

Sustainable Management of Construction Claims; Types, Causes and Settlements

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Abstract

Claims are considered as the most disruptive and unpleasant events for most of construction projects as of their impacts on project performance and objectives. The study in this paper was directed to identify the current claims types in construction projects in Jordan, and then identify the causes of each type related to project stakeholders (owner, consulting engineer, contractor and others). The research is then conducted to determine the current used approaches to settle claims. The actual data has been statistically analyzed after being collected from 63 questionnaire forms distributed to selected stakeholders as a field survey. In addition, more data were done collected from selected twelve real projects, as case studies, to be statistically analyzed and added to the field survey. The study and its conclusions and recommendations are expected to assist project management and contractors to avoid construction claims and then to direct project management to the best settlement approaches for claim resolutions. Despite that the study depends on projects and data collection from Jordan as case study, the outcomes and recommendations of this research are applicable to avoid and settle construction claims in any construction industry.

Keywords: Construction management, claim management, project management, construction claims

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INTRODUCTION

Many factors related to design; materials, equipment, labors and other resources, as well as the weather are affecting construction projects in Jordan. These factors are varying from one project to another in their nature, size and complexity. However, all of them affect projects by changing the project performance baselines of scope, cost and schedule.

Claims in construction projects in Jordan refers to the construction's nature of these projects that are strife and difficult. However both contractor and owner suffer from construction a claim which leads

projects to suffer instability and continues changes in their performance baselines of cost and schedule. Used approaches of claim settlement differ from negotiation to litigation. The management target is not using settlement approach but in how to avoid construction claims that could cause negative impacts on project cost and time performance baselines.

This paper has been conducted to highlight types of construction claims in Jordan, the causes of their occurrence, their impacts and settlement approaches in use for resolving these claims. The research work has been divided into two parts, the theoretical part and the field study and data

analysis part. Conclusions and recommendations have been reached as outcomes of the study.

CONSTRUCTION CLAIMS TYPES, CAUSES AND SETTLEMENT APPROACHES

Construction Claims Aspect

Many definitions have been given to construction claims as follows. The researches defined it as "Claim is requested by the contractor for an extension of time and /or additional cost and can involve into disagreement that may not be amicably resolved by the parties' concerned."^[1,2] Simon in 1979 defined the claim as "a right given to the party who deserves a request for construction for damages incurred by the other party."^[3]

It is defined by Wideman as "A legitimate request for additional compensation cost and/or time on account of change in the terms of the contract."^[4] Adrin in 1993 defined construction claim as "a request by a construction contractor for compensation over and above the agreed-upon contract amount for additional work or damages resulting from event that were not included in the initial contract."^[5] Other researches defined the Claim as "any application done by the contractor whether for an extension of time payment, or otherwise, which arises other than the ordinary contract provisions for payment of the value of work."^[6,7] It is also defined as "a request for compensation for damages incurred by any party to the contract. A claim presents the basis of the claim (causes and effects), and explains the contractual and legal basis for payment (entitlement), and quantifies the resulting damages."^[8] Finally Peter et al. in 2007 defined the claim as "differentiation needs to be made between a claimed within the contract by one or several parties to contract."^[9]

As result of the pervious definitions, the claim can be defined as "a compensate request by the contract parties (the contractor or owner) for an extension of time or additional cost as a result of a cause led to a need for extra cost and more time to complete the changes in the agreed work, or as a result of damage by the other party.

Types of Claims

A significant number of researches tried to identify the main types of construction claims. Two main researches have detailed the main types of construction claims as follows^[10,11]

Contract Ambiguity Claims (Contractual claims)

Contract Ambiguity claims refer to incomplete and inadequate understanding a clause in the construction contract forms and conditions. In addition, it is a logical result of poorly written contract and ambiguities in some contract clauses, which includes disagreement between the contract parties on the responsibilities or liabilities of specific controversial items that are not included in contract documents.

Delay Claims

Delay means the time overrun beyond the completion date of the project schedule baseline.^[12] To the owner, delay means loss of revenue, while to the contractor means higher direct, indirect, and impact costs. Moreover, Al-Saggaf simply defined delay as a project slipping over the scheduled completion date. Type of Delay in construction projects can be divided into three categories: direct delay, concurrent delay and serial delay.^[13]

Acceleration Claims

Acceleration claims refer to accelerated work which can take many forms such as working longer shift, increase number of equipment and labor, as well as performing various tasks concurrently (fast

track). The difficult aspect of establishing acceleration claims may determine the reasons and compensability of acceleration efforts. The requirements to accelerate works may originate from three sources.^[14] contractor direct acceleration, owner direct acceleration, and constructive acceleration

Changes Claims

A change in construction contract is normally happened as a result of changing the scope of the work by the client to meet his needs (requirements) or as a result of errors in the submitted design or drawings.

