EFFECT OF CLAIMS ON PROJECT PERFORMANCE

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ABSTRACT

Objective: This paper aims to assess the effect of claim types and causes on project performance in terms of time, cost & quality. It also proposes a framework for managing & controlling construction claims**.**

Research Method: A questionnaire survey was carried out using Google Forms as well as by hand among Pakistani construction industry practitioners. The statistical package software for social science (SPSS) version 20 was used to analyze the collected 51 responses from the survey. Also, interviews from experts were conducted to record their suggestions for managing types of claims & controlling causes of claims.

Findings: The results found that the top five most destructive claim types for the project performance are changes claims, extension of time, payment/financial, escalation, and project safety. While top five most destructive causes of the claim for the project performance are payment-related issues, evaluation of the quality and quantity of completed works, quality of work, final cost, and change or variation orders. Two frameworks are also presented for the managing different types of claims & controlling different causes of claims.

Originality: This paper presented a framework to control the causes of claims and achieve effective performance.

Keywords: claims, causes of claims, types of claim, construction industry of Pakistan, effect of claims, project performance

1. INTRODUCTION

The Construction projects are complicated, time taking, complex, involve several parties, and require the integration of various work components such as civil, electrical, and mechanical to operate as a single unit (Shah et al. 2014). The construction industry has become more dynamic, complicated in nature, and dominated by uncertainty as a result of modernization of past working procedures and the evolution of new ways to conduct work. The projects need highly specialized designs, precise plans and specifications, high-risk construction methods, efficient administration, complete supervision, and tight collaboration. Participants from diverse professions with their own aims and seek to maximize their own benefits in this complex setting. Conflicts are unavoidable as a result of these disparities in perspectives among project participants. Due to these differences in perceptions among the participants of the projects, conflicts are inevitable (Apte & Pathak, 2016). Conflict occurs when there is a misalignment of values or goals to be attained, both inside the individual and in relation to others. Owners, contractors, consultants, project scope, human resources, contracts and specifications, and external variables are all potential sources of conflict (Rauzana, 2016). Vorster (1993) defined dispute as, “an argument about an issue concerning project operations, usually resulting from a debate over differences in two or more parties‘understanding of situation.” Similarly Deutsch (1973) defines conflict as “incompatible activities; conflict occurs when the behaviour of one person is interfering or obstructing the actions of another”.

When conflicts are not handled correctly and promptly, they turn into claims. Claim is a demand for something due or believed to be due (Jalal et al. 2019). Claim is

a formal demand or assertion by any one of the contracting parties for reimbursement, the adjustment, clarification of contract conditions or other relief resulting from or relating to a particular contract (Mitchell, 2016). Construction claims demand a lot of attention since they are the most disruptive and unpleasant events that may happen on a project (Zaneldin, 2020). Construction claims are unavoidable in contractual relationships and, if not addressed properly, can lead to misunderstandings, disputes, and litigation (Akinradewo, 2017). If a risk is not clearly assigned it will turn into a conflict, if a conflict is not clearly managed it will turn into claim, and if a claim is not resolved it will turn into a dispute as demonstrated in figure 1.

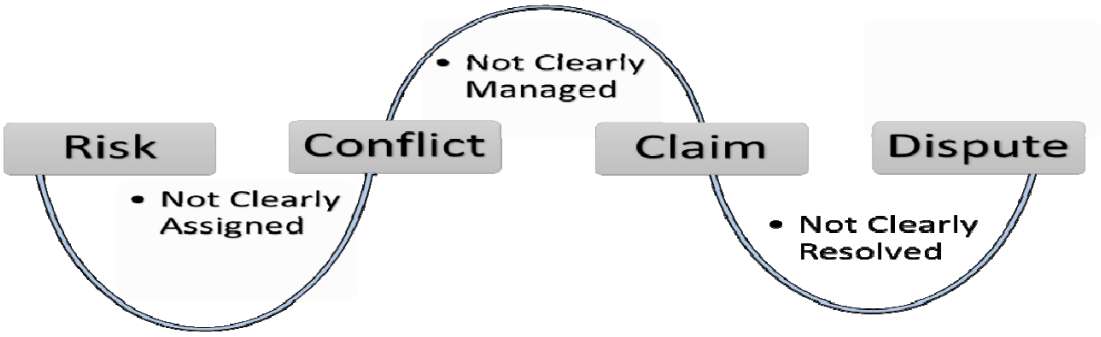

Figure 1: Process of claim management
Source: Apte & Pathak 2016' Joshi & Pimplikar 2021

