



# External Factors of Delay That Affect the Performance of International Construction Contractors in Kuwait

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**Abstract:** As the construction industry in Kuwait develops, the need for international contractors to handle and manage these projects rises as well. Currently, 70% of the projects in Kuwait get delayed, some by internal factors, and other by external ones. Typically, researchers focus on the internal delays and emphasize international contractors to enhance their understanding and implications of the required preventive and corrective actions. However, external factors of delay are a newly generated type of delays that represent all the delays that are beyond the contractor's control and cannot be anticipated in the project. Thus, the purpose of this research is to provide a framework for international construction contractors in Kuwait regarding the external factors of delay that they might face in their projects. In this research, a qualitative research methodology is applied by extracting and discussing the most important and frequently occurring external factors of delay with 15 project management professionals to elaborate their perspectives and construct a survey to evaluate the impact and frequency of these delaying factors in the construction industry in Kuwait. This survey was distributed to 80 project management practitioners; then, the outcomes were analyzed by using the Relative Importance Index methodology to rank the effect of the examined delaying factors. The results of this research have highlighted the significance of lack of project management proficiency, unreliable subcontractors & conflict between contractor and other contracting parties. Hence this research will provide international construction contractors with an illustration of the delaying factors that they should focus on and the ones they can pay less attention to them.

**Keywords:** Project delay, international contractors, delay factors, construction industry

## 1. Background

Currently, multiple new projects are starting in Kuwait, which reflects the government's striving investment strategies. The estimated total value of future projects in Kuwait is \$447.3 billion that is distributed between Building Sector for 72.7%, Infrastructure Sector for 15.3%, and Oil & Gas Sector for 12% [18]. Recently, Kuwaiti GDP is about \$141.68 billion in 2019, when the construction contribution to GDP is 7%. Moreover, the previous author stated that \$24 billion contracts would be available by the next year, which represents double the value of present year's contracts. The Kuwaiti construction nature is distinguished by the significant financial variations and multicultural workforce, including technical advisors and engineers. Regardless of the fact that projects worldwide suffer from time delays and cost overruns are not added information; typically, the construction industry in Kuwait contributes with average 7-10% in the national income, out of which 70% of these attributed construction projects are being delayed beyond their original completion dates [6]. The previous status of delayed projects has then been updated; currently the percentage of delayed projects has slightly decreased to be 60-70% average percentage [4].

The research for the factors that cause project delay in the Kuwaiti construction industry is not new; however, this research did not take its full capacity until the beginning of the twentieth century [37]. Consequently, these delays have pushed several researchers to adopt the reasons, causes, factors, and effects of delays and investigate them in depth. The roots of these delays are not solely attributed to the parties involved in the project, but also to other parameters like the geographical location, availability of resources, governmental laws and regulations, and public authorities' performance [26]. Therefore, a new type of project delays is to be considered and encountered by project and organizations, which is the External Delays type [31]. According to the previous authors, external delays are the delays that fall beyond the control, intent or expectation of clients, contractors, and subcontractors. These delays are not necessarily justifiable nor excusable, as it was informed that not all external delays would be compensable or reflect in an extension of time for the construction process of the project [32]. The implication of the previous type of delay in the Kuwaiti construction industry was informed by [6], when he stated that the safety implications in Kuwait and the Middle East is weak and does not reflect the magnitude of the assigned works to these developing countries which are trying to raise their business ranks. The previous author further stated that the primary root cause for accidents in Kuwait is severe and unseasonable weather conditions; by which, have reflected in 73% of the total number of accidents in Kuwait.

This unforeseen event can significantly because all works to be stopped in one area or the entire site for as long as the safety and federal investigations could go; thus, resulting in a total project delay in the best case, or in repairing damaged constructions and losing lives [3]. Furthermore, construction accidents can also affect running projects in the nearby areas; therefore, foreign contractors may not only be encountered by accidents happening at their sites, but also by accidents occurring in neighbors' projects.

Usually, external delay factors are slightly taken into consideration while preparing the sequence of works and the schedule of the project; by which, reflect that the impact of these factors is not always severe and can confirmatively be considered as a medium impact ([37]; [33]). Nevertheless, some external factors of delay might also cause the project to be drastically delayed. According to [23], they stated that the country has gone through severe rain showers during the spring of 2017 in Kuwait, against all forecasted weather reports, the country has had heavy rains and a thunderstorm that was not anticipated. These unplanned rain showers have resulted in a period of inactivity in all running projects, by which projects have lost more than money and wasted efforts. The affected site conditions for the mentioned projects and other construction projects across the country have delayed several projects for more than six months [2]. The reflection of these wastes has been concluded into projects' delays, which did not only affect a cost overrun and double works for projects but also threatened to disturb the reputation of several main contractors in Kuwait. Moreover, this unconditional and unseasonable weather also affects durability and maintenance of the used equipment in projects rather than significantly lowering the productivity levels of the project team [30].

