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Factors causing delay in payment of residential building projects in Thailand

By

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Motivation

The financial crisis in 2008 and oil crisis impact to construction industry which caused delays, disputes and cost overruns among construction practitioners (owner, consultant and main contractor).

Consequently, the success of project is delayed and main contractor faced difficulties in **making payment** to their sub-contractors. Therefore, it is interested to appraisal and evaluation the delay in payment impact to success of the construction project.

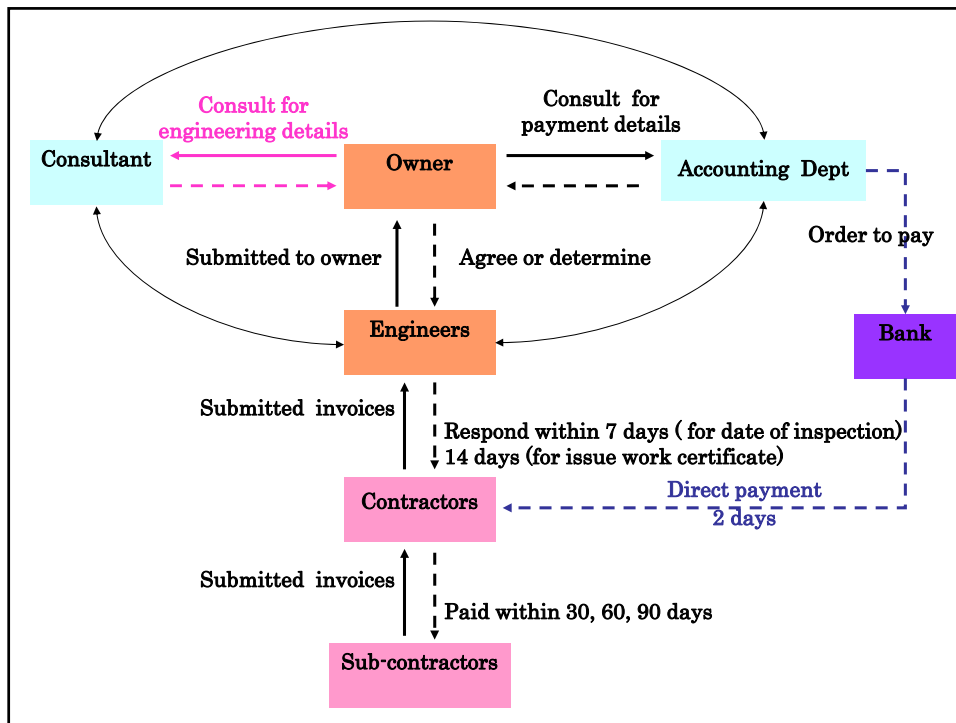
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Objective

The objective of this study is to **determine the main causes of delay in payment** for residential building projects in Bangkok, Thailand.

This paper identified and examined the causes of delay in payment on the residential building projects which were the period after awarded of the contract and the actual construction was carry on.

