



# Strategy mapping: a method for making value tensions explicit in design and deployment of IT systems

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## Abstract

A core activity promoted by the value sensitive design approach is the iterative and integrative performance of conceptual, empirical and technical investigations. In this essay, I will contribute and reflect on a method for conceptual mapping through which such tripartite investigations can be supported in ways that are open to stakeholder participation.

**Keywords** Collaborative conceptual mapping · Value sensitive design · Stakeholder participation · Strategy map

## Introduction

How can value tensions between stakeholders be investigated in a participatory manner during the design and deployment of IT systems? To attempt to answer this question I will briefly report on experiences from applying the strategy mapping method, a well-established method within management studies for collaborative conceptual mapping of organizational development activities (Nils-Göran et al. 2003). When applied to information systems studies, the proponents of strategy mapping claim that values are implicated, and should be explicitly presented in design, development, deployment and use of information technology (Falk et al. 2016). Based on my experiences from applying the method in both research and education, I will argue that the strategy mapping approach can contribute with ideas on how the ambitious value sensitive design (VSD) inquiries that integrate conceptual, empirical and technical investigations can be performed in practice.

To give a perspective on the importance of applying integrative tripartite investigations in information systems studies I will refer to a recent contribution to Human Computer Interaction (HCI) made by Antti Oulasvirta and Kaspar Hornbæk in a paper to the CHI'16 conference (Oulasvirta

and Hornbæk 2016). In this paper they argue that the primary goal of HCI research is to enhance its *problem-solving capacity*. Their starting point is that most HCI research is about three main types of problems—*empirical, conceptual, and constructive*—an observation that parallels the tripartite approach of VSD. To explore how HCI is performing as a problem-solving activity they review a sample of 21 papers presented at the CHI'15 conference that received Best Paper awards. They found that slightly more than half of the papers, 12 out of the 21, addressed what they defined as empirical problems. Eight of the 21 papers were mainly about constructive problems, while only one had the primary goal of addressing conceptual problems (Oulasvirta and Hornbæk 2016). This under-representation of conceptual investigations leads the authors to sum up their “snapshot of today’s HCI” with the observation that “[t]here is a split between addressing practical and theory-oriented research problems. This contributes to incommensurability of HCI research.”

The Oulasvirta and Hornbæk critique of the split between theory and practical problems in HCI is often expressed by VSD researchers as underlying their quest for a tripartite approach (Borning and Muller 2012; Friedman et al. 2006). Also, it should be noted, while Oulasvirta and Hornbæk point to the under-representation of theoretical studies in the field as a whole, the VSD commitment to integrate conceptual inquiries into the empirical and technical explorations, and thereby in the study as a whole, makes the conceptual considerations in VSD even more central than in individual studies that are exclusively concerned with theoretical analysis.

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In Oulasvirta and Hornbæk's argument for the enhancement of problem-solving capacity they present five criteria for what they argue should constitute HCI research (regardless of its problem type(s)): *significance, effectiveness, efficiency, transfer and confidence* (Oulasvirta and Hornbæk 2016). Their identification of the *significance of the problem* as the first criterion of what HCI research should focus on sheds new light on the role of the conceptual and theoretical investigations in the VSD tripartite set of inquiries. It is in the selection of problems to address and concepts and theoretical constructs used to define them that the values involved can be declared. The conceptual investigation also has to explain, with reference to theoretical frameworks, the significance of the problem and argue for the proposed solution. All this indicates the importance of the continuous rethinking of the concepts used in the empirical and technical investigations of a design project. Ideally, a conceptual map of values, problems and possible alternative solutions should be kept alive throughout any single project. And, I will argue, the strategy mapping method provides a method for representing these key dimensions of a project in conceptual maps. Maps that evolve during the project work while designers share them in dialogues with stakeholders and engineers at (ideally) all strategic phases of a project.

### Searching for ways to make human values explicit in design

My interest in the strategy mapping method grew out of practical research and educational work in which a series of interrelated values and value tensions had to be made explicit. In a workplace software quality evaluation program results regarding some 30 quality criteria were presented in certification reports and yearly user survey. During the first 5 years of this 11-year program, tables, bar chart diagrams and quotes from interviews with users and management personnel were used to present the results in protocols and survey reports (Walldius et al. 2009). In the 6th year an economist and management consultant recruited to the research group extended the project's methodology with the strategy map method. For the first couple of years, the method was used only within the research group to summarize the key software design and deployment activities performed and benefits documented in the certification protocols (see below). To take advantage of the method as a collaborative analysis and dialogue tool the method was applied in three research projects in parallel with the evaluation program. Map based dialogues on project goals and alternative design approaches were carried out with physicians and health management personnel (Walldius and Lantz 2013) as well as with management personnel in the transport (Cöster et al. 2012) and banking sector (Rönnbäck et al. 2011).

