

CITY UNIVERSITY OF HONG KONG
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ANATOMY OF CONSTRUCTION
DISPUTES
解構建築糾紛

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Abstract

Construction projects are often delivered under a complex and uncertain environment, with claims being an inevitable part. Construction disputes materialise if construction claims are not settled in an effective, economical and timely manner. However, resolving disputes can be expensive and time consuming. Therefore, it is pertinent to study the causes, sources, characteristics and manifestations of construction disputes. Although prevention is better than cure, the understanding of the characteristics of disputes alone will not reveal the root causes of such construction disputes. Therefore, this study aims to examine construction disputes by conceptualising the contributors to the dispute. By examining their likelihood of occurrence, the causes of construction disputes can also be assessed. Sectoral differences arising from the different nature of works are examined. In this research, an automated evaluation system for predicting the likelihood of the occurrence of construction disputes was developed for data collection. The automated system assists project managers to instantly identify the dispute manifestation.

While technical problems of construction are complex, they are usually manageable. However, disputes are different as they involve contractual ramifications and human factors. In this study, artifacts of construction dispute are grouped into task factors, contract incompleteness and human factors. Task factors are those directly affected by high uncertainty and the non-performance of project team members. Contract incompleteness arises due to unforeseeable contingencies and the complexity of construction. Human factors are influenced by behavioural habits and the psychological distress of human beings. This conceptualization enables the identification of critical components of construction disputes.

A detailed review of previous research on construction disputes and a pilot study consisting of 24 construction professionals were conducted to long-list the principal artifacts of dispute manifestation. The proposed anatomy of construction disputes assists the categorization of the types of construction disputes. A panel of construction professionals was asked to comment on the proposed categorization and the artifacts of dispute manifestation. The results obtained from the pilot study supported that the three categories of task factors, contract incompleteness and human factors as the key ingredients of construction disputes.

Based on the anatomy of construction disputes, the fuzzy sets approach was integrated with probability theory and employed to construct a fuzzy fault tree model for construction disputes. In addition, previous studies and applications of fault tree assessment were reviewed. In a fault tree model, the interrelationships among the artifacts of construction disputes are represented by logic gates. The proposed fault tree model of construction dispute was piloted with a panel of construction professionals. As a result, a refined list of artifacts was used to construct a fuzzy fault tree model for construction disputes. The tree-levels and basic faults in the fault tree model are developed according to the consolidation of experts' opinions to enhance the authenticity of the fuzzy fault tree model. Construction disputes, which are the top event in the fuzzy fault tree model, can be subdivided into contractual disputes and speculative disputes. The listed artifacts are confirmed as the basic faults of construction disputes, being the second sub-level of the fuzzy fault tree model.

The fuzzy fault tree approach allows for the analytical assessment of the occurrence likelihood of construction disputes. In addition, the fault tree model facilitates devising

an empirical study of construction disputes occurrence. In order to determine an effective method for immediately obtaining the results of the occurrence likelihood of construction disputes, the refined model is used to develop a web-based evaluation system. The web-based assessment automatically evaluates the occurrence likelihood of construction disputes from the input of participants. As such, project managers can thus identify the manifestation of the dispute, continuously monitor project performance and highlight the behavioural and psychological profiles of the project team members.

The results obtained from the empirical study indicate that contractual disputes have a similar severity to speculative disputes. In addition, the proposed ingredients of construction disputes, including task factors, contract incompleteness and human factors, are present in all construction projects.

Contract incompleteness is found to be the most serious problem in construction projects. Ambiguities, deficiencies and inconsistencies in contractual documents illustrate the incompleteness of construction contracts. The results indicated that contractual disputes mostly arise due to insufficient details, contradictory information and inconsistent details in drawings. Human factors are also considered as another problem in contractual disputes. During the construction process, consultants often fail to provide information in a timely manner. In addition, clients' unreasonable requests often trigger compensation claims.

Human factors are also identified as an underlying motive of speculative disputes. The findings confirmed that the probabilities of speculative disputes are dynamically associated with the behavioural attitudes of project team members. Opportunistic

behaviour is found to be significant in the construction industry. Clients typically reject outright extension of time and monetary claims submitted by contractors. Likewise, contractors often inflate claims. The results indicated that the occurrence likelihood of speculative disputes increases due to either structural problems of construction contracts or the non-performance of contracting parties. In practice, it is common for arguments over issues arising from contract incompleteness and incompatibilities during co-ordination would cause adversarial attitudes to arise among project team members.

Due to the unique particulars of individual construction projects, the occurrence likelihood of contractual disputes and speculative disputes differ. The anatomy of construction disputes assists construction participants to conceptualize the development of disputes in their particular project. The results of this study successfully illustrated the interrelationship among dispute components. The fault tree model enabled an empirical evaluation of occurrence likelihood of construction disputes.

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