Usually, researchers concentrate on understanding the types of delay, assigning them to their responsible parties, and calculating the impact of this delay to the overall project schedule and performance [29]. With the drastic increase and development of the construction industry in Kuwait in the last two decades, the need for minimizing, the affecting factors of delay is of more importance than calculating its impact and applying claims of the responsible party, as the general purpose is to prevent project delay, not deciding the blamed party [13]. Therefore, a considerable number of delayed projects have driven researchers into examining and investigating the reasons behind these delays. However, this research will have more concentration on external reasons or factors of delay that affect international or international construction contractors. Starting by [7] who have addressed this topic in the Kuwaiti construction industry and through the studies done by [22], ten years have passed, and the problem was not correctly handled and lightly investigated in the published articles. Moreover, it was further elaborated that this impoverished understanding of the external factors of delay causes subcontractors to delay their main contractors' project unknowingly and unwillingly [23]. These unplanned factors can be considered as a significant cause of losing reputation and in some cases, can lead to project total failure [4]. Also, publication records show that the number of publicized papers regarding the external factors in Kuwait, in general, is somehow limited [11]. Hence, the importance of this study signifies in the fact that it examines the main external factors of delay for international construction contractors working in Kuwait and provide them with a guideline or a framework about the factors that would affect the constructability of the project and eventually causing for its delay.

## 2. Literature Review

Due to the start of several new projects in Kuwait, the construction rise attracted several multinational construction contractors to invest in Kuwait. Several international construction contractors use the existing records of previous projects in Kuwait to frame and estimate their requirements during the tendering and planning stages of the project. Typically, international companies invest in the developing countries while knowing of their needs and demands; therefore, they provide the services, technologies, and resources that would exceed the satisfactory level of these countries to ensure their extended stay in these countries [19]. Thus, the internal problems or the project related issues that face international contractors are understandable and already considered by this international contractor.

However, the external factors are the ones that matter, as they may not be notable or visible during the tendering and planning or even at the beginning of the project. Therefore, international contractors frequently fall for sudden

factors of delay that they were not prepared for [28]. As the publication records show that the number of publicized papers regarding the external factors in Kuwait, in general, is somehow limited [5]. Hence, the importance of this study signifies in the fact that it provides a guideline or a framework for international construction contractors about the factors that are not directly related to their execution plan or unplanned during the tendering phase; however, would affect the constructability of the project and eventually causing for its delay.

## 2.1 Construction Project Delays

Delayed projects are the ones that experience delays in their construction period, where there are dissimilarities between the schedule works to be executed under the approved schedule and the actual works that are being executed at the site by 10% up to 30% [27]. On the other hand, the authors informed that sick projects are the ones that experience delays in their construction period where there are dissimilarities between the actual and planned activities by more than 30% or even the projects which have failed to be closed and completed by their approved schedule. Hence, when the project fails to achieve the planned schedule, approved budget, contractual scope or the required quality, this results in several unpredicted destructive influences on the projects. Typically, delayed construction projects are either treated with an extension of time for the project end date or accelerating its activities by increasing the project's workforce and equipment; hence, addressing additional unplanned costs to the project's approved budget [1]. However, the standard practice for establishing and approving the project's budget allows five to ten percent of the project's total budget as a contingency allowance in the signed contract price; by which, this allowance would generally depend on the contractor's previous experience and expert judgment [35]. Though the project's contract is approved and signed by all the participating parties, this contract also includes the required terms and conditions that define and frame the additional time and cost accompanying the happening delay. Hence, creating conflicts in several cases between the client and contractor as to whether this contractor is eligible to claim the additional cost [27].

## 2.2 External Factors that Construction Project Delays

The construction industry among the world has become progressively international over the past ten years [8]. With the growing need for modern technological advancements in all projects, a sole contractor or participant in major projects will not have the capability nor the required resources to satisfy the continuous demands of the project. Hence, countries, governments, and leading companies always consider the assist of international contractors to fill the gap between the available technological approaches and the required enhancements and developments. Accordingly, the way that developing countries are currently trying to enhance their world business record encourages international construction companies and contractors to bid and win projects in international construction markets [17]. In the Kuwaiti construction industry, the need for international construction contractors signifies in the fact that Kuwait itself lacks the technological advancement and the required proficiency in project management knowledge. Arab project managers are skilled construction executors; however, they lack the planning, scheduling and management skills that are essential for managing megaprojects or multi-discipline projects [21]. Hence, there is a constant need in Kuwait for international construction contractors to supervise the construction execution process by the local construction companies [34]. As a result, all mega-projects in Kuwait are being awarded to international construction contractors who would have a scope of Engineering, Procurement & Construction "EPC" as the minimal standard for their project. While the same international contractors may award each scope or section of scope to a local subcontractor, the international contractor would be on top of all these local subcontractors and with an exclusive and direct contract with the Client.

Typically, the classification of the delay types can be concluded in eight main types; critical, non-critical, compensable, non-compensable, excusable, non-excusable, concurrent and non-concurrent delays ([38]; [36]). However, these traditional categories do not always justify or be fair to the new types of delays and do not satisfy the representation of common factors of delays. Hence, a new type of project delays is to be considered and encountered by projects and organizations, which is the External Delays type [31]. According to the previous authors, external delays are the delays that fall beyond the control, intent, or expectation of clients, contractors, and subcontractors. These delays are not necessarily justifiable nor excusable; not all external delays would be compensable or reflect in an extension of time for the construction process of the project [32]. Usually, these factors are slightly taken into consideration while preparing the sequence of works and the schedule of the project; by which, reflect that the impact of these factors is not always severe and can confirmatively be considered as a medium impact. Nevertheless, some external factors of delay might also cause the project to be drastically delayed, like Force Majeure or the unexpected accidents that happen at the site.

