

Using Cartoons to Engage Stakeholders in Innovation and Design of IT Artefacts

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Abstract: This paper presents how cartoons have been used to engage a large number stakeholder in the design of a radical new type of IT-artefact. It demonstrates how cartoons can increase the number of people that are actively involved and also how they can aid innovation, making them useful in many types of design. It also shows how they can serve as starting point for “traditional” IT artefact development methods.

It includes a case study of a pioneering project where student will participate in the design of a versatile, omnipresent electronic agent, an e-Me, that schools, authorities and companies are required to address with interacting with the student. It might be thought of as turning the internet around – rather than having students find and keep track of sites, the sites will have to come to the students and interact with them in the way specified by them.

Keywords: Design methods, design processes, participatory design, reflective practice, systemic design, Cartoons in Design.

1. Introduction

This paper presents:

- How cartoons have been used to engage a large number stakeholder in the design of a radical new type of IT-artefact.
- What qualities cartoons have making them useful in many types of design
- How they can serve as starting point for traditional IT artefact development methods

Today students are offered, indeed required to use, a rapidly increasing number of IT artefacts. They range from school and course web sites to interactions with authorities as well as companies offering student discounts. This forces students to remember a multitude of userIDs, passwords and login procedures. On top of this students are often provided with special email accounts for courses and educations. Many students have four or more different email addresses. At the same time the students are themselves increasingly use mobile phones to communicate as well as store contacts, schedules etc.

In a pioneering project in Sweden we are working with a radical approach to this, namely to issue the student with a electronic agent, an e-Me, that schools, authorities and companies are required to address with interacting with the student. It might be thought of as turning the internet around – rather than having students find and keep track of sites, the sites will have to come to the students and interact with them in the way specified by them.

The concept is developing as a counter reaction to the massive onslaught of sites, home pages and email spam. Amongst the partners are several universities, government authorities and companies like Intel, Microsoft, VISA, Telia, as well as smaller student oriented companies.

2. The research method of this paper

The methodology is case study and reflection in the spirit of Donald Schön's Reflecting Practitioner (Schön, 1983). The reflection is grounded in Co-Design Theory by Churchman (Churchman, 1968) and Forsgren (Forsgren, 1991) as well as in Action and practice theory by Goldkuhl and Röstlinger (Goldkuhl and Röstlinger, 2002). The author has an extensive experience as project manager and designer of large public and private IS projects as well as having held executive positions in corporations. This approach is a dominant theme for the University College of Borås, which is focusing professions in both education and research.

3. The design challenges

There are several challenges facing the design process of the e-Me. The e-Me concept transgresses organisational borders, there are a large number of different stakeholders, the project has a wide scope and low immediate urgency for many stakeholders.

3.1. The e-Me concept transgresses many organisational borders

The e-Me concept is going to aide the student in a multi-organisation environment; it is in the relationships and interactions with many organisation that the problems occurs. This also means that any single organisation acting on its own can't offer any improvements, there has to be collaboration between many organisations to produce the e-Me.

3.2. Large, varied stakeholder complex

Four groups of stakeholders have been identified, which the project will engage:

- **Students:** The most important stakeholders are of course the students; if they choose not to use the service it has utterly failed. The students are not a homogenous group however and there is a great variance in the uptake of new technologies and services, as well as big differences in attitudes towards issues of integrity and security.
- **Universities:** The universities on one hand would like to improve the quality of student services, but on the other hand they are aware of increasing "branding" issues. They would like to be viewed as unique and that includes student service concepts and may be reluctant to collaborate on these. They are also dispersed as a group, smaller universities may have simple and elegant services while the larger ones have many departments needs to consider.
- **Companies:** Some of the companies have students as their primary customers, others want to build their brands for future business, others again would like to sell technology and services to the e-Me itself. They range in size from local student companies to the global corporations. Taken together all this makes them a very heterogeneous group.
- **Government Authorities:** Last but not least there are a number of government authorities that we need to involve. They also have their own agenda, where on the one hand they would like to improve their services offerings, but on the other hand may compete with each other for funds.

3.3. Unclear scope

Being a research project there is definitely a clear scope for the project as such, but there are no clear scopes for the suggested e-Me concept, rather that is to be designed in project. There are several questions that need to be answered:

- Will the e-Me be available to all students or any subset?
- Which types of organisations and services need to be present to allow for a meaningful launch?
- Which geographical scope should the e-Me have?

