# Design of Information Technology as Design of Information Society

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**Abstract.** The design of technical product is often focused in the development of that particular artefact. However, when we introduce new technology we don't simply replace old technology with new, but change many things in the whole context of use. With the help of familiar examples from our everyday life we illustrate how far-reaching tiny-looking technological changes may be. Finally, we propose a design model which combines the traditional user-centred design cycle with broader view. The premise of the proposed model is that when designing information technology we fundamentally design information society.

## 1 Introduction

The construction of information society and the design of information and communication technology (ICT) have a complex relationship. In this paper, we analyse the relationship focusing on the kind of technology that best represents the stereotypes of how information society shows up in our everyday life. That is, we aim at conceptualising the design of ICT consumer products in terms of the construction of information society.

In an idealistic approach to the construction of healthy information society we would have a detailed vision, which would form the basis for the development of practical issues like technology. In other words, the role of technology would be to purely serve the realisation of a societal vision.

However, most of creative efforts in the development of technology are hardly based on some commonly agreed societal value or vision. More likely the motivation is purely commercial, even if the façade looks innocent; e.g. environmental friendly technology became popular only after commercial opportunities became evident. Another more or less hedonic striving force in the development of technology is surely the pure playfulness of human nature, combined with creative problem solving in everyday life [1]. In addition, the emerging new technical opportunities appear to trigger creative ideas about practical applications.

adfa, p. 1, 2011.

In all of these motivations the common feature is that they are highly technology driven. Technology is created primarily for individuals, and the success of the development is assessed in terms of, e.g. sales (consumer-view), usability or user-experience (user-centred approach). Whether we talk about consumers or users, we talk about individuals, not the society. The societal success of technology has not been paid that much attention to, not to speak about designing technology primarily to gain societal benefits.

The societal issues can be seen from many perspectives. It has been argued [Gidd, Castl] that individuals are becoming disembedded from their immediate social and spatio-temporal context and being increasingly participating in a global social context. This change can be attributed to a large extent to information and communication technologies [Gidd]. On the other hand, it has been argued that users shape use cultures rather than the other way around [Fish]. From a social network perspective, for example in the case of telephone, technology reinforces rather than disrupts existing social ties. However, users may initially shape the uses of technology, but having become an established part of social life, the consumption of technologies turns to a determinant of everyday living. Therefore it should be asked, how technology will distinctively shape culture, and how this cultural phenomenon relates to social change. Thus, individually and socially, the culture of consumption emerges in a stream of new goods. What industrialised countries thus have in common is that they are "consumer cultures", meaning a culture that has achieved a stable form, and that is simultaneously continually changing because of the combination of new technologies and high economic growth. It can be argued that consumption of technology has ritualised referring to the relation between technology and culture [Mintz]. Further, it can be said that the consumption of particular technological devices such as telephone becomes routinized after a period of novelty [Löfgren, 1995] thus turning to constituent of our culture and society. In other words, personal technologies change the behaviour of the individuals, and once ritualised, the new behavioural patterns change the society. Figure 1 illustrates these relationships; technology is provided for an individual, who is in constant interaction with the society and related culture.

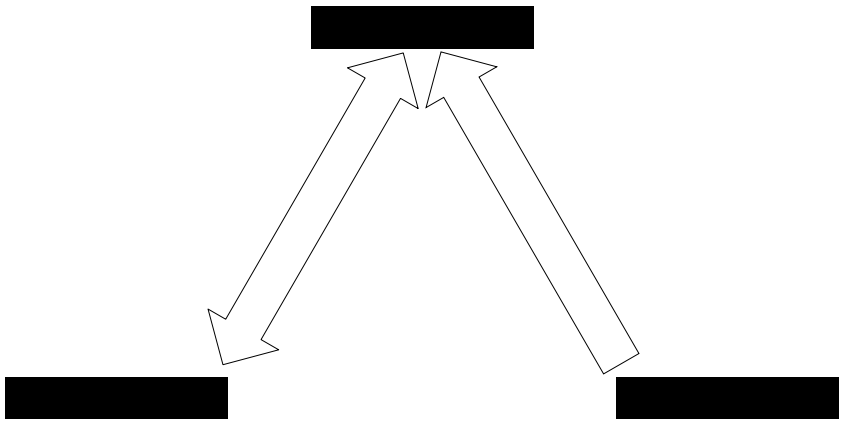

**Fig. 1. Relationships among individual, society and technology**

Technology here becomes culture insofar as it is translated into everyday life. How technology relates to culture or society is the core of this article; a question of how the everyday phenomenon brought about by technology add up to larger, cultural and social phenomena and how these can be taken into account in the design of ICT products and services.

