



Disputes in Construction Project Management: A Digital Solution

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How to Cite this Article:

Jha, F. (2026). Disputes in Construction Project Management: A Digital Solution. International Journal of Creative and Open Research in Engineering and Management, <i>02</i>(04). <https://doi.org/10.55041/ijcope.v2i4.334>

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<https://doi.org/10.55041/ijcope.v2i4.334>

Abstract—

Several types of disputes are common issues to be dealt with by constructors in respect to clients, material suppliers, designers and working personnel at the site and at the management team level. This way construction project time of completion with desired standard quality parameter get affected. Also, the project cost gets enhanced due to time elapsed during dispute handling and reaching up to a resolution. In turn, the disputes grow dissatisfaction and several grievances in the minds of all the stake holders of the construction project. This manuscript focuses on identification of such disputes, stages of their appearance in few previous construction projects, and reasons associated with them. It also proposes a digital solution towards minimizing disputes and real time information sharing between various stake holders of any construction project.

Keywords— construction, project, dispute, digital solution



I. INTRODUCTION

There arise various disputes between client and constructor during construction project management. The disputes cause delay in project completion, grievances of the all associated people (client, staff, suppliers, labor etc.) and hence finally, the project outcomes get affected [1] to [6]. There is need to identify all critical disputes and analyze the root cause [7] to [12]. It is also prudent to take a review and recheck on the prevailing dispute resolution methods and contract method [3]. Literatures bring forward upsurge of misunderstanding in between various stake holders of the project [6]. In case of manual handling of the disputes, there happens delay in reaching upto a resolution. The unresolved claim results to conflict and litigations. Hence, it is pertinent to handle and address the disputes, before they affect all the concerned stake holders of the project.

Present system of carrying out construction projects is generally managed at personal level by the constructor/owner of the project. This trend lacks inclusion of suggestion/ inputs from the clients, who generally remain unaddressed in respects of various crucial information related to the project. Clients get control of the project after possession, when there is rise of disputes after completion of the project. This creates several claim and conflicts. Its learnt from available literature that dispute arise in the construction project [1-13]. However, there is need of passage of timely information to each stake holder and everyone's input/ suggestion about the work done or incompleteness. Delay in dissemination of each progress done or if hurdles any in the growth of project to each associated party of the project, erroneous manual exercises may create serious disputes out of primary disputes [5], [9], [13]. In this situation, it would be prudent to make use of information Technology tools and software to add on 100% transparency in the construction project work and growth or challenges being faced. In this situation, with a vision to fill the said research gap and to ensure disputes reduction, the present manuscript focus on findings of inter-relationship of various root causes of disputes, and devising a smart technic for their reduction in present age construction projects. The aim is to ascertain a team of all stake holders where all may give their open inputs and their timely resolution by the constructor team. This has been thought to effective in maximum information sharing and collection of inputs/suggestions from each stake holders.

II. LITERATURE REVIEW

Common disputes and 50 causes of disputes in construction projects have been identified by Amila Gamage and Suresh Kumar [1]. The causes were categorized into 04 types viz., client related (34%), consultant related (36%), contractor related and Other

causes. Out of the various 50 causes of disputes, 51% disputes emerged in the pre-contract phase.

Amila Gamage studied importance of effective communication to minimize disputes in construction project [3]. Disputes impact negatively on project performance and unsuccessful project completion. It has been reported that a well-established information distribution system brings effective communication between team leaders in managing resources, project cost, time of completion and quality of project performance.

K. K. Naji et. al have studied methods for modelling and evaluating construction disputes: a critical review [4]. It is reported that disputes are major obstacle to successful project outcomes. Emphasis has been given on strategies to identify disputes, causes of disputes, management of disputes and timely resolution of disputes. Disputes appear when there is a difference of opinion, extension of time, issue of compensation of damages incurred by any party to a contract. In case of disputes are left unresolved they affect project outcomes. Disputes are Question[ing] the truth or validity of (a statement or fact), an argument, a disagreement between management and employees that leads to industrial action". Disputes are also defined as "any contract question or controversy that must be settled beyond the job site Management. Early settlement of disputes, in pre-construction phase, will reduce/avoid time and monetary loss. Early intervention can limit/reduce occurrence of later disputes.

M. M. Kumaraswamy also reported few types of Disputes viz., "disputes due to Conflicts, disputes due to claims and disputes in construction [5]. Some different types of root causes of claims and disputes were highlighted (viz., unfair risk allocation, lack of professionalism and competence of project participants, uncontrollable external events, client unrealistic time/cost targets, indecisiveness by client, inappropriate contract type, tender pricing faults, adversarial culture). In addition, some immediate causes of disputes were mentioned (viz., weak communication, vested interests, personality conflicts, weak or slow client response, internal disputes, insufficient design documentation, inappropriate contract selected, amplified claims, changes by client, estimation error, improper form of contract, insufficient contract administration, design information inaccuracy, incomplete tender information and inappropriate payment modalities).