Claims are regarded to be among the most inconvenient and unwanted parts of a project (Eshofonie, 2008). Due to disagreements and disputes over claims, the construction industry is plagued by a hostile attitude between clients and contractors (Harmon, 2003). Claims are one of the difficulties that any construction project may encounter. This may result in work stoppage, time extensions, and payment delays (Malki & Alam, 2021). As the complexity and size of construction projects grow, so does the number and frequency of claims, which has an adverse impact on the construction industry (Alqershy & Kishore, 2021). Claims affect negatively on a project's supply chain by risking stakeholder relationships, project execution, and project outcomes (Stamatiou et al., 2019). Adel et al. (2019) pointed out that the most significant issues of legal proceedings have been claims for additional payments and damages. It is unsurprising that the number of claims in the construction sector continues to rise in light of these circumstances. Stakeholders can recognize potential claims scenarios by understanding the various forms of construction claims. This acknowledgment can help protect stakeholders from losses and help in the recovery of compensation. In this paper effect of types and causes of claims are discussed on project performance in terms of cost, time and quality.

A comprehensive review of literature was done regarding possible types and causes of construction claims. Previous study efforts yielded extremely helpful data on the types and causes of construction claims in various countries. From literature 25 causes of claims and 8 types of claims were identified as summarized in table 1 and table 2.

Table 1: Causes of Claims

S. No	Causes Of Claims	Refrences
1	Awarding bid to the lowest bidder	Al-Quershi & Kishore 2017
2	Change or variation orders	Zaneldin 2006; Al-Quershi & Kishore 2017; Hadi 2018; Enshassi et al. 2009; Mehany et al. 2018; Chau 2007; Mishmish & El-Sayegh 2018; Assaf et al. 2019; Mahamid 2016; Shen et al. 2017

3	Changes in government regulations and laws	Al-Quershi & Kishore 2017; Mehany et al. 2018
4	Complex execution of the project	Al-Quershi & Kishore 2017
5	Delay caused by owner	Zaneldin 2006; Al-Quershi & Kishore 2017; Hadikusumo & Tobgay 2015; Hadi 2018; Enshassi et al. 2009; Assaf et al. 2019
6	Delays of shop drawings approval by owner's representative	Al-Quershi & Kishore 2017
7	Design errors or omissions	Zaneldin 2006; Kumaraswamy 1997; Abdulnabi & Agarwal 2016; Al-Quershi & Kishore 2017; Hadikusumo & Tobgay 2015; Hadi 2018; Enshassi et al. 2009; Mehany et al. 2018; Chau 2007; Assaf et al. 2019; Mahamid, 2016
8	Discrepancies between contract documents	Al-Quershi & Kishore, 2017
9	Estimating errors	Zaneldin 2006; Hadi 2018; Diekmann & Nelson 1985; Enshassi et al. 2009; Assaf et al. 2019; Mahamid 2016
10	Evaluation of the quality and quantity of completed works	Mahamid 2016
11	Execution errors	Zaneldin 2006; Al-Quershi & Kishore 2017
12	Final cost	Kumaraswamy 1997; Chau, 2007
13	Inadequate documentation	Diekmann & Nelson 1985; Mishmish & El-Sayegh 2018
14	Inadequate site investigation before bidding	Zaneldin, 2006; Mishmish & El-Sayegh 2018
15	inflation	Al-Quershi & Kishore 2017; Enshassi et al. 2009; Chau 2007; Mahamid 2016
16	Lack of coordination among parties	Kumaraswamy 1997; Wang et al. 2005; Al-Quershi & Kishore 2017; Diekmann & Nelson 1985; Mahamid, 2016
17	Low price of contract due to high competition	Zaneldin 2006; Wang et al. 2005; Al-Quershi & Kishore 2017; Assaf et al. 2019
18	Payment related issues	Zaneldin 2006; Wang et al. 2005; Al-Quershi & Kishore 2017; Hadi 2018; Enshassi et al. 2009; Chau 2007; Mishmish & El-Sayegh 2018; Assaf et al. 2019; Mahamid, 2016; Shen et al. 2017
19	Project extrinsic factors	Diekmann & Nelson 1985
20	Quality of work	Zaneldin 2006; Al-Quershi & Kishore 2017; Hadi, 2018; Enshassi et al. 2009; Chau, 2007; Mishmish & El-Sayegh 2018; Assaf et al. 2019; Mahamid 2016
21	Scheduling errors	Zaneldin 2006; Hadi 2018
22	Slow client response (decisions)	Kumaraswamy 1997; Enshassi et al. 2009
23	Specifications and drawings inconsistencies	Zaneldin 2006; Acharya et al. 2006; Abdulnabi & Agarwal 2016; Hadikusumo & Tobgay 2015; Diekmann & Nelson 1985; Enshassi et al. 2009; Chau 2007; Mishmish & El-Sayegh 2018; Assaf