Among the research articles on strategy maps, introduced to the research group by the economist, one stood out for its pedagogical qualities (Eppler and Platts 2009). The article was put up as mandatory reading in a course in Cooperative Design that engaged students from both HCI and management studies in joint design project challenges. Supervising the course for 6 years have given the research group a deeper understanding of the pros and cons of the strategy mapping method. The course assignment was to use the maps as a means for giving project members and stakeholders a common image of what human values were implicated in the project, how the values were relate to each other (tensions), with what concepts and terms they could be described, and how both tangible and intangible dimensions could be estimated, measured and validated.

### Strategy maps: what are they and how do they work?

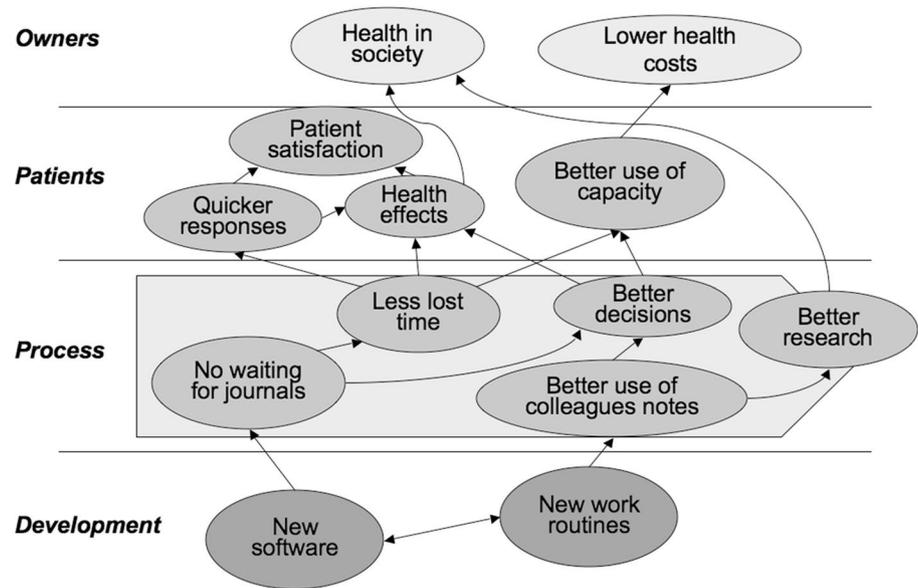
The practice of drawing strategy maps is a common method for management personnel who need to include non-financial aspects in their day-to-day interpretation of the value tensions they have to account for (Falk et al. 2016). The strategy map format is an extension of the Balanced Score Card practice (BSC), introduced by Robert Kaplan and David Norton in 1992 (Kaplan and Norton 1992). Today BSC is regarded as one of the dominant paradigms for managing the balance between financial and non-financial values in private as well as (and notably in Sweden) in the public sector organizations (Falk et al. 2016).

The strategy map is a horizontally layered diagram format. In the upper-most layer the values and goals of the owner are represented in concise rubrics. In the layer beneath, the values experienced by customers that, when satisfied, generate owner values are depicted in the same way. In a third layer, the sought for effects in operations that in turn generate customer values are detailed. In a fourth layer, the new designs of artefacts, processes and competence development efforts that in turn promote those effects in operations are identified ("New software" and "New work routines" in Fig. 1).

Behind each entity in the map is a set of specification of the respective entity (e.g. Initiatives, Measures, Targets). Being a conceptual map, the team members responsible for each drawing iteration are prompted to rethink each concept used in the map and its associated initiatives and evaluations to be carried out. This conceptual investigation in turn prompts a rethinking of the empirical and technical investigations needed to inform, assess and explain the relationships among the design efforts, effects and values articulated in the map. Obviously, as the business and political environment is in continuous change, these investigations have

**Fig. 1** A strategy map that summarizes values for *owners* and *patients*, and of *process* effects gained from the *deployment* of a Medical Record System, as seen by users and management in a user-driven software certification assessment

