https://doi.org/10.22306/al.v10i1.351 Received: 03 Nov. 2022; Revised: 28 Jan. 2023; Accepted: 06 Feb. 2023

The management of construction projects in Iraq and the most important reasons for the delay

Layth AL musawi
Altinbaş University, Civil Engineering Department, Dilmenler Caddesi Mahmutbey Yerleşkesi No:26, 34218 Istanbul, Turkey, ORCID 0000-0002-2562-3429, 203724545@ogr.altinbas.edu.tr, Laitha09@gmail.com (corresponding author)
Sepanta Naimi
Altinbaş University, Civil Engineering Department, Dilmenler Caddesi Mahmutbey Yerleşkesi No:26, 34218 Istanbul, Turkey, ORCID 0000-0001-8641-7090, sepanta.naimi@altinbas.edu.tr

Keywords: delaying construction, delaying project time, management, logistics, projects.
Abstract: In Iraq, there is a vast construction movement. Still, it is accompanied by many problems, the most important of which is the delay in completing projects during the specified time. The time must be optimized by adopting the leadership practice and dedicating it to the benefit of performing the process and functions of the project. The research aims to identify the most important reasons and factors that affect the project delivery process within the specified period. The investigation initially dealt with the most important previous studies, on this subject, by researchers, then touched on the concept of construction projects, their types and details. A questionnaire containing reasons for the delay was identified and divided into several items. It concluded that the most common reasons for delays are delays in laboratory testing of materials, assignment of works to the lowest bidder, contractors' financial incompetence, and high building materials prices. The most crucial factor is to streamline building material inspection procedures, set up inspection laboratories on several occasions and assess the contractor's effectiveness and ability to implement before the project is referred financially. Organizations and individuals should coordinate their work between the construction departments to prevent any issues that may arise during completing tasks.

1 Introduction

The main objectives of this study are to identify the root causes behind time overruns on construction projects in Iraq. The building industry is one of the essential areas for a country's economic development [1]. Construction projects in Iraq, like those in other countries, necessitate a wide range of resources, including labour, funds, equipment, machinery, materials, and technical expertise. This puts building projects at risk of delays and cost overruns [2]. Whether it's simple home construction, multistory flat residences, or civil engineering projects, all projects have completion deadlines [3]. However, the primary purpose of this research is to identify the variables that contributed to delay from the employers' perspective to assist them in setting proper evaluations in future contracts via the use of quantitative data gathered in this article. Delays are rather usual. It is critical to ensure that the project is completed on schedule. It is one of the most important requirements of clients in the building industry [4]. The amount of time allotted for a construction project's completion is essential for both the project owner and the project contractor. Delays and the inability to complete work on schedule are the prime sources of construction conflicts. Time delays are common and are virtually always related to construction projects [5]. Economic crisis, poor management, ineffective design, financial corruption, lack of contractor experience, inefficient scheduling, changes in legislation and government Regulations, a lack of application of modern technologies, poor working conditions, delays, a lack of planning, and poor project safety planning are some factors contributing to unfinished projects in the Iraqi construction industry [6]. After the invasion of Iraq in 2003, the Iraqi economy experienced several crises. Destructive policies were implemented, which worsened the situation after the civil war in 2006 and the financial crisis in 2008, which led to fluctuating oil prices that hurt the environment for construction projects [7]. The most critical factors affecting construction projects in Iraq are terrorism and its impact on worker and equipment safety. Terrorism has become a significant issue in world politics and threatens construction, particularly in countries like Iraq, where fighting and wars are common. These issues will have a substantial impact on the performance of construction projects.

2 Literature review

There are several construction project delays based on who is responsible for them. Compensation for a short delay, customers' actions or inactions may be to blame for this form of hold-up. Contractors are entitled to additional time and reimbursement for delays if they face this issue. In the case of the client's architect, the late release of drawings is an example [8]. Excusable lateness without remuneration is also responsible for the delay in the project. This type is brought on by third parties or events outside the client's and contractor's control. Unexpected weather, strikes, fires, and government acts in their

