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# Reinforcing Family Values with Web Design - Case Yle “P2” Children’s Website

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**Abstract.** This paper describes the findings of a redesign project of a children’s website, where social considerations have been providing the guidelines for design. The case company, Yle, is the national public service broadcasting company of Finland. The website redesigned is a cross-platform programming extension of Yle’s Pikkukakkonen (“The Little Channel Two”, P2), a TV show with media content that targets primarily pre-school age children. Our study utilizes action design research (ADR) as the research method, touchscreen game applications as the facilitating technology and theories on social values as theoretical lenses to formulate design principles. These design principles are used for redesigning the P2 website to enhance its contribution to the public service of Yle. Following the principles of ADR, our study demonstrates how the results can be used both for the benefit of the case company and to a class of similar problems. This study contributes to the knowledge on theories on social values and web design of public services, when also social considerations need to be taken into account.

**Keywords:** ADR, web design, public services, social considerations, social values

## 1 Introduction

In today’s world, information and communications technology (ICT) is increasingly ubiquitous by nature (Yoo 2010; Ferscha 2012). It has transformative effects on everyday life, work, societies and social life, for example by increasing the time spent with technology and technology-mediated social interaction and by blurring the line between work and leisure (Beath et al. 2013; Sawyer and Winter 2011; Scheepers and Middleton, 2013; Yoo 2010). ICT may also be deliberately designed for increasing the time spent using it (Blohm and Leimeister, 2013). An example of such design orientation is gamification, which refers to incorporating the elements of game-design into products, services and information systems with an intention of transforming everyday routines towards motivating, hedonistic and engaging experiences (Hamari and Koivisto 2013; Hamari et al. 2014). While some scholars have argued that the increasing technology use in social situations leads to the deterioration of human sociality (Cameron and Webster 2013), others have proposed that ubiquitous technology can be designed to enhance the quality of life of the users (see Scheepers and Middleton 2013). This paradox is difficult to solve and all of its implications are not well understood, yet.

Also the media industry, including government-controlled public service broadcasting, is being profoundly changed by digitalization, mobile Internet and the emerging era of multi-platform services (Debrett, 2009). Digitalization is increasing the options for delivering media content, including more channels, cross-platform programming, interactivity, user-generated content, the personalization of content and on-demand content consumption (Oestreicher-Singer and Zalmanson 2013; Xu et al. 2013). Along with the new possibilities, digitalization is also creating challenges for public service broadcasters in form of new user demands and competition with an increasing number of commercial players (Debrett, 2009). In addition, the increased options for consumers in terms of both available access technologies and content have led to media audience fragmentation, meaning that no single technology or content can reach all of the general public. As a result, public service broadcasters need to reinvent themselves as media content companies while still fulfilling their public service mission.

The primary stakeholders in public services are the authorities providing the services and the citizens receiving value from them. The principles of public services generally include the principle of universal coverage, meaning a free service accessible by everyone. In public service broadcasting, this means providing impartial news and information on current affairs, servicing both the mainstream audience and different minorities, taking national culture and identity into account, aiming at quality service to all audience segments despite their size and, catering to educational and civic interests.

Also Yle (The Finnish Broadcasting Company), as the national public service broadcasting company of Finland, is facing the challenges of digitalization. Yle was founded nearly 100 years ago (This is Yle 2014). It is 99.9% state-owned and supervised by a parliament-appointed administrative council. Yle currently operates four television channels, a dozen radio channels and various digital services on the Internet. It offers several TV shows specifically for children, including “Pikkukakkonen” (P2; “The Little Channel Two”) targeted at pre-schoolers and their families. P2 has been running continuously since 1977 and the P2 website (<http://yle.fi/pikkukakkonen/>) was launched in 1998. Currently, the P2 website offers a range of activities, including arts and crafts projects, games, and storytelling experiences. In 2013, Yle launched a project with the goal of redesigning the P2 website.

