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Requirement Elicitation Technique: - A Review Paper

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Abstract

Requirement Elicitation is important for developing any new application. Due to wrong elicitation decision most of the system fails. It is impossible to find out requirements and the needs of the users without help of elicitation technique. The most common challenge for analysts during elicitation process is to ensure effective communication between analyst and the users. Most of the error comes in the system because of poor communication between user and analyst. This research paper is based on understanding elicitation techniques and their usage in real time applications, by implementing the Elicitation techniques in a new application. According to this research paper we cover the gap between analyst and the users by implementing requirement elicitation technique.

Keywords: Requirement elicitation & its technique, Interview, prototyping, Questionnaire, Laddering, Ethnography.

Introduction

Requirements elicitation is the initial stage in requirements engineering process definitions. The development of a project depends on requirement elicitation. **"**The success of the requirements elicitation activity gives high impact on the achievement of the goals set for requirement elicitation, which gives the development of correct application" [1]. The process of requirement elicitation in which intensive interaction between stakeholders and analyst will be easy for improving the quality of extended requirements. **"**Requirements elicitation is that process which is used to understand a problem and its application domain**.** The main goal of requirements elicitation is to identify many requirements by using the concept of requirement elicitation we can get several alternate solutions for the particular problem. The concept of requirement elicitation will be defined as initial input statements of desired functions and also the method of expression of a user to express its problem, this term is usually referred to as requirements. The prototype of requirement elicitation should concentrate on the main requirements and this prototype is to be presented before the users. It is not necessary to complete the requirements and the prototype may be expressed in an unstructured way. The requirements will be written in a user requirements document as the output of the requirements elicitation activity .This activity includes the following activities:

- Knowledge of general area where system is applied.
- The details of the specific customer problem where the system will be applied must be understood.
- Interaction of system with external environment.

- Detailed investigation of user needs.
- Define the constraints for system development.

Requirement Elicitation Techniques

Requirements elicitation is the initial stage requirements engineering process definitions. "By using the concept of requirements elicitation techniques system analysts determines the problems, opportunities, and all possible needs of the customers, due to this system developer can construct systems that actually resolve those problems and also covers those opportunities, and/or address customers needs"[2]. Elicitation techniques contain those tools which are generally used to find the exact meaning of existed problems. The main goal of Elicitation technique is to find out as many problems as possible by using the goal of elicitation requirement technique it could become easier for stake holder to get the best and suitable application according to the all possible requirements. Now, Requirements can be find out by interacting with stakeholder and other resources. The process should be represented all the thought and requirements of stakeholders and all those involve in system and it could only be done by adopting the elicitation techniques which is a difficult and intensive task. Requirements elicitation is performed by analysts (also known as systems analysts, requirements engineers, and requirements analysts) using elicitation techniques.

Type of Techniques in Requirement elicitation

There are basically two type of Elicitation Technique.

1. Direct approach: - Direct approach classifies the methods by whom We interact with the domain expert. The purpose is to enhance the Understanding of the problems of system that is currently in used. Most common techniques used are Interviews, case study, Prototype [3].

2. Indirect approach: - Indirect approach classifies them by what type of Information is obtained. Indirect methods are used in order to obtain Information that cannot be easily access directly. Questioners and Documents analyses are its examples.

Some direct type requirement elicitation technique:-

1. Interview: - An interview is a communication between two or more people where questions are created by the interviewer to important facts or statements from the interviewee [4]. Interviews are used to select different extraordinary variety of domains, and are often successful for a good survey [1]. Interviewing is based on the asking phenomenon the domain expert questions about the domain of interest and how they perform their tasks. Interviews can be exist in any form like all those format which is used to identify an unstructured, semi structured or structured. Generally the degree of success of an interview session depends on the questions created or asked (but difficulty about the questions is that which questions should be asked, particularly if the interviewer is not familiar with the domain) and it is also depends on ability of the expert to represent their knowledge. The expert may not remember exactly how they perform a task, especially if it is one that they perform

automatically". In present scenario we can say that the interview methods are used to build a particular type of model of the task. The interview model is built by the knowledge engineer based on actual information obtained during the interview and then with the domain expert. There are also in some cases, the models can be built interactively with the expert, especially if there are software tools available for model creation" [3**].**

Interview Essentials:

- Probably the most common technique of requirements elicitation.
- Interviewers must be open-minded and should not approach the interview with pre-conceived notions about what is required.
- Stakeholders must be given a starting point for discussion
  - a question
  - a requirements proposal
  - an existing system.
- Interviewers must be aware of organizational politics Some requirements may not be discussed because of their political

Implications.

