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A Model to Determine the Contractors' Claims of Construction projects

Majid Gholhaki*, Ali Kheyroddin, Ali Ghorbani
Department of Civil Engineering, Semnan University, Iran
*E-mail: mgholhaki@semnan.ac.ir

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Abstract

Complexity, dynamicity and uniqueness of construction projects, in addition to high financial turnover and numerous human resources increase the possibility and potential of claim between involved parties of execution. So claim is common involved and possible matter of subject. As the financial, qualitative and time effects of claims are high, it is necessary to recognize the contractors' claim accurately in order to take an appropriate decision. In this study, a new model is presented to recognize the contractors' claim which included three parts: common frequent claims, causes, and origins. To codify and design the model, 140 common claims and 60 causes which are originated of 7 origins were recognized. The model is used as decisive, determining, and anticipating model.

Keywords: anticipating model, claim, contractor, model of claim determination

Introduction

Construction is one of the fundamental pivots of country's development. It is impossible to do trading without production and to produce without construction. Construction programs and related projects are considered as basic undergrounding of development and financial growth. Considering the above; success in construction projects is of high importance in development and financial growth. Time, cost, and quality are three main criteria that constitute Iron Triangle which determines the success of projects. Shortage or deficit of each criterion affects the others. As construction projects are complicated and unique and involve several influential parties, high speciality of human resources and high turnover of financial resources cause that different and several experts (individuals) with different job skills gather in projects. This matter cause high potential of disputes and claims and affects on project process and also the mentioned three parts of Iron Triangle (time, cost, and quality). Increase in numbers of claims has negative effect on those three factors. The number of claims and disputes are increasing and it is considered as extra cost in construction industry. Claims have major role in contractual relationship between owner and contractor. On the other hand, claim is considered as a prologue to dispute. So determining and recognizing complicated nature of claim is an appropriate guide for adopting an appropriate way of confrontation and decision for resolution. So, recognition of claims is the first and maybe the most important step in claim management. Claim management is about anticipation of claim.

Through the present study, the researchers had classified the common and frequent claims in Iran's construction projects and presented the findings as an anticipating model of claims.

Review of Literature

Dispute

Robins (2005) brings shortest definition of dispute: "disagreement between two or more groups." Nonali (1999) also described dispute as: disagreement between parties on a dimension of contract". Dispute and tension appears when project's parties think about their profit and wanted and

can't achieve what they want (Kohan, 1999). So contrast in expectations can be the basic origin of dispute.

Dispute appears layer by layer (Ghorbani, 2005). In underneath layers; cost and time for resolution is lower and less individuals are involved. When the dispute becomes deeper and moves to next layers, more parties become involved that can spend more time and cost in addition to more complexity and delay. Figure 1 illustrates the process of formation of dispute and its layers.

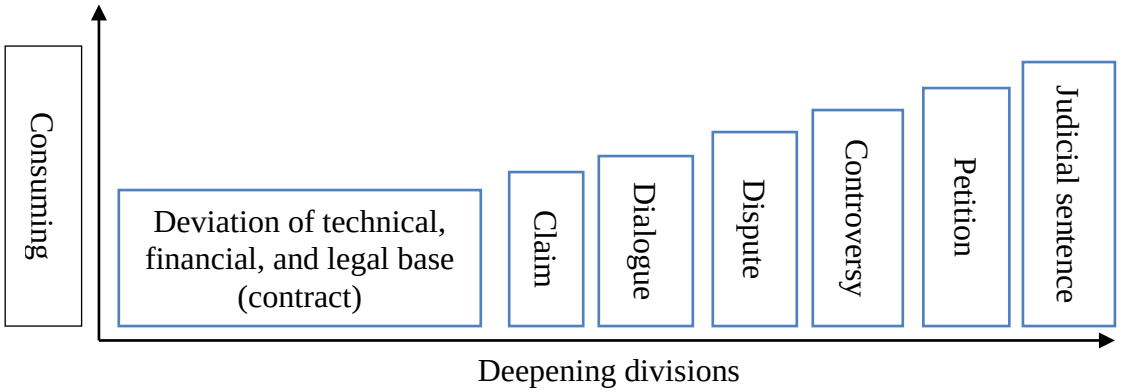

Figure 1: The schematic figure of dispute process (Ghorbani, 2005)

According to Kohan; whenever disputes increase, the effectiveness decrease more. It means that there is a negative relationship between the amount of dispute and effectiveness. Figure 2 shows the relationship.

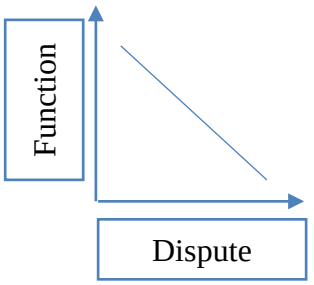

Figure 2: The relationship between Dispute and Performance (Kohan, 1999)

The process of dispute formation and importance of its layer development indicates the position of claims more. So recognition, control, prevention, and resolution of claims can prevent dispute to develop to next deepest layers.

