

Conflicts Identification among Stakeholders in Goal Oriented Requirements Engineering Process



Muhammad Suhaib

Abstract: *Requirements Analysis are the most important part of Software Engineering for both System Application Development, and project requirements. Conflicts often arise during the requirements gathering and analysis phase. This research aims to identifying conflicts during requirements gathering phase in software development life cycle, Research, Development, and Technology converted the world into a global village. During requirements elicitation/gathering phase it's very difficult to understand the main objective of stakeholders, after completion of requirements elicitation task final results are used for Software Requirements Specification (SRS), SRS is the highly important outcome of the requirements analysis phase. this is the foundation between the developers and stakeholders or customers, proposed methodology will be helpful to identify those conflicts in very easy manner during the initial phase of the project.*

Keywords: *Goal Oriented Requirements Analysis, Conflicts Identification Model, Requirements Analysis, Requirements Engineering.*

I. INTRODUCTION

This Paper presents a model for identify conflicts among OR Connected sub-goals in goal oriented requirements analysis, a very useful technique to identify conflict among sub-goals during the requirements analysis phase in Software engineering development process. Our method contains five steps, in the proposed method analyst set the initial goal first as per stakeholder needs, stakeholder goal on the top view of goal-graph. The second step which will comes after establishing the initial goal as per customer need decomposed and refinement process to goals of the stakeholder in to sub-goals to objective to reach the parent goal. 3rd step stakeholder will provide the operating values to the or connected sub-goal. The '+ sign' shows supporting and '- sign' shows the non-supporting values, forth step Identifying conflicts among sub goals in initial phase of software development / requirements gathering phase in very way and simple way.

A Process of software Requirements Analysis is the most important and initial part of Software Development that examines together project and software requirements.

Software requirements analysis process contain of requirement elicitation and description. In Requirement elicitation is a phase where an analyst gathers information from the customers, and explains the issues, and try to provide best solutions. Sensibly analysis of software requirements plays a very important role to develop a high quality system and decrease software development costing which are significant and essential points for stakeholders as well. Implementation of the all functionality of the system is highly necessary for Software Systems. Nowadays, many stakeholders are not getting exact outcome that they need from Software Engineers or wishes and needs are not highlight correctly in outcome. sometimes stakeholders do not understand his idea or clear requirements. all stakeholders has his own interest related to his department. Financial Manager aim should be low cost on project but other department or stakeholder do not care about the cost they want functionality of the system. so, easing to identify these types of conflicts among stakeholders' goals in goal oriented proposed the very easy impelled model during the requirements gathering and requirements analysis phase.

II. PROBLEM STATEMENT

Nowadays some researches in Goal-Oriented Requirements Analysis have been emerging simplify to investigate and to recognized stakeholder's needs but still there are some problems that must be solve. present GORA researches are not advantageous for all kind of stakeholders, very less mention about identify potential conflicts identification among sub-goals due to quality attributes as per stakeholder needs.

III. OBJECTIVE

The objective of this research is to present an easy method for identifying conflicts among Sub-Goals in Goal-Oriented Requirement Analysis. Since we studied that software development stage is the most important and crucial stage where we cannot avoid errors and conflicts & can create the cost-effective and best utilizing tool for organizations. But we noticed that many problems and conflicts occur when the accurate and actual information doesn't flow from the stakeholder to the developer. The study proposed the method of potential conflict identification among or connected sub goals in goal-oriented requirement analysis (GORA). However, quality attributes (non-functional) will be using in this study.

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IV. RELATED WORKS

There are multiple techniques available for the Requirement Analysis. Many methods provide guidance to analyze the requirement. This proposed conflict identification method is also top-down approach like other Goal Oriented Requirements Analysis researches such as Attributes Goal Oriented Requirements Analysis

[1] Jennifer Horkoff, Fatma Başak Aydemir, Goal modeling has been adapted and applied to many sub-topics within RE and beyond, such as agent-orientation, aspect-orientation, business intelligence, model-driven development, security, and so on. Despite extensive efforts in this field, the RE community lacks a recent, general systematic literature review of the area. As a first step towards providing a GORE overview, we present a Systematic Literature Map, focusing on GORE-related publications at a high-level, categorizing and analyzing paper information in order to answer several research questions, while omitting a detailed analysis of individual paper quality.

