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# Use Case Building from Gathered Requirements based on Story Telling Techniques for Design Development

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ABSTRACT:

During software planning, the duration of time and budget for development are the important factors estimated. When they are not estimated correctly for the software projects, there is a fall in software projects development due to unrealistic estimates. The core reason for fluctuation in the estimation is, thelack of understanding of the requirements properly. These problems have to be assessed at the time of requirements analysis in the requirement engineering phase so that the deflection is not high. Hence the requirement level computing, is often is weighted of a high score. To evaluate each criteria the story telling concept can be used for reducing the deflection of the estimation. In this method, we can understand the stakeholders' role the requirements which are the base and the business value of each requirement. Hence the analyzing of requirements in view of the stakeholders with regards to the various implementation ways is easier to estimate its need. This research aims to develop a support tool for stakeholders and the requirements engineers to useit in thegathering and analysis of requirements. Implementing the story concept is estimated to reduce the deviations of time and budget plan to near accuracy. The result shows a 75 percentreduction of deviation by using the prediction methods. The prediction method involves Taylors series and exponential methods for evaluation of the requirements to extract the information from the contexts. This method has high accuracy with only about 0.5 percent deviation.

Key words – Requirement gathering, Use case ,Taylor series, Gaussian series

## INTRODUCTION

Artificial intelligence is an available subject which can be used in requirement Gathering system in requirement engineering phase. We would require ontology and various Concepts to implement the proper functioning of the semantics. The requirement engineering phase consists of three phases namely the ontology scope, the domain description and the ontology type. The ontology scope specifies the boundaries which should be included or excluded based on the requirement strategy that we are following. It does not require include the activities of requirements analysis phase.

In the domain description face, we explain the knowledge of requirement of objectives and we have three pioneers in requirement engineering.[2] The interaction between the system sessions and surroundings are considered foremost. The use of techniques which satisfy the system prevents are mostly classification techniques, we merge more than one technique or more than one requirement to form a complete input statement mostly requirements are in form of phrases, which can comprehensively tell the same thing. In addition, we classify both vertically and horizontally the requirements based on functionalities. We'll have it helps in leveling the requirements in the front phases. The data requirements phase specifies the input and output of the data in general. They do not contain any specific function requirements.[1]

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The procedural requirements explain how the computer has to transform or transmit data accordingly.[3] The performance of the system can also be specified as a performance requirement. It is based on time resource and throughput of the system. The time required for the system to perform its functions and the execution to take place is the time requirement the resource, which will be Available for the system to use to perform its functions is the right resource utilization requirement. The throughput requirement is the entire output rate of the system based on its functions and the inputs. There are also ethical requirements such as Integrity requirements and authenticity requirements the Integrity requirements cover the accessing and modifying of data while authenticity requirements are based on the subjects and the resource the system can provide.[4]

And requirements and maintainability requirements. The cost requirement Covers the entire cost of achieving the system to work. The variability requirements are few customized and could be customized functions. The deadline requirements are the deployment date of the system and the maintainability requirement. Covers The overall changes throughout the system in functional state[5].

## RELATED WORK

The ontology can be found from two corpus destination based on requirement engineering. The first corpus is the libraries dedicated for ontologies and the second corpus is to build an ontology dictionary based on the research data for classifying requirements based on requirements engineering. Initially,the semantic search engines are checkedalong with the existing ontology libraries to inspect the existence of a similar ontology in the same domain. Protégé, Swoogle search engine, and DAML ontology libraries are the most popular examples for ontologies. But they are not necessarily sufficient for requirement classification and to return an expected result in the requirements engineering domain.[6]

Avdeenko et al.define a system based on both the structure of ontology and production rules to frame the ontologies.[7] This hybrid model has the property toaid the requirement engineering process and achieves to gather the set of properties, set of validation statements, set of verification statements, resolves ambiguous statements, maintains consistency, and traceability of each requirement. The developed ontology classes classify the various requirements types. The traceability between various functionalities and the elements of software requirements specification documentsis developed based on ontology. Though it helps in enhancing, but there may be missing concepts and missing domains in the developed ontology.[8]

In software engineering, Odeh suggested the classification of non-functional requirements to be done as a semantic framework of ontology adhering to Sommerville classification. The non-functional requiements are understood throughthis framework which acts as a source. This system focuses only on non-functional requirements, while disregarding the functional requirements.The ontology is built purely based on abstract terms and few important concepts are not addressed. By analyzing themeasure of risk, Lasheras et al. innovated a hypothetic descriptionfor presenting and sharing security requirements adhering the ontology to the IEEE standards. Incomplete and Inconsistent requirements affect the understanding of the system in many ways, this description serves its usage in detecting such requirements. In this ontology the main concept addressed is the security and the other features of requirements engineering is not implemented.[10]For improving the support given to requirements engineering domain by semantic tool, Rashwan et al. innovated a classification algorithm which classifiesnon-functional requirements in software specifications. A semantic notation is framed based on the software requirements specification document based on ontology notation.