		et al. 2019; Mahamid 2016; Shen et al. 2017
24	Unforeseen site Conditions	Zaneldin 2006; Al-Quershi & Kishore 2017; Hadikusumo & Tobgay 2015; Enshassi et al. 2009; Mehany et al. 2018; Chau 2007; Assaf et al. 2019; Mahamid, 2016
25	Variations in quantities	Zaneldin 2006; Al-Quershi & Kishore 2017; Hadi 2018; Mahamid 2016

Table 2: Types of Claims

S. No	Types Of Claims	Refrences
1	Changes claims	Zaneldin 2006; Diekmann& Nelson 1985; Kumaraswamy 1997; Nasirzadeh et al. 2019; Wang et al. 2005; Acharya et al. 2006; Abdulnabi & Agarwal 2016; Al-Quershi& Kishore 2017; Hadikusumo & Tobgay 2015; Hadi 2018; Diekmann & Nelson 1985
2	Contract ambiguity claims	Zaneldin 2006; Diekmann & Nelson 1985; Kumaraswamy 1997; Wang et al. 2005; Abdulnabi & Agarwal 2016; Al-Quershi & Kishore 2017; Hadi 2018; Mehany et al. 2018
3	Delayed approval/design information	Kumaraswamy 1997; Wang et al. 2005
4	Escalation	Kumaraswamy 1997; Al-Quershi & Kishore 2017
5	Extension of time	Nasirzadeh et al. 2019; Wang et al. 2005; Abdulnabi & Agarwal 2016
6	Extra-work claims	Zaneldin 2006; Kumaraswamy 1997; Al-Quershi & Kishore 2017; Hadi 2018; Mishmish & El-Sayegh 2018
7	Payment/Financial	Wang et al. 2005; Diekmann & Nelson 1985; Mehany et al. 2018; Abdulnabi & Agarwal 2016
8	Project Safety	Diekmann & Nelson 1985

2. RESEACH METHOD

This research aims to investigate causes affecting the project performance and types of claims occurring in the construction industry of Pakistan. To achieve this objective a questionnaire survey was conducted. Through Google Forms and by hand, questionnaire sets were delivered to Pakistani construction industry practitioners. The respondents (client, consultant, and contractors) were asked to rate the effect of each type and cause of claim on the project's cost, schedule, and quality. Total of 59 questionnaire sets were returned as a result of the questionnaire survey. There were 8 incomplete questionnaire sets, which were deemed invalid and inappropriate for further analysis, while the remaining 51 questionnaire sets were deemed legitimate for further research.

The data collected from questionnaires was analyzed by the Average index method suggested by Majid & McCaffer (1997). Average Index can be assessed by following expression.

$$\text{Average/Mean Index} = \frac{\sum_1^5 a_i x_i}{\sum_1^5 x_i}$$

Where, a = constant, weighing factor for i, {i = 1, 2, 3.....n}; xi= frequency of respondent. By applying the average index formula in the collected data, the result is shown in the following sections.

3. RESULTS AND DISCUSSION

3.1 DEMOGRAPHY OF THE RESPONDENTS

The survey's participants work in a number of construction-related areas. Contractors, consultants, and clients from the commercial and public sectors were among those involved. The details of the respondents absed on the type of organization is summenarized in figure 2.

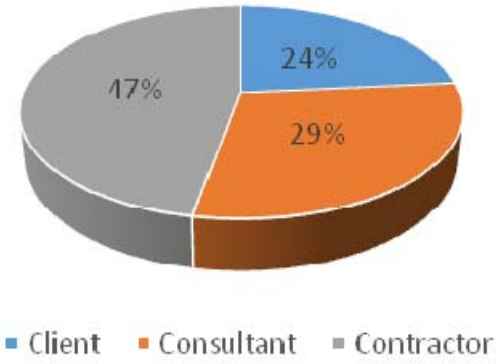

Figure 2: Respondent's Organization

Figure 2 demonstrates that the majority of respondents (24 of 51) are contactors, with a ratio of 47.1 percent. A considerable number of respondents, 15 of 51 with a percentage of 23.5 percent, are consultants, and 12 with a percentage of 23.5 percent are clients. These respondents are working in construction industry for several years as shown in figure 3.

