
Risk factors affecting conflict management for construction government project in Thailand

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Abstract.

Risk management has been widely used in project management to reduce the delay of projects or the loss from a granted budget. However, conflict is one of many causes which increases risk, affect timeline and budget of the project. Therefore, this research study aims to study the important risks which should be handled at most. The study tool was a questionnaire and the data were collected from 454 government projects which all project officer responded 100%. The data had taken into qualitative risk analysis and the results had found that there were 12 risk factors of conflict which affected cost management of the project, and also 8 risk factors of conflict which affected time management of the project.

Keywords. -

1. INTRODUCTION

Conflict and defectiveness in construction industry are unavoidable. They could happen in different procedures in construction works [1]. In addition, the conflict will affect time and cost of the project [1- 4]. Further, the construction project has lost 32.2 million US dollars in finance division also wasted time of resolving disputes 13 months in average [5].

A construction project has a clear scope of operations as the agreement and conditions of stakeholders [1-4]. The success of a construction project consists of project cost management, project time management, and project quality management [6]. Additionally, one of the knowledges applied in construction management for an effective and successful

project is risk analysis, which affects time and cost of the project. Moreover, a conflict of a project is also considered as a risk. The tool which is used to handle with construction project conflict could analyze the risk. Thus, this research study would present qualitative risk analysis [7] to find factors of conflict which affect time and cost of a project and to increase efficiency of conflict management.

2. LITERATURE REVIEW

The successful conflict management is to understand the different aspects of conflicts includes how the conflicts happen. Conflicts can be classified as follows; 1) Intrapersonal Conflict, 2) Interpersonal Conflict, 3) Intragroup Conflict [9]. According to the related studies, factors of conflicts could be summarized as in picture number 1.

Table 1 Summary of factors of construction conflict

Factors of Conflict Which Lead to Disputes	Related Studies (Key Support)
1.Conflicts Which Affect the Time	
1.1 Authority of the project owner [1,3,10-12]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), H. J. Thamhain and D. L. Wilemon. (1975), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Acharya, N. K., Dai Lee, Y., & Kim, J. K. (2006), Yates, J. K., & Epstein, A. (2006)
1.2 An unclear scope of project [1,3,11,12]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006)
1.3 Site condition [1- 3,13-15]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), San Loke, Y. (2013), Khahro, S. H., & Ali, T. H. (2014), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Acharya, N. K., Dai Lee, Y., & Kim, J. K. (2006), Yates, J. K., & Epstein, A. (2006), Zidane, Y., & Andersen, B. (2018)
1.4 Neglect or negative attitude of the project's members [2,11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)

Table 1 Continued

Factors of Conflict Which Lead to Disputes	Related Studies (Key Support)
1.5 Deviation of the project's documents [3,11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
1.6 Conflict of the locals [3,11,16]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Maemura, Y., Kim, E., & Ozawa, K. (2018)
1.7 Confused desire of the project owner [3,11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
1.8 A change of work [2-3,11-12,14-15]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), San Loke, Y. (2013), Khahro, S. H., & Ali, T. H. (2014), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Acharya, N. K., Dai Lee, Y., & Kim, J. K. (2006), Yates, J. K., & Epstein, A. (2006), , Zidane, Y., & Andersen, B. (2018)
1.9 Late attendance [1-3,11-12]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), San Loke, Y. (2013), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006)
1.10 Narrow construction site [1,3,11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
1.11 Shortage of materials [3,11-12]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006), Zidane, Y., & Andersen, B. (2018)
1.12 Late decision making of the project owner [1,3,11-12,14,16]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), , H. J. Thamhain and D. L. Wilemon. (1975), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Acharya, N. K., Dai Lee, Y., & Kim, J. K. (2006), Maemura, Y., Kim, E., & Ozawa, K. (2018), Yates, J. K., & Epstein, A. (2006), Zidane, Y., & Andersen, B. (2018)
1.13 The delay of delivering construction site to a contractor [3,11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)

