

Comparison between Causes of Disputes in the Published Literature and the Construction Industry of Pakistan

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ABSTRACT: *Disputes have detrimental effects on project leading to cost overruns, delays, poor quality of work and intangible losses to working relationship among the project participants. This study identifies the root causes of disputes in construction industry by an extensive literature review and a survey in the Pakistani construction industry. A three step content analysis approach has been adopted to collect and analyze the research papers published during the period 1993-2015. A total of 33 papers were found to be relevant. From these papers, 52 factors were found, out of which 31 have been shortlisted for this study. They were subjected to a screening process to determine the top five causes of disputes which are delays in payments, change orders, quality of works, delays in work and contractual anomalies. Based on the factors identified through literature review, a survey was conducted in Pakistani construction industry. The top five causes of disputes identified show an 80% convergence between published literature and professional practices in Pakistan with additional significance to poor contractor selection.*

Keywords: *conflicts; claims; disputes; systematic review; root causes; construction projects; literature review; content analysis*

Construction industry is getting complex day by day. It is riddled with dynamism and uncertainties owing to multidisciplinary nature of projects and stakeholders. Owing to the diversity, differences of opinion are bound to occur which may escalate to conflict. The interaction of several parties like architects, engineers, constructors, skilled and semi-skilled labor, financiers, owners, developers, etc. may lead to inevitable conflicts which can quickly turn into disputes (Cakmak and Cakmak, 2014). These disputes can take place at any phase of the construction project i.e. during the design or execution (Hall, 2002). They become the primary source of problems in the construction. Every construction project is unique and has no standardized format, the interface problems are bound to occur. These turn into disagreements due to which the team members loose the spirit to perform resulting into compromised quality of work (Cheung and Suen, 2002). Another aspect of damage materializes into the time and cost overruns putting a strain on the business relationships among the parties which creates a state of dissatisfaction (Ilter, 2012). The conflicts and disputes are found to be increasing in construction industry (Yates and Hardcastle, 2003) escalating the direct and indirect project cost. The direct cost is the amount spent in dealing with lawyers, claim consultants and the costs associated with the delays of project. The indirect costs are the mistrust and poor work quality which deteriorate project success. Conflicts in construction industry have been ranked to be the highest factor behind the increase in project cost (Brockman, 2013). Therefore, in this research the probable causes of disputes in the construction industry are identified both through a literature review and a survey in the Pakistani construction industry. The possible value-add of this study into the body of knowledge comprises of a better understanding of causes due to prime stakeholders which may practically imply an insight into occurrence of major issues during the project lifecycle.

Methodology

The primary objective of this study, i.e. identifying the factors leading to disputes in construction industry was achieved by reviewing the literature. The methodology was divided into three stages; in the first stage, a three-step content analysis as suggested by Yi and Wang (2013), Hong et al. (2011) and Osei-Kyei and Chan (2015) for collecting and analyzing the factors was performed. In the second stage, the identified factors were subjected to a two-step screening process based on their frequency of appearance in the published literature. Through this procedure the dispute causing factors were ranked. In Stage 3 a survey was conducted in the

construction industry of Pakistan to compare the results of literature review and factors currently affecting the market.

Stage 1

Step 1: Identifying the relevant Research Journals

In the first step, the pertinent journals publishing high quality research in the field of construction and project management are identified. The journals targeted included "Journal of Construction Engineering and Management (JCEM)", "International Journal of Project Management (IJPM)", "Journal of Civil Engineering and Management (J Civ Eng Manag)", "Construction Management and Economics (CME)" and "Engineering, Construction and Architectural Management (ECAM)". The journals JCEM, IJPM, CME and ECAM fall into the category of top six construction management journals (Osei-Kyei and Chan, 2015).

Step 2: Identifying the relevant Papers

In JCEM 6 research papers were found most relevant and used for further analysis. In IJPM only 2 papers were found to contain the required data. In J Civ Eng Manag and CME no article made it into the relevant ones. In ECAM only 3 were found relevant to the topic. Afterwards search was conducted using Google Scholar to find out more papers on the subject topic. In total, 33 articles were selected from the literature search process and used for further analysis.

Step 3: Examining the Papers

Factors having at least two citations were considered which then pass through the Stage 2 screening process.

Stage 2

Step 1:

The factors appearing in at least 25% of the total papers were considered for further study.

Step 2

The factors were subjected to another screening process where their quantitative and qualitative significance was evaluated. For the quantitative evaluation, Equation 2 was used.

$$\text{Quantitative marks} = (\text{No of citations} / \text{Total Citations}) \times 50 \quad (1)$$

The factors are also marked qualitatively and stated as High (H), Medium (M) and Low (L). They are given 1, 0.75 and 0.25 score respectively as given in Equation 2.

$$\text{Qualitative marks} = \text{Rating (H, M, L)} \times 50 \quad (2)$$

On the basis of sum of quantitative and qualitative marks, 5 most significant factors that could lead to disputes were identified.

