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Factors Causing Delays For Residential Building Construction in Abu Dhabi, UAE

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Abstract

Delay is the lack of performance or the extension of time required to complete a project that results from unexpected events may be caused by the contractor, the owner, third parties, or by unanticipated natural or artificial site conditions. The aim of this study is to explore the factors causing delays for residential building construction in Abu Dhabi. To meet the study aim, the questionnairers were distributed to 200 participants from Contractor's firms and 201 participants from Consultant's firms. Data were collected from 200 participants from Contractor's firms and 201 participants from Consultant's firms. Quantitative analysis by using ANOVA analysis in SPSS Software was applied to the collected data. The majority of contractor's participants (102=52.04%) and the consultant's participants (93=46.97%) indicated that client's financial difficulties is ''sometimes'' causing a delay in construction projects in UAE. The majority of consultant's participants (138=70.77%) indicated that change order is ''usually'' causing a delay in construction projects in UAE. However, the findings from this study become more important, if more studies are conducted to extend the exploring of the different factors causing delays for residential building construction in Abu Dhabi for wide range of projects in Abu Dhabi.

Keywords: Causes of Delays, construction project, Time and cost overruns

1.Introduction

Delays are a very common occurrence in construction projects, and they are the cause of many of the disputes and claims. Delay was described in its basic form to "involve an increase in the time necessary to complete the project beyond that which was contemplated at the time the contract was signed" **(Abu Osbeh, 2011)**. Delays can take place as a result of many events (reasons) caused by different parties or conditions. By their very definition, as mentioned above, delays lead to time overrun, which in many cases leads to cost overrun. Time and cost overruns are the main reasons for construction claims. The word delay is used to define the time during which some part of the construction work for the project has been prolonged behind what was contractually planned due to unpredicted conditions **(Braimah, 2014)**. Delay analysis is the practice of exploring the measures that influenced in a project delay. They added state that delay analysis has the purpose of formative the cost liability of the project parties in

relevant to the delay. Furthermore, delay analysis is a way of as long as the corr oboration and quantification of the time and cost penalty that are necessary to get decision in the diverse scenarios of a delay claim **(Braimah, 2014)**.The scope of this study is undertaken in the UAE and is based on the construction of the residential buildings including community villas development projects and residential towers projects which are representing an example for the projects that facing different type of delays during the construction. The study is targeted to explore the factors causing delays for residential building construction in Abu Dhabi (in theory and in practice) thoroughly with the interpretation to highlight these factors.

2.Literature Review

Construction projects practice delays in their completion due to a variety of causes in the world and United Arab Emirates (UAE) is no exemption. When a project is delayed, it has unenthusiastic impact on the relevant parties **(Ur Rahman, 2015)**. The research exposed that 50% of the construction projects in UAE face delays and they are not completed on time **(Abdelhadi and Bajracharya, 2019)**. The majority reason of delay for construction projects in Saudi Arabia is change order by client and engineer. Survey indicated that that 70% of projects in Saudi Arabia experienced time delay and found that 45 out of 76 projects were delayed **(Alsuliman, 2019)**. In addition, the majority grounds of delay for construction projects in Ghana are monthly payment complexity from organizations, weak Contractor management and lack of practical performance **(Amoatey, 2017)**. Furthermore, the general outcome indicated that the mainly significant reasons of delay for construction projects in Egypt are: funding by Contractor throughout construction, delays in Contractor's expenses by employer, design modifications by employer, incomplete payments throughout construction, and lack of professional construction management **(Shibani, 2021)**.Ten most significant reasons of delay for construction projects in Malaysia were: Contractor's inappropriate planning, lack in site management, insufficient Contractor knowledge, insufficient client's funding and expenses for completed work, troubles with subContractors, lack in material, manpower supply, availability of equipment, poor communication between parties, and error throughout the construction period **(Yap, 2021)**. The main reasons causing delays in construction projects in Indonesia is the change of work require by the project employers with 71.84% significance index **(Tarigan, 2018)**. The majority reasons of delay for construction projects in Libya were poor planning, shortage of useful communication, shortage of materials, design mistakes, unhurried decision-making and funding issues **(Alfakhri, 2018)**. In Algeria, the outcome shows that the managerial issues (including: planning, organization and management) are the mainly significant factor of delay in Algeria **(Roumeissa, 2018)**. It was found that the major reasons of delay for construction projects in Iran are lack of proficiency in site management and supervision, delay in work progress, payment by owner, change orders throughout construction, poor planning and by Contractor, funding difficulties, delay in decision making by employer, delays in issuing design, late in checking and accepting design documents by engineer, and weakness in contract management **(Rezaee, 2019)**. According to **Kog (2019)**, the important reason of delay for construction projects in Vietnam are lack of regulations, lack of skill, design, estimating and funding. While the majority reasons of delay for construction project in Jordan are: funding obstacles faced by the Contractor and change orders by the client are the main causes of construction delay **(Samarah, 2016)**. In addition, weather situation and changes in government system and laws ranked with the least significant reasons. According to **Ur Rahman (2015)**, quantitative research method was applied by performing a survey

to collect feedback from stakeholders about the factors of delays in the UAE. The report analysis showed that the main ten reason of delay according to the ranking are:

- Poor coordination with electro mechanical work
- Chosen of the lowest bidder
- Approval's delay and delay in decision making,
- Delays in material delivery
- Employer instruction for extra works throughout construction period
- Poor planning and scheduling of the projects
- Lack of productivity for labor and equipment
- Lack of coordination matter and quality of works
- Approvals delay for design
- Contractual period for the project is not realistic

According to **Alhammadi (2020)**, in depth questionnaire was issued and used to obtain feedback from experts associated with the UAE construction industry. Approval of design, insufficient proper planning, change order and delays of the owners' decision-making procedure are the main reasons of delay in the UAE construction industry. Research was performed by **Zaneldin (2020)** addressed the outcomes of a study of the categories, reasons and occurrence of construction claims in the emirates of Abu Dhabi and Dubai in UAE by using a data from 124 claims for a diversity of projects in the two emirates. The outcomes of this analysis showed that change orders are the most frequent reason of claims with a significance index of 55%. While ''delay caused by client'' was graded second with a significance index of 52.5%. ''Planning errors'' reason of claims was graded last with a significance index of 32.7%. A different study performed by **Motaleb (2013)** was depended on literature review and survey that examined 42 probable delay factors in the UAE. Questionnaires were distributed to 50 firms with a feedback rate of 70%. Characteristic outcomes in Table 1 have exposed that change order, payment issues and other client-associated factors are the main important reasons of delay. As well, cost and time override are the main important effects.

