

Looking Inside

Understanding Communication in the Organisational Context of Software Design

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1. INTRODUCTION

Organizational issues involved in software development and application have long been the focus of the Information Systems (IS) field. Nevertheless, some approaches in the Human-Computer Interaction (HCI) field also have concerns about organisational aspects influencing the design and use of computational systems. HCI and Information Systems have evolved from different backgrounds and focus on a common end: to achieve high quality in software usage (Ehn and Lowgren 1997). While quality has been widely stressed in literature as a goal of the software design methodologies, quality as a result of the interaction among the groups involved in the design and development processes has not received the same attention. This work investigates the software production process by addressing communication among work groups involved in an organization that produces software.

Even though the organisation as a whole may have a single clear set of goals and interests, individuals and groups within the organisation may not share these goals and interests in the same way. Understanding and integrating the whole development process requires an understanding of how

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different groups in the organisation engage in a process of negotiation towards the final product. Our focus in this work is on understanding the communication processes that take place between groups in a software design organisation, the nature of the changed messages in relation to their meaning for the audience, and how they impact and are propagated in the whole process.

2. UNDERSTANDING COMMUNICATION IN THE SOFTWARE DESIGN PROCESS

Semiotic approaches perceive the software interface as a communication act between designers and users, using the computer as medium (Andersen 1997). The designers establish the limits of this communication and create a set of signs that users can activate, which means that designers are the senders in this communication model. In this work, we argue that to understand the dimensions involved in the construction of the interface as a message, it is important to develop a better understanding of the dialogue that occurs among the many participants involved in the design and development activities. Besides designer/user communication, there are other groups also engaged in some type of communication through different channels: designers talk to marketing people, customer support mediates between developers and users, external consultants help both users' and developers' organisations, etc.

Several models of communication have been presented and discussed by thinkers from diverse philosophical schools. For a long time, Shannon and Weaver's Mathematical Theory of Communication drew strong influence in our understanding of communication. The direct transposition of the models derived from the Information Theory, to understand human communication has many drawbacks, however, as discussed in literature (Cherry, 1980; Brown, 1995; Liu, 2000). One of the difficulties is the unidirectional movement associated to the communication act, from a source (or addresser) to a receiver (or addressee). Receivers and senders actually engage in dialogues involving a process of meaning negotiation towards a common understanding.

In the software design process, not only designers and users, but also the remaining agents must engage in a process of negotiation in which communication acts occur and messages are exchanged using different channels. A fractal model of communication was proposed in our previous work (Salles *et al.* 2000), to capture the nature of the communication processes involved in the software interface design.

3. META-MODELLING A PRODUCT DEVELOPMENT CYCLE

In our perspective, the interface is understood as a unity-message that reflects what was grasped through the fractionated messages. So, the interface as a unity-message is directly affected by the choice of channels and messages used to compose the fractionated messages during the design process. Usability engineers, for example, communicate with users using a usability test as channel. In designing the test, they communicate with the emergent artefact (the test) through a checklist as a channel, in an inner level. This means that, in designing the interface, or the unity message, many fractionated messages are being exchanged. Each one of these messages should be carefully designed to ease the designer-user communication through the unity-message.

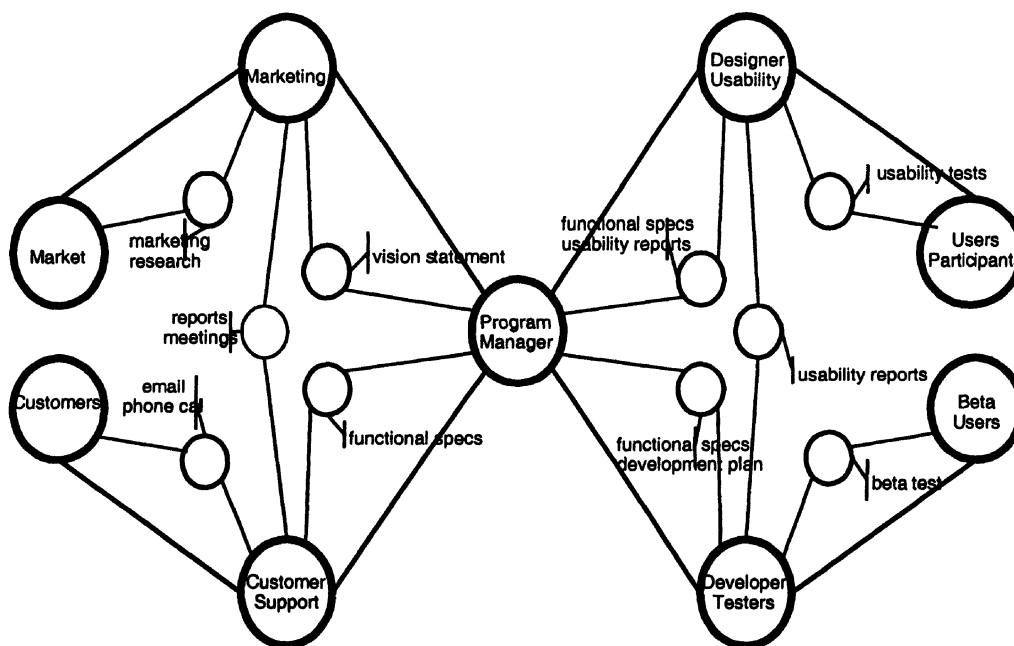


Figure 1. Meta-Model for the product development cycle at ORG

The meta-model was applied to a major software design company, here given the pseudonym “ORG”, which employs leading professionals in all areas involved with the creation of off-the-shelf commercial applications. Figure 1 illustrates the meta-model applied to the product development cycle of this particular organisation. An overview of the communication among the groups is shown in a simplified way, with two levels of the fractal structure.

Results of a first analysis on the generated meta-model showed that new communication channels and new messages propagation could lead to a more integrated design and development process and potentially to a better product. The meta-model showed us, for example, different categories of “users” communicating to different work groups. Also, the already existent groups of support to the clients and beta-testers would be powerful additional channels to identify usability problems, as they have direct access to problems pointed out by users. Certain channels, despite being present, do not establish a psychological connection between two groups. As an example, while developers think in functions as units of implementation (consistently with marketing objectives), designers need a much broader view that is not communicated by the specification document.

Summarising, the fractal communication model organises an analysis space that unifies some current independent practices of design, while it highlights issues that deserve more investigation. This view of the organisational context of software development, and the several questions addressed with the support of this meta-model enable a search for continual improvement in the process and potentially the development of more usable and useful software.

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