Old Methods, New Means:

Persuasive Technology in a Social Platform

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Authors: Armela Duzic
Anna Persson

Supervisors: Agneta Olerup
Claus Persson

Examiners: Odd Steen
Paul Pierce

Abstract

Persuasive Technology, technology that is designed to change users' attitudes or behaviors, has been exercised for a long time. Designing a technology that can change users' attitudes or behaviors is a process that needs to be carefully thought through. Captology makes this process easier by defining the most important factors that technology needs to contain in order to be classified as Persuasive Technology. Echo It is the object of study, which is used as a particular example to test our theories. The most significant theory is a framework called "the Functional Triad", a framework which is helping developers to identify what role a technology plays. Being aware of the role is important. However, for a technology to fully persuade its users, it is also important that it contains accurate information and has an appearance that attracts users. The purpose of this thesis is to establish guidelines for how Persuasive Technology should be designed in order to reach the target goal of helping users to change a behavior. The knowledge contribution is the guidelines which can be used by designers and developers and help them design and evaluate Persuasive Technology.

Keywords: Persuasive Technology, the Functional Triad, credibility, support aspects, behavioral change, guidelines, human-computer interaction (HCI)

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1. Introduction

1.1. Background

Technology can be used as a tool to motivate its users to changed behavior, for that reason there is a significant link between technology and psychology. Psychological methods can motivate and change behaviors and attitudes, while the technology can work as means to push the changes to ultimately reach the target behavior. A fairly new point of view on the link between psychology and technology is called Persuasive Technology (Fogg, 2003a). In a world of increased technology usage, Persuasive Technology is becoming a subject of interest - to a large extent based on B.J. Fogg's research at Stanford Persuasive Technology Lab. Although technology itself has not introduced new ways of persuading users, it allows for applying old methods in new ways. Awareness of Persuasive Technology is therefore important so as to use technology in a positive way (King & Tester, 1999)

With recent years' emergence of social networks, for example Facebook.com, and mobile technology usage, such as smart phones, the evidence almost speaks for itself (Vassileva, 2012). Even though the intention behind the designs in the example might not primarily be to change behavior, in some cases, it ultimately does. Facebook users can create personal profiles, enter "friendship" relationships and share photos (Lewis et al, 2008). This has changed the way that millions of people interact with each other (Rayport, 2011). Facebook had on average approximately 845 million monthly active users, of which around 425 million used Facebook's mobile products in December 2011 (Facebook, n.d.), meaning that approximately fifty per cent used the social platform from mobile devices. Facebook is merely one example of how technology can change its users' behavior despite their initial intention of using the site.

In other examples where design principles behind Persuasive Technology have been used, the aim has been to motivate changed behavior or attitude towards a positive change that will benefit own health, public health or the environment (Fogg, 2003). Technology can motivate people to stay physically healthy through exercise, manage chronic diseases and take preventive actions against illness (King &

Tester, 1999). One case is the Center for Disease Control and Prevention (CDC) in the United States launching a campaign in 2007 in association with World Aids Day. The purpose of the campaign was to motivate the population to get tested for HIV, hence motivating them to take precaution for their own- and public health. One of the motivating factors was, by sending a text message (SMS) with a zip code, the mobile user would receive a text message with the address and phone number of the nearest HIV testing clinic (Center for Decease Control and Prevention, 2012; Sabadosh, 2008). By eliminating the barrier of easily finding a nearby testing clinic, people would be more motivated to take a test.

However, designing to motivate changed behavior with technology is not limited to Persuasive Technology as such. Designing with elements from gaming can also motivate changed behavior to benefit health or environment (Vara et al, 2011). An example is Meeco, a Master's Degree project from La Salle Universitat Ramon Llull in Spain, which is a platform to enable users to share actions taken or advice, benefitting the environment. With a scoring system, users can compete against each other for the highest rank and build "a green status by collecting items and connect with brands that share their same eco-values" (Vara et al 2011, page 3). The competition and the prizes are what motivate the user to changed behavior.

The above are examples of activities that have persuasive purposes. They have either been or have the potential to be put into practice. However, thus far, the review of examples where Persuasive Technology has been put into practice is mostly by governmental institutions and non-profit organizations in order to trigger a positive change of behavior towards own health or the environment. On the other hand, companies could also use Persuasive Technology to change the behavior of employees in a positive way, for example to promote team work and/or increase clients' satisfaction, using social networking platforms to increase collaboration (Vassileva, 2012).

1.2. Problem Identification

Whether initiated by government or a company, to benefit from Persuasive Technology the system or platform should be designed in a way where the desired outcome corresponds to the actual outcome, changed behavior (Fogg, 2003a). However, the actual outcome could be challenging to measure since technology cannot change behavior itself - yet simply work as a trigger (Fogg, 1998). We have therefore identified that more emphasis should be put on the design and evaluation of Persuasive Technology. By design we refer to the finished product and not the design process since the end user can only see the finished product and it is then and there the persuasion happens. While increasing the

understanding for the design product and evaluation process, the desired effect of Persuasive Technology can be obtained. The question is – how?

1.2.1. The need for Persuasive Technology

Why is Persuasive Technology needed? We are on a daily basis surrounded by Persuasive Technology and influenced by various applications, Internet services and social networks (Stanford Persuasive Tech Lab, 2010). Persuasive Technology can be seen as immoral and evil because it can change attitudes and behaviors. It can have negative influences if people and organizations with the purpose of manipulation misuse it. However, if most of us focus on getting positive outcomes then the world can be changed in a positive way. By using persuasive methods we can create positive changes in health, business, safety and education and that is why Persuasive Technology is needed (King & Tester, 1999).

1.3. Purpose

Persuasive Technology simplified means designing with the intention of changing the user's behavior (Fogg, 2003a). Firstly, considering the discussion above, it can be determined that some initiatives have been made into persuading people to take care of their health, with technology as a mean to do so. Secondly, as Persuasive Technology is fairly new as a concept within academia, we have discovered that there are many research initiatives although from a limited number of resources. In order to establish how technology can be designed to persuade its users to changed behavior, further initiatives need to be put into practice, by researchers, governments as well as companies.

Therefore, the purpose of this essay is to establish guidelines for how the Persuasive Technology design product could look in order to reach the intended outcome. The intention is for these guidelines to become applicable and reusable by designers of systems with persuasive purposes, regardless of platform or means, since being aware of Persuasive Technology helps reach the desired outcome – changing user's behavior (Fogg, 2003a). The guidelines could become applicable to both governmental initiatives as well as commercially. Our hope is that companies will find Persuasive Technology as a means for motivating employees to, for example, share knowledge across teams or take action for the environment and ultimately increase employee- and client satisfaction.

1.3.1. Research question

With the background and the purpose of establishing guidelines for designing Persuasive Technology in mind, our main problem is to highlight the field of Persuasive Technology as important, in particular the design and evaluation of the final product. By emphasizing the importance, researchers and practitioners could become further accustomed with the field of study and ultimately more people could benefit from the positive outcomes of Persuasive Technology. Therefore our research question is twofold:

RQ1: Which aspects are crucial to evaluate ICT-systems designed for persuasive purposes?
RQ2: Which design criteria can be detected from an evaluation process?

These research questions open up for discussion on how to design and evaluate persuasive systems to reach the desired outcome. In addition to the design and evaluation, this paper also describes content and software functionally which may be found in the final Persuasive Technology. By referring to design, we refer to the finished product and not the process of designing. Functionality is part of the final product. By conducting this study the field is unavoidably highlighted as important.

1.4. Delimitations

In this thesis we will focus on one Persuasive Technology, namely a social platform called Echo It, which we refer to as "the system". The focus of this is not to investigate multiple cases but to focus on one particular example to test the theories on - and what we can learn from that.

In addition, Echo It is not a persuasive system per se. However, as discussed previously in this chapter, the objective is to change people's behavior and that is why Echo It is looked upon through a Persuasive Technology lens, to evaluate if that objective has been or can be reached through changes. Echo It is also a platform undergoing development, meaning that new features are implemented continuously. Therefore the focus will only be on evaluating what the system looks like at a certain point in time - regardless of the changes, for example new features, that are implemented after the evaluation have been done. Those changes are not in scope for this essay.

There are ethical issues in aiming to persuade people to change their behavior, for example, when people are persuaded into buying new products or services, which they do not need and sometimes cannot afford. Ethics of using Persuasive Technology is an important topic that will, however, not be considered in this essay because of that reason. It is a much too wide of a subject, neither does it help in answering the research question. However, ethics and reliability will be discussed in terms of methods for collecting the empirical data for the study.

2. Literature Review

In the previous chapter, the problem area was introduced. In this chapter, the theoretical foundation is presented in order to answer the research questions and to discuss how psychological methods work as ingredients in technological artifacts. The following main concepts within the literature are presented: social psychology and Persuasive Technology. Persuasion is discussed from a social psychology perspective. Persuasive Technology is discussed with emphasis on B.J. Fogg's research and Oinas-Kukkonen and Harjumaa's (2008) framework for designing and evaluating Persuasive Technology. These concepts then form the components of our theoretical framework, which will be the basis for the empirical study.

2.1. Persuasion in Social Psychology

In Social Psychology, persuasion is the process where a message changes a person's beliefs, attitudes or behaviors. It can be used effectively in for example marketing or politics, to sell a new product or to convince people to vote for a specific candidate. It is important to know that persuasion is neither good nor bad per definition. It is rather the purpose and the content of the message that cause it to be good or bad. A message that is of good nature can be seen as educational while a message of evil nature can be seen as manipulation or propaganda (Myers, 2002).

In social psychology, the aim is to understand what leads to long-term attitude change and which factors or what elements affect persuasion. Extensive research has been made and one study that has been brought to attention is Petty and Cacioppo's (1986) Elaboration Likelihood Model of Persuasion (ELM), a "general framework for organizing, categorizing and understanding the basic process

underlying the effectiveness of persuasive communication" (page 124). The ELM conceptualizes two routes to persuasion, the central- and peripheral route.

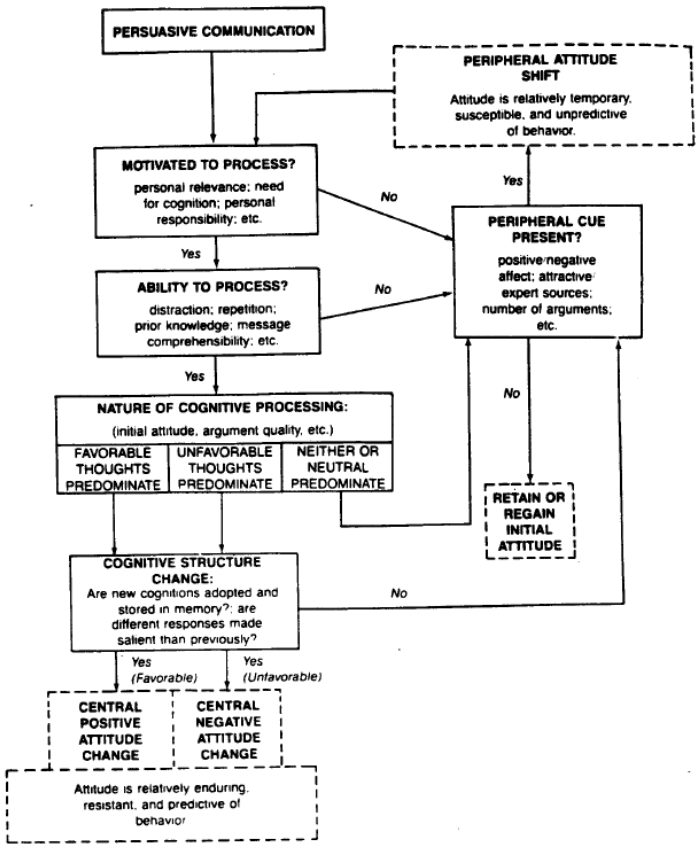

Figure 2.1: Elaboration Likelihood Model of Persuasion (Petty & Cacioppo 1986, page 126)

The central- and the peripheral routes to persuasion will both be presented in the following subsection.

2.1.1. Central vs. Peripheral route to persuasion

The two routes to persuasion discussed in the ELM (Petty & Cacioppo, 1986), are the central route and the peripheral route. Both routes can lead to persuasion based on different elements, which route is travelled depends on the motivation and engagement of the person receiving the persuasive message.

The focus of the central route to persuasion is on the arguments when a person is motivated to think. When the arguments are strong and the person responds with favorable thoughts, persuasion is likely to occur. The peripheral route to persuasion is used when a person is less motivated to think and focus on cues or triggers, such as an attractive speaker, instead of the arguments. These cues and triggers are most likely incidental and do not last long. The central route to persuasion however, is more durable and likely to lead to long-term behavioral or attitude change (Petty & Cacioppo, 1986; Myers, 2002).

2.1.2. Elements of Persuasion

There are essentially four elements of persuasion. The *communicator*, the *message*, how the message is *communicated* and the *audience*, in other words, *who* is communicating *what*, in *what way* and *by whom* is the message received (Myers, 2002).

Who is saying something has an effect on how the message is perceived. A credible communicator is perceived as trustworthy (Myers, 2002). However, interestingly, the impact on persuasiveness may fade over time as the message gets disassociated with the source, as opposed to the impact of a non-credible source, which may increase over time. A credible person or source may for example be a professor at Stanford University whereas a non-credible source may be a tabloid magazine. Not only credibility has an impact on persuasiveness, an attractive communicator often triggers peripheral route to persuasion (Myers, 2002). Here attractiveness could be physical appeal or some kind of similarity between the communicator and the receiver of the message. For example, a person is more likely to be persuaded by someone with in their own group, having similar opinions.

When looking at the message or what is being said, it can be either rational or emotional or sometimes both. Different people respond to the type of message in different ways. Research has shown that well-educated or analytical people respond better to rational messages as opposed to people who are less educated or analytical. Involved listeners travel the central route whereas people with low interest travel the peripheral route to persuasion (Chaiken, 1980). In addition, by linking good feelings with the message and by enhancing positive thinking, good feelings can increase persuasion. On the other hand, a message intended to intimidate may also act as an effective way to persuasion. Which message to choose depends on the audience, to whom the message is communicated, for example, trying to

persuade a smoker to quit might be effective with intimidating pictures on the cigarette package (Myers, 2002).

In what way a message is communicated, is also an important element of persuasion, if it is communicated by media or face-to-face. Contact with people has the most influence on persuasion. However, media has great influence on persuasion through the two-step flow of communication (Katz, 1957), meaning that opinion leaders get their ideas and opinions from the media and in turn influence other people.

Understanding and comprehension of the message is one of the first steps in the persuasion process and a complex message is easier to understand when written, while an easier message is easier to understand when videotaped. The medium together with the complexity of the message determines persuasiveness. As an example, instead of the viewer controlling the pacing of a message, the TV as a medium controls the pacing of him or her. The TV "also encourage people to focus on peripheral cues, such as the communicator's attractiveness, by drawing attention to the communicator and away from the message itself" (Chaiken & Eagly, 1983 cited in Myers, 2002, page 262).

The final element is the audience, the receiver of the message. Two characteristics of the audience are age and thoughtfulness. Depending on age, people tend to have different social and political values (Myers 2002). This could be explained in that either people becoming more conservative with age, or that the values remain unchanged. However, the younger generation does not share the same values, therefore a gap appears between the generations. Young people's attitudes are less stable and while their values are formed, they are easier to persuade (Myers, 2002).

The message itself is not the crucial aspect of central route persuasion. The crucial aspect is the responses the message produces in the receiver's mind. The message persuades if it summons favorable thoughts as opposed to if the message provokes to think of counter arguments, in which case the receiver will not be persuaded. It could therefore be important to consider the thoughts of the audience while conveying a message (Myers, 2002). For example, if the audience knows beforehand what is going to be said, they might have had time to come up with counter arguments. In turn, these arguments could be neutralized with distractions.

The different elements of persuasion need to be combined in certain ways to lead to persuasion. In which ways to combine them depends on the audience and the complexity of the message. If the audience is involved and motivated, it will respond to a persuasive message in one way as opposed to the audience being unengaged. In the same way, the message is dependent on which channel it is communicated through. A complex message might not be comprehended by the audience if communicated through a medium that does not adapt the pace to the audience's level of understanding. Hence, it is crucial to research the audience in order to determine how the message should be perceived (Myers, 2002).

2.2. Computers as Persuasive Technology

Technology has a big influence on us in our everyday lives and has affected our attitudes and behavior either incidentally or accidentally. Many technologies were not developed to affect us - but did. Developers and designers who use strategies to design technology that will change users' attitude and behavior can achieve great results. Technology that changes attitudes and behavior is called Persuasive Technology and Fogg (2003a) argues that Persuasive Technology changes a user's behavior intentionally. The area is called *Captology*. Captology derives from the acronym CAPT, which stands for and is the study of Computers As Persuasive Technologies (Persuasive Tech Lab, 2010). Captology focuses on human-computer interaction (HCI), which means that for technology to be able to affect a user, the technology must be a part of the interaction (Fogg, 2009). The interaction between the user and the technology can make the technology a source of persuasion and many HCI patterns can be applied to technology to persuade users (Fogg, 2003a). This means that technology can proactively motivate and influence a user based on strategies and functions programmed into the technology. An interactive computer product or a Persuasive Technology can be for example: a computer, a mobile phone, a website or a video game (Fogg, 1998).

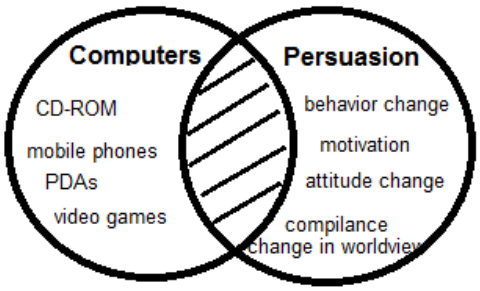

Figure 2.2: The intersection of computers and persuasion is called *Captology* (Fogg 1998, page 225)

2.2.1. Persuasion in Technology

Persuasion is not new; it has been used for years. Nevertheless, the main difference from before is that now there are more strategies that help with designing and evaluating Persuasive Technology. Dillard and Pfau (2002) argue that persuasion is one of the most effective tools to help change others' attitudes and behaviors. Ever since the beginning phases of designing technology, different HCI techniques to

change attitudes and behaviors and achieve the target goal with technologies have been used. (Fogg, 1998)

For a technology to be called Persuasive Technology it requires intent to change attitude and behavior. The event should be a persuasion event otherwise it is not a result of persuasion. (Fogg, 1998) A technology has no intentions but it is qualified as a Persuasive Technology if it is created and distributed with intent to change attitudes and behavior (Fogg, 1998). This means that those who create, distribute and adopt the technology must have intent to do so. Here is an example of the difference between a persuasion event and an ordinary event: when there is strong sunlight outside, many people go out to buy sunscreen for protection. This means that manufacturers make more money off the sun although it is not in fact a persuasive event. The reason is that there is no intent associated to it but if manufacturers where able to cause/create strong sunlight, then it would be a persuasive event.

