

Making the common object of a work "visible" and reflectable: a case of emerging software product

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Introduction: a need for a "visible" object of work

The most fundamental point of reflection for a reflective practitioner is the purpose of the work involved: are we doing the right thing? The cultural-historical activity theory (CHAT, see e.g. Kuutti 1996), one of the frameworks which have gained interest within the HCI research during the last years, has a good concept to deal with this, the concept of object of a work activity. One of the foundational hypothesis of the CHAT framework is the idea, that when seen from the viewpoint of an individual actor, work and also other spheres of life is organized into activities which are largest meaning-giving units within an individual horizon. According to the theory, activities are separated from each other by their object, which is the purpose of the corresponding activity: a potential fulfillment of a need that can be reached from where we are now, when we organize ourselves accordingly, select the right tools and transform the world by a set of directed, interconnected actions leading towards that fulfillment.

If the object of a work activity is well known by participants, it is a good beacon: at every moment everybody can check and compare the current state of affairs with the object and reflect and correct the direction, if needed, and thus there is a strong self-organizing feature in the arrangements. Correspondingly, if the object is known only by some, but it is not shared and common, there is a considerable effort in communicating the object, and the work has to be more strictly organized from above to ensure that the direction is right and the intermediate results will serve their ultimate purpose (the popularity of the terms of "mission" and "vision" in current management literature are clearly related to this issue).

It is, however, characteristic to human life, that objects cannot be easily "given" from above or from outside, but they must be "invented" or appropriated by the actors themselves, otherwise they will not have such organizing power – the given outside object, and the corresponding activity will exist only on paper, and the participants will be engaged into something else instead. Because objects and activities cannot be given, they are often not very clear to participants, and even when they may be clear for a while, they are not fixed. When situations develop and unfold in the course of actions, new possibilities and limitations reveal themselves, and the object will evolve accordingly. In times of crisis, an evolution is not enough, but it may be necessary to change the object radically. No wonder, that a considerable slice of work in organizations is, in a way or another, devoted to figure out the current object of work and communicate it to other stakeholders. Working out the object of work is a major point of reflection within work organizations.

It would be helpful, if we had ways of making the object more "visible", comprehensible, and even manipulable, and thus also a better tool for reflection. And given the prominence of information technology at the workplace one would like to see, if it could help us in this. We will illustrate the issue with a practical example, where different communities of stakeholders needed to produce a common conception of their object. The case is related to an ongoing doctoral thesis work in Oulu.

Case: New product development in an IT company

The ideas presented here are based on several years' fieldwork, observation and experiments in a medium-sized software company. The case company operates in software product business. It has sales offices, development centers and partner companies employing about 1000 people worldwide. The business consists of few different products for well-defined markets. Our analysis has been concentrating on their one new product idea and the emerging business for that (during our cooperation the unit consisting of about 100 people). The new software was more like an enterprise solution type of product than a true mass-market package software.

The development of the new product run into problems. The market and needs of the new innovation were not so clear in the case company and the software product itself was much more iteratively produced than it was assumed. The product seemed to be in a constant design phase; the very early releases were implemented for the pilot customers and later on their applications were updated based on the new releases. Both the company and its sales partners based their businesses on these early customers. Company was trying to understand the customers and generalise the market needs from these early pilots. At the same time sales partners were demanding new properties to satisfy their prospects. There was an obvious danger that the company long-term visions and the pilot customers needs were not always in harmony with each other, but there seemed to be no way to reconcile them.

With the iterative nature of development work, there was a potential to reflect the long-term visions with the market. Ongoing interplay between the representatives at the customer interface and the product developers would be the prerequisite for this. However, the product alone was not enough as a common focus for their interaction. Also the dispersed information about the business assumptions of the different stakeholders needed to be shared. However, this was lacking a suitable means for communication. There was a need to keep the different functional actions better focused during the early iterations in order to find the best possible business for the new product. We found a special piece of knowledge that needed to be shared among the different stakeholders around the new business area – a shared vision about the product-market-user -combination. As stated in one of the workshops, there was a need for “more systematic way of combining the strategies, technology, vision and the requirements as to company targets” (memo 12.10.2000). In short, what was missing was a new cross-functional work activity of defining the new product, the emergence of which was made difficult by different visions each function had about the potential object of the activity and also their fluidity and constant change.

Without a common frame of reference it was impossible to understand “how to evaluate and efficiently utilise the current implementations against these targets”. In order to define the best possible fit between the product and the user/market needs, they not only needed to share their assumptions about this, but they also needed to reflect these assumptions against their everyday practice. The "shared vision about the product-

market-user –combination", is a hypothetical and tentative idea that evolves all the time when more experience is gained.

As a result we did build our tentative model for the interaction between the different stakeholders. In our market centred approach to product innovation development (MAPID) the new software product development is seen as a process of iteratively both to identify the market needs and to improve a product to match them, cf. Figure 1. Next is an illustration of the main elements of the model.