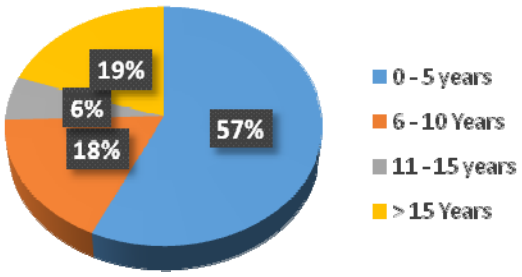

Figure 3: Cost of Project

Figure 3 shows that 29 of 51 respondents have 0-5 years of experience managing significant projects, 9 have 6-10 years of experience, 3 have 11-15 years of experience, and 10 have more than 15 years of experience. The respondents have achieved different level of academic qualifications as shown in figure 4.

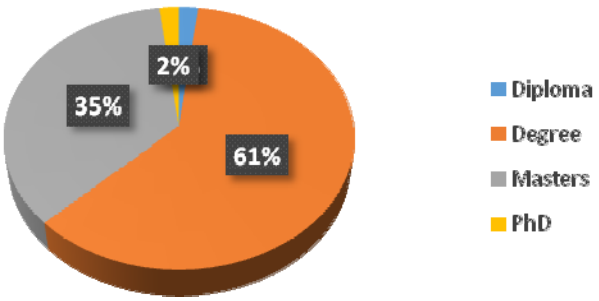

Figure 4: Qualification level

According to the figure 4, 31 out of 51 respondents (60.8 percent) have a bachelor's degree. The Masters level comes in second with 35.3 percent (81 of 51) of respondents. One responder has a diploma and the other has a Ph.D. (with a percentage 2 percent).

3.2 EFFECT OF CAUSES OF CLAIMS ON PROJECT PERFORMANCE

Most claims have a negative impact on project performance; following table shows the effect of causes of claims on project performance in terms of cost, time and quality collectively. In this table, the average of all the AI values of each of the causes of claims is calculated to understand the effect of the causes of claims on project performance.

Table 3: Effect of causes of claims on project performance

S. No	Causes of Claims	Average Index Values			Avg AI Value
		Cost	Time	Quality	
1	Payment related issues	3.863	3.922	3.902	3.895
2	Evaluation of the quality and quantity of completed works	3.686	3.725	3.745	3.719
3	Quality of work	3.765	3.647	3.627	3.680
4	Final cost	3.549	3.588	3.745	3.627
5	Change or variation orders	3.314	3.608	3.686	3.536
6	Estimating errors	3.569	3.353	3.608	3.510
7	Delay caused by owner	3.431	3.373	3.706	3.503
8	Slow client response (decisions)	3.431	3.333	3.686	3.484
9	Variations in quantities	3.314	3.588	3.275	3.392
10	Execution errors	3.333	3.196	3.627	3.386
11	Low price of contract due to high competition	3.294	3.255	3.588	3.379
12	Lack of coordination among parties	3.373	3.353	3.333	3.353
13	Awarding bid to the lowest bidder	3.294	3.314	3.353	3.320
14	Inflation	3.235	3.314	3.373	3.307
15	Scheduling errors	3.235	3.235	3.353	3.275
16	Unforeseen site Conditions	3.216	3.196	3.392	3.268
17	Inadequate documentation	3.373	3.196	3.216	3.261
18	Specifications and drawings inconsistencies	3.294	3.196	3.196	3.229
19	Inadequate site investigation before bidding	3.255	3.137	3.275	3.222
20	Complex execution of the project	3.176	3.294	3.157	3.209
21	Design errors or omissions	3.275	3.118	3.196	3.196
22	Changes in government regulations and laws	3.216	3.078	3.255	3.183
23	Discrepancies between contract documents	3.216	3.078	3.176	3.157
24	Project extrinsic factors	3.137	3.137	3.196	3.157
25	Delays of shop drawings approval by owner's representative	3.118	3.118	3.137	3.124

Table 3 shows that Payment related issues has an extremely high effect on project performance and has an Average AI value of 3.895. Evaluation of the quality and quantity of completed works is ranked 2nd with Average AI value of 3.719, while Quality of work is 3rd most severe cause of claim that effects the project performance. Final cost is ranked 4th, while Change or variation is the 5th most significant cause of claim that affects project performance.

