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

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***Abstract*—** The development of reliable software is based on design artifacts and its parameters. Maintain of high reliability require further study based on reliability analysis techniques and approaches that are applicable to software development process. This paper introduces a new reliability assessment model which applicable to high-level designs. The design stage is most important for software development. The multiple linear regression techniques are used to develop the reliability assessment model.

Keywords— Quality Factors, Object oriented characteristics, Software development process, Reliability, Assessment Model

I. INTRODUCTION

The main goal of reliability is to take out reliability approach and improve software reliability by using software phases. Starting from design, design through the whole software life cycle and include more features: for satisfying the design of reliability, the requirement of software reliability should be present [7].
Many measurement technique of software reliability are presented in previous. A numbers of experts explain the standards and criteria of reliability importance. A set of methods and techniques to ensuring the quality of software at design issues. In most software projects, the software reliability (or only software reliability testing) is put into practice only in the testing phase of software reliability. When estimating the reliability, software project is supposed for working all the time through the design procedure [8]. In real, numerous insignificant subsystems or not behavior date during the whole process sub function of software are not handling during the whole process.

II. SOFTWARE RELIABILITY

High reliable software is vital software quality parameters, which quantitatively state the stability of accurate examination result [1] [2]. Reliability in software systems are characteristically employed in separation at the later phase of the software development process [3]. Moreover, although the enormous work that has been done in software reliability, much work is at rest needed, especially in the software development ground regarding accessibility of software part reliability in sequence following a clear categorization scheme in figure 1.

Figure 1 Reliability associations

Try at deal with those efforts; to contribute software development process that reliability revision in design stages of software development. Software reliability is a clear requirement of concepts and their connection. Reliability represents the facts in a formal and structured form. Therefore, software reliability provides a better means for communication, functionality, and organizes the software. Moreover, software reliability not only presents a means for accuracy, but also a base for produced the reliable software.

III. MODEL ESTABLISHMENT

A proposed model is either a descriptive or prescriptive characterization of how software reliability is or should be developed. A reliability model describes the how design artifacts associated to reliability. Proposed models may be apply as the basis on object oriented design characteristics, and empirically validated to previous models. A proposed model describes how reliable software should be

developed. Reliability estimation model are used as process or frameworks to systematize and structure how software development activities should be achieved, and in what order. In general, it is easier and more common to clear a reliability model for how software systems should be developed. A proposed model correlation is established in figure 2.

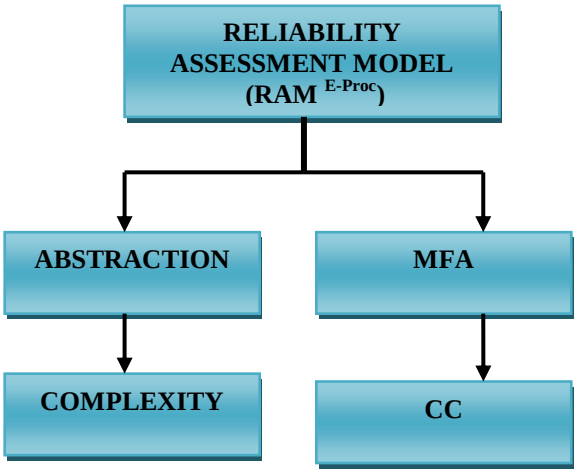

Fig 2 Correlation View

For justifying the correlation, developed model used the standard values of reliability index and the values of design metrics taken from [4, 8] large set commercial object oriented software projects. The values of Measure Functional Abstraction (MFA), Cyclomatic Complexity (CC) are shown in Table 1.

In order to used the multiple linear equation in format as.

$Y = Y=\alpha 0 + \alpha 1\ X1 + \alpha 2\ X2 + \alpha 3\ X3 + \ldots\ldots\ldots\ \alpha\ nXn$ **(equation 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.