While novel ICT products and services have improved both technically and in quality of service, they can create new problems as individuals try to adapt to new manners of use and use cultures. Therefore, it is not enough to focus solely on how they use specific devices, but there is a need for understanding on how people live in their realities. In other words, instead of understanding just the use of artefacts, their presence in peoples' everyday lives, the societal and cultural aspects should be understood as well [Hallnäs & Redström].

Technology has a profound impact on our everyday reality, and will continue to play a major role in shaping the future, both globally and locally. There are already clear indications that the cost of the prevailing IT-driven cultural phenomena will be high in terms of well-being [2]. Technological revolutions are, however, among the most consequential things that happen to humanity, and technological change is largely responsible for the evolution of basic parameters of the human condition. Because of the profound consequences of technological implementations, it seems inevitable to put much more efforts than currently in policies, placing objectives, and directing research and development of technology.

This article outlines a proactive approach to the development of technology. The proposed approach brings social and cultural issues relating to the design of technological products and services in focus.

### 1.1 From change of technology to change of culture: two cases from the past

The relationship between technology and culture is common sense. However, new technology is often introduced as if it were just individual, innocent organisation of given function. Therefore, we next remind with the help of familiar examples how wide-ranging impact even one single innovation can have in our culture. The examples illustrate the dynamics of typical process from initial technical concept to a product which finally becomes a constituent of a society.

- Example 1: Remote control device (RCD)

The development of remote control of television started from simple, well-defined practical problem: how to change channel and adjust volume of a television without leaving the viewing location. The first solution was to bring the control panel via wires to the viewing place ("Lazy Bone" from 1950's). Later the device was developed to work wirelessly[1]. In other respects, the basic concept has remained the same throughout the decades, which indicates that it served well the original need. The interesting issue is, however, what other influences the remote control had in our media culture. First, commercials were placed between the programs before we had

[1] The first product of this kind, Zenith Flash-Matic from 1955 worked with visible light

RCD. RCD made the change of the channel after a program so effortless and quick that the visibility of commercials drastically reduced. Therefore, the commercials had to be placed in-between programs in order to increase the probability to be seen. This, in turn, changed the structure of programs. Second, it was found out that the users of RCD tend to switch channel before the final credits of a program, so a split-screen technique was created: the credits role in half of the screen during the last scene. Third, it is quite common sense that the huge growth in the number of channels would hardly have happened without RCD; the culture of zapping through the channels was enabled with RCD. The zapping culture, in turn, highly rules the production of all televised material: In whichever moment you switch to a given channel, there has to be elements that lure you to stop zapping and stay in that particular channel. [3, 4]

RCD has thus become the enabler of zapping culture, which in turn has revolutionised much of our media consumption and production. This particular piece of technology has then become the bottleneck in the creation of televised material. In other words, RCD helped to control the television, but as a side effect, dramatically reduced the opportunities to create high quality television programs. The fragmented world of media and the increasing restlessness of our technology saturated everyday life can be argued to be partly caused by the trend that remote control of television launched.

- Example 2: Mobile phone

The shift from landline telephones to mobile phones has caused salient changes in our culture. Even if the time perspective for making objective comparison between the life before and after the penetration of mobile telephoning and other communication is probably too short, conclusions from mundane observations are self-explanatory.

