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COMPLETENESS ASSESSMENT MODEL TO ESTIMATE QUALITY OF THE EFFECTIVE E-PROCUREMENT PROCESS IN ADOPTION

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ABSTRACT - Completeness is recognized as a very important attributes of software quality. Completeness estimates carried out to convince the customer that the product conforms to and fulfils the e-procurement software specifications and functionality specified and agreed to. This study focus on software quality factors that can be used to measure the completeness of an object oriented e-procurement software. Completeness is used to evaluate the quality of software and one is used to assess classification performance. This paper shows that for this empirical study, the e-procurement software and classification performance of the discriminate modelling methodology are excellent and yield a potentially useful insight into the relationship between various independent variables.

Index - Completeness , E-Procurement Quality , Assessment model , Software Quality , E-Procurement Design

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I INTRODUCTION

The pursuit for conveying high impact quality software in an economic way requires propelled control over the software development process and the product on the complete phases of its life-cycle. It is initially recognized that the cost of removing defects, fault, errors and enhancing e-procurement software increases with the stage of the life-cycle, i.e. early completeness are desirable.This study encourages lifting the more evaluation of software products to an earlier stage. This observation can be done by collecting suited metrics from earlier artefacts like the structural design and design models. Delivering high impact quality e procurement software in a cost-effective way necessitates advanced control over the software development procedure and the product in all phase of its life-cycle. The use of highly quantitative software as means of control and improvement plays an important role in software engineering. One way of measure completeness is to assess the impact of correct analysis. Our study is depend upon both logical and experimental. It also involve defining a correct impact model, more complete and more general than those presented in the literature, and applying it on an industrial software system to assess its completeness. It aims at pinpointing the different parts of the e-procurement software design where problems due to undesired more interactions must be complete analysis. In this evaluations, identify the quantum of completeness indexes which belongs to particular e-procurement project.

II. COMPLETENESS AS QUALITY FACTORS

Design stage requires avoiding errors such as incompleteness. Drawn from this literature review, a design process needs to consider Completeness for the production of high quality software product.

Completeness is an important key issue need to validate the detect errors at design stage of software development process. Completeness involve that all designers needs will be met when the software is constructed.

A number of observations highlighted that completeness is a key attributes of high quality software.

- ✓ A software design must have depended on completeness.
- ✓ Software designers should include all relevant information about completeness.
- ✓ Completeness defines all functions and the constraints intended by the designers.
- ✓ Completeness behaviour indicates all possible errors in software system constraints.
- ✓ Completeness responses of the software to realizable the error or fault in software

III BACKGROUND OF RESEARCH

Literature review [14], Analyses analysis of completeness in large-scale software in industrial organizations. The following problems due to doubt about model completeness were reported:

- Uncertainty about correctness and exactness of assess based on model study,
- Miscommunication,
- Combination overhead

Author Lindland et al. [9] define that a model (M) has achieved semantic completeness. They relax the completeness goal by applying the notion of feasibility. Feasibility introduces a trade-off between the benefits and drawbacks for achieving a given model quality. Many state-of-the-art techniques perform with regards to completeness in the e procurement projects identified in the literature section. Completeness is evaluated by looking at the percentage of commits linked to a software issue. Software quality is one of the most essential paradigms in the structure of software engineering. Delivering high software is a preparatory prerequisite for fulfilling the completeness and fault free necessities of order and control software [5].In spite of the fact that software quality appraisal has been the centre substance in the software engineering condition, it is as yet an imperative subject. Experts can't choose and examine what precisely the word completeness relates to in field of software engineering, on the grounds that there is no ideal estimation for completeness. Because of modernization and globalization, numerous associations have contributed their extensive piece of capitals on building up the business structure [9].There is a tremendous dependence on the software product from the purpose of mechanizing the business to making vital parts in the business. To get this going, the software must be of a high calibre, and it ought to withstand numerous complexities [4]. It is difficult to develop an astounding software item in the market. It requires different sorts of measures for the traits. Aside from this, the framework completeness estimation influences the quality estimation of a software element. A numbers of researchers have been accepted that completeness is an important key for software quality. A systematically commented by researchers are shown in Table 1 and commonly accepted to completeness.

