Rule-based Feasibility Decision Method for Big Data Structure Fusion: Control Method

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Abstract — Evaluating feasibility at fusion phase is a method of important value for information system developers to make the fusion more ascertainable. The efficiency element of structure chart is important because it has great effect on all efficiency of the system, delivered finally. Feasibility has been thought as an important element to information system efficiency. Moreover study developed rule-based feasibility decision method and developed method has been verified using experimental measurement. Think of this situation, we discovery feasibility elements namely validity and availability and builds the connection among ascertainable, validity and availability and proves the connection with the help of measuring methods. Then, research combines the practical verification of the developed method for high level recognition. Finally an assumption measurement executes by the two methods to measure the importance of connection.

Keywords - Feasibility Method; Validity; Availability; Feasibility Elements; Fusion Phase

I. INTRODUCTION

Higher measurement coverage may be completed by making a fusion more ascertainable for the same quantity of effort, which as a result increases the confidence to the system. It is an inevitable situation that information system feasibility information is a helpful strategy complementary to measurement.The method proposed in this paper addresses many issues raised by various researchers and practitioners. This method has low-level fusion rules well defined in terms of fusion characteristics. It is evident from literature review that there is no known complete and comprehensive method or fusion available for evaluating the feasibility of big data structure information system taking fusion phase into consideration [1,2,3,4,5]. The set of empirically identified and weighted big data structure design properties are used to assess the ascertainable.

Object orientated technique has rapidly become accepted as the preferred paradigm in industrial information system development environments for large-scale system fusion [2,3].Classes in big data structure system provide an excellent structuring mechanism that allows a system to be divided into well designed units which may then be implemented separately [4]. Building efficiency information system is an important issue considering that information system industries are now used in all kind of environments, including some where human life depends on the computer's correct functioning to get better effect and to get competitive advantage [5]. Big data structure paradigm has created new challenges to measurement, which has to deal with new problems introduced by the powerful big data structure features such as encapsulation, inheritance coupling cohesion, polymorphism, and dynamic binding. One of the major advantage of having object orientation is its support for information system reuse, which may be achieved either through the simple reuse of a class in a library or via inheritance[6].Especially dealing with instantiations of classes and their collaboration may be very difficult when measurement is executed [6]. Feasibility suggests the measurement intensity, and gives the degree of difficulty which will be sustained during measurement of a particular position to identify a fault [7].

II. INFORMATION SYSTEM FEASIBILITY

According to IEEE method, the information system feasibility refers to the degree to which a system or part facilitates the measurements and the establishment of measurement criteria to determine whether those measurement criteria have been met [8]. In order to minimize the measurement effort, an attempt can be made to predict which class is more ascertainable, by looking at two classes [9]. Ascertainable, comprising of certain characteristics of information system that makes it easier or harder to measurement and to analyze the measurement results, is an important element to achieve an efficient and effective measurement process. Information system feasibility study has been an essential research direction since 1990s and becomes more pervasivewhen entering 21st century [10,11]. In ISO 9126 efficiency method,

feasibility holds a prominent place aspart of the availability characteristic of information system efficiency [12]. The determination of feasibility for an already written code may be too costly because in latter the changes are introduced the more expensive they are [9].Designing,verifying and measuring highly ascertainable information system becomes an important and challenging task for information system developers [10]. Much of the research work reveals that maximum efforts have been dedicated with the source code. Availability of a suitable and adequate measuring method at the early phase of development enables early prediction of system ascertainable, therefore, enhances the efficiency of making necessary changes. An extensive survey of literature reveals that processes, guidelines, and tools related to information system feasibility are missing [11]. Thus, there appeared to be need for evaluating the feasibility of information system in early phase of development life cycle without the availability of code.