Table.1. Ranking comparison between 2006 and 2010 of top causes of delay in UAE **(Motaleb, 2013)**

Factor Description	2010 Rank	2006 Rank	Rank Change
Change order	1	27	-26
Lack of capability of client representative	2	2	0
Slow decision making by client		-	Not applicable
Lack of experience of client in construction	4	-	Not applicable

Poor site management and supervision	5	19	-14
Incompetent project team	6	12	-6
Inflation price fluctuation	7	-	Not applicable
Inaccurate time estimating	8	-	Not applicable
Late delivery of materials	9	6	3
Improper project planning/scheduling	10	23	-13
Inaccurate cost estimating	11	8	3
High interest rate	12	-	-
Client's financial difficulties	13	10	3
Unreasonable constraint to client	14	17	-3
In appropriate construction methods	15	7	8

Comparing the causes of delay for construction projects in UAE and other countries based on aforementioned discussion shows that there are similar factors of delay between UAE and the other countries as shown in Table 2

Table. 2.Comparison for the Causes of Delay for Construction Projects in UAE and other Countries Based on Aforementioned Literature

Causes of Delay for The Construction Project	**UAE**	**Saudi Arabia**	**Ghana**	**Egypt**	**Malaysia**	**Indonesia**	**Libya**	**Algeria**	**Iran**	**Vietnam**	**Jordan**
Lack of coordination with Electro Mechanical works	✔										
Selection of the lowest bidder commercially	✔										

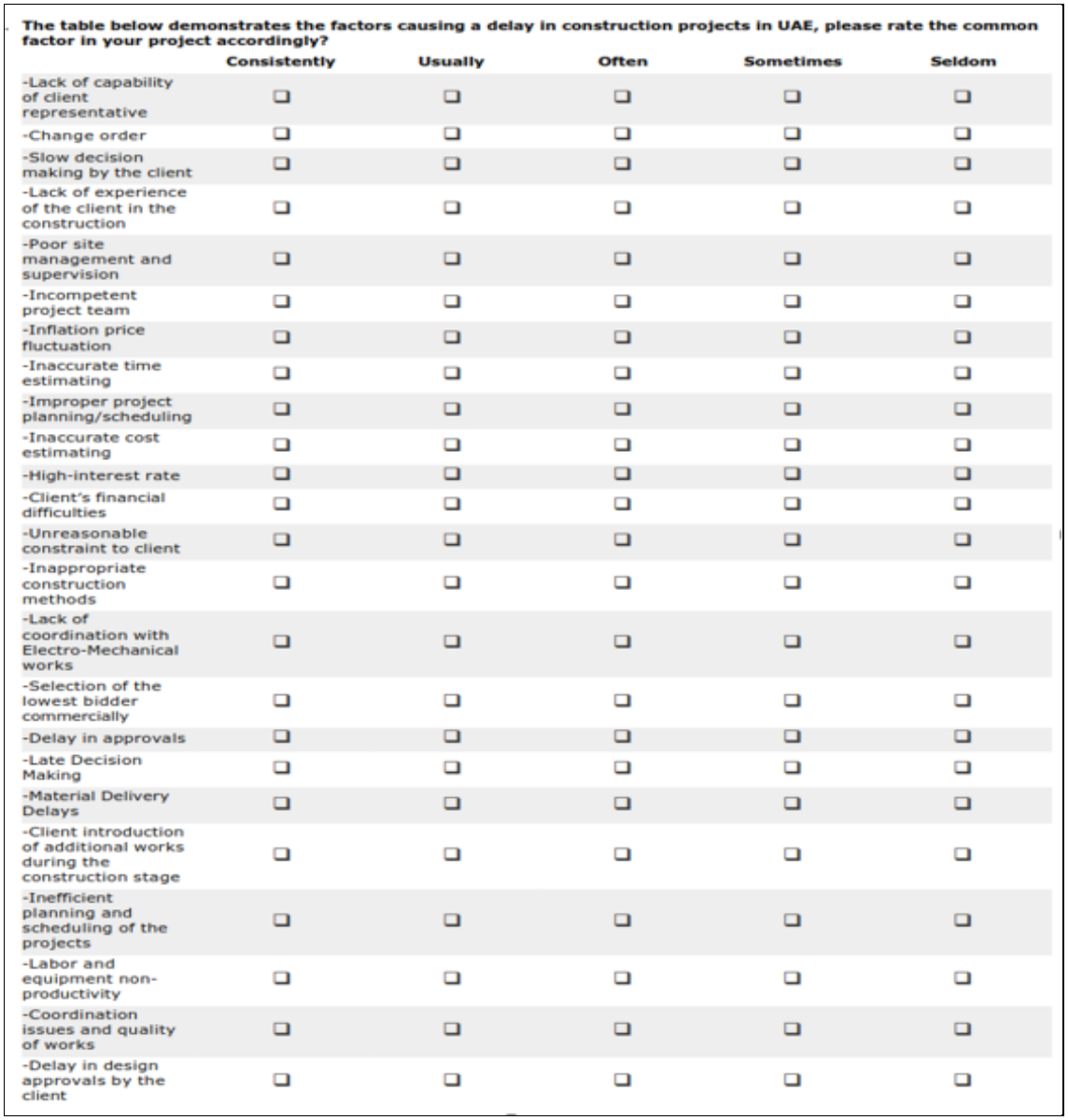
Delay in approvals	✔									✔	
Late Decision Making	✔						✔	✔	✔		
Material Delivery Delays	✔				✔		✔				
Client introduction of additional works during construction stage	✔							✔			
Inefficient planning and scheduling of the projects	✔						✔	✔	✔		
Labour and equipment non productivity	✔		✔							✔	
Coordination issues and quality of works	✔				✔		✔				
Delay in design approvals by client	✔								✔	✔	
Original contract duration is not realistic	✔										
Change orders	✔	✔		✔		✔		✔	✔		✔
Delay caused by owner	✔		✔	✔	✔				✔		
Planning errors	✔				✔		✔	✔			
Cost and time overruns	✔	✔									

From the above Table, it is found that the common causes of delay for the construction project in UAE and the most of the countries are the change orders and the delay caused by the owners. The study was investigated the causes of delay for the residential building project in Abu Dhabi throughout questionnaire as shown in the following sections.