To make it easier to identify persuasion opportunities, it is good to know about two levels of persuasion, macro and micro. A Persuasive Technology is on macro level when it is designed for an overall persuasive outcome which means that the product exists only to motivate and persuade to change behavior (Fogg, 2003b). Persuasion at a micro level is when a technology does not have an overall goal to persuade but uses smaller persuasive elements to achieve the overall goal. These elements can be designed as dialog boxes, visual elements, icons and other interactions patterns (Fogg, 2003a; Fogg, 2003b). Micro elements can be, for example, giving praise when a user has completed a task (Fogg, 2003a), giving rewards according to user's performance, reminders and visualization (Oinas-Kukkonen & Harjumaa, 2008). A technology that is designed on macro level can use micro elements to persuade.

Different techniques can persuade users to interact much longer with the computer or until users have achieved the target goal. The gambling industry is an example of how persuasion is used to convince users to keep playing. For example, the game Banana-Rama is where two monkeys at the bottom of the page are persuading users to keep playing. By adding physical cues such as movements, eyes, mouth, body and other physical cues and programming so that they support and celebrate each time the user wins will drive the user to keep playing (Fogg, 2003a). Persuasion depends on the interface and attractiveness as well, users are more likely to be persuaded by a technology or a person who is visually attractive (Fogg, 2003a), traveling the peripheral route to persuasion (Myers, 2002). This is also known in the area of sales and advertising where companies hire models and famous people to be their spokesperson. The interface must be adapted to the target group otherwise it can have opposite effect (Fogg, 2003a).

2.2.2. Computers

A computer can, for example, be a PDA, a mobile phone or a video game, all which can store and manipulate information. Humans use at least one of these daily and we are entering an era where computers are taking over human resources. For example in the car manufacturing unit, where an increasing amount of human resources are being replaced by machines, is it important that technology is designed and created, making it easier to benefit from. By designing technology with intent to change behavior and attitude, it can motivate humans to for example exercise more, eat healthier, carry out certain routines and achieve other target behaviors.

Table 2.1: The Functional Triad (Fogg, 1998)

Role	***Essence***	***Persuasive affordances***
Computer as a tool	Increases capabilities	Reduces barriers (time, effort, cost), increases self-efficacy, provides information for better decision making and changes mental models.
Computer as a medium	Provides experiences	Provides first-hand teaming, insight, visualization and resolve, promotes understanding of cause/effect relationship and motivates through experience, sensation.
Computer as a social actor	Creates relationships	Establishes social norms, invokes social rules and dynamics and provides social support or sanction.

Fogg (2003a) has introduced a framework called "The Functional Triad". This framework illustrates the different roles an interactive technology can play from a user's perspective. Dividing interactive technology into these roles gives us a better understanding of how users use and respond to technology (Fogg, 2003a). Being aware of The Functional Triad makes it easier to understand the link between persuasion and computers and what power persuasion has over computers (Fogg, 2003a). In table 2.1, three different roles a technology can play are established: a tool, a medium and a social actor where all roles use different persuasive strategies which reach different outcomes. Most technologies are a mix of these three (Fogg, 2003a). We will describe the different roles more in detail below.

Computer as a tool

To be an effective persuasion tool it requires using more than one single persuasive tool and usually two or more types of persuasive tools incorporate to reach the target behavior (Fogg, 2003a).

The first role is computer as a *tool*, which is a basic function of a computer and can be seen as something that increases capability. A tool makes the target behavior easier to preform, leads the user through a process and performs measurements and/or calculations that motivate. The tool does this by

providing humans with new abilities, allowing humans to do something they could not do before and makes the function more efficient to execute. (Fogg, 2003a) This can for example be a website which can track a user's workout, calculate how many calories have been burned and in this way help the user reach his or her target weight.

Table 2.2: A tool as a Persuasive Technology divided into seven types of persuasive tools

Type of persuasive tool	***Persuasion strategy***
Reduction	Persuading through simplifying
Tunneling	Guided persuasion
Tailoring	Persuasion through customization
Suggestion	Intervening at the right time
Self-monitoring	Taking the tedium out of tracking
Surveillance	Persuasion through observation
Conditioning	Reinforcing target behaviors

The first tool type is *reduction*, which is making a target behavior easier to perform by reducing a complex activity to a process with few steps (Fogg, 2003a). This has become more and more common on online shopping sites where you, before starting your shopping, need to sign up and provide personal- and bank account details. Once the account has been set up, it is possible to shop with only "one-click", meaning that the items are billed to the provided credit card, packed and shipped - only by clicking once on the shopping button. The theory behind reduction is to minimize cost and maximize gains (Fogg, 2003a). By making the behavior easier to perform, the user will gain time, which motivates users to do it more frequently.

The next type of persuasive role is *tunneling* which is about leading the user through predetermined actions, step-by-step. When a user uses a tunneling technology, the user submits a certain level of self-determination and becomes part of the audience because, to remain in the tunnel, the user must accept the assumption, the values and the logic of the actions (Fogg, 2003a). An example of tunneling is when we want to install software on our PC. We must accept the terms of use to get through the process, and if we decline, the installation will be canceled.

Tailoring is the third persuasive tool, which provides information that is relevant to the user to change behavior and attitude. The information is tailored to a user's needs, interests and other factors that are relevant (Fogg, 2003a). Many companies use this when they send out special offers to users' emails. They often write the user's first name in an effort to sound like the offer is specially made for that specific user. The theory behind this is that the information doesn't need to be tailored; it just needs to appear that way because when users think that a message is tailored just for them, they pay more attention and will process the information more deeply (Fogg, 2003a). Furthermore, if the information is something that they need, they will be more likely to be persuaded (Fogg, 2003a).

Suggestion as a persuasive tool is about suggesting a behavior at the right time. An example of this is a mobile application where every time you pass a specific store, the mobile application suggests current sales or special offers, perhaps with sound and/or a pop-up message. If it is the right moment, the user might visit the store and buy some things. But the problem with using suggestion as a persuasive tool is that even if the location is right, the user might be influenced by other factors such as: financial problems, limited time or other factors that prevent the user from visiting the store. These kinds of factors are hard for a technology to identify. (Fogg, 2003a)

The next persuasive tool is *self-monitoring,* which means that the users get data about their physical state and/or mental state, their location or progress in a task. This tool makes it easier for users to see how they are preforming in relation to a target, which will make them want to continue preforming to produce the target behavior (Fogg, 2003a). A tool that shows performance can for example be a heart rate monitor. This tool gives the users the opportunity to modify their exercise level to achieve a target heart rate.

Surveillance is a type of persuasive tool where we can learn about others behavior by watching or tracking their behavior. When we know that other people are watching us, we immediately start to behave in a different way. But it is important that the tool is not covert but overt. (Fogg, 2003a) An example is companies who use systems that track employees' performance and then reward them for good behavior.

The last type of persuasive tool is *conditioning,* which is technology that uses operant conditioning to change behavior. This means that the technology uses positive reinforcements or rewards to increase behavior or to form a specific behavior (Fogg, 2003a). The web-based game Banana-Rama is an example of a conditioning persuasive tool. Banana-Rama and many other games use sounds, visuals and high scores to keep the user engaged.

Computer as a medium

The government has created programs where they enabled young people to live life in prison for a while so that they can get a glimpse of how life is behind bars. These programs are created because experience can make a difference and change behaviors and attitudes. We use computers every day and instead of having experiences in real life, developers and technology innovators attempt to create real life experiences with computers. When a computer takes this role it is called: computer as a *medium*. Computer as a medium has increased since networking has become more and more common. A medium is something that provides experience because it conveys content through data, text, icons, audio, video or graphs and can be created as hypothetical worlds that are experienced as a real world. (Fogg, 2003a) People can react to hypothetical worlds as though they are the real world and therefore the concept of computer as a medium can motivate and persuade by giving users information that motivates them and makes users rehearse a behavior (Fogg, 2003a). Computer as a medium is not so

much about technological elements but rather about what the user experiences because it is the experience that persuades and much of the theory comes from psychology (Fogg, 2003a).

Table 2.3: Categories of computer as a medium

Categories of stimulation	***Offers/Creates***
Cause-and-effect stimulations	Offering exploration and insight
Environment stimulation	Creating spaces for persuasive experiences
Object stimulation	Experiences in everyday contexts

Each class is described below.

With cause-and-effect stimulation, people can see causes, observe outputs and observe effects. This stimulation gives the user a chance to observe the link between the cause and the effect almost immediately because it enables users to experiment and explore in a safe environment (Fogg, 2003a). Users can try new attitudes and behaviors, see the consequences and transfer these changes to the real world, which in turn can help them know which attitudes and behaviors are working in the real world (Fogg, 2003a). An example of a cause-and-effect stimulation is a computer program that shows you the affect of ten years of smoking and how it damages your skin. This program can show a recent photo of a user and with effects it can show a photo of the user after ten years as a smoker. The persuasion happens when a user sees a clear link between cause and effect (Fogg, 2003a).

The next class of simulations is environment simulations, which enables people to practice a behavior and enable them to change. Just like cause-and-effect simulation, the environment simulation enables people to explore and experiment in a safe world. (Fogg, 2003a) An environment simulation can for example be a spinning machine with a TV screen. An ordinary spinning machine can be perceived as boring but by adding a TV screen that shows "the real world", it can motivate users through rewarding them to work out harder and longer and by making it more enjoyable. Environment simulations can also be used to overcome phobias such as; spiders and flying in planes and to view the world from another person's perspective like a cancer patient's.

Object simulations, which are the last class in computer as a medium, are technologies that are designed for use during an individual's everyday routines. It emphasizes a certain behavior, which makes it easier for a user to see certain behavior and then motivate to change attitude and behavior (Fogg, 2003a). Baby Think It Over is an example of an object simulator; it is a doll that looks and acts like a real baby but it has a computer embedded inside. This simulator helps to decrease teenage pregnancies and to help teenagers to realize how much attention a baby really requires. After having the object simulation for a few days, they may realize that they are not ready for a baby and can change their attitude and behavior and use protection more often.

Computers as social actor

The last role is computer as a *social actor.* A social actor creates a relationship between a user and a computer by giving the computer animate characteristics like voice communications, physical features and/or emotions (Fogg, 1998). A computer that is a social actor is like a living creature. We can express our emotions on a computer (Fogg, 2003a) and many people respond to computers as though they are social entities, for example when people get angry with a computer. Because of this effect on people, we can use a social actor to change attitude and behavior. We can take our Banana-Rama game as an example of a computer as a social role. The game has two cartoon monkeys who celebrate and give the user feedback every time the user wins. This supporting and attentive audience persuades users to keep playing (Fogg, 2003a).

Table 2.4: Five social cues that make people respond to computers as social entities

Types of social cues	***Example***
Physical attractiveness	Face, eyes, body, movement
Psychological cues	Preferences, humor, personality, feelings, empathy
Simple language	Interactive languages use, spoken language, language recognition
Praise	Turn taking, cooperation, praise for good work, answering questions, reciprocity
Social dynamics	Doctor, teammate, opponent, teacher, pet, guide

Physical attractiveness (1) has a significant impact mostly because it is easier to like, follow and believe something that is attractive and therefor is it easier to persuasive target users if the visual look is attractive. (Fogg, 2003a)

Psychological cues (2) can be for example empathy messages or icons that show emotions. Psychological cues make us believe that the computer has personality because the technology gives us feedback (Fogg, 2003a).

Using *simple language* (3) can persuade to convey social presence (Fogg, 2003a).

Persuade through *praise* (4) is an effective method to persuade people. This positive feedback can help to reach the target goal because the users may feel good about themselves, be in a better mood and/or feel that they have performed well. When a user gets good feedback (s)he will want to continue to interact with the computer (Fogg, 2003a). Praise can be expressed through words, images, symbols and sounds.

Social dynamics (5) is about unwritten rules for how to interact with each other and those who do not follow the rules risk being alienated (Fogg, 2003a). Social dynamics is the fifth and last social cue. Social dynamics can be applied to computers to persuade users. For example when a user downloads a

software and the target goal is to persuade users to register, then the developers can use social dynamics to remind users through a dialog box that says "Do you want to register?" and the user can either click "Take me to the registration!" or "Maybe later!".

The computer as social actor can be emphasized with *pervasive games* or *gamification*. As previously discussed, Persuasive Technology is not the only technology triggering to change user behavior. Pervasive games are also effective vehicles for persuasion. One the one hand, a pervasive game is Persuasive Technology – but on the other hand it is not. The main feature that distinguishes pervasive games from traditional games is that they extend the gaming experience to the physical world. For example, pervasive games utilize technologies, such as global positioning systems (GPS), to link and track devices and users in the physical surroundings.

In relation to Persuasive Technology, pervasive games change the social landscape and consequently the activities in the game have potential to be learned and transferred to related off-game activities, thus changing real life behavior (Deterding et al, 2011). On the other hand, pervasive games are not designed to change behavior per se. Gamification is merely defined as "the use of game design elements in non-game context" (Deterding et al, 2011, page 2). However, a "gamified" application motivates its user into performing everyday actions, in relation to for example one's own health or the environment, while engaging in it because it is fun (Vara et al, 2011), also motivating change. This also indicates that the computer takes on the role as a medium.

Some of the founding elements in gamification stems from HCI (Deterding, et al 2011). Gamification relates to the area of *Game Mechanics,* which is built upon motivational patterns, rules and feedback loops that can be applied to develop game-like elements in, for example, online applications (Vassileva, 2012). Vassileva (2012) suggests four common patterns; ownership, achievements, status and community collaboration. In the introductory chapter, Meeco was used as an example of an application where gamification was used to raise the awareness and change people's behavior towards becoming more "green" and conscious about the environment (Vara et al, 2011). However, gamification has met some criticism suggesting that it is a passing trend and that playing a game is fun for a short period of time that passes quite rapidly, not promoting long-term change. Another aspect is that the reward received is devalued when a user collects points for insignificant actions (Vassileva, 2012). Although pervasive games are in fact games, while gamification is the elements of games, the objectives are the same. Put in a Persuasive Technology context, they both motivate and promote changed behavior in a social context relating to, for example, own health or the environment.

Some criticism to Fogg's Functional Triad has been discussed by Oinas-Kukkonen and Harjumaa (2008). They argue that the model has a weakness, as it does not explain how software requirements can be derived from the design principles in the model and hence be implemented as features in a system. They argue that "to be able to design and evaluate the persuasiveness of a software system, it

becomes essential to understand both the information content and the software functionalities" (Oinas-Kukkonen & Harjumaa 2008, page 169).

2.2.3. Computer credibility

Most of the time, people use computers to search information, to learn, for comfort and support and empowerment. The information has an impact on us and people often share and make decisions based on the information. Most of the information that we encounter we filter out leaving only the information that we find credible and useful. (Wathen & Burkell, 2002)

> *Credible sources are described as "trustworthy" and having "expertise"*
> (Self, 1996, according to Wathen & Burkell, 2002; page 135)

As discussed previously, credibility is a very important factor in persuasion; a computer can only persuade if its information is credible. When a source is credible it can change opinions, attitudes and behaviors, which is what persuasion is all about. (Fogg, 2003a) People are becoming more and more skeptical about the information that is available to them and therefore designers of Persuasive Technology need to understand credibility and how credibility is judged to be able to design the technology appropriately.

Below we will describe four dimensions of source credibility (Tseng & Fogg, 1999) and also give examples of how each dimension relates to technology.

Presumed credibility (1) is the general assumption of the perceiver. We assume that our friends tell us the truth and therefore we see them as credible, but all friends are not the same and some may disappoint us. General assumption can have negative effect on a specific technology label that has bad reputation, which can make people think that all products from that technology label are not bad.

Reputed credibility (2) is based on how much we believe in someone because of source labels. If a person has received the Noble Prize or is a professor, we tend to see them as more credible. A technology that has a reputation to be a specialist may affect the way people respond to that technology and they may think that it is more credible than others.

Surface credibility (3) is related to users' inspection. For instance, a book is often judged by its cover and our credibility can be affected depending on how people dress and how they speak. When it comes to technologies, a technology or a webpage can be seen as credible because of its visual design.

Experienced credibility (4) means that by interacting with people, we learn about their expertise, and then we can decide if they are credible or not. For instance, if we use a technology under a certain time period we can find out if it gives us accurate answers.

If the technology does the opposite and if users find the information erroneous, then the opposite, loss of credibility, may be the result. Once a technology loses credibility it is hard to regain it because many users stop using the technology and do not give it a new opportunity to prove itself (Tseng & Fogg, 1999). This is the reason why credibility is so important in Persuasive Technology.

Wathen and Burkell (2002) have created a model of how users judge how credible online information is but the same model can be used to judge information in every technology. The first stage (the authors are not sure if these are stages or simulations but we will call them stages) is that we enter the web or start the program. The second is to check the visual design and if there is any detailed information about the organization. We also check if there are any errors. If the page passes this stage of inspection, then we go on to the next stage where we check the source more in detail and whether or not it shows expertise and knowledge. We also look at the content and when it was written/ last updated, currency, accuracy and if it is relevant. In the last stage, we check if it is the information we were looking for, the depth of information and compare it with our previous knowledge. This information helps developers to know which things to focus on so that users see the technology as credible.

Metzger (2005) collected five criteria that she thinks should be used to check how credible the information is on the Internet. In table 2.5, Metzgers's (2005) criteria is described.

Table 2.5: Metzger's (2005) five criteria to check for credibility

Criteria	***Definition***
Accuracy	Refers to that the site is free from errors and reliability of the information
Authority	Refers to who authored the site and if there is detailed information
Objectivity	Refers to if the information is a fact or opinion and tries to check so that there is no commercial intent with the information
Currency	Refers to check if the information is up to date
Coverage	Refers to the depth of the information available

These five criteria could be applied to any source, whether it is a social platform or a company's web page. However, when the user encounters information that (s)he is not familiar with, it could be difficult for the user to judge the credibility.

