

# Final Account Preparation in Construction Industry: Competencies and Challenges of Quantity Surveyors

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## ABSTRACT

*Final account in a construction project is prepared to show the final cost of the project that has been completed by a contractor. Preparation of the final account involves reporting the final cost of construction works, and it is one of the services that must be provided by quantity surveyors. Quantity surveyors display their competencies in preparing a final account by producing the certificate without being disputed and in a timely manner. However, issues and problems usually occur when rolling the final account, often related to quantity surveyors' competencies. This paper aims to study challenges faced and competencies displayed by quantity surveyors in relation to the final account preparation. An extensive literature review of previous research and content analysis of court cases reported in the Malayan Law Journal were conducted to identify challenges and competencies of quantity surveyors in preparing a final account. In addition, a questionnaire survey was conducted among quantity surveyors to elicit their agreement on the issues and required competencies during the final account preparation. Three categories of issues pertaining to the final account preparation were observed: contractor-related; management-related; and contractual-related issues. This research also revealed six categories of competencies required in a final account preparation: procurement; quantification and costing; project finance control; contract administration; construction practice; and teamwork. Correlation analysis conducted shows that management related issues are likely to occur due to low competencies displayed by*

*quantity surveyors during the preparation of the final account. This research is expected to provide the knowledge related to the preparation of the final account by quantity surveyors, leading to a more satisfactory construction project deliverance.*

**Keywords:** *Final account; quantity surveyors' competencies*

## **INTRODUCTION**

Final account is the agreed sum to be paid by the employer to the contractor at the end of the contract. It includes all the necessary adjustments that an employer has agreed to pay to the contractor for the work done under the main contract (Curran, 2016). A final account involves any cost stated in the contract, addition or omission due to variation of work, cost imposed during defect liability period, and other related payment as stated in the contract (Ashworth, Hogg, & Higgs, 2013). Final accounts should be prepared immediately after the projects have been completed. However, delay usually occurs during the final account preparation and the process is often neglected because the process is less significant to project management (Zakaria, Ismail, & Yusof, 2014). The process of final account closing involves preparation, submission, and certification. These processes must be in order as well as made in a timely manner to ensure the success of a final account closing (Zakaria et al., 2014). Competencies of a quantity surveyor in preparing the final account are important to prevent any related issues (Zakaria, Ismail, & Yusof, 2013a). A professional quantity surveyor must be trained to supervise and manage a construction project related to the contract administration (Wao, & Flood, 2016). Competency can be described as a performance in different settings with satisfactory outcomes performed under specific skills and standard (Oke, Ogunsemi, & Adeyelu, 2018). This also includes the ability of a person to perform and adhere to the job requirements related to occupational competencies. Therefore, competencies displayed by quantity surveyors during the final account preparation are crucial for the success of the final account preparation (Cunningham, 2017).

## LITERATURE REVIEW

### Issues and Challenges in the Final Account Preparation

Issues arisen during the preparation of the final account happen frequently in construction projects because of one or more parties involved, either client, contractor, or consultant team (Zakaria, Ismail, & Yusof, 2013b). An extensive literature was perused to identify the issues related to the final account preparation. Furthermore, the relevant law cases pertaining to the final account issues reported in the Malayan Law Journal (MLJ) from year 2000 to 2019 were analysed. The issues related to the final account preparation were categorised into three: contractor-related, management-related and contractual-related (Zakaria, Ismail & Yusof, 2013c).

In *Liang Court Wanisara (Sarawak) Sdn Bhd v Mohamed Shookry Abdul Ghani & Ors (2014) 8 MLJ 157*, the issue of the contractor failing to submit required documents in accordance with standard forms of contract, led to the dispute arising. The same issue also arose in *Menta Construction Sdn Bhd v SPM Property & Management Sdn Bhd & Anor (2017) MLJ 526* in which documents that were required for the preparation of final account submission were being delayed. These two cases were related to the contractor-related issues on lateness and incomplete submission of related documents required for the preparation of final account (Zakaria et al., 2013a).

