the construction stages that could be saved, which led to a reduction of the budget of 535 thousand Saudi riyals by choosing sustainable options by 31% of the total cost, and the third model is the application of technique the critical path method CPM which contributed to the reduction of the 21 weeks accounts for 36% of the total schedule.

awareness of these techniques contributes to raising awareness of the approved practices in a way that serves every building owner to exert the least effort and obtain better results (Quality), according to a specific schedule, shorter (time), and a financial cost according to the available and deserving capabilities (Cost).

Introduction:

The stage of housing construction is considered one of the important stages in the life of the Saudi family, which implies the importance of understanding the requirements and determining the priorities in building the house.

Many houses go through a phase of stumbling in the construction stages for a set of reasons, including neglecting an important aspect of the work or not clearly and accurately identifying what is required, and the time and money required to complete the construction of the house was not properly estimated.

In project management, there is a set of constraints that regulate the construction process and they are useful tools, the most important of which is the so-called triangle of project management, which is quality, time, and cost. The three elements that represent the lifeblood of project management were represented by the three sides of the triangle and have a direct and opposite relationship.

One of the useful tools in project management is the use of the CPM technique, which is the Breakdown structure WBS, meaning the Composition of the project into stages and work packages that achieve the best timetable for completing the project and monitoring and controlling the change orders or dealing with risk management.

Introduction to project management:

Project management is one of the modern and advanced sciences that have tangibly contributed to the urban renaissance and the development of projects, and the construction of a private housing villa is one of the forms of project management, and to achieve optimal housing construction, the three sections are the most influential on the construction path, which is quality, time and cost, so it was called (the Project Management Triangle) Because it is considered the most influential sections.

Project management can be defined as the process of applying knowledge, skills, tools, and specific methods to project activities to reach the desired results and expected requirements.

As for the definition of the project, it is a work that must be accomplished and has a known starting and ending point. It is a group of activities interrelated with mutual relations in which a group of resources works side by side with a specific task at a specific time.

Project management is divided into a group of departments and departments, and it is possible to refer to the approved reference book, which is the guide book for the amount of knowledge in Project Management Body of Knowledge - PMBOK, which is a guide book issued by the Project Management Institute and that is every 4 years and is considered an important reference in the field of project management in the world. The Guide to Project Management, which is a reference for the project management specialist certificate, is certified as a standard in the field by ISO and ANSI, and the sixth edition was issued in 2017, which is the latest edition.

Background:

First: There are large numbers of citizens waiting for the opportunity to own a home. One of the main obstacles is financial solvency, poor preparation, planning, and familiarity with project management techniques and employing them appropriately to avoid faltering during the initiation of housing construction.

Second: The importance of awareness in setting priorities about the purpose of the housing because it has an impact on the course of construction and meeting the real need that the homeowner aspires for, according to the three main elements: quality, time, and cost that was represented in the project management triangle.

Third: It is possible to save time, cost, and effort in using CPM technique, as it will achieve the homeowner the best path in the schedule and can control the budget that matches his capabilities to achieve the quality and specifications he desires.

Literature Review:

Stumbling in the stages of building a private housing villa is a recurring phenomenon among citizens and is due to a set of reasons and considerations, including the lack of experience and the lack of information required in how to deal with the stages of building a private housing villa to achieve the required benefits according to specific specifications and standards represented in quality and to be by the allocated budget so that there is a failure to pay financial payments and work according to the specified schedule so that there is no delay in the construction stages and the expected time to receive the house and live in it.

Methodology:

A review of three models to demonstrate the impact of the three elements (the project management triangle) Quality - Cost - Time, and the application of the critical path method:

- 1- The first model, how to control the schedule (time management).
- 2- The second model, how to control quality and cost (quality management and cost management).
- 3- The third model is the application of the critical path technique (time management).

Project Management Triangle:

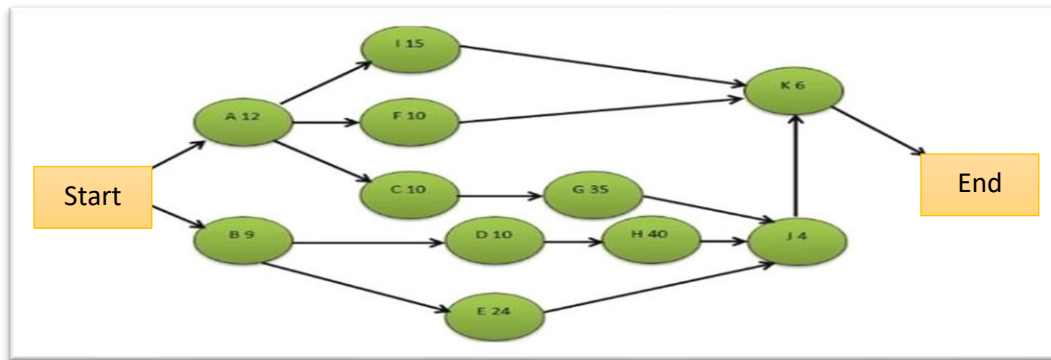
The project management triangle is the most influential section in project management, namely (quality -cost -time), which controls the course of the project and its completion.