Claim

Claim is defined as 'each purport or demand which can be real or unreal and needs be verified (Semsar, 1996). Nonali also described the claim: 'contractor demands for time extension for completion of the work or for extra payment. If contractor is dissatisfied with owner's (or representative's) decision about claim, then claim will be revised to 'dispute'. The American Institute of Architects (AIA) consider claim as: 'demand for money or compensation of loss in process of running contract or as a result of it' (Hinze, 1998). The present study considers claim as: 'Contractor demands owner or his/ her representative for time extension or extra payment which results from nature and aim of contract. It is clear that final aim of contracting is financial or credit benefit'.

Considering the above definitions and concentrating on indexes of construction projects like: expense, time, and quality, Ghorbani (2005) divides the claims of contractors into three classes: Financial claims, Time claims, Quality claims.

1. Financial claims: contractor's claims on extra expense or financial compensation in process of running project

2. Time claims: contractor's demand for time extension to cover delays of completion or time demand for accelerating to complete

3. Quality claims: claims on the difference between quality of what is done and what should be done

With accurate concentration, it can be found that all three classes has the similar foundation because time and quality also have financial value. Quality claim and time claim have hided the financial demand in their natures.

Table 1: Type and substance of claims

Contractor's claim	Type	Substance
	Time claim	Financial claim
	Financial claim (expenses)	
	Quality claim	

Ghorbani (2005) presented relation1 known as WGC about claims:

$$W - G = C \quad (1)$$

W: What contractor wants (Wanted)

G: What is given to contractor (Given)

C: Claim of Contractor (Claim)

'Wanted' of contractor is based on the pre-determined aims and originated from professional nature of contracting. Credit and financial goal, in general, 'profit' is 'wanted' of contractor. So, inadequate and insufficient achievement of 'wanted' makes G less than W in comparison with similar opportunities. In this situation, contractor seeks a way to compensate the loss and cover the difference between amounts of W and G and thinks about financial claims. Paying attention to the above matter, contractor thinks 'claim' as an assured safeguard even from the beginning of project.

Real (actual) and unreal claims

According to available studies, claims are classified into groups: 'Real (Actual) claims and Unreal claims'. Table 2 shows claim categories through validity and its effect on project.

Table 2: Types of claim on the basis of validity (Ghorbani, 2005)

Explanation	Effect of claim on project	Result of investigation by competent authorities	The truth of claim	Contractor 's claim
There is union and partnering. The contractor's and project's goal are in the same direction	Positive effect	Claim Confirmation	Real (Right)	
It resulted from weak function of outer and inner factors of project	Negative effect	Claim Rejection		
It resulted from weak function of outer and inner factors of project	Negative effect	Claim Confirmation	Unreal (wrong)	
It resulted from strong function of outer and inner factors of project	Positive effect	Claim Rejection		

Research Scope

Mitropoulos (2001) explains that recognizing the origins of problems is the first step to prevent dispute. Understanding the dispute is useful to anticipate future claims and to reduce the effects in future projects. So, the aim of the present study is about major causes of claims. It should be mentioned that discussion about claims' investigation and validation is out of scope of the study.

Review of Related Literature

There are many researches on claims in construction projects and their causes. Table 3 indicates some of the major studies in other countries.

Table 3: Some of the major factors in creating claims

Year	Researchers	Significant causes creating the claims	
2015	Bakhary et al.	1. Design changes after tender 2. Starting the project without sufficient knowledge about site, design, tender 3. Unclear and ambiguous area of technical specifications and materials in contract 4. Incomplete or incomprehensive design 5. Changing the owner after tender 6. Unclearness of owner's wanted 7. Tender confirmation without clarity and also considering the changes 8. Excessive consulting with claim consultant 9. Suddenly events of financial and market conditions 10. Negative effects of political factors	
2015	Mehani et al.	1. Difference in site 2. Difference in design or technical specifications 3. Error of design or technical specifications	4. Delay 5. Changes in materials, lack or deficiency of specifications 6. Extra works 7. Orders
2015	Hosny et al.	1. Changes made by project manager 2. Changes created by design 3. Technical specifications	4. Unpredicted conditions 5.Potential of owner and contractor
2013	Chau et al.	1. Changes of contract's contents 2. Unpredicted conditions in site	3. Order of changes from owner 4.Acceleration or delay in work
2011	Jaffar et al.	1. Communicative problems 2. Contractual problems 3.Technical problems	
2008	Chen et al.	1. overload work 2. Loss of work 3. Design changes 4. Design error 5. Basic plan 6. Changes in regulation 7. Technical changes	8. Work force 9. Materials and equipment 10. High supervision 11. Rework 12. Scheduling 13. Unknown conditions 14.Weather conditions
2006	Aychara et al.	1. difference in site conditions 2. stop in works 3. disagreement in evaluation of changes order	4. Defect in design 5. Extra changes in contract 6.Contract ambiguities

Methodology

Structure and aim of the study

Overall structure of this paper is shown in figure 3. The study is descriptive and information were gathered in library researches, questionnaire, and interview (field researches). The aim of the present paper is recognition, analysis, and ranking of frequency of common claims in Iran due to important role of claim in recognition, correct encounter, and preventing of occurring incorrect claims.

