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Requirement Elicitation for Requirement in Software Engineering

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Abstract

Requirement Elicitation is also called as Requirement Gathering, in which requirements are collected from User, Stakeholders, and Customer to build the system. Requirements elicitation practices include interviews, questionnaires, task analysis, domain analysis, user observation, workshops, brainstorming, use cases, role playing and prototyping by using this practices quality of the requirements are satisfied. A wide variety of tools exist that have been developed and used to support requirements elicitation.

Keywords: Requirement Elicitation, Requirement Engineering, Problem, Techniques

Introduction

In Requirement Engineering, Requirement Elicitation is first stage. Requirement Engineering is divided into Requirement Elicitation, Analysis, Validation, and Management. Before the requirements can be analyzed and modeled they must undergo through the process of Elicitation process. Requirement Elicitation means Requirement Discovery. Requirement Elicitation is very difficult task. The process of requirements elicitation is generally accepted as one of the critical activities in the Requirement Engineering process. Requirement Elicitation is process and normally considered as process of finding out what are the real need of the customer from system. Getting the right requirements is considered as a vital but difficult part of software development projects. Requirement Elicitation is important and fundamental aspect in Software development. Many problems occur at development and maintenance is due to poor requirement gathering, management and requirement change management. Certain techniques are used for requirement elicitation. Requirement Elicitation is iterative and incremental process in developer and end users take part. Success or failure of the Software is depends on the quality of requirement. Quality of the requirements greatly depends on techniques used for Requirement Elicitation.

Problems in requirement elicitation

- **Problems of scope**. The boundary of the system is ill-defined, so that unnecessary information may be given, or necessary information left out.
- **Problems of understanding**. Users have incomplete understanding of their needs, analysts have poor knowledge of the problem domain, user and analyst speak different languages (literally or figuratively). Due to poor knowledge and lack of understanding.
- **Problems of volatility**. Requirements evolve over time, either because of changing needs or because of changing perceptions by the stakeholders. Requirement may change over time. Lack of requirement change management.

Difficuilty in customer needs

- Customer sometimes is unable to specify the **scope of the project.** Sometimes customers specify too many technical details and this may increase the confusion.
- There is difficulty in **understanding the problem.** Sometimes customer could not decide what are their needs and wants. Sometime they have got poor understanding of capabilities and limitations the existing computing environment. Lack of knowledge.
- Customer find **difficult to communicate** with the system engineer about their needs. Sometimes customer may have got some conflicting requirements.
- As project progresses the needs or requirements of the customers changes. This creates a problem of **volatility.**

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Approaches in elicitation techniques

Direct approach

Interview, Case Study, Prototype techniques are used in Direct Approach, that to enhance understanding the problem of system. In Direct Approach more knowledge about the system and genuine data are gathered. Clarity in requirement is high, so requirement meets the quality. Customer and developer meet directly to discuss about the requirement of the system.

Indirect approach

Indirect Approach uses to gather the requirement which cannot gather by Direct Approach. Questionnaires and document analysis are example for Indirect Approach. Large quantity of data gathers by using document analysis. Requirements are clarified by using figures and statistics.

Requirement elicitation techniques

Interview

Interviewing consisting of asking domain expert question about domain of interest and how they perform their tasks. Interview may be Structured, Semi structured and Unstructured. Success of interview is depends on question asked and the ability of the expert to articulate their knowledge to built the system. An analyst will conduct the interview with experienced generic knowledge.

Four phase of Interview

1) Identify the candidates.
2) Preparing the interview.
3) Conducting the interview.
4) Following up.

Document analysis

Document Analysis involves gathering information from existing documentation. It may or may not involve human expert interaction to confirm the requirements. In it we find how expert organize and process the task information and how it complied to present with others. Document have vital role at organization. With the help of manuals of existing system gathering of information about existing system and its functions can be analyze that how it work and how it can perform different functions.

Prototype

Where there is great deal of uncertainty about requirements Prototyping is used or early feedback is need from stakeholders. Actually prototyping is the process to build the model about the system, prototypes help the system designers to build the information system according the

requirements and easy to manipulate for end users. Prototyping is an iterative process and it is also part of the analysis phase of system development life cycle. Helps the developers and reduce the development time. Reduce the development costs. Invite the users to contribute.

Questionnaires

Questionnaires are very important techniques in Requirement Elicitation. By using can gather information from many users, analyst will gather the information. Two ways can gather the information: to get statistical evidence for an assumption or to gather by opinions and suggestion. Quickly information is gathered from large number of people.

User observation

In User Observation, engineer, analyst, developer will observer expert performing the task. This prevents them from inadvertently interfering from process, but doesn't provide any insight why the decision made and what decision to take.

Task analysis

Task analysis employs a top down approach in which high level task break or decomposes into subtasks. Hierarchy of task is built in order to determine the knowledge used or requirement carry them to out. Task analysis gives interaction information between users and system with respect to tasks as well as a contextual description of the activities that take place and it is important to establish what level of detail is required and when components of the tasks need to be explorer further.

Domain analysis

Examining the existing and related documentation and applications is a very useful way of gathering early requirements as well as understanding and capturing domain knowledge, and identification of reusable concepts and components. These types of investigations are particularly important when the project involves he replacement or enhancement of an existing legacy system. These approaches also provide the opportunity to reuse specifications and validate new requirements against other domain instances. Problem Frames in particular provide a method for detailed problems examination in order to identify patterns that could provide links to potential solutions.

Workshops

Workshop is generic name given to different types of group meeting, where emphasis in discovering and developing the requirements for software to develop. There are different forms of workshops for requirement including cross functional which involves different form of stakeholders from varies area of business. Co -operative Requirements Capture (CRC) where like Joint Application Developer (JAD) there is a defined set of activities and the development community is especially involved, and Creativity which encourages innovative thinking and expression.

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Another variation of requirements workshops often used in market analysis is the Focus Group

Brainstorming

Brainstorming is Group technique for generating the ideas about the software to develop. Allow peoples to explore and suggest an idea. Group of 4 to 10 people will take part. Participants are from different stakeholders, take part and quickly produce different ideas without focusing on individuals. One of the major profits in using brainstorming is that it inspires wide ideas and expression, and includes the discovery of new and advanced procedures to existing problems

Brainstorming session has two phases

- Generation phase – offer as many ideas as possible, do not discuss the merits of the ideas
- Consolidation phase – ideas are discussed, revised, and organized.

Preparation for Brainstorming session

- Identify the participants.
- Designate the leader.
- Schedule the session.
- Prepare a meeting room.

Use cases

This technique intend at defining the requirements by portraying complete flow of event to stakeholders in form of storytelling style. Use cases are informal and easy to use that help understanding the requirements and validating them with stakeholders. Certain notations are used in Use case, its best way to collect the requirements from user. Show step by step input and its process.

Conclusions

Requirement elicitation deals with fact-finding, information gathering and getting the requirements. Requirement elicitation techniques are of great importance in all aspect because these techniques are keys to success of any developing system.There are no single techniques which fulfill all the demand of requirement elicitation and information gathering but it is necessary to keep in mind that success of requirement elicitation didn't depend upon number of techniques used but how these techniques are used and how exact the approach is to meet the stakeholder demands.

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