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College of
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Poster Book

IIIDBEE X 2023
20 JANUARY 2023
*International Invention, Innovation & Design Exposition
for Built Environment and Engineering 2023*

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DEVELOPMENT OF ELEMENTAL COST ANALYSIS (ECA) WEB-BASED APPLICATION PLATFORM

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INTRODUCTION

The cost estimation at the inception stage is important to forecast the actual budget of the project. The use of strategic historical cost data would produce benchmarking information that allows the development of accurate quantities and costs of a project. Elemental Cost Analysis (ECA) is one of the reliable sources of cost data that QS may refer to prepare a cost estimate. Therefore, documented ECA properly is highly needed. By having several numbers of ECA, cost trends for each material and element can be done. Due to that, **the compilation of ECA for the various type of projects is crucial for the QS to prepare a reliable estimate.**

PROBLEM STATEMENT

Unfortunately, there is a lack of documented ECA even though it can be done once the contract document has been issued (Soutos and Lowe, 2018). Through informal discussions with industry practices, the majority of them agreed that ECA is not properly documented. This is because of:

1. Lack of awareness in storing ECA systematically
2. Lack of interest in documenting the ECA
3. Time constraints due to being busy handling construction tasks

OBJECTIVES

1. To investigate the challenges faced by Quantity Surveyors in storing the ECA.
2. To identify the level of difficulty in preparing ECA forms.
3. To develop ECA web-based application for storing the ECA systematically.

RESEARCH METHODOLOGY

Exploratory Interviews

Interviews with construction practitioners to gain an in-depth understanding of the main causes of a poor compilation of ECA

Data Collection

Questionnaire survey

Conducted on 1st July 2022 until 31st August 2022

50 questionnaires were distributed among QS consultant firms within Klang Valley

Data Analysis

SPSS V25 (Descriptive Analysis)

Development of system in open-source platform using PHP framework

FINDINGS

Objective 1

Challenges faced by QS in documenting the Elemental Cost Analysis	Frequency	Rank
Lack of interest in documenting ECA manually	12	1
Too busy handling construction tasks	9	2
Too many documents need to refer while preparing for ECA	5	3
Difficult to understand Manual ECA by RISM	4	4

Objective 2

Difficulties of documenting ECA based on the item		Frequency	Percentage	Rank
Document Information	Contract Document	12	40	1
	Tender report	10	33	2
	Working drawing	4	13	3
	Specification	4	13	3
	Manual ECA	0	0	5
Form 1	Standard ECA form	0	0	6
	Competitive tender list	8	27	1
	Areas (Usable, Internal division, circular and ancillary area)	8	27	1
	Project details & site condition	4	13	3
	Contract particulars	4	13	3
Form 2	Accommodation and design features	4	13	3
	Functional Unit	2	7	6
	Element Unit Quantity (EUQ)	15	50	1
	Element Ratio	4	13	2
	Element Unit Rate (EUR)	3	10	3
Form 3	Cost/GFA	2	7	4
	Reinforced Concrete	2	7	4
	Formwork	2	7	4
	Reinforcement	2	7	4
	Specification for services	8	27	1
Form 3	Specification for finishes	6	20	2
	Specification for external work	6	20	2
	Specification for superstructure	5	17	4
	Specification for substructure	5	17	4

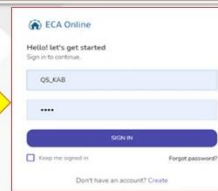
FINDINGS CONT'D

Objective 3 To develop ECA web-based application for storing the ECA systematically

Based on all these findings, the ECA web base application using an open source platform using PHP framework was developed to encourage the QS in storing ECA. The URL of the web base is <https://ecauiitm.epizy.com>. The followings are screen captures of the web features and steps required to document the ECA.

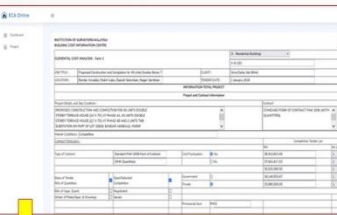
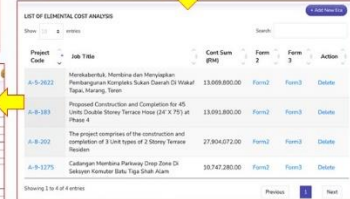
Step 1

Register as a User of the system and log in using Username & Password



Step 2

Add a new project and the user needs to key in details of the project such as the project title, project code, and contract sum in Form 1.



Step 3

The user is required to fill up Form 2. The cost breakdown of each element needs to be filled in every column. This is important to indicate the cost trend of the project.

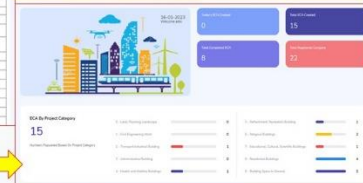


Step 4

The specification of each element will be filled in Form 3. The type of material used, quality, and method of construction need to be described.



Statistical view – Summary



NOVELTY

The novelty of this product is the enhancement from the manual method of documenting ECA to a web-based application. In line with digital transformation 4.0, the development of the ECA web based is valuable as a centralized historic cost data that can be accessed anywhere, flexible, and user friendly.

CONCLUSION

The development of the ECA web base will encourage QS in storing ECA systematically. The QS becomes motivated and attractive to compile the ECA for each project once the contract document has been issued. The benefits of developing the ECA web base such as centralized data, accessibility, and manageability hopefully help the QS to forecast a reliable future project cost.

COMMERCIALIZATION

The Elemental Cost Analysis (ECA) web based can be linked easily to the construction cost data portal such as Building Cost Information Services Malaysia (BCISM) and also can be customized toward organization preferences.

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