3.3 EFFECT OF TYPES OF CLAIMS ON PROJECT PERFORMANCE

Types of claims have negative effect on project performance in terms of cost, time and quality. Average index value of claims type on cost, time and quality as well as collective AI value are presented in table 4.

Table 4: Effect of types of claims on project performance

S.no.	Types of Claims	Average Index Values			Avg AI Value
		Cost	Time	Quality	
1	Changes claims	3.725	3.922	3.529	3.725
2	Extension of time	3.980	3.902	3.294	3.725
3	Payment/Financial	3.686	3.843	3.647	3.725
4	Escalation	3.824	3.725	3.608	3.719
5	Project Safety	3.686	3.765	3.608	3.686
6	Extra-work claims	3.784	3.647	3.333	3.588
7	Delayed approval/design information	3.725	3.706	3.235	3.556
8	Contract ambiguity claims	3.667	3.353	3.235	3.418

Table 4 indicates that the changes claim, extension of times, and payment/financial claimsare the most destructive type of claims (with an average AI value of 3.725) that affect the performance of the project. Escalation claims are ranked 2nd with average AI value of 3.719 and project safety claims are ranked 3rd with average AI value of 3.686. While extra-work, delayed approval/design information, and contract ambiguity claims are ranked 4th, 5th and 6th respectively.

1.3 CONTROLLING CAUSES OF CLAIMS

After the analysis, the effect of types of claims and causes of claims with an average index value of 3.5 or greater than 3.5 were selected for further study. A proforma was developed with seven causes of claims and seven types of claims to identify managing tools and techniques for construction claims.

Proforma sets were distributed among highly qualified experts through Google Forms and by hand. The respondents were requested to give suggestions for managing the types of claims and also advise measures/methods to control various causes of claims. As a result, a total 16 set of proforma were collected back, which were used in the development of a framework for managing construction claims. The details of the respondents is presented in table 5.

Table 5: Demography of the Respondents

Description	Frequency	Percent
Type of Organization		
Contractor	7	43.8
Consultant	6	31.3
Client	4	25.0
Experience		
> 15 Years	12	75.0
6 - 10 Years	4	25.0
Size of Projects		
> RS 3000 M	7	43.8
RS 150 M – RS 400 M	5	31.3
RS 1800 M – RS 3000 M	3	18.8
RS 800 M - 1800 M	1	6.3

Academic Qualifications		
Degree	10	62.5
Master	3	18.8
PhD	2	12.5
Diploma	1	6.3

Table 5 shows that 7 respondents of the proforma are contractors with 43.8%, 6 Consultants with 31.3% and 4 client with a percentage of 25.0%. Most of the respondents are highly experienced, 12 out of 16 respondents with a percentage of 75.0% have more than 15 years of experience. While 4 of 16 respondents with a percentage of 8.3% have 6-10 years of experience. It can be observed that, 7 respondents are working on projects more than Rs. 3000M with a percentage of 43.8%, 5 respondents are working on projects of RS 150M – RS 400M with percentage of 31.3%, 3 respondents are working projects of RS 1800M – RS 3000M with 12.5%, and one respondent is working on project of RS of 800M - 1800M with a percentage of 6.3%. It also shows that 10 out of 16 (62.5%) respondents are Degree holders, 3 out of 16(18.8%) are the Master's degree holders, 2 (12.5%) Ph.D., while 1 (33.3%) respondent has a diploma. These details show that these respondents are capable to provide useful feedback.

1.4 FRAMEWORK FOR MANAGING TYPES OF CLAIMS

The number of claims and disputes continues to rise at an alarming rate. The causes for this rising tendency toward claims must be investigated as soon as possible. Therefore, to manage construction claims, these frameworks are developed based on the data collected from the experts through proforma. All comments and suggestions from the experts for managing all seven types of claims were collected, and similar measures/suggestions were merged. There are many ways to manage different types of claims, most claims consultants have developed their own techniques & methodologies for the management of the claim types. Figure 5 shows a framework that contains guidelines and recommendations of the experts to manage different types of claims. The framework was designed primarily for use in the construction industry; however, it is applicable to various sectors as long as the methodologies utilized are appropriate for the project and industry in which it is to be applied. According to the framework, following methodologies/guidelines should be followed to manage these types of claims:

Changes Claims: Proper contract defined procedures regarding variation/ change orders should be implemented; timely analysis of cost and time; timely response to variation/change orders; detailed documentation; fair and reasonable decisions should be made and natural biases should be ignored.