The realities and difficulties in making payment



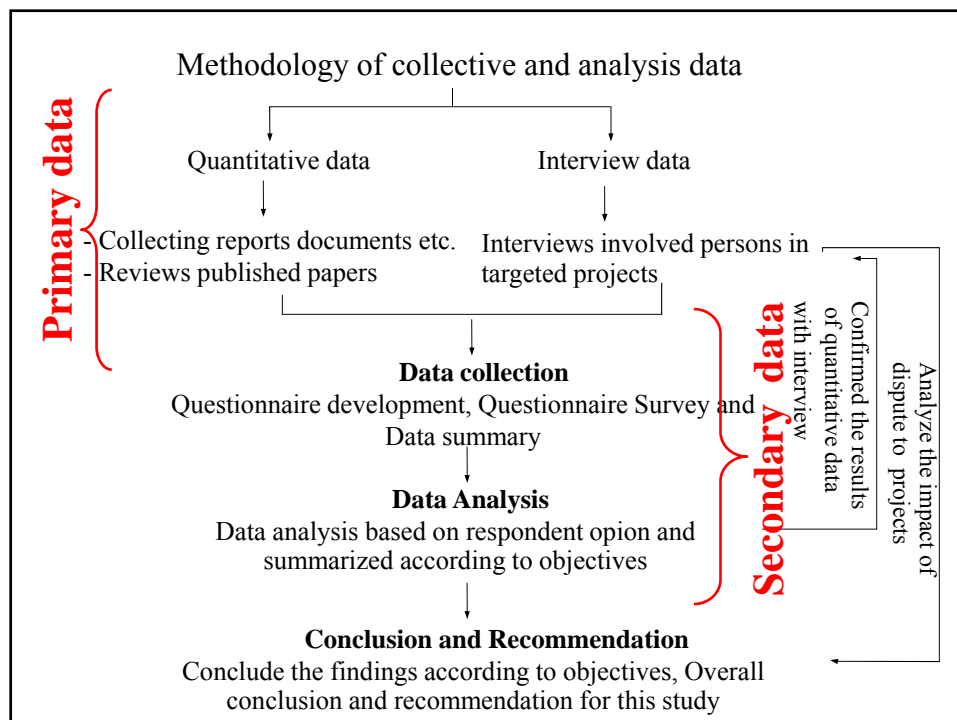
The payment procedure in Thailand (regulated)

Type of payment	Inspection stage	Payment stage	Total
Government			
Local currency	15	30	45
Foreign currency	15	40	60
Quasi-government			
Local currency	15	30	45
Foreign currency	15	45	60
Foreign loans			
Reimbursement	15	30	45
Commitment	15	45	60
Direct payment	15	15	30
Private			
Direct payment	15	30	45
Cheque	15	30	45

Methodology of research

The first stage consisted of literature review on the causes of delay from documents, reports, rules and regulations, guidelines and procedure prepared by the government institutions/agencies and the consultants. Non-structured interviews of 25 key players involved in the implementation process.

The second stage involved the development of questionnaire incorporating with 24 causes of delay in payment and data collection. The questionnaire comprised open-ended and closed-ended questions. A hand-delivered questionnaire method was used.



Based on the response to the survey, a severity index was calculated to interpret the degree of seriousness effect of those problems. This index was calculated as follows (Dominowski, 1980)

$$\text{Severity index } (I) = \frac{(\sum_{i=0}^4 (a_i)(x_i))}{(4\sum x_i)} \times 100\% \quad (1)$$

where

a_i = constant expressing weight given to i th response: $i = 0, 1, 2, 3, 4$

x_i = variable expressing frequency of I

The response for $I = 0, 1, 2, 3, 4$ illustrated as follows:

x_0 = frequency of very often response and corresponds to $a_1 = 4$;

x_1 = frequency of often response and corresponds to $a_2 = 3$;

x_2 = frequency of moderate response and corresponds to $a_3 = 2$;

x_3 = frequency of not often response and corresponds to $a_4 = 1$;

x_4 = frequency of seldom response and corresponds to $a_5 = 0$;

Equation (1) was used to calculate the severity index for all delay in payment factors. The index was ranked and categorised into five levels.

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Level 1: 0-15.5% is categorised as none severe;

Level 2: 15.5-38.5% is categorised as fairly severe;

Level 3: 38.5-63.5% is categorised as moderately severe;

Level 4: 63.5-88.5% is categorised as severe;

Level 5: 88.5-100% is categorised as most severe.

Rank agreement

The spearman's rank correlation, coefficient, r_s was used to measure the degree of agreement in the ranking of owners consultants and main contractors. The coefficient can be computed as follows (Dowdy, S & Wearden. S, 1985):

$$r_s = [1 - 6\sum d^2] / [N(N^2 - 1)] \quad (2)$$

r_s = Spearman's rank correlation coefficient.

d = The difference in ranking between the owner, consultant and main contractor

N = The number of variables, equals to 24 and 4 for all the delay factor and for the main categories of delay in payment, respectively.