RELIABILITY ASSESSMENT MODEL (RAM $^{E\text{-}Proc}$) = 2.86 - 2.41* MFA - 0.027* CC **equation (2)**

Using SPSS to measure how well the model describes the reply. SPSS is measured in the units of the response variable (Cal_ Reliability) and represents how far the data values fall from the standard values (Std_Reliability). The lower the value of Reliability, the better the model describes the response. The model calculated the reliability by equation 2 in table 2.

Table 1 Data calculation view

Project	Standard Reliability	MFA	CC
P_1	0.509	0.8630	3.142
P_2	0.734	0.9490	1.111
P_3	0.364	0.9230	0.333
P_4	0.821	0.7272	1.315
P_5	1.400	0.7954	1.600
P_6	0.899	0.8181	0.666

Table 2 . Reliability Index

Project	MFA	CC	Cal Reliability	Std Reliability
P_1	.4500	1.0000	1.7485	1.0980
P_2	.9167	.5000	.6373	.6650
P_3	.5362	1.4000	1.5299	1.4444
P_4	.8000	.6667	.9140	.8094
P_5	.5139	1.0833	1.5923	1.1701
P_6	.7317	.9167	1.0718	1.0259
P_7	.4783	.9231	1.6825	1.0314
P_8	.4344	1.1667	1.6853	1.2424
P_9	.7551	1.0769	1.0111	1.1646
P_{10}	.3448	1.8475	1.9791	1.8319
P_{11}	.6000	1.2857	1.3793	1.3454
P_{12}	.6863	.9412	1.1807	1.0471
P_{13}	.5362	1.5588	1.5256	1.5819
P_{14}	.4744	1.6190	1.6731	1.6341
P_{15}	.6555	1.4048	1.2424	1.4486
P_{16}	.9583	.5000	.5369	.6650
P_{17}	.9737	.3333	.5044	.5206
P_{18}	.8125	.7500	.8816	.8815
P_{19}	.8182	.6667	.8702	.8094
P_{20}	.8000	.7778	.9110	.9056

A model summary is automatically created when running a regression modeling or a classification modeling. The model summary displays the model name, the model type, and the model formula. For parametric models (Linear Regression and Logistic Regression), additional summary statistics, appropriate for the particular model values are also shown in table 3. The values of table 3 can give an indication of how well the model fits the data and can also be used to compare one model with another model of the same type.

Table 3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.999[a]	.998	.998	.0208753

a. Predictors: (Constant), CC, MFA, CAM

IV STATISTICAL SEGNIFICANCE

Experimental justification is a very important phase of proposed research. Experimental justification is the benchmark approach to validate the model approval. Study of this fact, practical validation of the reliability model has been performed applies the 2t test. Table 4 presented the statically analysis of two models. 2t tests apply to check the significance of proposed model and used the two types of Hypothesis.

Table 4 2t test view

	Mean value	N	Std. Deviation	Std. Error Mean
Cal Reliability	1.227849	20	.4386039	.0980748
Std Reliability	1.116108	20	.3523830	.0787952

Null hypothesis (H0): There is no significant difference between Standard Reliability and Calculated Reliability.
H0: μ1-μ2 = 0

Alternate hypothesis (HA): There is significant difference between Standard Reliability and Calculated Reliability.
HA: μ1-μ2 ≠ 0

In the above hypothesis μ1 and μ2 are treated as sample means of population. The hypothesis is tested with zero level of significance and 95% confidence level. The P value is 0.054. Therefore alternate hypothesis directly discards and the null hypothesis is accepted.

IV COMPARATIVE STUDY

Reliability is important key attributes of correctness, which show the positive indication about the software quality. Many experts have calculated the index value of reliability in different environment. So we assess the reliability with different parameters and show the significance level in figure 2. Graphical presentation is more justify to model at any stream. In this graph presented between standard value and calculated value.