Extension of Time Claims: Extension of time request should be fairly evaluated &timely responded; claims should be judged against the actual progress of work, not the programme & must show the link between cause and delay; fair and reasonable decisions should be made and natural biases should be ignored; proper contract defined procedures should be implemented.

Payment/Financial Claims: Timely notice for the claim with proper financial implications; fair and reasonable decisions should be made and natural biases should be ignored; detailed documentation; proper contract defined procedures should be implemented.

Escalation Claims: Proper contract defined procedures should be implemented; contingency funds should be used to cover this type of valid claims; don't let unresolved dispute accumulate; keeping a track of CPI and relevant clauses in the contract for price escalation and applying same on the periodic basis.

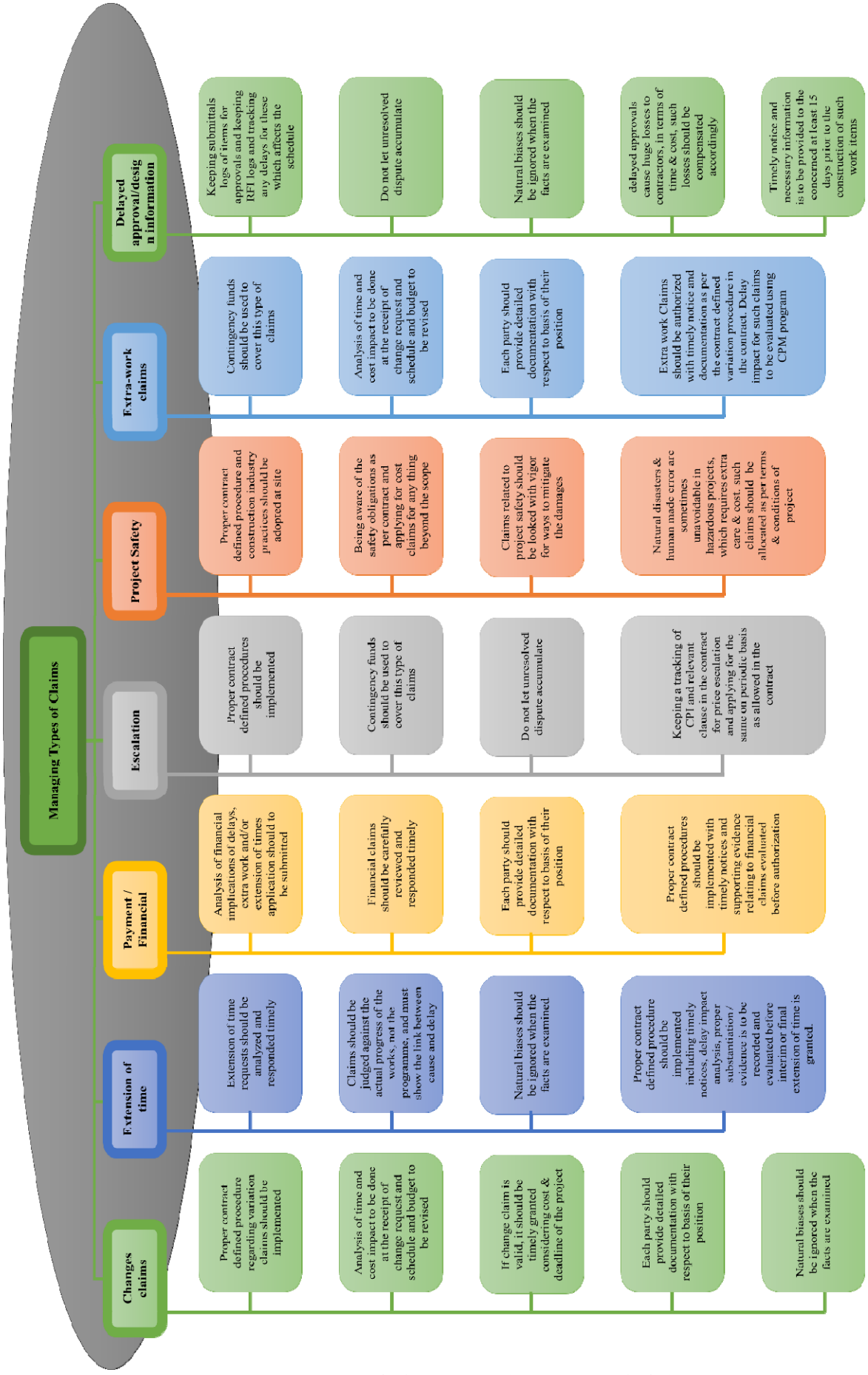

Figure 5: Framework for managing types of claims

Project Safety Claims: Proper contract defined procedures & construction industry practices should be adopted at site; being aware of safety obligations as per contract; project safety claims should be looked with vigor for ways to mitigate the damages.