The studies also identified four management-related issues arose during the preparation of the final account. The issues included quantity surveyors' inadequacies of their professional services such as lack of knowledge and confidence (Love, Sing, Ika, & Newton, 2019; Zakaria et al., 2014). In *Ann Joo Integrated Steel Sdn Bhd v Lim Chuan Hock & Sons Sdn Bhd (2017) MLJ 1552*, the issue was on the quantity surveyor's act in failing to conduct routine site valuation while the issue in *Projek Penyelenggaraan Lebuh raya Berhad v Base Specialist Sdn Bhd (2012) MLJU 788*, was on the delayed issuance of the final certificate by the quantity surveyor. These issues were considered as an ethical issue displayed by the quantity surveyors during the final account preparation (Zakaria et al., 2014). In *Tidalmarine Engineering Sdn Bhd v Conlay*

*Construction Sdn Bhd and another appeal (2017) MLJ 738 and CCG Concrete Construction (M) Sdn. Bhd. v Rich Avenue Sdn. Bhd. (2000) MLJ 422*, the issue was on the amount certified by quantity surveyor which was refused by the clients, causing non-payment to the contractor. This shows on clients' lack of knowledge on the quantity surveyors' roles in the final account certification and unawareness of own responsibilities throughout the process of preparing the final account by clients' and consultants' teams (Zakaria et al., 2014).

As for contractual-related issues, they are pertained to dispute on provisional quantities and quantities which require re-measurement (Cunningham, 2017) and those involving insufficient allocation provided for contractual risks, such as fluctuation of market price, material unavailability and work contingencies (Adafin, Rotimi, & Wilkinson, 2018; Offei-Nyako et al., 2016; Zakaria et al., 2013c). In total, there were seven issues and problems faced by quantity surveyors during the preparation of final account.

## **Competencies of Quantity Surveyor in the Final Account Preparation**

Generally, competencies or skills of quantity surveyors are associated with measurement, valuation and cost management (Oke, & Timothy, 2010). Cunningham (2015), highlighted that quantity surveyors are supposed to be capable of controlling the cost and providing advice towards the consultant team to ensure that their design is abided to the targeted cost. Competencies in construction contract practice are also one of the skills required for quantity surveyors in preparing a successful final account (Curran, 2016). RICS (2018), has classified competencies of quantity surveyors into three distinctive categories. These categories are mandatory, core and optional competencies required by quantity surveyors during the preparation of the final account. According to Jaafar, Jalali and Sini (2016), competencies closely associated with the preparation of final account are teamwork, procurement, quantification, project financial control, project evaluation, contract administration and contract practice. The competencies stated are crucial to be displayed when preparing the items included in the final account, including variable costs, contract instructions, variations, losses and expenses, fluctuations and risk allowance (Curran, 2016) as shown in Table 1.

**Table 1: Typical Items in Final Account and Quantity Surveyors' Competencies**

Items in Final Account	Definition	Quantity Surveyors Competencies
<b>Variable Costs</b>	Sum subjected to change either due to the unknown extent of works or specification. It is divided into four main types: provisional sums, approximate quantity, prime cost sums and day work allowance (Curran, 2016).	Teamwork, Procurement, Quantification and Costing of Construction Works, Project Financial Control, Project Evaluation, Contract Administration and Contract Practice
<b>Contract Instructions</b>	Any formal records in written form for change of work are part of the contract instructions and multiple of these documents are included in the final account (Curran, 2016).	
<b>Variations</b>	Works in which the contract specifications or drawings change throughout the construction works (Curran, 2016).	
<b>Loss and Expense</b>	Claims made by a contractor to changes cannot be referred to any clauses available in the condition of contract due to certain entitled circumstances (Yahya, Mohammad, & Musa, 2017).	
<b>Fluctuation</b>	Financial adjustments made to the original contract price to suit the price changes due to changes in market (Curran, 2016).	
<b>Risk Allowance</b>	Any uncertainty costs fall under the category of risk.	