Extra Work Claims

Extra work claims refer to any additional work ordered by the client or his engineer to the contractor to perform which is not included in original signed contract documents.

Different Measurements Pricing Claims

At final stage of construction, conflict between the contract parties may happen due to disagreement on the method of measurements or pricing items in the contract which leads to claims.

Different Site Condition Claims

During the construction phase, contractors may face subsurface or unforeseen conditions which are unexpected and have impacts on project performance baselines (scope, cost and schedule). So the different site condition claims can be defined as changes in physical aspects of the project or its site which differ materially from that specified in the contract documents.

Damage Claims

Those claims for any damages that may be happened due to act of the client or safety related problems, but it is rarely happened, as in construction projects contractor usually has full responsibility for the site health and safety.

Negligence Claims

Negligence is that fall below standard established by the law for protection of others against unreasonable risk of harm, which can arise from action or inaction, which is essentially a failure to do something required by contract, however negligence include a failure of a part to warn another part about defect, potential loss or danger.

Inefficient and Disruption Claims

Disruption between parts in construction project happen when performing contract work in different and less efficient than that originally specified in the contract. Often contractor submits his bids based on certain assumptions of; construction methods, level of resources (labour, material and machinery), and certain sequence of work activities. So any discrepancy from these assumptions will cause increase in the expected cost and time to perform the contract works. The contractor claims for any disruption or conditions that may result inefficient productivity of changes in his assumptions.

Termination Claims

This claims incur in case of the client terminates part of or whole of the contract due to default, which may cause delay or increase in the contract agreed cost that associated to the left works in the contract.

Quantum Meruit Claims

Quantum Meruit means paying the contractor after checking the quantity of the work done. This type of claim is considered as one of common types of construction claims which happen due to alleged breaches or changes into construction contracts.

However, it is based on a principle that the contractor should be compensated for all works to prevent “unjust enrichment” of

the other party of the contract by receiving the benefit of the work.^[14]

Owner Claims for Defective Work and Delay

Sometimes may be suffering from direct damages as a result of actions of several parts through construction process. Such damages can be as a delay, defective or incomplete work.

Causes of Claims

The causes of claims had been classified into four groups according to the source of causing these claims as following^[10,11]

Causes related to owners.

Causes related to engineers (consultants).

Causes related to contractors.

Causes related to others parties.

Causes of Claim Related to Owner

In Construction industries, there are many causes related to owner that can lead the contractor to apply for claims such causes are^[15-19]

Change and Variation Order

Delay Caused by Owner

Oral Changes Order

Delay in Payments

Owner Attitude

Termination of Contract

Suspension of Works

Planning Error

Causes of Construction Claim Related to Engineer (Consultant)

Engineer's decisions or his representative's actions on the site can lead the contractor to claim. Such causes are^[18,20,21]

Estimation Error

Scheduling Error

Specification and Drawings

Inconsistencies

Design Error (Omission or Additions)

Poorly Written Contract Documents

Unreasonable Supervision Attitude

Causes of Construction Claim Related to Contractor

Causes of claims that related to contractor can be considered from both sides of the contract parties, for contractor or for owner base on the case of claim itself. Causes of claims related to contractor can be listed as following^[22-24]

Variation in Quantity

Subcontracting Problems

Delay Caused by Contractor

Not Well Organized Contractor

Contractor Financial Problem

Bad Quality of Contractor Works

Accidents (Bad Safety Implementation)

Poor Management and Administration of Construction

Acceleration of Work

Changes in Resources (Material, Labour, and Machinery) Costs

Causes of Construction Claim Related to Others

Sometimes construction claims are incurred not related to owner, engineer or contractor, but as a result of factors related to other stakeholders or even Mother Nature (Acts of God) such causes as;
Low Price of Contract Due to High Competition

Subsurface Problems

The Effect of High Inflation

Government Regulations

Climate, Earthquakes and Volcanoes

Fossils

Delay by Authorization

Major Force

SCOPE OF FIELD STUDY

The first part of the field study included collecting real data related to construction claims that occurred in twelve real existing construction projects. Data analysis applied on the collected data to identify the existing types of construction claims their causes, and applied settlement approaches. Data collected of construction claims includes; construction contract types, duration, and budget, causes of incurred claims, and settlement approaches that used to solve the incurred claims.