Extra-Work Claims: Contingency funds should be used to cover this type of valid claims; fair and reasonable decisions should be made and natural biases should be ignored; detailed documentation; Timely response to the claim as per contract & should be evaluated using CPM program.

Delayed approval/design information Claims: Keeping submittals logs of items for approvals and keeping RFI logs and tracking any delays for these, which affects the schedule; don't let unresolved dispute accumulate; natural biases should be ignored when the facts are examined; delayed approvals cause huge losses to contractors, in terms of time & cost, such losses should be compensated accordingly.

1.4 FRAMEWORK FOR CONTROLLING CAUSES OF CLAIMS

Similarly, all expert suggestions for controlling all seven shortlisted causes of claims were collected, and similar comments/suggestions were merged, resulting in 4 to 5 measures/techniques for each cause of claim. Figure 6 depicts a framework with expert guidelines and suggestions for dealing with various sorts of claims. The framework was created primarily for use in the construction industry, but it may be adapted to a variety of industries as long as the approaches used are acceptable for the project and industry. The following methodologies/guidelines should be followed to manage various sorts of claims, according to the framework:

Payment related issues: Proper contract defined procedure should be implemented for smooth flow of payment; Financial flow is the backbone of any project, stakeholders should timely allocate the funds & pass bills to avoid any disturbances; records of IPCs, approval of payments and receipt of payment and claim time/cost for any delays caused by payment delays should be maintained; If the funds allocation body, generally the client allocate the funds timely, passes the bills of the contractor timely, these issues can be tackled smoothly; Proper communication & better management can play key role in avoiding such issues.

Evaluation of the quality and quantity of completed works: Proper contract defined inspection and testing procedures should be implemented for patent or latent defects in completed works; logs need to be maintained for the inspection of work requests and time taken for inspection approval with reasons for the delay in approval (if any); compliance to specification, quality pan and inspection/testing plan; If the project is executed with proper planning and as per specifications of drawing & design, such issues can be avoided; special party/team should be formed to quantify.

Quality of work: Quality of work should be as per specifications and as per instruction of client's representative; proper contract defined inspection should be implemented during execution phase with clear responsibility to be assigned for any negligence; projects should be supervised properly during execution phase, so the quality should not be compromised, which will ultimately help in avoiding such issues; design changes should be avoided in execution phase to maintain good quality of work; smart measures (like lean tools) to be taken to maintain quality.

Final cost: Early recognition of errors, scope/specification changes and realistic BOQ estimates with proper planning of the project will minimize the final cost; at the final stages, all change order have become part of the contract so basically a check needs to be done that the final cost is inclusive of all approved claims; in most of the projects, due to escalation & changes orders, the final cost of project is disturbed; contingency funds should be added in project cost to manage such any additional cost; client should have an experienced contract administration/construction claims expert to evaluate contract processes to ensure that they are suitable.