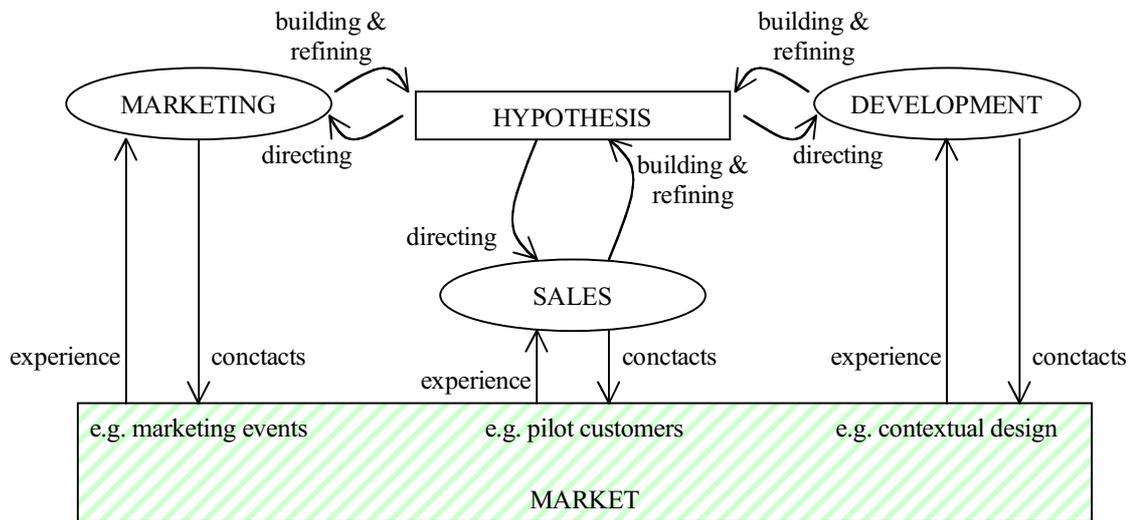


Figure 1. The MAPID model.

Creation of the product-market-user vision is seen as a hypothesis of the existence of a market and a potential product for this market – an emerging object for a new product business activity. The hypothesis (or there might be several of them) will be a combined view of the different stakeholders: the shared assumptions and the generalised view from the early contacts with the field (e.g. pilot customers). Developers need to understand how the marketing and sales people see the future business and what are their needs for the development. Marketing and sales people need to understand what kind of solutions the development is able to offer for them now and in the future.

The hypothesis evolves over time driven by the actions at the customer/market interface. Daily contacts with the possible customers (marketing and sales events, customer pilot projects, contextual design etc.) are the main points for the evaluation of the current hypothesis. The hypothesis is both directing the everyday actions of different stakeholders, and constantly questioned, validated and refined based on the experiences from the field. When developing a new software product by the means of pilot customer projects, each customer case should be treated as an experiment to validate and correct the current hypothesis. The concrete information about the real customer case should be contrasted with the assumptions described in the hypothesis.

We implemented a practical version of this model in the case company during 2002-03. Initially we had fancy ideas of rich IT support for both the object/hypothesis itself and the interaction around it, but we came soon into our senses and instead decided to produce something that could be taken into immediate use; without any further training, using already available tools and means for communication, and with minimal additional workload to our stakeholder users. We ended up with a true technology mundane solution of pre-structured Word-templates, predefined shared directories, e-mail

facilities, and some organizational arrangements – a new committee, and some guided practices for producing and reflecting these templates, cf. Figure 2.

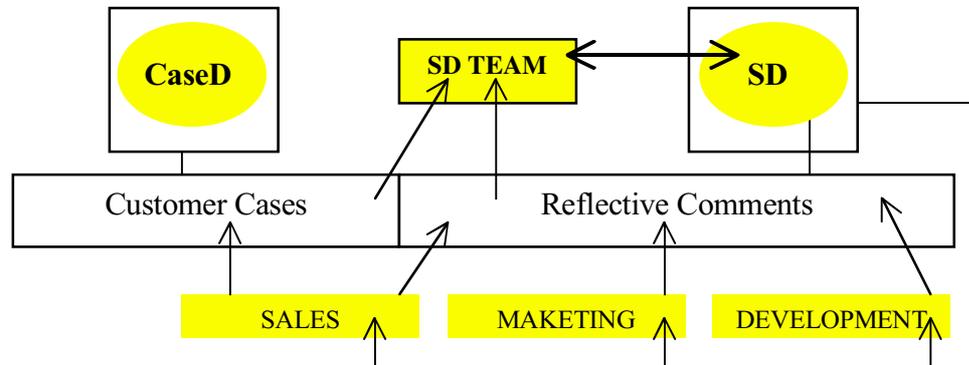


Figure 2. The implementation of the MAPID model in the case company.

The main document template (called Segment Description; SD in short) is used in documenting and sharing the hypothesis. It needed to be concrete enough to help to focus their daily efforts. Each SD has an owner appointed by the company management. The owner is responsible to collect a cross-functional team to produce the SD. The team would use all the available information to build a new SD. All stakeholders are able to comment the current SD based on their daily contacts with the field, and that way support the evolution of the SD. Comments need to be saved for further refinement of the SD. There is also a template for documenting the early and real customer cases (called Case Description; CaseD in short). This template was following the structure of SD in order to ease its reflection. The owner of the SD is responsible for the management of the teams work and the iterative progress of the SD.

In line with the CHAT assumptions, we did not invent the model by ourselves and give it to the organization "from above", but it was co-invented and constructed during a longer period. Thus the results were also accepted very well by the organization, and it started to become part of their thinking and vocabulary. When the system was set to work, it seemed to start to produce such interactions we have been hoping for. However, our project funding ended in early 2003, and we have not had possibilities to follow clearly, if our work has had any lasting effects. After summer 2003 we have not heard anything from the company (mainly because the main researcher, second author, has been busily writing her thesis). We hope that we can update the situation for the workshop.

Kuutti, K., *Activity Theory as a potential framework for human-computer interaction research*, in *Context and Consciousness: Activity Theory and Human Computer Interaction*, B. Nardi, Editor. 1996, MIT Press: Cambridge. p. 17-44.