## RESEARCH METHODOLOGY

The primary data for this research were collected by using a quantitative method in the form of questionnaire. Quantitative research method was applied to enable researchers to find out if a phenomenon has or has not happened by testing the existing theoretical knowledge. The questionnaire was pre-tested prior distributing to respondents as to ensure the clarity of its content to facilitate the study purpose. The list of registered quantity

surveyor practice in Malaysia was obtained from the official website of Board of Quantity Surveyors Malaysia (BQSM). The list was then narrowed down to only registered quantity surveyors who were working with consultant quantity surveyor firms. The number was further broken down to only quantity surveyors registered in Sarawak. As the exact number was hard to obtain, the number of registered quantity surveyors working in consultant firms was deduced from the number of Consultant Quantity Surveyor (CQS), Professional Quantity Surveyor (PQS), and Provisional Quantity Surveyor (PVQS) at 100%, 80% and 50% respectively, yielding a total population size of 222. Lastly, a sample size of 72 respondents was determined by using Raosoft Software at 8% margin error and 90% confidence level. Purposive sampling was used in this research by identifying quantity surveyors who were involved in the process of the final account preparation. Only quantity surveyors who had experienced doing the final account preparation were selected to fill in the questionnaire. This was to ensure the reliability of the data because they had the right knowledge and judgement. The completed questionnaires were analysed using SPSS Software to identify the frequency and mean value. It was useful to achieve the research objectives, including ranking the obtained findings. Correlation analysis by using correlation matrix was also conducted by using SPSS to seek for correlation between issues and challenges faced by quantity surveyors during the final account preparation and quantity surveyors' competencies.

## **RESULTS AND DISCUSSION**

### **Response Rate**

The response rate was at 33%, from which out of 72 questionnaires distributed, 24 questionnaires were filled in and returned by the respondents, fulfilling the criteria. According to Morton, Bandara, Robinson and Carr (2012), a response rate of 20% is sufficient to obtain a reliable result. Therefore, in order to achieve the research objectives, the 33% response rate obtained with the total number of 24 respondents was acceptable to be analysed.

## **Demographic Data**

From the data collected, 3.8% of the respondents had less than a year working experience, making up the smallest percentage of the data. The biggest percentage was those with 1 – 5 years working experience at 46.2% whereas 23.1% had a working experience of 6 – 10 years. Those with 11 – 15 years of experience made up 11.5%. Lastly, those with 16 – 20 years and more than 20 years working experience both had a percentage of 7.7%. The most frequent type of construction contract that the respondents were involved in was traditional contract and all 24 respondents had participated in the construction project using traditional contract, followed by novated design and build with 8 respondents. The type of construction contract that the respondents had the least experience was built-operate-transfer with only 1 respondent.

## **Issues and Challenges Faced by Quantity Surveyors During the Final Account Preparation**

Table 2 lists three different categories of issues and challenges (contractor-related, management-related, and contractual-related) with seven relevant variables. These three categories were proposed by Zakaria et al., (2013b), and the variables were identified from other literatures and law cases. All the variables have been marked as IC1 – IC7. Ranked first for issues and challenges faced by the quantity surveyors during the final account preparation was IC1 with a mean value of 3.96, followed by IC6 (3.88), IC7 (3.69), IC5 (3.69), IC4 (3.46), IC3 (3.12), and IC2 (3.04). The results obtained showed that all the issues and challenges listed existed during the process of the final account preparation with the most prevalent issue being incomplete submission of documents by the contractor, which was classified under contractor-related issue. On the other hand, inadequacies of quantity surveyors were the issue that the quantity surveyors encountered the least during the final account preparation. During a construction process, quantity surveyors must ensure that contractors submit important documents for the final account to avoid problems during the preparation of the final account.

**Table 2: Ranking of Issues and Challenges During the Final Account Preparation**

Categories	Code	Item	Mean	Std. Deviation	Rank
Contractor-Related	IC1	Incomplete submission of required documents by the contractor to prepare final account.	3.96	0.958	1
Management-Related	IC2	Quantity surveyors' inadequacies (lack of confidence, lack of knowledge).	3.04	0.871	7
	IC3	Quantity surveyors' ethics (not conducting site valuation routinely, delayed issuance of related documents).	3.12	0.816	6
	IC4	Client's lack of knowledge regarding the quantity surveyors' roles during the final account preparation.	3.46	0.905	5
	IC5	Clients' lack of knowledge of own roles during the final account preparation.	3.69	0.884	4
Contractual-Related	IC6	Disputes involving provisional quantities or quantities which required re-measurement.	3.88	0.766	2
	IC7	Disputes involving insufficient allocation provided for contractual risks (fluctuation of market price, material unavailability in the market, contingencies).	3.69	0.884	3