### Huddinge University Hospital - strategy map Take Care (spring 2009)



UsersAward certification protocol, Olve, Lind, Walldius 2009

to be made iteratively. And the physical confines of a map force the team to integrate relevant new results and re-interpretations into each successive version of the map. When the different stakeholders affected by a firm's new strategic decisions are brought into the team's drawing sessions, the *significance* and *confidence* of each and all concepts and relations have to be tested. Which in turn requires that key concepts, estimates and relationships have to be re-investigated and renegotiated. In Fig. 1, the results from a software certification of the deployment of a Medical Record System (MRS) are summarized in a strategy map. The results were gained from user surveys and interviews with users and managers performed at three hospitals in Sweden. Interviews and surveys were based on a set of 29 questions and the results were reported in a standardized protocol with diagrams and quotes from stakeholders and where the strategy map provided the overview of the certification outcome (Walldius et al. 2009).

This example of a mapping practice illustrates how explicit descriptions of stakeholder values (on the two upper layers) can be related to design initiatives and the effects they have in operations (on the two lower layers). It should be pointed out that, in practical use, the layering is quite flexible and allows for including layers for additional stakeholders, such as employees and partner organizations. In collaborative uses of the maps that focus on *the mapping activity as a communicative practice* between designers and stakeholders, it is up to the stakeholders themselves to ascertain that the problems addressed in the map are indeed significant. That the explanations given about the relations, and indicators proposed for evaluating them, are valid. And

that the values declared make sense in the deliberative activity of naming them and agreeing on ways to evaluate how they are met in practice (Falk et al. 2016).

In the case of the MRS map from the university hospital, it worked well for communicating the certification findings to, and receive feedback from, some of the direct stakeholders, the physicians. However, the map's high level of abstraction provoked further studies in which the general concepts depicting values, actions, effects and relationships were problematized and where its underlying empirical and technical investigations could be tested. It was here our educational initiative helped to extend our experiences of the methodology's opportunities and limits. One of the project course assignments was to let the students participate in six on-going development initiatives at a set of clinics at a Swedish university hospital. An assignment in which the six project group reports, with summarizing strategy maps, later were elaborated into a book chapter about how the maps could facilitate user participation in design, procurement and deployment of new digital health care support systems (Walldius et al. 2015).

## Conclusion

This brief review of the strategy mapping method applied in HCI studies indicates that the method may have pedagogical affordances in VSD projects in which it is paramount that stakeholders are allowed to participate in the project's conceptual investigations. The analytical and deliberative work behind drawing a set of successive strategy maps invite, if

not require, the same kind of tripartite investigations as those called for by VSD. That stakeholders are allowed to take part in the conceptual work can also be argued for with reference to Oulasvirta and Hornbæk's foregrounding of how this kind of work has to account for the project's overall significance. For the significant values at stake as well as for how the relevant empirical and technical data and relationships are explained.

To me, it seems a viable idea that VSD practitioners appropriate the strategy mapping method as a collaborative tool for performing the integrative tripartite investigations called for by the approach. By applying the tool—first within the design and/or research group and then with a stepwise wider groups of stakeholders—individual design teams will get experiences regarding its affordances as a dialogue tool and to what extent it allows for constructive discussions about value issues. In this way, through practical use and further studies of its pros and cons, the strategy map method may eventually be added to the growing body of methods and toolkits in VSD (Friedman et al. 2017).

Systematic use and adaptation by VSD practitioners of the strategy mapping method may also provide for interesting partnerships with policy makers and management consultancies, two communities in need for the rich knowledge base of human values and ethics that VSD can provide. Perhaps even more importantly, an increasing set of examples of VSD strategy maps summarizing important project work would attract researchers and critics from the social sciences and humanities who in these maps would find windows into what to them, up until now, have been the black boxes of IT and digital media design.

Today, when the public awareness of the social and institutional ramifications of digital media power is growing there is an accelerating need for scholarly evaluation and critique of the underlying systems and infrastructures (Lanier 2013; Powles and Veliz 2016; Zuboff 2015). Then, it is not enough that the designers and developers of those systems master the tripartite investigations needed to make the use of the systems sustainable. Philosophers, political economists, political scientists, media scholars and many others will have to join up in long-term programmes of IT and digital media evaluation and critique. This is, in my view, where the on-going conceptual inquiries into system use and system quality is most critical. This is also where VSD can find new urgent areas of application and new scholarly and scientific partnerships.

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