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Covid-19 Causes Of Delays On Construction Projects In Kuwait

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Abstract:- This paper has been prepared to identify the major causes of delays on construction projects in Kuwait during Covid-19. The major causes of delays from this research study were investigated following data collection carried out through a questionnaire survey with a wide range of construction professionals based in Kuwait. The findings from this research determined the major causes of delays based on an importance index, and the main conclusions from output of the data could help the construction sector to better assess not only the major causes of delays on construction projects but also how to minimise them by proper planning.

Keywords:- *Covid-19, Construction projects, Kuwait, Causes of delay, Survey questionnaire, Relative importance index.*

Introduction

Delay in construction project refer to delays or events that delay the construction program. Delays are a major challenge faced in the construction projects and current studies are looking into ways to manage them. There are many factors that cause delays in the construction project, some falling within the owner's liability and some within the contractor's liability.

A literature review has been carried out. Through this literature review it is seen that a large number of researchers have conducted surveys on the causes of delay in the construction projects by conducting a pilot study sent to construction industry practitioners who have experience in civil construction, including contractors, consultants, and clients. For example, a large number of construction projects in Saudi Arabia have been delayed and the causes of delay were summarised as follows:

- Changes of shop drawing during construction projects.
- Errors of shop drawing during construction projects.
- Conflicts in work schedules of subcontractors.
- Delays in approval of shop drawings.
- Delays in payments to contractors.
- Inadequate labour skills.
- Labour shortage.

Additionally, 130 public building projects were examined on the causes of delays in Jordan during the period of 1990-1997. The researcher presented a quantitative analysis model on the different causes of delays in different types of building facilities. The researcher summarised the main causes of delays in construction projects as site conditions, designers, weather, user changes, late deliveries, increase in quantities, and economic conditions.

Moreover, key project participants such as clients, consultants, and contractors were selected in research conducted in Ghana in order to determine the most important causes of delay in construction projects. The causes of delay were identified as follows:

- Materials
    - Delay in material delivery.
    - Material shortages on market or site.
- Manpower
    - Shortage of skilled labour.
    - Shortage of unskilled labour.

- Equipment
    - Breakdown of equipment.
    - Unskilled operators of equipment.
- Financing
    - Delay in payment.
    - Price variations in market.
- Environmental
    - Bad weather.
    - Inappropriate site conditions.
- Changes
    - Poor design.
    - Foundation conditions.
    - The necessary variations.
    - Errors in soil investigation.
    - The initiated variations of client.
- Government action
    - General holidays.
    - Permission delays from the municipality.
    - Conflict between building code and design specification.
- Contractual relations
    - Legal arguments.
    - Delay from subcontractors.
    - Lack of professional management.
    - Insufficient communication between parties.
    - Delay from consultants in providing instructions.
- Scheduling and controlling techniques
    - Lack of supervision.
    - Construction accidents.
    - Lack of site management.
    - The construction methods.
    - Poor programmes of works.
    - Reducing of costs in projects.
    - Reducing of complexity in projects.
    - Reducing of time in completion projects.

Furthermore, a previous study demonstrated the existence of delays on construction projects in Kuwait due to the covid-19 pandemic. The results confirmed that the delays in the projects were critical delays and the cause was that 95% of employees could not work at any time due to government reaction to the pandemic. Therefore, this paper aims to identify the other major causes of delays on construction projects in Kuwait during the covid-19 Pandemic. The objective was to gather the information from employees working in projects such as architects, engineers, surveyors, construction management and coordinator practitioners. This was achieved by conducting surveys and telephone interviews with construction professionals based in Kuwait.

Research Methodology

The research methodology used in this research is illustrated in Figure 1. This study has designed a questionnaire survey of 17 delay factors collected from literature review and the information from participants was gathered using the Likert Scale based on a 5 point scale with values from 1 to 5, where 1, 2, 3, 4 and 5 represent a response of very low, low, moderate, high and very high, respectively. The survey was launched between 1st of July 2020 to 1st of August 2020. 35 out of 170 construction sector practitioners completed the surveys. The responses were from 16 engineers, 8 architects, 5 surveyors, 4 construction management, and 2 coordinators.