2.3. Designing and evaluating Persuasive Technology

Oinas-Kukkonen and Harjumaa (2009) have based their research on how to design and evaluate Persuasive Technology on B.J. Fogg's Functional Triad. Their focus differs from ours as they focus on the design processes, while our focus is on the finished designed product. They suggest the following phases during the development of Persuasive Technology:

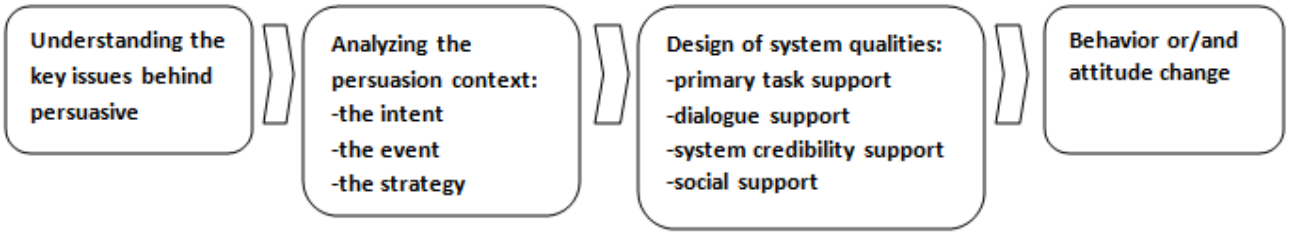

Figure 2.3: Phases in Persuasive Technology development (modified from Oinas-Kukkonen & Harjumaa 2009)

The development process takes a stance in the key issues behind Persuasive Technology. The second phase is the analysis of the persuasion context after which the system qualities can be designed. This will then ultimately lead to behavioral change in the user. Each of these phases will be explained in detail in the following three sections.

2.3.1. Key issues behind Persuasive Technology

Before we describe more about how to design and evaluate Persuasive Technology, we will describe seven postulates (assumptions or biases) that, according to Oinas-Kukkonen and Harjumaa (2008), should be mentioned when evaluating and designing persuasive technologies.

Information technology is never neutral (1) which means that every information technology influences people's behavior or attitude in one way or another and it is not something negative. We are being persuaded in a similar manner by teachers in school, which we do not perceive as negative.

People like their views about the world to be organized (2) which means that we are more able to be persuasive if we are committed and have cognitive consistency. For example, if the target behavior is that a company wants their users to send more emails to their friends and relatives, then the company should enable a function that the user commits to. This function should make it easier to send emails to that specific group. The commitment may cause that the user will use this function more often. But

commitment and cognitive consistency can also have a negative effect. If the user does not have the opportunity to reverse the commitment, then some users may feel dissonance while others will just accept it. When a user feels dissonance, the company can offer information that will help the person to, for example, feel consistent with an application that explains the advantages of the function.

Direct and indirect routes are key persuasion strategies (3) meaning that if a user evaluates the content carefully (s)he can discover that he is she is being persuaded via the direct route. On the other hand, if the user cannot see the persuasive message then (s)he is persuaded via the indirect route.

Persuasion is often incremental (4) which means that it is easier to persuade people if they do things in series of actions to reach the target behavior instead of a solitary action. Series of actions will allow people to get used to the behavior. For example, a "quit smoking" application can encourage users to cut down on their amount of smoking.

Persuasion through persuasive systems should always be open (5). Content should not be untruthful or false because it can lead to loss of persuasiveness and, consequently, mislead the users.

Persuasive systems should aim at unobtrusiveness (6). The system should not disturb the user while a user is preforming tasks to reach the target behavior. The moment for reminding the user of the behavior should be considered so as not to end up with adverse outcomes.

Persuasive systems should aim at being both useful and easy to use (7). This means that it should serve the users' needs, not contain any errors, have high information quality and give the user a positive experience.

2.3.2. Persuasion context

If we want to persuade someone there needs to be intent, for example the intent source can be the creators. This type of technology, where the creators have intent, is called endogenous technology and should always be designed with respect to the user, which basically means that the content should be truthful. Exogenous technology is when the intent source is those who give access to or distribute the product. Exogenous technology should have the opportunity to personalize goals because the attitude and behavior change is based on the outcome of the self-set goals. When the person who is using the product is the intent source, it is called autogenous technology and should reward the user's experience so that the user keeps using the technology. (Oinas-Kukkonen & Harjumaa, 2009)

The second persuasion context is the event. The event is about focusing on the use context and the problem domain as well as its depended features. Often users have the right information and attitude

but have problems with their behavior in relation to information and attitude, which is understandable because many inappropriate behaviors have often been learned over a long time period and can be difficult to change or reverse. The technology can help by strengthening proper behavior and making it easier to stick with the right behavior in every situation. It is not only important to analyze the use context but also the user context because users are different, therefore affecting their need of cognition. The user context is important to analyze to be able to understand users' goals, if the user has tried to achieve the goal before and users past performances. However, the technology should encourage the user to set a goal and help the user to discover ways in which to reach their goal (Oinas-Kukkonen & Harjumaa, 2009).

Persuasion can be seen as trying to convince someone into something and it is difficult to draw the line between convincing and persuading. The difference is that persuasion is more about trying to trigger behavior and has to do with emotions whereas convincing is about trying to logically prove something which has to do with users' reasons and intelligence (Oinas-Kukkonen & Harjumaa, 2009).

There is indirect and direct strategy to persuade the user. Direct strategy is the more enduring one where the user can see that (s)he is being persuaded. With the indirect strategy, it is harder to notice and the user does not know that (s)he is being persuaded (Oinas-Kukkonen & Harjumaa, 2009).

2.3.3. Design of system qualities

This framework for designing and evaluating Persuasive Technology is based on Fogg's Functional Triad and his design principles but Oinas-Kukkonen and Harjumaa (2008) have modified and added further principles which resulted in a list of, in total, 28 principles with examples of requirements and examples on how the principles can be implemented.

The list is divided into four system feature categories: primary task support, dialogue support, system credibility support and social support.

The primary task support is for the support to carry out the primary tasks. This category is based mostly on Fogg's design principles but some of his principles, like conditioning and surveillance, are according to Oinas-Kukkonen and Harjumaa (2008), not acceptable means. The dialogue support category contains principles which helps the user moving to the target behavior and is partly based on Fogg's ideas about social actors (section 2.1.1). The principles in the system credibility category are about how to design a system so that it is more credible, which will at the same time make it more persuasive (Oinas-Kukkonen & Harjumaa, 2008). The final category is social support, which is about how to design a system so that it motivates a user. According to Oinas-Kukkonen and Harjumaa (2008),

the process is about leveraging social influence. Principles in this category are from Fogg's principles on mobility and connectivity.

Table 2.6: The 28 design principles divided into four categories (Oinas-Kukkonen & Harjumaa 2008)

Social support	*System credibility support*	*Dialogue support*	*Primary task support*
22. Social learning	15. Trustworthiness	8. Praise	1. Reduction
23. Social comparison	16. Expertise	9. Rewards	2. Tunneling
24. Normative influence	17. Surface credibility	10. Reminders	3. Tailoring
25. Social facilitation	18. Real-world feel	11. Suggestions	4. Personalization
26. Cooperation	19. Authority	12. Similarity	5. Self-monitoring
27. Competition	20. Third-party endorsements	13. Linking	6. Simulation
28. Recognition	21. Verifiability	14. Social Role	7. Rehearsal

2.4. Research Model

Based on the literature review in this chapter and the problem identification in chapter 1, the extensive research model is illustrated in figure 2.4. The problem area for the research was used as a starting point to work out research categories needed to build further research categories which will act as a foundation of the empirical study. Our research approach, the evaluation perspective and research categories, will be realized in the chosen research method, which in turn will be directed on the object of study.

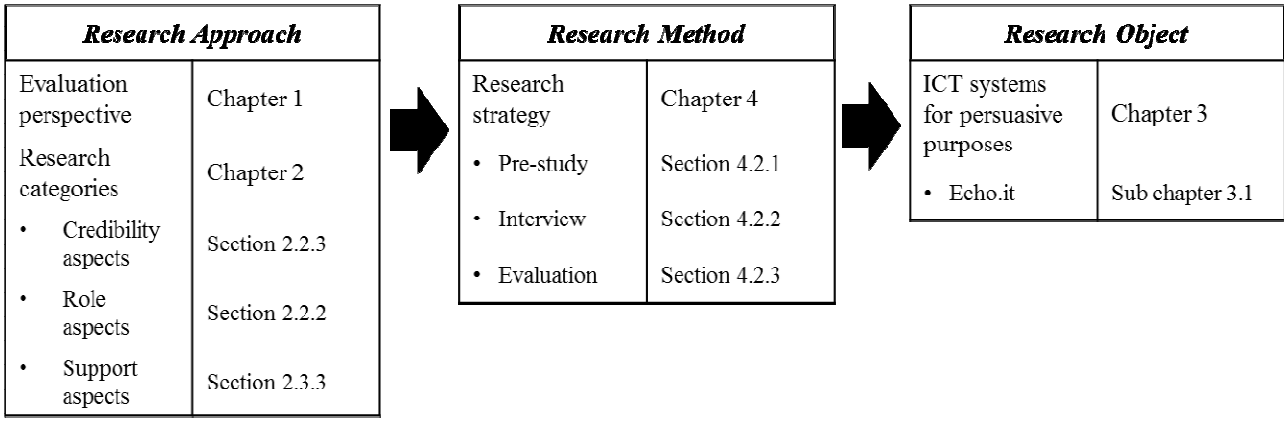

Figure 2.4: Our extensive research model

The key words of the main problem are *design*, *evaluate* and *persuade* and they are repeated in both research questions. Therefore, previously in this chapter, the concepts of Social Psychology and Captology have been discussed in relation to persuasion. Certain elements need to be present and combined in specific ways for persuasion to emerge. These elements are similar in Social Psychology and Captology but differing on the level of involvement of technical means. Where Captology calls for the involvement of technical means to persuade, persuasion in social psychology does not, as it can arise from face-to-face meetings (Myers, 2002).

2.4.1. Research categories

Three main research categories have been chosen from the literature review. These are credibility, the role of the technology and support aspects. They have been chosen in order to lay the foundation of the empirical research - hence the empirical research will be based upon the following research components:

1. *Credibility aspects.* Credibility is linked to the support aspects through Fogg's Functional Triad which is explaining the role that technology takes on. Therefore first, it is important, when designing a persuasive system, to design for credibility and to be aware of the elements of credibility. In section 2.1.3, credibility and technologies were discussed and there are a couple of criteria that the user should check to ensure credibility. To establish that credibility is checked in Oinas-Kukkonen and Harjumaa's (2008) framework, we matched Metzger's (2005) five criteria with the 28 design principles. Metzger's first criteria: accuracy is about that the site

is free from errors, if the information can be verified offline and the reliability of the information (Metzger, 2005). Accuracy is matched with the seventh postulate which is about serving the needs of the user. The second criteria is authority, which involves knowing who is the author of the site, information on the author, possibility contacting the author and if there are any third-part endorsements (Metzger, 2005). This criterion is matched with three principles from Oinas-Kukkonen and Harjumaa's, (2008) framework, Real-world feel (principle 18), Authority (principle 19) and Third-party endorsement (principle 20). Real-world feel (principle 18) checks that the system provides information about the organization and/or the people behind the system and whether or not it is possible to contact them. Authority (principle 19) and Third-party endorsement (principle 20) means that the system is using well-known and respected sources like people in an authoritative role or a logo of a certification. Objectivity, which is Metzger's (2005) third criteria, is about identifying the purpose of the information provided and if the information is the authors' opinion or facts. This is matched with Trustworthiness (principle 15), which means that the information provided is truthful, fair and unbiased. Currency is the fourth criterion which refers to the information provided being up to date and this is matched with expertise (principle 16). Expertise means that the information is incorporating expertise through knowledge, experience and competence. The last criterion is Coverage which refers to the comprehensiveness of the information.

2. *Role aspects.* It is also relevant to determine the role that the technology takes on in the system, in order to understand what kind of power persuasion has over it (Fogg, 1998). If the technology is a tool, a medium takes on the role as a social actor and investigate the way in which users respond to it.

3. *Support aspects.* Understanding how support aspects are used is important from a design and evaluation perspective, the four different categories of support aspects that make up Oinas-Kukkonen and Harjumaa's (2008) framework will be used to gather the empirical data of this study. From a design perspective, going back to the four gamification patterns suggested by Vassileva (2012), ownership, achievements, status and community collaboration, we can see that the patterns relate to Oinas-Kukkonen and Harjumaa's (2008) design principles. The patterns mainly correspond to design principles in the Dialoge and Social Support categories. The patterns are used to motivate the user and create user loyalty and engagement. By adding credibility and primary task support the system is not only motivating but also persuasive.

The object of study and the research method will be presented in chapter 3 and chapter 4 respectively.

3. Object of Study

In the previous chapter, the theoretical foundation was presented and summarized in the research model for this study. In this chapter the object of study, an ICT system for persuasive purposes, is presented from both a technical but also a functional viewpoint.

3.1. Echo It

The object of this study is Echo It which is a system available for organizations wanting to increase employee and customer satisfaction. The purpose of the system is twofold, firstly to translate an organization's goals and strategy into daily actions and efforts that can be shared with colleagues across the whole organization and secondly to acknowledge colleagues for the effort made in their everyday work in relation to the strategy and reaching the goals (Echo It, 2012). By using shared goals within an organization as a motivational factor, the system can be said to have persuasive purposes (Tucker & Panteli 2003).

However, when the company was first started in 2010, the initial idea was to use the Internet to change the way people behave and improve the way they treat each other. After some of the original founders dropped out, the project continued in a different direction. By using gamification to change the way people behave, they tried to make a public version which was about "echoing" or spreading good deeds, that is doing good for others, through the Internet. Meanwhile, the idea was to see how the concept worked within companies, to gamify the company values in order to measure set targets and

giving employees recognition for meeting the targets. Through the technology it is also possible to extract statistics which could be of value for the companies (appendix A2a).

Simply described, the system allows for each user to create a personal profile. The user can share efforts made in their everyday life and link them to different categories defined during the customization. These categories could for example be Innovation, Increased Sales, Collaboration and Customer as in the example from the demo system below. Once the user has shared efforts which have been recognized ("liked") by other users or recognized other users' efforts, the user can unlock different types of badges to reach the "next level".

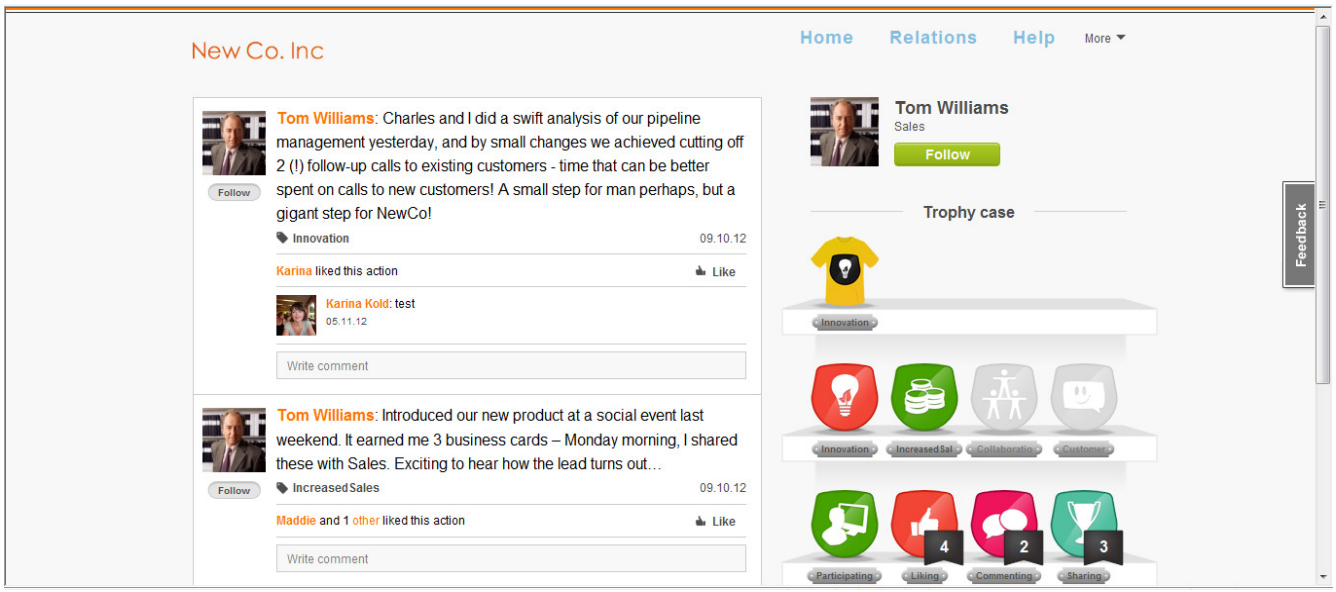

Figure 3.1: Echo It profile page from the demo system

The initial version of the system that was given access to in order to conduct the study and on which the evaluation was performed was implemented and customized to a specific company, a Danish client. The client is the first to have installed Echo It and the organization has agreed to become a test client with approximately 1200 users in Denmark. By implementing the system, the client hopes to ultimately increase customer satisfaction through happy employees passing their positive attitude on to the customers (appendix A2b).

However, the focus of this essay is not on the client's usage of the system, but the system itself, Echo It. Echo It is not a persuasive system per se. However, as discussed previously in this section, the

objective is to change people's behavior hence having persuasive purposes. This is the reason why Echo It is looked upon through a Persuasive Technology lens, to evaluate if that objective has been or can be reached through guidelines of designing and evaluating Persuasive Technology.

In this study, Echo It is referred to as a social platform. Social media is by Kaplan and Haenlein (2010) defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content" (page 61). Echo It can be placed within this definition for social media. It was decided to implement *platform* since Echo It facilitates exchange of information between its users (Kaplan & Haenlein, 2010).

Echo It was selected as the object of the study since it is a relatively new platform, which is constantly undergoing development for improvement. The aim of the system is to, by using technology, change the behavior of its audience, the users. However, no specific models or frameworks have been used for developing the platform (appendix A2a). Therefore, by evaluating Echo It from a Persuasive Technology perspective we will be able to discuss if the platform is in fact persuasive and we might also be able to suggest new design features in order to improve the persuasiveness of the system and social platforms in general.

4. Research Method

In the previous chapter the object of the study was presented. In this chapter the research strategy for the essay is presented, or in other words, how Echo It is analyzed. The methods for data collection and data analysis are discussed as well as ethics and scientific quality in relation to the methods.

4.1. Research Strategy

An approach was needed to answer the research question and create guidelines for how to design and evaluate Persuasive Technology. The approach is illustrated in the figure below.