Picture No. (1) Project Management Triangle

The direct or inverse relationship depends on the constraint focused on and represents the priority for the beneficiary, who is the owner or the executor that represents the company or contractor that carries out the project More impact.

Critical Path Method:



Picture No. (2) the critical path diagram

The critical path method is one of the important tools in project management, and it is a network-based tool that links project activities and their relationship to what came before and after them. Planning is defined as developing a workflow structure for project activities, while scheduling is concerned with calculating activity variables (example: time, cost, Number of people) while controlling the project is concerned with monitoring the schedule during project implementation and updating and modifying work methods or schedule accordingly.

A critical path is a powerful tool that facilitates project schedule development and resource planning for required projects in the first place. The tasks mentioned in the Critical Path Analysis are those that focus on the timely completion of the project as a whole. It also provides an accurate view of the tasks that can be suspended if resources are required that can be allocated to complete project tasks.

Critical path analysis is a representation of the tasks required to complete the project, the amount of time required to complete each task, and the extent of overlap between these tasks. Projects are usually created and managed using a planning mechanism or tool such as project management software.

Phases of building a private residence villa:

One of the most prominent problems facing the building owner is ignorance of the requirements and specifications related to the construction stages. The following is a brief and simple explanation and description of the stages of building a private residence villa, which is as follows:

Serial No.	Activities	Description
1	Engineering office	The design stage, approval of plans, and issuance of licenses by the concerned authorities
2	Site preparation and excavation work	Receive site boundaries, coordinates, and levels, and carry out required excavation work
3	The black structure	The basic stage in building the house and the most important thing is to define the features of the house, which according to which the uses, services, and rooms are distributed
4	Plumbing works	All that is related to networks and sanitary works such as toilets, sewage networks, and sanitary installations for kitchens with their related water pumps and heaters
5	Electrical Works	Everything related to electric current networks and electrical works, including lighting points, electricity distribution points, an extension of telephone lines, and the Internet.
6	Survey works	Surveying works related to all internal and external facades of the house
7	Air conditioning works	Selecting the air-conditioning company and extending the ducts and distributing them to the rooms of the house
8	the elevator	It is one of the optional works that depend on the need of the house and the available space.
9	Decoration	The aesthetic aspect that shows the features of the house and the divisions and the most important aspect that the eyes fall on permanently
10	Floors	The areas on which the walking path and movement are located and depend on the options and uses according to the type of room and the cost allocated to it
11	Carpentry	Two stages of us are related to the stage of the structural structure and the other in the stage of finishes related to doors, cabinets, and some aspects of home decoration sometimes.
12	Blacksmithing and aluminum works	Blacksmithing is also part of it related to the structural stage in concrete molds, as well as the finishing stage related to iron doors from the house wall and some works related to iron uses such as canopies and the like, as for aluminum it is related to windows and aluminum blinds and sometimes for cabinets and kitchen equipment
13	Painting works	One of the works that take place in the last stages of building the house is based on hiding the faults of the surveyor and choosing the appropriate colors according to the use of the rooms between light or dark colors and ultimately depends on the taste of the user and the owner
14	Interfaces	There are many types of facades of stone, marble, metal cladding, etc., but they depend on the climate and the specifications in force and with the choice of the owner

Table No. (1) A brief and simple explanation and description of the stages of building a private residence villa

Case study:

Three models will be reviewed in this study:

Model No. (1) Practical model for the timetable for building a private residence villa

According to some statistics and practical experience, the attached schedule represents, in a simple way, the timetable for the basic stages of construction for a 280-square-meter residential unit consisting of two floors and an extension to be implemented in a residential suburb in Saudi Arabia according to the attached table:

Coding	Activities	Estimated time per week minimum	Estimated time per week Average	Work starts
A	Engineering office	2	4	0
B	Site preparation and excavation work	2	3	A
C	The black structure	24	40	B
D	Sanitary works	4	5	C
E	Electrical Works	4	5	C
F	Survey works	3	4	D+E
G	Air conditioning works	3	4	C
H	the elevator	2	3	E
I	Decoration	3	4	C+E+F
J	Floors	4	5	D+E
K	Carpentry	2	3	F
L	Blacksmithing and aluminum works	2	3	F
M	Painting works	3	4	D+E+F
N	Interfaces	3	4	F
	Total	61 Weeks	91 Weeks	

Table No. (2) The schedule of construction phases

*** Note:** The time (estimated) according to the work performed according to specifications and works in Saudi Arabia, and is subject to change.