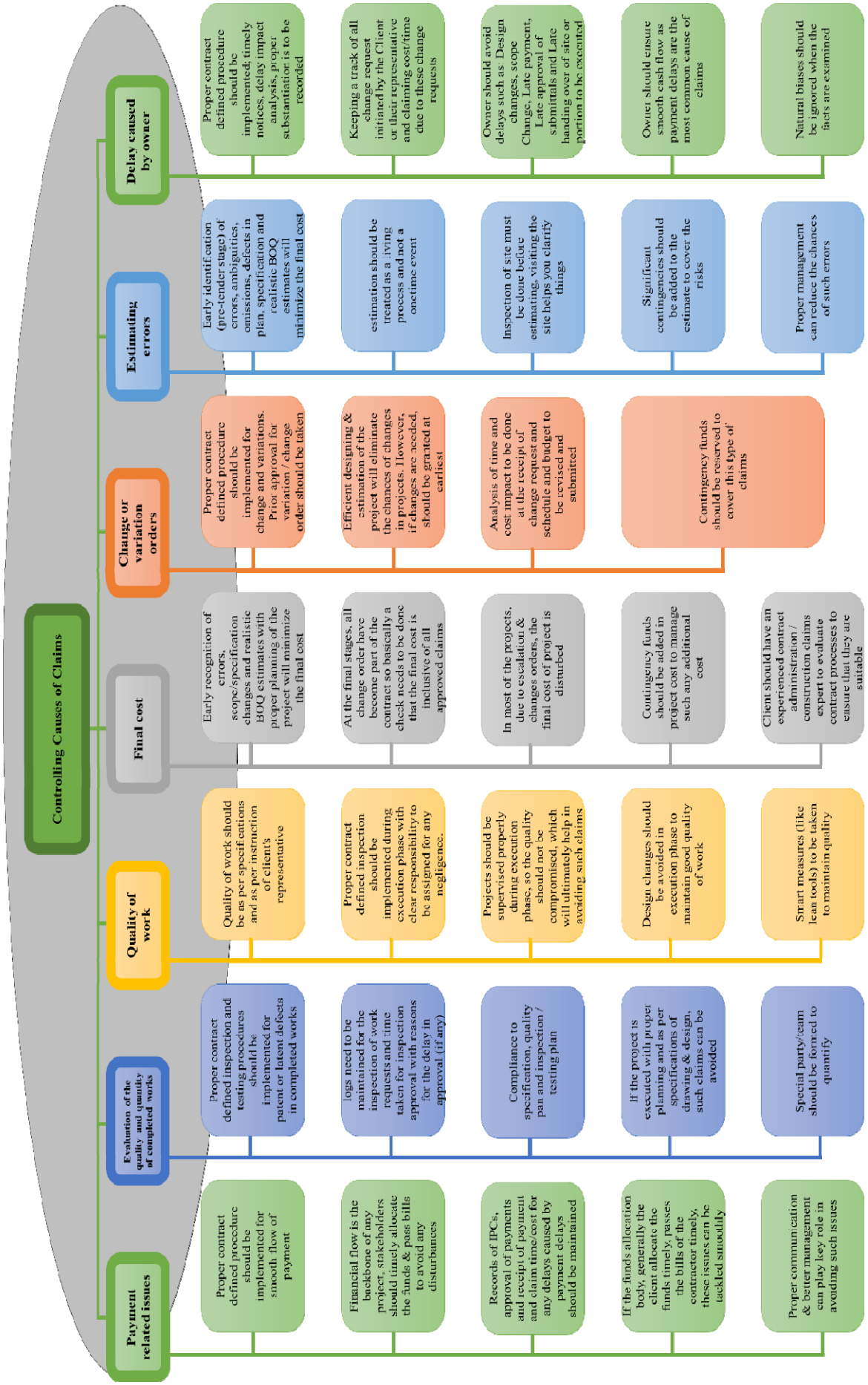

Figure 6: Framework for controlling causes of claims

Change or variation orders: Proper contract defined procedure should be implemented for changes and variations; efficient designing & estimation of the project will eliminate the chances of changes in projects, however, if changes are needed, should be granted at earliest; analysis of time and cost impact to be done at the receipt of change request and schedule and budget to be revised and submitted; contingency funds should be reserved to cover this type of claims.

Estimating errors: Early identification (pre-tender stage) of errors, ambiguities, omissions, defects in plan, specification and realistic BOQ estimates will minimize the final cost; estimation should be treated as a living process and not a onetime event; inspection of site must be done before estimating, visiting the site helps in clarifying things; significant contingencies should be added to the estimate to cover the risks; proper management can reduce the chances of such errors.

Delay caused by owner: Proper contract defined procedure should be implemented; timely notices, delay impact analysis, proper substantiation should be recorded; keeping a track of all change request initiated by the Client or their representative and claiming cost/time due to these change requests; Owner should avoid delays such as: Design changes, scope Change, Late payment, Late approval of submittals and Late handing over of site or portion to be executed; owner should ensure smooth cash flow as payment delays are the most common cause of claims; natural biases should be ignored when the facts are examined.

4. CONCLUSION

There were two objectives of this study; first was to assess the effect of claim types and causes of claims on project performance and second was to propose a framework for managing construction claims. The first objective was achieved through a questionnaire survey, the expert's opinion were collect to assess the effect of types and causes of claims on project performance in terms of cost, time, and quality from the survey. The results found that the top five most destructive claim types for the project performance are Changes claims, extension of time, payment/financial, escalation, and project safety. While top five most destructive causes of the claim for the project performance are payment-related issues, evaluation of the quality and quantity of completed works, quality of work, final cost, and change or variation orders. Based on the feedback received from highly experienced respondentsa framework for types and causes of claims is developed which will help to manage claim types and mitigate the root causes of claims.

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