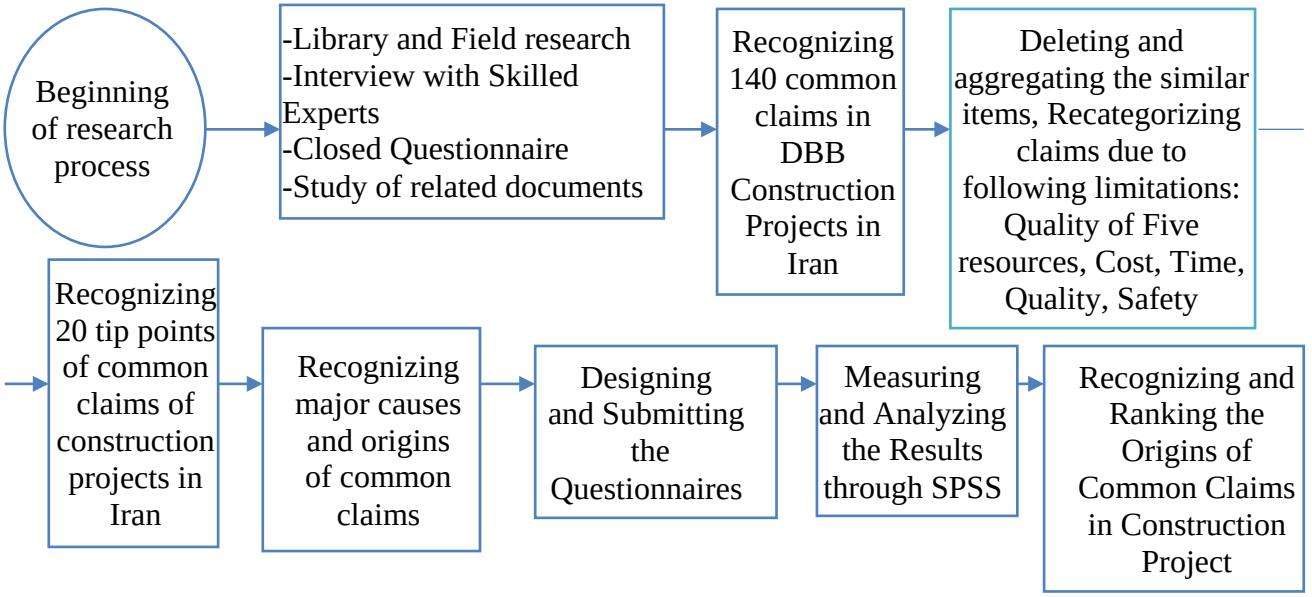

Figure 3: The Structure of the Study

The Resources used in the Study

The resources used to achieve the major proposed aims of the study are as follows:

Table 4: The Used Resources and Instruments

	Research resources
1	Performing the informal interviews with skilled involved factors with different positions (owner, consultant, contractor) in several projects in offices and sites
2	Studying and checking the correspondences and letters of contracting companies about proposed claims
3	Study about 250 files, correspondences and inquiries of contracting and consulting companies from ‘Management and Planning Organization (MPO)’ about disputes in interpretation or performance of related matters in construction projects in Iran
4	Study of regulatory reports of ‘Management and Planning Organization’ about 40 national construction projects in aspect of major inadequacies in creating claims and disputes
5	Study 101 issued arbitration votes in courts and the Supreme Court in Iran about files of contracting companies in aspect of quality and type of claim

The Suggested Model

The major causes of claims found in other studies (table 3) were considered as the basis of research in the present study too. Through accurate investigation of claim and its effect on project function, the recognition must be comprehensive and complete in order to decide for an appropriate and conclusive reaction. Figure 4 illustrates the overall structure of the model.

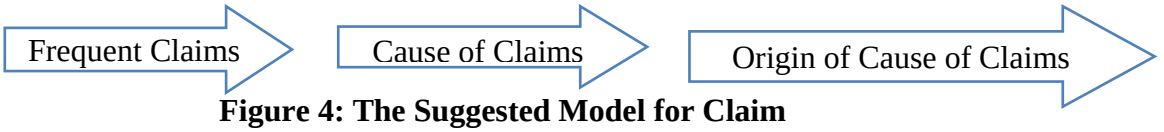

Figure 4: The Suggested Model for Claim

Through this model, the cause of claim and its origin will be determined. So, the model can be a decisive supportive model for project's decision- makers. Harmon (2003) discussed that the main origin of destructive misunderstanding and dispute is about "insufficiency and inadequacy of time, financial resources, human resources, material, machinery, and equipment." So after recognition of common claims, the researcher had classified into 20 categorizes considering the major factors of project (time, cost, quality, and limitation of safety) as table 5:

Table 5: Common claims of contractors of Design- Build- Bid (D.B.B) project

No.	Common claims of contractors of D.B.B projects
1	Design deficiency (unqualified design)
2	Design Fault
3	Error in financial, technical or time estimation
4	Ambiguity in tender documents
5	Deficiency in tender documents and contract
6	Inflation
7	Low cost of contract or contract's item
8	Delay in payments
9	Extra work or loss of work
10	Delay in announcing plan, work order, and minutes
11	Work order and oral supervisory orders
12	Quality or quantity of machinery and materials
13	Method of Execution
14	Quality or quantity of human resources
15	Delay in delivery of materials, machinery, and or work
16	Delay in delivery of site
17	Force major and unpredicted issues
18	Ambiguity in contract
19	Delay, stop or postponement
20	Safety

Using the resources mentioned in table 4; there were found 60 causes of common claims as follows:

Table 6: Effective causes of contractor's claims in Design- Build- Bid (DBB) Projects in Iran

	Effective Causes of Contractors' Claims in DBB Projects
C.1	Contractor selection on the basis of lower cost without considering quality and other dimensions
C.2	Presenting incomplete documents and information to contractor, Stereotypical documents
C.3	Shortage or lack of adequate studies on "feasibility, evaluation, selection of technology, funding, type of contract, and coordination with rules"
C.4	"Public call" instead of limited tender among skilled and competent experts
C.5	Incorrect and cheaper evaluation than real base cost by consultant which cause attending contractors with low- ranking (low grade) in tender
C.6	Evaluating and offering incorrect price on the basis of price list by contractor (because of inconformity with real cost in market)

C.7	Lack of visiting the location and lack of study of technical documents before offering the price by contractor
C.8	Lack of meeting between owner and consultant with contractors before tender
C.9	Lack of accurate and complete study of draft of contract and its attachments by technical units or (technical, financial, legal, and administrative) consultants of each party.
C.10	Lack of considering the background of "eviction and expulsion, baseless claims, changes of contracted cost, changes of contracted time, previous faults" in process of contractors' jurisdiction
C.11	Unclear and uninterpretable contents of contract
C.12	Lack of accurate codification of scope of work
C.13	Discontinuity and disintegration and maybe contrast between content of contract and documents and attachments
C.14	Partiality in contract in benefit of state owner, owner- centered approach instead of project-centered approach in contents of contract
C.15	Inappropriate distribution of risk with responsibilities of contract parties
C.16	Non-professional scheduling of technical, financial, legal, and administrative duties
C.17	Uneffectiveness of system of investigation and compensation of financial effects resulted from orders of changes in specification, quality, volume, and time of execution ordered by owner or consultant
C.18	Lack of effective anticipating system in contract to investigate and analyze the effects of increasing expenses of contractor in the period of stop or postponement of execution operations
C.19	Lack of anticipation system or ambiguous anticipation system for actions and responsibilities of parties and financial and time effects of inevitable accidents
C.20	Ambiguous and ineffective structure of investigation and resolution of claims and disputes
C.21	Lack of acquaintance and dominance of parties on legal affairs of contract's contents
C.22	Great and abnormal changes of cost of material, wages, or machinery, and lack of definite and effective mechanism to cover the above items
C.23	Lack of timely announcement of list price and its indexes like inflation index
C.24	Changes of weight (volume and extent of work) of different chapter of list price after contract and also possibility of increase on price of low-profit chapters
C.25	Inclination (interest) of using the execution technology or material which price is not available in list price (interest of usage with new cost)
C.26	Low wage, cheap material and machinery despite of expectation of high-quality execution (from contractor)
C.27	Delay in well-timed and sufficient payment to contractor and lack of owner's guarantee of financial promise
C.28	-Low cash flow of contractor to provide necessary supplies (provisions) and execution resources -Supply cash flow with high expenses from unofficial resources
C.29	Vast amount of subtraction in contractor's statement, decrease of cash flow and lack of rules for investigation
C.30	Contrast of professional priorities and goals of parties and contract
C.31	Diverse decision makers about project and unclearness of parties' duties in contract
C.32	Incoordination of designing and execution operations (lack of coordination between designer and builder)