The second part of the study was directed as a field survey in questionnaire forms that were sent to a sample of 153 of selected project stakeholders (owners, engineers, contractors and arbitrators) as a research sample representing construction industry in Jordan. The responses on the questionnaire forms were then collected, and statistically analyzed to identify types,

causes and settlement approaches of claims that are exist in construction projects in Jordan.

Out of 153 questionnaire forms that were distributed, as shown in Table (1), only 63 of the participants responded and that represented 41% of the total sample size.

Table 1. Details of the Research Sample of the Field Study.

Type of Participants	No. of Forms Sent	No. of Forms Received	% of Response	% of Returned Forms out of 63
Owners	11	7	64	11.1
Engineers	50	22	44	34.9
Contractors	77	23	30	36.5
Arbitrators	15	11	73	17.5
Total	153	63	41	100

Likert scale was used as rating scale for answering questions in the questionnaire form, which is ranged between (1- strongly disagree), and (5- strongly agree).

Statistical Analysis of the Collected Data

The Whole data that collected, from both; responses to the questionnaires forms and the real data from existing projects were analyzed statistically to determine the most common types, causes and settlement approaches of construction claims in Jordan. Statistical parameters of; Mean, Standard Deviation and Skewness were calculated by using the following statistical equations;

$$\text{Mean} = \sum W_i X_i / N \quad \text{Eq. (1)}$$

Where

W_i is the weight assigned to the i th option;

X_i is the number of respondents who selected the i th option;

N is the total number of respondents

Standard Deviation

$$(\text{Sd}) = (\sum X_i * (W_i - Y)^2 / N - 1)^{1/2} \quad \text{Eq. (2)}$$

Where W_i is the weight assigned to the i th option, X_i the number of respondents, who selected the i th option, N the total number of respondents and Y is the mean

$$\text{Skewness} = (\sum X_i (W_i - Y)^3 / N) / \text{Sd}^3 \quad \text{Eq. (3)}$$

where W_i is the weight assigned to the i th option, X_i the number of respondents, who selected the i th option, N the total number of respondents, Y the mean, and SD is the standard deviation.

By using the number of responses for each scale (1–5) and then divided by the number of participants 63, the statistical parameters have been calculated as shown in the example;

For example, for “Extra Work” type of claims, the statistical parameters are calculated as follows;

$$\text{Mean} = [0 \times 1 + 1 \times 2 + 6 \times 3 + 23 \times 4 + 3 \times 5] / 63 = 4.4$$

$$\text{SD} = [(0 \times (1 - 4.4)^2 + 1 \times (2 - 4.4)^2 + 6 \times (3 - 4.4)^2 + 23 \times (4 - 4.4)^2 + 3 \times (5 - 4.4)^2) / 62]^{1/2} = 0.73$$

$$\text{Skewness} = [(0 \times (1 - 4.4)^3 + 1 \times (2 - 4.4)^3 + 6 \times (3 - 4.4)^3 + 23 \times (4 - 4.4)^3 + 3 \times (5 - 4.4)^3) / 63] / 0.733 = -1.04$$

Table 2 shows the results of statistical calculations of the responses to the questionnaire forms

Types of Claims in Jordanian Construction Industry

Table 2 shows that there are thirteen types of claims exist in Jordanian construction industry. Figure 1 shows graphically the difference in their values statistical parameters for claims construction projects in Jordan. Extra work claims were the most common type of claims addressed. It was ranked as the first among the different claims with a mean of (4.40). While Negligence represented the lowest claims mean (2.05). It was noted that, extra work claims (4.40), change claims (4.27) and delay claims (4.19) were the highest means are indicating that these three claims are the most popular types of claims in the

construction projects, which were classified to be claims of high degree among the other types.

In addition to that, Figure (1) shows that the owners, engineers and contractors have similar response in ranking the first five types of claims, while the arbitrators have different response in ranking types of claims. However, the most common five types of construction claims are:

Extra Work claims

Changes claims

Delay claims

Quantum Meruit claims

Owner claims for Defective Works and Delay

Table 2. Statistical Analysis Parameters for Types of Construction Claims

Type of Claim	Owner		Engineer		Contractor		Arbitrators		Total		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Skewness
Extra Work	4.14	0.69	4.41	0.59	4.61	0.58	4.09	1.14	4.40	0.73	-1.04
Changes (Variation Orders)	4.00	0.82	4.32	0.72	4.35	0.78	4.18	0.75	4.27	0.75	-0.49
Delays	4.29	0.95	3.95	0.90	4.30	0.88	4.36	0.67	4.19	0.86	-0.70
Quantum Meruit	3.57	0.79	3.55	0.86	3.61	0.84	2.82	0.98	3.44	0.89	-0.32
Owner Claims for defective Work and Delay	3.14	1.77	3.09	1.15	3.22	1.20	2.91	1.04	3.11	1.21	-0.22
Different Measurements Pricing	3.00	1.15	2.95	1.17	3.04	1.30	3.45	0.69	3.08	1.14	-0.16
Contract Ambiguity (Contractual claims)	3.14	1.21	3.05	1.17	3.04	1.30	3.09	1.38	3.06	1.23	-0.18
Different Site Condition	2.86	1.07	2.50	0.74	2.57	1.04	2.91	0.70	2.63	0.89	-0.21
Damage	2.14	0.38	2.55	1.22	2.43	1.12	2.73	1.10	2.49	1.09	0.21
Inefficiency and Disruption	1.86	1.07	2.59	1.30	2.26	1.10	2.91	1.04	2.44	1.17	0.35
Acceleration	2.29	1.38	2.36	1.22	2.65	1.23	2.09	1.14	2.41	1.21	0.66
Termination	2.00	1.41	2.18	1.05	2.65	1.27	2.55	0.82	2.40	1.14	0.50
Negligence	1.86	1.07	2.23	1.07	1.83	1.07	2.27	0.65	2.05	1.01	0.69

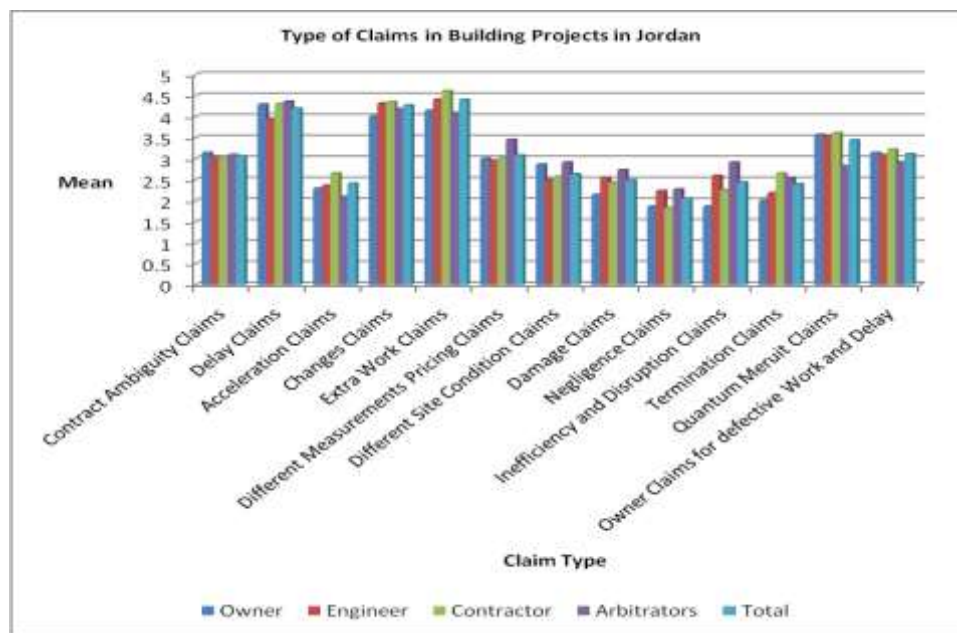


Fig. 1. Type of Claims in Construction Projects in Jordan.

Table 3. Causes of Claims in Real Existing Construction Projects in Jordan.

Cause of Claim	Total Repetition in Projects
Changes or Variation Orders	11
Oral change orders by owner	10
Estimation errors	9
Design errors	9
Specifications and drawings inconsistencies	8
Delay caused by owner	7
Bad coordination and communication between parties	7
Delay in payments by owner	6
Suspension of Works	6
Planning errors	6
Scheduling errors	5
Unreasonable supervision attitude	5
Owner attitude	4
Poorly written contracts	4
Subcontracting problems	4
Contractor is not well organized	4
Bad quality of contractor's work	3
Acceleration of the work	3
Subsurface problems	3
Variations in quantities	2
Delay caused by contractor	2
Contractor financial problems	2
Changes in material , labor and machinery costs	1

Causes of Claims in Construction Projects in Jordan

Analysis of the twelve selected construction projects showed that the highest frequent repetition of claim causes as presented in Table 3. "Changes and variation orders" that have repeated in eleven projects out of twelve projects.

The second highest frequent cause was "the owner's oral change" with a frequent of ten out of the twelve projects. Both of the two causes indicated that the owners have problems in defining the scope of project work, or they don't have a clear idea about the project work.