In this paper, we describe the process and findings of the P2 website redesign project in the empirical context, using theories on social values as the lens along with action design research (ADR) as the method. With an aim to create more nuanced understanding about the abovementioned paradox regarding the increasing use of ICT, we address the following research question: “How can website design for pre-schoolers incorporate public service and social considerations with the consumer demands in the digital age?” We formulate design principles for the redesign, suggesting that the design principles formulated are both directly useful to Yle and can be applied to a class of comparable problems.

The structure of this paper is as follows. In the next section we lay the theoretical grounding of the study, review relevant literature and introduce the concepts used. These are followed by an overview of the research method and description of empirical data collection. We then describe the website redesign process and discuss the results in relation to the theories on social values. We conclude with thoughts on the implications of the social considerations in the design of ICT.

## **2 Theoretical grounding**

### **2.1 Digitalization and the increasing use of ICT**

Studies on digitalization have been reporting the increasing use and ubiquity of information and communication technology from the 1990's onwards (Ferscha 2012; Weiser 1991), and this trend has been gaining momentum with the increasing mobility of ICT (Beath et al. 2013; Sawyer and Winter, 2011). According to extant literature, the increasing use of ICT facilitates evolution in social life, work and leisure. Research on the effects of this development is ambiguous: some caution against dangers of IT-addiction and the disturbing effects of technology use on social interaction (Cameron and Webster 2013; Zwanenburg 2013), while some argue for the positive effects of increased ICT use, especially when combined with the right kind of design (Golsteijn and van den Hoven 2013; Scheepers and Middleton 2013). What constitutes "the right kind of design" leading to positive effects of increased use of ICT is, however, still an open question (Choi et al., 2007). Popular discussion, affecting the public opinion on increasing ICT use, often emphasizes the potential negative effects, including isolation from social interaction, especially in intimate relationships including families and children (see e.g. Turkle 2012). A part of the alleged isolation effect has been linked to the previous generation of stationary computers (Quandt and Pape 2010), with some evidence of the potential sociality enhancing effect of mobile technologies (Kennedy and Wellmann 2007).

Because technology is dominantly used in a context where there are many individuals present (Lamb and Kling 2003), the social context of technology use is an important point of consideration (Tuunanen et al. 2010). The mobility of ICT often further increases the presence of social interactions in use situations (Voorveld and van der Goot 2013; Wajcman and Rose 2011). Although individual requirements are important (Lamb and Kling 2003), in a social context, technology use is mainly determined by the value-driven institutionalized elements present, not the needs and wants of an individual (Weick 1996).

### **2.2 Family, family values and theories on social values**

Family has been defined as "a group of individuals linked by kin connections, with the adults taking responsibility for caring for children" (Giddens 2009, p. 331). Families are social institutions based on intimate and meaningful relationships (Giddens 1984). Tending these relationships is guided by family values, a subgroup of social values (Giddens 2009). Social values are defined as institutionalized cultural and situational moral judgements on what kind of behaviour and thinking is considered desirable and legitimate within a certain setting or society (Giddens 2009; Scot et al. 2007; Spates 1983). Social values are an example of social institutions, ubiquitous social constructs formed in interaction (Scott 1994). Social values consist of meaning systems, symbolic elements and regulatory processes that have over time become institutionalized, that is, mutually recognized and binding to the members of a society. Social values manifest themselves, for example, in recurring behavioural patterns based on norms and rule systems. Theories on social values (see e.g. Durkheim 1952; Parsons and Bales 1956; Tönnies 1887) focus on the distribution and validity of social values as well as their situated variability, evolution and effect of sociality and well-being. All of these theories regard social values as an important guiding force in social life, but there are different

views on how much control social values exert over individuals and how stable social values are over time. Some theories argue that social actors are formed of and restricted by the rigid and predefined social institutions always present in their operating environment (see e.g. Parsons 1937), while others see the daily interactions as constructing and reconstructing social institutions over time (see e.g. Giddens 1984; Orlikowski and Barley 2001). Adopting the latter perspective, we view social values as a social institution comprising historical, cultural and current social phenomena. In this view, social values are not entirely stable, but tend to slowly evolve over time, as well as be subject to a degree of situational negotiations (Giddens 1984).