C.33	High bureaucracy in organizational structure of owner and inter-organizational relations between Owner, Consultant, and Contractor
C.34	Insufficient coordination between headquarter staff and execution operators, different sensitivity (concern) of each about project
C.35	Lack of well- timed and written announcement in important periods of contract
C.36	Emphasize on individuals instead of documents, emphasis on oral conversation instead of written documents
C.37	Unhealthy, hidden, and unusual financial relations, collusion between parties
C.38	Using untechnical, non- executive staff, shortage of technical and experienced staff in owner's company
C.39	Lack of appropriate motives and efficiency of staff and experts of owner's organization because of low wage, income, and facilities
C.40	lack of efficiency of owner's technical office on supervision, documenting, and managing the contract
C.41	Lack of fast decision-making in important and key periods of projects
C.42	Owner's specificity approach (particularism) instead of holistic approach towards contractor's function (overhanding or owner's interference)
C.43	-Demand of extra duties from contractor -Demand of unrelated operations from contractor
C.44	Continuous changes of consultant or supervisor by owner
C.45	Delay, shortage, or lack of supply of promised material, machinery, or staff by owner
C.46	Delay or lack of issuing the necessary permits, confirmation, or release of legal deductions
C.47	Incorrect, incomplete or unexecuted design
C.48	-Delay in announcing plans, documents, orders -Delay in confirmation and investigation of minutes and statements
C.49	Consultant in the shadow (dominance) of owner and his/ her conservation in professional function
C.50	Insufficient knowledge and experience of supervisory organization for appropriate supervision
C.51	Ineffectiveness of technical office of consultant in control, documenting and management of contract
C.52	Weakness in claim management and its arbitration
C.53	Incorrect technical information and orders in response to technical and executive inquiries of contractor
C.54	Possibility of "Formation of jobbery between contractors" and accordance of contracting nature with claims in order to gain more profit
C.55	Contractor's view towards "claim" as assured safeguard against owner's lack of support
C.56	Contractor's low risk-taking
C.57	Dominance of contractor's experience on owner and consultant's experience
C.58	-Rework because of incoordination of works -Lack of issuing integrated orders -Incorrect programming or execution
C.59	Short, ruined (old) or low-efficient machinery and equipment of contractor
C.60	Contractor's parallel engagement in several construction projects and other projects (contractor's engagement over the capacity)

Shin (2000) identified the key role of project parties in claims and disputes. Organizational, contractual, and technical problems are main factors of claim and dispute (Jaffar, 2011).
The researchers of the present study found 7 origins for claim of contractors of construction projects through field and library studies.

Table 7: Origins of Contractors' Claims

	Origins of Contractors' Claims
O.1	Structure of tendering system, system of contractor's jurisdiction
O.2	Structure of contract
O.3	Economy of project
O.4	Organizational and contractual relations in execution process of project
O.5	Structure and function of owner
O.6	Structure and function of consultant
O.7	Structure and function of contractor

The model presented in figure 4 illustrated more detailed in figure 5 (includes 20 common claims which have 60 causes and 7 origins).

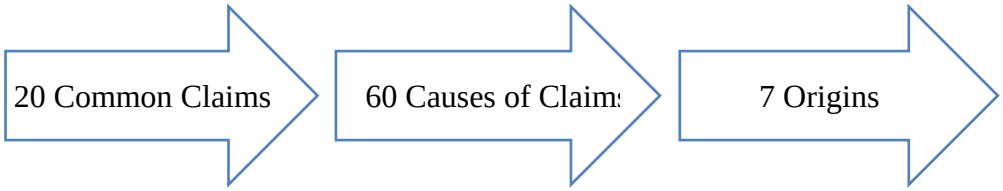

Figure 5: Structure of Suggested Model of the Study

Limitation of the Study

One of the main limitations was lack of integrated and compiled information of previous claims. So, the researchers deducted some of the claims indirectly. On the other hand, some of the contractual and legal documents were in possession of only contractors or owners. Because of significance of documents, one party of dispute could not presented the documents without permit and agreement of another party. Access and receipt of some contractual documents was the other major problem of the study.

Statistical Groups

To provide input for model, the skilled experts were requested to judge table 6 again. First step, they were asked about frequency of common claims. After then, the common claims were being asked about the share amount of each factor in creating claims (whether owner, consultant, and contractor). They were requested to mention their project information like area, contracted time and cost of project, percentage of increase or decrease in time and cost of project, and type of contract. The statistical group of the study were skilled owners, skilled consultant or contractors of construction projects in Iran. The criterion to be considered skilled expert is: 5 years' employment in technical office, project control, contract, and company management. The sample size were determined through (2):

$$n = \frac{\left(z_{\alpha/2}\right)^2 \times pq}{(\varepsilon)^2} \qquad (2)$$

Permitted error equals 0.1, security coefficient for 0.95 was Z = 1. 96, and p and q to be considered 0.5. So, n (sample size) had its maximum amount (n = 96).

This means whenever 96 skilled experts answered the questionnaire, the results can indicate the opinion of total society of experts. Gathering information, 200 questionnaires were submitted to

the skilled experts by attendance, in electronic form, and innovative and new way of online questionnaire in order to accelerate and facilitate to response. The minimum required number to analyze the information was 96. The completed questionnaires received from experts were 138 that equals 69 % of submitted questionnaires which is adequate for the study. The experience of respondent is very important that shows more accuracy. So, the questionnaires were divided on the basis of job division of respondents (experts):

- Less than 5 years……..coefficient 1
- Between 5 and 15 years…….…..coefficient 2
- More than 15 years……..…coefficient 3

In other words, the study has considered the significance of experience of respondents. The questionnaire was closed tests and Likert Scale was the index. Table 8 shows the categorization of Likert scale.