**Competencies Displayed by Quantity Surveyors During the Final Account Preparation**

Table 3 shows a list of six categories of frequent competencies during the preparation of the final account as stated by a previous paper (Jaafar et al., 2016): teamwork, procurement, quantification and costing, project finance control and reporting, construction practice and construction administration. The three competencies placed on the top of the list were procurement (Rank 1, 6 and 7), quantification and costing (Rank 2, 3, 4 and 5) and contract administration (Rank 9). Three lowest



competencies in the ranking were project finance control and reporting (Rank 15 and 14), construction practice (Rank 13 and 11) and teamwork (Rank 12, 10 and 8). Out of all variables, most respondents were competent to present reports related to the procurement process; however, they were least competent on strategies and tactics in dealing with funding and financial issues. Generally, all competencies listed displayed a mean value of greater than 3.50, ranging from 3.62 to 4.15 and indicating high level of agreement on the confidence in displaying their competencies during the preparation of the final account. From the findings, the quantity surveyors displayed all required competencies during the preparation of the final account. However, the quantity surveyors shall improve their ability in project finance control and reporting, including advising strategies and procedures to control budget, and in providing evidence and advice to deal with funding and financial issues.

**Table 0: Ranking of Quantity Surveyors' Competencies During the Final Account Preparation**

Categories	Code	Item	Mean	Std. Deviation	Rank
Teamwork	TW1	Know the roles of various team members in the project.	3.81	0.634	12
	TW2	Can communicate effectively and efficiently, formally without discrimination and harassment.	3.92	0.628	8
	TW3	Able to provide general legislation advice within my area of practice.	3.88	3.88	10
Procurement	PR1	Able to give reasoned advice on the appropriateness of various procurement routes.	3.96	0.528	6
	PR2	Can manage tendering and negotiation process.	3.92	0.628	7
	PR3	Present report on the outcomes related to procurement process.	4.15	0.613	1
Quantification and Costing	QC1	Can advise on quantification and costing for specific project.	4.08	0.688	4
	QC2	Can take responsibility for the preparation and issuance of pricing documents.	4.00	0.693	5

**Table 3** (continued).

Categories	Code	Item	Mean	Std. Deviation	Rank
	QC3	Can price and analyse documents related to quantification and costing.	4.12	0.711	2
	QC4	Can give advice and/or supervise the valuation of works throughout the project.	4.08	0.744	3
Project Finance Control and Reporting	PFC1	Able to give advice on strategies and procedures to control predicted expenditure in line with a budget.	3.69	0.838	14
	PFC2	Able to provide evidence and reasoned advice to clients and senior management related with strategies and tactics for dealing with funding and financial issues.	3.62	0.983	15
Construction Practice	CP1	Can provide evidence of reasoned advice, prepare and present reports on the selection of appropriate form of contract for the chosen procurement route.	3.73	0.778	13
	CP2	Can advise on the most appropriate contractual procedure to be executed throughout the various process of construction.	3.85	0.675	11
Contract Administration	CA	Can implement administrative procedures necessary to ensure smooth running of construction contract.	3.88	0.766	9

## Correlation Analysis

The significance of correlation analysis was useful in determining which issues and challenges were more likely to be related to competencies displayed by quantity surveyors during the final account preparation. The correlation was interpreted by using the negative and positive relationship. Ranging from -1 to +1 relationship, both values indicate perfect, negative and positive relationship. Value of 0 equals to absence of correlation. Positive monotonic relationship is observed when one variable increases, the other variable will also increase. On the contrary, negative monotonic relationship implies that when one variable increases, the other variable decreases. Correlation significance level (p-value) was used to determine that the relationship between the variables existed at 0.01 or 0.05 level, of which the former was higher in significance compared to the latter.