Table 1 Continued

Factors of Conflict Which Lead to Disputes	Related Studies (Key Support)
1.14 Shortage of machines [3,11-12,14]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006), Zidane, Y., & Andersen, B. (2018)
1.15 The delay of contractor's work [3,11-12]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006)
1.16 A contractor with work inefficiency [1,3]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), , Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006), Zidane, Y., & Andersen, B. (2018)
1.17 A subcontractor with work inefficiency [1,3]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), , Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006), Zidane, Y., & Andersen, B. (2018)
1.18 Strikes of workers [3,11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
1.19 Natural disaster [3,11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
1.20 The delays of other parties involved in the project [1,3,10-11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), , H. J. Thamhain and D. L. Wilemon. (1975), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
1.21 The lack of Communication [1,3,11,13-14,17]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), Khahro, S. H., & Ali, T. H. (2014), Huo, X., Zhang, L., & Guo, H. (2016), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Zidane, Y., & Andersen, B. (2018)
1.22 An accident in the project [3,11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)

Table 1 Continued

Factors of Conflict Which Lead to Disputes	Related Studies (Key Support)
1.23 Shortage of manpower [1-3,10-13]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), , San Loke, Y. (2013), Khahro, S. H., & Ali, T. H. (2014), H. J. Thamhain and D. L. Wilemon. (1975), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006)
1.24 Too many numbers of other participants involved in the project [3,11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
1.25 The involved participants lack of management and supervision the project [3,11]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
1.26 Precipitation or suspension of work [3,10-11,17]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Huo, X., Zhang, L., & Guo, H. (2016), H. J. Thamhain and D. L. Wilemon. (1975), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
2. Conflicts Which Affect the Cost Factors of Conflict Which Lead to Disputes	Related Studies (Key Support)
2.1 A contractor with work inefficiency [1,3]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), , Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006), Zidane, Y., & Andersen, B. (2018)
2.2 A subcontractor with work inefficiency [1,3,12,14]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), , Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006), Zidane, Y., & Andersen, B. (2018)
2.3 A change of work [1-3,11-14]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), , San Loke, Y. (2013), Khahro, S. H., & Ali, T. H. (2014), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Acharya, N. K., Dai Lee, Y., & Kim, J. K. (2006), Yates, J. K., & Epstein, A. (2006), , Zidane, Y., & Andersen, B. (2018)

Table 1 Continued

Factors of Conflict Which Lead to Disputes	Related Studies (Key Support)
2.4 Work does not meet the requirements [1-3]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), , San Loke, Y. (2013), Khahro, S. H., & Ali, T. H. (2014), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
2.5 The involved participants lack of management and supervision the project [2-3,11,13-14]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), San Loke, Y. (2013), Khahro, S. H., & Ali, T. H. (2014), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Zidane, Y., & Andersen, B. (2018)
2.6 Defectiveness of work [2-3,14-15]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), , San Loke, Y. (2013), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Yates, J. K., & Epstein, A. (2006), Zidane, Y., & Andersen, B. (2018)
2.7 Precipitation or suspension of work [3,10,11,17]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Huo, X., Zhang, L., & Guo, H. (2016), H. J. Thamhain and D. L. Wilemon. (1975), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006)
2.8 A change of work [2-3,11-12,14-15]	Jaffar, N., Tharim, A. A., & Shuib, M. N. (2011), Pétursson, B. K. (2015), , San Loke, Y. (2013), Khahro, S. H., & Ali, T. H. (2014), Acharya, N. K., Dai Lee, Y., & Man Im, H. (2006), Acharya, N. K., Dai Lee, Y., & Kim, J. K. (2006), Yates, J. K., & Epstein, A. (2006), , Zidane, Y., & Andersen, B. (2018)

3. RESEARCH METHODOLOGY

Population in the study were 454 construction government projects which were supervised in all kind [18]. And data had been collected from those 454 construction projects. In addition, the representatives from each project were the engineers who experienced government construction management. Data collection had been done with questionnaire which were separated into 2 parts; (1) general information of a participant and (2) issues of contract conditions for a creator and a construction supervisor, the questions used were rating scale questions with 5 levels. The mentioned questionnaire had passed the quality inspection for research tools with Index of Item-Objective Congruence (IOC) by 3 experts [19-20]. Furthermore, the questionnaire was tested to find its reliability, which Cronbach's Alpha accounted for 0.967. After that, the questionnaire was sent to the population which they have the period of one month to respond, and the population responded at 100%.

Data analysis part was separated into 2 parts; (1) general information of a participant, this part was analyzed by statistics: frequency and percentage and (2) Qualitative risk analysis, which was done by taking chance of conflict score, cost, time and quality impact scores and calculating with Probability and Impact Matrix as shown in a picture no. 1 [4].

