A Review of User Requirement Analysis

This research paper conducted by the authors-Martin Maguire and Nigel Bevan deals with the general methods for supporting user requirement analysis to facilitate adaptiveness to a larger range of situations. The User Requirement analysis is labeled as a complex process in which analysts face several problems; this paper addresses the selection of appropriate methods for supporting the user requirement generation and validation procedure as a means to mitigate those problems.
The basis for the user requirement method is described as a simple process combining 4 elements: Information gathering, User-needs Identification, Envisioning and Evaluation, and Requirements Specifications.

1. Information Gathering:
This is considered the initial step for the user requirement analysis process which refers to gathering the relevant information about the users and stakeholders. In this, the authors discuss various methods such as Stakeholder analysis, Secondary market research, context of use analysis, task analysis, rich pictures, field study and observational methods, diary keeping and video recording. Stakeholder analysis is mentioned as considering all the stakeholders and users involving the system. This ensures that their needs are taken into account for the user requirement analysis. Secondary Market Research is seen as researching the published sources that give information about the possible end user markets. This may include research reports, official websites, census data, demographic information, etc. Context of use analysis is discussed as a factor which needs to be well understood for improving the quality of a system by maximum usability and accessibility. An example of an ATM is given; it will be much more usable if it could be used at night as well, in bright or normal sunlight, by disabled people, etc. Authors mention the context of use factors being: user group, tasks, technical environment, physical environment and organisational environment. Task Analysis is a defined as a process that involves expecting a user to do tasks in terms of actions or cognitive processes. It focuses on the user's understanding of the current system and how problems were faced by the user while performing the required tasks. It is capable of showing the people's roles and participation in the system. Simple figures like thought or speech bubbles are mentioned by the authors to be useful for showing particular areas of problem that may lead to new user needs. Similarly, diary keeping and video recording are viewed as processes that can capture the stakeholder's or user's activities and aspirations towards the organization. These data are analysed for further information about their requirements. Therefore, these are the steps taken for information gathering as discussed by the authors.

2. User Needs Identification
After the Information has been gathered, authors discuss the importance of identifying the user needs. For this, a number of methods are mentioned: User survey, Focus groups, Interviewing, Scenarios and use cases, future workshops, evaluating an existing or competitor system. The user surveys are described as involving a set of questions to a small group of users. These contain a mix of 'closed' questions with fixed responses and 'open' questions where

respondents have a freedom to answer. Authors describe this process useful for obtaining quantitative and qualitative data. Focus Groups are defined as a process which brings groups of stakeholders for a discussion. This method is particularly useful for tackling and identifying the current needs since they are the majority of the decision-making in the company or business. Interviewing is seen as a common technique where questions are asked to the users, stakeholders and domain experts to gain some information about their requirements in context to the new system-which is deemed to be very informative by the author's perspective. Scenarios and use cases are seen to give a realistic example of how many users actually perform their tasks in a specified context with the future system. Scenarios are useful to identify usability targets and likely task-completion times of the users. Future workshops are discussed as a way to help designers think without current constraints. Discussions are to be held as to ask users where they think they might be in the future of the company, what their future goals are and what implications these might have for the organization. Finally, authors talk about evaluating an existing or competitor system as a method which provides valuable information to avoid potential usability problems in the new system. The techniques like measures of effectiveness, efficiency and satisfaction are mentioned which could be used as a baseline for the new and improved system in the future.

3. Envisioning and Evaluation

The goal of this method as mentioned by the authors is to develop a prototype including the new user requirements and gaining user feedback to validate and refine the newest inclusions. Brainstorming approach is discussed as a session to bring together experts and designers to formulate new and innovative ideas by freeing the mind to accept any idea that is suggested by anyone-this allows for maximizing creativity. Card Sorting is defined as a technique for unraveling the hierarchy in a set of concepts by allowing users to group items written in a set of cards. This is used often to work out the organization of a website. Affinity diagramming is a method to organise the structure of a new system by allowing group participation. This method is seen particularly effective after a brainstorming session. Prototyping is discussed as a process where designers create simulations of the new systems in a software. A prototype can be manipulated by the design team before it is finalized. This gives valuable insight as to what fits and what doesn't-what may be the best design to the end-users. Design guidelines and standards are defined as the process which is referred by HCI specialists for guidance on ergonomic issues for the new system development. These guidelines and standards are to be followed for a safe and consistent system implementation. Parallel Design are sessions involving groups of designers working simultaneously and independently to create variations in the solutions. The main objective being to develop and evaluate different systems designs before the best solution is chosen from them.

4. Requirement Specification

The authors mention that the general guidance on specifying user and organisational objectives is provided in ISO 13407. There is seemingly great importance in managing changing

requirements of the system as it develops. Several methods are described to support user requirements specifications. They are Task/function mapping, requirements categorisation, organizational requirements, prioritisation, criteria setting, etc. The authors mention that these factors must be taken in account while changing the requirements of the system mainly for health and safety reasons. After these four techniques are analysed, the authors deal with a comparison study in which every method is represented in a table accentuating the benefits and drawbacks. This provides an overview of the several techniques involving user-requirement analysis and servers as a comparison chart. A series of case studies is conducted to show how the mentioned techniques affect user requirement development. The authors mention that a combination of the aforementioned methods is needed for a realistic user requirement development.in this paper. In this paper, the authors have stated the importance of a good user-requirement analysis for the development of any system and have deemed this process as complex and time-consuming. For this, they discussed a model which simplifies this process into four methodologies-each having its own significance and roles. The authors concluded that to ensure a successful outcome, the development team needs to satisfy the requirements of the stakeholders and end-users when the development is complete. In order to achieve this, there shouldn’t be focus on only one aspect of the user-requirement analysis. User needs shouldn’t be elicited only by techniques such as surveys, interviewing, focus groups-which fall under information gathering.