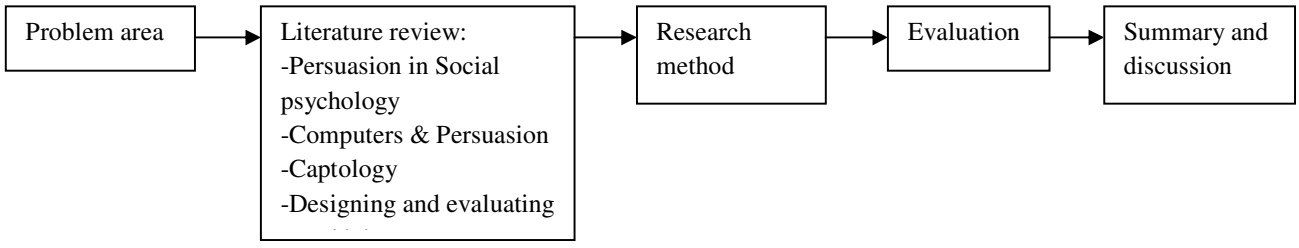

Figure 4.1: Research strategy for this essay

Once identifying the problem area, we read previous studies on persuasion within social psychology as this field discusses behavior and can explain certain behaviors. To some extent, behavior can also be predicted, which is necessary when designing with intent to change behaviors. Since this is an essay in Informatics we also wanted to look at persuasion in relation to technology and therefore we needed to analyze first if, and then how, computers can work as Persuasive Technology to its users. During the analysis, we discovered the term *Captology* which defines computers as Persuasive Technology. While exploring Captology, we found much information about computers as Persuasive Technology and what characterizes technology as persuasive. We found that technology can take on different roles in order to be persuasive and the importance of technology to be credible. A framework was also discovered, summarizing design principles for technology to be persuasive. With this information we created our research model for designing and evaluating Persuasive Technology which is described in detail below.

We decided to use Oinas-Kukkonen and Harjumaa's (2008) framework of design principles to evaluate if the object of study is in fact persuasive to its users. However, the framework does not contain any means for evaluation; it only explains the design principles and gives examples on requirements and how those can be implemented in a system. Thus, in order to confirm that a system is in fact persuasive, the system and the usage of the system should be evaluated. Hence, based on the information in the framework we created a checklist of questions in order to evaluate the system. The aim of the evaluation was to give it a realistic feel, as if the evaluator is a user of the system and we therefore created use cases. With use cases we could evaluate several principles from the framework simultaneously by grouping them together. The uses cases are simple and can look like the example in table 4.1.

Table 4.1: Example of use case used during the evaluation of Echo It

Use Case 2	***Steps***	***Testing principle(s)***
You see your colleague being one of the members on Echo It and you decide to add her as a friend. You are curious about her activities. While asking her to connect, you also want to ask her if she wants to join you and your friends for drinks after work. You want to share an interesting article with all your friends.	a. Add your colleague as a friend on Echo It b. Send a message to your friend through Echo It c. Read her latest status update d. Check how many updates she has done and if she has been provided with any rewards e. Update your status with an article you have read on CNN's website	14, 18, 21, 23

The use cases are used by the evaluator of the system when evaluating and after each use case, (s)he will answer questions from the checklist. The questions are based on which design principles are checked in each specific use case and the possible answer is "yes" or "no". We used this approach, as mentioned earlier, to make it more natural and because it simplifies the evaluation of whether or not the system has these design principles.

When all use cases have been performed and the questions in the checklist have been answered, the principle with a negative response (where the answer is "no") will be selected for further analysis. We wanted to discuss the design principles with a negative response on the subject of them being necessary and to give the developers ideas of how they can improve the technology with these design principles, in order to make the system persuasive to its users.

4.2. Data collection

The approach chosen for the data collection consists of a pre-study, interviews and observations. These three qualitative methods were chosen because a mixed research method can collect stronger evidence than using one single method (Yin, 2008). The data collected through the different methods should answer the same research question yet it can address different parts of the question. Even though Yin (2008) discusses mixed methods mostly in relation to case studies, this study should be able to benefit in a similar way. Likewise, a mixed approach of the method is adapted to the research question and not vice versa.

First, a study of common features of social platforms will be collected and consolidated in order to understand how social platforms are used. The consolidated list of features will then be compared to the features available in the object of study. Secondly, data will be collected through interviews in order to understand which role the system takes on in Persuasive Technology. It is beneficial to hold interviews with the experts to gain knowledge about the system and by discussing its intended use, clarifications and follow-up questions can be made directly (Kvale & Brinkmann, 2009). The final method for data collection is cognitive walkthroughs. According to Lewis and Wharton (1997), cognitive walkthroughs are used to identify problems in a user interface. The method is useful to our study as it does not focus on actual interface but the mental process of the user (Lewis & Wharton 1997). We will use this method when we evaluate the system to get a picture of how the software works for the user. We will be performing the cognitive walkthrough and the checklists will be used when observing the software, the results will be part of the data collection and the results will also be used to suggest the guidelines.

The object of study itself is also part of the data collection as a physical artifact. According to Yin (2008), the physical artifact has less relevance in a case study but he also argues that it could be an important component. Echo It is used as a part of the data collection because we think it can have an important role to exemplify and test the theories.

4.2.1. Pre-study

The pre-study was conducted in order to add a discussion about features and functionality of persuasive systems. It is used as a way to collect additional data about social platforms and their functionality, in relation to design features. Given the discussion in chapter 1, social platforms could be seen as technical means for triggering changed behavior. The aim of the pre-study is to research which features enable or trigger change in behavior. The aim is also to study how these features relate to persuasive elements. The results from the pre-study will mostly be used in the discussion on credibility. The findings in the pre-study will thus be taken into account during the evaluation of Echo It as a persuasive system. The method for the pre-study will, to some extent, be defined during the data collection itself and therefore the approach is described in the next chapter. We see it as beneficial not defining the approach for the pre-study as we are uncertain how to find and work with the data in advance.

4.2.2. Interviews

The purpose of the interviews was to gain knowledge about the object of study, its functionality, intended use and if the design was based on any existing models. The information obtained from the interviews will then be used in order to evaluate the role that the platform has, whether it is a tool, a medium or a social actor or a combination of all three roles (Fogg, 1998). Fogg (1998) argues that by determining the role, we can gain a better understanding of the link between persuasion and the technology. Therefore, the theme of the interviews is to collect information about the system in a semi-structured manner. As the purpose of the interviews is to gather facts, a mix of introductory questions and follow-up questions will be most sufficient. The interviews will start with introductory questions leaving room for rich descriptions, and uncertainties can be clarified through the follow-up or second questions (Kvale & Brinkmann, 2009).

We also had the opportunity to perform a second interview with the client project manager. The second interview was not planned; therefore it had to be performed in an ad hoc manner. Some of the questions from the first interview could be reused, however some of the questions were created on the fly and follow-up questions were used.

Both interviews were audio recorded and later transcribed (Kvale & Brinkmann, 2009). The first interview took place in an office setting with the expert of Echo It together with the Chief Operations Officer (COO). The expert of Echo It is also Chief Executive Officer (CEO) of the company. As both the CEO and COO are in key positions within the company, consideration is taken to the time spent on this kind of interview as time is limited and there is a risk that the interview can be cancelled due to time constraints (Yin, 2009). The second interview was conducted in the same location, together with the client's project manager. After the first interview, the COO also made a quick demonstration of the system and its features, as well as provided a test version to be used during the evaluation of the design as having access to potential data is essential.

As the first interview was prescheduled, some preparation was necessary to ensure the questions asked generated the answers needed to answer the research questions (Kvale & Brinkmann, 2009). As part of the preparation procedure, an interview guide was created. Due to the fact that the purpose of the interview was to gather facts about the system and its intended use in order to determine the role that the object of study takes as a persuasive mean, some interview themes were identified. The interview themes are summarized in the table below. The full template with interview questions can be found in Appendix A1.

Table 4.2: Interview guide

Research category	***Interview themes***	***Interview questions***
Evaluate the role technology takes	The purpose of the system	Can you tell us about the purpose of the system?
	Guidelines during the design process	Did you use any theory/theories or model/models as a basis for designing the system? a. If yes, which one? b. How did this/these model/models or theory/theories help you design the system?
	Opportunities to make customization	Are there any opportunities for the company to customize the system? a. If yes, can they customize it themselves?
	The number of installations	How many installations have been made? a. How many users does the system have? (with users we mean the employees within a company and not a company as a whole)
	The way users find the system	How do your users find the system? Is it voluntary or not voluntary)?
	The way the system is used	Can you describe in what way the users use (companies, organizations, individuals) the system? a. In what way does this lead to, or intend to lead to, changes in behavior?

The answers to these questions formulated from these six interview themes will help with evaluating what kind of role or combination of roles from Fogg's (1998) Functional Triad that Echo It takes on. For instance, in what way the users use the system in general helps with evaluating the role of the technology and to compare if the way it is used differs from the purpose of the system, i.e. how it is intended to be used. Another example is by knowing the number of installations, the networking potentials and possibility for generating content can by evaluated in terms of the system functioning as a medium. Knowing how users find their way to the system will determine if it is voluntary or forced. This might affect the system as the role of a social actor, if there is a positive relationship between the user and the technology. Further, by enabling users to perform a new behavior, opportunities to customize might help users to easily repeat the behavior. As a last example, with a theory or model as the basis for the design, the role of the technology can be evaluated depending on what the theory or model represents (Fogg, 1998).

As the second interview was performed ad hoc and with limited preparation time, we concentrated on a couple of the themes relating to the purpose of the implementation and usage. Themes relating to design process were avoided because customers might not always be involved during that phase. The themes that were used are summarized in table 4.3.

Table 4.3: Summary of themes form the interview guide used during the second interview

Category	***Interview themes***	***Interview questions***
Themes from interview guide	The purpose of the system	Can you tell us about the purpose of the system?
	The way users find the system	How do your users find the system? Is it voluntary or not voluntary)?
	The way the system is used	Can you describe in what way the users use (companies, organizations, individuals) the system? a. In what way does this lead to, or intend to lead to, changes in behavior?
Ad hoc themes	Changed user behavior	"Have you seen any like, I mean you have seen that people are using it, but have you noticed any change in behavior?"
	Mobility	"Since you have a lot of people that are out, not staying in front of computers, do you see it being beneficial having Echo It on a mobile device as well? Like an app?"

The motivation for the themes from the first interview is to get either different perspective on the same theme or to back up statements given by the CEO and COO of Echo It. The motivation for the ad hoc themes is to see if there has been a noted change in the behavior of the users so far and if mobility and consequently availability is seen to have an effect on the usage of Echo It.

4.2.3. Tests with Checklist and Use Cases

The checklist used for the cognitive walkthroughs was constructed based on Oinas-Kukkonen and Harjumaa's (2008) framework of design principles for Persuasive Technology. From the description of their principles, we formed questions in line with the examples that Oinas-Kukkonen and Harjumaa provide in their framework, for instance "*does the system give the user positive feedback?"* which is formed out of Praise (principle 8). All questions were collected in a spreadsheet with the corresponding principle and a Yes/No checkbox with a blank field for comments (Appendix A4). From the questions in the checklist, four use cases where created. Each use cases include three to five questions (Appendix A3). The questions were grouped based on similarity and for testing similar functionality that would make up a credible scenario. The use cases are merely used as an aid to the person answering the questions in the checklist in order to be guided through and put the questions in the checklist into context.
Some of the principles were found difficult to use for creating credible use cases, for example, Third-party endorsements (principle 20). In these particular cases, a single question was formed to be answered when going through the checklist. The questions were not included in the use cases.

The kind of evaluation method used is a usability method called Cognitive Walkthrough for testing (Lewis & Wharton, 1997). The Cognitive Walkthrough method is used to inspect the user interface by analyzing the mental process required of a user when going through a set of tasks. It is often done in the design stage when the interface is presented in form of a mock-up but it can also be a fully developed interface. In comparison to other similar methods, such as User Tests and Thinking Aloud, Cognitive Walkthroughs reflects the analyst's conclusion of what a hypothetical user might think of the system, which is beneficial in order to detect problems early in the process. Cognitive Walkthroughs are task specific, traces the correct paths and assigns reasons for the errors as well as analyzing the users' mental processes (Lewis & Wharton, 1997), which we find useful as Persuasive Technology aims to change users' attitudes.

When performing a Cognitive Walkthrough, it requires one to four usability experts which means that there is no need for users, which makes it easier to perform. There are some constraints involving end users such as availability. In order to perform a Cognitive Walkthrough, the person performing the test chooses one task out of a test case that the interface is intended to support. The tester then determines the correct actions for that task, in the correct order, after which these actions are tested in the system and the user assesses whether "a hypothetical user would be able to select an appropriate action at each point" (Lewis & Wharton, 1997; 717). Therefore, during the test, one of us will take on the role as the usability expert and the other will lead and read the use case, after which we will switch roles. If a

difficulty is detected, a reason, such as a button, will be added for the user to be able to reach the goal of the task.

4.3. Data Analysis

The main goal of the data analysis was to give meaning of the raw data collected and ultimately to be able to answer our research questions. In order to derive valuable information out of the data collection, some steps are necessary to be taken to organize the data. First, the interviews had to be transcribed from audio into written from. Second, the results of the pre-study and the results of the checklist had to be coded and organized in a fashion so that it seems sensible and is easy to navigate through during the analysis.

4.3.1. Interview transcription

By transcribing the interview, the spoken words become transformed into written words and the interview gets a second abstraction where the color of the language, for example intonations and tone of voice, are lost (Kvale & Brinkmann, 2009). On the other hand, the process of transcribing an interview is also an interpretative process and for the raw data to give meaning, direct quotes can be used in appropriate context (Creswell, 2007). The approach used during the transcription was to play short episodes of the recording and then write down what was said. This generated several repetitions in order to transcribe correctly. The process was repeated until no further issues were found for both interviews. The process of transcribing is time consuming and it was therefore started immediately after the interviews were held (Creswell, 2007).

As previously mentioned, the purpose of the first interview is to gather facts; hence the way in which the interviewee presented the facts was of little interest. Therefore, the verbatim was directly translated into a flowing text of full sentences, excluding pauses, stutters etcetera. Using this style makes quote of statements from the interview easier for the reader to grasp which fits the purpose of the interview better than transcribing only verbatim. The same approach was used for the second interview.

4.3.2. Pre-study and evaluation analysis - matching

Oinas-Kukkonen and Harjumaa (2008) divides the analysis of persuasion into two different contexts, use- and user context. This division then helped them to develop the 28 principles for designing Persuasive Technology. By taking one step further, their design principles will be used to evaluate the object of study in terms of support aspects. In addition, the most common features from social platforms collected during the pre-study will be used in a separate evaluation of the system to open a discussion on persuasive features and functionality.

As previously mentioned, the method for the pre-study was formed during the data collection. As the method for collecting the data was not known, the way in which it should be analyzed was not either known. The initial thought however, was that the information was intended to be used in order to determine which features in common social platforms could be considered credible. Consequently, the features had to be compared and mapped with the characteristics identified in chapter 2, which makes a system credible. Thus, the most common features were consolidated in a list and mapped with a corresponding characteristic with reference to the source. If no corresponding characteristic was found, then this indicated that the feature was not credible, at least not on its own.

The results from the Cognitive Walkthrough where stored in the checklist from each of the two tests. The answers in the checklist were simply *Yes* or *No* but the tester(s) could also provide comments if something was unclear or if the answer could depend on a specific situation. It was then decided to analyze two types of answers. The answers where both testers answered no, that the design principle was not applicable, and the answers where the testers disagreed on a design principle being applicable or not. This approach was decided upon since the *no*-answers would verify that the principle was not included in the design and the *yes*- and *no*-answers would open up for a discussion about whether or not it was included, depending on the interpretation.

In order to organize and track the answers, the numbers of the questions were kept and they were then grouped by the type of response. An example is illustrated in the table below. In this example, Simulation (principle 6) and Rehearsal (principle 7), were not found to be available in the system.

Table 4.4: Example of coding from the system evaluation based on the checklist

	Tester 1		*Tester 2*	
Principle	***Yes***	***No***	***Yes***	***No***
6. Simulation				
Does the system show the link between cause and effect?		X		X
7. Rehearsal				
Does the system provide means for rehearsing?		X		X

The results will be presented and discussed further in the following two chapters.

4.4. Ethics and scientific quality

Ethics is very important in all kinds of research and should be devoted great care (Creswell, 2007; Kvale & Brinkmann, 2009; Yin, 2009). The first step in the interview was to get informed consent by informing and explaining to the interviewee about the purpose of the study as well as possible risk of participating. According to Kvale and Brinkmann (2009), this can be done through briefing and debriefing. We did both by explaining the purpose and risks before the interview and after the interview we sent the transcription to the interviewees in order for the interviewees to approve it.

A verbal agreement was made in order to ensure the usage of the name Echo It and the people involved. The usage of the company name Echo It was approved by the CEO. Screenshots and other material from the system itself had to be approved by the CEO in each single case, and it was therefore decided to keep these to a minimum.

In the text, we have chosen not to mention the names of the participants of the interview. The rationale behind this is that the focus of this essay is not on the people behind Echo It – but the platform itself – and therefore specific names should not be associated with this essay in future online search. Instead of using the names of the interviewees, they are referred to as the CEO and COO.

Scientific quality should also be devoted care. The methodological choices motivated from the beginning of this chapter contribute to quality. In order to establish scientific quality in the essay we, for example, base our checklist on an already published framework (Oinas-Kukkonen & Harjumaa, 2008) instead of creating one. This way, the quality of an already existing framework is tested. In general, we aim to report in a "thick" way in order to assist the reader as the quality is in the details (Seale, 1999).

4.4.1. Bias

According to Yin (2005), the research should be advanced with an open mind by the researcher to avoid influencing the outcome. To avoid bias, Yin suggests testing openness towards conflicting results by providing preliminary reports of the findings to colleagues for their review. The nature of this study did not allow us to obtain continuous feedback from peers. Instead we provided feedback to ourselves and each other by constantly question the choices made. Hence, in this chapter and throughout the rest of the essay we have motivated our choices. In order to minimize our influence on the results, the evaluation of the system was made early on in the process when there was as little knowledge as possible about the system and additionally the tests were executed separately.

However, one choice that needs further attention is that having interviewees behind one particular system might lead to structural bias. This means that the interviewees could act in favor of each other and the system hence affecting what is being said and how it is presented (Velasco, 2004). Trying to avoid structural bias, as mentioned above, we tried to be self-critical and additionally, we conducted the second interview in order to be able to contradict or support what was being said during the first interview. Even though we initially did not plan for a second interview, we accepted the offer for this reason. Furthermore, Echo It was chosen as an example to ease the explanation of theories used and to create the guidelines based on being a system with persuasive purposes. In other words, interviewees speaking favorably about the system do not affect our findings.

5. Result of the Empirical Study

The results from the empirical study is presented in this chapter and discussed in the next chapter. The results are presented in tables and quotes from the interviewees. As presented in the previous chapter, the empirical foundation was collected through a pre-study of the most common features of social platforms, two interviews with (1) the CEO and COO of Echo It and (2) the client project manager, as well as an evaluation of the system based on Oinas-Kukkonen & Harjumaa's (2008) framework for evaluating Persuasive Technology.

5.1. The Pre-study

As mentioned in the previous chapter, the approach used for the pre-study was defined during the collection of the empirical data. This approach was used because we had to see what kind of data was available before the method was established. Thus, the pre-study was conducted in an exploratory manner.