The vision of the creators of mobile phone has probably been very simple: Wouldn't it be fantastic if all people could carry their personal telephone in their pocket? Like in the previous example, the early visionaries hardly had much wider than individual's perspective. The introduction of mobile phone has resulted in the rundown of much of the opportunities and social patterns which relate to the stationary telephone. Along with the internet, mobile devices have been the fore most catalysts of our fragmented, hectic lifestyle, not least among the young generation. At the same time, families have lost their communication "nerve centre", the landline telephone, in which families became familiar with each others contacts. Thus the device which was – according to slogans – supposed to connect people has caused unravelling of social order [5]. We argue that if landline phone with its social benefits and superb sound quality – resulting in ultimate feeling of presence – would be introduced now, that would be praised as a brilliant innovation, providing that someone manages to create profitable business around it.

## 2 Re-orientation: Design of Technology->Design of Society

As a concluding statement, we will propose a model of technology design, which would articulate the design of information technology as design of information society. This does not refer to technical orientation to information society, but to the fact

that the introduction of new ICT-products and services inevitably shape our society. Therefore, the designers should be well aware of the consequences of their work. The proposed model is a framework which would enable the designer of individual product or service to conceptualise his or her work as a contribution to the construction of information society. Figure 2 illustrates the proposed method. The method combines typical iterative user-centred design model and so called Rich Use Scenario (RUS) method. The lower cycle in the figure illustrates the user-centred approach and the upper one illustrates RUS, respectively.

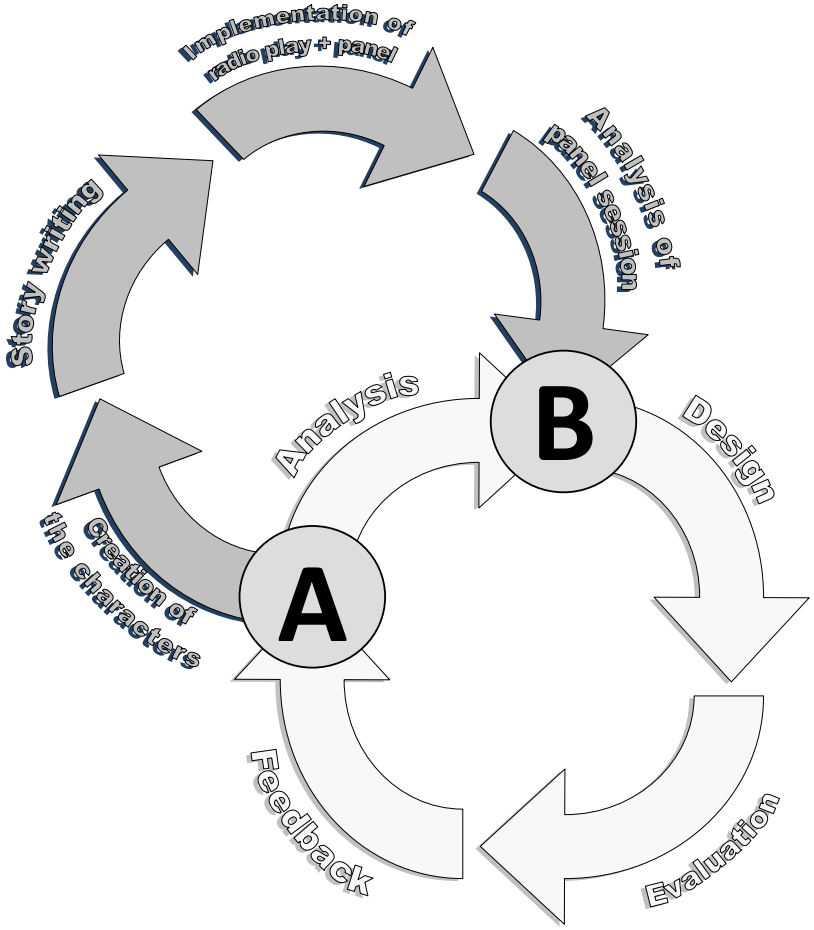


**Fig. 2. Composite of UCD and RUS cycles**

The typical iterative, user centred design cycle is based on the idea of frequent reflections of user's perspective to proposed design ideas: Once something has been

designed, it is exposed to evaluation, which often means some kind of user study. The feedback from the evaluation is then analysed and utilised in the next design iteration.

As such, the above described cycle surely represents user's point-of-view. However, there are at least two weaknesses in this strategy. First, the thing to be evaluated is something that has taken form already, an embodiment of a concept. It does not tell where the initial idea or concept comes. Second, in being user-centred, it is very individualistic by nature. The evaluation criteria are more likely to be hedonistic than social. In other words, it stresses the individual's wants and experienced needs rather than common good.