The authors also presented an inter-relation between various parameters which is reproduced as shown below:

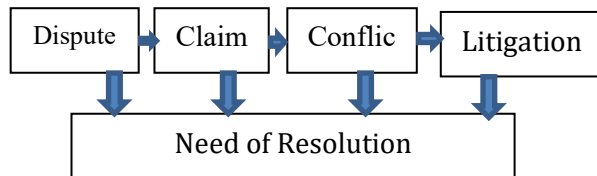


Fig. 1 Inter-relation between Various Parameters

In addition, A. Al-Keim identified 09 key issues of disputes (viz., scope variations, contractual clause interpretation, extension of time claims, site conditions, obtaining approvals, access to the site, design quality, late or incomplete information, and resource availability) [6].

A. H. L. Tajul and M. Sutrisna indicated that the main causes of disputes may be due to non-completion, poor workmanship, EOT and loss and expense, lack of a proper contractual relationship, contract termination, design changes, work variation, construction manager employment issues, document clarifications, defects liability liquidated ascertained damages, and payment [7]. The researchers classified dispute causes into seven categories based on their source or origin. These categories were related to the owner, the contractor, the design, the contract, human behaviour, the project, and external factors.

S. O. Cheung and K. H. Y. Pang [8] explained major two types of disputes (viz., contractual and speculative). They identified related parameters (viz., Task factors such as risk and uncertainty, collaborative conflict; contract incompleteness like ambiguity, deficiency, inconsistency and defectiveness; people factor such as affective conflict and opportunistic behaviour) [8].

Nishith Desai [9] and Lee et al. [13] studied common causes of construction disputes may come from the stage of contract formation which tends to legal conflicts. Also there may be misinterpretations of documents leading to tender and contract related fraud. There may arise disputes due to bank guarantees, as well. Once disputes arise there may be risk allocation and calculation of relief to the affected parties.

Lee et al. [13] reported that disputes arise when there is any violation of contractual issues incorporated during its document formation but not complied. In addition, Durand A. (2019) has studied that construction disputes do arise due to varying interest of the people coming from different cultural groups. This issues do affect project cost, time and quality as well as material procurement from various sources and industry partners.

Fadhlullah et al. [11] have reported that there is upsurge of construction disputes which require timely resolution

without any delay, which in turn may affect adversely to the project completion time. Hence, they suggested a fast track arbitration method.

Also, Nguyen et al. [12] have discussed construction disputes frequently arising in case of small and medium size construction enterprises. This way misunderstanding grow between the associated parties, which they attributed to reluctance to work, poor team work and diversity of working style.

III. METHODOLOGY

It has been learnt from literature [1-9] that it is essential to conduct Real time survey & data collection of the ongoing construction project management practices and common disputes of the client, designer, constructor, staff & working personnel, resource materials suppliers, and the cost associated. This may need to prepare a set of questionnaire for each party associated with the construction project at any site. Also, need may arise to carry out Survey & Data Collection about the ongoing contract method, and prevailing dispute resolution method in construction projects [7-13]. At last, most demanding would be to analyze of the survey data and preparation of summary sheet/graphical model in line with the Literature Review done in advance, as presented in above section of this manuscript.

Set of Questionnaire

Based on the issues addressed in the mentioned literatures, carrying out survey for data collection about the prevailing status of construction project at any point of time, various sets of questionnaire have been thought, as detailed below:

First set of question and responses (as Yes or No to each question) will provide clients basic knowledge about the construction project like:

1. Have you checked the land detail and got satisfied about its legal credentials:
2. Are you satisfied with the proposed project plan and design
3. Do you know area detail for which you will be charged a cost
4. Have you seen approved map of the project from the local authority
5. Are you informed about construction work time schedule for foundation



6. Have you visited the construction site and got satisfied about the quality of work

7. Are you receiving timely update about the progress of work of each stage (like plinth/brick work/RCC column/lintel/ceiling/staircase room/window frame/door frame/RCC roof slab casting/plastering/flooring/finishing/electrical wiring/plumbing etc.

8. Have you submitted your input/ suggestion to any stage work or quality

9. Have you got answer of the builder/ constructor to your input/suggestion

10. Are you satisfied with the services given by the constructor/ builder

11. Have you received the assured detail of the building project as per plan design of the project

12. To you have anything incomplete in the project under your ownership

13. Is anything missing in the project which cause your dissatisfaction

14. Is any quality issue after construction under your possession

Second type of questions will be asked to the working personnel at the construction sites:

1. Are you aware about the rate of your service on daily basis

2. Are you paid your wage amount on time

3. Is any amount remaining unpaid to you by the constructor

4. Are you satisfied with the security aspects at the site

5. Are you provided first aid service in case of injury during work at the site

6. Are you happy with the behavior of the constructor team

7. Are you getting life insurance facility

8. Are you getting any bonus for appreciation to your continuous work at the site

9. Are your satisfied with your work at the site

10. Is there any violation of rule by anyone at the site

11. Are you using content and quality of material as per design drawing

12. Are you completing the construction work on time as per schedule

13. Is any dispute at the site which causes delay in work progress

Third set of questions may be asked to the material suppliers associated with the site work:

1. Are you supplying material at the site with any written order from the constructor

2. Are you bringing good quality material

3. Are you paid for the supplied material on time

4. Do you supply material quantity as per order

5. Do you have any pending claim of material cost

Fourth set of questions may be asked to the constructor/ builder team:

1. Have you checked land detail as per local record of the concerned department

2. Have you got land soil testing done from expert engineering firm or authorized persons

3. Have you prepared project plan and per client input/ suggestions/ requirement

4. Are your plan, design etc. liked by the client/ customer who purchase the project part or whole

5. Have you informed each client associated with the project before implementation in the work

6. Have you published plan design after approval of the local authority

7. Have you intimated the client at each stage of work to get a site visit or give input

8. Have you maintained material quality standards

9. Do you follow IS Codes and govt. norms prescribed for construction project

10. Do you have any software to act as an interface between the associated party

11. Have you taken written consent of the client for their part in the project

12. Is any dispute of the constructor with any one unresolved

13. Is each stage of the project progressing on time

14. Is qualified engineer visit and check construction work at the site



15. Are you taking written recommendation of the authorized engineer to start new stage ahead
16. Are you taking material testing done before use in the project and certified quality part
16. Are you meeting time schedule of construction
17. Did your project complete on time
18. Is any delay in completion of work
19. Is any dispute of the constructor with anyone associated with the project
20. Is cost of the project under control as estimated
21. Have you published contract and tender document in written form
22. Have you briefed your client about the process of the contract & tender with specifications
23. Have you taken consent of the client as NOC to move ahead
24. Have you taken materials quality certified by the suppliers

Digital Solution Model Proposed

Based on the data collection under each question asked to each one as mentioned above, for each negative response that reveal some dissatisfaction may be automatically passed on through a web based software to the responsible member of the constructor team for necessary changes and correction. This process of data collection and information sharing may be frequently at each stage of construction and activity start and end time. In order to ensure a real time information and input sharing, each party involved (viz., each one of the Clients, Workers, suppliers and constructor team members will register on the software with password protection and OTP verification through mobile No. or Email ID. This would ascertain maximum transparency of the work flow and progress as well as will gather every one's suggestions, inputs and grievances without any loss of time. The interface flow of information from one to another may smoothen the construction process and minimize disputes and hence support timely project completion with maximum quality commitment during the construction period. The proposed process (i.e. to provide a digital solution for disputes reduction) is reproduced graphically as presented below:

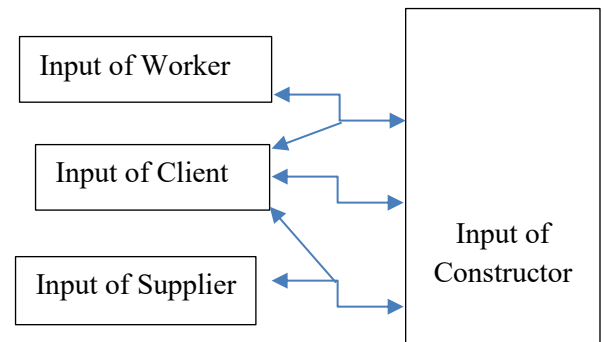


Fig. 2 Survey data collection through questionnaire and response/ input sharing sequence through a software

IV. RESULTS AND DISCUSSION

It can be observed from the literature review reporting and Fig. 1 that construction disputes emerge to create new claims, which if not addressed may cause conflict and litigations. In order to reduce them, it is pertinent to reduce root cause of dispute appearance during the construction period from the first activity to the last activity. With this perception, as Fig. 2 describes some working sequence of a proposed software i.e. a digital solution may become a convenient tool to facilitate instant messaging about construction work development at each stage and work activity both at the time of starting event to end event to each stake holder of the project. Such interface is found non-available in private sector housing which perform majority of construction. This may ensure transparency resulting into dispute reduction, which may avoid unnecessary project delay, quality commitment and less chances of cost escalation. As seen in Fig. 2, transfer of input/response of each one (viz. client, worker and suppliers) to the constructor will activate the project constructor to respond to each negative response. The inputs of the worker and suppliers will pass on to the client also along with the constructor, which will create another monitoring of the project at each stage by them. This way every one may get cautious and additional motivation to act without any delay, which finally ensure project quality and timely completion.

V. CONCLUSION

It can be concluded that disputes rise in construction projects and there are several root causes of disputes. In order to ensure dispute reduction, a digital solution as an interface through a web based software may facilitate timely sharing of information of each stage construction development by carrying out survey and data collection through set of questionnaire for associated each of the clients, workers, suppliers and the constructor members.



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