Causes of claims that came in the third order and equal frequencies (nine out of the twelve projects) are both; "the estimation errors" and "design errors", which are related to the problems in quality and experiences of engineers staff, as well as the quality and reliability of engineers productivity.

Causes of Claims as per Field Study

Causes of claims can be classified to four main causes as followings:

- Causes related to Owner
- Causes related to Engineer
- Causes related to contractor
- Causes related to other

In Jordan, total causes of claims reached to 33 causes related to four main causes as following;

Causes of Claims Related to Owner

Changes or a variation order was the most causes addressed by the owners with a mean of (4.54) as shown in Figure 2. The owner personality represented the lowest cause of construction claims with a mean of (2.27). Taking consideration that Owners, Engineers, Contractors and Arbitrators have the same opinion about the first cause of claims related to the owner. But they have different opinions about ordering the next causes, while arbitrators mentioned that, the changes or variation ordered first cause, then delay in payment and delay by owner, respectively.

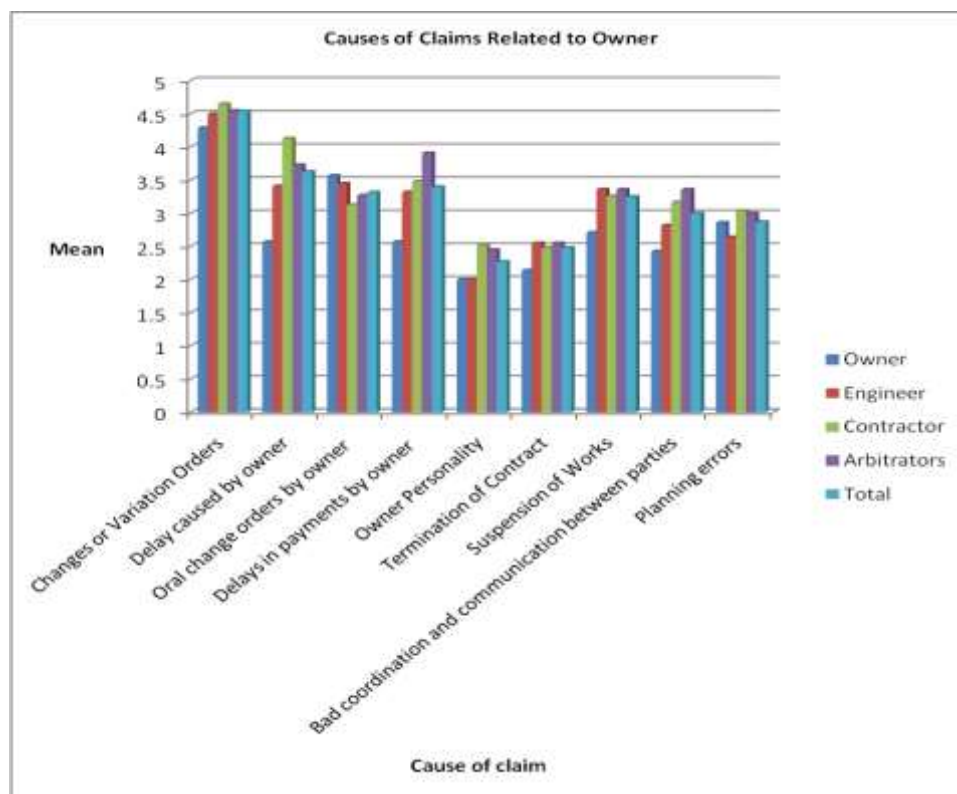


Fig. 2 Causes of Construction Claims Related to Owners.