By looking at the above table, all stages are reviewed and focus on what is possible in reducing the time. It is important to focus on two important factors:

- 1- What is the work that requires the most time between all construction work?
- 2- What is the work to which more than one work is related, meaning that it is not possible to start with others until it is completed.

After that, the stages that can be controlled and shorten the time are determined:

First: the engineering office:

- 1- Choosing the engineering office with a good reputation and experience, by reviewing the most prominent projects it has completed and its long experience, and there are no complaints or cases on it.
- 2- What matters to the engineering office is the clarity of what is required, clearly and precisely, and the lack of hesitation in taking decisions and change orders.
- 3- The importance of following up the official and administrative procedures that require prior approval, and some of them may be by review and communication because many transactions remain imprisoned, which I would like to leave without vigorous follow-up, which would reduce the routine administrative time, which in some of them only needs the signature and approval of the official.

At this stage, it is possible to reduce the period from 4 weeks to two weeks.

Second: the black structure:

It is considered one of the most time-consuming stages of construction and it is possible to deal with it professionally by choosing the more dedicated contractor because many contractors work on more than one project and it would cause a lack of focus and the lack of sufficient labor to complete the work in the required time, and accordingly consider the following points:

- 1- Selecting the contractor who has available and skilled labor.
- 2- He does not have many projects, and some of them may be in distant regions.

3- He is distinguished by honesty and integrity. He can be asked about by those who have dealt with him in the past.

At this stage, it is possible to reduce the time instead of 40 weeks to 24 weeks or so, and it is subject to a set of circumstances and data and represents a shortening of time and speed in completion, and also contributes to expediting the completion of the rest of the stages that depend on the stage of the Black Temple.

This applies to all stages, and as a result, in time management it is possible to reduce the construction period from 91 weeks to 61 weeks, approximately 30% of the total time allocated, which is a reduction and an important and useful achievement. You need to study each stage separately and determine the possibilities in reducing the time, some of which require a decision. There are two important factors:

1- Financial: Some cases require payment of additional amounts to reduce the time, which is a motivating factor for the contractor and the workforce.

2- Employment Increasing the workforce and focusing on the specialized and skilled ones.

Conclusion: The timetable is one of the most important and prominent obstacles facing housing projects, and it can be controlled through follow-up, supervision, and appropriate decision-making, and identifying change orders, which are among the biggest obstacles to delaying projects.

Model No. (2) Practical model for the costs of building a private residence villa

The costs are under the requirements in Saudi Arabia, and it is a matter of estimation subject to the conditions of the local and international market, and it is subject to change, but with a limited margin.

coding	Activities	Low cost	Medium cost	High cost
A	Engineering office	10000	15000	30000
B	Site preparation and excavation work	10000	15000	20000
C	The black structure	30000	400000	500000
D	Sanitary works	40000	50000	70000
E	Electrical Works	30000	40000	50000
F	Survey works	20000	30000	40000
G	Air conditioning works	50000	70000	100000
H	the elevator	30000	50000	70000
I	Decoration	20000	30000	50000
J	Floors	30000	40000	50000
K	Carpentry	25000	35000	50000
L	Blacksmithing and aluminum works	20000	35000	50000
M	Painting works	15000	20000	30000
N	Interfaces	25000	35000	50000
Total Price		625000 Saudi Riyals	865000 Saudi Riyals	1160000 Saudi Riyals

Table No. (3) a table of costs for construction stages

The cost depends on the quality. If the quality is low, then the total cost is = 625,000 Saudi riyals, and if the quality is medium, the total cost is = 865,000 Saudi riyals, and if the quality is high, the total cost = 1160000 Saudi riyals.

Through the above table, an assessment of the financial need and capacity to control expenses and reduce the cost to the required level that corresponds to the capabilities of the owner and the beneficiary.