The software system cost and quality of measurements can be managed to a well balance through this approach, but it addresses non-functional requirements and does not addressing functional requirements. Li and Chen suggested a method of ontology to help security in requirements engineering[9]. After extensive field study, new set of ontology was framed. The list of security keywords, linguistic features, and the relationship between

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security-requirements were gathered as a primary need, manually.This method totally focuses onthe requirements based on security, only those can only be addressed here and not any other functional requirements

PROPOSED SYSTEM

The conceptualization of the relations and attributes are done through different studies of the requirements based on classification techniques. The classification techniques are performed on the various fields of requirement engineering. Several International standards are followed in the field of software product development. These standards help develop a comprehensive idea based on the domain of the software. The key term of the requirements is a data dictionary. And a formulated list of various functions. This data dictionary helps in understanding the requirements better.

| S. No. | Competency Data Classification |
|---|---|
| 1 | Set of requirements to represent input |
| 2 | Set of constraints over the system |
| 3 | Set of input, output and the processed values |
| 4 | Set of instructions to process input to produce output |
| 5 | Set of risks from external factors and improvement inputs |
| 6 | Set of information about the system requirement during deployment |

The next step is the UML diagrams. The diagram consists of a base of the building based on the ontology terms different classification of requirements is done based on the various requirements, which are we have gathered. The next step is the instance definition. This is based on the methodology of concept visualization phase.

It is based on various concepts attributes and values. During the implementation of the system. The requirement classification helps to build a reality in understanding the development tools. All is represented for requirements classification face. Prodigy tool is also implemented to understand the ontology of the requirement. Usually the requirements are classified based on. They are references and they are interrelationships. Around 40 to 50 axions are allocated and the classes are developed.

*4.1 Prediction Estimation*

Relative Increase coefficient (RIC) is an approximation using the Taylor's approximations through the inverse of MLE,

$$\text{RIC} = \frac{\sum_{n=a}^{x}(U_n - U_a)}{x-a} \quad \ldots (1)$$

For all forms of approximation, the relative increase coefficient remains the same, for both Taylor series and Linear approximation

The requirement relation is calculated by solving the logistic curve equation,

$$Ts = T * \left(1 + a\, log_e{}^{-1}(b.t)\right) \quad \ldots (2)$$

where *a*, *b* are constants, and *t* is time. Hence the equation 2 becomes,

$$Ts = \frac{2U_0U_1U_2 - {U_1}^2(U_0+U_2)}{U_0U_2-{U_1}^2} \quad \ldots (3)$$

Taylor series as linear approximation is,

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$f(x) \approx f(a) + f'(a)(y - a)$ … (4)

This is an optimal approximation for *y*when it is close to *a*; since a curve, when closely examined, will start to look like a straight line. Hence, the equation of the curve after *a* is same as the equation for the tangent line to the graph of *f* at *(a, f(a))*.

Due to this, the process is also called the tangent line approximation. The equation for requirement understanding is as follows,

$U_{proj} = Uast + B\,(proj - last)$ … (5)

where B $= \frac{U_{last} - U_{first}}{last - first}$ … (5a)

*4.1.4 Deviation is requirements*

The equation for usage decline is,

$U_{proj} = RIC * (Us - Ulast) * cli$ … (6)

## RESULTS AND DISCUSSION

The ontology prediction plays an important role in this phase of development. It ensures that the ontology is correct based for real world application. The ontology evaluation is divided into validation and verification based on the engineering requirements. It is to check if the ontology is related and correct. It is to also ensures if the ontology is developed correctly based on the specific design standards.

Two approaches can be used for validation process the ontology content is a evaluated based on the requirements while the second method will be using a prediction system to verify the developments. Protege helps validating the developer ontology using original plugin. The different relation between classes instances and their properties along with characteristics and constraints can be used.

For ontology verification we use set off main criteria mentioned in the taxonomy of the requirements classification. Using these requirements classification, the ontology is verified if it is proper. The system uses a statistical model based on Taylor series and Gaussian curve. By using the prediction system, we can approach overcome hurdles and achieve many goals such as inclination towards the requirement, expert level of ontology understanding and also exclude discrepancies.

## CONCLUSION

It's going to be concluded about this study helps in development and evaluating the requirements based on ontology and production systems. The classification of requirement is the most important part in the understanding of requirements engineering. This is mostly driven by ontology and production systems which help to understand requirements better. The proposed system is based significantly on the ontology libraries. The increase in the quality of software requirement specification helps in understanding ontology better for the future. The semantic correction is the most important tool in understanding lemons language of requirements engineering. This system helps a better understanding for requirement engineer to reduce the communication.

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