

## Reasons for Delaying in Completion Construction Projects in the City of Diwaniyah

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**Abstract:** Recently, the cities of Iraq including the city of Diwaniyah have witnessed massive reconstruction projects, accompanied with marked delays in the completion of these projects. The present study aims to identify the most pressing issues that have caused delays in the delivery time of the projects as well as to reveal all factors affecting the occurrence of these cases in the city of Diwaniyah. It also, aims to avoid or minimise the impact of these factors by investigating their influence from real projects and identifying effective ways to overcome the causes of delays. The study was based on data from 31 completed realistic projects in the city of Diwaniyah from 2005-2014. An analysis of these real data has been conducted to investigate the reasons for owner delays and possible ways to avoid such delays. It was found that the average total rate of reasons associated with the owner was 61.56%. The Additional Events (AE) were the most effective reason for delaying related to the owner at 21.05% which includes political reasons such as sudden holidays. The Difference of Quantities reason (DOQ) which was the second most reason was less than one-fifth (around 18.42%) compared to a rate of appearance equal to 14.2% for the Inaccuracies of Design (IOD). It was also, concluded that more than a third (around 32.52%) of these reasons were under full control of the owner as opposed to 29.04% were out of control.

**Key words:** Reasons of delay, realistic projects, delay rates, delays under control, delays out of control, owner delay

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### INTRODUCTION

Many reasons are causing delays in any project which could be related to the owner. This has called many researchers for further investigation for valid reasons due to their adverse impacts on any construction process. Fraser (2000) conducted research in Australia covering 61 directors of projects. His research aimed to show the influence of the personality of the project manager and the management on the project's success. He also, focused in his work on the importance of selecting cadres and human elements administratively distinguished as a key factor in reducing the delay of the project. Sadi *et al.* (1995) identified the main causes of delays in construction projects in Egypt from three various points of views: contractors, consultants and owners. The resulting list of causes was subjected to a questionnaire survey for quantitative confirmation and identification the most important causes of delay. The causes were discussed based on the type and size of the project. Ndekugri *et al.* (2008) reported in a pilot practice study, the use of new

methodologies in construction contracting organisations in the UK. It was a part of a broader study aimed at developing a framework for better analysis of delay claims. In Iraq Sawsan (2014) examined qualitative and quantitative determinants of risk. She focused on responding mechanism to risk and presented the possible claims arising from risks that cause project's delay using a questionnaire form. The study of Al-Ageeli and Alzobae (2016) included several investigations in various countries of the world. The purpose was to identify all factors causing a time delay in the implementation of a construction project and to determine the importance and weight of each factor. It also identified the statement of the responsibility of each party of the project in the time delay without trying to determine the expected number of day's delay. Santoso and Soeng (2016) inspected the causes and effects of delays in road construction projects in Cambodia. Based on the importance of the factors classified by the contractor, consultant and employer they found that the first ten factors are linked with the contractor and project. Durdyev *et al.* (2017) adopted a

questionnaire survey technique to reveal the main causes of project's delay in the construction industry of Cambodia.

According to what has been summarised, it can be stated that several studies have identified and evaluated causes of project's delays in other countries. The lack of a unified methodology for project management in Iraq led to the failure of companies to complete the projects at the required levels regarding time and cost and even the quality of implementation (Al-Zwainy *et al.*, 2016). Therefore, this study aims to fill a critical knowledge gap by identifying and assessing the causes of delay in construction projects in the city of Diwaniyah, based on data from completed realistic projects. It also, tries to address the most effective factors for optimum and time-effective results. The causes have been used as factors to predict the expected delay by the owner for an additional requested period of work which in turn will help the owner in prediction the actual completion time of the project.

**Research objective:** This research presents the reasons for the delays in the finalisation of engineering projects within the city of Diwaniyah including the investigation of the delay rates. It also highlights the factors effect on the delaying time of the project in construction sector using data from realistic projects. This will be useful for the work to be delivered in more accurate time than the scheduled time based on types and durations of delays. It will also, propose the actual later date for the project to be completed taking into consideration the start period of operation and the reasons for delay that may not be solved, especially in the investment and residential units service.

