



جامعة الجميع الذكية  
EVERYONE'S SMART UNIVERSITY

## Everyone's Smart University

### Project (Spring 2021)

|              |                                  |               |
|--------------|----------------------------------|---------------|
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Section

Course

Code

Thursday

Master

Date

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## Advanced project Management

### Instructions:

- اخر موعد للتسليم هو يوم الخميس 2021-05-20 في تمام الساعة ٩ مساءً.
- الإجابة متاحة باللغة الإنجليزية أو اللغة العربية مع مراعاة أن تكون المصطلحات العلمية باللغة الانجليزية.
- يتم تسليم المشروع في صيغة ملف . pdf مع الالتزام نموذج الجامعة ولن تقبل أي مستندات أخرى.
- يجب مراعاة أقسام البحث الرئيسية (مقدمة Introduction، دراسات علمية سابقة Literature Review، طريقة البحث Methodology، النتائج والمناقشة Results and Discussion ، وأخيراً المراجع References . وان كان هناك ملحقات Appendices يتم إضافتها)
- يجب الالتزام بـ Theme موحد كما يلي:
- حجم الخط 12.
- نوع الخط Arial.
- لون الخط أسود.
- المسافة بين الأسطر 1.5 line spacing

## Building - 12 stories

- Introduction

We are real estate company, Our Purpose is Construction building than 6 stories, the purpose of constructing these building is for commercial purpose over 15 years and then sold it to make the full profits. At this time, we need to construction building with 12 stories every story has 2 apartments in Riyadh , the first two stories for commercial offices and the other 10 stories for residential apartments.

My roles and responsibility as a Project manager of this project are to meet the organization and stakeholder requirements and to construct this building with exact time and cost.

Now we are in the planning stage, and we prepare all project management plans (cost, schedule, risk, communication, resources, quality, stakeholder and prepare the Procurement plan ) with the managers.

I choose this stage to talk about because, in this stage, we must know how to do the project and what is the methodology and the processes to achieve the goals and the mission of our organization without planning we cannot do any stages in the right way.

The goal of this research to know the best method criteria to manage the fast track project in this stage and how to achieve the cost effect in our project with our budget and under our mission.

- Literature Review

Concurrent engineering is a production management philosophy that has been widely used in the manufacturing industry over the past several decades to achieve as much as 50% reduction in product development cycle (Bogus et al. 2003).The reduction in schedule is achieved by using concurrent, overlapped processes instead of sequential product and process design. Construction projects executed using the principles of concurrent engineering are commonly known as fast track projects to symbolize the reduction in the total schedule from design to commissioning of the facility. The traditional construction project delivery process is characterized by the sequential execution of front

end planning, design, procurement, construction and commissioning. The front end planning stage and the design stage are executed in a sequential manner, whereas there is some overlap between procurement and construction. The traditional project delivery process is used in design-bid-build projects, as it suits that project delivery philosophy perfectly. The main objective of fast track projects is to leverage the ability to execute many of the activities of the design, procurement and construction phases concurrently in order to compress the schedule. In a typical fast track project, the design, construction and procurement phases overlap significantly. In many cases, the design and construction phases have more than a ninety percent overlap, meaning that construction starts when the design is as little as ten percent complete. The procurement process begins concurrently with the design phase. In the current highly competitive economic environment, there is a significant business need to get the product to the market as quickly as possible. This has led to the widespread adoption of the fast track project delivery philosophy in industrial projects

- The nature of Fast-Track construction

Chapter one, defines what is Fast-Tracking and what are the strategic options for implementing Fast-Track construction. The benefits and economic analysis are also discussed briefly. Chapter two and three considers the management process on a Fast-Track .project and the interrelationships between the management contractor and works contractor. Chapter four, discusses in depth the process of Fast-Tracking organizational structures, client role, planning and programming, quality assurance and financial planning for a Fast-Track project. Chapter five, illustrates the future role of Fast-Tracking in relation to issues such as; marketing effect, the level of client's awareness, acceptable and available standardised form of contracts. The final section of the report - gives general observations of the techniques and suggests the type of organisations best suited for adopting Fast-Track construction.