sovereign role are common examples [9]. A thorough literature analysis and survey of Iraqi project participants was conducted to learn more about the most common reasons for delays in public works projects. According to the literature research and pilot study, 65 reasons were divided into four categories: client-related, contractor-related, consultant-related, and external variables [10]. They concluded that the most significant causes of delays in Iraqi public projects were the security measures, government changes to rules and bureaucracy, official and unofficial holidays, the poor performance of lowest bidder contractors in the government tendering system, design changes made by the owner and consultants, delays in the owner making progress payments, issues with the local community, and the owner's lack of construction experience. Kazaz et al. [11] used a questionnaire to survey 71 enterprises operating in Turkey. The analysis concluded that out of 34 factors impacting project time, design and material changes were the most important, followed by payment delays and cash flow issues [11]. Abd El-Razek et al. [12] investigated the reasons for construction project delays in Egypt. The most common causes, according to the research, include contractor financing during construction, delays in owner payment to contractors, design modifications by the owner or his agent during construction, partial payments during construction, and non-use of expert construction/contractual management. Two studies have been conducted in Jordan. Sweis et al. [13] investigated the reasons for construction delays in residential projects. They found that the contractor's financial issues and the client's many change orders are the most common causes of delays [13]. Al-Momani performed the second research, which looked at the reasons for delays in 130 public projects in Jordan, including housing, office and administration buildings, school buildings, medical centres, and communication infrastructure. According to the study, the most common delays in public buildings are connected to the designer, client changes, weather, site circumstances, late deliveries, economic situations, and increased quantity [14]. Kaming et al. investigated the elements influencing the construction of Indonesia's high-rise structures. The study discovered that design modifications, low worker productivity, poor planning, and resource limitations are the main causes of delays. Two studies, one on Saudi Arabia and the other on Libya, are used as the literature review of emerging countries [15]. Shebob et al. [16] investigated the effects of delays in Libyan building projects by identifying and evaluating the elements that cause delays. Libyan construction projects discovered low workforce skills, changes in the project scope, slowness in issuing instructions, and other crucial variables. The significance of the data was tested using statistical methods, and the findings were confirmed to be significant [16]. Assaf et al. [17] obtained the reasons for delays in Saudi Arabian construction projects. Across nine primary categories, the researchers collected data on 56 different reasons. Customers, consultants, and contractors were all included in the poll. Assaf et al. [17] also did a time performance assessment in Saudi Arabia to identify the importance of each project participant (client, consultant, and contractor). During the investigation, they discovered 73 reasons for delays [17]. Zack defined delay as an act or event which extends the required time to perform or complete work of the contract and manifests itself as additional days of work. The main causes of delay were identified as a designer, user changes, weather, site conditions, late deliveries, economic conditions, and an increase in quantity (i.e., poor design and negligence on the part of the owner, change orders, weather, site conditions, late deliveries, economic conditions, and an increase in quantity). According to the report, paying close attention to these delay causes will aid industry practitioners in reducing contract conflicts. Delays are also significantly linked to contractor failure and inefficient performance [18]. Momani [19] offered a detailed evaluation of 130 public projects, including residential, office, hospital, school, and communication facilities. Poor design, change orders, weather circumstances, site conditions, late delivery, economic conditions, and an increase in quantities were all major causes of delays in the research. The Pourrostam et al. [20] research was conducted used an essential index scale to investigate sixty-four reasons for delays in Lebanon's building sector. Financing and scheduling of subcontractors, poor contractual ties, and design modifications by owners were identified as the most significant delay causes. The researcher proposed value engineering and creative management strategies to improve efficiency and effectiveness [19] and identified the primary causes and repercussions of delay in Iranian building projects, identifying the (10) most important reasons for a delay from a list of (27) distinct sources of delay that contribute to (6) various delay effects [20].

3 Methodology

3.1 Description of the individual survey

This study intended to choose a research sample from surveyed individuals with experience and know-how in completing construction projects. The aim is to benefit from the accurate and helpful information provided by them and obtain ideas that enhance the importance of the research. In line with that, the authors of this study began distributing 62 forms that included engineers and workers in construction projects, and 50 valid responses were obtained for analysis, meaning that the response rate was 81%.

3.2 Analytical tools

The analysis relied on a set of statistical methods and means for data processing, tabulation, and scheduling and the responses contained in the questionnaire in proportion to the number of sample members [21]. The statistical program statistical package for the social sciences (SPSS)

was also used. It reviews the mathematical details of the tools used in the current research:

1. Repetitions: review the answers of the respondents.
2. Arithmetic mean: to display the average of the answers for a particular variable, which is a sum value for their number.
3. The standard deviation shows the degree of dispersion of the answers from their arithmetic means.
4. Percentage: A mathematical expression that shows the percentage of answers for a given variable.
5. The Kendall correlation coefficient [22] reveals the correlation between two variables for non-parametric studies. It is a preferred coefficient because it modifies and treats the abnormal values in the respondents' answers.
6. Simple Regression Coefficient: to measure the effectiveness of an independent variable on a dependent variable.
7. The f-test shows each variable's effectiveness and verifies the signature of the functional relationship between the variables.

3.3 Description of the individuals surveyed

The investigation aimed to select a research sample from individuals surveyed who have experience and knowledge of completing construction projects and their requirements. This was done to ensure that accurate and helpful information is provided and to obtain ideas and suggestions that enhance the importance of the research. In line with that, the researcher began distributing 62 forms that included engineers and workers in construction projects, and (50) valid records were obtained for analysis, meaning that the response rate is (83%), and Table 1 shows the characteristics of the individuals surveyed in the construction projects.