Probability and Impact Matrix

Probability	Threats				
0.90 Very High	0.05	0.09	0.18	0.36	0.72
0.70 High	0.04	0.07	0.14	0.28	0.56
0.50 Moderate	0.03	0.05	0.10	0.20	0.40
0.30 Low	0.02	0.01	0.06	0.12	0.24
0.10 Very Low	0.01	0.10	0.02	0.04	0.08
	0.05 Very Low	0.10 Low	0.20 Moderate	0.40 High	0.80 Very High
Impact (numerical scale) on an objective (e.g., cost, time, scope or quality)					
Impact thresholds are established according to organizational risk tolerances.					
Note: numerical precision is NOT intended ; these scores simply provide a means of relative comparison.					

Figure 1 Probability and Impact Matrix Risk [4].

4. CONCLUSION AND DISCUSSION

The results had found that there were 62 administrators who administrated 454 construction projects under government agencies in Thailand. In addition, those projects were many types including building constructions, highway construction, bridge construction, square pipe construction, and irrigation construction. More than a half of the projects, projects values were less than 50 million.

4.1. Result of Qualitative Risk Data Analysis

The results had found that risk factors of conflict affecting cost of the project at most was a subcontractor with work inefficiency, which its risk score made up for 6.46. The study showed that an inefficiency subcontractor came from ineffective selection by the main contractor or the financial conflict between the main contractor and the subcontractor [21]. The following risk factor of conflict was the delay of contractor's work which its risk score made up for 6.08. From the study, the delay of work affecting cost of the project was from the dispute of the project's owner as followed; 1. The delay of the owner's payment, 2. No compensation for a change from the owner, 3. The owner's standard of payment. Those conflicts affected the delay of projects and the expensive costs [22]. And the last one was a contractor with work inefficiency, which its risk score made up for 5.94. Risk factors of a contractor could be divided into 4 categories: 1. Social Politic, 2. Government Regulation, 3. Natural Disaster, and 4. Monetary. Further, the risk factors affecting cost of the project the most was the increased gas price and economic crisis [23]. The data showed in table 2 and picture number 2 in cost part.

However, the risk factors of conflict affecting the delay of payment was separated as followed: 1. Lack of Funds, 2. Poor Financial Projection on the Client Side, 3. Inadequate Contract Provision for Enforcement of Timely Payment, 4. Delay Originating from Evaluation Process of the Contractors by the Consultants. Those affected cost project management [24].

The result had found that risk factors affecting conflict of time of the project at most was a subcontractor with work inefficiency, which its risk score made up for 6.52. The subcontractor was selected inefficiently [21], which mostly because of the main contractor's administration. In addition, it had not only affect the main contractor [21], but also all stakeholders of the project [4]. The following risk factor of conflict was a contractor with work inefficiency, which its risk score made up for 5.89. From the research study, it showed that a contractor with work inefficiency would extend the period of time and cause conflict in a contract if the contract had unclear indication of the penalty and fines in case of the delay of construction [25]. And the third one was a change of work, which its risk score accounted for 5.24. Additionally, it had found from the study that the incomplete construction drafting affected the delay of construction project and additional cost continuously [22-23]. It caused a mistaken draft and incorrect cost [24] which might come from the unclear contract between partners [26] respectively. The data showed in the table 2 and picture number 3 in time part

On the other side, it had mentioned that the delay from the conflicts could be managed correctly if there was a proper solution [27]. There were steps and procedures of conflicts management as followed; 1. Withdrawing or Avoiding, 2. Smoothing or Accommodating, 3. Compromising or Reconcile and 4. Forcing or Directing [4,8].

Table 2 The result of data analysis of risk factors affecting conflict of cost and time of a project.

Factor	Description	Opportunity	Impact	Risk scoring
The risk factors affecting conflict of cost for a project.				
Cost 1	A subcontractor with work inefficiency	2.52	2.57	6.46
Cost 2	The delay of contractor's work	2.36	2.57	6.08
Cost 3	A contractor with work inefficiency	2.41	2.47	5.94
Cost 4	A change or work	2.26	2.40	5.41
Cost 5	A fine for contract cancellation	2.24	2.37	5.30
Cost 6	Precipitation or suspension of work	2.36	2.22	5.24
Cost 7	The request for extending construction period of time	2.37	2.17	5.16
Cost 8	Error cost estimation	2.27	2.26	5.14
Cost 9	No payment for a contractor or a subcontractor	2.23	2.27	5.06
Cost 10	An error drafting	2.09	2.37	4.95
Cost 11	The failure of the owner's money management	2.06	2.20	4.53
Cost 12	Work does not meet the requirements	2.03	2.22	4.50
The risk factors affecting conflict of time for a project.				
Time 1	A subcontractor with work inefficiency	2.61	2.50	6.52
Time 2	A contractor with work inefficiency	2.39	2.46	5.89
Time 3	A change or work	2.24	2.34	5.24
Time 4	Work does not meet the requirements	2.27	2.25	5.12
Time 5	The involved participants lack of management and supervision the project	2.17	2.23	4.84
Time 6	Defective work	2.19	2.18	4.77
Time 7	Precipitation or suspension of work	2.16	2.18	4.70
Time 8	Quality of construction materials or machines	2.13	2.20	4.68