- Design Impact of Fast-Track Construction

This paper identifies the potential disadvantages of the Fast-Track technique. Problem areas are identified which include; additional steel, elevator shaft, interference, design

errors and electrical design changes. The far reaching effects of mistakes during the early design / engineering phase. Trouble areas requiring special attention have been recommended i.e. design errors and omissions, design changes, coordination between design and construction, coordination between work packages and lack of field work input. Finally accelerating a project through Fast-Tracking is a major decision and construction professionals should be aware of its implications. It has also been shown that unless considerable attention is directed to problem areas especially those related to design, such a popular technique could result in unexpected delays.

- Methodology

I Used multiple methodologies in this project. One of the Gantt charts because it is easy to understand what is the duration of the project, the start date, and finish date, know the milestone, what is the relationship between activities, and what is the WBS (work breakdown structure ) for the project & we can follow up the performance in our project and we can know in this chart the critical path and where we can apply the fast track method and how many resources we need. the other one is Top-Down estimation is a detailed estimate and accurate but it takes too much time to estimate the cost and used three-point estimation with expert judgments for the schedule & I used Primavera software to monitor and follow up the project.

- Results and Discussion

The Gantt chart : we noticed that we have 3 critical path have the same duration , and have more than one near-critical path

The Three-point estimation :

| Duration (mean) day | *ID   | Optimistic | Most likely | Pessimistic |
|---------------------|-------|------------|-------------|-------------|
|                     | Start |            |             |             |
| 120                 | A     | 110        | 120         | 130         |
| 30                  | B     | 20         | 30          | 40          |
| 30                  | B.1   | 20         | 30          | 40          |
| 30                  | B.2   | 20         | 30          | 40          |

|     |        |     |     |     |
|-----|--------|-----|-----|-----|
| 345 | C      | 335 | 345 | 355 |
| 30  | C.1    | 20  | 30  | 40  |
| 50  | C.2    | 40  | 50  | 60  |
| 120 | C.3    | 110 | 120 | 130 |
| 90  | C.4    | 80  | 90  | 100 |
| 20  | C.5    | 10  | 20  | 30  |
| 60  | C.6    | 50  | 60  | 70  |
| 30  | C.7    | 20  | 30  | 40  |
| 60  | D      | 50  | 60  | 70  |
| 30  | D.1    | 20  | 30  | 40  |
| 20  | D.2    | 10  | 20  | 30  |
| 60  | D.3    | 50  | 60  | 70  |
| 30  | D.4    | 20  | 30  | 40  |
| 45  | E      | 35  | 45  | 55  |
| 45  | E.1    | 35  | 45  | 55  |
| 30  | E.2    | 20  | 30  | 40  |
| 20  | E.3    | 10  | 20  | 30  |
| 30  | E.4    | 20  | 30  | 40  |
| 15  | E.5    | 5   | 15  | 25  |
| 60  | F      | 50  | 60  | 70  |
| 45  | F.1    | 35  | 45  | 55  |
| 60  | F.2    | 50  | 60  | 70  |
| 60  | F.3    | 50  | 60  | 70  |
| 120 | G      | 110 | 120 | 130 |
| 90  | G.1    | 80  | 90  | 100 |
| 120 | G.2    | 110 | 120 | 130 |
| 120 | G.3    | 110 | 120 | 130 |
| 28  | H      | 18  | 28  | 38  |
| 15  | H.1    | 5   | 15  | 25  |
| 15  | I      | 5   | 15  | 25  |
|     | Finish |     |     |     |

The Top-Down estimation :

| Cost (Accumulative) | Cost           | Activity name                               | ID    |
|---------------------|----------------|---------------------------------------------|-------|
|                     |                | Project of construction                     | Start |
| SAR 163,852.42      | SAR 163,852.42 | Design , coordination , examination         | A     |
| SAR 163,852.42      | SAR 0.00       | Preparatory work                            | B     |
| SAR 198,852.42      | SAR 35,000.00  | Preparation of construction site            | B.1   |
| SAR 216,982.42      | SAR 18,130.00  | installation of construction equipment      | B.2   |
| SAR 216,982.42      | SAR 0.00       | Main Steps of construction and installation | C     |
| SAR 237,814.75      | SAR 20,832.34  | Pit                                         | C.1   |
| SAR 470,500.94      | SAR 232,686.19 | Foundation                                  | C.2   |