During the pre-study, we consolidated a list of common features used in popular social platforms. The features were collected from five social network websites. Four of the networks, Facebook, Twitter, Google+ and LinkedIn, were chosen based on the high number of registered users and their global availability from a list of social networks consolidated by Wikipedia (Wikipedia, 2012). In addition, a fifth social network, Foursquare, was chosen because it has been described as a platform designed with features of gamification and mentioned during the first interview as a source of inspiration to the CEO of Echo It "we tried various things that we got inspired from, heavily from Foursquare" (Appendix A2a). These networks are free and open to anyone above 18 years of age (in some cases younger) to join.

We first documented the available features and functions in each of the social platforms consolidating them into a matrix where they were sorted in alphabetical order and were assigned an identification

number. The features were then cross referenced with the social networking sites and then each feature was summarized in terms of points. For example, we could see that the Chat feature was available on two sites, Facebook and Google+, and was summarized with 2 points accordingly. See the sample in Table 8.

Table 5.1: Sample of Social Platform Features Matrix

		Sources					
ID #	***Features and functions***	***f***	***T***	***L***	***G+***	***4S***	***Summary***
1	Block user	X	X	X	X		4
2	Bookmarks			X			1
3	Chat	X			X		2
4	Comment	X		X	X	X	4
5	Connection (one-way)		X		X		2

The Social Platform Features Matrix can be viewed in its entirety in the appendices. From the sample above, we can see that the feature has been given an ID number and a name. The initials of the sources have been used as identifiers and the total number of points has been summarized in the last column.

Secondly, the features with a summery ranking of 4 or higher were chosen as features to base the final list on, the list reflecting the features available on the average social platform. We made this selection because with a summary of 4, the feature was available in approximately over 80% of the sources and could be considered as common. This limitation gave a list of 20 features.

Finally, the list of features was then matched with the theories in chapter 2 in mind. They were mapped to one or several persuasive elements, where it was possible to do the mapping. In some cases we did not find the feature to have any element of persuasion. The findings are summarized in the table below.

Table 5.2: List of common features of social platforms with corresponding persuasive element

ID	*Features*	*Persuasive element*	*Reference*	*Motivation*
1	Block user	Personalization	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to not showing content from certain users
4	Comment	Credibility	Myers 2002	Persuasion due to friend having opinions
8	Friends/Connections/Contacts	Presumed credibility	Tseng & Fogg 1999	Persuasion due to friends
9	Friends/contacts list (organize)	Presumed credibility	Tseng & Fogg 1999	Persuasion due to friends
10	Groups	Presumed credibility	Tseng & Fogg 1999	Persuasion due to people with common interests
11	Integrated with other social networks	Third party endorsements	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to recognition by other social networks
13	Languages	Reduction	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to adaptation to different languages
14	Like	Personalization	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to personalized content
15	Messages (private)	Personalization	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to personalized content
16	Mobile application	Reduction	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to reducing barriers
17	News feed	Tailoring	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to personalized content
18	Notes	Tailoring	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to personalized content
19	Notifications	Reminders	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to reminders of targeted behavior
20	Personal profile	Self-monitoring	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to tracking of own behavior
21	Photos (albums)	Surface credibility	Tseng & Fogg 1999	Persuasion due to appearance
22	Photos (profile)	Surface credibility	Tseng & Fogg 1999	Persuasion due to appearance
25	Share links/content	Verifiability	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to source credibility
26	Share location (Check-in)	Real-world feel	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to connection to real-world places
27	Status update (adding content)	Tailoring	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to personalized content
28	Subscription/Follow	Tailoring	Oinas-Kukkonen & Harjumaa 2008	Persuasion due to personalized content

Users of social platforms tend to change their behavior using the social platform as a tool, even though the aim of the platform is something else, for example, allowing childhood classmates to reconnect. Therefore, we conclude that the features that make up the social platforms must to some extent be persuasive. For instance, credibility plays a big part in persuasion and in turn credibility increases if the

user's friends use the same platform (Tseng & Fogg, 1999). A person is more likely to be persuaded by someone within their own group who has similar opinions (Myers, 2002). Therefore Friends, Connections or Contacts (feature 8) can be seen as an element of persuasion, as a user finding friends on the same platform presumes that the platform is trustworthy. Integration with other social networks (feature 11) is a persuasive element due the fact that integrating one platform with other respectful platforms or web pages makes the platform credible (Oinas-Kukkonen & Harjumaa, 2008), for example if a respected newspaper makes it possible to "like" hence share their (online) articles on a specific platform. In relation to this, sharing links/content (feature 25) can be seen as credible as it is possible to verify statements made on the platform by linking to external content (Oinas-Kukkonen & Harjumaa, 2008) and following what friends share makes the site seem more credible to users (Tseng & Fogg, 1999).

The majority of the features in table 11 relate to credibility. In combination, they make the system credible and increase the persuasiveness. To examine Echo It in terms of functionality and credibility, the final list of 20 common features in social networks were used to evaluate Echo It. The list of 20 features was thus used as a supplement to Oinas-Kukkonen & Harjumaa's (2008) framework, in order to brace the credibility. This will be presented further in section 5.3 below.

5.2. Results from the Interviews

The interviews were centered on the second research category, which is the role of the technology. The three main roles are summarized in Fogg's (1998) Functional Triad (table 1). The computer as a tool to increase capabilities, a medium providing experience or as a social actor establishing relationship with the user, the technology can take on either one role or a combination of roles. The interview was focused around six themes (table 5) and these themes would help determine which role Echo It takes on as a Persuasive Technology. The analysis of which role or which roles that the system takes on, will be presented in the next chapter. Nevertheless, this section is divided into subsections, one subsection for each theme, starting with a summary of the answers from the interviews in table 10 below before going through each answer in depth.

Table 5.3: Summary of answers to the research category the role of technology

Research category	***Interview themes***	***Answers***
the role of technology	Purpose of the system	To change people's behavior
	Theory/theories or model/models as a basis for designing the system	Game Dynamics, User Adaptation Model and influence from other various models
	Opportunities to customize the system	Customization of badges, logos and colors
	Number of installations that have been made	1 customer, 1200 users
	How users find the system	E-mail invitation from Echo It
	In what way users use the system	Users emphasize each other's behavior more than they emphasize their own

As can be seen in the table, all themes were answered during the interviews. For the fully transcribed interviews, refer to the appendices.

5.2.1. Purpose of the system

The first interview theme is the purpose of the system, in what way the system is used helps evaluating the role of the technology and to compare if the way it is used differs from the purpose of the system - how it is intended to be used. The CEO of Echo It answered this question, embedded in the history of the company, during the first interview. He started with the initial underlying ideas (first quote) and then continued with the purpose of Echo It specifically (second quote):

> "The first thoughts were about […] using the Internet to improve how people behave towards each other […] and if you can get them to behave more like we want them to behave and […] thirdly, on a more philosophical note, if it matters why people behave like they do as long as they behave the way you want them to" (Appendix A2a)

> "The main focus for me has always been to take this technology… I wanted to know how it worked inside a company and using Gamification of company values or target or goals […] it is very easy to put a sales target up there but how do you actually get to that, there is a lot of actions there that is very valuable for a company to know and it is very important to recognize for an employee to do the right things but also to get the relevant feedback." (Appendix A2a)

The theme about the purpose of the system was not discussed during the second interview with the client due to the focus being on the usage of the system, not the principles behind it.

5.2.2. Theory/theories or model/models as a basis for designing the system

The second theme is focused on which, if any, theory/theories or model/models have been used as a basis for designing the system. With a theory or model as the basis for the design, the role of the technology can be evaluated depending on what the theory or model represents. The CEO and the COO answer this question during the first interview in the following way:

> *CEO*: "I don't know […] I mean I have some concepts, I have some philosophers stuff that I read and that I am inspired by but models and tool set come is where you have to pinpoint" (Appendix A2a)
>
> COO: "I don't know either […] but there is definitely Game Dynamics, it is an emerging theoretical field, there is definitely something to begin there." (Appendix A2a)

Both interviewees agree that there is no single model or theory that has been used when designing the system. Rather, different bits and pieces from within various fields, for example Game Dynamics that is mentioned above and as the CEO continues "one theory we did use a lot is User Adaptation Model".

5.2.3. Opportunities to customize the system

The third theme is opportunities to customize the system by enabling users to perform a new behavior, opportunities to customize might help users to easily repeat the behavior. The CEO says:

> "We are working with making the customization part standardized so that when they want to change a color or a logo we know where it is. And of course how you get the badge and what they represent, that is of course customized." (Appendix A2a)

The system can be adapted to each company but right now the clients cannot customize themselves, the COO says "as of today we are doing everything back-end" meaning that the users cannot customize either.

5.2.4. Number of installations made

The fourth theme is *number of installations that have been made* and by knowing the number of installations, the networking potentials and possibility for generating content can by evaluated in terms

of the system functioning as a medium. At the time of writing, Echo It has one client with 1200 users. "We started with this to make it right" the CEO motivates (Appendix A2a).

5.2.5. How users find the system

The fifth theme is about how users find the system. By knowing how users find their way to the system it will be possible to determine whether or not it is voluntary or forced. This might affect the system as the role of a social actor, if there is a positive relationship between the user and the technology. The COO explains that the users "are not forced to join but it is encouraged by the top managers […] if the employee says 'no, I don't want to be part of this' – he could". The CEO added "what we are hoping is that you don't have to be but you want to be" of the system (Appendix A2a).

The client Project Manager (PM) from the second interview provides an extended point of view and explains that there is a second element if a user joins Echo It:

> PM: "to give something physical in return, some physical gifts, not only badges that you get rewarded through Echo It but so that you get something in real life. It could be breakfast or something else that you can share with your department […] the excitement should be about what you can achieve in Echo It, "thumbs up", things like that but the second element is what you really get out of it in real life, so it's the small gifts." (Appendix A2b)

The system itself should be the main motivation but the small gifts add a dimension beyond the technology.

5.2.6. In what way users use the system

The sixth theme is in what way users use the system. This in general helps when evaluating the role of the technology and when comparing whether or not the way it is used differs from the purpose of the system, how it is intended to be used. The COO says that the users do not really use the system in the way that it is intended. She says "the users emphasize more each other's behavior more than they emphasize their own behavior […] we wanted that they focus on […] their own behavior and that they say 'I am glad that you did this but I did this'". (Appendix A2a)

This question was also asked to the Client Project Manager but since the interview was performed ad hoc it was asked in a different manner so that it was a mix between the intended use and the actual use. He explained:

> "Our main focus is to make it a bit more fun or exciting to go to work and we hope that in the end it will… in the end what is going to happen if you have more fun at work you pass that on to the customers […] and gives more customer satisfaction" (Appendix A2b)

In other words, the users are intended to share what they have done well at work through Echo It and get instant feedback from their colleagues in terms of comments or likes. As the Client Project Manager says "normally when you go to work, maybe when you do something that is a bit extraordinary, maybe sometimes someone will notice and give you this little 'thumbs up'-thing […] but it happens seldom that people would do that." (Appendix A2b)

5.3. Results from Checklist and Use Cases

As presented in the previous chapter, a checklist of questions was constructed based on Oinas-Kukkonen and Harjumaa's (2008) framework of design principles for Persuasive Technology. We took the role as testers, below called Tester 1 and Tester2, and carried out two observations independent of each other in order not to influence the results. When both tests were completed, the results were consolidated and recorded in a spreadsheet (appendix A4c). The result from the checklist is presented and categorized based on the type of principle. If the principle in the checklist was supported in the system and the answer to the correlating question was 'Yes', then the answer was used as the result, if it was not supported then the answer was 'No' and in some cases both answers could be applicable as subject to the tester's interpretation. When comparing the results, three groupings were of interest. The results are presented in the subsections below and they are grouped (1) as principles not supported, (2) principles where Tester 1 and Tester 2 had differing results or (3) where both answers Yes and No where applicable, depending on the tester's interpretation. The complete results from the tests can be found in the appendices.

5.3.1. Checklist items with negative response

The first grouping is both testers agree that the statements are not supported in the system. Table 11 displays the results where both testers got the same answer that 'No', the system does not support the principle. Five principles in total were found not being supported by the system during the test.

Table 5.4: Consolidated results – testers agree that the questions are not supported in the system

	Tester 1		*Tester 2*	
Principle	***Yes***	***No***	***Yes***	***No***
6. Simulation				
Does the system show the link between cause and effect?		X		X
7. Rehearsal				
Does the system provide means for rehearsing?		X		X
19. Authority				
Does the system refer to people in the role of authority?		X		X
20. Third-party endorsements				
Does the system show endorsements from third-parties?		X		X
26. Cooperation				
Does the system provide means for cooperation?		X		X

Considering the four categories of support in table 11, the first two principles, Simulation (principle 6) and Rehearsal (principle 7), are categorized under Primary Task Support. Authority (principle 19) and Third-party Endorsement (principle 20) are categorized under System Credibility Support and Cooperation (principle 26) is categorized under Social Support. All of the principles in Dialogue Support were found in the system.

5.3.2. Checklist items with differing response

The second grouping is where the results from the test differed between Tester 1 and Tester 2. Table 12 contains the results where, for example, Tester 1 concluded that the principle was not supported by the system and where Tester 2 disagreed. We found four principles where the answers differed.

Table 5.5: Consolidated results – response differing

	Tester 1		*Tester 2*	
Principle	***Yes***	***No***	***Yes***	***No***
21. Verifiability				
Does the system provide means for verifying the accuracy?		X	X	X
23. Social comparison				
Can users compare their results with other user's results?	X		X	X
24. Normative influence				
Is there means for gathering together people who have the same goal?	X		X	X
28. Recognition				
Does the system provide public recognition for users?		X	X	

The first principle, Verifiability (principle 21), belongs to the category System Credibility Support and Social comparison (principle 23), Normative influence (principle 24) and Recognition (principle 28) are categorized under Social Support. Verifiability (principle 21), Social comparison (principle 23) and Normative influence (principle 24) were considered as both supported by the system and not supported by the system by Tester 2 depending on the context. Tester 1 did not find Recognition (principle 28) supported by the system whereas, Tester 2 found it did.

5.3.3. Checklist items with both answers applicable

The last group consists of the results where the testers agreed that both answers were applicable depending on the context. For example, if the context was a user being new to social media then the answer to the correlating question of a principle could be 'No', whereas if the user was familiar and previously used other social media, then the answer would be 'Yes'. This was taken into consider when the answer was not obvious.

Table 13 displays the results where the testers found that the questions to the principle could be answered both Yes and No depending on the context, hence there were multiple answers and it was difficult to determine which answer was more correct than the other. Here, three principles were identified.

Table 5.6: Consolidated results – both Yes and No response applicable

Principle	*Tester 1*		*Tester 2*	
	Yes	*No*	*Yes*	*No*
4. Personalization				
Can the user personalize the content?	X	X	X	X
15. Trustworthiness				
Is the information truthful, fair and unbiased?	X	X	X	X
16. Expertise				
Does the provided information contain expertise?	X	X	X	X

Personalization (principle 4) is categorized under Primary Task Support and Trustworthiness (principle 15) and Expertise (principle 16) under System Credibility support.

5.3.4. Summary of not supported checklist items

By summarizing the results grouped by category, the results show that all principles categorized under Dialogue Support are in fact supported by the system. The category with the least amount of principles supported by the system is System Credibility Support followed by Social Support and Primary Task Support. The result per category is consolidated in table 14 below.

Table 5.7: Consolidated results – number of principles per category not supported by the system

Primary task support	*Dialogue support*	*System credibility support*	*Social support*
3	0	5	4

Having seven design principles per category, out of which five could potentially or are not supported by the system, as in the case of System Credibility Support, potential improvements can be suggested. The System Credibility Support category is about designing so that the system is credible, hence making it more persuasive (Oinas-Kukkonen & Harjumaa, 2008). The system is lacking the following design principles: Trustworthiness (principle 15), Expertise (principle 16), Authority (principle 19), Third-party endorsements (principle 20) and Verifiability (principle 21).

In category Social Support, four out of seven design principles are not supported by the system. The category is about leveraging social influence in order to motivate people (Oinas-Kukkonen & Harjumaa, 2008). Here, as in the previous category, potential improvements could be made in order to increase the user's motivation. The system is lacking the following design principles: Social Comparison, Normative Influence, Cooperation and Recognition.

The final category, Primary task support, also leaves some room for improvement with three out of seven principles not supported by the system. These are Personalization, Simulation and Rehearsal.

5.4. Summary of Empirical Data

A high-level summary of the empirical results under each research category will facilitate the discussion in the next chapter because the results from each method can be applicable to more than one research category. It is worth noting that the initial idea was to have one method for each research category. However, as the results were presented, we discovered that the results could be useful across the different categories. In the following sections, each main research method will be presented together with additional methods per research category.

5.4.1. Credibility aspects

The results from the pre-study were primarily used to investigate the persuasiveness of the system in relation to credibility. As previously mentioned, the basis for the evaluation was a list of 20 common features of social platforms. These features were linked to a type of persuasiveness that was presented in the literature. On that list we can see that some of the features can be related to aspects of credibility, surfaced- and presumed credibility in particular but also third-party endorsement from other social network sites. Thus for social platforms the main credibility is based on what the user can see and what his or her friends, or people with common interests, think.

After viewing the empirical results we decided not to limit one research category to a research method but to also look at the other two research methods for credibility, the interviews and the evaluation. The interview themes were mostly related to the role. However, theme 3 – number of installations and 5 –

how users find the system, could also be relevant from a credibility angle and in particular presumed credibility. We assume that when the number of colleagues using the system increases, the credibility increases as well. In a similar way, if the users get an invitation from a credible source, for example the company that they work for where the system is implemented, it is likely that credibility is increased. From the answer to these to the themes (see table 10), we can see that the system is available to 1200 colleagues and that the invitation to the system is sent out by Echo It.

When looking at the checklist, there is a separate category for credibility aspects. These are principles number 15 through to 21 (see table 3). We can also see in the summary in subsection 5.3.4 that the least supported category is actually credibility aspects. For example, both testers found that either Authority (principle 19) or Third-party endorsements (principle 20) were supported by the system. Tester 1 did not find Verifiability (principle 21) to be supported while Tester 2 found that it depended on the context. Also found to be depending on the context, meaning that there could be cases when the principle was not supported, were Trustworthiness (principle 15) and Expertise (principle 16).

5.4.2. Role aspects

The main purpose of conducting the interview was to determine the role of the system, if it is a tool, a medium or a social actor (see section 5.2). For example, the way the users use the system in general can be helpful when evaluating the role of the technology and also by comparing if the way it is used differs from the purpose of the system, how it is intended to be used. However, as Oinas-Kukkonen and Harjumaa's (2008) framework is based on Fogg's Functional Triad (1998), empirical evidence of the systems role could also be found in the evaluation (see section 5.3). As the whole framework related to the role of the system, the findings will be discussed in detail in the next chapter.