## MATERIALS AND METHODS

The following methodology has been adopted to achieve objectives:

- Theoretical work: it includes reviewing of national and international published work regarding this investigation
- Field work: it includes stages as follows

The first stage deals with preliminary interviews with engineers. The second stage involves with data description and identification which describes the reasons of delaying projects in the city of Diwaniyah caused by the owner in addition to the

Table 1: Background of interviewees

Interview	Mr. A	Mr. B	Mr. C	Mr. D	Mr. E
Functional position	Dprt. Manager	Proj. Manager	Proj. Manager	Site Eng.	Estimator
Academic qualification	PhD	MSc	BSc	BSc	BSc
No. of engineers	1	2	5	4	5
Years of experience	30	15	11	10-15	10-14
No. of construction projects	14	5	6	5	9

rate of appearance of these reasons. The rate of appearance is calculated from the following Eq. 1:

$$\text{Rate} = \frac{\text{Sum of delaying days related by the type of reason}}{\text{Total delaying days related by the owner}} \times 100$$

The third stage describes the conclusions and future work in the research area.

**Collecting data:** The data of this study is limited to the following limits:

- Time limits: collecting data on construction sector projects that were implemented from 2005-2014
- Spatial limits: local construction project in the city of Diwaniya in Iraq

There were interviews with many engineers to get more information about the type of projects and to provide the necessary facilities through their practical experience. Table 1 shows the background of those interviewees. The data describes the reasons of delaying the projects in the city of Diwaniya that caused by the owner. The data obtained from contract department in the governorate building and engineering department at the University of Al-Qadisiyah and many state departments in buildings sector between the years 2005-2014 (Appendix A).

## RESULTS AND DISCUSSION

### Causes of delay in construction projects in the city of

**Diwaniyah:** The data of 31 completed realistic projects were analysed after collecting detailed information from a range of construction projects within the city of Diwaniyah. The reasons for delaying the projects were classified into six groups according to their relationship with the contractor or the owner:

- Inaccuracies of Design (IOD)
- Difference of Quantities (DOQ)
- Reasons are due to the executing company (COR)

- Expected Risks (ER)
- Administrative Reasons (ADR)
- Additional Events (AE)

The Administrative Reasons (ADR) include:

- Change orders policy
- Delay in advance payment
- Delay in project site delivery
- Delay penalties

While Additional Events (AE) include:

- Political reasons
- Existence of archaeological area
- Weather conditions

The rate of appearance of each factor was determined according to Eq. 1. Figure 1 and Table 2 show the type of cause delay and the rate of its appearance in the building sector that related to the owner. These are critically discussed and highlighted in this study. However, the total delay caused by the contractor (ECR and ER that are represented by COR in Fig. 1 will not be involved as it is outside the scope of this

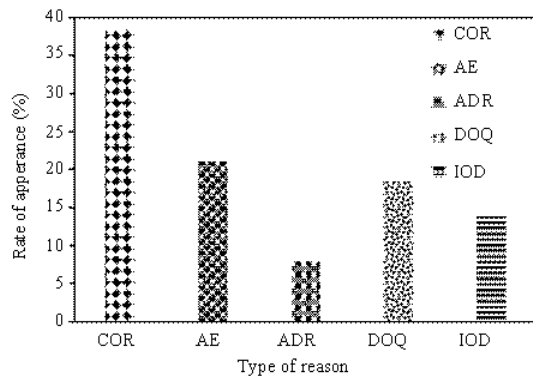


Fig. 1: Type of reason with rate of appearance

research. The other factor COR in Fig. 1 which represents the total delay caused by the contractor (ECR and ER) will not be involved as it is outside the scope of this research.