## 3. Research Methodology

The research for the factors that cause project delay in the Kuwaiti construction industry is not new; however, this research did not take its full capacity until the beginning of the twentieth century [27]. Though, to investigate these factors, the global external factors of delay must first be studied to determine the selection and inclusion criteria of some specific factors of delay in the research survey. In this research, the selection criteria of the investigated external

factors of delay must be based upon a logical explanation of the interrelation between the impact of the factors and their frequency of occurrence. This method will ensure the inclusion of the most affecting factors of delay while considering their frequency of occurrence to avoid the low-impact factors or the factors that rarely happens. In assistance to the selection of the most affecting external factors of delay, all the reviewed literature was considering the use of Relatively Importance Index (RII), which will be further explained in detail, to evaluate the importance of selected and studied factors in their researches. Thus, making it easier to compare between all the literature and obtain the most affecting external factors by choosing the factors with the highest RII and compare them in lieu with their frequency in being examined both by other researchers. Hence, indicating that the extracted factors are the most affecting and the frequently examined ones to study their existence in the construction industry in Kuwait. Upon segregating the examined factors in several studies ( [16]; [10]; [15]; [38]; [24]; [11]; [20]; [17]; [28]; [31]), the highest scores considered for the investigated delaying factors in researches are respectively; Unfavorable Weather Conditions, Unreliable Subcontractors, Client's Financial Issues, Accidents During Construction, Conflict Between the Parties, and Price Fluctuations. Henceforward, these six factors will be considered as inputs in the interview conduction and survey formation to be further discussed and evaluate their impact and frequency of occurrence in the construction industry in Kuwait.

Consequently, the extracted factors of delay from the literature will be thoroughly discussed with the interviewed project managers of international contractors. Besides, the interview with the project managers will add two more factors of delay to be included in the questionnaire. The configuration of the interview itself will follow the semi-structured interview criteria, as the same set of sequenced questions will be asked to each participant [25]. Thus, the collected data could be compared and analyzed across all the participants. On the other hand, the design of the questionnaire will consider creating a Likert Survey, as its best suits qualitative analysis and management and business surveys [14]. After collecting the survey's outcomes, each external factor of delay will be analyzed according to its frequency of occurrence and its impact on delaying the project. The purposive sampling methodology shall be used in this research to emphasizes its concentration on specific participants to interview them. The advantage of this methodology is its assistance in constructing a better understanding of the variance delaying factors, and their frequency to occur in current or future projects. As a result, it is saving time and effort by interviewing a selected group of participants and concentrate on getting specific information from them. Typically, it was highly recommended to have a minimum sample size for qualitative researches interviews of 12-15 interviews to reach data saturation [12]. According to the authors, data saturation is when the research does not gain or obtain any or minimal additional knowledge from each following interview. This research will adopt the same methodology and will maintain a sample size of 15 participants for the qualitative interviews.

After including two delaying factors from the conducted interviews, the use of the below equation would determine the sample size to undertake the questionnaire. Increasing the sample size by up to 50% ensures that the minimum number of samples is met; however, for simplicity, this research will use a population size of 100 participants to be considered for any further analysis. While considering a variance of the population  $P=50\%$ , Confidence level= $95\%$ , and  $5\%$  margin of error, the ideal sample size should be 80 participants.

$$n = \frac{p(100-p)z^2}{E^2} \tag{1}$$

The selection criteria for the interview participants shall focus on Project Managers, Project Management Office (PMO), Project Management Team (PMT), and Project Control Managers of international construction contractors in Kuwait or local companies that have several integrated projects with international construction contractors in Kuwait. To analyze the collected data, this research will follow the Relative Importance Index to study the performance of projects in Kuwait for each delaying factor by the following equation.

$$RII = \frac{\sum_{i=1}^5 w_i x_i}{A \times N} \tag{2}$$

To explain the equation mentioned above,  $\mathbf{W}$  is the weight of the delaying factor that was given to it by using the Likert Scale; accordingly, its value ranges from one to five, where the weighting of one means not significant and five means extremely significant. Moreover,  $\mathbf{X}$  represents the frequency of selecting a specific response for a delay factor in the questionnaire by its candidates.  $\mathbf{A}$  is the highest value a delay factor can be given.  $\mathbf{N}$  is the total number of candidates who have matched the selection criteria and finished the questionnaire.

As previously mentioned, the population size for this questionnaire will be 100 participants, while the sample size is only 80 participants; hence, the survey will fulfill its requirement and start segregating and analyzing the collected data when the feedback is received from 80 participants. To expedite the data collection process, the questionnaire has been distributed via a printed copy of the survey to some participants, while creating an online version of the survey by using the services of SurveyMonkey to be distributed to others. As the focus of this questionnaire is to evaluate the respondents' contribution to the effects of external factors of delay, experienced managers and engineers have been

chosen to participate in the survey. In addition, the survey was also distributed to young engineers who have less than five years of experience to understand their logic and perspective of the problem. Thus, the inclusion of various age categories in the sample size of the survey would higher the reliability of the research and generalize its outcomes.