3.4. Low immediate urgency for many stakeholders

Virtually none of the project participants, be they students, civil servants, working of partner companies or project members, work full time on the project. In most cases the project is not even, from their point of view, their most important undertaking. Therefore the process must be extremely effective in the use of stakeholder's time, where they will spend a minimum of time working out ideas, discussing with others and reading/reviewing specifications, design and other project material.

To deal with this complex design situation the project has chosen a Co-Design Approach, engaging as many of the stakeholders as possible in a constructive dialogue about possible e-Me designs.

4. A note on the Co-Design Approach

A Co-Design Situation is a design situation where the success is dependant on some collaboration between people with different interests, perspectives or cultures. Co-Design is about making these people, interests and perspectives positive, constructive forces in the design process.

When inviting stakeholders to Co-Design something, the stakeholders need to be able to express their own ideas, thoughts and feelings, as well as being able to understand the others. This method of expression we call a "Design Language".

The one component of design language we've found most useful is the scenario. A Co-Design Scenario is a first person story about a client of the organisation and his/her experience. The Co-Design Scenario should scope the overall relationship with the organisation as well as the situation where the particular artefact is used. The Co-Design Scenario should therefore include also other interactions, services and staff that might be part of overall concept. The wide scope of the Co-Design Scenario allows the IT artefact to be designed in its context, and other stakeholder's perspectives to be considered, visualised and explored in the design process.

It's fair to say that all people are familiar with stories, so the Co-Design Scenario as a language does not exclude anyone per se.

The Co-Design Scenarios will also make it possible for service providers etc to analyse the consequences of the proposed idea, not only IT-wise but also in terms of organisation, staffing, processes and overall cost.

It's often useful to create one or more personas (For instance: Pruitt and Grundin, 2003), fictive but typical clients, for the Co-Design Scenario. (That is; if personas weren't created

already at beginning of the design, when stakeholders are chosen.) The richer the personae are the more aspects of the design can be explored. In most projects there is a need for many personas since they must reflect the diversity of the citizen/customers/clients to be served. (There is however projects aimed at specific target groups and then fewer personas are needed.). The choice of personas should be done in a fashion that gives the broadest range of interests and behaviours.

Co-Design Scenarios help people be more innovative in at least one way; they let everyone explore ideas. This helps reduce the feeling of risk by giving a clearer understanding of what the proposal really mean. It also allows a nuanced critical thinking, in that objections can also be explored and help improve the design, rather than just rejecting it. (Albinsson and Forsgren 1996)

5. Cartoons as medium

According to the basic Co-Design ideas we refer to there is a need to give feed back to the stakeholders and maintain involvement in the design process. As the Co-Design Scenarios grow during the project, they also may become difficult to communicate in the form of documents. The situation when stakeholders are to review them might also make documents unsuitable. Last but not least, when engaging stakeholders who have little or minimal interest in the design process documents may not be useful at all; for instance in a market survey of a possible future service it may no be possible to get potential customers to read documents and respond to these, they simply not willing to invest the time and energy required.

One effective way to avoid documents is to use Co-Design Scenarios dramatised into movies, interactive multimedia etc (Albinsson, 2005). In earlier projects we have produced many in the form of multimedia movies. These would typically illustrate one or more client persona, the actual situation the client would be in, the interaction with the IT artefact but also other interactions that are relevant for the situation. The advantage is that they are more “compact” in the sense they can tell their story in less time than required by the viewer to read a corresponding document. An analogy is that few people read a novel in the same time they could watch a movie made from the novel.

The production of movies and multimedia presentations are however costly, even if they are cost efficient compared to discovering design flaws late in a project. They also require presentation technology, limiting the number of situations there can be presented and reviewed. Therefore we chose cartoons in the design of the e-Me. Cartoons are fast to produce and require no technology when read.

Another property of cartoons and animations are that they are less precise. For instance they can show someone interacting with a computer without having to present an actual user interface. Or they can show someone using a phone like device without having to spell out if it's a mobile phone or PDA, whether the communication shown is voice, SMS, 3G Video conference etc. This makes them useful for presenting concept without going into detail. In many cases we have observed that when confronted with a realistic prototype, most people tend to concern themselves with the prototype as the actual system and have difficulties in considering it an example or suggestion for further development. Being imprecise is a very useful quality, enabling stakeholders to discuss ideas and concepts at a higher level.

Last but not least cartoons offer the richness to tell a good story that touches, enrages, inspires, and provokes. Engaging people in a design is not only about giving them rational influence, it's also about having fun, having impact and all sorts of “irrational” qualities.