Table 8: Likert Scale

	No significance	Less important	Middle significance	Significant	High Significance
Score	1	2	3	4	5

Validity and Reliability of the Study

The major instruments of the study were closed questionnaire and SPSS software. To determine validity, the researchers applied content validity. The researchers submitted a part of questionnaires to the involved skilled experts in order to identify the ambiguities. Then ambiguous or unnecessary questions were deleted or edited. The questionnaires were submitted again to confirm the content of questionnaire.

Calculating the Cronbach's Alpha Coefficient, in first part of model (frequent and common claims) showed 91.18 % reliability and second and third part (the Causes and the Origins) resulted 94.56 % that shows high reliability of data. It means the received answers were not by chance and random and it indicates the effects of the tested variables.

Table 9: Cronbach's alpha coefficient for Questionnaire

	Alpha Coefficient
Questionnaire of Causes and Origins	0.9456
Questionnaire of Common Frequent Claims	0.9118

Data Analysis

According to tables 4 and 5, the package of claim recognition has three parts. So, each part is analyzed separately.

Frequent and Common Claims (First part of the model)

The data related to frequent claims (table 5) were analyzed and the ranking of the claims on the basis of frequency are shown in table 10. Most frequent claims are "Delay in payments, Delay in announcing plan, work order, and minutes, Error in financial, technical or periodic estimation, Design deficiency (Unqualified design), Design Fault, Ambiguity in tender documents." It is obvious that frequent claims are about financial resources and then technical and contractual resources.

According to relation of WGC and the above findings; when contractors confront with financial and or executive difficulty and pressure, the alarm of claim can be heard. So, readiness for necessary anticipation can prevent effective frequent claim.

Table 10: Ranking of frequency of common claims

No.	Claim	Frequency
1	Delay in payments	4.92
2	Delay in announcing plan, work order, and minutes	4.36
3	Error in financial, technical or periodic estimation	4.30
4	Design deficiency (Unqualified design)	4.25
5	Design Fault	4.18
6	Ambiguity in tender documents	4.01
7	Deficiency in tender documents and contract	3.84
8	Ambiguity in contract	3.79
9	Work order and oral regulatory orders	3.72
10	Extra work or loss of work	3.64
11	Low cost of contract or contract's item	3.56
12	Quality or quantity of human resources	3.48
13	Delay in delivery of material, machinery, and or work	3.41
14	Delay in delivery the site	3.32
15	Force majeure and unpredicted issues	3.28
16	Delay, stop or postponement	3.26
17	Method of Execution	3.09
18	Quality or quantity of human resources	3.03
19	Safety	2.78
20	Inflation	2.63

Causes of Claims (Second part of the Model)

Five major and frequent causes were found through analyzing the results of Questionnaires as shown in figure 5.

1. Selecting contractor on the basis of lower cost without considering quality and other capabilities

2. Great and abnormal changes of cost of material, wages, or machinery, and lack of definite and effective mechanism to cover the above items

3. Delay in well-timed and sufficient payment to contractor and lack of owner's guarantee of financial promise

4. Using untechnical, non- executed staff and personnel, shortage of technical and experienced staff in owner's company

5. Lack of fast decision-making in important and key periods of projects

According to figure 5, whenever profit; as nature of contracting, decrease, the possibility of appearing claim increase. Selecting contractor with lower cost without considering the quality, unusual and great changes, and delay in timely and sufficient payment are reasons that make contractor to think "claim" to cover financial loss caused by offering low price In order to balance the relationship of WGC.

On the other hand, because of complicated, unique, and dynamic nature of the project; it needs a leader and supporter from the beginning to the end. The major responsible of decision-making of Design- Build- Bid (DBB) projects is owner. If owner employs untechnical, unexecuted, and low-experienced experts, this matter can make disturbance in decision- making process; like delay in adopting appropriate decision and also adopting an incorrect decision. Owners' decisions

have extra cost and the major part of its pressure impose on contractor. These decisions affect on contractors' financial and executive structure and capabilities.

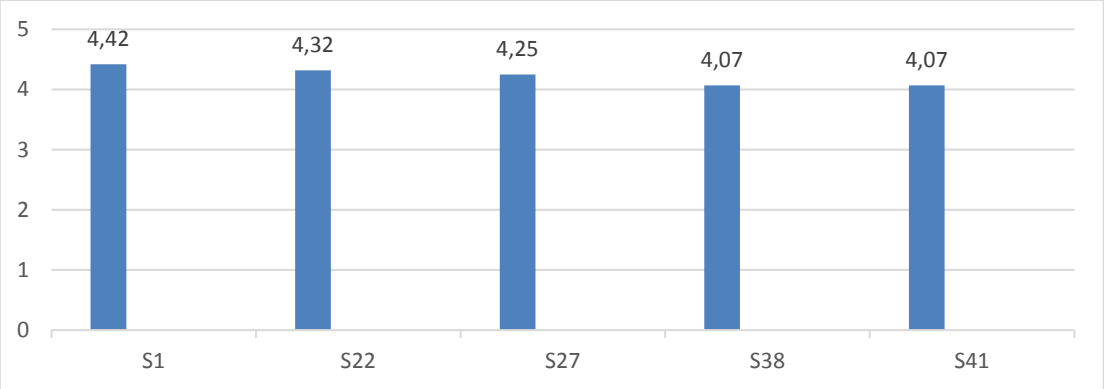

Figure 5: Five Major Frequent Causes of Contractor's Claims

Origin of Claims (Third part of the model)