One objective of the research is to determine the reasons for delaying the projects related to the owner and find their rates of appearance. Table 3 shows all reasons that related to the owner and all their details with the rates of appearance. It was found that the total rate of reasons associated with the owner equal to 61.56%. Furthermore, the Additional Events (AE) which is related to the owner were the most effective reason for delaying at 21.05% that included political reasons such as sudden holidays. The Difference Of Quantities (DOQ) which was the most next reason (around 18.42%) compared to a rate of appearance of 14.2% for the Inaccuracies of Design (IOD) Table 4.

Table 2: Type of reason and rate of appearance

Type of reason	Rate of appearance (%)	Related to
Inaccuracies of Design (IOD)	14.20	Owner
Difference of Quantities (DOQ)	18.42	Owner
Execution Company Reasons (ECR)	28.92	Contractor
Expected Risks (ER)	9.520	Contractor
Administrative Reasons (ADR)	7.890	Owner
Additional Events (AE)	21.05	Owner

Table 3: Type of the reason and rate of appearance

Type of owner reason	Description	Rate (%)	Total rate (%)
Inaccuracies of Design (IOD)	Lack of design	14.20	14.20
Difference of Quantities (DOQ)	Variation in design	18.42	18.42
Administrative Reasons (ADR)	Change orders policy	3.400	7.89
	Delay in advance payment	2.900	
	Delay in project site delivery	1.000	
	Delay penalties	0.590	
Additional Events (AE)	Political reasons	12.000	21.05
	Existence of archaeological area	4.000	
	Weather conditions	5.050	

Table 4: The reason delay type and possible ways to reduce it

Type of owner reason	It includes	Possible ways to reduce the reason	State
Inaccuracies of Design (IOD)	Lack of design	Election of a consultant with experience, efficiency and good reputation when preparing designs	Under control
Difference of Quantities (DOQ)	Variation in design	Election of a consultant with experience, efficiency and good reputation when preparing design	Under control
Administrative Reasons (ADR)	Change orders policy	-	Out of control
	Delay in advance payment	Follow the project resource control programs such as MS project and follow up the schedule with the actual port to determine the completion ratios and pre-monitor the contractor's entitlement accordingly	Under control
Additional Events (AE)	Delay in project site delivery	-	Under control
	Delay penalties	-	Out of control
	Political reasons	-	Out of control
	Existence of archaeological area	Coordination with the Department of Antiquities and the dissemination of areas	Under control
	Weather conditions	The existence of an archaeological area	Out of control

### Possible ways to reduce an owner delays by using (CBR):

Case-Based Reasoning (CBR) defined as the process of solving new problems based on the solutions of similar past problems (Shabniya and Dilruba, 2017). Therefore, identifying the causes of delaying in real old projects helps in providing the necessary solutions to overcome these reasons and reduce the delay rates of new projects. There are many reasons of delay related to the owner in a construction project in the city of Diwaniyah. Some of them under control and the owner can command but others are out of hand because they are under the supervision of central laws and conditions or the control of nobody such as weather conditions. It was found that 32.52% of reasons are under control against 29.04% are out of control. Thus, there are some possible ways to reduce owner delays.

### CONCLUSION

From the results presented in this research the following conclusion can be drawn: the total causes for delaying projects connected with the owner have a rate of

appearance equals to 61.56%. The most effective delay reason associated with the owner was the Additional Events (AE) with just over one fifth per cent rate of appearance (i.e., 21.05%). This reason was followed by the Difference of Quantities (DOQ) with only 18.42% against 14.2% as a rate of appearance achieved by the Inaccuracies of Design (IOD).

A 32.52% of reasons related to the owner was under control and can be commanded in opposite to just under thirty per cent (i.e., 29.04%) of uncommanded reasons (i.e., out of control reason). This delay is due to the lack of a unified methodology for project management in the city of Diwaniyah/Iraq.