[2] D. Amyot, S. Ghanavati, J. Horkoff, G. Mussbacher, L. Peyton and E. Yu established evaluation method, Agent-goal models offer a way to systematically and graphically capture this information, even as it evolves through continued elicitation. However, the complexity of resulting models makes it difficult to evaluate the achievement of key stakeholder goals within a model without applying systematic analysis procedures. Existing approaches to agent-goal model evaluation focus on automated procedures, without explicitly promoting model iteration and domain elicitation. We argue that “Early” Enterprise modeling requires analysis procedures which account for the incompleteness and informality of early agent-goal models, facilitating iteration, elicitation, and user participation. We introduce a qualitative, interactive evaluation procedure for agent-goal models, using the i* Framework in our illustrations.

[3] Prof. Atsushi Ohnishi, Muhammad Suhaib Established the method for Potential Conflicts Identification Among OR-Connected Sub-goals in Goal Oriented Requirements Analysis Using Matrix. Conflict identifications are very critical and important in software engineering, Application needs the all wishful functionality implementation. In the proposed model main needs and requirements of stakeholders are considered as initial goal in goal graph and analyst put those goals on the top view of diagram. While initial goals are main needs and requirements of stakeholders, product outcomes must satisfy initial goals in result.

[4] Such recognition has led to a whole stream of research on goal modeling, goal based specification and reasoning or some other purpose, like as requirements elicitation, verification, conflicts, management and multiple forms as well.

According to him various software and applications are slumped on account of less quality attributes. An extraordinary piece of the software engineer's life is spent in keeping up quality attributes of thing. All things considered they are called application's utilities. It contains versatility, security, performance and constancy.

[5] This process is linear to iterative structure model, this study on two Australian companies on requirements engineering process, this research study contains qualitative mythology, conducted some interviews with the clients based on requirements engineering activities, after that this study

analyze with their existing models in requirements engineering, experimental study present that it's a very meaningful and have knowledge of actual commitments and demands

The above experimental study shows that this is very important to understand the actual need and demand of stakeholders at the time of software development stage. If conflicts identify at the initial level so output will be effective and efficient. Therefore, scientist has proposed multiple factors and models which can be helpful for maintaining the conflict free software development.

V. TRADITIONAL TECHNIQUES

This technique is consisting on traditional method, where analyst gather large generic data. This data include questionnaires, surveys, interviews and uses organizational charts and process for analyzing the data.

VI. GROUP ELICITATION TECHNIQUE

This technique consists of group interviewing instead of individual. This includes brainstorming session and focus group interviews. This is actually the technique to understand the need of stakeholder with agreement and buy-in conditions.

VII. PROPOSED METHOD

Requirement Analysis is the most important and fundamental piece of software improvement and engineering. It causes analyst to distinguish issues and find out determination in order to lessen cost. The very much performed requirement analysis increase the nature of the item too. These days, requirement analysis is the essential demand of the present IT industry.

Proposed method contains four steps:

- 1 Establishing initial goal as per stakeholder or Customers' needs and demands.
2. Decomposing parent goal in to sub goals
3. Stakeholder offers contribution values to sub-goals
4. Identifying conflicting sub goal among stakeholder needs.

1-Establishing initial goal as per stakeholder needs
Main needs and demand of stakeholders are actually consider initial goals. Analyst put these goals as an objective, at the top of goal graph view diagram. Initial goals are basic requirement of the stakeholder and the results but must satisfy the stakeholder.