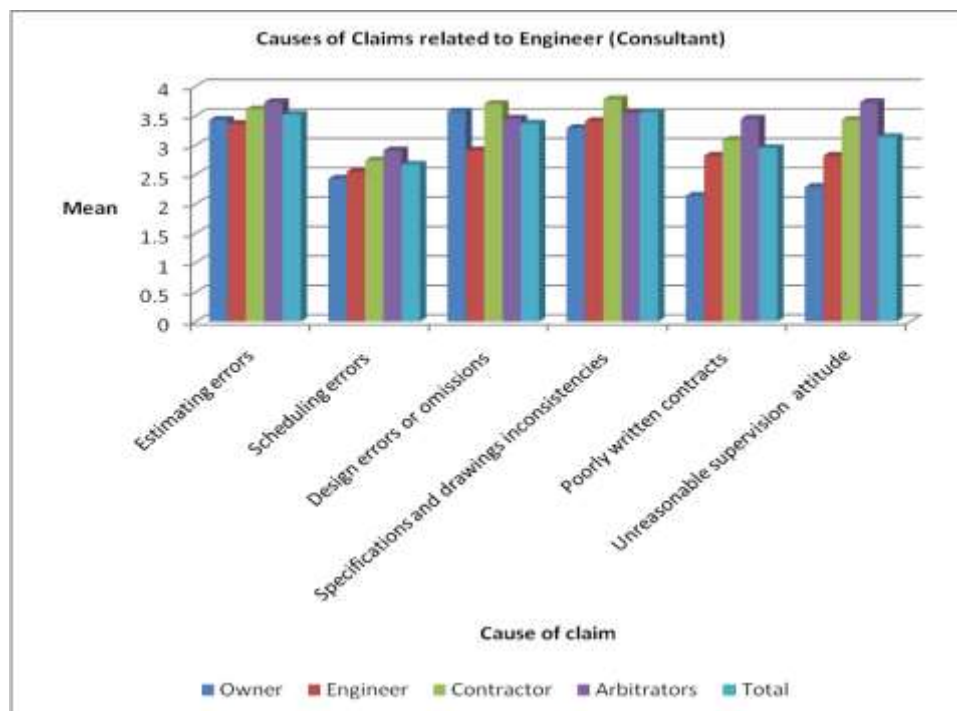


Fig. 2. Causes of Claims Related to Engineer.

Causes of Claims Related to Engineer

Specification and drawings inconsistency cause was the most because it addresses by the engineer (consultant) as it ranked as the first cause with a mean of (3.56) as shown in Figure 3. Scheduling errors is representing the lowest cause of construction claims as it has the lowest mean (2.67). However, project stakeholders (owners, contractors and engineers) have the same opinion about the first three causes that related to engineers, but in different order. While the Arbitrators consider unreasonable supervision attitude as the second cause of claims that was related to engineers.

Causes of Claims Related to Contractor

The delay refers to the contractor was the most important cause that were addressed by the contractors, as it ranked the first cause with a mean of (3.78) as shown in Figure 4. Acceleration of works was the less important cause of construction claims which it has the lowest mean (2.68). There were different opinions among projects parties about ordering of claims causes

related to the contractors. Owners considered that, variation in quantities, bad quality of contractor works and delays referred to contractor, as the first three important causes, respectively.

While engineers' responses indicated that the delay by contractor, bad quality of contractor work's and contractor not well organized, respectively as the main important causes. From the contractor side, the changes in material, labours and machinery costs, in addition to delay by contractor and financial problems are the first three causes of claims in construction projects, respectively. While arbitrators have opinions similar to that of engineers but in different order, with delay by contractors as the first cause followed by contractor not well organized then bad quality of contractor's works.

Causes of Claims Related to Other

Subsurface was the most important cause addressed by the others as it ranked the first cause by a mean of (2.98) as shown in Figure 5. Fossils are considered as the less

important of the other causes of construction claims as it has the lowest mean of (1.92). The project parties were

different in their responses about ranking of the main causes related to the others.