6. The e-Me Case study

The project have during the autumn run a number of workshops with students to design an “e-Me” according to their ideals. Separate workshops have also been held with the projects other stakeholders to develop business models for making the e-Me a real service. As a third source of inspiration design oriented researchers has been involved giving their ideas about different possible futures with an e-Me service. Two groups of students, one in Stockholm and one in Borås, have participated in three workshops.

6.1. Student Workshop 1

The first workshop the students discussed their own situation in respect to their school, authorities, companies, shopping, living, friends, private life, email, mobile phones etc, in groups. The groups then presented to each other their findings and conclusions were drawn, identifying the problematic issues. The purpose of the first workshop was to ensure that the project is “barking up the right tree”, that the e-Me will address important issues. We didn’t introduce the idea of electronic agents or services, because we didn’t want to bias the students in coming up with cool ideas for unimportant services. By letting them discuss issue of student life in general, we would be able to get a view over how many of these could be improved by new services. An example of this is that in major cities like Stockholm one of the major problems is getting an apartment. Since this stems from shortage of housing and low student incomes, it’s not really solvable with IT-artefacts. But a major of the problems discussed were information related and therefore we knew the project could produce new services that would be meaningful to the students.

6.2. Student Workshop 2

The second workshop focused on improving “last week”. The basic idea of the e-Me was introduced at the beginning of this workshop, using a series of cartoons. The students were asked to discuss in groups how their last week should have been ideally, given the experience of the first workshop and the concept of a versatile, omnipresent electronic acting on their behalf. They were asked to present their conclusions as Co-Design Scenarios preferably as cartoons, using flip charts. At the end of the WS all students participated in a discussion on the usefulness of the scenarios.

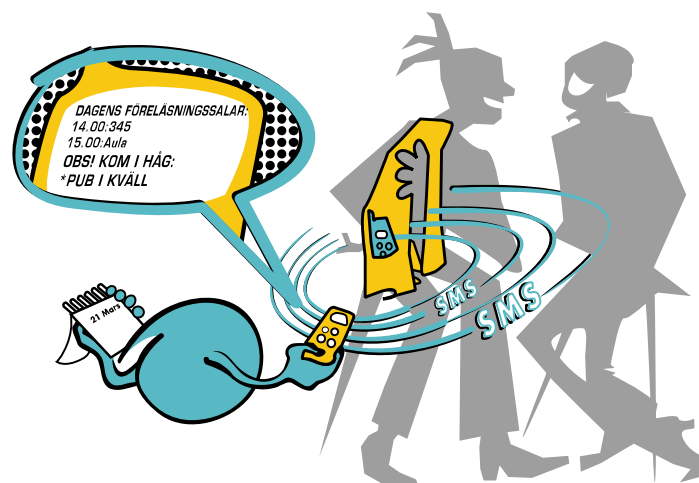


Figure 1. Single cartoon showing a scenario where the electronic, omnipresent agent e-Me reminds “its” student via SMS. This type of cartoons were used to introduce the concept of the e-Me.

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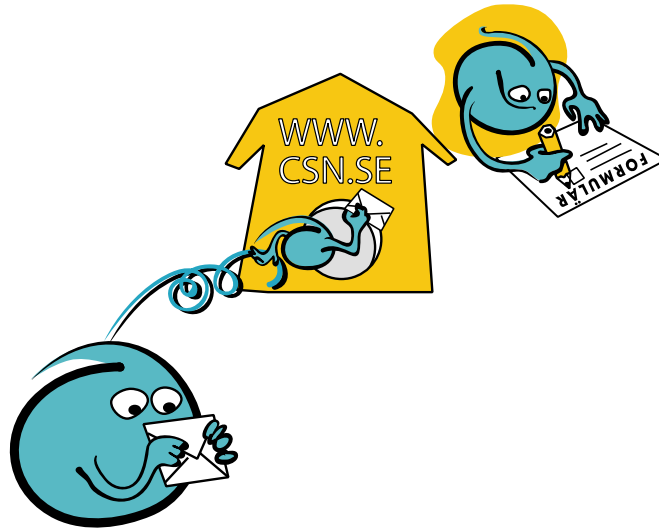


Figure 2. Single cartoon showing a scenario where the electronic, omnipresent agent e-Me reminds reads an email containing a request to fill a form. The e-Me “goes” to the corresponding web site and fills the form out. This type of cartoons were used to introduce the concept of the e-Me.
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Figure 3. Co-Design Scenario produced by students in Borås during WS 2, showing how they ideally would like find and sign up for a course
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Based on the work and discussions of the students the project team wrote 10 complete scenarios, addressing the situations in greatest need of improvement according to the students and describing the ideal way the students wanted to experience these situations.