|                  |                |                                                               |        |
|------------------|----------------|---------------------------------------------------------------|--------|
| SAR 1,191,561.64 | SAR 721,060.70 | Building a box at home                                        | C.3    |
| SAR 1,232,474.68 | SAR 40,913.04  | stair flight , grounds                                        | C.4    |
| SAR 1,243,058.68 | SAR 10,584.00  | Refuse chute                                                  | C.5    |
| SAR 1,349,562.76 | SAR 106,504.08 | Roofing                                                       | C.6    |
| SAR 1,501,602.76 | SAR 152,040.00 | Installation and commissioning of elevators                   | C.7    |
| SAR 1,501,602.76 | SAR 0.00       | Finishing works                                               | D      |
| SAR 1,606,361.13 | SAR 104,758.37 | Façade decoration                                             | D.1    |
| SAR 1,629,417.45 | SAR 23,056.32  | Other façade works                                            | D.2    |
| SAR 1,821,544.52 | SAR 192,127.07 | Interior decoration                                           | D.3    |
| SAR 1,860,044.52 | SAR 38,500.00  | Finishing works of common premises                            | D.4    |
| SAR 1,860,044.52 | SAR 0.00       | Installation of technological construction                    | E      |
| SAR 1,935,160.68 | SAR 75,116.16  | Windows , glazing and all doors                               | E.1    |
| SAR 1,965,955.08 | SAR 30,794.40  | Interior doors                                                | E.2    |
| SAR 1,980,470.28 | SAR 14,515.20  | Apartments doors                                              | E.3    |
| SAR 2,026,596.36 | SAR 46,126.08  | Bathroom and other plumbing fixtures                          | E.4    |
| SAR 2,051,796.36 | SAR 25,200.00  | Electric stove                                                | E.5    |
| SAR 2,051,796.36 | SAR 0.00       | Internal networks and communications                          | F      |
| SAR 2,172,101.16 | SAR 120,304.80 | Installation of electrical wiring and equipment               | F.1    |
| SAR 2,408,701.16 | SAR 236,600.00 | Installation of water supply , heating and sewerage system    | F.2    |
| SAR 2,488,501.16 | SAR 79,800.00  | Installation of the other utilities                           | F.3    |
| SAR 2,488,501.16 | SAR 0.00       | Gasket and connection engineering network                     | G      |
| SAR 2,600,218.73 | SAR 111,717.56 | Laying and connection to electrical network and communication | G.1    |
| SAR 2,767,795.06 | SAR 167,576.33 | Laying and connection to water supply and sewerage network    | G.2    |
| SAR 2,898,132.20 | SAR 130,337.14 | Laying and connection to heating networks                     | G.3    |
| SAR 2,898,132.20 | SAR 0.00       | Improvement                                                   | H      |
| SAR 2,903,032.20 | SAR 4,900.00   | Disassembly of temporary structures                           | H.1    |
| SAR 2,914,932.20 | SAR 11,900.00  | Putting the objective into operation                          | I      |
|                  |                |                                                               | FINISH |

Assumption that the contingency reserve is 10% of (total activity cost)

The Cost baseline = Activity costs + contingency reserve = 2,914,932 + (0.1\*2,914,932)  
= 3,206,425 SR

We will distribute all this data to all stakeholders and team to be (buy-in) Via email and put it in the offices, to know all information about the project and to be commitment and each individual in the project know his responsibility and roles.

The communication between the team is very important so, the offices will be collocation offices (open offices) and we will use emails for any letters.

Dissection :

Finally, I got the results from my research and I found that we cant easily plan fast track project to finish our project because we cant use fast track method in project have more than one critical path because it means we have too much risk in this project and we cant use fast track methods in these kind of project .

- References :

- A guide to the project management body of knowledge PMBOK 6 edition .
- Kwakye, 1991 "Fast-Track Construction" CIOB Occasional Papers"
- Fazio, P etc. "Design Impact of Fast-Track Construction"  
Construction Management and economics, 1988, Vol. 5, 195 – 208