### SUGGESTIONS

Reasons of delay in road and bridge projects sector in the city of Diwaniyah. The role of laws and regulations in delaying projects. Prediction model for the real time of construction projects in Iraq.

Appendix 1: Construction projects inside the city of Diwaniyah

Project name	Schedule duration	Location	Total delay	Total percentage of delay to contractual period (%)	IOD (%)	DOQ (%)	ADR (%)	AE (%)	Sum. of delay by owner (%)
Kinder garten	150	Shamia	33.0	22	3.124	4.0524	1.7358	4.63100	13.54320
School	180	Shamia	37.8	21	2.982	3.8682	1.6569	4.42050	12.92760
School	180	Shamia	55.8	31	4.402	5.7102	2.4459	6.52550	19.08360
Inspection department	210	Diwaniyah	65.1	31	4.402	5.7102	2.4459	6.52550	19.08360
Part-school	180	Al-Hamza	46.8	26	3.692	4.7892	2.0514	5.47300	16.00560
School	210	Diwaniyah	42.0	20	2.840	3.6840	1.5780	4.21000	12.31200
Computer Science and Mathematics	210	Diwaniyah	31.5	15	2.130	2.7630	1.1835	3.15750	9.23400
Home baby	150	Diwaniyah	13.5	9	1.278	1.6578	0.7101	1.89450	5.54040
Multi-purpose hall services	180	Diwaniyah	9.0	5	0.710	0.9210	0.3945	1.05250	3.07800
Part-school	180	Al-Hamza	48.6	27	3.834	4.9734	2.1303	5.68350	16.62120
Faculty of education	150	Diwaniyah	13.5	9	1.278	1.6578	0.7101	1.89450	5.54040
Animal house building	240	Diwaniyah	25.3	11	1.562	2.0262	0.8679	2.31550	6.77160
School	210	Salahia	126.0	60	8.520	11.0520	4.7340	12.63000	36.93600
Afak Primary School	150	Afak	112.5	75	10.650	13.8150	5.9175	15.78700	46.17000
School	230	Diwaniyah	25.3	11	1.560	2.0260	0.8670	2.31550	6.77160
Primary School	275	Diwaniyah	44.0	16	2.272	2.9472	1.2624	3.36800	9.84960
Central preparatory building	360	Diwaniyah	50.4	14	1.988	2.5788	1.1046	2.94700	8.61840
Specialised centre for diseases	300	Diwaniyah	90.0	20	4.260	5.5260	2.3670	6.31500	18.46800
Primary school	360	Ghammas	75.6	21	2.982	3.8682	1.6569	4.42050	12.92800
Secondary school	360	Al-Hamza	46.8	13	1.846	2.3946	1.0257	2.73650	8.00280
Primary school	360	Diwaniyah	104.4	29	4.118	5.3418	2.2881	6.10450	17.85240
Primary school	360	Al-Askari	72.0	20	2.840	3.6840	1.5780	4.21000	12.31200
Primary school	300	Al-sader3	48.0	16	2.272	2.9472	1.2624	3.36800	9.84960
Central stores	300	Diwaniyah	54.0	18	2.556	3.3156	1.4202	3.78900	11.08080
University presidency phase I	360	Diwaniyah	21.6	6	0.852	1.1052	0.4734	1.26300	3.69360
Primary school	360	Al Hamza	198.0	55	7.810	10.1310	4.3395	11.57750	33.85800
Primary school	360	Imam Ali Village	151.2	42	5.964	7.7364	3.3138	8.84100	25.85520
Building of the Integrity commission	360	Diwaniyah	36.0	10	1.420	1.8420	0.7890	2.10500	6.15600
College of Arts	500	Diwaniyah	65.0	13	1.846	2.3946	1.0257	2.73650	8.00280
Course section in Arts college	550	Diwaniyah	60.5	11	1.562	2.0262	0.8679	2.31550	6.77160
Student club-law Faculty	400	Diwaniyah	64.0	16	2.272	2.9472	1.2624	3.36800	9.84960

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