The main origins of contractors' claim in construction projects were found through the questionnaires as follows:

1. Owner's structure and function
2. Economic of project
3. Consultant's structure and function
4. Contractor's structure and function
5. Structure of tendering system, system of contractor's jurisdiction
6. Structure of contract
7. Organizational and contractual relations in execution process of project

As it is obvious in figure 6; the owner's structure and function, economic of project, and consultant's structure and function are of high importance.

Because of fundamental role of owner; any disformity of owner's structure can be an undergrounding reason of contractor's problems that can lead to claim.

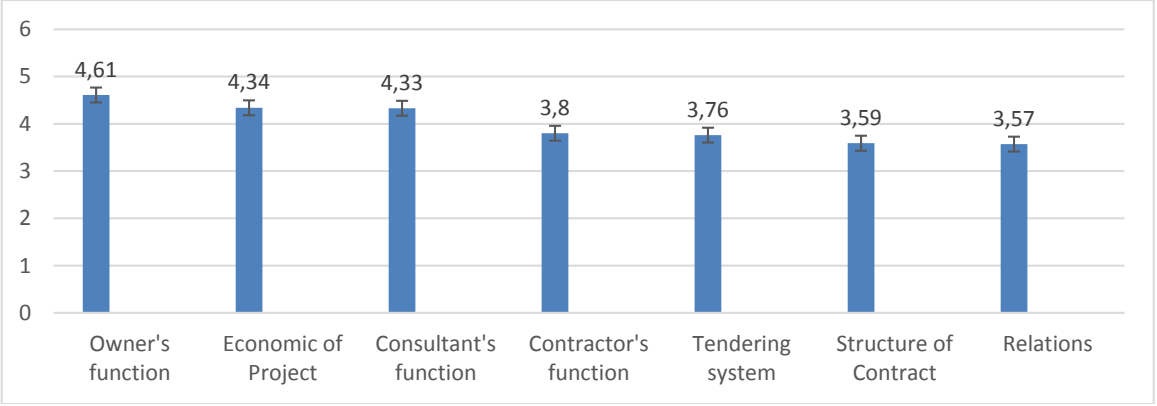

Figure 6: Ranking of Origins of Contractors' Claims

Economic of project; as second main origin illustrates that financial shortage can be an origin of problems in achieving pre-determined goals. It means all the aims which needs financial resources and provisions, can be affected. So, the claim can be suggested as a cover and compensation to provide cash flow.

Consultant as owner's technical trustee agent and referee interpreter of technical affairs has unique and incomparable role in designing, tendering, contract, execution and delivery processes. Function of consultant can impose loss to contractor and finally to project because of its affect on contractor's execution process or achieving goals that can bring the contractor to make claim.

Conclusion

1. Focusing on importance of appearing stage of claim in formation of upper layers of dispute and its effect on execution of construction projects; there is high necessity for a planning to decrease the baseless claims and also control the claims after appearance.

A basic point that the researchers considered is that considering and viewing the claim as a negative matter can make more problems itself. So, the claim is happening reality in construction projects which appears anyway but it depends on imposed pressure on "contracting bubble". So, negative attitude to claim is not remedy and resolution of matter. Such realistic view was the basis of the present study.

2. The present study presented a new three-element model through deep investigation of contractors' claims. The parts of model are common claims, causes of claims, origins of claims. 140 common claims and its 20 top points and 60 causes of claims were found and investigated. Seven effective origins are shown in figure 7.