3.Method

To meet the study aim, the below questionnaire was distributed to 200 participants from Contractor's firms and 201 participants from Consultant's firms to explore the factors causing delays for residential building construction in Abu Dhabi. The reasons for using a questionnaire survey allowed for the incorporation of the perspectives of a large population. In addition to this, the process was repeated and given its high reliability due to the quality aspects of data collection that took place under controlled conditions**(Fowler, 2013)**. The questioonaire asked participants to rate the common factors causing a delay in construction projects in UAE. The reverse-coded responses ranged from 1 = "Seldom" to 5 = "Consistent" as shown in Figure No.. Data was collected from 200 participants of varying nationalities from Contractor's firms and 201 participants from Consultant's firms . A statistical analysis by using SPSS Software was applied to the collected data. Exploratory data analysis uses descriptive statistics, e.g., frequency/percentages and means/standard deviations, and graphical forms to analyze data **(Bagdonavicius et al., 2013)**. Furthermore, descriptive statistic was produced for the Likert scale questions. A Kaiser-Meyer-Olkin (KMO) test is used to determine the sampling adequacy of data that are to be used for Factor Analysis. Factor Analysis was used to ensure that the variables which used to measure a particular concept are measuring the concept intended **(Kothari, 2020)**. In general, KMO values between 0.8 and 1 indicate the sampling is adequate. KMO values less than 0.6 indicate the sampling is not adequate and that remedial action should be taken. In contrast, others set this cutoff value at 0.5. A KMO value close to zero means that there are large partial correlations compared to the sum of correlations. In other words, there are widespread correlations which would be a large problem for factor analysis.The Bartlett test tests the degree that the matrix deviates from an identity matrix **(Bell, 2018)**.

Figure.1. A sample of the questionnaire was distributed to the consultants and contractors.



The table below demonstrates the factors causing a delay in construction projects in UAE, please rate the common factor in your project accordingly?

	Consistently	Usually	Often	Sometimes	Seldom
-Lack of capability of client representative	❑	❑	❑	❑	❑
-Change order	❑	❑	❑	❑	❑
-Slow decision making by the client	❑	❑	❑	❑	❑
-Lack of experience of the client in the construction	❑	❑	❑	❑	❑
-Poor site management and supervision	❑	❑	❑	❑	❑
-Incompetent project team	❑	❑	❑	❑	❑
-Inflation price fluctuation	❑	❑	❑	❑	❑
-Inaccurate time estimating	❑	❑	❑	❑	❑
-Improper project planning/scheduling	❑	❑	❑	❑	❑
-Inaccurate cost estimating	❑	❑	❑	❑	❑
-High-interest rate	❑	❑	❑	❑	❑
-Client's financial difficulties	❑	❑	❑	❑	❑
-Unreasonable constraint to client	❑	❑	❑	❑	❑
-Inappropriate construction methods	❑	❑	❑	❑	❑
-Lack of coordination with Electro-Mechanical works	❑	❑	❑	❑	❑
-Selection of the lowest bidder commercially	❑	❑	❑	❑	❑
-Delay in approvals	❑	❑	❑	❑	❑
-Late Decision Making	❑	❑	❑	❑	❑
-Material Delivery Delays	❑	❑	❑	❑	❑
-Client introduction of additional works during the construction stage	❑	❑	❑	❑	❑
-Inefficient planning and scheduling of the projects	❑	❑	❑	❑	❑
-Labor and equipment non-productivity	❑	❑	❑	❑	❑
-Coordination issues and quality of works	❑	❑	❑	❑	❑
-Delay in design approvals by the client	❑	❑	❑	❑	❑

3.1Data Collection Tools

Data was collected from the questionnaire, extracted and recorded by using Survey Methods Software. Data were collected from participants of various nationalities. The data were recorded error-free and imported into a statistical application. All the data were reviewed individually through Survey Methods Software and printed as PDF, MS Word and MS PowerPoint files. Data was collected from 200 participants from Contractor's firms and 201 participants from Consultant's firms.

3.2Research Process

A research methodology refers to the principles and procedures of logical thought that applied to a scientific investigation **(Fellows and Liu, 2015)**. The research was undertaken based on the findings of the literature reviews as shown in Figure 1. The questionnaire was a research technique to achieve the research objectives. The purpose of this study is to explore the factors that cause delays in residential buildings in Abu Dhabi from the perspective of the consultants and contractors. The data

that was obtained from the survey results were analyzed so that results could be quantified and an interpretation obtained. The specific methodological framework involved a five -stage process:

Stage 1: Fully formulated the problem statement for the study, including finalizing the topic, objective, and scope of the study.