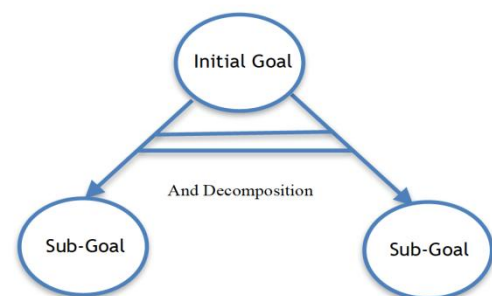


Figure 1: Decomposing Initial Goal in to Sub-Goals By using AND Decomposition

2- Decomposing Initial goal into sub-goals

For achieving the main goal, analyst decompose initial goals in to sub-goals. There sub-goals are essential to achieve the parent goal. There are two types of decomposition of these sub-goals called ‘AND decomposition’ and ‘OR decomposition’. The ‘AND decomposition’ decompose the initial goal into sub goals, AND Decomposed sub goals must be achieved. Besides, ‘OR decomposition’ also decompose sub-goals into alternatives, however any one alternative is also fine to achieve.

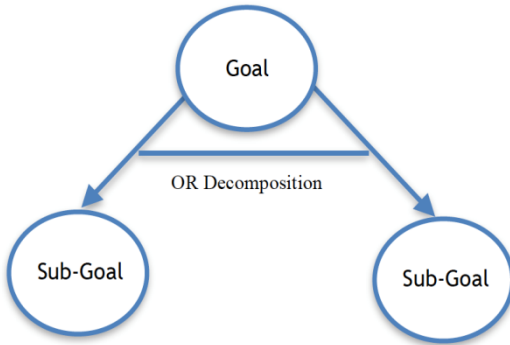


Figure 2: Decomposing Goal in to Sub-Goals By using OR Decomposition

3- Stakeholder Providing values to sub-goals

Stakeholder will provide contribution values to the sub-goal or alternatives. The chart will be formed where each sub-goal will be measure with all participated stake-holder’s contribution values according to his interest. These characteristics, measures and scores will be provided by each stakeholder of the project.

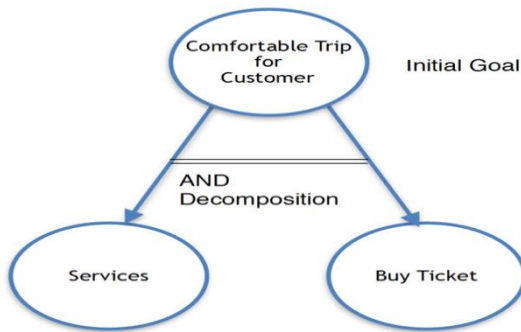


Figure 3: Decomposing and refine Initial goal in to two sub-goals services and Buy Ticket

4- Identify Conflicts

The sub goals chart will help to identify the supporting and conflicting sub-goals as per multiple stakeholder needs. The characteristics and score of compare to the sub-goals will decide, which sub-goal is potential conflict and which sub-goal is supporting to achieve parent goal. Case Study: Japanese Railway(Train) Base Software Development Requirements Analysis (JRBSDRA).

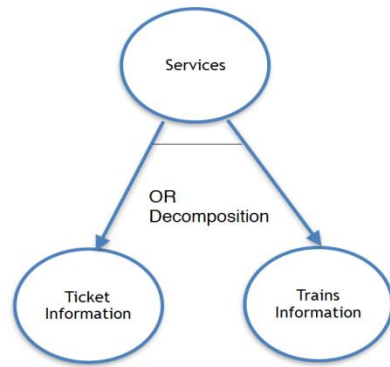


Figure 4: refine services goal in to further or decomposition Ticket Information and Trains Information

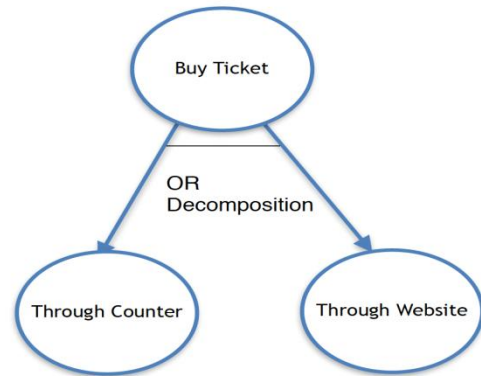


Figure 5: refine Buy Ticket goal in to further or decomposition buy Ticket through counter or Through Website.