#### 4. Analysis and Discussion

Upon conducting the interviews, most of the interviewees have given high importance to the delays that resulted from the late issuance of work permits. These delays usually cannot be avoided, and its impact on the total delay of the project depends on the location, criticality, and importance of this project. All projects have suffered from this factor of delay; however, the duration and severity of this delay are affected by the influence of contractor, client, and government. The managers who have their projects affected by this factor stated that the duration of the impacted delay could be ranged from a week to months, as this delay tends to occur daily by short intervals every day [20]. Also, considering the frequency of this delaying factor to occur, both interviewed project managers and the literature reviewed researchers have confirmed the continuity and criticality of this factor in some projects, as some construction projects may take place in existing plants or live areas. Therefore, the government or the responsible authorities delay the issuance of the related work permits until they ensure that all the standardized work practices and safety procedures are being following and satisfied. Thus, this was the first factor to be considered from the conduction of the interview.

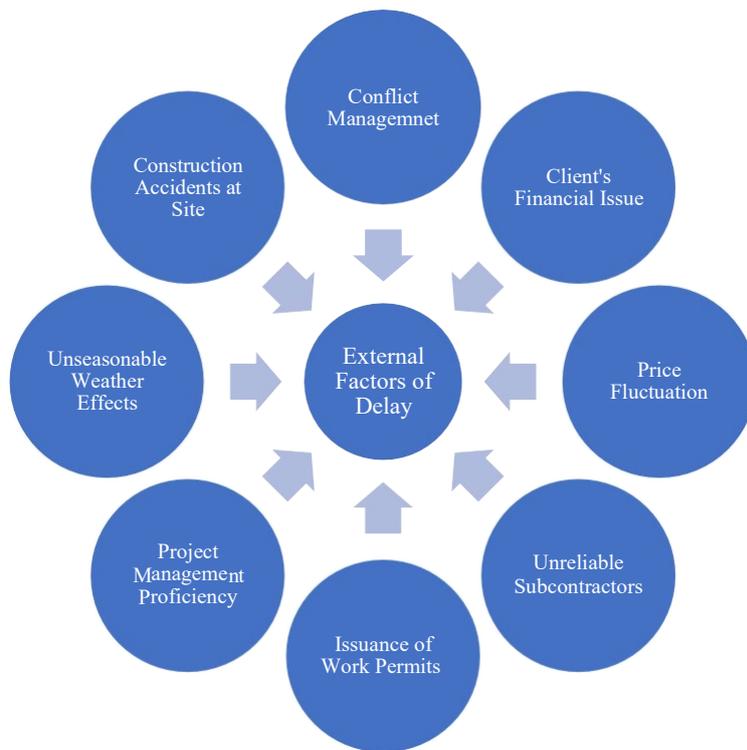
Finally, all interviewees have agreed on the irrefutable impact of client and subcontractor's knowledge project management's principles on the total delay of the project. According to 7 project managers and project control managers, limiting the project manager and project team's knowledge to their technical experience significantly affect the project as their ability to understand the project's schedule, cost, contract, and proper communication methods would be drastically limited. Regardless of the focus of the interviewed project managers on this point, it was merely mentioned in the reviewed literature ([9]; [21]) have considered the arisen conflict between contractual parties, but did not consider the proficiency of project management in these parties. Hence, this factor was considered the second one from the interview conduction that would be input in the survey.

**Table 1 - An illustration of the collected data from interviews and presented regarding the thematic analysis and Coding System Method**

Theme	Code	Respondents' Participation
<b>Understanding the Research Topic</b>	1. Distinguish Purpose and Use	1. 15 participants have contributed to this point
	2. Topic Introduction and Explaining	2. 15 participants have contributed to this point
	3. Changing the Common Understandings	3. 14 participants have contributed to this point
<b>Familiarity with the Topic</b>	1. Differentiate Between Different Types of Delay	1. 15 participants have contributed to this point
	2. Relating Existing Factors to the Research Topic	2. 13 participants have contributed to this point
	3. Tracking the Source of Participants' Knowledge	3. 15 participants have contributed to this point
<b>External Factors of Delay in Kuwait</b>	1. Impact Level of External Factors on Project Duration	1. 13 participants have contributed to this point
	2. Bad Weather	2. 12 participants have agreed to this point
	3. External Factors' Effect on Project Performance	3. 11 participants have agreed to this point
	4. Deprived Implementation of Risk Management in Kuwait	4. 13 participants have agreed to this point
<b>Effect of Contractual Parties</b>	1. Clients' Poor Communication Skills	1. 9 participants have agreed to this point
	2. Lack of Project Management Principles	2. 14 participants have agreed to this point
	3. Lack of Conflict Management	3. 11 participants have agreed to this point
	4. Poor Decision-Making Process	4. 10 participants have agreed to this point
	5. Lack of Subcontractor's Technical Knowledge	5. 7 participants have agreed to this point
	6. Poor Project Supervision	6. 7 participants have agreed to this point
<b>Geographical and Society-Related Factors</b>	1. Effect of Unseasonable Weather Conditions	1. 12 participants have agreed to this point
	2. Cultural Differences	2. 6 participants have agreed to this point
	3. Issuance of Work Permits	3. 11 participants have agreed to this point
<b>Relating Personal Experience</b>	1. Effect of Unseasonable Weather Conditions	1. 12 participants have agreed to this point
	2. Lack of Conflict Management	2. 11 participants have agreed to this point
	3. Project Management Proficiency	3. 15 participants have agreed to this point