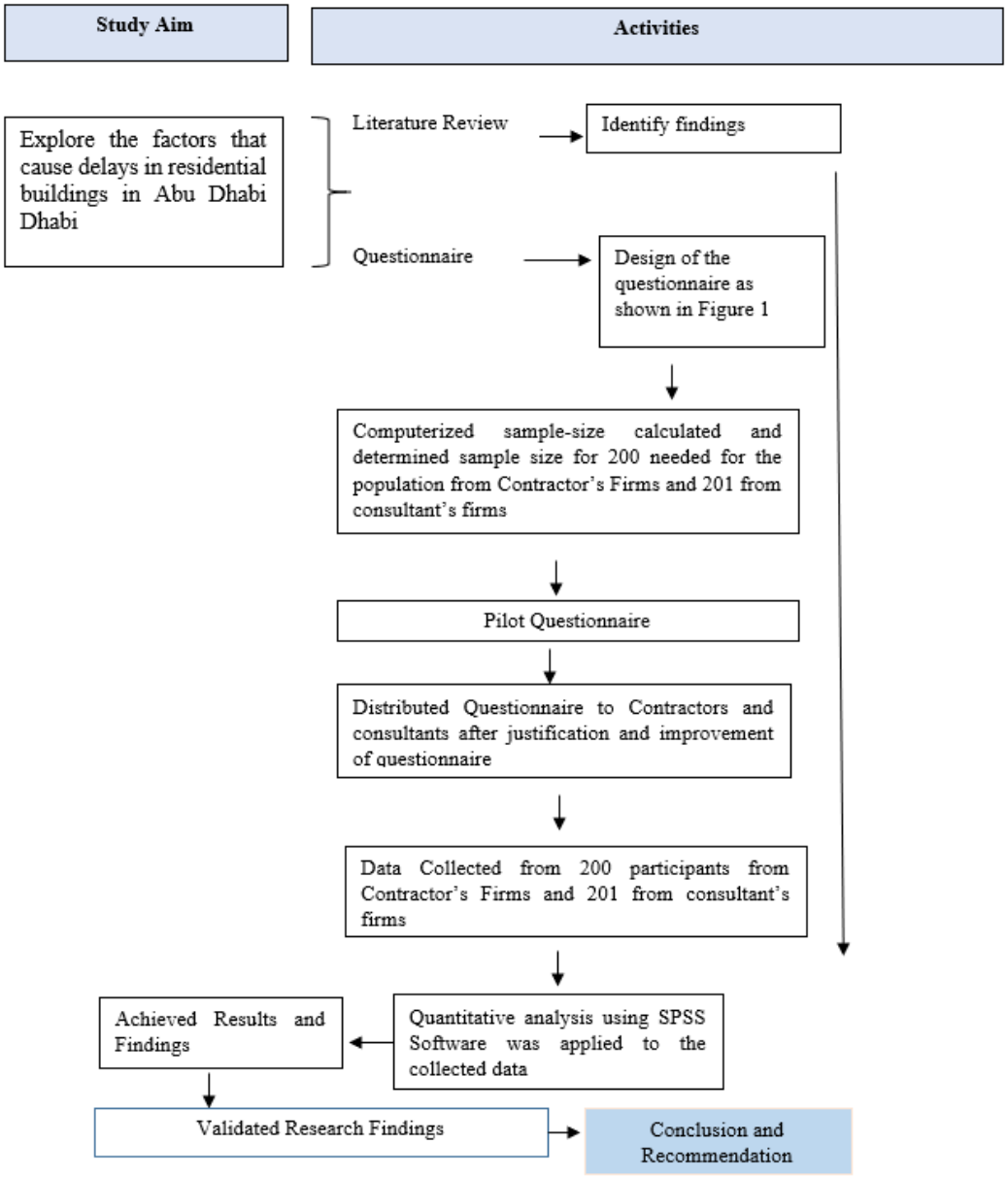
Stage 2: Conducted a thorough and comprehensive systematic literature review of the problem.

Stage 3: Developed the full research methodology, including selecting appropriate research technique and data collection method.

Stage 4: Analyzed the collected data

Step 5: Validated research findings

Figure. 1. Flowchart showing the research process



3.3Analysis of Data

Data analysis methods helped to understand facts, observe patterns and formulate explanations. Data analysis was defined as a practice in which, unorganized or unfinished data was ordered and organized so that useful information could be highlighted **Bagdonavicius et al. (2013)**. In this study, the decision about which statistical test to use depended on the research design, the distribution of the data, and the type of variable. In general, if the data is normally distributed, parametric tests will be chosen **(Kothari, 2020)**. The study used the quantitative analysis and the descriptive statistics. The quantitative analysis by using ANOVA analysis in SPSS Software was applied to the data collected from 200 contractor's participants and 201 consultant's participants. The acronym SPSS name stands for Statistical Package for the Social Sciences **(Bala, 2016)**. In this study, quantitative analysis was selected to analyze the collected data for the following reasons according to **Tolmie (2011)**:

-Quantitative analysis is explaining the phenomena by collecting numerical data that are analyzed using mathematically-based methods (in particular statistics).

-Quantitative analysis is subjectivist. In contrast to the realist view that the truth is out there and can be objectively measured and found through research.

According to **Larson (2015)**, there are a number of stages in the process of setting up a data file and analyzing the data:

-The first step is to check and modify the options that SPSS uses to display the data and the output that is produced.

-The next step is to set up the structure of the data file by defining the variables.

-The third step is to enter the data - that is the value obtained from each participant or respondent - for each variable.

-The fourth step is to screen the data file for errors.

-The fifth step is to explore the data using descriptive statistics and graphs.

-The sixth step is to modify the variables for further analysis.

-The seven step is to conduct statistical analysis to explore relationships and to compare groups.

3.4Findings

The findings from the research are provided under the theme topics. View of preservice teachers on blogs:

-Contractor's view of point on the common factors causing a delay in construction projects in UAE
-Consultant view of point on the common factors causing a delay in construction projects in UAE

3.4.1 Contractor's View of Point On the Common Factors Causing a Delay in Construction Projects in UAE

Descriptive statistic was produced for Contractor's questionnaires. The Likert scale is composed of a series of four or more Likert-type items that are combined into a single composite score/variable during

the data analysis process **(Boone, 2012)**. The Likert scale question used a series of questions with five response alternatives: consistently, usually, often, sometimes, and seldom to create an attitudinal measurement scale. The questioonaire asked participants to rate the common factors causing a delay in construction projects in UAE. The reverse-coded responses ranged from 1 = "Seldom" to 5 = "Consistent". The analysis shows that the majority of participants (102=52.04%) indicated that Client's financial difficulties is ''sometimes'' causing a delay in construction projects in UAE. Furthermore, some of the participants (71=36.04%) indicated that change order is ''Often'' causing a delay in construction projects in UAE. Analysis for Likert type responses are presented in Tables 3 ,4,5 ,6 and Figure 3 providing a graphical representation.

