MODIFIABILITY ESTIMATION MODEL: REQUIREMENT STAGE

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Abstract : ***Modifiability is an important key issue of Software Requirement Specification. To good documentation and deliver quality products within any circumstances modifiability plays an important job. This paper analysis the need and importance of modifiability at requirement phase and the correlation establishes with modifiability and completeness and ambiguity as an influencing factor for SRS. A model has been proposed for modifiability quantification of requirement specification by establishing multiple linear regressions. The centre on this paper is to propose a model to quantify the modifiability of SRS by using multiple regression technique at requirement phase.***

IndexTerms - SRS, Quality characteristics, Modifiability.

I. INTRODUCTION

SRS is a significant action for venture achievement yet in the meantime experiences numerous intrinsic difficulties e.g., a high level of vulnerability about the framework being worked on and the unavoidable impact of diverse orders. Consequently, quality assurance is focal to requirements designing, and measurements based approaches are a promising intends to this end when connected correctly. As per software engineering standards, if the procedure for SRS is correct, the possibility of accomplishment of the document undertakings is enormously increased. To accomplish this target, study has to focus in a trained way around both the quality of the software requirement specification and on the procedure used to develop the product. A SRS is considered organized if its content is organized, that is, readers can easily locate information and logical relationships between adjacent sections are evident [2, 11]. Quality SRS is one that exhibits the following qualities, which presents in figure1. Early investigations of programming requirements specifications (SRS) are known to be a compelling and cost-effective quality assurance procedure. In any case, examinations are regularly connected with the fundamental suspicion that they work similarly well to survey a wide range of value qualities of SRS. Little work has yet been done to approve this presumption.

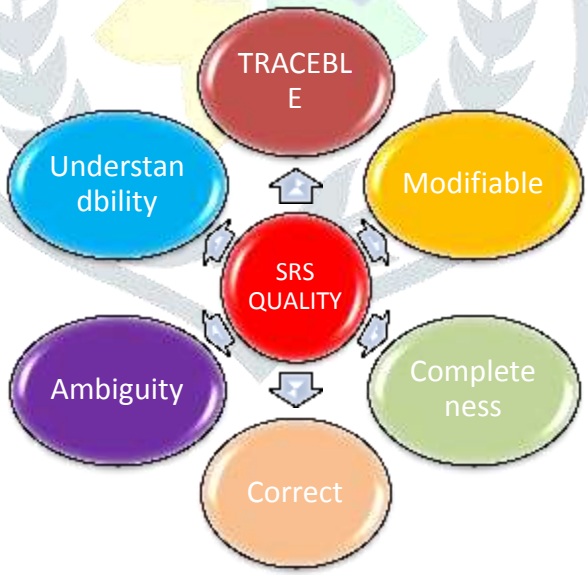

Fig 1 SRS quality issues at requirement stage

II Developing Correlation between Modifiability and SRS quality attributes

The proposed model establishes discourse impact relationship between modifiability and SRS quality attributes. The values of Completeness and Ambiguity can be easily identified with the help of UML diagram. The quantifiable analysis of modifiability is extreme valedictory to induce SRS quality index.

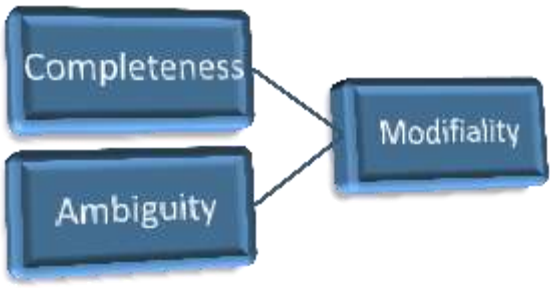

Fig 2 Relationship Presentation

III MODEL DEVELOPMENT

In the above proposed model low- level SRS quality issues are used namely completeness and ambiguity to describe a SRS characteristic. This will be helpful for quantitative assessment of degree to which SRS, component or process hold a given attribute. Using Statistical Analysis software (SPSS) values of all independent variables of the proposed equation (SRS), regression intercept and coefficient of the respective independent variables are calculated. On the basis of the multiple linear regression equation concepts, Requirement Modifiability model has been developed that is given in equation (2). Factor of a class depend upon one or more number of SRS, quality factor may be fixed by using model 'Requirement Modifiability Quantification Model of SRS documentation. The data have taken from [4] and standard values from [5] for model development.

In order to set up a model for Requirement modifiability, multiple linear regression process has been used. Multivariate linear model is given below in Eq (1) which is as follows

$Y = \alpha 0 \pm \beta 1 * x\ 1 \pm \beta 2 * x\ 2 \pm \beta 3 *$..... (1)

Where this equation has

-Y is dependent variable.

- β1, β2 and β3 are the coefficients of respective independent variables completeness and ambiguity. Table 1 shows the development of model. Table 2 presents the model summary about the model in terms of completeness and ambiguity. Table 3 describes the calculate index of modifiability.

Table 1 Model development table

Project	Completeness	Ambiguity	$STD^{Modifiable}$
P_1	0.781	0.130	4.0114
P_2	0.887	0.210	3.4560
P_3	0.890	0.153	3.8050
P_4	0.824	0.126	2.4240
P_5	0.740	0.230	4.0600

Y

= 4.61 - 2.40 *Completeness + 5.43* Ambiguity (2)

Table 2 Index Table

Project	Completeness	Ambiguity	$CAL^{Modifiable}$	$STD^{Modifiable}$
P_1	.838	.143	3.375	3.930
P_2	.783	.110	3.328	3.640
P_3	.687	.121	3.618	3.580
P_4	.879	.173	3.440	3.640

P_5	.924	.216	3.565	3.650
P_6	.834	.133	3.276	3.760
P_7	.735	.164	3.737	3.730
P_8	.738	.187	3.854	3.800

Table 3 Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.996[a]	.993	.990	.020651

a. Predictors: (Constant), Ambiguity, Completeness

IV EMPERICAL VALIDATION

It is necessary to check the validity of proposed model, so we apply to 2t test to check the p value and fount the outcomes the correlation between Standard index and Calculate index. 2 t test also called the Hypothesis test.

Null Hypothesis: There is no significance difference between Standard and Calculated index

Alternate Hypothesis: There is significance difference between Standard and Calculated index

The table 4 presented the 2t test table and provides the p values.

		Paired Samples Statistics					
		Mean	N	Std. Deviation	P value	t value	Std. Error Mean
Pair 1	**CAL**[Modifiable]	3.52421	8	.204845	0.056	2.285	.072424
	STD[Modifiable]	3.71625	8	.113003			.039953

V CONCLUSION

The paper presented the significance of SRS quality and an approach is presented for assessing Modifiability of requirements based on the collection of requirement quality measures. Modifiability is obviously relevant to the context of ambiguity and correctness highly significant role for delivering SRS quality. Subsequently, proposed a Modifiability equation to obtained multivariate linear model have been measured for the Modifiability of requirement.

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