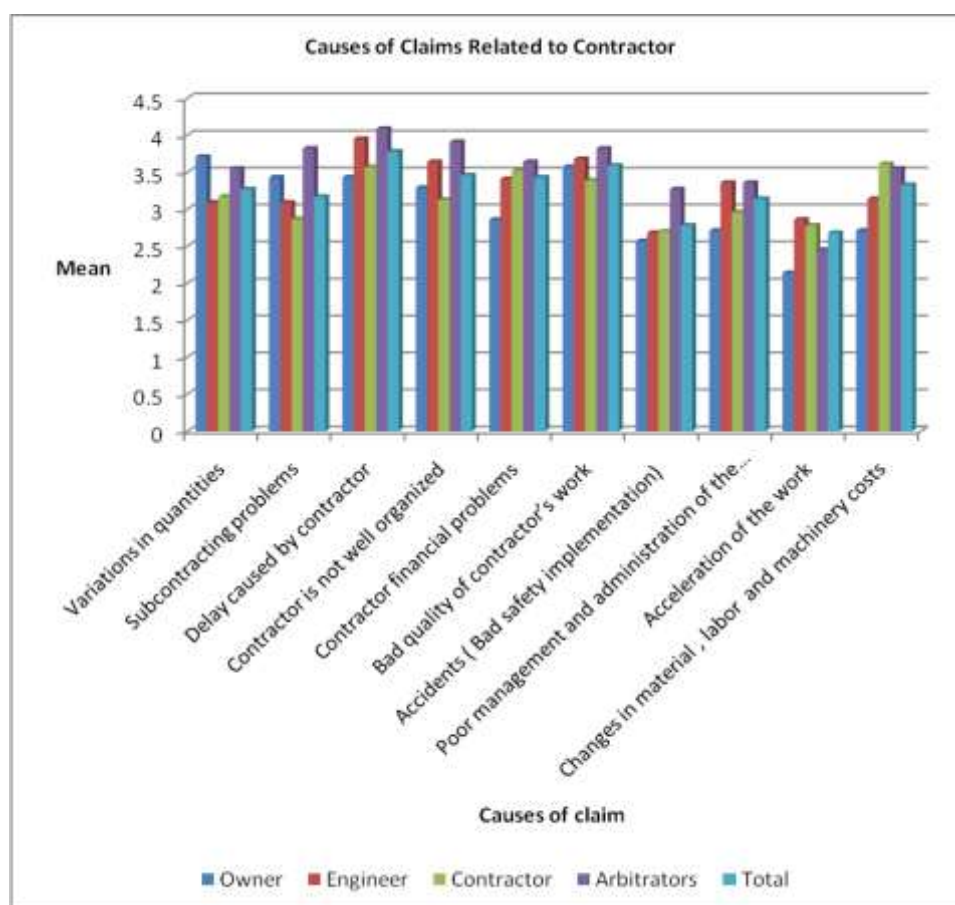


Fig. 4: Causes of Construction Claims Related to Contractor.

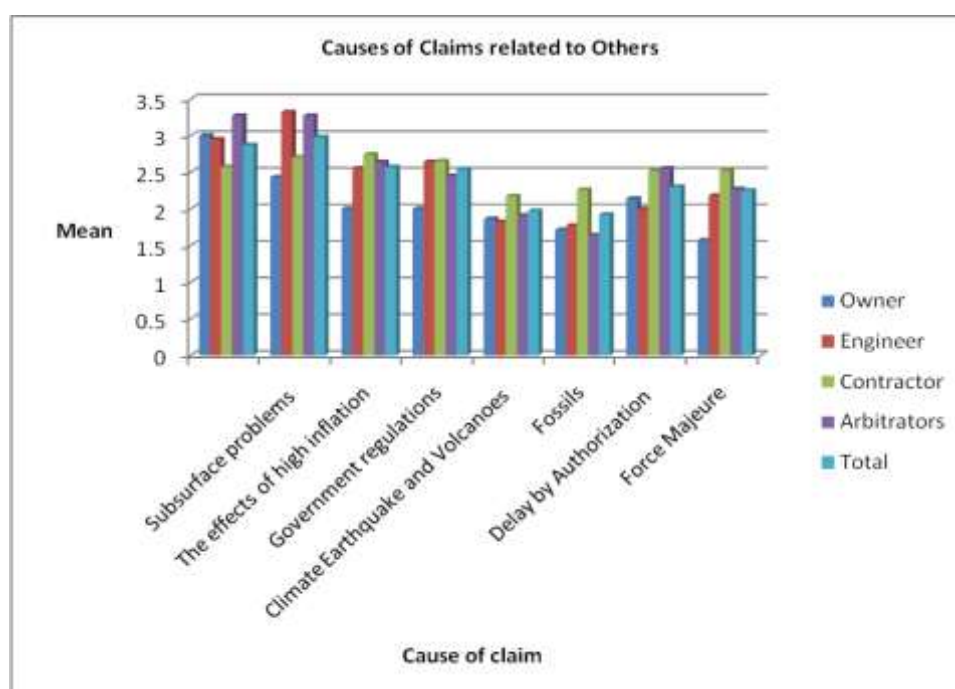


Fig. 5. Causes of Construction Claims Related to Other.

Claim Settlement Approaches

Figure 6 shows, in histogram presentation, the resolution approaches that were used to settle construction claims. The figure shows that the owners and contractors resolve construction claims by using negotiation approach which was repeated in seven projects. Mediation was the second common settlement approach.

Results presented in Figure 7 indicate that values of means and standard deviations for the resolution approaches were used to resolve claims in the construction projects as per participant in questionnaire. Negotiations were the most important approach was used. It was ranked as the

first among the other approaches with a mean of (4.41).

Litigation is the less used settlement approach as it has a mean of (2.11). It was noticed that, negotiation has a mean of (4.41), mediation has a mean of (3.57) were the most popular approaches in resolving construction claims in the construction contracts. In addition to that, Figure 7 shows that, projects stakeholder who participated in the field survey have the same opinions about the most and the least common approaches used for resolving claims in the construction project, but they differ in ordering them in terms of the prevalence of use.

