

## **METHODS FOR INTEGRATING USERS IN PROCESS DEVELOPMENT OF PRODUCT**

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**Abstract.** In order to increase the focus on the user during the early product development phases, new methods have been developed. With users' inputs becoming more crucial for product development, incorporating users requirements into the design process has become significant in the continuing quest for reducing time to market. The paper presents results of theoretical research, on methods for integrating the user in the process of product development. The paper highlights a fundamental research that consists of analysis, processing and assimilation of bases knowledge found in international used.

### **1. INTRODUCTION**

Awareness of the importance for integrating users in product development has increased in recent years. However, there is a lack of support for handling this. Moreover, the enhanced technology of products and the increasing number of functions they contain may lead to more time and resources being needed for concentration on technological development, which competes with regard to the time that can be spent on working with user aspects.

Traditional product development theories have focused on technical functions and more or less on integrating users in product development. The existing methods are mostly intended for analysis activities. There is a need for new dynamic methods that focus on integrating the users in product development. The aim of this research work is to identify the methods for users integration in product development, which should support activities in early product development phases.

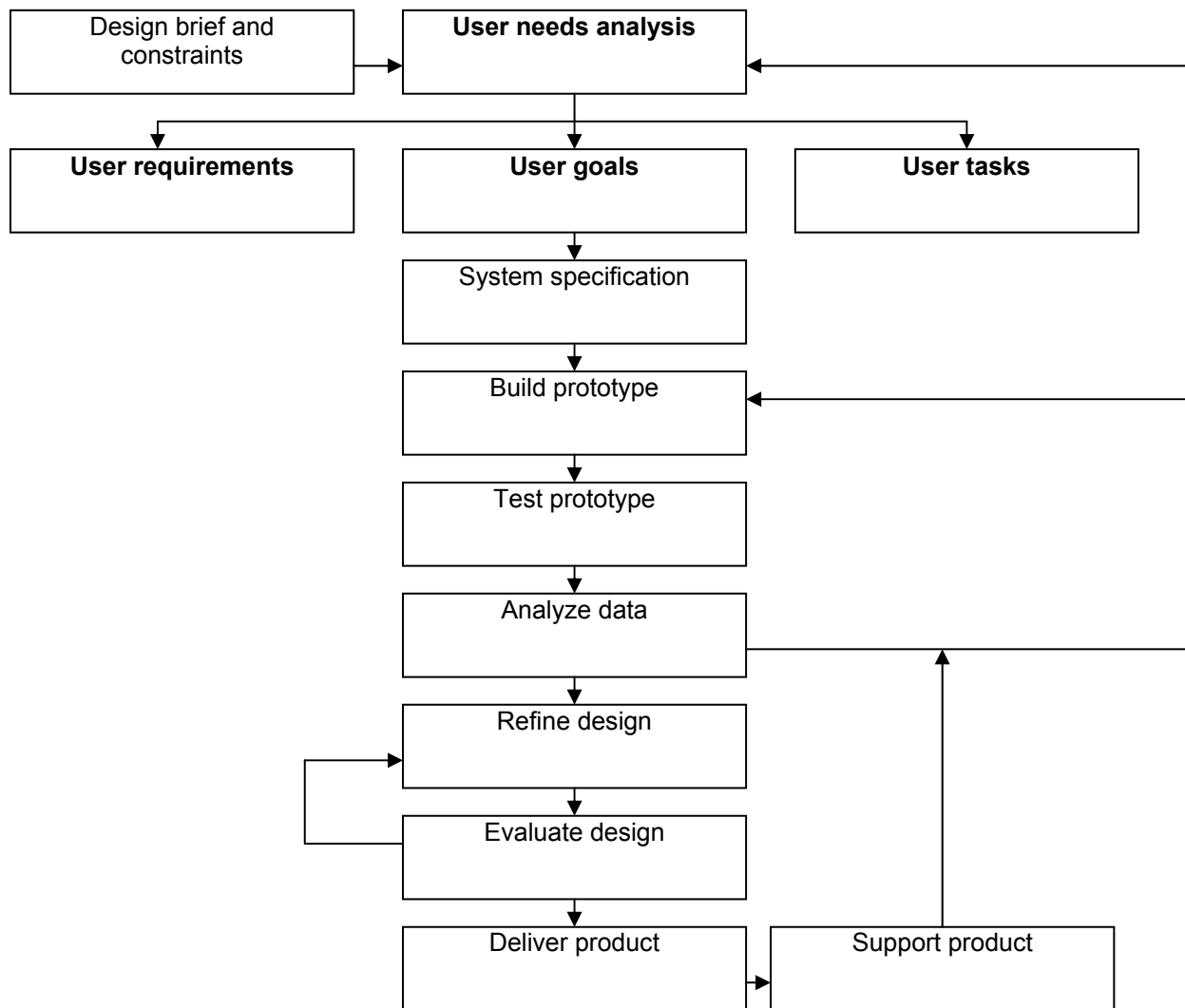
Questions that need to be answered are: “What methods do product developers use today” and “How are new methods going to suit the current work situation?” That it's a need for design methods that support the synthesis activity in early product development stages and take user aspects into consideration. The methods may very well join the different product development disciplines that are working with user aspects, or at least it should be possible for all of them to utilize the methods.