Interviews Different Techniques:-

1. Structured (closed) interviews
   - Stakeholders answer a predefined set of questions
   - Easy to analyze (+)
   - Well-formed questions generate well-formed answers (+)
   - Knowledge about what and how to ask (-)
2. Non-structured (open) interviews
   - No predefined agenda
   - Generating new ideas (experimental, brain storming) (+)
   - sometimes hard to handle (dynamics of discussion) (-)
3. In practice: mixed interview types are normal.

2. Prototyping: The general idea related to the prototyping has been used for elicitation and the things which are used to identify a realistic calculation regarding this idea where there is a great deal of some uncertainty about any type of requirements and there is also a healthy environment where any initial feedback from stakeholders is required [5]. Prototyping is an attractive and rotating process and it is also a very important part of the analysis phase of system development life cycle in real domain. Prototyping can extend the information collection process, because prototyping can convert the basic things (indefinable requirements into definable requirements).With the help of the prototyping we can get feedback from the users, users can see facilities and provide the response and then system analysts can evaluate the response and also modify the existing requirements as well as developing new ones. Prototyping is also used to save the cost and ambiguous work. Developers use the prototyping and analyze the idea of planning concept to improve that how it would work in real life. Prototyping experiment provides the two kinds of actual requirements.

1. Product level requirements: In this level, prototyping define the required functionality is realistic and useful [6].

2. Design-level requirements: In this level, prototyping define such an interface statistics for goals of the system [6].
Prototyping has some advantages & disadvantages:-

Advantages:-

- Helps the developers and reduce the development time.
- Prototypes may demonstrate progress at an early stage of development.
- Prototypes may demonstrate progress at an early stage of development.
- Invite the users to contribute.
- System analysts and developers receive the productive feedback.

Disadvantages:-

- May be follow insufficient analysis.
- Sometimes leads to incomplete documentation.
- After see the prototype, users expect the same performance of the system, but some time it is too difficult.

Some indirect type requirement elicitation technique:-

1. Questionnaire: "Questionnaires are very important technique in requirement elicitation techniques, questionnaires helps to get the information from many peoples, analyst can gather opinions from two ways: to get statistical evidence for an assumption, or to gather opinions and suggestions.
2. Laddering: Laddering method is a form of structured interview that is widely used in the field of knowledge elicitation activities to elicit stakeholder's goals, aims and values analysts and laddering method to create, review & modify the hierarchical contents of expert's knowledge in the form of tree diagram. Basically there are 3 step of laddering:
(1) Create (2) Review (3) Modify
Laddering is mainly used as a way to clarify requirements and categorize domain entities.

3. Ethnography: These techniques are especially useful when addressing contextual factors such as usability, & when investigating collaborative work settings where the understanding of interactions between different users with the system is paramount. In practice, ethnography is particularly effective when the need for a new system is a result of existing problems with processes and procedures, and in identifying social patterns and complex relationships between human stakeholders.

Litreture review:-

Comparison of various elicitation technique

Serial No.	Elicitation Technique	Type	Output
1.	Interview	Direct	Depending on questions asked by the users.
2.	Prototyping	Direct	Evaluation of a proposed approach
3.	Brain Storming	Direct	Collective minds gives ideas, information and requirements
4.	Questionnaire	Indirect	Information used for problem solving.
5.	Laddering	Indirect	Hierarchical map of the task in simple structure.
6.	Ethnography	Indirect	Effective need for a new system.
7.	Card Sorting	Indirect	Classification of entities (dimension chosen by subject) by using games.

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