5.4.3. Support aspects

The main method for collecting empirical results in the research category support aspects is the checklist. Understanding how support aspects are used is important from a design and evaluation perspective. The four different categories of support aspects that make up Oinas-Kukkonen and Harjumaa's (2008) framework were used to gather empirical data. Here again we could determine that the least supported principles where those relating to credibility (table 14).

In addition, we can see some of the support aspects being present in the pre-study, in the list of 20 common features in social platforms, especially after linking them to persuasive elements. The list will help us to support some of the findings during the evaluation of the system. The list is presented below including motivation for persuasion and whether it is available in Echo It or not.

Table 5.8: 20 features of Social Platforms with persuasive element, motivation and availability in Echo It

ID	*Features*	*Persuasive element*	*Motivation*	*Echo It (Yes/No)*
1	Block user	Personalization	Persuasion due to not showing content from certain users	
4	Comment	Presumed credibility	Persuasion due to a friend having opinions	X
8	Friends/Connections/Contacts	Presumed credibility	Persuasion due to friends	X
9	Friends/contacts list (organize)	Presumed credibility	Persuasion due to friends	X
10	Groups	Presumed credibility	Persuasion due to people with common interests	
11	Integrated with other social networks	Third party endorsements	Persuasion due to recognition by other social networks	
13	Languages	Reduction	Persuasion due to adaptation to different languages	
14	Like	Personalization	Persuasion due to personalized content	X
15	Messages (private)	Personalization	Persuasion due to personalized content	
16	Mobile application	Reduction	Persuasion due to reducing barriers	
17	News feed	Tailoring	Persuasion due to personalized content	X
18	Notes	Tailoring	Persuasion due to personalized content	
19	Notifications	Reminders	Persuasion due to reminders of targeted behavior	X
20	Personal profile	Self-monitoring	Persuasion due to tracking of own behavior	X
21	Photos (albums)	Surface credibility	Persuasion due to appearance	
22	Photos (profile)	Surface credibility	Persuasion due to appearance	X
25	Share links/content	Verifiability	Persuasion due to source credibility	X
26	Share location (Check-in)	Real-world feel	Persuasion due to connection to real-world places	
27	Status update (adding content)	Tailoring	Persuasion due to personalized content	X
28	Subscription/Follow	Tailoring	Persuasion due to personalized content	X

The table shows that 9 out of 20 features are not available in Echo It. The features that are not available come from two categories in particular, 4 out of the 9 features are relating to credibility and Credibility Support while 5 out of 9 features come from Primary Task Support and mainly relate to personalization of content on a user level.

From the interview, two themes in particular were relevant in addition to the checklist on a general level. Those themes are *Purpose of the system* and *In what way the users use the system* since these could help us to evaluate if the system was used as intended. This proved that to a certain extent, it was not being used as intended, as the users were a slightly limited in their usage.

6. Discussion of the Results

In the previous chapter, the results of the empirical study were presented. In this chapter, these results are discussed in relation to the different perspectives that Echo It is looked upon. Firstly, we attempt to establish if the system is credible. Secondly, through the interview the role of the platform is determined. Finally, the persuasiveness of the system is determined based on the answers to the questions in the checklist.

6.1. Credibility aspects

From the literature review we can see that credibility is an important aspect of persuasion in general and Persuasive Technology in particular (Myers, 2002; Fogg, 2003a). When searching for information using computers, we filter information to only have credible and useful information remaining (Wathen & Burkell, 2002). If we find the information not to be credible it does not persuade us, thus technology can only persuade if credible (Fogg, 2003a). In the previous chapter we presented the results from the pre-study and from that we could see that for social platforms the main type of credibility that is present is based on what the user can see in terms of, for example, the visual design and the opinions of his or her friends or opinions of other people with similar interest to the user relating to two types of credibility according to Tseng & Fogg (1999), surface- and presumed credibility. Experienced credibility can also emerge over time. However, due to the limited timeframe of this study, this was not possible to determine (Tseng & Fogg, 1999). From the evaluation of Echo It, we could see that the system, to some extent, does not support principles from the credibility aspects category. The System Credibility Support category was the least supported category, which is the category that refers to an increase in system credibility (Oinas-Kukkonen & Harjumaa, 2008). During the evaluation, the system was found to be missing Authority (principle 19) and Third-party endorsements (principle 20). By referring to people in the role of authority, the systems credibility could be increased. In the case of Echo It, people in the role of authority could be, for instance the CEO, CFO, CIO and perhaps the team lead closest to the user in the company where the system is implemented. These authoritative people are tied to the system in terms of being users, however, to increase the level of authority. For example, the CEO could write an (automated) welcome message to all new members. In addition, during the first

interview we found that the invitation to the users to join Echo It is sent by Echo It instead of from the company where the system is implemented (appendix A2a). Using the name of the company rather than the name of the system when sending out the invitation could lead to increased credibility. In other words, the source is important in terms of credibility (Myers, 2002; Tseng & Fogg, 1999). In terms of Third Party Endorsement it is difficult for a relatively new system to have earned awards in terms of, for example "Best system" in various categories. However, if and when this happens in the "Information"- or "About" section, this could be stated together with a link to the official website for the award (Oinas-Kukkonen & Harjumaa, 2008). In terms of social networks, third-party endorsements could also be implementing integration between networks, for example a "tweet" on Twitter could also be shared on Facebook. Having this option might increase the credibility, if it is a well-known network, however with Echo It this might have the opposite effect since it is a closed system and to integrate with open systems might create a concern rather than credibility.

The number of users is also interesting from a credibility point of view. Since the system is closed and limited to one organization, users will find the system credible as long as their colleagues are using it (Tseng & Fogg, 1999). Based on presumed credibility we have concluded that an increasing number of colleagues using the system will also increase the systems credibility. Here we found the system to be credible as, during the first interview (appendix A2a), it was explained that they are using a theory called User Adaptation Model to bring users to the system. By identifying early adopters of new technology, others will follow them.

Depending on the context, Verifiability (principle 21) can be seen as supported or not supported by the system. Since the system is closed to trusted members, that is, users within the same organization, this can be seen as a verification of accuracy of added content yet there is no guarantee that an employee in an organization adds accurate content, though the likelihood might increase. However, it was not possible to find any evidence of the system providing means for verifying the accuracy in general (Oinas-Kukkonen & Harjumaa, 2008). The same goes for Trustworthiness (principle 15) and Expertise (principle 16), where we also found differing answers depending on the context. A credible communicator is perceived as trustworthy (Myers, 2002) and since the content is added by the employees of the company, the content could be seen as trustworthy. Expertise depends on whether or not the user has a relation to the colleague adding content or if an authoritative person adds the content, yet if the person adding content is unknown to the user it will not result in the same effect (Tseng & Fogg, 1999). It may be challenging to increase the credibility based on these principles since the idea behind Echo It is for content to be added by members, not experts. However, credibility in terms of trustworthiness and expertise might increase if users can provide links to other users within the network, such as tags, or link to external content, such as articles as it is important for information not to be disassociated from the source (Myers, 2002).

The 20 features of social platforms that were collected during the pre-study were used to evaluate Echo It in relation to credibility. We could see, for example, that third-party endorsements were missing, as

discussed above. In addition we also found that it was not possible for users to form groups, or share photos (other than their profile picture) and that it was not possible to share locations. As people tend to trust their friends and people with common interests, it could be useful to enable the possibility to create groups or discussion forms for different topics (Tseng & Fogg, 1999). This allows for the users of Echo It to connect with other colleagues with common interests, which increases the credibility.

6.2. Evaluate the Role Technology Takes

The Functional Triad demonstrates different roles a computer technology can take on. The three roles use different strategies to persuade a user. *A tool* uses for example reduction, tunneling and tailoring to persuade a user, *a medium* uses cause-and-effect stimulations, environment stimulations and object stimulations and *a social actor* uses for example physical attractiveness, social dynamics and psychological cues (Fogg, 2003a). A Persuasive Technology can take one role or a combination of different roles. A user uses and responds to a computer technology in different ways and therefore knowing which role a computer technology plays, gives us an understanding of which power persuasiveness has over computers and how they should be designed and evaluated to reach the targeted behavior (Fogg, 2003a). The roles within the Functional Triad persuade users in different ways and if we do not know which role a computer technology has, we may use an incorrect strategy and it might take more time to reach the targeted behavior.

For example, when a technology takes the role as a medium, it is best to use some of these three strategies: cause-and-effect stimulation, environment stimulation or object stimulation to persuade a user (Fogg, 2003a). When a user is interacting with that technology, the user uses it and expects to gain an experience from the interaction. Therefore is it not proper to use factors from other roles or social actors like praise or social dynamics because it will not give the same outcome (Fogg, 2003a).

To find out if Echo It is a Persuasive Technology and what kind of role(s) Echo It takes on, we first wanted to know what Persuasive Technology is, which is described in section 2.2 as well as what kind of roles there are and what they stand for, as presented in subsection 2.2.2. We then analyzed Echo It's purpose on the platform which is to translate the goals and strategy of an organization into daily actions and efforts that can be shared with colleagues across the whole organization. In addition, its purpose is to acknowledge colleagues for the efforts they have made in relation to the strategy and reaching the goals (Echo It, 2012; appendix A2a). These purposes tell us that Echo It developed the platform to

make it easier for employees to share daily actions and efforts and at the same time give the employees the ability to acknowledge each other.

In table 2.1, we can see that *computer as a tool* plays a role as a technology that increases capability and makes a target goal easier to perform, whereas *computer as a medium* attempts to create a real-life experience simply by interacting with computers while *computer as a social actor* is a computer with animated characteristics and is comparable to a living creature (Fogg, 2003a). Knowing what the different roles stand for and putting them side by side with Echo It's purpose, we can determine that Echo It plays a role as *computer as a tool.*

Below we will present types of persuasive tools and analyze and discuss if and how Echo It uses these tools to persuade their users. To be an effective and persuasive tool, Echo It needs to at least use more than one persuasive tool. However, two or more is commonly used (Fogg, 2003a). Computer as a tool consists of seven persuasive tools; in table 6.1 we can see that Echo It is using six out of seven possible tools. The seventh tool is *conditioning*, which is about using sounds and visual effects to keep users engaged. We do not think Echo It would benefit from adding a visual effect because users may even see it as an annoyance.

We will also go through computer as a social actor and computer as a medium to find out if Echo It can use some of their strategies to improve persuasiveness.

Table 6.1: Persuasive tools used by Echo It

Persuasive tools	***Used by Echo It***
Reduction	X
Tunneling	X
Tailoring	X
Suggestion	X
Self-monitoring	X
Surveillance	X
Conditioning	

Sharing good deeds and having as many people as possible hear about the deeds could be a complex activity; however Echo It has facilitated this activity through their platform. Users can share good deeds in a simple process and reach many users simultaneously (appendix A2a). By easing the process, it implies that the first type of persuasive tool, *reduction*, is supported in the system. Reduction motivates users to share good deeds more frequently because it is a simple process to perform the behavior (Fogg, 2003a). Echo It has also made it easy to register as a user on the platform through sending invitation letters through new users and the new user only needs to choose a password to get access to the platform (appendix A2a). The personal information is entered by Echo It and is based on the contact information that the company has about the user.

The next type of persuasive tool is *tunneling,* which means leading the user through a process (Fogg, 2003a). Echo It uses tunneling when the user registers and the first time a user logs into the platform. The first time the user logs in, the user will get a short introduction which is about the platform, what it offers and how to use it.

Echo It uses the third persuasive tool which is *tailoring*. They use this when sending invitation letters to new users. The invitation letter starts with the user's first name which triggers the user to think that the message is personal and they will consequently pay more attention and process the information more deeply (Fogg, 2003a).

Echo It uses the fourth persuasive tool *suggestion* to remind a user if (s)he has not been active for a couple of days. An email is then sent out to alert the user to log in and share deeds. This function can be annoying if the timing is inappropriate or when other factors may influence the user (Fogg, 2003a). Therefore, Echo It has made it possible for users to turn this function off if the user perceives it as an annoyance.

Echo It uses *self-monitoring,* the fifth persuasive tool, to show the user how many deeds the user has shared that current week, how many new connections the user has and if the user has received any new badges (Fogg, 2003a). The data is available to the user in order to track the individual activity.

Echo It uses *surveillance* by way of awarding the user with badges when they share good deeds. It is the company who decides what each of the badges stands for and when a user should receive a badge (appendix A2a). When a user is awarded for their behavior, the user will continue to display the behavior because (s)he will feel good. This also motivates other users to be more active because they will want to be awarded as well (appendix A2b).

The only tool Echo It does not support is *conditioning*, the last persuasive tool. In some ways it is supported, because when a user is rewarded, it motivates other users to share deeds. However, Echo It does not use sounds, visuals and high scores to keep users engaged (Fogg, 2003a). We do not think Echo It needs to use conditioning to persuade users because it is more commonly used in games (Vara et al, 2011). If Echo It decides to use a visual effect when for example a user gets a new message, feedback or a like then there should be an option available to them to turn it off.

We will discuss why we don't think Echo It plays a role as a medium and social actor in short. Computer as a medium can persuade users in two different ways: symbolic media and sensory media. Captology mostly focus on sensory media, which Echo It cannot use, to help the users to reach the targeted goal. However, if symbolic media was the focus, then Echo It could use graphics, icons and maybe charts so that users could convey information. Computer as a social actor is when a computer takes on a role as a living entity which Echo It does not (Fogg, 2003a).

6.3. Evaluate and Design with Support Aspects

The research category Support Aspects have mainly been based upon Oinas-Kukkonen and Harjumaa's (2008) framework of principles for designing Persuasive Technology. In addition to the findings under the research category Credibility aspects, Echo It was evaluated as a whole, supported by use cases including the principles from the framework. In total, five principles were not supported by the system, two of which have previously been discussed in relation to credibility, namely Authority (principle 19) and Third-party endorsements (principle 20).

The other three aspects not supported were Simulation (principle 6), Rehearsal (principle 7) and Cooperation (principle 26), where Simulation (principle 6) and Rehearsal (principle 7) belong to the Primary Task Support category and Cooperation (principle 26) to Social Support. Primary Task Support principles are designed for helping users to carry out tasks and the one principle that is missing refers to how the system should help the user to see the link between the cause and its effect (Oinas-Kukkonen & Harjumaa 2008). In other words, the user should be provided means to understand the targeted behavior by seeing the reward. We could not immediately find any support for Simulation in the system. As the purpose of the system is to translate the organization's goals and strategy into daily actions and then share the actions and efforts with other colleagues, the system should provide means for translating what the individual user does and the effect of that action. In addition, the system should also provide rehearsal for performing the targeted behavior in the real-world (Oinas-Kukkonen & Harjumaa 2008). In contrast, principles in the Social Support category are about getting users to work together. Oinas-Kukkonen and Harjumaa (2008) suggest that the system should provide means for co-operation, for example by studying behavioral patterns through mobile application collecting data which sends it to a central server. The system does this in one way. It measures statistics of activities such as Echoes, Comments and Likes (appendix A2a) but it only consolidates the results in pie charts and bar charts, it does not provide any analysis, which according to our interpretation of Cooperation (principle 26), it should.

In addition, four principles were, depending on the context, found not to be supported. These principles are Personalization (principle 4), Social Comparison (principle 23), Normative influence (principle 24) and Recognition (principle 28). The system does not support much personalization of content for the user, as (s)he can only change profile picture, phone number and notification settings. However, during the first interview it was stated that the organizations could personalize the system in terms of colors and badges (appendix 2a). In that sense, it offers personalization, however not to the same extent on a user lever. One thing found during gathering empirical evidence was that the user could not change the language of the application (Oinas-Kukkonen & Harjumaa 2008). Even though we looked at the

implementation for a Danish company, users should have the option of changing the language for example to English which is a common language on the Internet. We also consider sending private messages as a sign of personalization, as it is only the user and the receiver of the message who can see it. Sending private messages is one of the features found during the pre-study which is not available in Echo It.

The principles of Social comparison (principle 23), Normative influence (principle 24) and Recognition (principle 28) all belong to the social support category. Social comparison (principle 23) could be seen as supported by the system as it is possible to see when colleagues have been awarded badges for different kinds of behavior. However, there is no easy overview or list ranking enabling users to easily compare their results with their colleagues', instead they need to look at each user profile individually to see the results of others. Normative influence (principle 24) was also not found to be supported by the system. Here Oinas-Kukkonen and Harjumaa (2008) suggest that the system should provide means for gathering people with the same goal. As found during the pre-study, the system does not provide the ability to create groups which could be a means of bringing people with common interest or goals together. Recognition (principle 28) could also be seen as supported by the system as the badges that the users earn are visible to everyone. However, again there is no easy overview or ranking list where this information is collected therefore leading us to interpret it as recognition being able to pass by others unknown, and as such, it is not public.

From the pre-study, we found that 9 out of 20 features are not available in Echo It. Four of the features related to credibility, which have been discussed previously, and 5 features come from Primary Task Support mainly relating to personalization of content on a user level. Personalization of content and the look of the system could be seen as relating to surface credibility, what the user can see, which in turn can persuade users not willing to take a deeper look (Myers 2002). Therefore it is important for the user to be able to personalize the content, in order to allow the users to travel either the central or the peripheral route to persuasion both via what the users can see and what they can read.

Two themes from the first interview can be relevant in addition to the checklist on a general level. The Purpose of the system and in what way the users use the system. These two themes relate to the evaluation of the system and actually achieving its purpose. The findings from the interview show that the users are not yet using the system as intended (appendix A2a). As the purpose of the system is to change their behavior, the users need show or communicate their behavior, whether it is their current behavior or the targeted behavior. During the interview, the COO mentioned that the users are slightly reluctant to share but they are happy to promote other users sharing their behavior (appendix A2a).

6.4. Research Questions & Guidelines

While Oinas-Kukkonen and Harjumaa (2008) have developed a framework for designing and evaluating Persuasive Technology by focusing on specific features, we have focused on the design as the finished product. We have applied our theories on one system in particular, Echo It. In this way this study complements the framework. The main problem of this thesis is how technology can be designed and evaluated to persuade users to change their behavior. The main problem was too extensive and had to be crystalized. Thus, based on the two research questions that were formed (RQ1): which aspects are crucial to evaluate ICT-systems for persuasive purposes and (RQ2): which design criteria that can be detected from an evaluation process. In subchapter 2.4 the extensive research model was presented, focusing on three research categories namely credibility, the role of technology and support aspects. These categories and the empirical results have been discussed in detail above. From the above analysis we have formed guidelines in order to answer our research questions.