Family values, like all social values, tend to diffuse from one generation to the next (Giddens 2009). Parents are traditionally the main socialization agents of a family, passing their values on to their children and this gives parents primacy defining the desirable ways of acting at home. Family values have been progressing over several decades from stable, normative and binding towards more individualistic, situated and negotiated, but have nevertheless retained their position as the fundamental guiding principles of family life (Beck and Beck-Gernsheim 1995; 2008).

Individuals tend to hold a variety of values including both personal ones, and social ones shared by the community they live in or a certain social peer group (Spates 1983). These comprise the individual's value system that forms a consistent set of beliefs regarding the preferred ways of acting, often with some values having primacy over the others. The various values individual has may be prioritized differently in different situations and under particular conditions, however (Beck and Beck-Gernsheim 1995; 2008). Sometimes equally weighted values included in the individual's value system can contradict within a single setting or in relation to a certain topic and this leads to the ambiguity of priorities and needs of compromising and situationally re-negotiating the possible courses of action and interpretation of the values related to it (Scott 1994).

As the family values are becoming more and more individualized and situationally negotiated, the children increasingly get their say in these negotiations. This further complicates the setting of priorities in families (Beck and Beck-Gernsheim 1995; 2008; Giddens 2009). Family values are good examples of the complex and interrelated values often resulting in collision and dissatisfaction in social settings (Giddens 2009).

Stemming from their institutionalized nature, family values tend to be shared and binding within a society and evolve only slowly, with a timeframe of decades (Giddens 1984; 1992). Demands of family values are typically given primacy over individual wishes in social situations at home although the individualization development has been increasing the importance of personal fulfilment, too (Beck and Beck-Gernsheim 1995; 2008; Giddens 1992). Because of the shared and restricting role of family values regarding behaviour at home, families with a similar cultural background are likely to employ similar rules to the use of technology at a given time and as a result use it in diverse yet predictable ways. This means that the socially preferred and undesired ways of using technology at home can be revealed by inspecting family values and the meanings and interpretations that families give to them.

## **3 Research method and data collection**

### **3.1 Action Design Research method**

In this research project, we utilized the action design research (ADR) method (Sein et al. 2011). In ADR projects, the aim is to produce new design and theoretical knowledge through IT artefact creation and evaluation in a real case context (Sein et al. 2011). Gregor and Hevner (2013) define IT artefacts in design science setting as including designs for the information systems, tools for modelling or strategies, evaluation methods and change interventions. An IT artefact can be a material, artificially made object like a model or a process including software, but also a more abstract thing like design knowledge or theory that can be turned into a material object with some further effort (Gregor and Hevner 2013). Along the guidelines of ADR (Sein et al. 2011), this research project has two goals: Firstly, intervention and evaluation are used in the case setting to address the problem situation, that is, the P2 website redesign. Secondly, an IT artefact answering a class of problems similar to the encountered one is constructed and evaluated.

In ADR (Sein et al. 2011), IT artefacts are seen to be shaped by the context from which they arise. Therefore, the design of an IT artefact is a process of guided emergence, where research suggests the initial direction to design and the finalized artefact gets formed in interaction with the context of its use. While in action research the role of theory is tentative (Lee and Baskerville 2003), existing theories and technologies are utilized in defining the ADR research opportunity.

Both design science research (Hevner et al. 2004) and action design research (Sein et al. 2011) typically ground the design of IT artefacts on theories adopted either from the natural or social sciences. There is a rich stream of research application examples of this type in IS research (Sarker et al. 2013), where theories from natural or social sciences (or both) are used to form a set of design principles (Walls et al. 1992). These can be used to include social considerations in the design (Gregor 2006; Gregor and Jones 2007; Sarker et al. 2013), including human values, as in value-sensitive design (Friedman et al. 2008; Friedman 1996; Purao and Wu 2013) and ethical considerations taking a moral stand on the preferred and discouraged outcomes of design (Chae et al. 2005). According to Gregor and Hevner (2013), kernel theories adopted from another fields are necessary to design knowledge, because they at least partly explain why the design works. Kernel theories are a form of justificatory knowledge, comprising all knowledge informing design research, including empirical knowledge gained during fieldwork as well as knowledge stemming from the experience of the practitioners (Gregor and Hevner 2013).