6.3. Student workshop 3

In the third WS the students were given the written scenarios based on the previous WS and asked to review and further develop these scenarios. Some scenarios was also made into cartoons and presented. Figure 4 display one of the cartoons, showing the ideal way to experience the “New Course” situation.



Figure 4. Cartoon showing the student personae Nya signing up for a new course.

The students clearly stated that they preferred to “read” the scenarios as cartoons rather than text. Even the few students who preferred the text version stated that the cartoons were giving useful complementary help.

As we can see the Cartoon Scenario includes:

- **The context in which the IT artefact will be used -**
We can see the personae Nya at school, in here apartment and also her Gym. This gives valuable input to the design of the IT artefact both regarding it reach and capabilities.
- **Interactions with people and tools not part of the IT-artefact -**
We can see her meeting and talking to people. This gives input to what kind of information the e-Me needs to provide Nya with and also in which situation it’s going to be used, indicating what kind of language to use.
- **Interactions with multiple organisations and services -**
The e-Me interacts with universities, the gym and her own department. This gives input on the range of organisations and services the e-Me needs to encompass.
- **The cartoon clearly hints the difficulties of realising the scenario -**
Is it really likely that the e-Me will be able to reschedule her spinning class? It inspires a discussion on how important those capabilities really are and would be required to achieve this scenario

The Cartoons are, as we can see, not only a tool to present and “sell” the e-Me concept and design, they also reveal weaknesses and inspire discussions on difficulties at an early stage of the project.

The Cartoons are used to communicate with the partners of the project and other stakeholders. They are used as storyboard for an interactive presentation, will be published in “comic” book and made out as back drops for exhibitions. Since they do not only focus the student and its interaction with a specific IT artefact, but a larger context, they can serve as basis for designing business model as well as other services need to realise the e-Me. They communicate a broad and rich image of the e-Me concept, without the hassle of long written documents, the stakeholders have far more impact on the project than with a traditional approach, allowing them to read “specifications” rapidly and easily. ‘Cartoons have become the design tool for the entire e-Me project.

7. How Cartoons can improve the design process of IT development Methods

Studies of IT project failures (Glass, 1998) clearly state that “unclear and changing requirements” are the main culprit. This problem stems from miscommunication between managers, users, IT developers and clients/customer/citizens (in case they where at all involved.)

In a study of IT design methods (Singh and Kotzé, 2003), both traditional and modern object oriented, the conclusion is:

“The short comings of all the methodologies are therefore related to the complexity introduced by the [business environment], and how these aspects should inform the systems development process.”

“Both the traditional SDLC and OO approaches fall short on the issue of human aspects and stakeholder involvement.”

In our experience Co-Design Scenarios and Cartoons are very useful tools addressing precisely these shortcomings. They allow a larger, more varied stakeholder complex to engage in exploring more and wider perspectives of the design, including the business context.

They can also work well with established IT development methods like RUP (IBM Rational Unified Process) (Gornik, 2003), one of the most popular and used methods for Information Systems development. In RUP “use cases” are produced, describing the user’s interactions with the system to be developed. The Co-Design Scenarios and Cartoons can serve as the basis for writing and developing the “use cases”.

8. Conclusion

The experience from the design of the e-Me is that the Co-Design Scenarios produced as Cartoons are very useful in engaging large and varied stakeholder complex. They facilitate an early exploration of many perspective of the design, including business context. They do not limit the design to just the IT artefact and interactions with immediate users.

The Co-Design Scenarios as cartoon can live in flexible design process. It allows one to design the whole before the parts. The first version doesn’t have give any details or parts of the IT artefact, it can just describe a desired series of desired actions or events. The design can evolve as the parts are expanded, while still maintaining an overall idea.

The Cartoon is a very rich Design Language. It allows both Aesthetical and Ethical concerns to be explored in a context. Sometimes they become brutally realistic in way that early reveals weaknesses within ideas, that otherwise may have reached later stages in projects when the time and cost to correct them will be significantly greater.

The Co-Design Scenarios can help improve innovation in design by aiding a nuanced, constructive criticism, rather than rejection of radical proposals.

The Co-Design Scenario can at any point serve as a starting point for existing IT development methodologies. For example when using RUP, the Scenario will be the basis for use cases. So the Co-Design Scenario complements and improves many existing IT development approaches.

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