- *Guideline 1: Accurate information from a credible source increases credibility*

  While researching credibility we found that the information communicated to users is important and in addition, the source from which the information is communicated is equally important. Firstly, Echo It is a closed system to a certain number of users within an organization. As such, the system is credible as it contains a presumed credibility and trust between members (Trustworthiness principle 15) (Tseng & Fogg, 1999; Oinas-Kukkonen & Harjumaa 2008). A user might know another colleague to be an expert within a certain subject and can therefore expect expertise and the answer to be credible (Expertise principle 16). However, there is no general way of verifying accuracy and the question of how users can trust their colleagues to always speak the truth arises. There is no general way of determining expertise, trustworthiness or accuracy unless the users previously know or know of each other. Hence it is important that the system provides means to check the validity of the information added. Secondly, from this we can also conclude that the source of the information is important. For example, previously we have discussed that Echo It is not supporting the principle of authority (principle 19). If for example a message of the purpose of implementing the system is to be communicated to the employees, an authoritative person would increase the credibility of that message. From this discussion we can conclude that the information in a message must be accurate and in order for it to be credible it must come from a credible source. The system must provide means to support both.

- *Guideline 2: Identify the system's role as a persuasive mean*

  From the theory and the empirical study, we learned that technology which is developed with intent to change users' attitudes and behaviors, is a Persuasive Technology (Fogg, 2003a). Echo It is developed with the intent to persuade users to share good deeds which means that it is a Persuasive Technology (appendix A2a). Knowing which role a technology takes on provides an understanding of how users use and respond to that technology and it also helps to focus on the right things when evaluating and using persuasive technologies (Fogg, 1999). Each role uses different strategies to persuade users and by identifying the role we know which strategy to use.

  From the study we have not found or discovered any specific technique for identifying the role of a system, however a good starting point would be to study what the different roles are and what can be achieve through them. In addition, by knowing the purpose of the technology the role can be identified.

- *Guideline 3: Appearance and message are equally important*

  From the research process as a whole, we have learned from social psychology that there are two routes to persuasion, one depending on a strong message (central route) and the other purely on looks (peripheral route). Therefore we can conclude that both the message and the look of the system are equally important, depending on the mood of the user, if (s)he is motivated to think or not. In relation to support aspects, we have found that both tailoring and personalization is important. If a user can personalize the look and the message, the content can be tailored for them which will increase persuasiveness. In Echo It we can see that there are few ways for the single user to customize the system after his or her wishes or needs. After the pre-study, some features in relation to personalization were found to be missing. These features allow for the user to create content that (s)he finds relevant and is thus making him or her more likely to be persuaded.

7. Conclusion

In this final chapter we present the findings from our study and conclusions drawn from them. The conclusions are presented together with our knowledge contribution in form of three guidelines (section 6.4). The chapter concludes suggestion of further research for others interested in the field- or skeptics of Persuasive Technology.

7.1. General conclusion

The purpose of this thesis has been to establish guidelines for how Persuasive Technology design products could look in order to reach the intended outcome, that is, to persuade the user to changed behavior. The intention is for these guidelines to become applicable and reusable by designers of systems with persuasive purposes, regardless of platform or means, since being aware of Persuasive Technology helps in reaching the desired outcome – changing users' behavior (Fogg, 2003a). Within this investigation, findings have been gained in regard to answering the research questions which were formed from the main problem to highlight the field of Persuasive Technology as important, in particular the design and evaluation of the final product.

Simply by conducting this study, the field of Persuasive Technology is highlighted as important or else the research would not have been worthwhile to pursue. It is highlighted as important to users of persuasive systems as they can benefit by receiving help to changing a behavior, for instance to quit smoking or to manage a chronic disease (King & Tester, 1999). It is also highlighted as important for designers and developers of systems with persuasive purposes since being aware of Persuasive Technology helps in reaching the desired outcome – changing users' behavior (Fogg, 2003a).

7.2. Contribution

The first research question *which aspects are crucial to evaluate ICT-systems designed for persuasive purposes* (RQ1) and the second research question *which design criteria can be detected from an evaluation process* (RQ2) was developed into three research categories which are summarized in table 19. While researching credibility aspects, we could learn that the system should have means for verifying the accuracy of the information added to ensure that it is communicated from the right source to increase credibility. Looking at role aspects we could learn that certain features were needed to be fulfilled for the system to actually be persuasive. Researching support aspects, we could learn that the appearance and the message of the system are equally important. These guidelines will be discussed in relation to the research questions below.

Table 7.1: Research categories and knowledge contribution

Research category	***Knowledge contribution***
Credibility aspects	Guideline 1: The system should provide means for verifying accurate information from a credible source in order to increases credibility
Role aspects	Guideline 2: Identify the system's role as a persuasive mean in order to hint at which kind of users the system might have and what functionality should be available
Support aspects	Guideline 3: Appearance and message are equally important and should be taken into account while designing the final product (go beyond the design processes)

To begin with, identifying the system's role as a persuasive mean (guideline 2) helps us when answering the first research question, *which aspects that are crucial to evaluate ICT-systems designed for persuasive purposes* (RQ1). The Functional Triad helped us to understand computers, what power it has and how computers can be used to help us in everyday life. Identifying the role a system plays is one of the aspects that are crucial to identifying when we want to evaluate an ICT-system designed for persuasive purposes. The role is important because, when we know what role a system plays then we know how the user uses and responds to the system and what users expect when they use the system. Knowing the role gives us a hint as to what kind of users we may have, which in turn makes it easier to design a system for that target group. It also makes it easier to evaluate a system because we know what features the system should contain and we need to evaluate if the system supports those features. With the Functional Triad it is possible to evaluate the system and get to know what is missing in a timely manner. Without the Functional Triad, we think the focus may land on things not suitable for this kind of system.

Furthermore, accurate information from the right source increases credibility (guideline 1) and appearance and message being equally important (guideline 2) help when answering the second research question, *which design criteria can be detected from an evaluation process* (RQ2). From an evaluation process, we can detect where the system's weak spots are and where to improve the system. The Functional Triad is useful here as well because when we have identified what role a system plays then we know what tools the system should have in order to be able to persuade users. As Oinas-Kukkonen and Harjumaa's (2008) framework of design principles is based on the Functional Triad, we could not only determine the role that the system takes on, we have also learned that credibility is an important aspect. Therefore the system should provide means for verifying that the content added to the system should be accurate and come from the right source. If a source is correct or incorrect depends on the message and the credibility of the message could also be enhanced, coming from a credible source. We can also detect that the appearance of the system and message it tries to convey are both of the same importance while designing the final product. This means there is a need for going beyond the design process itself and focus on the finished product by giving looks and functionality equal space with the source, while keeping the source in mind.

These guidelines could become applicable to initiatives of research-, governmental- or commercial character. Our hope is that companies will find Persuasive Technology a means for motivating employees to, for example, share knowledge across teams or take action for the environment and ultimately increase employee- and client satisfaction.

7.3. Suggested research

After studying the design process of persuasive technologies, we suggest that it could be beneficial to do further research on the actual outcome of persuasive systems. For example, by implementing the guidelines suggested in this thesis and measuring the behavior of the users, as well as examining how the users' behaviors change towards the targeted behavior.

It could also be interesting to examine the impact that a Persuasive Technology system has on employee satisfaction after implemented in a company. For instance, outcomes after Echo It, or similar systems, have been successfully implemented and in use over some time, irrelevant of whether or not it has changed the users' attitudes or behaviors.

Appendices

A1. Interview Guide

Interview #:
Interviewee:
Interviewers:
Date:
Location:
Audio record:

- □ Yes
- □ No

The purpose of this interview is to obtain facts about Echo It and about the system's intended use in order to initiate the collection of data for our study. The purpose of the data collection is to evaluate the system from a checklist based on Fogg's Functional Triad and suggest guidelines. This will help us answers our two RQs.

Interview themes	***Interview questions***	***Motivation***
The purpose of the system	Can you tell us about the purpose of the purpose of the system?	Knowing the purpose of the system it can be determined if it has persuasive purposes
Guidelines during the design process	Did you use any theory/theories or model/models as a basis for designing the system? c. If yes, which one? d. How did this/these help you design the system?	With a theory or model as the basis for the design, the role of the technology can be evaluated depending on what the theory or model represents (Fogg, 1998)
Opportunities to make customization	Are there any opportunities for the company to customize the system? b. If yes, can they customize it themselves?	Enabling users to perform a new behavior, opportunities to customize might help users to easily repeat it (Oinas-Kukkonen & Harjumaa, 2008)
The number of installations	How many installations have been made? b. How many users does the system have? (with users we mean the employees within a company and not a company as a whole)	Knowing the number of installations, the networking potentials and possibility for generating content can by evaluated in terms of the system functioning as a medium (Fogg, 1998)
The way users find the system	How do your users find the system? Is it voluntary or not voluntary)?	Knowing how users find their way to the system will determine if it is voluntary or forced. This might affect the system as the role of a social actor (Fogg, 1998)
The way the system is used	Can you describe in what way the users use (companies, organizations, individuals) the system? b. In what way does this lead to or intend to lead to, changes in behavior?	Knowing the way users use the system helps evaluating the role (Fogg 1998). It also enables comparison if the way it is used differs from the purpose of the system, how it is intended to be used

A2a. Transcription of interview 1

Interview #: 1
Interviewee: Stefan K Madsen (CEO), Ida Adler Olsen (COO)
Interviewers: 1) Anna Persson, 2) Armela Duzic
Date: 2012-04-03
Location: Echo It's office, Copenhagen
Audio record:

- ✓ Yes
- □ No

The purpose of this interview is to obtain facts about Echo It and about their system's intended use in order to initiate the collection of data for our study.

Interview questions including answers:

1. **Can you tell us about the company?**

CEO: We started the company about two years ago. I guess the first thoughts were about using the internet to improve how people behave towards each other. They dropped out of the project and the project took another direction. Because I have always been very interested in why people behave the way they do and if you can get them to behave more like we want them to behave and on a more philosophical note - if it matters why people behave like they do as long as they behave the way you want them to? So that been covered with a big interest in gamification, you know Foursquare and those kind of things became…made it so I decide to continue some of the work we been doing with these two guys originally, which is something completely different. And then I came up with the name and I got Simon, Mike and Paul from Sortedam Ventures who I have known for ages. We have done case competitions together and we had an entrepreneurship network at CBS together so we know each other for ages and they been doing web mobile stuff for many years as entrepreneurs. And then I got Lars Torben, who was the first investor, is a great business angle in Denmark that I know because I was CFO and one of his companies and so he has worked with me a lot and I have assisted him on various deals and so on - and then we got some founding, we tried to make a public version which was about good deeds, trying to use gamification to actually improve the way people behave and we got a great sum, we got some really good learnings from that.

It also was from the beginning not really what we wanted to do, it was part of what we wanted to do but wasn't the main focus, the main focus for me has always been to take this technology, wanted to know how it worked inside a company and using for gamification of company values or target or goals. Because I think there is a lot of, I mean it is very easy to put a sales target up there but how do you actually get to that, there is a lot of actions there, that is very valuable for a company to know. And it is very important to recognize for an employee to do the right things but also to get the relevant feedback. So, and using gamification gets a lot of statistics which is, which is really nice, right? So yeah, then I was working, next to this I was working for PE Fond at the time so I was really busy and project kind of suffered under that and we didn't really know where to take it and tried to make some big investors in and they didn't really buy it, it was also bad timing and maybe we should have focused on selling because we got a lot clients interesting in testing the product. So then we finally decided, we're going try to go different direction, just focusing on one of the clients that signed up as a test client, which was DSB S-tog, the S trains in Copenhagen. We're launching for them in December, I'm sorry in April, for 12 hundred people and already now we have a loaded pipeline again - so it is going really well.

In that process we also got a couple, we closed with a couple more angels so didn't do like this huge venture a-round but we just like got a little more in to it. And I quit my job at the PE found and very important we got Ida

who has been a great asset for the product, and she is the Chief Operating Officer and is also part of the company now. So that was shortly the story…

Interviewer 1: OK, so how many employees do you have now?

CEO: We are three people working on it full time.

Interviewer 1: OK, and the other people in there they are…?

CEO: One of them was a student worker who was just helping to temporarily with the S-tog and then Jonas works for S-tog, yeah, we have a work session today, he is leaving for New York in a couple of days so - and we are lunching like almost tomorrow like so we are going to have, and the Easter is not far away so we thought it would be good to work side of each other. The other people work for other companies as well.

Interviewer 1: OK, I see, alright.

Interviewer 1: You talked a bit about the purpose of the system to… about corporate values and so on, so maybe we already have the answer to that one, I think so.

***Follow up question*: But when you designed the system, you did that yourself? Or you with the three, or the two guys you started with? How did that work?**

CEO: Well, basically we contracted in Simon and Mike. Mike is a coder and he is coding for Echo It now, they have a coding agency so they know how to do this kind of solution, they have a lot experience and do really popular sites in Denmark and mobile solutions so they build the first site, the public site and we actually continue a little bit with that with that model now because we have had talks with hiring a developer in but we need to find the right guy. And so right now Mike is coding at and doing a really well job.

And the way we, we based, we know what we wanted to do and we, for the public version we tried various things that we got inspired from heavily from Foursquare, Twitter a little bit Facebook and then also very much inspired by going the other way around saying that we want to sell to enterprises and they have other needs and concerns than a consumer does. Especially a lot about safety and access to data and these kinds of things. It is very different than a lot consumer's site, it should still like a consumer site, that is important for the users but it should primarily be an enterprise site.

So we have, this is why it is very great to work with S-tog, they have been spending a lot project resources with us, this has been really good because we have learning's there and that means next time, we will get, will be much easier for us and the next and again but every time we do a new client we have decided we will put down some learning's targets- Like what is, beside revenue, what do want of this client like what do we want to learn from this. Because we of course have got some strategy concerns what we want to a focus on and where we want take and so on.

2. **Did you use any theory/theories or model/models as a basis for designing the system?**
    a. **If yes, which one?**
    b. **How did this/these model/models or theory/theories help you design the system?**

CEO: I don't know.

COO: I don't know either.

CEO: I mean, Mike and Simon they have a lot of experience and some of that is based on theory but we don't remember like the name of those theories necessarily. I mean I have some concepts, I have some philosophers stuff that I read and that I am inspired by but models and tool set come is where you have to pinpoint.

COO: Yeah, I mean there is J. McOliver for example with Game Dynamics so you can see a lot of game dynamics used at Foursquare and Facebook bla bla bla. She kind of spins it down and she makes knowledge as a theory in this area. So you might want to use that one, so there is different, I don't remember what the other one is, there is also game designing, so for the game dynamics there is definitely some theories in there for us we kind of use it as a back bone and because especially Mark and Simon have done a lot of projects like this now. So, so they just use it, not necessarily acknowledge it, you make potentially

Interviewer 1: But there is some…?

COO: There is definitely game dynamics, it is an emerging theoretical field, there is definitely something to begin there.

CEO: You work for Accenture right, I guess you will be familiar with this like for instance I have toolbox from McKinsey with me still. Whenever I use a model I just go in and find it also there is a lot of theoretical stuff and analytics going down but I don't necessarily remember who's …

One theory we did use a lot is User Adaptation Model which is interesting for you guys maybe to think about. So normally when you (draws a figure) talk about a system you divide your users in a triangle. It is a triangle because you expect to have many on the bottom level and few on the top level. I think that the theory goes is there is five levels in this, we simplify and say there is three levels of this. Up here we have lead-users, LU, we try to identify them early on. And that means, right now there is people who get access to the system before everyone else. Right now we have people who do that and they do a lot of stuff, they will drive a lot of the content. Then we have the C-level here, it is call the contributors, these are the people who think they are lead users, they are not really lead users but they contribute a lot, they do Echo's and they will boost and those kind of things. Down here we have the L-level, which is, not loser but lecher level, the lecher lever, they think they are contributors but in fact they are just leaching but they are important because they make contributors feel important they boost a lot and so on. By far most people in the system.

What is then very interesting, because none of this is how you go about when you launch a site, but because this is an enterprise solution we can draw a square around here. Because you know the total, you know the *n*-level, right? Which in this case would be 12 hundred. Because the know the usage of this system would be 12 hundred, so where it would be 6 billion for facebook, because there are 6 billion people in the world there are only 12 hundred here, so we are concerned about when we are launching this site is to start with having some of these in here, because we start with them, but then the rest is in this square basically, we have to do initiatives to getting people in the leaching level, and from the leaching level up to the contributor level. We don't so much care about getting people up here, it will always only be 5 per cent.

So all our work with the client and so on with implementing the system, is to get people from the square, in to the triangle up the triangle. And our KPI's in terms of DSB, we have some set KPI's, to measure how many are in this level, how many are on this level, on this and on this level So that is how we approach it. That is based on various User Adaptation theories.

3. Are there any opportunities for the company to customize the system?

CEO: I wanted to do Software as a Service, and we might do a SaaS solution, where everything can be customized by the client. However, if you look at companies, even very successful companies, SaaS is not necessarily your

road to success, there will always be a lot of customization. And if you can gear your business model towards that, you can show that even if you're customizing and you're charging for it and you do it in a scalable manner, it does not cost so much.

Right now we are very far from a SaaS but our back end is optimized towards it, but for example our next client if he wants to change the logo, that would be very easy to do, we know exactly where it is. We are working with making the customization part is standardized so that when they want to change a color or a logo we know where it is. And of course how you get the badge and what they represent, that is of course customized. And of course, how you get the badges and what the badges represent.

a. Can companies do that by themselves?

CEO: Not right now, right now is that we do it.

COO: As of today we are doing everything back-end. It is also a prcing stragety, how much it costs for the customers to do it themselves versus how much consultancy time do we have to spend on doing it for them. There is a lot of elements in that decision.

CEO: And also, one thing for us, if you come from a consumer background, SaaS is very compelling because it so nice that I can set everything up, I can charge and I can leave it. Big companies doesn't necessarily think that way. They don't mind paying a relatively high upfront consultancy fee, so that they get a solution that they know works, that is customized for them. Because they are affirming, it's not just a matter of "we are going to start next month" because that's not how it works, they might. They might cut the project but they rather do it over time or whatever, there are a lot of different concerns. That is one of the big challenges of being a provider for companies and enterprises versus consumers and you have to get that into your DNA, very quickly.

4. **How many installations have been made?**

CEO: DSB- is the first real one. We have a loaded pipeline of various projects.

   a. **How many users does the system have? (with users we mean the employees within a company and not a company as a whole)**

      CEO: 12 hundred users (DSB). We started with this to make it right.

5. **How do your users find the system (voluntary/not voluntary) (27:00)**

COO: They are invited by a letter with a temporarily password. It is not forced but it is encouraged by the top manager on DSB. If the employee says "No, I don't want to be part of this" – He could.

CEO: What we are hoping is that you have to be but you want to be.

COO: We are not forcing people but once who are not on the system kind of misses out. There is some sense of "Hey, what is it all about" and stuff like that.