Table 1 Characteristics of the research sample

Distribution of the respondents according to gender															
male								female							
number				%				number				%			
44				88%				6				12%			
Distribution of the respondents according to age groups															
From 25-29				From 30-39				From 40-49				From 50-59		<60	
NO.		%		NO.		%		NO.		%		NO.		%	
8		16%		21		42%		15		30%		5	10%	1	2%
Distribution of the respondents according to years of service															
1-5		6-10		11-15		16-20		21-25		26-30		>31			
NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.		%	
10	20%	10	20%	5	10%	10	20%	10	20%	4	8%	1		2%	
Distribution of the respondents according to academic achievement															
Doctor				Master				Bachelors				Diploma			
NO.		%		NO.		%		NO.		%		NO.		%	
-		-		1		2%		2		4%		47		97%	

4 Analysis and findings

The answers to the researched variables are described and interpreted in the light of the data and information that was done either using a questionnaire to know the results or using descriptive statistical methods (means Standard deviations, weighted percentage). The statistical effort requires early detection of the strength and weakness of the answers to reach its goal. The use of a heptagonal Likert scale [23], which consists of seven fields distributed from the highest weight, which is the field which is represented by the answer field (7), to the lowest weight, which is the first field, which is represented by the answer field (1), and between them, there are five other, weights (6,5,4,3,2). Thus, it's hypothetical mean is the value of the weighted arithmetic means equal or greater than (4), which means that the sample on the variable tends to agree on its availability. Still, if the values are less than 4, the sample answers to the variable tend to disagree. This investigation also found that there is a discrepancy in the results of the sample according to the answers of the piece researched in the projects (Table 2).

Table 2 The level of the research variables by extracting the arithmetic averages and standard deviations

Questions Time planning	The daily work falls within a list of the tasks that I want to accomplish daily within paragraphs arranged in order of priority	The project activities shall be carried out according to an organized schedule to define and document the work	Setting the project according to a timetable	Adjust the daily project schedule as part of the control process. To be supervised by management	Scheduling daily activities often leads to the speedy completion of planned projects	TOTAL
Strongly agree	6	2	0	2	2	
Agree	19	6	8	3	7	
Somewhat agree	18	22	9	14	9	
Undecided	3	5	5	4	3	
Somewhat disagree	2	12	27	17	16	
Disagree	1	2	1	8	10	
Strongly disagree	1	1	0	2	3	
N (No. of respondents)	50	50	50	50	50	
Mean	5.3400	4.4200	3.9200	3.7400	3.6800	4.22
Standard deviation	1.22241	1.31071	1.20949	1.48200	1.64677	0.9118
Weighted percentage	76.3	63.1	56.0	53.4	52.6	60.3
Questions determine priority points	The organization sets priorities for project completion to be consistent with its strategic objectives	The organization sets a timetable for achieving the project objectives, which helps in the speed of their achievement	Delegating authority is one of the priorities of the organization's work in completing its projects	Complete projects on time, one of the priorities of the organization's work	The organization is keen to adhere to the deadlines for the completion of projects and considers them among its main priorities	TOTAL
Strongly agree	2	1	1	2	4	
Agree	3	7	6	6	6	
Somewhat agree	10	7	9	9	15	
Undecided	4	5	5	4	1	
Somewhat disagree	21	23	19	16	12	
Disagree	7	5	7	7	4	
Strongly disagree	3	2	3	6	8	
N (No. of respondents)	50	50	50	50	50	
Mean	3.5600	3.7000	3.6400	3.5800	3.8571	3.6776
Standard deviation	1.47302	1.43214	1.49503	1.69139	1.88193	1.3164
Weighted percentage	50.9	52.9	52.0	51.1	55.1	52.5
Questions about wasting time	There is clarity in the responsibilities for the work of the organization despite the overlap in the powers	The result of the organization in the spirit of one team at work	Specialized and efficient staffs work in our organization	The organization can provide financial resources promptly	There is an assortment of heads and supervisors within the same project	
Strongly agree	3	2	2	3	2	
Agree	5	7	6	3	3	
Somewhat agree	8	10	10	7	5	
Undecided	5	2	3	4	3	
Somewhat disagree	18	22	20	18	22	
Disagree	8	6	7	10	8	
Strongly disagree	3	1	2	5	7	
N (No. of respondents)	50	50	50	50	50	
Mean	3.6800	3.8600	3.7600	3.3800	3.1600	
Standard deviation	1.60916	1.49843	1.53277	1.62744	1.54339	
Weighted percentage	52.6	55.1	53.7	48.3	45.1	
Strongly agree	3	2	2	3	2	
Questions about wasting time	Individuals in the organization rely on the method of self-censorship	There is a severe interest in preparing project implementation follow-up	The organized communication system between the relevant authorities as being effective	Many of the decisions taken in the organization are well thought out	TOTAL	
Strongly agree	3	3	2	2		
Agree	6	4	5	3		
Somewhat agree	4	4	9	6		
Undecided	2	2	1	3		
Somewhat disagree	15	18	16	15		
Disagree	16	10	12	4		
Strongly disagree	4	9	5	17		
N	50	50	50	50		
Mean	3.3200	3.1200	3.4000	2.7959	3.3832	
Standard deviation	1.73134	1.73370	1.67819	1.70758	1.2231	
Weighted percentage	47.4	44.6	48.6	39.9	48.3	