Table.3. KMO and Bartlett's Test (Contractors)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.824
Bartlett's Test of Sphericity	Approx. Chi-Square	4595.415
	df	378
	Sig.	.000

Interpretation of table-3.

In table 3 above the p-value of KMO is above 0.5 indicating that sample is adequate for analysis whereas the p-value for bartlett test of sphericity is below 0.05 indicating that factor model is appropriate.

Table. 4.Total Variance Explained (Contractors)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
1	11.681	41.718	41.718	11.681	41.718	41.718	5.248	18.743	18.743
2	2.740	9.785	51.504	2.740	9.785	51.504	4.549	16.246	34.989
3	2.467	8.809	60.313	2.467	8.809	60.313	3.254	11.622	46.611
4	1.677	5.990	66.303	1.677	5.990	66.303	3.008	10.743	57.354
5	1.224	4.373	70.675	1.224	4.373	70.675	2.799	9.997	67.350
6	1.088	3.887	74.562	1.088	3.887	74.562	2.019	7.212	74.562
7	.925	3.305	77.867						
8	.856	3.059	80.926						
9	.721	2.575	83.500						
10	.561	2.003	85.503						
11	.491	1.753	87.256						
12	.447	1.597	88.853						
13	.422	1.508	90.361						
14	.388	1.387	91.748						

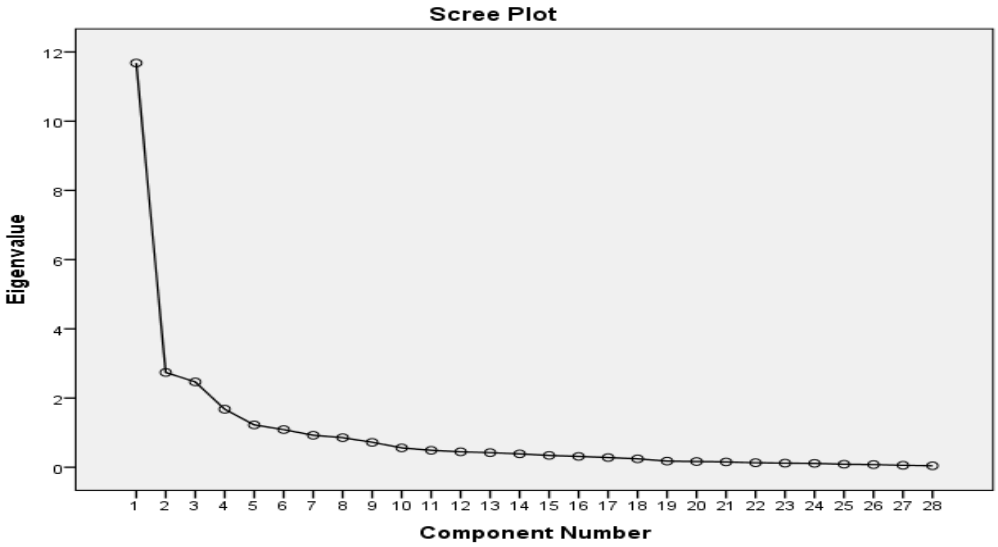
15	.341	1.219	92.967						
16	.315	1.124	94.091						
17	.281	1.004	95.095						
18	.244	.871	95.966						
19	.178	.635	96.600						
20	.167	.595	97.196						
21	.155	.552	97.748						
22	.131	.468	98.215						
23	.119	.424	98.640						
24	.114	.406	99.045						
25	.089	.318	99.364						
26	.078	.278	99.642						
27	.057	.203	99.845						
28	.044	.155	100.000						

Extraction Method: Principal Component Analysis.

Interpretation of table-4.

In Table 4 it can be seen that 6 factors are extracted since the Eigenvalues value is above 1.

Figure. 3. Scree Plot (Contractors)



The above plot in Figure 3 shows the number of factors which is based on initial eigenvalues of the total variance explained table.

Table. 5. Rotated Component Matrixa (Contractors)

	Component					
	1	**2**	**3**	**4**	**5**	**6**
Lack of capability of client representative	.730					
Change order					-.630	
Slow decision making by the client		.456	.519			
Lack of experience of the client in the construction					.863	
Poor site management and supervision	.572	.468				
Incompetent project team		.637	.428			
Inflation price fluctuation	.482			.642		
Inaccurate time estimating				.787		
Improper project planning/scheduling	.423		.685			
Inaccurate cost estimating	.552				.597	
Highinterest rate		.601			.514	
Client's financial difficulties		.700				.562
Unreasonable constraint to client	.826					
Inappropriate construction methods	.603		.465			
Lack of coordination with ElectroMechanical works			.588	.602		
Selection of the lowest bidder commercially				.640		
Delay in approvals	.521	.637				
Late Decision Making		.766				
Material Delivery Delays	.552					
Client introduction of additional works during the construction stage						.779
Inefficient planning and scheduling of the projects			.801			
Labor and equipment nonproductivity	.479		.440		.505	
Coordination issues and quality of works		.648				
Delay in design approvals by the client		.782				
Original contract duration is not realistic	.817					
Delay caused by the owner	.661					
Planning errors		.400	.508			
Cost and time overruns						.621
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.						
a. Rotation converged in 10 iterations.						