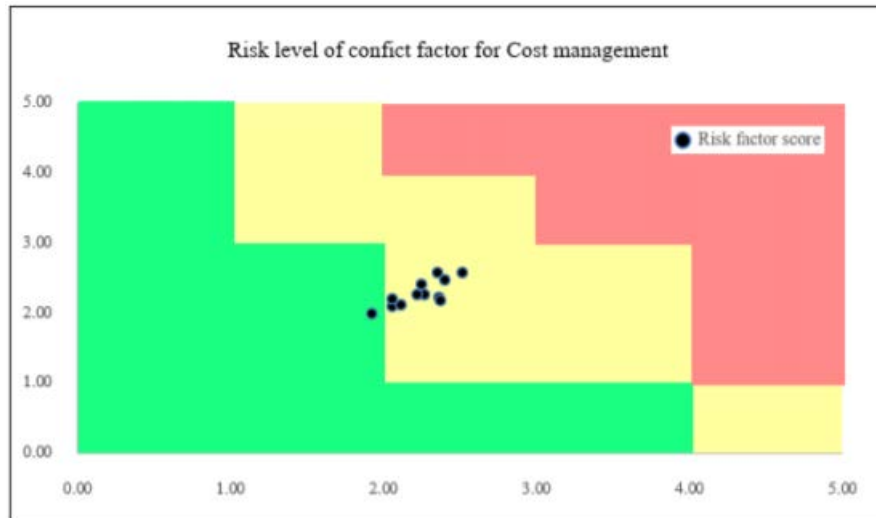


Figure 2 Risk factors of conflict affecting cost of construction government projects.

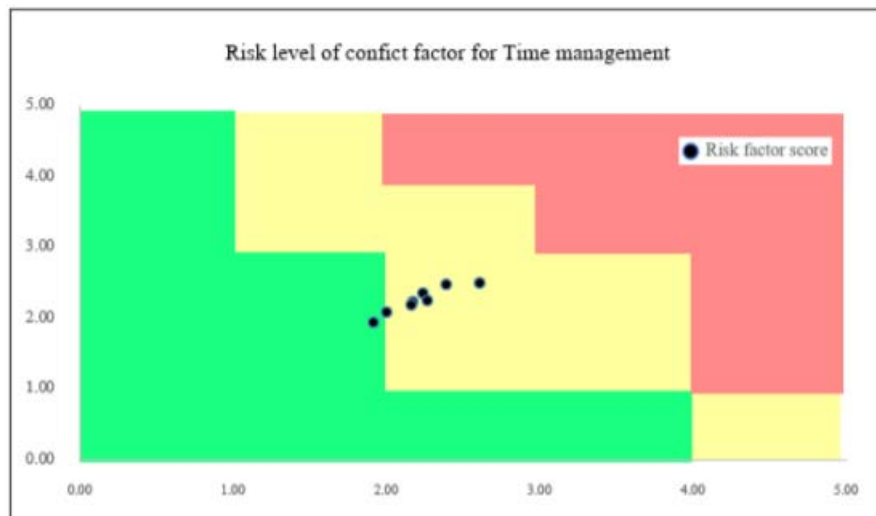


Figure 3 Risk factors of conflict affecting time of construction government projects.

5. CONCLUSION

From the scores of risk factors affecting conflict of government constructions in Thailand, it is found that the factors of conflict in cost management, which is at the highest risk, consist of a subcontractor with work inefficiency respectively. Moving on for the factors of conflict in time management, the highest risk factors of conflicts consist of a

subcontractor with work inefficiency, a contractor with work inefficiency, and a change of work respectively. Those factors affect directly to the cost and time of the government construction projects.

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