The time management variable included three dimensions (time planning, setting goals and priorities, and avoiding time wasters). With a standard deviation of (0.9118), and since the hypothetical mean is (4) on the scale area, the research sample agrees about the importance of time planning. It was obtained that the highest average of 5,340; as for the lowest standard of my account, was obtained in paragraph (5) related to (scheduling daily activities plays a high role in the speed of completion of the planned projects), and their mean was 3.680.

As for the second dimension (setting goals and priorities), the weighted mean reached (3.6776) with a standard deviation of (3146.1), and since the hypothetical mean was (4) on the scale area, this indicates that the respondents' opinions were almost in agreement towards the stage of setting goals and priorities.

The relative importance of the location reached (52.5), which is an average percentage, and paragraph (5) related to (the organization's keenness to adhere to the deadlines, considering them among its main priorities) achieved the highest arithmetic mean (3.8571), while the lowest arithmetic mean was obtained by the paragraph (1). The value is related to the organization sets priorities for the completion of projects to be consistent with its strategic objectives and it's an is 3.5600.

As for the third dimension, avoiding time wasters, the weighted arithmetic means reached (3.3832) with a standard deviation of 1.22. Since the hypothetical mean was (4) on the scale area, this indicates that the average response of the respondents was almost in agreement towards avoiding time wasters. As for the relative importance of the stage, it reached (48.3), which is a semi-average percentage; paragraph (2) related to (the organization prevails in the spirit of one team at work). It achieved the highest average calculation of (3.8600), while the lowest arithmetic mean was obtained by paragraph (9) related to (many decisions taken in the organization carefully studied) whose arithmetic mean reached 2.7959.

The time management variable reached the arithmetic mean (3.7620) with a standard deviation (1.04609), and since the hypothetical mean is (4) on the scale area, this indicates good progress in a positive direction towards time management, and the relative importance of the variable. It reached (53.7), which is a good percentage, and this indicates that the respondents focus on completing their projects within the specified time and identifying the obstacles that hinder work.

The project completion stages included four dimensions: the project initiation stage, the project's planning stage, the project implementation stage, and the project's closing or termination stage.

Regarding the first dimension (stages of starting the project), the weighted arithmetic mean was 3.928, with a standard deviation of 1.3048. Since the hypothetical mean was (4) on the scale area, this indicates the average answers of the respondents were close in terms of the agreement on this dimension. The relative importance of the stage reached 56.1, which is higher than the average. Paragraph 3 related to the project team's experience and competence, achieved the highest arithmetic mean of 4.2200, while paragraph 5 on project management's follow-up to changes and conditions had the lowest arithmetic mean of 3.7000.

About the second dimension (the project planning stage), the weighted calculation means reached 3.628 with a standard deviation of 1.3407. Paragraph 2, related to the project management determining start and end dates of activities, achieved the highest arithmetic mean of 3.8000. Paragraph 5, related to effective communication plan for risk management, contracting, and auditing, had the lowest arithmetic mean of 3.20. As for the third dimension, the project implementation stage, the weighted arithmetic mean reached 33.96 with standard deviations of 1.5458. Since the hypothetical mean was (4) on the scale area, this indicates a simple agreement for the sample of respondents about the project implementation stage. As for the relative importance of the location only, it reached 48.5, which is close to the average. Paragraph (1) related to (the project management is keen to apply international standards and use modern technology methods to improve the quality of work) achieved the highest average calculation of (3.5200), while the lowest arithmetic mean was obtained by paragraph (5) related to the project management checks and inspections. As per the fourth dimension (the stage of closing or termination of the project), the mean was 3.196, and the standard deviation was 1.5526. Since the hypothetical norm was (4) on the scale area, this indicates that the average answers of the respondents agreed to some extent about the stage of closing or ending the project. As for the importance, the relative level for the setting only reached (45.7), which is close to the average. Paragraph (2) related to (the project management possesses high confidence in the qualifications, performance and achievements of its workers) achieved the highest arithmetic mean of 3.5400, while the lowest arithmetic mean was obtained by Paragraph (5) related to (take Project management reviewing what has been achieved and research by performing better than its competitors) (Table 3). Its arithmetic mean reached 2.7600 for the variable as a whole (Management and Completion of projects went the arithmetic mean) (3.5370) and with a standard deviation of 1.2155 and since the hypothetical mean was (4) over an area. The scale indicates that the respondents were not satisfied with the processes of completing their projects within the specified time, but this did not prevent them from presenting what they could accomplish even as much as possible. The variable in question only had a relative importance of 50.5, indicating a medium level of importance.