Interpretation of table-5. Table 5 shows the correlation between the factor and each variable where individual item in rotated factor matrix is called factor loading also the Kaiser normalization is providing stability to the solution. **Table. 6.**Frequencies and Percentages for Survey Question (Contractors)

	Consistentl y	**Usually,**	**Often**	**Sometimes**	**Seldom**
-Lack of capability of client representative:	42(21.32%)	46(23.35%)	26(13.2%)	83(42.13%)	0(0%)
-Change order:	1(0.51%)	57(28.93%)	71(36.04%)	68(34.52%)	0(0%)
-Slow decision making by the client:	1(0.51%)	32(16.16%)	88(44.44%)	77(38.89%)	0(0%)
-Lack of experience of the client in the construction:	13(6.57%)	41(20.71%)	48(24.24%)	96(48.48%)	0(0%)
-Poor site management and supervision:	20(10.2%)	33(16.84%)	67(34.18%)	76(38.78%)	0(0%)
-Incompetent project team:	0(0%)	56(28.43%)	67(34.01%)	74(37.56%)	0(0%)
-Inflation price fluctuation:	5(2.54%)	65(32.99%)	63(31.98%)	64(32.49%)	0(0%)
-Inaccurate time estimating:	25(12.56%)	28(14.07%)	61(30.65%)	85(42.71%)	0(0%)
-Improper project planning/schedulin g:	20(10.15%)	40(20.3%)	50(25.38%)	87(44.16%)	0(0%)
-Inaccurate cost estimating:	2(1.01%)	70(35.35%)	66(33.33%)	60(30.3%)	0(0%)
-High-interest rate:	8(4.08%)	43(21.94%)	80(40.82%)	65(33.16%)	0(0%)

-Client's financial difficulties:	16(8.16%)	33(16.84%)	45(22.96%)	102(52.04%)	0(0%)
-Unreasonable constraint to client:	14(7.07%)	58(29.29%)	47(23.74%)	77(38.89%)	2(1.01%)
-Inappropriate construction methods:	1(0.51%)	50(25.51%)	71(36.22%)	74(37.76%)	0(0%)
-Lack of coordination with Electro-Mechanical works:	12(6.09%)	43(21.83%)	58(29.44%)	84(42.64%)	0(0%)
-Selection of the lowest bidder commercially:	19(9.64%)	57(28.93%)	53(26.9%)	68(34.52%)	0(0%)
-Delay in approvals:	26(13.13%)	44(22.22%)	70(35.35%)	58(29.29%)	0(0%)
-Late Decision Making:	7(3.55%)	58(29.44%)	49(24.87%)	83(42.13%)	0(0%)
-Material Delivery Delays:	11(5.61%)	62(31.63%)	59(30.1%)	64(32.65%)	0(0%)
-Client introduction of additional works during the construction stage:	9(4.55%)	39(19.7%)	69(34.85%)	81(40.91%)	0(0%)
-Inefficient planning and scheduling of the projects:	16(8.12%)	41(20.81%)	53(26.9%)	87(44.16%)	0(0%)
-Labor and equipment non-productivity:	4(2.04%)	62(31.63%)	62(31.63%)	68(34.69%)	0(0%)
-Coordination issues and quality of works:	12(6.12%)	47(23.98%)	76(38.78%)	61(31.12%)	0(0%)

-Delay in design approvals by the client:	16(8.12%)	48(24.37%)	47(23.86%)	86(43.65%)	0(0%)
-Original contract duration is not realistic:	19(9.64%)	65(32.99%)	44(22.34%)	69(35.03%)	0(0%)
-Delay caused by the owner:	8(4.04%)	53(26.77%)	64(32.32%)	73(36.87%)	0(0%)
-Planning errors:	5(2.59%)	38(19.69%)	66(34.2%)	84(43.52%)	0(0%)
-Cost and time overruns:	7(3.57%)	41(20.92%)	63(32.14%)	85(43.37%)	0(0%)

3.4.2Consultant's View of Point On the Common Factors Causing a Delay in Construction Projects in UAE

Descriptive statistic was produced for for consultant's questionnaires. The Likert scale in used a series of questions with five response alternatives: consistently, usually, often, sometimes, and seldom to create an attitudinal measurement scale. The questionnire asked participants to rate the common factors causing a delay in construction projects in UAE. The reverse-coded responses ranged from 1 = "Seldom" to 5 = "Consistent". The analysis shows that the majority of participants (93=46.97%) indicated that Client's financial difficulties is ''sometimes'' causing a delay in construction projects in UAE. Furthermore, the majority of participants (138=70.77%) indicated that change order is ''usually'' causing a delay in construction projects in UAE. Analysis for Likert type responses are presented in Tables 6 ,7,8 and Figure 4 providing a graphical representation.

Table. 6. KMO and Bartlett's Test (Consultants)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.889
Bartlett's Test of Sphericity	Approx. Chi-Square	4798.830
	df	378
	Sig.	.000

Interpretation of table-6

In Table 6 the p-value of KMO is above 0.5 indicating that sample is adequate for analysis whereas the p-value for bartlett test of sphericity is below 0.05 indicating that factor model is appropriate.

Table. 7. Total Variance Explained (Consultants)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% Of Variance	Cumulative %
1	11.935	42.627	42.627	11.935	42.627	42.627	8.271	29.538	29.538
2	2.793	9.976	52.602	2.793	9.976	52.602	4.876	17.415	46.953
3	2.686	9.593	62.195	2.686	9.593	62.195	2.799	9.998	56.951
4	1.362	4.865	67.060	1.362	4.865	67.060	2.574	9.192	66.144
5	1.136	4.057	71.118	1.136	4.057	71.118	1.393	4.974	71.118
6	.925	3.305	74.423						
7	.867	3.098	77.521						
8	.730	2.608	80.128						
9	.710	2.535	82.664						
10	.611	2.182	84.846						
11	.482	1.721	86.567						
12	.453	1.618	88.184						
13	.392	1.399	89.583						
14	.364	1.301	90.884						
15	.326	1.163	92.047						
16	.305	1.091	93.138						
17	.265	.947	94.085						
18	.252	.902	94.987						
19	.245	.877	95.863						
20	.223	.797	96.660						
21	.173	.617	97.277						
22	.150	.534	97.811						
23	.134	.480	98.290						
24	.131	.468	98.758						
25	.114	.406	99.164						
26	.096	.342	99.506						
27	.081	.288	99.794						

28	.058	.206	100.000						
Extraction Method: Principal Component Analysis.									

Interpretation of table-7

In Table 7 above it can be seen that 5 factors are extracted since the eigen value is above 1.