In this respect, two important elements control the decision:

1- Quality (specifications)

2- Cost

Undoubtedly, every building owner wants his house to be of the highest specifications and quality, but the question that arises is, does financial ability allow this, and here the logic of reason controls the estimation of things without exaggerations and realism and is it a real need or exaggerations that go beyond even the level of luxuries, and there are many shreds of evidence. Where many homeowners encountered him after some time after he lived in his new home and approached him, that there are vast areas in the house that are not exploited or of little exploitation, such as those who cost heavily on the guest room using the highest specifications in the quality of finishes and the large area allocated to it that may not be They are used only once a year, while you find that the standard of living and sleeping rooms have modest finishes and small sizes, which are used daily.

By reviewing Table No. (2), it is possible to refer to the most high-cost items and review the most important works that require them to be of a high degree of specifications or possible to accept an average rate that would reduce the cost significantly.

First: Determining the businesses that are acceptable to have a lower degree of quality and savings in their budget.

In this field, some works represent importance, and any malfunction or defect in them in the future costs the homeowner large fees and sums, so they must be of a medium and high degree of quality, namely:

1- Sanitary works, 2- Electrical works, 3- Survey works, 4- Floors, 5- Conditioning.

Second: What are the works that could be renewed in the future more easily and would not affect the building if it was damaged or damaged?

- 1- Carpentry work, 2- Blacksmithing and aluminum works, 3- Decoration
- 4- Painting, 5- The elevator

If the budget is limited, the previous items can be considered and saved, as modification or change in the future does not require high costs.

An important consideration is the view of the beneficiary and the owner of the dwelling for the house that he builds, is it the house of a lifetime in which he will spend the longest time of his life, or is it a transitory residence for a specific stage because it is an important factor in your evaluation of the works to be carried out, for example, some want his children to live in the house It is an important consideration, and some consider housing as a transit station, as they wish to change the area of residence in the future for a set of considerations, and it is a decision that affects the method and specifications of building the house, as it may be satisfied with certain limits, as the house is temporary and not permanent. the available choices:

1- Low quality costs 625,000 Saudi riyals, but it is an option with a large area of risk because maintenance operations and the possibility of breakdowns are expected and will be costly to the owner.

2- Medium quality 86,500 SAR is a balanced option.

3- High quality costs 116,000 Saudi riyals, which is an expensive option and may not comply with the allocated budget and carries exaggerated specifications and less need.

4- The fourth option, which is more balanced than the second option, is useful for those whose budget is limited so that he chooses the least need elements to be of high quality and is possible in the future to be renewed if the budget is available, and it is shown in the following table:

Activities	Low cost	Medium cost	High cost
Engineering office		150000	
Site preparation and excavation work	100000		
The black structure		4000000	
Sanitary works		500000	
Electrical Works		400000	
Survey works		300000	
Air conditioning works		700000	
the elevator	300000		
Decoration	200000		
Floors		400000	
Carpentry	250000		
Blacksmithing and aluminum works	20000		
Painting works	15000		
Interfaces		35000	

Table No. (4) Schedule of construction phases costs (the most balanced choice)

It is possible to exit from the previous table No. (3) with a set of balanced options, so that the total cost = 800,000 Saudi riyals, which is the most appropriate option for those whose budget is limited.

Conclusion: Construction work can be carried out at the lowest cost and quality limits, but it represents a risk that it will result in an expected increase in future expenses and make repairs that may burden the home owner's budget. The owner has expenses that may exceed their original cost, and this implies that the saving areas should be in the least expensive matters in the event of a malfunction or defect.

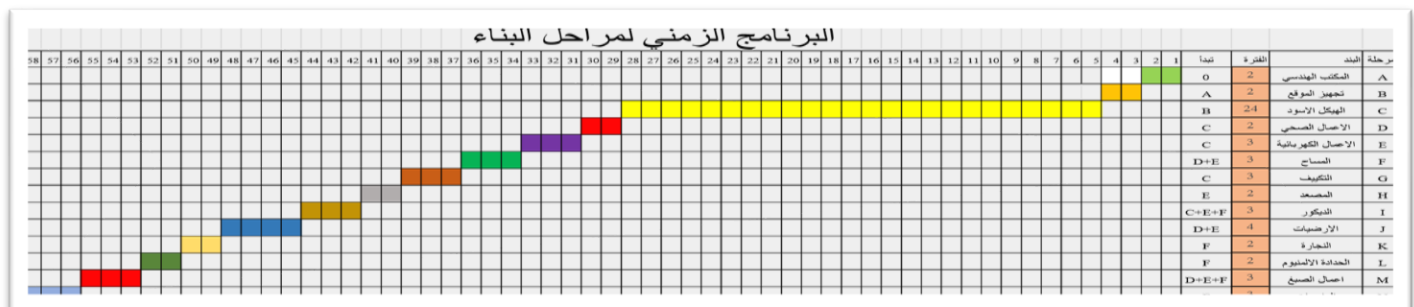


Table No. (5) the schedule before using the critical path method

Model No. (3) applying the critical path method to a private residence villa

The critical path system can be applied after identifying the overlaps between tasks and their impact, more than one task can be performed at the same time, which allows saving time and completing the project in the shortest possible time. Attached table No. (4) shows the construction phases according to the timetable for building a 280 square meter housing unit the building consists of two floors (according to the usual procedures and stages, the period reaches 58 weeks, before using the critical path method.