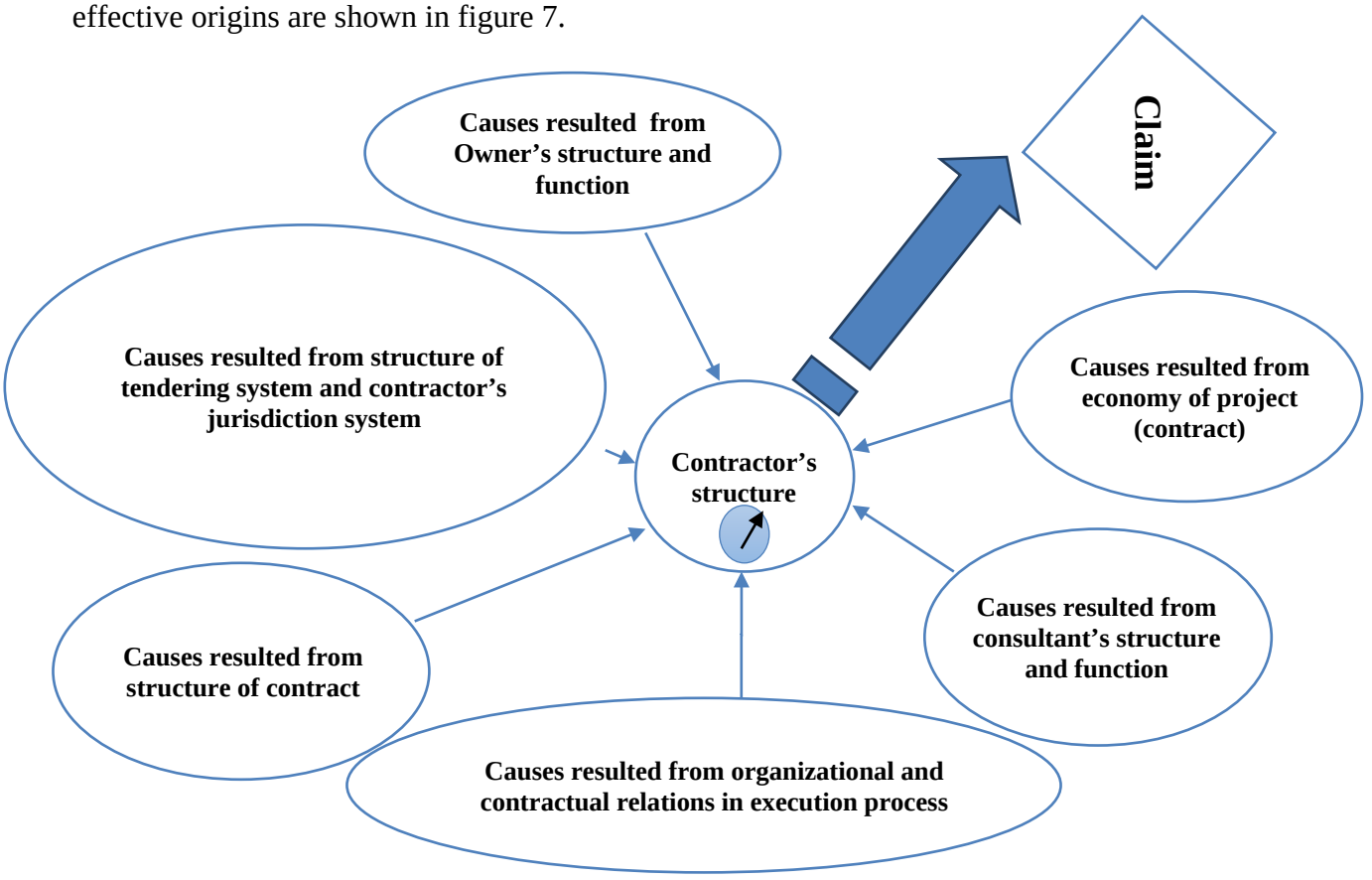

Figure 7: Schematic Design of Seven Major Origins of Contractors' Claims

3. To recognize the claim basically; the tables 6, 9, and figures 5, and 6 are helpful tools for project's decision makers in order to proceed the processes of decrease, control and prevention of appearing claims. The position of findings of the study in mechanism of claim management is illustrated in figure 8.

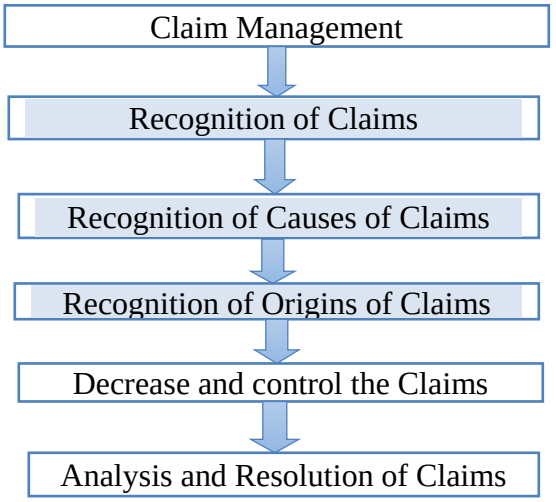

Figure 8: The Position of Findings of the Study in Decrease, Control, and Prevention Process of Contractors' Claims

4. On the contrary to general thought, function of owner and consultant is more effective than contractor's function. So it clears the importance of accurate recognition of claim.

5. Designing, tendering and signing the contracts are most influential steps although the contractor's claims appear in execution steps. Adopting any decision to decrease the claims before appearing is the best solution.

6. The present study's focus was on the determination and recognition of claims in construction projects. "The analysis of cost of claims in construction projects" according to finding of the study is suggested for further studies.

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