Table 1. Commonly accepted by Researchers

Experts	Years	Completeness	Traceability	Reliability	Maintainability	Testability	Ambiguity	Understandbility	Changeability
Khashayar[1]	2004	√		√	√		√	√	
Sahraouh [6]	2005	√	√	√	√	√	√	√	√
E. Mulo [2]	2007	√	√	√	√	√	√	√	√
D. Esposito [7]	2008	√	√	√		√		√	√
Jianping [10]	2010	√	√	√	√	√	√	√	
Piveta [11]	2012			√	√		√	√	
Amid [3]	2013	√	√	√	√	√		√	√
Kaur [8]	2013	√	√	√	√	√	√		√
K. Chandra [15]	2016		√	√		√		√	√
Jyoti Devi [16]	2017	√	√		√	√	√	√	√

IV RESEARCH OBJECTIVES

At the conclusion of research work, need to assess whether or not met research objectives and if not, why not. However, researchers may not always meet your aims in full, since your research may reveal that research questions were inappropriate, that there are intervening variables you could not account for or that the circumstances of the study have changed. Whatever the case, your conclusion will still have to reflect on how well the research design, which was guided by research objectives, has contributed to addressing completeness of e-procurement software. A number of question have summarized in table 2 by experts during the research work.

Table2 Analytical View of Research Objectives

Sr. No.	Research Questions
1.	Which are the factors that directly influence completeness of e- procurement software?
2.	Which are the factors affecting quality of design for development of e-procurement software?
3.	Is any standard approach is available for quantifying completeness of e procurement software at early stage?
4.	Can we develop a guideline for identification of quality factors at design stage?
5.	How general are the lessons learned in this study? Can they be applied in situations involving other metrics, or to organizations, which have different operational contexts?
6.	Can we develop quality quantification model targeting completeness of e -procurement software?
7.	Can we get a model, which can estimate completeness at early stage of e- procurement software development?

V. COMPLETENESS ASSESSMENT MODEL

The general purpose behind the software is to deliver quality situated software that is effective in activity, effectively agreeable to user inside indicated time and given spending plan on the grounds that conveying quality software is not any more acceptable position, yet a required factor.

The purpose of this research is to assess software completeness by utilizing the ideas of the software quality estimation aimed to the underlying time being developed life cycle. Here research is expected to develop an organized logical way to deal with guarantee that software is stable, effective and high quality.

5.1 Correlations among Quality Factor, OOD Properties and OOD Metrics

The figure 1, describes the assessment process of completeness model in order to establish a multivariate model for completeness and OOD constructs. The values of these metrics can be easily identified by class diagram metrics. This metrics will play the role of independent variables while completeness will be taken as dependent variable. The experimental assessment of completeness is very helpful to achieve completeness index of software design for e-procurement software quality product within time and given budget. Cohesion and abstraction are affected to completeness and suited metrics associated as CAM and MFA. These metrics values have calculated by UML diagram of software.

5.2 Model Development

In order to establish a assessment model for effectiveness, multiple linear regression techniques have been used .The proposed multivariate model takes the following form

$$Y=\alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \ldots\ldots \alpha_n X_n \qquad \text{Eq (1)}$$

Where

- Y is dependent variable
- X1, X2, X3…Xn are independent variables.
- α 1, α 2,…. α n are the regression coefficient of the respective independent variable.
- α 0 is the regression intercept.

Using SPSS software values [15, 16] of all independent variables, regression intercept and coefficient of the respective independent variables are calculated in Table 3. On the basis of this approach, the multiple linear regression effectiveness models have been developed that is given in equation 2.

Completeness Assessment Model ($ComAM^{E\text{-}Proc}$) = 0.716 - 0.0403* MFA + 0.213 *CAM Eq (2)