6. **Can you describe in what way the users use (companies, organizations, individuals) the system?**
   a. **In what way does this lead to or intend to lead to, changes in behavior?**

COO: They are using it in the right way; they are doing a lot echos and comments and liking a lot. It is very easy to like something. The users emphasize more each other's behavior more than they emphasize their own behavior. We are not that surprised about it but that is something that we wanted to change, we wanted that they focus on (????) their own behavior and that they say I am glad that you did this but I did this.

Interviewer 1: is that cultural differences as well?

COO: yeah, there are definitely cultural aspects there. We want to make people talk about others actions then it will be easier to talk about their own. But that is the key that we need to emphasize that it is your own actions.

Interviewer 1: Has this lead to that people have started to do more?

COO: I think that it is too early to say in this point we have been ??? it under a month but it is definitely platform where they can acknowledge each other and also say what they are doing and get an inside each other's work. That is something surprising for us but they get to know more about what others are doing and their jobs.

A2b. Transciption of interview 2

Interview #: 2
Interviewee: DSB S-tog project manager (PM)
Interviewers: Anna Persson (1), Armela Duzic(2)
Date: 2012-04-03
Location: Echo It's office, Copenhagen
Audio record:
- ✓ Yes
- □ No

1. **Can you describe in what way the system is intended to be used?**

   PM: How we intend to use it?

   Interviewer 1: Yes, because I understand that there are only a couple of users on the system right now? 40-50?

   PM: There are one hundred users, a hundred approximately. 60 leaders and 40 ambassadors

   Interviewer 1: But you intend to get more users on there?

   PM: Yes

2. **Can you tell us a little bit more about what you intend to get out of it?**

   PM: I will try to, in my English… Our main focus is to make it a bit more fun or exciting to go to work and we hope that in the end it will… in the end what is going to happen if you have more fun at work, you pass that on to the customers so that they experience that you meet an employee who has a bit more…

   Interviewer 1: You mean so that you, if employees are more satisfied with what they do, they will pass that on

   PM: … and give more customer satisfaction

   Interviewer 1: How do you think that Echo It would make it more fun?

   PM: I think it's, when you get more people to "like" what you are doing then, I think that motivates you and it makes it more fun to go to job. Normally when you go to work, maybe when you do something that is a bit extraordinary, maybe sometimes someone will notice and give you this little thumbs up thing in the daily life but it happens seldom that people would do that. So here you have the possibility of writing what you're doing in the daily life and you can receive a lot of thumbs up from your colleagues and maybe that will make it a bit more exciting to go to work.

   Interviewer 1: Yes, I agree.

3. **We also understood that it is voluntary to participate or not. How do you plan the "force" but not actually force users to get on there?**

PM: It is my responsibility to make it exciting to go into Echo It. So, the way we are doing it is we have these badges that you can achieve in Echo It. I think that Stefan has maybe explained about it?

Interviewer 1: Yes

PM: and my responsibility is to make… to make these… to give something physical in return, some physical gifts, not only badges that you get rewarded through Echo It but so that you get something in real life. It could be breakfast or something else that you can share with your department… if it makes sense, or something else. I haven't figured out what to give people yet. The excitement should be about what you can achieve in Echo It. "Thumbs up", things like that but the second element is what you really get out of it in real life, so it's the small gifts.

Interviewer 1: So, for example like people that are not on there today will see what people who are actually on the system…

PM: Knowledge sharing

Interviewer 1: …get out of it and then they will ???

PM: yes, that will be another generator to get more people on there but the other thing could be knowledge sharing that is built into this Echo It. As you can actually read what is going on in S-train on a daily basis and that should make it fun as well. Because you read about things that goes on in other departments that you couldn't read anywhere else and you would never know what is going on there if it hadn't been for Echo It.

Interviewer 1: Did you take part in the decision to implement this or?

PM: Yes

Interviewer 1: What was the reasoning behind it?

PM: What was the reason to implement it?

Interviewer 1: Yes, I mean why this system?

PM: Why we didn't choose between other systems was more random. Stefan he contacted our sales director and asked if this could be a good idea in some way. And in that stage, in that point of time I think Echo It was only developed as a public version.

So, that was what I got to work with when I got involved. Our sales director, we had a meeting together him and me and the sales director asked Stefan to… he was also with us at the meeting and Stefan told us about his ideas and his motivation to work with Echo It and after that I went on paternity leave for three months and I could go and think about how we could use Echo It in the company.

So I started to think about how this could fit into an organization, so I and then I met with Stefan some times and we talked about things and finally I had a concept that I presented to the board of directors in S-tog and the main driver is that we can improve customer satisfaction. So that was the argument.

But the other thing…, I think that customer satisfaction is the main driver but the other thing is that we can improve employee satisfaction as well.

Interviewer 1: OK.

Interviewer 1 and interviewer 2 are having a short discussion about the questions

4. **What is the feedback that you have gotten from the people that are on there using the system now?**

   PM: It is very positive.

   Interviewer 1: What are they saying? In what way is it positive?

   PM: They say that it a very good place to share knowledge. It's a positive element in the everyday life of the employees. So, that's the two main things.

   Interviewer 1: No one has said "oh, this is another technology that I have to work with, this is difficult"

   PM: No, not yet but maybe we will experience it later.

   Interviewer 1: Well, most people are on facebook so it would be pretty much self-explanatory. You can see that they are using it and they are using it a lot?

   PM: Yes

   Interviewer 1: Do you think that at some point it will interfere with their actual work?

   PM: Not really. I don't think so. We said to the leaders that they should of course be aware but normally it wouldn't be a problem because people have something to do and most people are out fronting our customers every day. Train driver and the people that control the tickets. That's 800 people and we are a thousand employees all in all so everyone has something to do somewhere else. So, I don't think it will become a problem.

5. **Since you have a lot of people that are out, not staying in front of computers, do you see it being beneficial having Echo It on a mobile device as well? Like an app or something?**

   PM: Yes, in the future. But our problem right now is that we don't have smart phones. But I think in two years' time or something. The train drivers might get an iPad in some time so in the future it would be a great advantage to have it.

   Interviewer 1: So basically when you have the tools to use it?

   PM: Yes. Right now we only have these Nokia phones so we are using an SMS solution that people can use and I think that it is good for now.

   Interviewer 1: Are people using the SMS solution?

   PM: Not yet. But you cannot actually see it. When you go into the system you cannot see which echoes have been sent through SMS. I don't think so at least. I think most of the people are doing it from the computer and I think it will be so in the future as well because the only reason why we have made an SMS solution is that we have a lot of train drivers that have used that argument that "we will not be a part of it because we don't have a computer!"

6. **Have you seen any like, I mean you have seen that people are using it, but have you noticed any change in behavior.**

   PM: No, not yet. It's only 40 people who have it so… I think it will be difficult to measure in behavior. I think that from the knowledge sharing people will inspire each other to do similar things and some good ideas will come out of this and I think that the best way we can do this is to find out how many people got inspired by each other through Echo It. And that is the way that we can find out if this generates value or not. I haven't found the formula for how to measure the customer experience part yet but it will come to me.

7. **Is there anything that you would like to share with us about Echo It or your experience here?**

PM: I think that one of the main points that we learned here is that the way to implement social media is not so straight forward thinking as you would believe. I think if you implement a social media in an organization, people would also think that you do it the top-down way, because that is the way you implement things but that is not the way to do it with social media. You have to implement it the bottom up way. And it is a much longer and more complicated process than the other way around. You have to involve a lot of people and you have to meet a lot of people and you have to convince them because you need them. You need a lot of people as ambassadors to succeed with this. And we have tried this way but we were also limited by the time frame because we have 6 months to try this out and see if it works. I think in the best case you will need 6 months or 1 year just to implement it. Because you need to have this curve that raises very slowly and we don't want this steep curve where we have a lot of activity to start with and just to find out "oh shit" and it falls down. In the best case we want enough time to develop this software. That is the challenge right now, to find out if this can be possible, even if we get this steep curve in the beginning because it will be a bit steeper than when we hope for, I guess. So, social media is about revolution and it smells a bit of garage and not so much of top CEO. One more things that it gives us is a feeling that you are a part of the company, part of something bigger.

The interview was rounded off with approval of using the name S-tog and DSB and also about time frames for releasing the system and when the thesis was due.

A3. Use Cases

1. Today you took the train to your work and when you open your email you see that you have got an email from Echo It that wants you to join their site. You are interested in what they have to offer so you decide to join. When you look at your personal site you see that they have your wrong phone number and that the site is on Danish, which is not your strongest language.
    a. Change your number
    b. Change the language
    c. Look around on the site
    d. Update your status

    Testing principles: 1, 2, 3, 4

2. You see your colleague being one of the members on Echo It and you decide to add her as a friend. You are curious about her activities. While asking her to connect, you also want to ask her if she wants to join you and your friends for drinks after work. You want to share an interesting article with all your friends.
    a. Add your colleague as a friend on Echo It
    b. Send a message to your friend through Echo It
    c. Read her latest status update
    d. Check how many updates she have done and if she have been provided with any rewards
    e. Update your status with an article you have read on CNN's website

    Testing principles: 14, 18, 21, 23

3. You are interested in if any other of your colleagues have been updating today.
    a. Go back to your home page and read others good deeds
    b. Like a good deed
    c. Comment a good deed

    Testing principles: 22, 24, 25, 27, 28

4. You have been sick for a couple of days and not been able to go to work but today is a new day! Today you answered a survey about sustainability, which took you 20 min and you won a sustainable mobile phone! You are excited and want to tell your colleagues about your good deed that brought you a reward.
    a. Check your email if you have got any news from Echo It
    b. Update your status
    c. Look at your old statuses
    d. Check how many status updates you have done this week
    e. Check if you have been provided a reward

    Testing principles: 5, 6, 7, 9, 10

A4. Checklist

Principle	Yes	No	Comments
1. Reduction			
Is the behavior target simple to preform?			
2. Tunneling			
Does the system guide the user through the attitude change?			
3. Tailoring			
Is the information tailored?			
4. Personalization			
Can the user personalize the content?			
5. Self-monitoring			
Does the system track users preformance or status?			
6. Simulation			
Does the system show the link between cause and effect?			
7. Rehearsal			
Does the system provide means for rehearsing?			
8. Praise			
Does the system give the users positive feeback?			
9. Rewards			
Does the system give users rewards when they preform the target behavior?			
10. Reminders			
Does the system reminde users of the target behavior?			
11. Suggestions			
Does the system give suggestions of certain behaviors?			
12. Similarity			
Is the system customized to the target group?			
13. Linking			
Is the system visually attractive?			
14. Social Role			
Have the system adopt a social role?			
15. Trustworthiness			
Is the information truthful, fair and unbaised?			
16. Expertise			
Does the provided information contain expertise? (knowledge, experinece, competence)			
17. Surface credibility			
Does the system have a competent look and feel?			
18. Real-world feel			
Is there any possibility to contact the organization behind the system?			
19. Authority			
Does the system refer to people in the role of authority?			
20. Third-party edorsements			
Does the system show endorsements from third-parts?			
21. Verifiability			
Does the system provide means for veryfing the accurancy?			
22. Social learning			
Can users observ other users perfomance?			
23. Social comparison			
Can users compare their results with other users results?			
24. Normative influence			
Is there means for gathering together people who have the same goal?			
25. Social facilitation			
Does the system discern opther users who preforming the target behavior?			
26. Cooperation			
Does the system provide possibility for co-operation?			
27. Competition			
Does the system provide possiblity for competitions?			
28. Recognition			
Does the system provide public recognition for users?			

A4a. Result from Checklist evaluation, Tester 1

Principle	Yes	No	Comments
1. Reduction			
Is the behavior target simple to preform?	X		
2. Tunneling			
Does the system guide the user through the attitude change?	X		There is a review in the beginning.
3. Tailoring			
Is the information tailored?	X		Depends, it is tailored to my company
4. Personalization			
Can the user personalize the content?	X	X	not possible to change language- default language are danish.
5. Self-monitoring			
Does the system track users preformance or status?	X		
6. Simulation			
Does the system show the link between cause and effect?			Maybe the rewards shows.
7. Rehearsal			
Does the system provide means for rehearsing?	X		
8. Praise			
Does the system give the users positive feeback?	X		By giving rewards, others comment and like.
9. Rewards			
Does the system give users rewards when they preform the target behavior?	X		
10. Reminders			
Does the system reminde users of the target behavior?	X		Email notifications if not online 24 hours.
11. Suggestions			
Does the system give suggestions of certain behaviors?	X		Maybe by seeing others doing updates.
12. Similarity			
Is the system customized to the target group?	X		
13. Linking			
Is the system visually attractive?	X		
14. Social Role			
Have the system adopt a social role?	X		
15. Trustworthiness			
Is the information truthful, fair and unbaised?	X	X	Hard to determine because ordinary people do the updates.
16. Expertise			
Does the provided information contain expertise? (knowledge, experinece, competence)	X	X	Hard to determine because ordinary people do the updates.
17. Surface credibility			
Does the system have a competent look and feel?	X		
18. Real-world feel			
Is there any possibility to contact the organization behind the system?	X		
19. Authority			
Does the system refer to people in the role of authority?		X	
20. Third-party edorsements			
Does the system show endorsements from third-parts?		X	
21. Verifiability			
Does the system provide means for veryfing the accurancy?		X	
22. Social learning			
Can users observ other users perfomance?	X		
23. Social comparison			
Can users compare their results with other users results?	X		
24. Normative influence			
Is there means for gathering together people who have the same goal?	X		
25. Social facilitation			
Does the system discern opther users who preforming the target behavior?	X		
26. Cooperation			
Does the system provide possibility for co-operation?		X	Dont know if it is possible to tag other persons.
27. Competition			
Does the system provide possiblity for competitions?	X		
28. Recognition			
Does the system provide public recognition for users?		X	

A4b. Result from Checklist evaluation, Tester 2

Principle	Yes	No	Comments
1. Reduction			
Is the behavior target simple to preform?	x	x	Not very clear the first time you log on
2. Tunneling			
Does the system guide the user through the attitude change?	x		
3. Tailoring			
Is the information tailored?	x		Yes, to S-Tog
4. Personalization			
Can the user personalize the content?	x	x	
5. Self-monitoring			
Does the system track users preformance or status?	x		
6. Simulation			
Does the system show the link between cause and effect?		x	Not emidietly
7. Rehearsal			
Does the system provide means for rehearsing?		x	
8. Praise			
Does the system give the users positive feeback?	x		Badges and awards
9. Rewards			
Does the system give users rewards when they preform the target behavior?	x		
10. Reminders			
Does the system reminde users of the target behavior?	x		
11. Suggestions			
Does the system give suggestions of certain behaviors?	x		Yes, through "Inspiration"
12. Similarity			
Is the system customized to the target group?	x		
13. Linking			
Is the system visually attractive?	x	x	It's simple, almost too simple
14. Social Role			
Have the system adopt a social role?	x		
15. Trustworthiness			
Is the information truthful, fair and unbaised?	x	x	The content is uploaded by the users, so in some cases probably not.
16. Expertise			
Does the provided information contain expertise? (knowledge, experinece, competence)	x	x	The content is uploaded by the users, so in some cases probably yes.
17. Surface credibility			
Does the system have a competent look and feel?	x		
18. Real-world feel			
Is there any possibility to contact the organization behind the system?	x		
19. Authority			
Does the system refer to people in the role of authority?			?
20. Third-party edorsements			
Does the system show endorsements from third-parts?		x	
21. Verifiability			
Does the system provide means for veryfing the accurancy?	x	x	You have to be a trusted member. Closed to the employees.
22. Social learning			
Can users observ other users perfomance?	x		Yes, by looking at their badges and awards
23. Social comparison			
Can users compare their results with other users results?	x	x	Yes, but only to people you are connected to. There is no list of scores.
24. Normative influence			
Is there means for gathering together people who have the same goal?	x	x	Yes, as the system is adapted. No, it is not possible to form groups.
25. Social facilitation			
Does the system discern other users who preforming the target behavior?	x		Yes, by awarding badges
26. Cooperation			
Does the system provide possibility for co-operation?		x	
27. Competition			
Does the system provide possiblity for competitions?	x		"Ledartröjan"
28. Recognition			
Does the system provide public recognition for users?	x		Everyone can see the badges and awards on your profile

A4c. Result from Checklist evaluation, consolidated results

Principle	Yes	No	Yes	No	Summary of the results
1. Reduction					
Is the behavior target simple to preform?	X		x		Equal positive response
2. Tunneling					
Does the system guide the user through the attitude change?	X		x		Equal positive response
3. Tailoring					
Is the information tailored?	X		x		Equal positive response
4. Personalization					
Can the user personalize the content?	X	X	x	x	Both answers applicable
5. Self-monitoring					
Does the system track users preformance or status?	X		x		Equal positive response
6. Simulation					
Does the system show the link between cause and effect?		X		x	Equal negative response
7. Rehearsal					
Does the system provide means for rehearsing?		X		x	Equal negative response
8. Praise					
Does the system give the users positive feeback?	X		x		Equal positive response
9. Rewards					
Does the system give users rewards when they preform the target behavior?	X		x		Equal positive response
10. Reminders					
Does the system reminde users of the target behavior?	X		x		Equal positive response
11. Suggestions					
Does the system give suggestions of certain behaviors?	X		x		Equal positive response
12. Similarity					
Is the system customized to the target group?	X		x		Equal positive response
13. Linking					
Is the system visually attractive?	X		x		Equal positive response
14. Social Role					
Have the system adopt a social role?	X		x		Equal positive response
15. Trustworthiness					
Is the information truthful, fair and unbaised?	X	X	x	x	Both answers applicable
16. Expertise					
Does the provided information contain expertise? (knowledge, experinece, competence)	X	X	x	x	Both answers applicable
17. Surface credibility					
Does the system have a competent look and feel?	X		x		Equal positive response
18. Real-world feel					
Is there any possibility to contact the organization behind the system?	X		x		Equal positive response
19. Authority					
Does the system refer to people in the role of authority?		X		x	Equal negative response
20. Third-party edorsements					
Does the system show endorsements from third-parts?		X		x	Equal negative response
21. Verifiability					
Does the system provide means for veryfing the accurancy?		X	x	x	Differing response
22. Social learning					
Can users observ other users perfomance?	X		x		Equal positive response
23. Social comparison					
Can users compare their results with other users results?	X		x	x	Differing response
24. Normative influence					
Is there means for gathering together people who have the same goal?	X		x	x	Differing response
25. Social facilitation					
Does the system discern opther users who preforming the target behavior?	X		x		Equal positive response
26. Cooperation					
Does the system provide possibility for co-operation?		X		x	Equal negative response
27. Competition					
Does the system provide possiblity for competitions?	X		x		Equal positive response
28. Recognition					
Does the system provide public recognition for users?		X	x		Differing response

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