<b>Frequency of Occurrence</b>	1.	Very Limited External Factors of Delay	1.	11 participants have agreed to this point
	2.	Some External Factors Merely Exist	2.	12 participants have agreed to this point
	3.	Poor Management Skills is an Always Factor of Delay	3.	14 participants have agreed to this point
<b>Linking Frequency to Impact</b>	1.	Enhancing Project Performance	1.	13 participants have agreed to this point
	2.	Issuance of Work Permits	2.	11 participants have agreed to this point
	3.	Force Majeure	3.	9 participants have agreed to this point

Regarding the above table, the highest scores considered for the investigated delaying factors in researches from the literature review are respectively; Unfavorable Weather Conditions, Unreliable Subcontractors, Client's Financial Issues, Accidents During Construction, Conflict Between the Parties, and Price Fluctuations. Besides, two more factors to be included from the interview conduction which are; Issuance of Work Permits and Project Management Proficiency. The final eight factors of delay will be under examination in the next step, and their impact on project delays shall be analyzed accordingly.



**Figure 1 - This figure illustrates the external factors of delay that would be examined in the research survey**

To simplify the data collection process, two examination parameters were included (impact/frequency) in every question to reduce the number of questions by half; thus, ensuring that the targeted managers have understandably read and filled the survey. In order to get the outcomes in the below-mentioned table, each parameter had to be examined in the relation of the other; afterward, an average weight of the number of participants to each parameter in each question was to be calculated in order to evaluate the response rate per each question. In this case of this research, the Likert scale is being used, which is giving a numeric value to each parameter from 1 to 5. For the “Impact” factor, the highest value of 5 will be given to the “Very High Impact” parameter, while gradually and respectively decreasing in between for the lowest value of 1 for the “Very Low Impact” parameter. On the other hand, in the “Frequency” factor, the highest value of 5 will be given to the “Always Happens” parameter, while gradually and respectively decreasing in between for the lowest value of 1 for the “Rarely Happens” parameter.

Moreover, the Relative Importance Index (RII) was calculated according to the number of responses that a parameter has got with relative to the other parameter to the total number of responses that this parameter has got in its category by using the previously mentioned equation (2) to calculate the relative importance index for each parameter. In this equation,  $\underline{W}$  is the weight of the delaying factor according to the Likert scale,  $\underline{X}$  is the number of responses per parameter for the impact and frequency categories.  $\underline{A}$  is the highest score given for a parameter, which is “5” in the case of Likert Scale; however, as this research is evaluating two factors to each other, the highest score will be if a participant has chosen the highest parameters in the two factors. Hence the highest score would be  $5 \times 5 = 25$ , instead of the usual “5” as per the Likert Scale. Also,  $\underline{N}$  is the total number of participants in the questionnaire, which is “80”

participants in the case of this research.

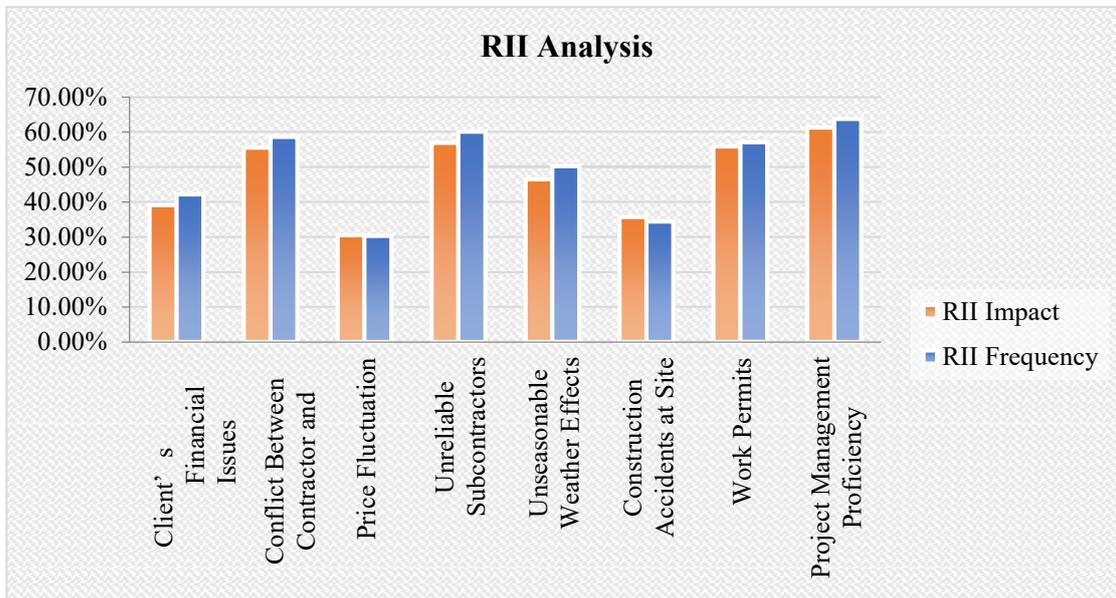
The relative importance index methodology will be used to calculate the severity and the frequency of each factor as per its records in the questionnaire. Hence, from the severity index and the frequency index, the importance index would be calculated by multiplying the first two parameters together. The importance index is a percentage that identifies the significance of each delaying factor about its impact on the project and the frequency that it affects projects.