Table 3 The level of the study sample's answers to the paragraphs of the second phase (stages of project completion)

Questions regarding Project start	The project management obtains information from multiple parties for the feasibility study	The project management is keen on defining the activities and scheduling the material resources for the project	The project team consists of experienced and competent individuals	Establishing an office for the project to listen to the opinions of workers and beneficiaries	There is a follow-up by the project management for the change in the project's conditions	TOTAL
Strongly agree	3	2	2	1	2	
Agree	4	7	8	8	7	
Somewhat agree	15	16	16	11	9	
Undecided	5	4	4	3	4	
Somewhat disagree	12	14	15	16	17	
Disagree	7	3	3	7	6	
Strongly disagree	4	4	2	4	5	
N (No. of respondent)	50	50	50	50	50	
Arithmetic mean	3.8800	4.0800	4.2200	3.7600	3.7000	3.923
Standard deviation	1.64924	1.58874	1.48860	1.62330	1.66905	1.3048
Weighted percentage	55.4	58.3	60.3	53.7	52.9	56.1
Questions About project planning	Project management prepares project phases within a specified schedule	The project management determines the start and end date of each project activity.	Project management can provide resources at the right time and in quantity	Project management takes environmental variables into account when setting the project schedule	The project management is keen to develop an effective plan for communication between departments to ensure risk management contract and review	TOTAL
Strongly agree	2	3	2	2	1	
Agree	6	5	4	4	8	
Somewhat agree	10	11	12	10	6	
Undecided	3	3	8	4	3	
Somewhat disagree	19	18	13	20	11	
Disagree	8	8	7	9	9	
Strongly disagree	2	2	4	1	12	
N (No. of respondent)	50	50	50	50	50	
Mean	3.7400	3.8000	3.7400	3.6600	3.2000	3.628
Standard deviation	1.54933	1.59079	1.56244	1.45139	1.86263	1.3407
Weighted percentage	53.4	54.3	53.4	52.3	45.7	51.8
Questions						
Project execution	The project management is keen to apply international standards and uses modern technology methods to improve the quality of work	Project activities are carried out exactly as planned and according to the schedule	Project management can deal with unexpected crises successfully	Project management follows the method of external control in the project implementation process	The project management carries out sudden checks and inspections to verify the quality of the implementation of the project contract and review	TOTAL
Strongly agree	3	2	1	1	2	
Agree	5	6	6	7	4	
Somewhat agree	12	10	9	8	6	
Undecided	4	2	5	2	3	
Somewhat disagree	10	13	13	14	16	
Disagree	3	7	9	13	13	
Strongly disagree	13	10	7	5	6	
N (No. of respondent)	50	50	50	50	50	
Arithmetic mean	3.7400	3.4200	3.4400	3.4000	3.2000	3.396
Questions						
Close or terminate the project	The blueprint for the project is matched with what has been accomplished, and the results are recognized and matched	The project management has high confidence in the qualifications, performance, and achievements of its workers	Project management seeks to enhance trust with service beneficiaries	The project management aims to create a good reputation among its competitors through its achievement	Project management takes a review of what has been achieved and research by doing better than its competitors	TOTAL
Strongly agree	3	2	3	2	2	
Agree	5	6	4	3	5	
Somewhat agree	8	9	5	5	5	
Undecided	2	4	5	3	0	
Somewhat disagree	11	13	13	14	12	
Disagree	15	11	16	17	7	
Strongly disagree	6	5	4	6	19	
N (No. of respondent)	50	50	50	50	50	
Arithmetic mean	3.3600	3.5400	3.3000	3.0200	2.7600	3.196
Standard deviation	1.80340	1.70486	1.66905	1.58423	1.90123	1.5625

This suggests that respondents have an intermediate level of knowledge about the problem of completing construction projects due to various obstacles, such as lack of experience and efficiency, lack of resources and development, and adherence to outdated methods. A lack of a scientific research unit to keep pace with scientific development also contributes to these difficulties. The evaluation also reported that the delay of one activity makes it impossible to start the next one, which is similar to the research of [24,25].