### **3.2 Data collection**

The Yle P2 website redesign project began in November 2013 and it is still in progress. Data collection so far has included five meetings (with a number of follow-ups by email) with Yle representatives, families being observed and interviewed at their homes, videotaping children using the P2 website and various applications, collecting and analysing quantitative user feedback on changes being made and by discussing them with the Yle design department representatives. The initial design was built based on the first three meetings with the Yle representatives. It was evaluated and refined based on the succeeding two meetings. The data

utilized in this paper was collected between November 2013 and March 2014, consisting of emails, interviews with ten Finnish user families (10 children, 10 parents), 10 videos on children using touchscreen devices, documents describing the goals of the project agreed earlier, documents stating the vision and mission of Yle, laws on Yle’s public duty, notes made during the management and practitioner meetings, and consumer use and feedback data collected after implementing the first round of redesign. For the user interviews and videos, the first author visited the homes of the ten families recruited for the study. These home visits, including the interviews, were videotaped using two video cameras. One video camera was stationary and positioned in the room where the children were using their devices for a general view on action, while the other one was hand-held by an assistant and used both for recording the interviews and doing close-up documentary on the children’s interactions with their devices. Each video lasts between 1 and 2 hours in duration. The home location was chosen for the interviews and observation to gain rich contextual understanding on the children’s use of technology in their natural surroundings.

## 4 Redesigning the P2 website

The P2 redesign project followed the general outline of ADR method (Sein et al. 2011), below.

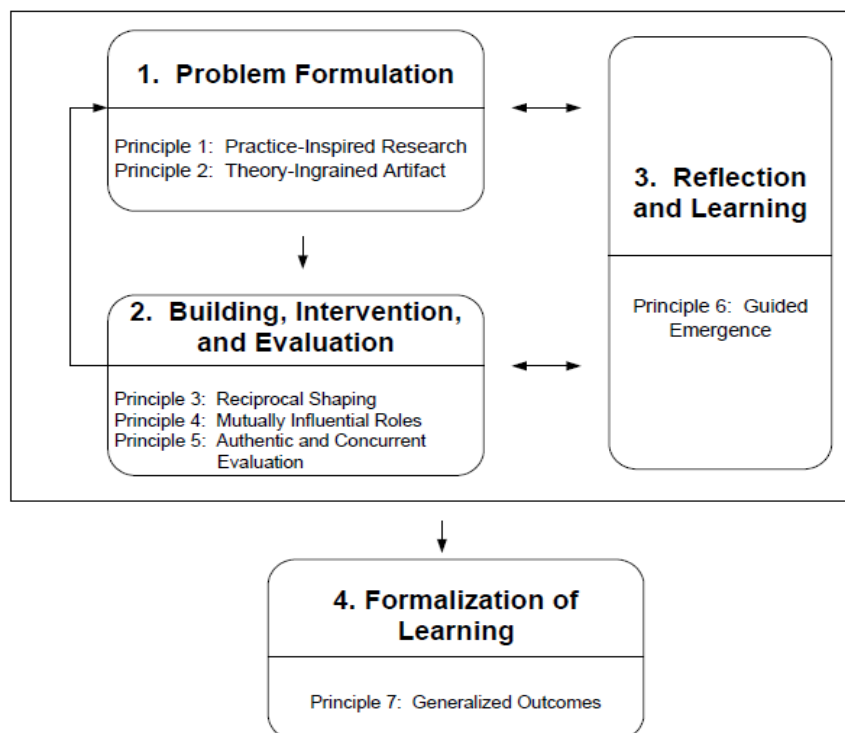


Figure 1: ADR Method: Stages and Principles. (Sein et al. 2011, p. 41)

Accordingly, we will next describe how the research problem was formulated, first as an initial research question, and then as operationalized as a class of problems. After that, we depict the building, intervention and evaluation (BIE) cycles carried out during the project. We will then discuss how the practical results of the study were transferred to the case

company, and finally, present the findings of the study in terms of design principles and their consequences.