Stage 3: Identification of Causes of Disputes through Survey

The causes of disputes identified through the literature review were subjected to a survey in Pakistani construction industry. The aim was to determine the ranking of these dispute causing factors in local industry. A pilot survey was conducted in the form of face to face discussions with professionals of construction industry to shortlist the factors for the detailed survey. Hill (1998) has suggested 10-30 participants to be adequate for such survey. The factors for which at least 60% respondents reported a candidacy to be a cause of dispute in the industry were carried forward to the next step. Based upon these suggestions, a detailed questionnaire in English was developed on Google Forms which was physically distributed to the professionals of construction industry. The respondents were asked to individually rate the probability and impact of these factors from 0 to 5 where 0 means no impact/no chance of occurrence and 5 depicts very high impact/very high chance of occurrence. These dispute causing factors can also be treated as risks as by definition "risk is the deviation of a variable from its expected value that may be positive or negative". Generally risks are considered to be negative occurrences (Schieg, 2006). Risks are calculated by multiplying the probability and impact of the events. Hence, these dispute causing factors are ranked by means of the methodology used to calculate the risks. The survey was sent to clients, consultants, contractors and subcontractors with the aim that the respondents should have an adequate experience to respond to the survey. According to Dillman (2000) for a population size greater than 30,000, at 95% confidence interval and 10% allowable margin error, the sample size comes out to be 96. This was the targeted size of sample in the survey. The reliability of data was checked in SPSS by calculating the value of Cronbach alpha. If the value of alpha is above 0.8, the data is considered to be very reliable (Gliem & Gliem, 2003). Afterwards relative importance index (RII) of the factors was determined using Equation (3).

$$RII = \frac{W}{N} \quad (3)$$

where W is the weight given to each factor by the respondents and ranges from 0 to 5, A is the highest weight (i.e. 5 in this case) and N is the total number of respondents.

Analysis and results

The factors which are the root cause of disputes in construction industry are identified. A total of 52 factors appeared in literature that could become the cause of dispute. Based on the first level screening, 31 factors that

had at least 2 citations are enlisted along with selected references as shown in Table 1.

Delays in payment is the most cited cause of dispute by researchers with 20 out of 33 citations. Change orders and contractual disputes are next on the list. The top 3 factors have close competition. Therefore, from the literature point of view these three factors contribute almost equally towards occurrence of a dispute. Based upon the minimum 25% citation criteria set for first level screening, a total of 12 factors (Serial number 1 to 12 in Table 2) with at least 8 citations each are carried forward for further analysis. Based upon quantitative and qualitative scores the top five causes of disputes are highlighted in Table 2.

Afterwards face to face discussions were carried out with 10 experts of the Pakistani construction industry in which the 31 factors identified through literature review were discussed. A total of 18 factors passed the 60% screening process. The rest were dropped out from further analysis. The responses were obtained from 18 clients, 19 consultants, 45 contractors, 13 subcontractors and 2 suppliers/fabricators. In total, 50 respondents have more than 20 years of experience, 11 have 10-20 years of experience, 15 with 5-10 years of experience and 21 have 0-5 years of experience. This shows that the respondents have an adequate experience to respond to survey. The reliability of data was determined in SPSS using Cronbach's alpha method. The value of alpha came out to be 0.879 which shows that the data is very reliable. Afterwards, results were ranked on the basis of RII (Table 3)

The most significant cause of dispute in local construction industry is delays in payment. In case payment does not take place associated stakeholders face serious cash flow issues. This often gives rise to disputes of higher degree. This is in agreement with the findings of Khahro and Ali (2014) that delays in payments is the most significant cause of dispute in Pakistan industry. Change orders has been ranked 2nd according to literature but 5th in Pakistani industry. This is also in perfect agreement with the findings of Farooqui, Umer, and Azhar (2014) who have placed variations as the 5th most important cause of dispute. There is a complete agreement of the literature and the Pakistani industry on the ranking of poor quality of works (3rd position). Cost, quality and time are the key factors governing the project performance. Keeping this in view, there is an increasing importance given to quality of works in construction these days. The poorly executed works lead to reworks and increased maintenance cost, and a dispute among the project participants. This

justifies its 3rd position in top ten lists. Delays in work has been ranked 2nd by the Pakistani industry and on 4th position according to the literature. It causes lawsuits, litigation, abandonment, over costs in local industry (Haseeb, Bibi, & Rabbani, 2011). Therefore, it has been categorized as a significant dispute by the construction industry.