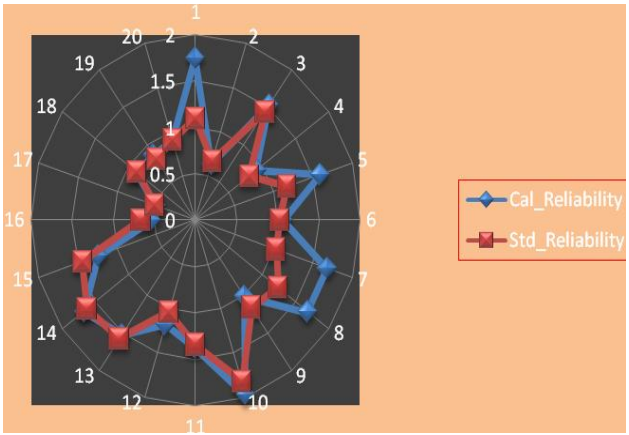

Figure 3. Graphical presentation

V CONCLUSION AND FUTURE SCOPE

This research paper presents models to analyze the re liability of software design artifacts. Reliability is evidently very suitable and significant in the perspective of software reliability. After a comparison with other index values, our model is proved to be a best model for estimate the reliability of software in the early stage of the software development cycle. Reliability estimation model has been empirically validated using experimental tryout.

After the successful implementation of security assessment model [10], the next research step to evaluate the completeness assessment model [12], traceability assessment model [11], functionality assessment model [13] and reliability assessment model for the quality of the correctness assessment model to the adoption of effective e-procurement process.

REFERENCES

[1] J. Musa, Software reliability engineering, more reliable software
[2] faster development and testing‖, McGraw-Hill, 1998.
[3] D. R. Wallace, "Practical software reliability modelling," proceeding of 26th Annual NASA, Software Engineering Workshop, 2001.
[4] W.L. Wang, M.H. Chen, "Heterogeneous software reliability modelling," proceeding of 13th International Symposium on Software Reliability Engineering, 2002.
[5] Nidhi Gupta et. al., "Reliability Measurement of Object Oriented Design: Complexity Perspective", International Advanced Research Journal in Science, Engineering and Technology Vol. 2, Issue 4, April 2015.
[6] J. Bosch, Design & Use of Software Architectures -Adopting and Evolving a Product Line Approach: Addison-Wesley, 2000.
[7] S. Gokhale, K.S. Trivedi, Analytical Models for Architecture-Based Software Reliability Prediction: A Unification Framework. IEEE Transaction on Reliability, 55 (4), 578-590, 2006.
[8] Cortellessa, V., Singh, H., Cukic, B. Eerly reliability assessment of UML based software models. In: Third International Workshop on Software and Performance, Rome, 2007.

[9] M. Jureczko and L. Madeyski, "Towards identifying software project clusters with regard to defect prediction", IEEE, 2010.
[10] Surabhi Saxena, Devendra Agarwal, "Model to Quantify Security For Adoption Of Effective E-Procurement Process ", Journal of Emerging Technologies and Innovative Research (JETIR), Volume 5, Issue 5- May2018,pp. – 792 -796.
[11] Surabhi Saxena , Devendra Agarwal , " Traceability Assessment Model to Estimate Quality of the Effective E-Procurement Process in Adoption", International Journal of Engineering Trends and Technology (IJETT) , Volume 58 Issue 4 – April 2018 , pp. – 177 – 180
[12] Surabhi Saxena ,Devendra Agarwal ,"Completeness Assessment Model to Estimate Quality of the Effective E-Procurement Process in Adoption", International Journal of Management, IT & Engineering (IJMIE) , Volume 8 , Issue 6 – June 2018 , pp. – 369-280
[13] Surabhi Saxena ,Devendra Agarwal ,"Functionality Assessment Model to Estimate Quality of the Effective E-Procurement Process in Adoption", International Journal of Creative Research Thoughts (IJCRT), Volume 6 , Issue 2 – April 2018 , pp. – 274- 278 .

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. Research interests include Software Engineering, Software Quality Models, ISO Standards, E-Commerce, E-Governance, E-Procurement, ERP**,** and Software Security.

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