#### 4.1 Problem formulation

The need to redesign Yle's P2 website arises from the on-going digital transformation and its impact on public service broadcasting. To fulfil the principle of universal coverage, a public service broadcaster of today needs to be able to offer its content across various platforms (Debrett 2009). When revising the delivery of its services for a target group of small children in a way that potentially leads to the increased use of technology within families, Yle has to balance the requirements for public services, company values and consumer demands. This includes thorough consideration of the social and ethical questions related to the use of its services, by children in particular.

In this study, following theories on social values (Giddens 1984; Orlikowski and Barley 2001; Scott 1994; Spates 1983), the families of the children using the P2 website are seen as social institutions, and family values are seen as the guiding principles for children's website use. The practical design problem faced by Yle results from the tacit nature of social values: their structure and functioning are difficult to observe although their presence and effects are ubiquitous in social action (Scott 1994). As suggested by the theories on social values (Giddens 1984; Orlikowski and Barley 2001), family values are likely to have an impact on the user requirements. Hence, the family values related to the P2 website use have to be understood and taken into consideration in redesigning the P2 website.

Unlike its competitors, the commercial media companies, Yle does not broadcast advertisements or sponsored content (This is Yle 2014). The funding base of Yle was revised in 2013 from TV licence payments to public broadcasting tax paid by every Finnish taxpayer (This is Yle 2014). This initiated public discussion on the mission of Yle. The statutory duties of Yle's public service include for example the facilitation of Finnish culture, art and inspiring entertainment and taking educational aspects as well as children's needs into consideration. In addition, Yle also has company values stating, for example, that content targeted at children has to be free of violence and promote constructive behaviour.

The research opportunity arises from the on-going nature of digital transformation, resulting in need to produce new theoretical knowledge (Debrett 2009; Choi et al., 2007), and from the practical need for Yle's P2 website redesign. These have to be combined with the public service duty of Yle, its company values and customer demands, while taking into account the non-profit nature of Yle's funding and the public opinion on the children's increasing use of consumer technology to ensure the public value of the redesign. Based on the above considerations, **the initial research question** for the project was defined as follows: *How can Yle redesign its P2 website in a way that is simultaneously compatible with its public service duty, company values, non-profit nature, customer demands and universally acceptable public value objective?*

Yle operates in an intersection of various interests including digitalization, public service duty and related values and consumer demands. According to the literature reviewed, there are potential contradictions between these interests: digitalization and consequential consumer demands call for designing more attractive ICT-solutions (Debrett 2009), which may lead to the increasing ubiquity of ICT with its ambiguous effects as discussed earlier. As the statutory duty of public service is to provide public value and increase the quality of life for its users



(Act on Yleisradio Oy; Debrett 2009), all the designs of Yle services have to be based on this premise, as well as on trying to avoid the potential ill effects of the increasing use of ICT. Based on the above considerations, the initial research question was operationalized as **a class of problems** as follows: *How can website design for pre-schoolers incorporate public service and social considerations with the consumer demands in the digital age?*

The primary target group of the Yle's P2 website is 3 to 6 –year-old children, but it targets their parents, too. According to the literature reviewed, young children need assistance with their technology use from parents and siblings, especially in the very beginning (Morley 1986; Moser 2013; Shaffer and Kipp 2007). These suggest that the use of the P2 website occurs in a social context. In addition, the need for ethical design with social considerations was recognized based on Yle's company values. This can be combined with the family perspective by turning to literature on social values, families and family values as a society-level and situational phenomenon (see e.g. Giddens 1984, Orlikowski and Barley 2001; Scott 1994). The contradictory effects of the increasing ubiquity of technology resulted in a need to ensure that the P2 redesign would aim at increasing the quality of life for the users.

The iterative and long-term nature of the ADR method (Sein et al, 2011) was discussed with the Yle representatives. The project objectives were divided into short- and long-term goals and several project evaluation meetings were arranged in relation to each phase. Presentations of the findings to the user families and YLE management were arranged with an increasing degree of formalization of learning.

The research process began with assigning the first author as a project researcher for Yle and discussing the project objectives with the representatives of the management and research making up the ADR team. During these discussions, the objectives for research as well as the interview and observation guides were formulated during several iterations that utilized existing user knowledge.