**Table 4: Correlation Between Issues and Challenges**

Spearman's Rho	IC1	IC2	IC3	IC4	IC5	IC6	IC7
<b>TW1</b>	0.120	-0.087	-0.248	-0.221	0.028	-0.088	-0.144
<b>TW2</b>	0.157	-0.051	-0.062	-0.064	0.189	0.255	-0.031
<b>TW3</b>	-0.023	-0.116	-0.282	-0.288	-0.075	-0.015	-0.305
<b>PR1</b>	<b>.408*</b>	0.128	-0.091	-0.015	0.187	0.108	0.071
<b>PR2</b>	0.357	0.257	-0.059	-0.059	0.140	0.173	0.119
<b>PR3</b>	0.366	0.279	-0.088	0.101	0.249	0.088	0.064
<b>QC1</b>	<b>.547**</b>	0.101	-0.086	0.216	0.346	0.333	0.251
<b>QC2</b>	<b>.474*</b>	0.032	0.000	0.334	<b>.493*</b>	0.241	0.315
<b>QC3</b>	<b>.519**</b>	0.025	-0.167	0.257	0.356	0.327	0.192
<b>QC4</b>	<b>.429*</b>	-0.036	-0.219	0.138	0.279	0.309	0.118
<b>PFC1</b>	0.059	-0.167	<b>-.447*</b>	-0.245	-0.023	-0.120	-0.080
<b>PFC2</b>	-0.132	-0.218	<b>-.476*</b>	-0.251	-0.048	-0.196	-0.056
<b>CP1</b>	-0.162	-0.283	<b>-.403*</b>	-0.172	0.031	-0.258	-0.219
<b>CP2</b>	-0.012	-0.154	-0.344	-0.199	0.013	-0.021	-0.128
<b>CA</b>	0.284	-0.023	-0.037	0.162	0.199	0.269	0.119

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Positive relationship observed indicated that issues and challenges occurred were less likely to be caused by low competencies displayed by quantity surveyors. Significant positive correlation at 0.01 level was

shown between IC1 and QC1 and QC3. Note that IC1 was a contractor-related issue and it showed significant positive correlations with few quantity surveyors' competencies. Significant positive correlation at 0.05 level was observed between IC1 and PR1, and QC2 and QC4. The same correlation was also observed between IC5 and QC2. Therefore, it can be deduced that contractor-related issues are less likely to occur due to quantity surveyors being incompetent during the final account preparation.

Negative relationship observed indicated that issues and challenges occurred were more likely to be the result of low competencies displayed by the quantity surveyors. Negative correlation existed between issues and challenges and competencies displayed by quantity surveyors during the final account preparation. Significant negative correlation at 0.05 level was observed between IC3 and PFC1, and PFC2 and CP1. IC3, a management-related issue was also negatively correlated with all quantity surveyors' competencies except for QC2, which showed no correlation between them. All other issues and challenges listed were negatively correlated with at least one quantity surveyors' competencies. From this observation, it can be concluded that management-related issues are more likely to occur because the quantity surveyors display incompetence during the final account preparation.

Overall, contractor-related issues arisen during the final account preparation are less likely to occur due to low competencies displayed by quantity surveyors during the final account preparation. On the other hand, management-related issues are more likely to occur due to low competencies displayed by quantity surveyors during the final account preparation. It shows that management-related issues are more likely to be associated with the quantity surveyors' competencies during the preparation of the final account.

## **CONCLUSION**

In conclusion, this paper highlighted the issues and challenges faced by quantity surveyors in relation to the final account preparation. Issues and challenges were categorised into contractor-related, management-related, and contractual-related. Six required competencies by quantity surveyors during the final account preparation were also laid out in this paper:

teamwork, procurement, quantification and costing, project finance control and reporting, construction practice, and construction administration. Correlations between issues and challenges, and competencies required by quantity surveyors during the final account preparation existed and they were mostly negatively correlated.

There are a few limitations observed from this research. One is that the data obtained for this research were only from Sarawak construction industries. This study only focuses on consultant quantity surveyors, limiting the research to some extent. In addition, the quantitative data collection method restricted exploring certain variables that have been collected from previous research. For future research, more thorough research, including qualitative research is ought to be conducted to explore the negative correlations between issues and challenges faced by quantity surveyors and competencies. The research scope is ought to be broadened to include other parties to gain insights regarding their issues and challenges that may affect those faced by quantity surveyors during the preparation of the final account.

Finally, hopefully this research will provide knowledge related to the closing of the final account, including identifying the cause and proposing strategies to avoid issues and challenges during the final account preparation. Hence, the result obtained will improve the process of the final account preparation in achieving more successful construction project deliverance.

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