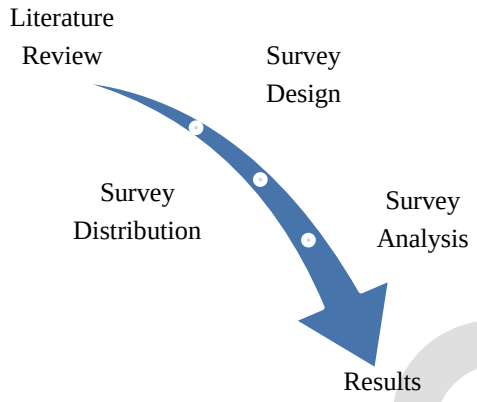

Figure 1: - Research methodology process

The following equation of Relative Importance Index (RII) was chosen from the literature review to evaluate the major causes of delays obtained from the survey.

$$RII = \frac{\sum W}{AxN}$$

where, W = weight given to each factor (ranging from 1 to 5) by the participants, A = the highest weight (i.e. 5 in this research study), and N = the total number of participants. The higher the RII value means that it is more important than the others.

Findings

The majority of the respondents (59%) worked for large organisations. The annual turnover of their organisation was more than £37.5m. Respondents were involved in a variety of projects in the transportation, energy, water supply, sanitation and water, and building sectors. The main findings of the research study are presented in Table 1. From Table 1, the ranked delay factor based on RII values can be observed.

Table 1: - RII and Ranking of Delay Factors by Respondents.

Number	Causes of delays	RII%	Rank
1	Delay in payments to contractor	60	4
2	Delay in approval of completed work	61.18	3
3	Delay from consultants in providing instructions	63.53	2
4	Delay in delivery (i.e. materials, equipment, and documents, etc)	60	4
5	Delay from subcontractors (i.e. Poor performance and Poor management)	56.47	7
6	Delay from the main contractor (i.e. Poor performance and Poor management)	60	4
7	Delay in revising and approving documents (i.e. design drawing, shop drawing, and sample materials, etc)	58.82	5

8	Poor safety conditions	60	4
9	Poor site management and supervision	57.65	6
10	Poor scheduling and planning of project	61.18	3
11	Poor communication with other parties (i.e. consultants, project manager, and site engineering, etc).	57.65	6
12	Low productivity of workers	61.18	3
13	Lack of construction materials	49.41	10
14	Lack of skilled labour	55.29	8
15	Lack of construction equipment	50.59	9
16	Escalation and inflation of material prices	85.88	1
17	Inappropriate site conditions.	60	4

Discussion

The previous study indicated that there are critical delays on construction projects in Kuwait and these critical delays were mainly due to covid-19. The previous study also reported that the critical delays in construction projects can be reduced by a proper planning. Hence, this study identified the causes of delays on construction projects in Kuwait during covid-19, as shown in Table 1.

It is evident there are many factors which affect the construction industry, some are inherent problems due to the complex relationship between the employers, the architects and engineers, and the contractors, while others are local problems or problems out of human control such as the weather, floods, earthquakes and covid-19.

The majority of the highly ranked causes for delay in this study, such as delay in approval of completed work (ranked 3) and delay from consultants in providing instruction (ranked 2), can be resolved through proper planning. Others, such as low productivity of workers (ranked 3), might be a management or training issue. This study highlights not only the need for proper planning from the very early stages but also the importance of communication throughout the project, and the need to keep everyone informed of serious problems as they arise, such as shortages, and changes affecting the construction.

It is in everyone's interests to reduce delays as far as possible. The owner faces the financial consequences of delay and the possible implications of the unavailability of a facility, but the contractor might have to pay for additional and unforeseen labour and equipment charges. As seen from Table 1, the highest ranked concern was the escalation of material prices, and it is therefore important that this is addressed throughout the project.

Delay factors can be minimised by proper decision-making throughout the construction process but further research is required. This could include research into the communication of decisions, the content of training programmes for construction site managers, the value of apprenticeship schemes to provide a more skilled workforce, the possibilities of greater use of pre-cast materials, etc.

Conclusion

Many delays in construction projects can be eliminated when their causes are clearly identified. Therefore, the aim of this paper was to identify the major causes of delays on construction projects in Kuwait during the covid-19 Pandemic. To do that, a questionnaire survey with 17 factors of delay was designed, based on a literature review. The questionnaire survey was sent to various construction professionals based in Kuwait. 35 respondents evaluated the delay factors and these factors were ranked according to their importance level for delays using a relative importance index. The importance factors were achieved through ranking results.

The covid-19 pandemic has highlighted additional issues affecting management at all levels. The construction industry cannot ignore the impact that this is having, not only now but possibly in the future, on working practices. Programs might have to be re-designed so that there is less labour on site at any given time to allow for social distancing, a greater use of pre-cast materials might be considered, increased welfare facilities on site for workers so they feel safe in going to work, etc.

Further research can be conducted through case studies in construction projects and this will help to identify the other factors that may be causes of delay factors as well as to identify what procedures could be used to minimise the factors causing delays on construction projects in Kuwait during covid-19, and beyond.

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