## 4.2 Building, intervention and evaluation

Building, intervention and evaluation (BIE) stage in ADR includes several iterative cycles, where the problem formulation is worked towards the finalized design of the IT artefact. The BIE stage includes three principles: The **principle of reciprocal shaping** that was realized in this study by refining the design objectives iteratively during the process according to the researcher's increasing knowledge on Yle and target group context. The **principle of mutually influential roles** included a flexible approach to the roles within the ADR group, with, for example, the researcher suggesting design for visual appearance and functions for the website, and Yle representatives offering novel insights to the theoretical discussion based on their areas of expertise. The third **principle, authentic and concurrent evaluation**, was carried out with the end users discussing their technology using habits, websites they typically use and related applications before the redesign. These were analysed and used for the initial design. Quantitative user feedback was collected through user metrics and reviews after the implementation of the redesigned website. The direction and outcomes of research were evaluated with several meetings and discussions with the Yle representatives.

The BIE stage began with an analysis of the qualitative user data consisting of the interviews of the children and their parents and videos showing the children using web applications. The restrictions and facilitating factors related to the children's technology use were listed, along with the change trajectories addressing the evolution of the special

challenges in children's abilities and preferences in relation to their age. Comparisons between different types of touchscreen devices and PCs, as well as between different types of applications were made. Based on the findings, the strengths and weaknesses of different devices and applications were mapped, along with the consumer demands and contexts related to their use. The influence of the parents, siblings and friends was also mapped and evaluated. During analysis, the social context of use, consisting of family values and the presence or absence of the parents and siblings in the use situation turned out to be a major determinant of children's technology use along with children's age-related development phases and technology skills. All of these turned out to be interconnected, forming consistent age-related change trajectories. With further analysis, the findings were organized according to the children's age with the most important age-related family values, contexts, challenges, restrictions and preferences (of the children, their siblings and parents) forming the possible "media worlds" for each age group. These "media worlds," setting the boundaries for the children's technology use, were used for the initial redesign of the P2 website. After implementing the initial redesign, quantitative user feedback given by the users of the P2 website was collected from Yle's feedback website and analysed. Most of this feedback was given by the parents of the children, because most of the children using P2 website are too young to be able to read and write. The number of individual users of the P2 website before and after the redesign was recorded. The initial design turned out to be successful, verified by the increased number of individual users and an increase in the 5-star reviews (by the parents) for the P2 website, after which further revisions were designed, implemented and evaluated based on the findings of the analysis of the qualitative interviews and observation material collected during the 10 home visits. Along with the redesigns, the BIE cycles continued with frequent discussions among the ADR team; evaluating, merging and building the growing body of knowledge towards the emerging finalized design.

### **4.3 Reflection and learning**

The third stage of ADR, reflection and learning, aims at transferring the practical results of the project towards knowledge that can be applied to a class of problems through guided emergence (Sein et al. 2011). For the P2 redesign project, reflection and learning meant evaluating the data collection methods, refining the contributions to the public service objectives, focusing the emerging design knowledge according to the non-profit nature of Yle, defining the survey questions for the subsequent quantitative approaches, and formulating the design knowledge into presentations and design principles discussed below.

The outcomes of ADR BIE cycle(s) can be IT or organization dominant, meaning inclined towards the IT-design or organizational design knowledge outcome, or a combination of both objectives (Sein et al. 2011), as in the case of Yle P2 website redesign.

The objective of the IT-dominant BIE cycles for Yle was the finalized new design of the P2 website. The objective of the organizational BIE cycles for Yle was to formulate new practical design knowledge incorporating the principles of the public service and Yle's company values with theoretical knowledge on family values and current consumer demands. The new knowledge was communicated to Yle in form of two presentations by the first author. The first presentation concentrated on the 3 to 6 –year-olds' "media worlds" including the practical age-related contexts, ways and restrictions of children's media use with a special interest in touchscreen devices. The presentation contained data excerpts including video

clips, screen shots and quotations from user interviews that can be used during future design. This presentation offered Yle practical design implications and design slogans incorporating public service, social considerations, internet-era and current consumer demands. The second presentation focused on the theoretical knowledge on family and media use, including a historical perspective on change trajectories in family media use practices, family values and sociality based theory and research on social values. This presentation aimed at giving a broader view to the current and potential future demands of the multi-platform era.