Results

Organization	Number of questionnaires		Percentage return
	Sent	Filled	
Contractor (Domestic)	52	30	58
Contractor (International)	65	47	72
Consultant	65	46	70
Total	172	123	67

23 interviewees

Classification	No. of projects
High-rise building	50
Low-rise building (less than 6 storied building)	62
Total	112

Factors	Owner	Consultant	Main contractor	Overall rank
	SI (%)	SI (%)	SI(%)	
Technical and inspection category	61.8	64.0	62.2	1
Adverse weather conditions	61.1	68.4	66.5	11
Unforeseen problem underground	45.8	46.4	45.8	20
Delay in work approval	65.8	71.7	71.5	2
Delays in inspection and testing works	63.0	66.0	68.8	10
Ground problems	60.6	59.4	59.4	18
Substandard workmanship	63.2	70.0	70.5	5
Supervisor incompetence	70.5	70.5	59.2	6
Poor instructions	64.1	59.9	55.9	17

Factors	Owner	Consultant	Main contractor	Overall rank
	SI (%)	SI (%)	SI(%)	
Administration category	59.5	63.1	64.1	2
Insufficient working drawing details	62.0	71.0	66.8	7
Inaccurate bill of quantities	67.4	69.4	69.4	4
Violating condition of the contract	60.2	68.9	68.6	10
Poorly done planning and scheduling	63.9	63.9	63.7	14
Change orders	58.0	59.2	67.9	15
Verification submitted documents	60.8	65.3	66.0	13
Government/local rules and procedures	44.3	44.3	46.5	21

Factors	Owner	Consultant	Main contractor	Overall rank
	SI (%)	SI (%)	SI(%)	
Others common category	58.5	60.7	59.2	3
Slow in making decision from owner	60.9	66.8	70.7	8
Major accidents	71.4	71.4	64.4	3
Third party delays	41.1	45.8	41.0	22
Social events	60.4	58.7	60.9	17

Factors	Owner	Consultant	Main contractor	Overall rank
	SI (%)	SI (%)	SI(%)	
Financial category	52.1	51.3	46.0	4
Banks procedure	54.3	54.0	40.6	19
Owner financial problems	72.4	73.8	73.1	1
Exchange rate	35.8	31.3	28.6	23
Inflation	34.2	30.6	24.5	24
Fluctuation in materials cost and labor	63.7	66.7	63.0	12

Table 4. Comparison spearman rank correlation

Correlation	Spearman rank correlation coefficient	
	Main delay categories	All delay factors
Owners-Main contractors	0.8	0.85
Main contractors-Consultants	0.8	0.79
Owners-Consultants	1	0.61

Findings

- The five highest severity index factors agreed by owners, consultants and main contractors
- The owner's perspective was owner financial problems, unexpected social events, supervisor incompetence, inaccurate bill of quantities and delay in work approval.
- Whereas, consultant's perspective was owner financial problems, delay in work approval, unexpected social events, insufficient working drawing details and supervisor incompetence.
- And, main contractors's point of view on cause of delay in payment were owner financial problems, delay in work approval, slow in making decision from owner, substandard working manship and inaccurate bill of quantities.

Conclusions

- This study had classified four main categories which were administration, financial, technical and inspection and other common. And also identified twenty-four causes of delay in payment factors.
- The result showed that main contractors faced moderately severe impact from four main categories of delaying in payment.
- All the three groups of respondents generally agreed that the top five causes of delay in payment factors arranged in descending order of severity were owner financial problems, delay in work approval, major accidents, inaccurate bill of quantities and substandard workmanship.
- However, accumulated conflict and dispute experiences between owners of the projects and their main contractors lead to a tendency of resulting in construction delays and cost overruns. Therefore, main contractors had usually been disqualified and replaced.

Recommendations

1. In order to minimise the delay in payment risks and burden costs of delay in payment impact, owner should also open-minded on introducing other type of contracts such as target cost contract, cost-plus-incentive-fee contract and construction management.
2. Including, promoting and providing incentives to construction practitioners should be transplanted and faired if project can be early completed.

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Thank you