By referring to Table No. (2), we find that there are intertwined works that are not related to each other, which leads to saving in the time accomplished, namely:

First: Works related to the (structural) black structure, which are:

1- Sanitary works, 2- Electrical works, 3- Conditioning.

Second: works related to electrical and sanitary works, which are:

1- Survey works, 2- Floors, 3- The elevator.

Third: works related to the survey works, namely:

1- paint, 2- Decoration, 3- Aluminum and blacksmithing works, 4- Interfaces.

Conclusion: After implementing the critical path system, the period can be reduced to 37 weeks, meaning that the time was reduced to 21 weeks, which represents 36% of the estimated time, which is a significant period, as shown in the attached table No. (6).

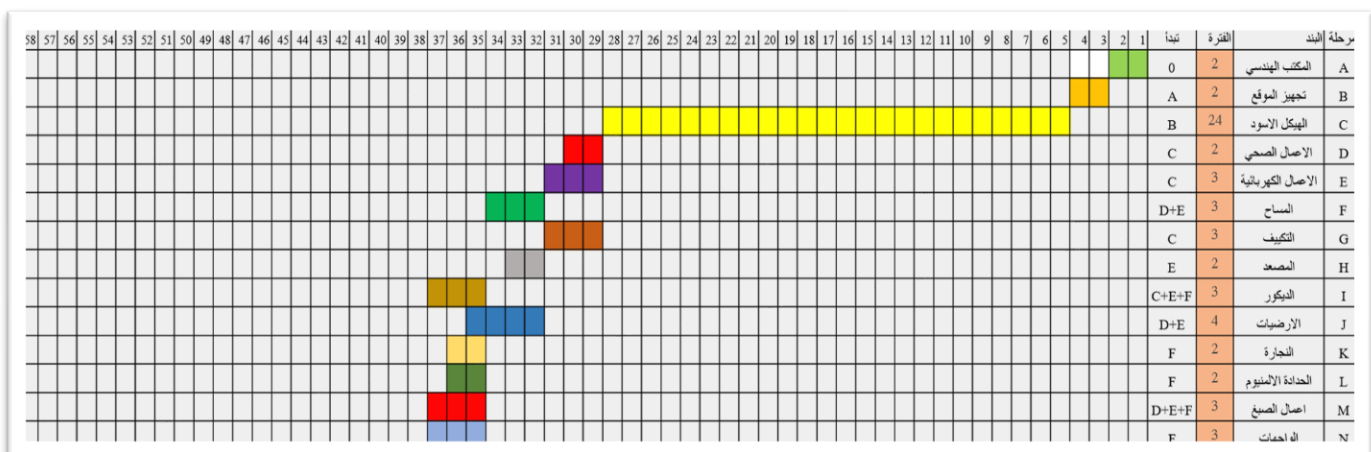


Table No. (6) The schedule after using the CPM critical path method

Results and Discussion:

Based on the above, a summary of the most prominent recommendations for everyone who wishes to build a house that represents the home of a lifetime is as follows:

First: Determining the real and actual need for housing allows avoiding many errors in design and stumbling in the change orders that unfold with time because of the lack of clarity of what is required accurately.

Second: The importance of determining the priorities that the owner or the beneficiary aspires to because it will be the compass that determines the direction of project implementation, as was previously reviewed in the research according to the project management triangle, which are the three main elements (quality - time - cost).

Third: The use of the critical path system, timetables and specification sheets with cost estimation makes the decision-maker the opportunity to make appropriate decisions according to a vision based on numbers, not estimates.

Fourth: Follow-up is important by the owner and not content with paper reports, he must be present from time to time on the site so that he is aware, because not everything that is in the reports is accurate and implemented in reality, and the visit achieves a message for the workers in the project with the interest of the person concerned and communication. One of the motivating factors, as follow-up makes it easy to make timely decisions when any amendment, addition or treatment of any emergency is needed.

Fifth: The importance of balance between capabilities and requirements according to the estimated budget and not to exaggerate and give employers their rights according to the contracts concluded and not to delay payments that significantly affect quality and time accomplished.

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