Traceability Assessment Model to Estimate Quality of the Effective E-Procurement Process in Adoption

Surabhi Saxena[1], Devendra Agarwal[2]
[1]*Ph.D. Research Scholar,* [2]*H.O.D*
Department of Computer Application, Babu Banarasi Das University
Lucknow (U.P.)India

Abstract- *Developing high quality software is a necessary for software system. Traceability is a significant aspect during the software development process. Software that is easily traceable is known as high quality software. Quantification is an essential aspect that is acquainted with the objective of producing high quality software. It is suggested to assessment of traceability with design construct. In this article, experts propose a traceability assessment model. The developed models for computing traceability point outs the possible influence of design characteristics and also discussion the impact analysis of computation with design stage metrics.*

Index :- *Software Quality , Traceability , Assessment model .*

I INTRODUCTION

It has already been proved that software traceability is a key factor of proficient software development life cycle and software systems quality [6, 4]. The main focus of this paper is to introduce a framework supports traceability through prerequisites particulars, static and dynamic software design, models, system architecture models and execution relics [1, 3].We apply our traceability approach to e-procurement software which is needs in the sense that it is based on concepts used during early software development analysis. These key are used for e-procurement software to model not just early needs, but also late need, as well as software design. During design, traceability enables designers and maintainers to monitor what happens when a change asks for is actualized before a system is redesigned [2, 7 , 5]. Systems development requires a superior comprehension of the necessities, which must be accomplished by the agile to follow back to their sources [10]. Traceability gives the capacity to cross-reference things in the necessity determinations with things in the design particulars [3, 8]. Besides, test methodology, if traceable to necessities or design, can be adjusted when blunders are found. In this paper, Author have identified traceability that arises during e-procurement software development. By presenting a general model for traceability, which can also be useful in the context of e-procurement software [9]. We sketch the approach to enhance the software system to support traceability.

I TRACEABILITY AS QUALITY ISSUES

Traceability of the relations would then be able to be explored for the coordinated classes. Since the design speaks to a reflection of the execution, relations between classes in the design are required to be all present in the code, while extra relations in the code can be viewed as usage points of interest. Along these lines the cancellation of a connection from the design is viewed as traceability blame, and is motioned to the client, while the expansion of new relations in the code does not really infer the need of a design refresh. Another traceability index is given by the lexicon of words used to manufacture compound identifiers. An indistinguishable names and acronyms from utilized as a part of the design ought to be found in the code, since they are the main intends to guarantee traceability. By fragmenting compound identifiers into the making words, a design/code lexicon can be developed which permits the refresh of both design and code to an institutionalized and traceable arrangement of acknowledged and perceived terms

III MODEL DEVELOPMENT

The basic traceability model has been measured as a base to develop the Traceability Assessment Model for object oriented e-procurement software. Estimation of UML is prerequisite for the complete traceability assessment. Proposed model implemented by the correlation are shown in fig1. To develop a pertinent impact connection between Object Oriented Software traits and quality factors,

the effect of Object Oriented Software characteristics on each factor of testability was reviewed by a couple of researchers. Most by far of the investigations loped their undertaking to examine the impact of Object Oriented characteristics and have successfully settled built up with quality factors. In any case, we investigated and assessed their impact on the particular piece of study i.e. traceability and by cooperatively and consistency perspective, completed up on perceiving traceability factors impacted by Object characteristics.

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

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

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.

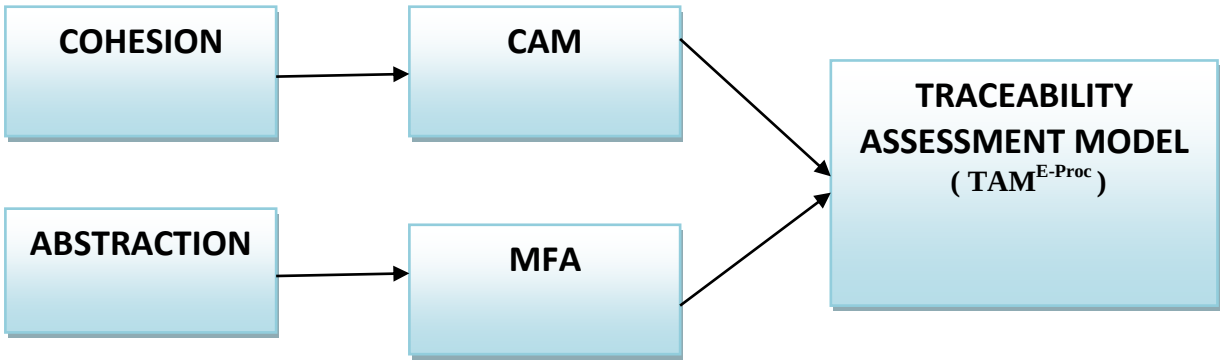

Figure 1 Correlation Establishment

The data used for establishing traceability model is taken from [7, 11, 12] that have been collected through large commercial object oriented systems shown in table 1. The relationship between quality factor and design issues has been established as depicted in Figure 1. As per the mapping, Metrics are selected as independent variable to build up the traceability assessment model via SPSS, values of coefficient are calculated and traceability model is formulated as given below in table 1.

