

# Understandability Estimation Model: Requirement Stage

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**Abstract-** The most important quality criteria are understandability for software specification at requirement stage. Understanding user needs is an essential element of SRS and is critical to the success of development stage. This paper describes quality issues of SRS to support user needs analysis that can be analysis based on ambiguity and completeness. Empirical brief studies are described to illustrate how these observations have been applied in practice.

**Keywords — Index Terms** SRS quality issues, User requirement, Completeness, Ambiguity, Understandability.

## I. INTRODUCTION

Understanding user requirements is a vital piece of data frameworks plan and is basic to the accomplishment of intuitive frameworks [1, 4, and 12]. It is currently broadly comprehended that effective frameworks and items start with an understanding of the necessities and requirements of the users [2, 3]. Software system has experienced significant troubles. Most programming building ventures tend to be late and over spending plan [7, 5, and 6]. A few of the reasons for these disappointments are identified with requirements building issues, for example, requirements crawl, inadequately reported requirements, requirements that were difficult to fulfill, and requirements that neglected to address the issues of the user[8, 9]. The quality of a system, including usability, accessibility and social understandability, ambiguity and completeness factors, depends on having a very good understanding of the context of use of the system.

## II. CORRELATION ESTABLISHMENT

Correlation is a statistical technique that can show whether and how strongly pairs of variables are related. Figure 1 shows the correlation between ambiguity, completeness and understandability. For this purpose were used methods of statistical analysis, data collection and processing and methods of mathematical statistics.

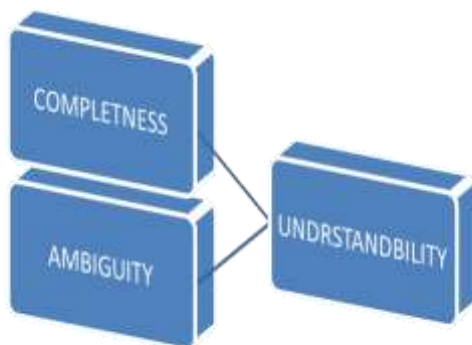


Fig 1 Relationship view

## III. MODEL DEVELOPMENT

Understandability have been considered as a basis to develop the metric based assessment model for considering SRS issues at requirement stage. **Figure 1** shows correlation establishment among, correlation between ambiguity, completeness and understandability and describes the estimation process of estimation model. Summary of the values obtained the model against the ‘Known Values’ of understandability are given in Table 2. The data have taken from [10, 11]. In order to set up a model for SRS estimation, a multiple regression technique has been used to get the coefficients of regression variables and regression intercept, shown in equation 2. Multivariate regression equation is given in Equation (1) which is as follows

Where

- Y is dependent variable
- X1, X2, X3 ... Xn are independent variables.
- $\alpha_1, \alpha_2, \dots, \alpha_n$  are the regression coefficient of the respective independent variable.

Table 1 Model development table

Project	Completeness	Ambiguity	STD <sup>understandbilit</sup> <sub>y</sub>
P <sub>1</sub>	0.881	0.133	1.667
P <sub>2</sub>	0.787	0.210	2.129
P <sub>3</sub>	0.840	0.116	5.569
P <sub>4</sub>	0.772	0.113	6.863
P <sub>5</sub>	0.663	0.158	3.118

$$Y = 22.4 - 15.0 * \text{Completeness} - 44.1 * \text{Ambiguity} \quad (2)$$

Table 2 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.996 <sup>a</sup>	.993	.990	.101808
a. Predictors: (Constant), Ambiguity, Completeness				

Table 3 Index Table

Project	Completeness	Ambiguity	CAL <sup>Understandability</sup>	STD <sup>understandability</sup>
P <sub>1</sub>	.883	.113	4.172	4.000
P <sub>2</sub>	.777	.171	3.204	3.000
P <sub>3</sub>	.834	.116	4.774	4.491
P <sub>4</sub>	.754	.133	5.225	5.275
P <sub>5</sub>	.835	.180	1.937	2.000
P <sub>6</sub>	.758	.167	3.965	3.500
P <sub>7</sub>	.768	.133	5.015	5.175
P <sub>8</sub>	.874	.120	3.998	3.118
P <sub>9</sub>	.840	.116	4.684	5.569

#### IV. EMPIRICAL VALIDATION

Spearman's Rank Correlation coefficient  $r_s$  was used to test the significance of correlation between calculated values of Known Values and Standard Value. The formula for the Spearman rank correlation coefficient when there are no tied ranks is:

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

'd' = difference between 'Calculated values' and 'Known values' of understandability. n = number of projects (n=9) used in the experiment. The rank is shown in table 3 and also provided empirical validated.

Table 4 Validation Table

Project	Calculated Ranking	Known Ranking	$\sum d^2$	$r_s$	$r_s > Value$
P <sub>1</sub>	5	5	0	1	√
P <sub>2</sub>	2	2	0	1	√
P <sub>3</sub>	9	9	0	1	√
P <sub>4</sub>	6	6	0	1	√
P <sub>5</sub>	8	8	0	1	√
P <sub>6</sub>	1	1	0	1	√
P <sub>7</sub>	3	4	1	0.999	√
P <sub>8</sub>	7	7	0	1	√
P <sub>9</sub>	4	3	1	0.999	√

#### V. CONCLUSION

This article displayed the criticalness of SRS quality (completeness, ambiguity) and an approach is introduced for evaluating Understandability of requirements in view of the accumulation of prerequisite quality measures. Understandability is clearly applicable to the setting of vagueness and accuracy profoundly noteworthy part to deliver SRS quality. Accordingly, proposed an

Understandability condition to get multivariate direct display have been estimated for the Understandability.

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