III. INFORMATION SYSTEM FEASIBILITY AT FUSION STAGE

During the fusion phases of information system, it is represented in terms of requirement specifications, architectural and detailed fusion diagrams [11]. These representations capture the structure and behavior of the information system before it is implemented. The representations are then transformed into the actual information system implementation.A fusion is a process that starts from a study of a domain problem leading to some formal documentation. Information system fusion, in some ways, is an eccentric art. At the first instance, it may result in a method of the domain problem by formally capturing and representing the user's requirements and hence, paving the way for a conceptual relation. Identifying such characteristics and/or patterns would enable one to create representations of information system that evolve into better ascertainable implementations and thus, improve on the time and effort-efficiency during information system measurement. The challenge is to study how these representations impact the final implementation of the information system, with the aim of identifying characteristics and/or patterns in the representations that may enhance or perhaps impair ascertainable. Improving information system feasibilityis clearly a key objective in order to reduce the number of defects that result from poorly designed information system. Aspects of feasibility like fusion validity and availability behavior are the primary focus of good fusion and require special treatment. No doubt, it is a key to the successful development of efficiency information system. It is also the step that will determine the all structure, nature, and approach of the resulting information system.Ascertainable design is more specific then good fusion becauseit is explicitly intended to match a particular measurement context. One proactive strategy that organizations canadopt is to design their information system products with feasibility as one of the key fusion criteria.

IV. FEASIBILITY ELEMENTS AND MAFOR ROLE

It has been inferred from the literature survey on feasibility analysis that there is a heavy need of identifying a commonly accepted set of the elements affecting information system feasibility[11]. It has been found that there is a conflict in considering the elements while evaluating information system feasibility in general and at fusion level exclusively. A number of methods of measuring feasibility have been proposed. Unfortunately, significant achievements made by the researchers in the area have not been widely accepted and are not adopted in practiceby industry. "Validity" and "Availability" are identified the key feasibility elements that accurately affect information system feasibility Decision and fulfill the efficiency criteria,particularly validity efficiency criteria is traceability, understandability, self-descriptiveness and Availability efficiency criteria is complexity, simplicity. A significant effort has been prepared to collect a set of information system feasibility elements namely, validity, understandability, simplicity, availability, self-descriptiveness, complexity, trace ability and modularity that can affect information system feasibility at design time in development life cycle [3,5].Plenty of work has been carried out in describing the need and importance of incorporating information system feasibility since early 90s. Therefore, it comes into view realistic to include validity andavailability for feasibility Decision at fusion phase. Out of these feasibility elements, some of them have their direct impact in evaluating feasibility of big data structure information system,while other elements have less or negligible impact. An endeavor has been made to identify the feasibility elements that accurately affect information system feasibility decision at fusion phase.

V. INFORMATION SYSTEM FEASIBILITY METHOD

Figure 1, shows the connection establishment among Ascertainable, Feasibility elements, Fusion Rules, and describes the decision process of feasibility method. M. Safaei's efficiency method and Feasibility Quantification Fusion [5] have been considered as a basis to develop the Rule-based Feasibility Decision Method for Big data structure Fusion. This involves subsequent steps:

1.A means of linking them.

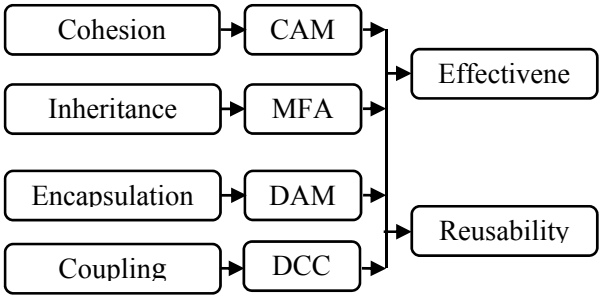

Fig.1 Correlation among testability, factor

2.Identification of Feasibility Elements that influences feasibility of information system.