Summary table 2 for Traceability Model proves that all the four selected design metrics are statistically significant at confidence level of 95%.

Table 1: Computed Data for Model

Project	Standard Value	MFA	CAM
P_1	**0.893**	**0.74**	**0.357**
P_2	**0.897**	**09024**	**0.533**
P_3	**0.957**	**0.917**	**0.460**
P_4	**0.877**	**0.454**	**0.311**
P_5	**0.765**	**0.880**	**0.50**

Table 2 : Model Summary for Traceability Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.999[a]	.998	.997	.004880

a. Predictors: (Constant), CAM, MFA

Traceability Assessment Model ($TAM^{E\text{-}Proc}$) = 0.936 + 0.306* MFA - 0.68* CAM **Eq (2)**

IV. EMPIRICAL VALIDATION

The empirical validation is significant phase of study to assess the proposed traceability quality model for high level acceptability and appropriate execution. Empirical validation is the well approach and best practice for claiming the model acceptance. To justify claiming approach for acceptance of model, an experimental validation of the proposed traceability model at design phase has been carried out using samples. This part of work proves that how important proposed study, where metrics and model are able to estimate the traceability quality index of object oriented design at design time. The empirical validation is important phase of research to evaluate the proposed traceability model.2 Sample t tests apply for check the impact between standard integrity and calculated integrity. 2t-test is handy hypothesis tests in statistics when compare means.

Null hypothesis (H_0): There is no significant difference between Standard and Calculate Traceability **H0: μ1-μ2 = 0**

Alternate hypothesis (H_1): There is significant difference between Standard and Calculate Traceability **HA: μ1-μ2 ≠ 0**

Mean value and Standard Deviation value have been calculated for specified two samples and represented in table 4. Correlation comes out to be 0.978, that shows the standard confidentiality and calculated confidentiality is highly correlated. The hypothesis is tested with zero level of significance and 95% confidence level. The p value is 0.58. Therefore alternate hypothesis directly discards and the null hypothesis is accepted. The developed equation used for confidentiality estimation is accepted.

Table 3: Traceability Data Table

Project	MFA	CAM	CALCULATED INDEX	STANDARD INDEX
P_1	.597	.231	.962	.954
P_2	.500	.184	.964	.933
P_3	.925	.750	.709	.736
P_4	.914	.750	.706	.738
P_5	.952	.600	.819	.837
P_6	.455	.464	.759	.793
P_7	.881	.500	.866	.897
P_8	.714	.667	.701	.737
P_9	.825	.500	.867	.865
P_{10}	.987	.667	.785	.788
P_{11}	.765	.500	.830	.878
P_{12}	.200	.221	.847	.875
P_{13}	.725	.373	.904	.893
P_{14}	.877	.391	.939	.886
P_{15}	.929	.750	.710	.777
P_{16}	.923	.667	.765	.797

Table 4: 2 t- tests

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Calculate Traceability	.82078	16	.091818	.022954
	Standard Traceability	.83650	16	.070939	.017735

V. CONCLUSION

Traceability is considered as a vital quality factor for developing the well-organized e- procurement software system. Object-oriented approach enhances the traceability of e-procurement software system. Measuring traceability of a software system in the design phase may help a software designer improve the traceability of software system before delivery to the customer and hence reduces a lot of efforts, time and cost. Our traceability assess model is able to record information from design phase of e- procurement software. Traceability model is developed with the help of multiple linear regression method.In Future Research Completeness Assessment Model will be introduced .

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Author Profile

Surabhi Saxena received the MCA degree from Rajasthan Technical University , Jaipur in 2013. She is enrolled as Full time Ph.D., research scholar in BBDU , Lucknow in Department of Computer Application . His research interests include Software Engineering , Software Quality Models , ISO Standards, E-Commerce , E-Governance , E-Procurement , ERP **,** Security **.**

Dr. Devendra Agarwal is currently working as HOD , Department of Computer Science in BBDU , Lucknow. He has over 18 years of teaching & 5 years of industrial experience. He has done his B.Tech in Computer Science from Mangalore University in 1993, M.Tech from U.P. Technical University, Lucknow in 2006, and Ph.D. from Shobhit University, Meerut in 2013. He has over 18 research papers with 4 students pursuing Ph.D.