#### 4.4 Formalization of learning

The final stage of ADR, the formalization of learning, operates on the principle of generalized outcomes, aiming at presenting the findings as design principles or even as refinements to the theories used during the process in a way that is beneficial also outside the case organization context (Sein et al. 2011). The lessons learned from the P2 project were used to formulate a set of design principles that address the research question “How can website design for pre-schoolers incorporate public service and social considerations with the consumer demands in the digital age?” The design principles comprise an overarching principle that we call “Lifification of Games” and two derived design principles with consequences (see Table 1). The overarching principle, “Lifification of Games,” means that the website content designed for small children should resemble real life and the activities encountered in it. The principle of “Lifification of Games” is an emergent concept, derived by analysis from user data (the interviews of the parents and children, the observation of the children), the company values and public service objective of Yle combined with the theories on social values. The purpose of this principle is to avoid the risk of its opposite scenario, “gamification of life,” another emergent concept derived from user data, summarizing the parental fears of the children getting addicted to the technology and virtual worlds. The Design principles comprising the overarching principle “Lifification of Games” are elaborated on below (Table 1).

<i>Overarching principle: “Lifification of Games”</i>	
<i>Consequence: Designing the website content for small children to conform to the real life</i>	
<i>Design principle</i>	<i>Consequences</i>
Reinforcing family values	<ul style="list-style-type: none"> <li>-Educational content encouraging hunger for learning both real-world and media skills, facilitating curiosity, creativity, empathy, eye for quality and aesthetics, focusing and long-term goals instead of addiction</li> <li>-Facilitating sociality, teamwork and sharing, diminishing conflicts within the family</li> <li>-Providing traditions for the family</li> <li>-Promoting child’s independent technology use safely</li> <li>-Promoting feelings of competent parenting and peace of mind for the parents</li> </ul>
Supporting child development	<ul style="list-style-type: none"> <li>-Content follows the real-life development of 3 to 6-year –old children progressing from spontaneous exploration and discoveries to co-created narratives</li> <li>-The child can increasingly take part in and be in charge of co-creation as her skills increase</li> </ul>

Table 1. Formulated Design Principles

## 5 Findings

With the on-going digital transformation and increasing ubiquity ICT, companies across different industries need to design more attractive products to keep their competitive advantage. At the same time, they are faced with the conflicting effects of the increasing use of technology. This leaves the companies with a question of how to design products and services that combine the increased use of ICT with increasing the quality of life for the users, while at the same time avoiding the alleged pitfalls of the ubiquitous ICT. This design dilemma is especially challenging for a public service company like Yle that is a non-profit organization, and in addition to the market demands, has to take into account its public service duty and company values with the universally acceptable public value objective.

Family values are present at technology use situations at home. These family values guide the pre-schoolers' use of ICT, along with the practical boundaries set by the developing technology skills of the children. Demands of the everyday routines, siblings and friends also have an effect on technology use, although family values tend to have primacy over these in situations with conflicting objectives. The parents are the gatekeepers at home, executing the family values and thus enabling and restricting pre-schoolers' technology use in various ways.

We noted during the interviews and observations that the diversity of family values present at home regularly creates tension between the family members in technology use situations. For example, the parents talked a lot about conflicting objectives related to the family values and technology use. They said, for example, that they wanted to provide their children with good parenting, meaning possibilities to learn real life skills and activities, creativity, aesthetics and social skills, to support the children's growth into independent and responsible citizens. They wanted to protect their children from getting addicted to the virtual worlds with little resemblance to the real life. The parents said they worried that spending too much time using technology would interfere with the development of the real-life skills of the children. Another point of concern for the parents was maintaining harmony at home. Parents worried that the children's increasing use of technology would lead to more conflicts between the siblings about sharing the devices, or arguing between the children and parents about time use at home. According to them, this would be detrimental to the sociality at home and parental authority. The parents also wanted to provide the children with traditions, meaning things to do and experiences to share together with the whole family.