3. Identification of Big data structure Fusion Rules.

In order to set up a rule-based method for Feasibility decision, a multiple regression technique has been used to get the coefficients of regression variables and regression intercept, shown in Table I.Identified feasibility elements will take part in the role of independent variables while feasibility will be taken as dependent variable. The relative importance of individual identified feasibility elements that have major impact on feasibility decision at fusion phase is weighted proportionally. The values of these fusion rules can be identified by structure chart rules. Decision of feasibility is very helpful to get feasibility index of information system fusion for high efficiency product.Multivariate regression equation is given in Equation (1) which is as follows:

$$Y = a_0 \pm a_1 X_1 \pm a_2 X_2 \pm a_3 X_3 \pm \cdots \pm a_n X_n \quad (1)$$

Where

Y is dependent variable X_1, X_2, X_3,⋯,X_n are independent variables. a_1, a_2, a_3⋯,a_n are the regression coefficient of the respective independent variable. a_0 is the regression intercept, It has been broadly reviewed and discussed in Section 4; Validity and Availability are the major element saffecting information system feasibility decision at fusion phase. By applying the regression method,study already developed Validity Method [3] and Availability Method [5] that is given in Equations (2)and (3) respectively. The method of Validity and Availability forms the strong basis for development of Feasibility Decision Method. Therefore, these identified major f easibility

$$Validity = 8.7 - 1.6 * Encapsulation + 11.1 * Inheri\tan ce - 0.86 * Coupling - 6.4 * Cohesion \quad (2)$$

$$Availability = -37.1 + 3.97 * Coupling + 32.5 * Inheri\tan ce + 20.7 * Encapsulation \quad (3)$$

TABLE I. CONNECTİON COEFFİCİENTS.

Method		Unmethodized Coefficients		Methodized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	58.53	47.82		0.33
	Validity	−4.72	3.74	−0.55	0.34
	Reuse-ability	0.81	0.34	1.03	0.15

Figure 1, gives an Correlation of the main idea. In order to establish a method for information system feasibility decision, a multiple regression method discussed in Equation (1) has been applied. It was observed that every Big data structure Fusion rules affect efficiency element. Consequently considering, the impact of fusion rules namely Inheritance, Coupling, Cohesion and Encapsulation on feasibility contributors "Validity and Availability", following multiple regression method has been formulated that can be used to develop feasibility method for big data structure information system.These two identified elements are further used to measure feasibility index of big data structure information system at fusion phase in development life cycle. Fusionrules namely Inheritance (MFA: Measure of Functional Abstraction), Encapsulation (DAM: Data Access Rules), Cohesion(CAM: Cohesion Among Methods) and Coupling (DCC: Direct Class Coupling) are used to address the key feasibility elements namely Validity and Availability.

$$Ascertainable = \alpha_0 + \beta_1 \times Validity \pm \beta_2 \times Availability \quad (4)$$

For developing information system feasibility method, the data has been taken from, which consist of six commercial information system projects with around 10 to 20 number of classes. The values of fusion rules namely, Encapsulation Rules (DAM), Inheritance Rules (MFA), Coupling Rules (DCC) and Cohesion Rules (CAM) and thevalues of "Validity and Availability" have been used. Using SPSS, math work information system connection coefficients are calculated and method of feasibility Decision is thus formulated as given in Equation (5).

$$Ascertainable = 59.5 - 4.6 \times Validity \pm 0.8 \times Availability \quad (5)$$

The result of Method Summary is most helpful when executing multiple regressions. "R" is the multiple

connection coefficient that is used to know how strongly multiple independent variables are related to dependent variable. "R square" gives supportive coefficient of determination.

VI. DEVELOPING FEASIBILITY DECISION METHOD

The value of Pearson connection "r" lies between±1. Positive value of "r": shows positive connection between the Feasibility and Validityas well as Feasibility and Availability. The values of "r" close to 1 specify high degree of connection between them.The applications for case studies in validation process for the developed feasibility method (Equation (5)) havebeen taken from. We labeled the applications as: Case Study A, Case Study B, Case Study C, and Case Study D. Paper concludes the result of the Pearson connection analysis for feasibility decision method, which shows that for all the projects, both Validity and Availability are strongly correlated with Ascertainable.