**Table 2 - Summary of the outcomes of the survey given weight ratios and RIIs for each examination parameter**

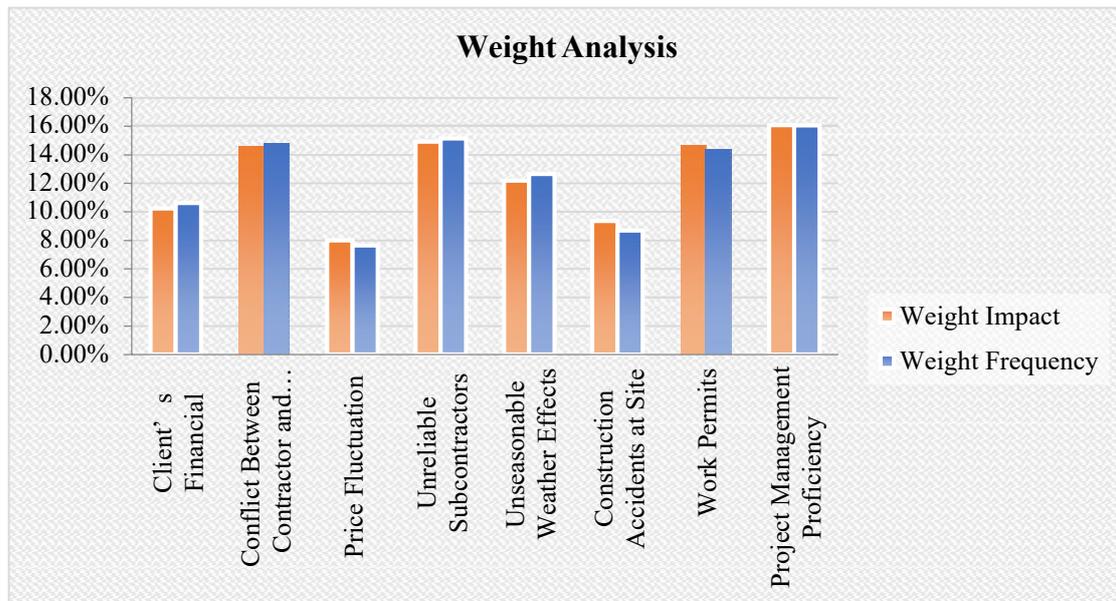
Impact & Frequency	Relative Importance Index (RII)	Client' s Financial Issues	Conflict Between Contractor and Other Contracting Parties	Price Fluctuation	Unreliable Subcontractors	Unseasonable Weather Effects	Construction Accidents at Site	Issuance of Work Permits	Project Management Proficiency
Very High	Ave. Weight	17.67%	7.90%	9.56%	12.27%	11.23%	13.10%	8.73%	19.54%
	RII	10.37%	4.63%	5.61%	7.20%	6.59%	7.68%	5.12%	11.46%
High	Ave. Weight	8.71%	19.91%	6.45%	17.19%	12.67%	5.43%	14.82%	14.82%
	RII	4.42%	10.09%	3.27%	8.72%	6.42%	2.75%	7.51%	7.51%
Moderate	Ave. Weight	3.29%	13.35%	8.62%	15.81%	12.94%	11.50%	20.33%	14.17%
	RII	1.25%	5.06%	3.27%	6.00%	4.91%	4.36%	7.71%	5.38%
Low	Ave. Weight	0.00%	10.09%	11.93%	1.83%	9.17%	17.43%	39.45%	10.09%
	RII	0.00%	2.26%	2.67%	0.41%	2.05%	3.90%	8.82%	2.26%
Very Low	Ave. Weight	0.00%	0.00%	0.00%	0.00%	28.57%	28.57%	0.00%	42.86%
	RII	0.00%	0.00%	0.00%	0.00%	2.00%	2.00%	0.00%	3.00%
<b>Weight Ratio</b>		<b>10.24%</b>	<b>14.57%</b>	<b>8.00%</b>	<b>14.92%</b>	<b>12.18%</b>	<b>9.37%</b>	<b>14.65%</b>	<b>16.07%</b>
<b>RII Impact</b>		<b>39.05%</b>	<b>55.55%</b>	<b>30.50%</b>	<b>56.90%</b>	<b>46.45%</b>	<b>35.75%</b>	<b>55.85%</b>	<b>61.30%</b>
Always	Ave. Weight	1.16%	12.21%	0.00%	18.90%	5.81%	4.65%	23.84%	33.43%
	RII	0.93%	9.77%	0.00%	15.12%	4.65%	3.72%	19.07%	26.74%
Often	Ave. Weight	4.02%	24.44%	1.77%	18.97%	12.22%	3.05%	21.22%	14.31%
	RII	2.45%	14.92%	1.08%	11.58%	7.46%	1.87%	12.96%	8.74%
Sometime	Ave. Weight	15.92%	12.11%	9.29%	14.43%	18.57%	8.46%	7.63%	13.60%
	RII	7.29%	5.54%	4.25%	6.61%	8.51%	3.87%	3.49%	6.23%
Occasionally	Ave. Weight	21.01%	7.98%	18.31%	8.22%	14.79%	20.42%	3.64%	5.63%
	RII	5.82%	2.21%	5.07%	2.28%	4.10%	5.66%	1.01%	1.56%
Rarely	Ave. Weight	36.32%	0.00%	38.68%	1.89%	6.13%	15.09%	1.42%	0.47%
	RII	5.70%	0.00%	6.07%	0.30%	0.96%	2.37%	0.22%	0.07%
<b>Weight Ratio</b>		<b>10.63%</b>	<b>14.79%</b>	<b>7.64%</b>	<b>15.15%</b>	<b>12.67%</b>	<b>8.69%</b>	<b>14.38%</b>	<b>16.06%</b>
<b>RII Frequency</b>		<b>42.15%</b>	<b>58.65%</b>	<b>30.30%</b>	<b>60.10%</b>	<b>50.25%</b>	<b>34.45%</b>	<b>57.05%</b>	<b>63.70%</b>