Poor contractor selection has been ranked 4th by the Pakistani industry but it did not make it to the top 10 list in the literature review. Around 83% of contractors are selected on the basis of lowest bid in Pakistan (Khan & Abdul Qadir Khan, 2015). This may lead to selection of an incompetent contractor that results in a dispute at a later stage due to poor quality of works, time and cost overruns. Owing to the low bid practice, incompetent contractor selection is a significant dispute in Pakistani industry. There is a significant difference in the position of disputes due to contractual anomalies in the literature and that in Pakistan. In local context, importance given to contract documentation is not significant as it has been indicated by Farooqui et al. (2014) that breaches of contract by the project participants is the least treacherous cause of dispute among the contract related disputes. This justifies its lowest position in Pakistani construction industry. Errors in drawings and specifications have been ranked alike at 6th position by literature and construction industry. This is also in agreement with the findings of (Khahro & Ali, 2014) who have ranked the errors in project documents to be the 7th most significant cause of dispute in the Pakistani industry. Lack of proper supervision did not make it to the top ten list in the analysis of literature review but has been placed on 7th position by the Pakistani industry. It appeared in 5 out of 33 research papers thus showing that as per the literature it is not a significant factor but Pakistani industry requires a proper supervision of the construction project. On similar grounds, negative attitude of parties appeared in 6 out of 33 papers but it made to the top ten list as per local preferences. Also there is a difference of opinion on the ranking for lack of communication and changed conditions between the literature and the views of Pakistani industry. But on the whole it can be seen that 4 out of top 5 causes of disputes are common in the literature and the Pakistani construction industry. This depicts that there is an 80% agreement on the critical causes of disputes.

Conclusion

This analysis culminates into identification of most important root causes of disputes in construction projects through literature: delays in payment, change orders, quality of work, delays in work and contractual

anomalies. Afterwards the factors identified through the literature review were subjected to a pilot survey and then a detailed survey in the Pakistani construction industry. Delays in payments, delays in work, poor quality of works, poor contractor selection and change orders have been ranked as the top five causes of disputes in the Pakistani industry. This indicates a near agreement on the critical causes of disputes as indicated by the literature and the Pakistani industry.

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Appendix

Table 1: Dispute causing factors from literature

S.No	Factor	No of Citations	References
1	Delays in payment	20	Acharya et al., 2006
2	Change orders	19	Al-Hammad,2000
3	Contractual anomalies	18	Musonda and Muya, 2010
4	Quality of work	14	Choudhry et al., 2012
5	Errors in drawings and specifications	14	Mitropoulos and Howell 2001
6	Lack of communication	13	Kumaraswamy,1997
7	Delays in work	12	Brooker, 2002
8	Changed conditions	12	Acharya et al., 2006
9	Delay in reply to queries	12	Acharya et al., 2006
10	Changes in prices of materials and labors	09	Iyer et al., 2008
11	Acceleration/Suspension of work	09	Semple et al., 1994
12	Estimation errors	08	Cheung and Yiu, 2006
13	Acts of God	07	Al-Hammad, 1993
14	Restricted access to site	07	Al-Hammad, 1993
15	Improper contractor selection	07	Kumaraswamy, 1997
16	Technical competence of team	07	Al-Hammad, 2000
17	Low bidding price	06	Zaneldin, 2006
18	Negative attitude of parties	06	Zaneldin, 2006
19	Lack of proper supervision	05	Farooqui et al., 2014
20	Health and safety issues	04	Brockman, 2013
21	Insufficient drawing details	04	Huang et al., 2008
22	Risk allocation	04	Chan and Suen, 2005
23	Lack of familiarity with local laws	04	Huang et al., 2008
24	Unrealistic expectations	04	Cheung and Yiu, 2006
25	Extension of time	03	Chan and Suen, 2005
26	Exaggerated claims	02	Farooqui et al., 2014
27	Adversarial relationship	02	Chan and Suen, 2005
28	Team lacking spirit	02	Chan and Suen, 2005
29	Owner provided material	02	Bassioni et al., 2007
30	Extra works	02	Cheung and Pang, 2012
31	Productivity of labors	02	Huang et al., 2008

Table 2: Top ten causes of disputes as per literature

S.No	Description	Quantitative Points	Qualitative Rating	Total Points
1	Delays in payment	30.30	H	80.3
2	Change orders	28.78	H	78.78
3	Quality of work	21.21	H	71.21
4	Delays in work	18.18	H	68.18
5	Contractual anomalies	27.27	M	64.77
6	Errors in drawings and specifications	21.31	M	58.81
7	Lack of communication	19.69	M	57.19
8	Changed conditions	18.18	M	55.68
09	Changes in prices of materials and labors	13.63	M	51.13

10	Acceleration/ Suspension of work	13.63	M	51.13
11	Delay in reply to queries	18.18	L	30.68
12	Estimation errors	12.12	L	24.62

Table 3: Causes of disputes in Pakistani construction industry

Factor	RII	Ranks
Delays in payments	0.517	1
Delays in work	0.494	2
Poor quality of works	0.471	3
Poor contractor selection	0.443	4
Change orders	0.413	5
Errors in drawings and specifications	0.409	6
Lack of proper supervision	0.4	7
Negative attitude of parties	0.388	8
Estimation errors	0.369	9
Changes in prices off materials and labors	0.358	10
Delay in reply to queries	0.353	11
Acts of God	0.345	12
Lack of communication	0.336	13
Acceleration/Suspension of work	0.335	14
Changed conditions	0.329	15
Health and safety issues	0.312	16
Restricted access to site	0.312	16
Contractual anomalies	0.306	18