5 Testing the correlation and effect between the research variables

5.1 *The Kendall correlation coefficient was used to test the hypotheses about the correlation*

5.1.1 The first sub-hypothesis test

There is a significant correlation between time planning and project completion stages (initiation, project planning, project implementation, project closing)

The results indicate a positive and significant relationship, where the correlation between time planning and project completion (project start, project planning, project implementation, project closure) was recorded in the amount of (0.367, 0.336, 0.457, 0.290, 0.414), respectively. It is a significant correlation at the level of Significant 0.01. If the P-value is less than the significance level. A considerable correlation indicates that time planning has a meaningful relationship in those dimensions. As for the correlation between time planning and project completion stages, the Kendal correlation coefficient reached 0.414. It is significant, and this indicates a significant correlation between time planning and project completion stages. Table 4 shows the values of Kendall's correlation coefficient between time planning and project completion stages.

Table 4 Values of Kendal correlation coefficient between time planning and project completion stages (project start-up, project planning, project implementation, project closing)

	Project started	Project planning	Project execution	Close the project	Project completion stages
Time planning	0.0367	0.336*	0.457*	0.290*	0.414*
p-value	0.001	0.001	0.002	0.005	0.000
Significance level at the level of significance 0.05	moral	moral	moral	moral	moral

** It indicates a significant level of 0.01.*

5.1.2 Test the second sub-hypothesis for the first central hypothesis

There is a significant correlation between setting goals, priorities, and project completion stages (Initiating the project, planning the project, implementing the project, and closing the project). The results showed a positive and good moral relationship. The correlation was recorded between setting goals, priorities, and project completion stages (project start-up, project planning, project implementation, and project closure).

And there is a correlation between setting goals and priorities and (project start-up, project planning, project implementation, and closing the project) of (0.453, 0.415, 0.496), respectively, and it is significant at the level of significance (0.01) if the P value is less than the level of morale. Thus, there is a moral correlation relationship, and this indicates that setting goals has a significant, influential relationship in those dimensions as for the correlation relationship (0.513). This shows the existence of a substantial correlation between setting goals, priorities and project completion stages. The correlation coefficient reached Kendall (0513) (Table 5).

Table 5 Shows the values of Kendall's correlation coefficient between setting goals, priorities, and project completion stages (project start-up, project planning, project implementation, project closure)

	Project started	Project planning	Project execution	Close the project	Project completion stages
Setting goals and priorities	0.453*	0.415*	0.496*	0.403*	0.513*
p value	0.002	0.000	0.001	0.000	0.000
Significance level at the level of significance 0.05	moral	moral	moral	moral	moral

** It indicates a significant level of 0.01.*

5.1.3 Test the third sub-hypothesis of the first central hypothesis

There is a significant correlation between avoiding time wasters and the stages of project completion (project start, project planning, project implementation, and project closure).

The results indicated a positive and good significant relationship, where the correlation between avoiding time

wasters and the stages of project completion (project start, project planning, project implementation, project closure) was recorded as (0.314, 0.354, 0.455, 0.442), respectively, which is a significant correlation at the level of (0.01) important. Suppose the P-value is less than the level of significance. In that case, there is a significant correlation, which indicates that avoiding wasting time has a substantial relationship in those dimensions, as for the correlation relationship between avoiding time wasters and the stages of project completion. The Kendall correlation coefficient reached (0.442), indicating a significant correlation between avoiding time wasters and the locations of project completion (Table 6).

Table 6 Shows the values of the Kendall correlation coefficient between avoiding time wasters and the stages of project completion (project start, project planning, project implementation, project closing

	Project started	Project planning	Project execution	Close the project	Project completion stages
Avoid wasting time	0.314*	0.354*	0.455*	0.360*	0.442*
p-value	0.004	0.001	0.000	0.001	0.000
Significance level at the level of significance 0.05	moral	moral	moral	moral	moral

** It indicates a significant level of 0.01*

5.2 Test the second central hypothesis

There is a significant correlation between time management and project completion stages. The results indicate a positive and good considerable relationship. The correlation between time management and project stages was recorded, as the correlation coefficient amounted to (0.433, 0.426, 0.541, 0.380, 0.533) respectively, which is a significant correlation at the significance level (0.01). Suppose the value of the P-value is less than the level of energy. In that case, there is a significant correlation, indicating that time management has a substantial relationship in those dimensions. As for the correlation between time management and project completion stages, the Kendall correlation coefficient was (0.533), indicating a significant correlation between time management and project completion stages (Table 7).

Table 7 Shows the values of the Kendall correlation coefficient between time management and the stages of project completion

	Project started	Project planning	Project execution	Close the project	Project completion stages
Time management	0.433*	0.426*	0.541*	0.380*	0.533*
p value	0.000	0.001	0.002	0.000	0.000
Significance level at the level of significance 0.05	moral	moral	moral	moral	moral

** It indicates a significant level of 0.01*

6 Second impact tests

6.1 The first sub-hypothesis test

There is a significant effect of covering the time in the project completion stages, and β amounted to (0.880). Table 8 shows the regression analysis results of the effect of covering time on the likely variable, the stages of project completion.