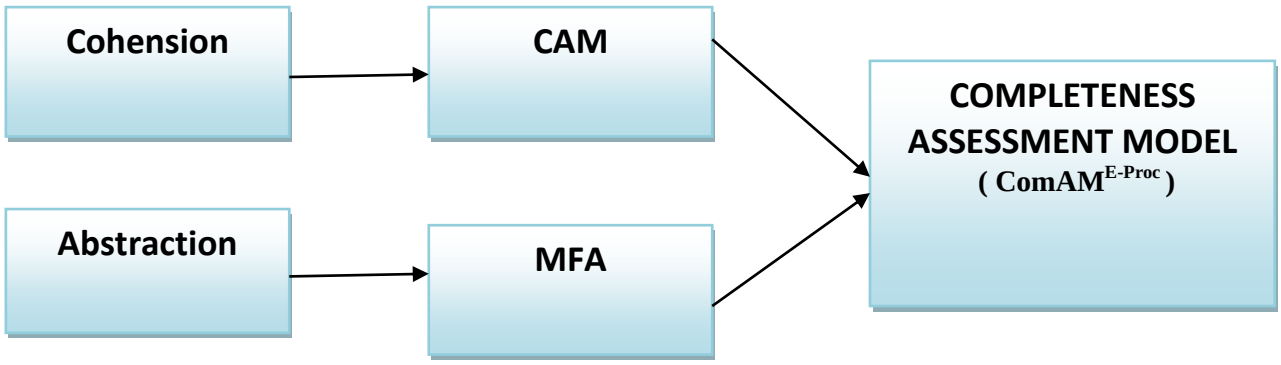

Figure 1 Correlation Between Design Constructs And Completeness

Table 3 Completeness Computed Value

Project	Standard Index	MFA	CAM
P_1	0.781	0.963855	0.75
P_2	0.887	0.580645	0.291667
P_3	0.890	0.980892	1.00
P_4	0.824	0.652174	0.285714
P_5	0.740	0.822222	0.444444
P_6	0.742	0.948718	0.666667

5.3 Statistical Significance

Summary Table 4 for completeness assessment Model proves that all the four selected metrics are statistically significant at confidence level of 95%. This table 4 displays R, R squared, adjusted R squared, and the standard error. R is the correlation between the observed and predicted values of the dependent variable. The values of R range from -1 to 1. The sign

of R indicates the direction of the relationship (positive or negative). The absolute value of R indicates the strength, with larger absolute values indicating stronger relationships .

Table 4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.982[a]	.964	.953	.016216
Predictors: (Constant), MFA, CAM				

5.4 Empirical Validations

This section of work proves that how the significant proposed study, where metrics and model are able to estimate the completeness quality index of object oriented design at design time. The empirical validation is important phase of research to evaluate the proposed completeness quality model for high level acceptability and appropriate execution. The data is taken from [15, 16] this model is from various versions of windows application frameworks and calculated index shown in Table 5.

Table 5 Known and Calculated index

Project	MFA	CAM	CALCULATED INDEX	STANDARD INDEX
P_1	.755	.354	.763	.738
P_2	.804	.467	.777	.754
P_3	.588	.254	.812	.783
P_4	.740	.595	.905	.887
P_5	.821	.296	.670	.679
P_6	.627	.191	.796	.787
P_7	.902	.600	.756	.735
P_8	.841	.304	.656	.633
P_9	.673	.191	.753	.738
P_{10}	.650	.333	.850	.878

5.5 Statistical Significance

It is compulsory to check the correctness of the proposed model for approval. A 2t test has been acquainted with test the significance of **Calculated Index** respect to **Standard Index**. The t test history of completeness is specified in table 5.

Null hypothesis (H_1): There is no significant difference between **Calculated Index** and **Standard Index . H_1: μ1-μ2** = 0

Alternate hypothesis (H_2): There is significant difference between **Calculated Index** and **Known Index H_2: μ1-μ2 ≠ 0**

In the above hypothesis μ1 and μ2 are treated as sample means of population. Mean value and Standard Deviation value have been calculated for specified two samples and represented in table 5.The t value 2.158. The hypothesis is tested with zero level of significance and 95% confidence level. The p value is 0.053. Therefore alternate hypothesis directly discards and the null hypothesis is accepted. The developed equation used for completeness assessment is accepted.

Table V 2t- test between Calculated Index and Standard Index

	Mean	N	Std. Deviation	Std. Error Mean
Calculated Index	**.77372**	**10**	**.074875**	**.023678**
Standard Index	**.76120**	**10**	**.078610**	**.024859**

VI. CONCLUSION

In this paper we studied the quality factors and assessment of completeness. This evaluation used for improving the quality of e-procurement software. A set of quality attributes has been identified through the analysis of several proposals for models and e-procurement process. Our work provides the evaluation of the completeness has to

be done through multivariate regression lines methods. This empirical validation provides the practitioner with some empirical evidence demonstrating that most of these metrics can be useful to develop completeness model for e- procurement software..

VII FUTURE RESEARCH

In future research Understandability assessment model has been proposed to estimate quality of the effective e-procurement process in adoption

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