Figure .4. Scree Plot (Consultants)

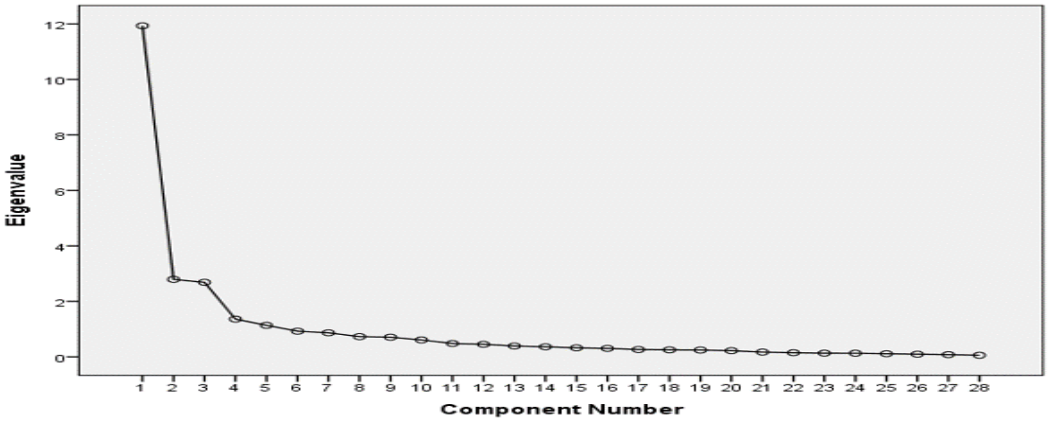


Table. 8. Frequencies and Percentages for Survey Question (Consultants)

The table below demonstrates the factors causing a delay in construction projects in UAE, please rate the common factor in your project accordingly?					
	Consistently	**Usually,**	**Often**	**Sometimes**	**Seldom**
-Lack of capability of client representative:	131(66.84%)	30(15.31%)	7(3.57%)	28(14.29%)	0(0%)
-Change order:	44(22.56%)	138(70.77%)	11(5.64%)	2(1.03%)	0(0%)
-Slow decision making by the client:	75(38.46%)	42(21.54%)	75(38.46%)	3(1.54%)	0(0%)
-Lack of experience of the client in the construction:	29(14.72%)	63(31.98%)	22(11.17%)	82(41.62%)	1(0.51%)
-Poor site management and supervision:	67(34.18%)	34(17.35%)	23(11.73%)	64(32.65%)	8(4.08%)
-Incompetent project team:	20(10.2%)	75(38.27%)	32(16.33%)	61(31.12%)	8(4.08%)

-Inflation price fluctuation:	38(19.39%)	42(21.43%)	41(20.92%)	68(34.69%)	7(3.57%)
-Inaccurate time estimating:	31(15.74%)	47(23.86%)	25(12.69%)	93(47.21%)	1(0.51%)
-Improper project planning/scheduling:	61(31.12%)	23(11.73%)	26(13.27%)	86(43.88%)	0(0%)
-Inaccurate cost estimating:	22(11.17%)	67(34.01%)	28(14.21%)	74(37.56%)	6(3.05%)
-High-interest rate:	46(23.35%)	31(15.74%)	43(21.83%)	72(36.55%)	5(2.54%)
-Client's financial difficulties:	30(15.15%)	48(24.24%)	25(12.63%)	93(46.97%)	2(1.01%)
-Unreasonable constraint to client:	50(25.64%)	23(11.79%)	37(18.97%)	79(40.51%)	6(3.08%)
-Inappropriate construction methods:	8(4.1%)	67(34.36%)	31(15.9%)	82(42.05%)	7(3.59%)
-Lack of coordination with Electro-Mechanical works:	42(21.54%)	34(17.44%)	41(21.03%)	72(36.92%)	6(3.08%)
-Selection of the lowest bidder commercially:	35(18.04%)	80(41.24%)	22(11.34%)	56(28.87%)	1(0.52%)
-Delay in approvals:	90(45.92%)	61(31.12%)	28(14.29%)	16(8.16%)	1(0.51%)
-Late Decision Making:	58(29.59%)	98(50%)	31(15.82%)	9(4.59%)	0(0%)
-Material Delivery Delays:	57(28.93%)	64(32.49%)	42(21.32%)	31(15.74%)	3(1.52%)
-Client introduction of additional works during the construction stage:	36(18.46%)	66(33.85%)	20(10.26%)	68(34.87%)	5(2.56%)

-Inefficient planning and scheduling of the projects:	48(24.62%)	49(25.13%)	31(15.9%)	66(33.85%)	1(0.51%)
-Labor and equipment non-productivity:	16(8.12%)	69(35.03%)	33(16.75%)	74(37.56%)	5(2.54%)
-Coordination issues and quality of works:	40(20.73%)	44(22.8%)	47(24.35%)	62(32.12%)	0(0%)
-Delay in design approvals by the client:	61(30.96%)	83(42.13%)	14(7.11%)	37(18.78%)	2(1.02%)
-Original contract duration is not realistic:	51(26.29%)	52(26.8%)	32(16.49%)	56(28.87%)	3(1.55%)
-Delay caused by the owner:	66(33.67%)	87(44.39%)	22(11.22%)	19(9.69%)	2(1.02%)
-Planning errors:	43(21.83%)	47(23.86%)	37(18.78%)	67(34.01%)	3(1.52%)
-Cost and time overruns:	30(15.46%)	61(31.44%)	24(12.37%)	77(39.69%)	2(1.03%)

4.Results and Discussion

The majority of contractor's participants (102=52.04%) and the consultant's participants (93=46.97%) indicated that Client's financial difficulties is ''sometimes'' causing a delay in construction projects in UAE. A different study performed by **Motaleb (2013)** was depended on literature review and survey examined 42 probable delay factors in the UAE. Characteristic outcomes had exposed that payment issues are the main important reasons of delay which is the similar to the factor for the delay was found in this study. According to **Amoatey (2017)**, the majority grounds of delay for construction projects in Ghana are monthly payment complexity Furthermore, **Shibani (2021)** found the mainly significant reasons of delay for construction projects in Egypt are funding by Contractor throughout construction, delays in Contractor's expenses by employer and incomplete payments throughout construction. Moreover, a study prepared by **Yap (2021)** found that insufficient client's funding and expenses for completed work are the most significant reasons of delay for construction projects in Malaysia. Also, a study prepared by **Alfakhri (2018)** found that he majority reasons of delay for construction projects in Libya are the funding issues. This is similar to the study prepared by **Rezaei (2019)** found that the major reasons of delay for construction projects in Iran is the payment by owner. According to **Kog (2019)**, the important reasons of delay for construction projects in Vietnam are estimating and funding.