At the same time, the parents felt that their everyday demands (including homework and outwork) often left them with little time for realizing their values of ideal parenting on a daily basis. Parental concerns were typically related to a feeling of not having enough time to supervise the children's play and clean up after the real-life arts and crafts projects or spend time reading stories as much as they would have wanted. On the other hand, teaching the children how to use TV remotes or laptops was also seen as time consuming, while parents noted that the children seemed to learn to use touchscreen devices either on their own or with minimal guidance. The parents said that the technologies that could make the everyday life run more smoothly increase the quality of life for both the parents and the children. The parents said, for example, that they sometimes used ICT as a childcare when time was tight, but they tended to feel guilty about this. The parents worried, for example, if it was safe to leave the children alone with the technology in case of frightening or low quality content. They also said that they would prefer to see their children doing something useful for their

development instead just sitting passively in front of the screen. On the other hand, the children's recurrent demands to use technology often left parents feeling guilty about having to deny the children of a this pleasure that they saw as an essential part of everyday life for themselves. The parents said that these conflicting objectives and accompanying negotiations often led them situationally weighting the priorities of their family values, and the resulting need to compromise left them feeling distressed and less than ideal as parents. They also said that they would allow their children more unrestricted use of a website addressing these issues and being free of the conflict-creating features.

Conflicts can be expected to arise if the use of technology demands the user to compromise the demands of the family values related to the social context of use present in certain use settings. According to our findings, this can be avoided by taking into account the demands of the difficult-to-observe and tacit social constructs with user involvement and analysis, and by designing technology to conform to and reinforce the family values present in a use situation, instead of creating conflicts between the values. This approach brings together the social and technological sides of a use situation in a mutually reinforcing and fulfilling way. With this kind of design that reinforces the family values related to the social context of technology use, incorporating technology use into everyday life can become an enhancer for the sociality and quality of life for the users. With the increasing ubiquity and social applications of technology, the social considerations related to the context, design and use of technology are likely to increase in importance.

The observed benefits of the P2 redesign project have so far been related to the user satisfaction with the new design and functionalities, verified by an observed increase in number of individual users for the P2 website and as increased number of 5-star reviews of the website. In addition, Yle has gained knowledge on how to translate its public service duty and the company values into web design by reinforcing family values in a way that also answers the current consumer needs and produces universally accepted public value in the potentially morally hazardous area of designing media content for small children.

The studied case setting of Yle can be generalized to similar settings, where a public service broadcasting company or any media company opts for considering the social and ethical implications of the use of their designs targeting pre-school -age children. Our results highlight the importance of designing solutions that take into account the social context of use and the family values present in the use situations in addition to tailoring the content to the interests and the technology use skills of the children. Combined with the consumer demands, the social values view enables designing technology towards increasing the quality of life for its users. The usefulness of the solution presented here has already been validated by the user feedback.

## **6 Conclusions**

This project is a part of Yle's on-going initiative of continuous service design based on consumer needs and wishes. The social shaping of the IT artefact described in this paper will continue in the future. Our ADR project has contributed to the goals of YLE in several ways. The most concrete practical contribution is the redesign of its P2 website, with increased amount of varied content for touchscreen devices. Additionally, the design knowledge created and communicated to Yle can be used for both short- and long-term design for public service

in the multi-platform environment. These facilitate Yle's digital transformation into a media content company.

This study also contributes to theory by focusing on the importance of the social technology use context with theories on social values as a lens. This sheds light to the potential pitfalls related to the technology use in a social context, and increases understanding on how these issues can be solved through research and design. Methodologically, this study contributes to the application of ADR in the public service broadcasting context, considering the potential social and ethical issues of design, the social context of technology use, and demands for user involvement.

The two design principles formed in this study using ADR in a public service broadcasting company setting: reinforcing family values and supporting child development can be applied to a class of similar problems, when designing content for small children. The overarching design principle, "Lifification of Games," brings these together by suggesting ways of designing games for 3 to 6-year-old children to resemble real life, support discoveries and learning in the process in a way that is mutually accepted by the children and their parents alike, while also being sociality-reinforcing in the social use context at home.

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