Now Stakeholder provide the contribution value as per own interest. In this Case Study we apply two types of Stakeholders:

- 1- Local People
- 2- International Tourist

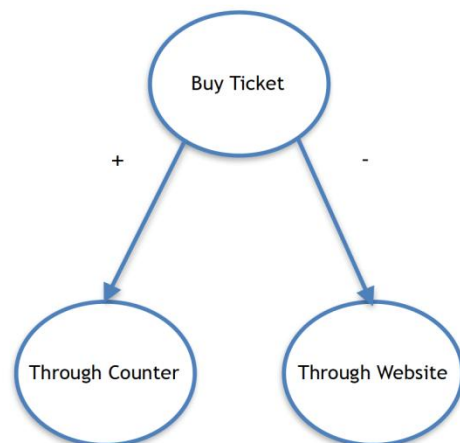


Fig 06: Local People Participation According to own interest and provide values to sub-goals

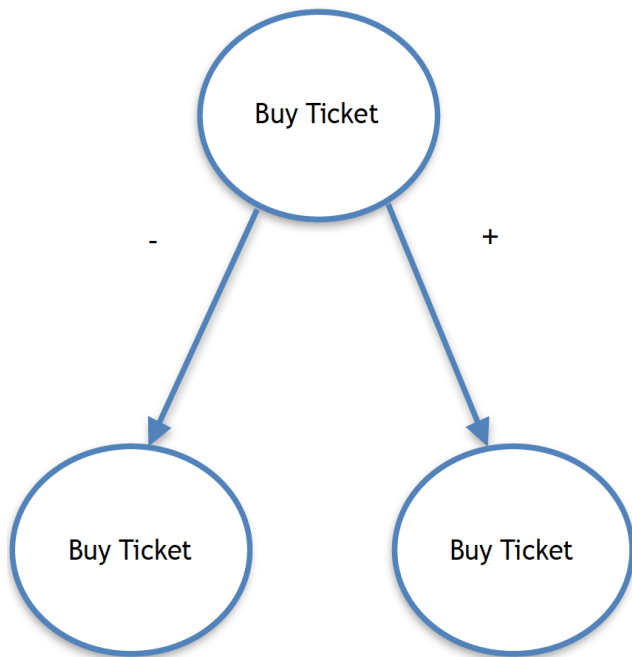


Fig 07: International Tourist People Participation According to own interest and provide values to sub-goals

Usefulness	Through Counter	Through Web
	Local People	+
International Tourist	-	+

Fig 8: Evaluation of Sub-Goals by usefulness characteristic.

Affordability/Price	Through Counter	Through Web
	Local People	-
International Tourist	+	-

Fig 9: Evaluation of Sub-Goals by affordability/price characteristic.

VIII. FINAL EVALUATION

Final Evaluation and Conflicts Identification: In Order to identify conflicts Analyst now can easily identify stakeholders needs through the final evaluation chart, according to above chart provided by two stakeholder have own interest of the system has conflicts to each other for booking ticket due to characteristics of the goals, international tourist do prefer to buy ticket through internet, but local citizen have own vehicle so they prefer to use own transportation which is feasible for them, initially apply this method on just two stakeholder on achieving the goal for understanding the established model.

IX. CONCLUSION

This research paper about the conflicts identification among sub-goals due to stakeholders in goal oriented requirements Analysis a supportive and very helpful model to conflicts identification during Requirements Elicitation phase in Requirements Analysis the goal for understanding the established model.

Furthermore, in this paper four steps of method are described which are:

1. Establishing initial goal as per stakeholder or Customers' needs and demands.
2. Decomposing parent goal in to sub goals
3. Stakeholder offers contribution values to sub-goals
4. Identifying conflicting sub goal among stakeholder needs.

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