Because of the above-mentioned weaknesses we propose the development of iterative design of ICT applications and services by adding an analysis of wider impacts in each iteration. As the method for such an analysis we propose Rich Use Scenario (RUS), which has originally been created for the practical needs of user-interface design.

### 2.1 RUS in a nutshell

Use scenarios have been used for a long time in application development. In general level, use scenarios can be defined as descriptions about user using an application [Carr]. The main reason for using use-scenarios is that pure technical descriptions are inadequate to reveal user-related issues of design.

Typical guidelines for the preparation of use-scenarios [] encourage to create many scenarios in order to cover as many use cases and as possible. However, the problem in this strategy is that the scenarios tend to be mechanical and the relating user characters flat in nature. The objective of Rich Use Scenario is, in a contrary to a typical use scenario, to inspire the design team rather than being as likely or credible as possible []. The underlying idea is that RUS would form a common basis for discussions within an interdisciplinary design team: When engineers, designers and usability specialists gather together, there is an apparent communication problem. Engineers talk about technical opportunities, while usability specialists talk about the user. RUS is found to be an effective method of avoiding communication gaps among different perspectives.

Due to its nature, in RUS one single use scenario is created. The preparation of the scenario starts by the creation of inspiring character (or characters), the persona []. Then the whole story is written in the form of a radio play manuscript. The essential thing in the preparation of the manuscript is that the story is vivid and provides with an opportunity for the listener to identify herself or himself with the character. The technology to be designed has a role in the story, but the story should not be about the application but about life.

The manuscript is then used as a basis for a radio play. Radio plays have been found to be an appropriate stimulus for group discussions. Compared to video, radio play leaves more space for imagination thus supporting creative thinking. Compared to written story, in turn, radio play's strength is in that it provides with shared temporal focus: each member of the group focuses in the same point of story at a time,

while when reading a written story group members don't have this shared experience [].

Having listened through the radio play, the participants of the design panel are supposed to discuss the story. The organisation of the group discussions may differ vastly depending on the actual design task. The discussions are usually recorded and analysed.

Even if RUS has mostly been used to reveal individual user's point-of-view [], radio play may as well deal with societal, environmental or health issues, to name but a few. Therefore the application areas of RUS are endless.

### 2.2 RUS as an element of the proposed design method

As described above, RUS-method can be used in a wide variety of contexts. The essence of the method is to evoke creative ideas and enhance communication within a design group. As such, it serves the pursuit of expanding the typical user-centred design cycle to cover broader issues.

In Figure 2, point 'A' refers to the phase where usability related issues will be analysed in user-centred circle, and wider issues are handled in RUS-iteration. In phase 'B' individual user's point-of-view and wider, e.g. societal perspective are converging. This is the crucial point since it provides the input for the next design iteration. I.e. in point B, the output of analysis of RUS cycle and usability cycle provide input to the design phase.

## 3 Discussion

The aim of this paper is not to diminish the potential of technological innovations in the construction of healthy information society. It is neither realistic nor appropriate to demand that in all creation of technology the sole motivation should be the realisation of ideal society. It is up to the political system to set limits to research and development. On the other hand, in order to fully exploit human creative potential, setting limits is obviously not enough; the governments should also promote the construction of innovation-friendly circumstances. In other words, the political system is responsible for both enabling creative activities and reflecting them in terms of ethical values. In the creation of well-being in the information society, it is essential to acknowledge that the information society is fundamentally a product of human creativity and political decisions. The way to well-being in the future society is thus to support creative design and to expose the outcome to ethical reflection.

This paper proposes an approach to combine the development of novel technologies with the construction of healthy information society. Ideally, these should not be separate issues but the construction of technology should be fundamentally seen as the construction of society. In Figure 1, there is no feedback from society to technology. The proposed approach would imply the adding of two-headed arrow between words 'society' and 'technology': First, the requirements of healthy society would

work as a criteria for design, and on the other hand, a healthy society would more likely feed constructive technical ideas which ultimately contribute to well-being.

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