VII. PRACTICAL VERIFICATION OF FEASIBILITY METHOD

These computed rankings are then compared with the known ranking given by experts with Rank Coefficient of Connection method. Practical verification of work proves that how significant developed method, where rules and method are able to quantify the feasibility index of big data structure fusion in fusion phase. This validation is an essential phase of research to estimate the developed method for appropriate execution and high level acceptability. It is also the fine approach and practice for claiming the method recognition. To justify claiming for recognition of developed method, an experimental validation of the developed feasibility method at fusion phase has been carried out using try out data. In order to validate developed method, the values of rules are available by using above data set for following projects in paper. Through experiment, feasibility index value of the projects has been computed using the developed method, followed by the computation of feasibility ranking.

We indicate a very important connection between the calculated ranking and given ranking of feasibility decision method, at the 0.01 for a 99% confidence interval.

- $r_s > 0.4815$ means significant results.

- Feasibility Decision method had statistically significant rank connections with 23 of 23 projects.

Coefficient of Connection r_s was applied to measurement the importance of connection between Calculated Values of Feasibility method and its "Known Values". The "r_s" was calculated using the formula given by Coefficient of Connection.

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)} \quad -1.0 \le r_s \le +1.0 \tag{6}$$

Where

r_s is coefficient of Rank Connection.

d is the difference between calculated index values and known values of availability.

N is the number of information system projects for experiment. (In this research n=23 information system projects).

Σ is notification symbol, importance "The Sum".

The connections are good enough with high degree of confidence, which is up to 99%. Therefore; study can conclude without any loss of generality that Feasibility Decision Method, measures are highly reliable and significant at fusion phase.

VIII. KEY CONTRIBUTION AND FINDINGS

The Method has been verified using the same set of try-out data.This Study developed 'Rule-based Feasibility Decision Method for Big data structure Fusion: Control method'.A practical verification of the developed method is also executed using try-out data. Some of the major findings are as given below:

- Low level measures of each of the feasibility elements may be obtained.

- Information system design constructs are most appropriate and power full for controlling information system efficiency elements in fusionphase.

- There is a feasibility of establishing connection between feasibility and other efficiency elements in the order to address them in fusion phase.

- Validity and Availability are identified as two major elements affecting information system feasibility in designing phase.

- Feasibility indexing (TI) is possible using the method "Rule-based Feasibility Decision Method for Big data structure Design: Control method" for Industry project ranking.

- The methods may be generalized and used by other researcher for making feasibility leveling of

projects undertaken.

•Information system feasibility has been recognized as a key element to efficiency information system, addressed in fusion phase of big data structure information system development to produce efficiency information system.

IX. ASSUMPTION MEASUREMENT OF CONNECTION

Moreover to justify the result , a measurement to compute the statistical importance of the connection coefficient obtained possibly will be appropriate. A practical coefficient of connection of Validity and Availability with Feasibility strongly indicates the higher importance and importance of taking into consideration both the identified key elements (Validityand Availability) for making an evaluation of information system feasibility at fusion phase. A null assumption measurement is applied to measurement the importance of Connection Coefficient (r) using the given Equation(7):

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \tag{7}$$

With $n-2$ degree of freedom, a coefficient of connection is evaluated as statistically important when the t value equals or exceeds the t important value in the t distribution important values.

H_0 (T^E): Feasibility and Validity are not highly correlated.

H_0 (T^R): Feasibility and Availability are not highly correlated.

Using 2-tailed measurement at the 0.05 for a 95% confidence interval with different degrees of freedom, the null assumption is rejected (with the exception of, for Case Study "D" of "Feasibility and Validity" and Case Study "A" of "Feasibility and Availability"). As a result, the researcher's claim of correlating Feasibility with Validity and Availability at fusion phase is Statistically justified.

X. CONCLUSION

Feasibility Decision method for big data structure design has been developed and the statistical inferences are verified for high level method acceptability. The developed method to evaluate feasibility of big data structure information system is extremely consistent and correlated withbig data structure design situations. That validation study on this research work proves that developed feasibility decision method is highly acceptable, more practical in nature and helps the information system industry in project ranking. Information system feasibility key elements namely validity and availability are identified and their importance on feasibility decision at fusion phase has been measured and justified. Feasibility Decision method has been verified theoretically as well as empirically using experimental measurement.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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