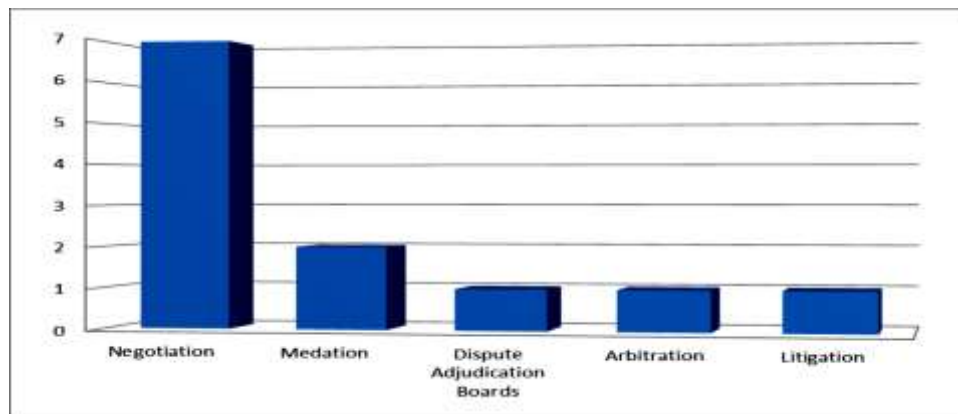


Fig. 6. Settlement Approaches of Claims in Real Existing Projects.

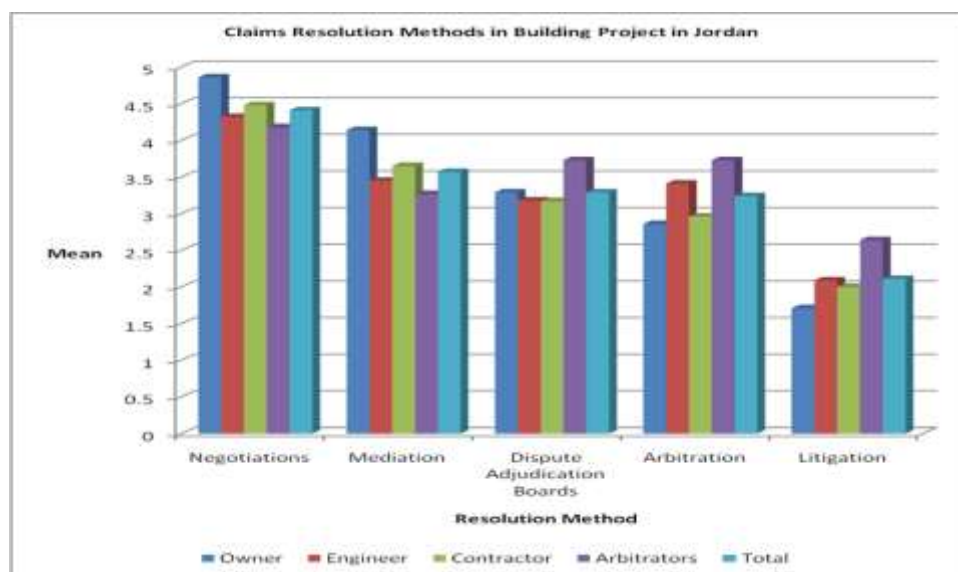


Fig. 7. A Histogram Presentation of Responses on Settlement Approaches of Construction Claims.

CONCLUSIONS

This study has determined the most common and existing types of construction claims in Jordan. The research has concluded that the main common types of claims are; Extra works claims, Changes claims, Delay claims and Quantum Merit claims respectively. In addition, has also concluded that the causes of construction claims defer from construction site to another, however the main ten causes of claims in construction projects are; change orders or variation orders, delays caused by contractor, delays caused by owner, bad quality of contractor's work, specifications and drawings inconsistencies, estimation errors, contractor is not well organized, contractor financial problems, delays in payments by owner, design errors (additions or omissions), respectively. The negotiation of settling the construction claims is the main and common settlement approach in Jordan.

RECOMMENDATIONS

To reduce occurrence of construction claims in Jordan, the study has recommended the following points that may assist project management in avoiding or even reducing occurrence of construction claims:

1. The Client must have a clear idea about the project scope and objectives to minimize change and variation orders in project.
2. Choosing Contractors must be based on their performance and price and qualifications, not only on lowest price.
3. Project management team has to take enough time to produce clear and comprehensive contract documents that include design, specifications, drawings, contract conditions. Clear contract documents will prevent contractors from applying for claims.
4. The contractor has to assign a construction manager to manage

claims, variation orders and any technical issues related to claims, as well as, manage cost, time and quality.

5. The contractors have to use professional project management techniques to control construction process, and avoid any changes in project performance baselines (scope, cost and schedule).
6. Finally good written contract documents will prevent or even number of claims in construction projects.

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