The F value is calculated (37.078), which is greater than the tabular value at the level of significance (0.01,0.05) and below the degree of freedom (48). The R^2 explained (44%) of the number of contributions made in the stages of jazz projects, and the respective value is presented in Table 8.

Table 8 Results of the impact of the time coverage phase on the project's completion phases using the ordinal logarithmic model

Independent variable	Dependent variable	Constant value	β parameter value	Coefficient value R^2	The calculated F value
Time planning	Project completion stages	-0.177	0.880	44%	37.078

Beta (β) refers to the probability of Type II error in a statistical hypothesis test. The first dimension by one unit leads to a speed in the completion of projects by (0.880). An F-value is the ratio of two variances. If the F-value was Tabluted below the significance level (0.05), then the degree of freedom (48) is 3.84. On the other hand, if the F-value is tabulated below the significance level 0.01, then the degree of freedom (48) = 10.

6.2 The second sub-hypothesis test

There is a significant effect of setting goals and priorities in the project completion stages. Table 9 shows the regression analysis results of the effect of setting goals and priorities on the approved variable and stages of

project completion. It is noted that this dimension has a significant impact on the steps of project completion, as the calculated F value was (46.44), which is greater than the tabular value at the level of significance (0.01, 0.05). Under the degree of freedom (48), and (R^2) explained (41%) of the estimated contributions made in the stages of project completion, and the value β amounted to (0.533). It also indicates that the change that occurs in the second dimension by one unit leads to Increasing project completion stages by (0.533).

Table 9 Shows the impact of setting goals and priorities in the stages of project completion using the ordinal logarithmic model

independent variable	dependent variable	constant value	β parameter value	coefficient value R^2	The calculated F value
Setting goals and priorities	Project completion stages	0.621	0.533	41%	46.44

7 Main Hypothesis Test

There is a significant effect of time management in the stages of project completion. Table 10 shows the regression analysis results of the effect of time management on the adopted variable, stages of project completion. 48) R^2 explained (39%) of the contributions made in the project completion stages. The β value amounted to (0.852) and indicates that the change that occurs in the independent variable time management by one unit leads to an increase in the project completion stages by (0.852).

Table 10 Shows the results of the impact of time management on project management and completion using the ordinal logarithmic, linear model

independent variable	dependent variable	constant value a	β parameter value	coefficient value R^2	The calculated F value	Indication level
Avoid wasting time	Project and achievement management	0.109	0.852	39%	45.33	There is an effect

8 Conclusions

The current study's has some outcomes and suggestions, which are given below:

1. Most respondents ignore the importance of time management, especially with their daily schedules. This, combined with a lack of credibility and realism in project scheduling at both lower and upper management levels, leads to projects not being completed within the planned timeframe and at the required pace.
2. The lack of seriousness of the surveyed organizations in achieving their strategic objectives leads to the lack of priorities for the implementation of projects. The main reason for not completing the strategic goal is the management and central funding of the surveyed organization's construction projects.
3. The research sample tends to be more interested in planning time than it is concerned with setting goals and priorities and avoiding waste of time due to completing business requirements.
4. The plans for the completion of projects do not agree with the strategic directions, which are considered among its main objectives due to the lack of coordination between activities.
5. The research sample lacks the fundamental mandate of its engineers, which leads to sluggishness in the performance of tasks, scheduling work and studies. It is required during the specified time and is also a routine that hinders taking urgent decisions during the completion period of the project.
6. The study is counting the balance of the research sample with the deadlines specified for project completion and measuring project implementation according to a timetable. This may be due to the nature of the unstable conditions within the sample.
7. The absence of a team-working method makes the work challenging and complicated.

References

[1] POURROSTAM, T., ISMAIL, A.: Causes and effects of delay in Iranian construction projects, *International Journal of Engineering and Technology*, Vol. 4, No. 5, pp. 598-601, 2012.

[2] AL-MOMANI, A.H.: Construction delay: a quantitative analysis, *International Journal of project management*, Vol. 18, No. 1, pp. 51-59, 2000.

[3] NAFE ASSAFI, M., HOSSAIN, M.M., CHILESHE, N., DATTA, S.D.: Development and validation of a framework for preventing and mitigating construction delay using 4D BIM platform in Bangladeshi construction sector, *Construction Innovation*, Vol. ahead-of-print, No. ahead-of-print, 2022. https://doi.org/10.1108/CI-08-2021-0160

[4] KASIMU, A.M., ISAH, A.D.: Causes of delay in Nigeria construction industry, *Interdisciplinary Journal of Contemporary Research in Business*, Vol. 4, No. 2, pp. 785-794, 2012.