From the above table, the overall RII and weightage were calculated for both the “impact” and the “frequency” factors for every external factor of delay. The below graphs illustrate the relationship between the RII<sub>Impact</sub> and

$RII_{Frequency}$  and between the weight of the two examined factors. In the first graph, the directly proportional relationship between  $RII_{Impact}$  and  $RII_{Frequency}$  can easily be noticed. This relationship emphasizes that the importance and considerable influence of an external delaying factor get higher with its chances to occur and be repeated in projects. Hence, it gives international construction contractors a better chance to understand the required preventive and corrective to face this delay when it happens. Moreover, the second graph also focuses on the same message that the first graph delivers; however, in the case of the “Construction Accidents at Site” the  $RII_{Impact}$  is higher than  $RII_{Frequency}$  while it is the opposite all other delaying factors. This means that, in some cases, the influence of a delaying factor to affect the performance of a project and causes for its delay is higher than its probability of occurrence in a project. Thus, the project management team must recognize and acknowledge the severe impact of this factor even if its chances to happen are lower than others.



**Figure 2 - An illustration of the Relative Importance Index for every external factor of delay**

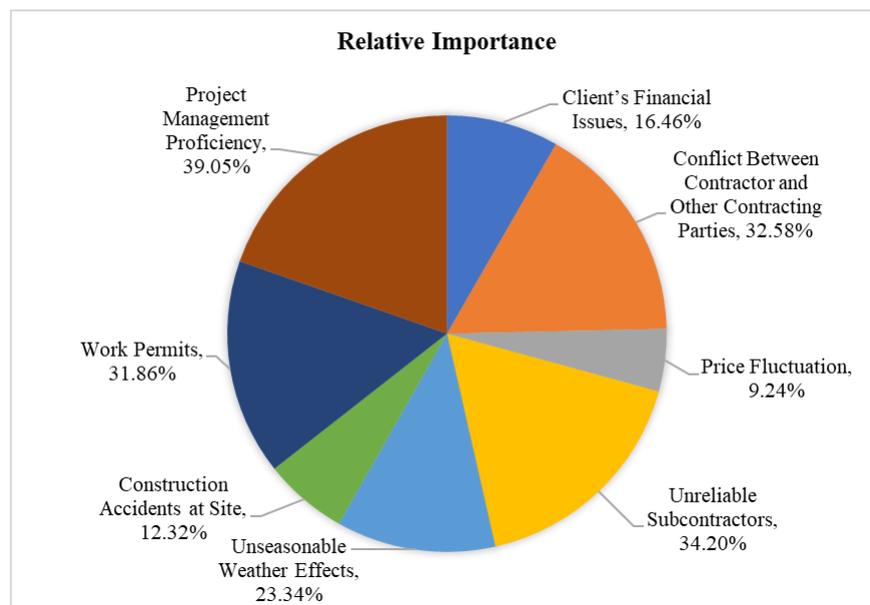


**Figure 3 - An illustration of the weightage for every external factor of delay**

On the other hand, the key objective of this research is to evaluate the RII of the examined external factors of delay and categorize them to rank their ability to affect the project in a way or another. Therefore, by multiplying the  $RII_{Impact}$  and  $RII_{Frequency}$  together, the overall RII for each examined external factor of delay can exemplify the rank of

each factor and its importance to international construction contractors to take care of and prioritize their effort to understand them. In the above pie-chart, the project management proficiency comes first with the highest RII of 39.05%, while the client’s financial issues come last with RII of 9.24%. This outcome informs about the present situation of which the focus of the local market is on the project manager’s technical knowledge and practical experience, rather than managerial information and leadership familiarity.