### **2. METHODS FOR INTEGRATING USERS IN PROCESS DEVELOPMENT OF PRODUCT**

Numerous methods and procedures have been developed. They include heuristics, observations, questionnaires, layout analysis, link analysis and hierarchical task analysis [3]. A presentation of methods relevant to this research work follows below.

#### **2.1. User-Centred Design**

A **User-Centred Design** approach will, not unlike other formal design processes, start with an analysis of the user needs. According to Stanton (1998), these needs, together with the functional specification and technical requirements, constitute the system specification. From these data, a prototype is built, tested and evaluated, according to Figure 1. The result of the analysis may lead back to a new analysis of user needs, a modification of the prototype or a refinement of the design, and a new prototype. There may be many loops in the process before the final product is developed.



**Figure 1. A model of a user-centred design approach [3]**

The basis of **User Centred Design** is the knowledge about the users and their tasks (figure 1). Based on this it is possible to develop integrated solutions that meet the users' needs and fit to their workflows. However, the knowledge of the types and relevance of customers has also to be considered to create a substantial advantage for the user and the customers' organizations. Thus, the company needs to understand the users and the market likewise.

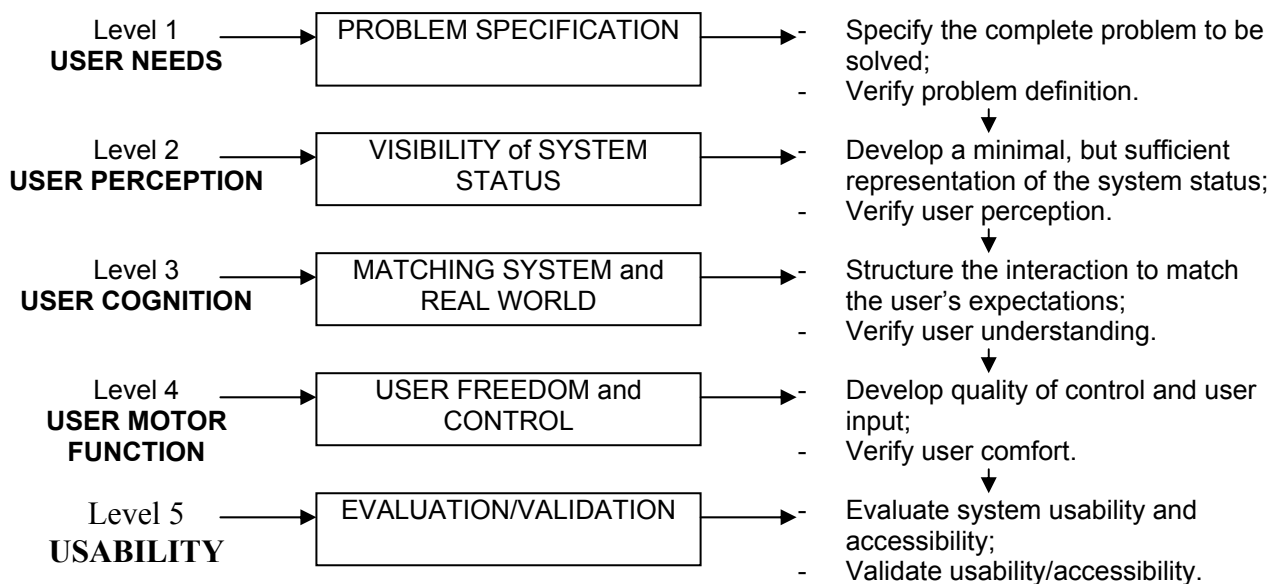
## 2.2. Inclusive Design

The British Standards Institute (2005) defines **Inclusive Design** as "The design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible ... without the need for special adaptation or specialised design." By meeting the needs of those who are excluded from product use, **Inclusive Design** improves product experience across a broad range of users. **Inclusive Design** is not:

- Simply a stage that can be added in the design process;
- Adequately covered by a requirement that the product should be easy to use;

- Solely about designing products for a particular capability loss;
- Naively implying that it is always possible (or appropriate) to design one product to address the needs of the entire population;
- Inclusive design should be embedded within the design and development process, resulting in better designed mainstream products that are desirable to own and satisfying to use.

Clarkson & Keates (2001) present an approach whose objective is to make the products accessible for a large section of the population where all types of users are expected, including elderly and disabled people. The **Inclusive Design** approach embraces a 5-level approach (Figure 2).



*Figure 2. The 5-level design approach [1]*

### 2.3. Scenarios

Scenarios are described as narrative descriptions, i.e. stories, of people and their activities. Every scenario consists of at least one user/actor, which has particular goals, a work context and a sequence of actions and events.

Scenarios can be defined as descriptions of natural, constructed, or imagined contexts for user integration in product development. Scenarios have many different roles in product development. Among other purposes, they can be used for environment, implementation, documentation training and evaluation. Scenarios are also useful for analysing, acquiring and validating requirements.

According to Holt (1989) and Carroll (1995) scenarios could help the design team to focus on the future use and needs of the product. Since a scenario deals with use in a very concrete way, it becomes easier both to talk about use and design for use.

## 4. THE RELATION BETWEEN USER AND THE PRODUCT

A product may have more than one user (e.g. primary users, secondary users) and there are different kinds of relations between these users [2]. The relation between user and the product may be based on control, collaboration, performance/demonstration, meeting, prevention and social relationships. The relation between user and the product is presented in table 1.

| Relation                             | Features  | Explanation  |
|--------------------------------------|---|--|
| <b>Control</b>                       | <b>User with responsibility and dependent user</b>                | The user who operates the product and is responsible for it has a responsibility towards another user who is dependent on him/her and the product.           |
|                                      | <b>User who affects another person</b>                            | The affected user may not use the product for its primary purpose and he/she may not have chosen to be in this relation with the product and the other user. |
| <b>Collaboration</b>                 | <b>Collaborating users of the same product</b>                    | Some products need more than one user in collaboration in order to be used in a proper way.  |
|                                      | <b>Collaborating users with one user controlling the product</b>  | A user of the product may need to collaborate with a person who is not primarily using the product but may use another product.                              |
|                                      | <b>Compromised users</b>  | Users who need to agree with each other when using the product may need to compromise.   |
| <b>Performance and Demonstration</b> | <b>User with spectators</b>                                       | A user may need to handle the product while others are watching.   |
|                                      | <b>Expert and amateur/novice</b>                                  | A person could be at a disadvantage to another user since there may be differences in their knowledge about the product.                                     |
|                                      | <b>Instructor and learner</b>                                     | Sometimes, a person needs to demonstrate and explain to another user how a product works.  |
| <b>Meeting</b>                       | <b>Users meeting via the product</b>                              | Users may not interact physically but could meet through the product.  |
| <b>Prevention</b>                    | <b>User who inhibits another user with the aid of the product</b> | This type of relation occurs when a user prevents another user from doing something with the product or with the aid of the product.                         |
| <b>Social Relationships</b>          | <b>Person who wishes to influence other persons</b>               | A user may want to use the product to give those around him/her the impression of being a particular person or to show group affiliation.                    |

**Table 1. The relation between user and the product**

### 3. CONCLUSIONS

Since the aim of the research was to analyzing methods for integrating user in product development, it is relevant to consider theories of relations between designers and users, the nature of rewarding design methods and an overview of existing design methods which take user aspects into account. The purpose was also to investigate whether the methods for integrating user in product development could be based on existing theories and methods for design.

Therefore, the theories of technical systems, domains and the design process are of great importance. User aspects should be combined with engineering design theories and therefore a good approach is to investigate whether the user can be described in a similar way to the technical system.

In this paper, we have identified several methods for integrating the user in the product development process, and we established relationships, which may be between the user and product.

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