[5] DATTA, S.D., RANA, M.J., ASSAFI, M.N., MIM, N.J., AHMED, S.: Investigation on the generation of construction wastes in Bangladesh, *International*

Journal of Construction Management, Vol. 0, No. 0, pp. 1-10, 2022. https://doi.org/10.1080/15623599.2022.2050977

[6] WOLFERS, J., ZITZEWITZ, E.: Using markets to inform policy: The case of the Iraq war, *Economica*, Vol. 76, No. 302, pp. 225-250, 2009.

[7] HATEM, W.A., AL-TMEEMY, S.M.H.: The impact of terrorism on the construction industry in Iraq, *Wasit Journal of Engineering Sciences*, Vol. 3, No. 2, pp. 69-84, 2015.

[8] ASSAF, S.A., AL-KHALIL, M., AL-HAZMI, M.: Causes of delay in large building construction projects, *Journal of management in engineering*, Vol. 11, No. 2, pp. 45-50, 1995.

[9] JAHANGER, Q.K.: Important causes of delay in construction projects in Baghdad city, *Australian Journal of Basic and Applied Sciences*, Vol. 7, No. 4, pp. 14-23, 2013.

[10] CRICHTON, C.: *Interdependence and Uncertainty: A study of the building industry*, Routledge, 2013.

[11] KAZAZ, A., ULUBEYLI, S., TUNCBILEKLI, N.A.: Causes of delays in construction projects in Turkey, *Journal of Civil Engineering and Management*, Vol. 18, No. 3, pp. 426-435, 2012.

[12] ABD EL-RAZEK, M.E., BASSIONI, H.A., MOBARAK, A.M.: Causes of delay in building construction projects in Egypt, *Journal of Civil Engineering and Management*, Vol. 134, No. 11, pp. 831-841, 2008.

[13] SWEIS, G., SWEIS, R., HAMMAD, A.A., SHBOUL, A.: Delays in construction projects: The case of Jordan, *International Journal of project management*, Vol. 26, No. 6, pp. 665-674, 2008.

[14] AL-MOMANI, A.H.: Construction delay: a quantitative analysis, *International Journal of project management*, Vol. 18, No. 1, pp. 51-59, 2000.

[15] KAMING, P.F., OLOMOLAIYE, P.O., HOLT, G.D., HARRIS, F.C.: Factors influencing construction time and cost overruns on high-rise projects in Indonesia, *Construction Management & Economics*, Vol. 15, No. 1, pp. 83-94, 1997.

[16] SHEBOB, A., DAWOOD, N., XU, Q., EGBU, C., LOU, E.: *Analyzing construction delay factors: A case study of building construction project in Libya*, In: Proceedings 27th Annual ARCOM Conference, ARCOM, pp. 1005-1012, 2011.

[17] ASSAF, S.A., AL-KHALIL, M., AL-HAZMI, M.: Causes of delay in large building construction projects, *Journal of management in engineering*, Vol. 11, No. 2, pp. 45-50, 1995.

[18] ZACK, J.G.: Schedule delay analysis is their agreement, In: *Proceedings PMI-CPM college of performance spring conf*, Vol. 41, 2003.

[19] AL-MOMANI, A.H.: Construction delay: A quantitative analysis, *International Journal of project management*, Vol. 18, No. 1, pp. 51-59, 2000.

[20] POURROSTAM, T., ISMAIL, A.: Causes and effects of delay in Iranian construction projects, *International Journal of Engineering and Technology*, Vol. 4, No. 5, pp. 598-601, 2012.

[21] DATTA, S.D., MANNAN, M.B., ISLAM, M.N., RAHMAN, M.H.: *Assessment of Crisis Factors in the Construction Industry of Dhaka City in Bangladesh*, Paper presented at 6th International Conference on Engineering Research, Innovation and Education School of Applied sciences & Technology, SUST, Sylhet, 2021.

[22] ABDI, H.: The Kendall rank correlation coefficient, *Encyclopedia of measurement and statistics*, Vol. 2007, pp. 508-510, 2007.

[23] CHERREZ-OJEDA, I., VANEGAS, E., FELIX, M., MATA, V.L., JIMÉNEZ, F.M., SANCHEZ, M., CHEDRAUI, P.: Frequency of use, perceptions and barriers of information and communication technologies among Latin American physicians: an Ecuadorian cross-sectional study, *Journal of Multidisciplinary Healthcare*, Vol. 13, pp. 259-269, 2020.

[24] TAŽIKOVÁ, A., STRUKOVÁ, Z.: The impact of logistics on the cost of prefabricated construction, *Acta logistica*, Vol. 8, No.1, pp. 65-71, 2021. https://doi.org/10.22306/al.v8i1.204

[25] GRABARA, J., DABYLOVA, M., ALIBEKOVA, G.: Impact of legal standards on logistics management in the context of sustainable development, *Acta logistica*, Vol. 7, No. 1, pp. 31-37, 2020. https://doi.org/10.22306/al.v7i1.155

Review process
Single-blind peer review process.