

## Delays in construction projects: The case of Jordan

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### Abstract

The construction industry is a major player in the economy, generating both, employment and wealth. However many projects experience extensive delays and thereby exceed initial time and cost estimates. A host of causes of construction delays in residential projects were identified and classified according to Drewin's Open Conversion System. The most common causes were evaluated by using both, the data collected in a survey conducted to residential projects consultant engineers, contractors, and owners, and interviews with senior professionals in the field. Most correspondents agreed that, financial difficulties faced by the contractor and too many change orders by the owner are the leading causes of construction delay. Severe weather conditions and changes in government regulations and laws ranked among the least important causes.

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### 1. Introduction

Stumpf [1] defined delay as an act or event that extends the time required to perform the tasks under a contract. It usually shows up as additional days of work or as a delayed start of an activity. He showed, in his article, that delay does matter, and that different methods for analyzing schedule delay lead to different results for the owner and contractor.

Construction delays became an integral part of the project's construction life. Even with today's advanced technology, and management understanding of project management techniques, construction projects continue to suffer delays and project completion dates still get pushed back [1].

There are many reasons why delays occur. They may be due to strikes, rework, poor organization, material shortage, equipment failure, change orders, act of God and so

on. In addition, delays are often interconnected, making the situation even more complex [2].

Recent events in the Middle East region coupled with restructuring of economies, emergence of the World Trade Organization and the rising price of oil are expected to yield an unprecedented growth in construction activities, especially in the tourism and the residential sectors. Consequently, a huge number of large-scale projects are currently under construction or in the planning and contract-awarding phase. Recently, the Jordanian construction industry has been undergoing a boom. One major question of concern however arises: what are the major causes of delays in the Jordanian construction industry and their relative importance?

### 2. Problem statement and study objectives

Delays in construction projects are common in the Jordanian construction industry. Construction delays are often responsible for turning profitable projects into losing ventures. These delays can be avoided or reduced

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provided the major causes of such delays can be identified and dealt with in a timely fashion. Therefore the study objectives are (a) to identify the major causes of delay in the Jordanian residential construction sector; and (b) to assess the relative importance of these causes from the point of view of residential projects consultant engineers, contractor, and owners.

### 3. Literature review

Delays happen in most construction projects, whether simple or complex. Construction delay could be defined as the time overrun either beyond the contract date or beyond the date that the parties agreed upon for delivery of a project [11].

Odeh and Battaineh [8], Kaming et al. [13] and Alaghbari et al. [14] stressed the importance of early identification of construction delays and suggested major delay-reducing remedies.

Analyses of delays are characterized as complex and difficult due to the large number of activities that have to be dealt with in any construction project [25]. Researchers have studied the numerous causes of delay in construction projects; Baldwin et al. [16], Arditi et al. [17], Okpala and Aniekwu [18], Dlakwa and Culpin [19], Mansfield et al.

[20], Semple et al. [21], Ogunlana et al. [22], Lo et al. [23], Chan and Kumaraswamy [24], and Aibinu and Odeyinka [9] cited many significant causes of delays as: inclement weather, shortages of resources, financial difficulties faced by public agencies and contractors, poor contract management, shortages of materials, and inadequate resources. Their overall ranking of delay causes indicated areas of construction industry practices that require improvement. However, they still differed in their perceptions as to what should be emphasized most among the different construction delay causes.

Few studies have been conducted in Jordan as well as the Middle East region on the subject of construction delays. Such studies are found in different countries like Saudi Arabia [5,11,3], Lebanon [4], and Kuwait [6]. Table 1 shows a summary of previous studies on construction delays in the Middle East.

There is no consensus in the literature on the identification of factors which affect construction times of buildings. One reason for this is that researchers have largely viewed the subject from diverse perspectives. Even most recent research in construction delay is characterized by diversified views on what should constitute a major delay cause in construction projects [27–34]. This study seeks to build on prior research by ranking each individual cause of con-

Table 1  
Summary of previous studies of the causes of delay in construction projects (middle east region)

Country	Researchers	Major causes of delay
Saudi Arabia	Assaf et al. [3]	<ul style="list-style-type: none"> <li>• Slow preparation and approval of shop drawings</li> <li>• Delays in payments to contractors</li> <li>• Changes in design/design error</li> <li>• Shortages of labor supply</li> <li>• Poor workmanship</li> </ul>
Lebanon	Mezher et al. [4]	<ul style="list-style-type: none"> <li>• Owner had more concerns with regard to financial issues</li> <li>• Contractors regarded contractual relationships the most important</li> <li>• Consultants considered project management issues to be the most important causes of delay</li> </ul>
Saudi Arabia	Al-Khal and Al-Ghafly [5]	<ul style="list-style-type: none"> <li>• Cash flow problems/financial difficulties</li> <li>• Difficulties in obtaining permits</li> <li>• “Lowest bid wins” system</li> </ul>
Jordan	Al-Moumani [7]	<ul style="list-style-type: none"> <li>• Poor design</li> <li>• Changes in orders/design</li> <li>• Weather</li> <li>• Unforeseen site conditions</li> </ul>
Kuwait	Koushki et al. [6]	<ul style="list-style-type: none"> <li>• Late deliveries</li> <li>• Changing orders</li> <li>• Owners’ financial constraints</li> <li>• Owners’ lack of experience in the construction business</li> </ul>
United Arab Emirates (UAE)	Faridi and El-Sayegh [15]	<ul style="list-style-type: none"> <li>• Slow preparation and approval of drawings</li> <li>• Inadequate early planning of the project</li> <li>• Slowness of owner’s decision making</li> <li>• Shortage of manpower</li> <li>• Poor site management and supervision</li> <li>• Low productivity of manpower</li> </ul>
Saudi Arabia	Assaf and Al-Hejji [13]	<ul style="list-style-type: none"> <li>• Change in orders by the owner during construction</li> <li>• Delay in progress payment</li> <li>• Ineffective planning and scheduling</li> <li>• Shortage of labor</li> <li>• Difficulties in financing on the part of the contractor</li> </ul>

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