The conduction of interviews had provided some more delaying factors to be examined in the distributed survey; which, has shown that a critical problem faces the current industry in Kuwait, which is the lack of project management proficiency. This factor affects the construction industry in Kuwait on local and international levels, as it might prevent projects from being completed and affect international contractors’ capability to establish proper communication plans with their local markets’ correspondences. Furthermore, the above pie chart illustrates that the second most affecting factor is the unreliability of the assigned subcontractors, which severely affects the project’s ability to make decisions and understand the other parameters of the project rather than the scope and technical knowledge. The rest of the external factors of delay are organized according to their effect on project’s delay by the following order; Conflict Between Contractor and Other Contracting Parties, Issuance of Work Permits, Unseasonable Weather Conditions, Client’s Financial Issues, Construction Accidents at Site & Price Fluctuations.



**Figure 4 - The overall Relative Importance Index between the examined external factors of delay**

External Factor of Delay	Rank <sub>Impact</sub>	Rank <sub>Frequency</sub>	Total Rank
Project Management Proficiency	1	1	1
Unreliable Subcontractors	2	2	2
Conflict Between Contractor and Other Contracting Parties	4	3	3
Issuance of Work Permits	3	4	4
Unseasonable Weather Effects	5	5	5
Client’s Financial Issues	6	6	6
Construction Accidents at Site	7	7	7
Price Fluctuation	8	8	8

Furthermore, it can also be concluded from the low responses for the “Low Impact” and “Very Low Impact” in Table 4.3, that due to the lack of project management proficiency and poor academic understanding of the concepts and principles of project management, only a few survey participants have distinguished the difference between a low and high impact factors. Thus, emphasizing on the score that this delaying factor has already got; by which, raising the authenticity and credibility of this research and genuinely informs international construction contractors about the current conditions and weaknesses in the Kuwaiti construction market that can affect their performance and cause their projects to be delayed. On the other hand, the low score of Client’s Financial Issues confirms the stable and steady financial situation in Kuwait and the Gulf Area in general; which, reflects the current richness of Kuwait and its ability to stand to and adapt to several financial cases within their projects. The dependence on the intensive technical knowledge of project managers, without addressing their managerial skills may be used to run small projects. However, the future thriving period of construction projects and the severe need for international contractors to handle these projects requires the local construction community to categorize the affecting delaying factors and address them correctly.

The data analysis has taken a different direction; as instead of comparing the Impact and Frequency factors individually, both factors must be combined and their measurements to be unified as to compare them suitably to each other. Hence, Table 4.6 was a reference to analyze and rank the examined factors of delay according to their calculated RII. As shown in the below table, the rank of both the Impact and Frequency factors is mostly the same. However, in the case of “Conflict Between Contractor and Other Contracting Parties” and “Issuance of Work Permits” their ranks were switched together, indicating that their importance and along with their frequency of occurrence overlaps with each other. With the use of two data collection approaches, this research was able to identify the main delaying factors for international contractors in Kuwait. Moreover, interviewing professional project management practitioners have enabled the addition of two more delaying factors to infuse an integration between theoretical studies and existing market situations in Kuwait. From the response of the survey, the impact of each of the mentioned delaying factors on the performance of their associated projects identified, which results by default as a delay for these projects. Hence, the effect of the contractual, environmental, cultural, and legal factors on the performance of the project were indicated by the number of responses and the marks that each factor has collected regarding its parameters.

## 5. Conclusion and Recommendations

The results of this research show that the Kuwaiti construction industry severely suffers from a lack of project management knowledge and understanding of management principles. This result was given by the outcomes of the research survey, which indicates that the leading factor for delays in Kuwait is due to lack of project management proficiency. Hence, it is highly recommended that local clients, contractors, and subcontractors consider preparing training sessions and seminars for providing the next management team with the essential knowledge to compete with the proficiency of the international contractors that are currently needed in Kuwait. Furthermore, international contractors must ensure that their subcontractors’ key personnel have the required project management proficiency by performing interviews with them that evaluates their managerial skills more than their technical skills. Practical approaches for international contractors may vary upon their projects and their contract type; however, these contractors may seek accreditation or credential from their subcontractors that show their managerial professionalism. Moreover, the results have also shown that international construction contractors get their performance affected, and their projects delayed due to local subcontractors’ inability to complete their scope within the approved schedule. Therefore, international contractors, along with the assistance of local clients, must emphasize local subcontractors to provide transparent information about their liability and capability to handle and manage their assigned projects. Hence, international contractors should have preventive and sanctioning penalties for subcontractors who are not able to complete their scope within the approved schedule. Also, international contractors can benefit from other international contractors’ experience in Kuwait, and their lessons learned record regarding their current or completed projects. Elsewhere, international contractors must provide and instruct their subcontractors to provide continuous safety training to emphasize all workers to follow the required safety procedures and minimize accidents at the site.

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