While the majority reason of delay for construction project in Jordan is funding obstacles faced by the Contractor **(Samarah, 2016)**. Furthermore, the results of this study show that some of the contractor's participants (71=36.04%) indicated that change order is ''Often'' causing a delay in construction projects in UAE. While, the majority of participants (138=70.77%) indicated that change order is ''usually'' causing a delay in construction projects in UAE. This result is similar to the research was performed by **Zaneldin (2020)** which addressed the outcomes of a study of the categories, reasons and occurrence of construction claims in the emirates of Abu Dhabi and Dubai in UAE by using a data from 124 claims for a diversity of projects in the two emirates. The outcomes of analysis by **Zaneldin (2020)** showed that change orders are the most frequent reason of claims with a significance index of 55%. It is worthy to mentioned that Table 1 and the aforementioned studies demonstrated that change order is the significant factor of delay for the construction project in UAE **(Alhammadi, 2020)**, Saudi Arabia **(Alsuliman, 2019)**, Egypt **(Shibani, 2021)**, Indonesia **(Tarigan, 2018)**, Algeria **(Roumeissa, 2018)**, Iran **(Rezaee, 2019)** and Jordan **(Samarah, 2016)**.

5. Conclusion and Recommendations

The study of this field becomes more important, especially in the absence of sufficient research volumes for UAE construction industry. Delays lead to time overrun, which in many cases leads to cost overrun. Time and cost overruns are the main reasons for construction claims. More studies are required to extend the exploring of factors causing a delay in construction projects in UAE in order to solve the impacts and the complicated circumstances of the delay

References(APA)

[1]. Abdelhadi, Y., Dulaimi, M.F. and Bajracharya, A., 2019. Factors influencing the selection of delay analysis methods in construction projects in UAE. International Journal of Construction Management, 19(4), pp.329-340.

[2]. Abu Osbeh, M. (2011). Integrated Forensic Delay Analysis Framework for Construction Projects–Time and Cost Perspectives (Doctoral dissertation, Concordia University Montreal, Quebec, Canada).

[3]. Alfakhri, A.Y., Ismail, A. and Khoiry, M.A., 2018. The effects of delays in road construction projects in Tripoli, Libya. International Journal of Technology, 9(4), pp.766-774.

[4]. Alhammadi, A.S.A.M. and Memon, A.H., 2020. Inhibiting Factors of Cost Performance in UAE Construction Projects. International Journal of Sustainable Construction Engineering and Technology, 11(2), pp.126-132.

[5]. Alsuliman, J.A., 2019. Causes of delay in Saudi public construction projects. Alexandria Engineering Journal, 58(2), pp.801-808.

[6]. Amoatey, C.T. and Ankrah, A.N.O., 2017. Exploring critical road project delay factors in Ghana. Journal of Facilities Management.

[7]. Bala, J., 2016. Contribution of SPSS in Social Sciences Research. International Journal of Advanced Research in Computer Science, 7(6).

[8]. Bagdonavicius, V., Kruopis, J. and Nikulin, M.S., 2013. Nonparametric tests for complete data. John Wiley & Sons.

[9]. Bell, J. and Waters, S., 2018. EBOOK: DOING YOUR RESEARCH PROJECT: A GUIDE FOR FIRST-TIME RESEARCHERS. McGraw-Hill Education (UK).

[10]. Braimah, N., 2014. Understanding construction delay analysis and the role of preconstruction programming. Journal of Management in Engineering, 30(5), p.04014023.

[11]. Boone, H.N. and Boone, D.A., 2012. Analyzing likert data. Journal of extension, 50(2), pp.1-5.

[12]. Fowler Jr, F.J., 2013. Survey research methods. Sage publications

[13]. Kog, Y.C., 2019. Construction Delays in Indonesia, Malaysia, Thailand, and Vietnam. Practice Periodical on Structural Design and Construction, 24(3), p.04019013.

[14]. Kothari, C.R., 2020. Research Methodology: Methods and Techniques

[15]. Motaleb, O. and Kishk, M., 2013. An investigation into the risk of construction projects delays in the UAE. International Journal of Information Technology Project Management (IJITPM), 4(3), pp.50-65.
[16]. Rezaee, M.J., Yousefi, S. and Chakrabortty, R.K., 2019. Analysing causal relationships between delay factors in construction projects: A case study of Iran. International Journal of Managing Projects in Business.
[17]. Samarah, A. and Bekr, G.A., 2016. Causes and effects of delay in public construction projects in Jordan. American Journal of Engineering Research, 5(5), pp.87-94.
[18]. Shibani, A., Mahadel, O., Hassan, D., Agha, A. and Saidan, M., 2021. Causes of time overruns in the construction industry in Egypt. International Research Journal Of Modernization In Engineering Technology And Science (IRJMETS), 3(1).
[19]. Tarigan, A.P.M., 2018, March. On the delay factors of the private construction projects in Medan city. In IOP Conference Series: Earth and Environmental Science (Vol. 126, No. 1, p. 012043). IOP Publishing.
[20]. Tolmie, A., Muijs, D. and McAteer, E., 2011. Quantitative methods in educational and social research using SPSS. McGraw-Hill Education (UK).
[21]. Ur Rehman, G., 2015. Causes of Delay in Construction Projects in Abu Dhabi
[22]. Yap, J.B.H., Goay, P.L., Woon, Y.B. and Skitmore, M., 2021. Revisiting critical delay factors for construction: Analysing projects in Malaysia. Alexandria Engineering Journal, 60(1), pp.1717-1729.
[23]. Zaneldin, E.K., 2020. Investigating the types, causes and severity of claims in construction projects in the UAE. International Journal of Construction Management, 20(5), pp.385-401.