



Universiteit Utrecht

FACULTY OF SCIENCE
DEPT. INFORMATION AND COMPUTING SCIENCES

MASTER THESIS BUSINESS INFORMATICS

**Persuasive technology
to support self-directed learning
in adult learning programs**

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October 18, 2012

Abstract

The field of human resource development struggles with the rapid changing business environment it operates in. 'Learning needs' keep on changing and for human resource developers it is hard to keep up with these ever growing learning needs. Research on human resource development points towards self-directed learning as a solution for this challenge. This introduces the question how members of an organization can become self-directed learners. The aim of this thesis is to explore the possibilities of using persuasive technology to persuade people in activities that support self-directed learning. To achieve this, three research activities have been conducted to gather requirements for a system that should persuade people in becoming self-directed learners. From these requirements a prototype has been created to test this conceptual premise in a real-life situation.

The first literature study is performed on the behaviour that is required for people to be self-directed learners. Second, a literature study is performed on the concept of persuasive technology to get the requirements on how technology can persuade people in doing particular behaviour. The third research activity is a case study on an adult learning program that uses technology to persuade people in becoming self-directed learners. The case study and interviews with experts on learning and development created input to see what the requirements were for the currently used technology.

To determine if it is possible to use persuasive technology to persuade people in becoming self-directed learners the requirements were verified in an experiment. Two prototypes were tested that differ in their principle to persuade people to reflect on their learning activities and stimulate social interaction.

Results from experts and literature have indicated that these two types of behaviour are important for self-directed learning. The persuasive principles on social comparison and social learning are integrated into the prototype to persuade people to reflect on their learning activities. The two prototypes have been used for 35 days by 18 participants of an adult learning program. After this, they were interviewed and usage of the information system was registered and evaluated. From the experiences of the users the general conclusion can be drawn that the social persuasive design principles has a positive influence on the usage of a tool to support self-directed learning. However, some participants notice demotivating behaviour on the long run because of the two persuasive principles used. Improvement of social interaction among the participants has not been measured. Within the prototype only three reports could be made of actual dialogues between participants via the information system.

This study did not provide clear evidence to show that persuasive technology can support self-directed learning. However, the insights from design process add to our understanding of the linkage between the persuasive technology and self-directed learning. The design part of this research has given more empirical evidence on the usability of design methods for persuasive technology and this is a contribution that is of importance for the information science discipline. This can be used as a base for further interdisciplinary research between the HRD research and research on persuasive technology.

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Chapter 1

Introduction

Since the concept of persuasive technology has been coined by B.J. Fogg from Stanford University ten years ago it has been used to solve problems on different domains. Most of the research conducted on persuasive technology and design are systems that are evolved around issues common in the healthcare and sustainability domain. Most of the research intended to persuade people to have a more healthy way of living (Arteaga, Kudeki, & Woodworth, 2009; Gasser, Brodbeck, Degen, & Luthiger, 2006; Foster, Linehan, Kirman, Lawson, & James, 2010; Wiekens, 2011) or to get a more sustainable lifestyle (Kort & McCalley, 2008; Jackson, 2005).

In this master thesis the usage of persuasive technology will be explored to solve issues in domains other than healthcare or sustainable lifestyle. The goal of this thesis therefore is to investigate if persuasive technology could be used to persuade people in becoming more self-directed learners. By doing interdisciplinary research between the field of human resource development and persuasive technology a new solution is investigated for this growing problem. The effectively support of people to become self-directed learners is a problem of importance from the human resource development research field. The problem description further on will answer why the support of the process towards becoming and maintaining a self-directed learner is of importance.

Furthermore there are still many issues within the research discipline of persuasive technology especially regarding the development of persuasive technology. These two problems will be addressed in this research by investigating the process of developing technology to support self-directed learners in learning programs for adults. The next section discusses the importance to support self-directed learning for the future workforce, human resource development discipline and companies in general.

1.1 Problem description

1.1.1 Why is it important to become a self-directed learner?

In public and private organisations there is a continuous need for change. Reasons for companies and non-profit organisations to change are consolidated world markets, rapidly developing technologies and evolving business models. Non-profit organisations have likewise an ever growing pressure to change because of new demands from clients services, evolving patient communities and budget crises (Seidman & McCauley, 2008).

It is well known that in the turbulent and unstable business environment individual firms as well as entire supply chains must compete for their survival through continuous learning and innovation (Bessant, Kaplinsky, & Lamming, 2003). Firms that are continuous learning and innovating are defined as 'learning organisations'. These learning organisations are "...skilled at creating, acquiring, and transferring knowledge, and at modifying [...] behaviour to reflect new knowledge and insights" (Garvin, 1993, p. 80). The basic rationale for becoming a learning organisation is that in situations of rapid change, only those that are responsive, flexible, innovative and productive will excel and survive. So therefore becoming a learning organisation can be seen as one of the key components for the creation of a sustainable company that will survive in the 21th century.

The creation of a learning organisations starts at the organisation's people. They have to be able "to create, acquire and transfer knowledge and reflect upon new knowledge and insights" (Garvin, 1993, p. 80). How can this be done? What kind of attitude and behaviour needs to be acquired by the members of an organisation to contribute to the creation of a 'learning organisation'?

According to a recent study from the domain of human resource development and adult learning, an answer can be found in the concept of self-directed learning . The study of Merriënboer, Kirschner, Paas, and Sloep (2012) reported that self-directed learning is essential for the process of becoming a learning organisation. Furthermore they concluded that the most important aspect of learning organisations are the people that constitute such an organisation. In the end the members of the organization have to become self-directed learners which will create a learning organisation. Members need to take responsibility for their own learning behaviour and this is the essence of self-directed learning (Guglielmino, 2008; Stubbé & Theunissen, 2008). Thus self-directed learning is from the organisational perspective vital behaviour for the existence of a learning organisation.

From the perspective of the people within current organisations, today's growing learning needs are the reason why self-directed learning is important. Learning needs have changed dramatically in the last fifty years. Research has shown that sixty years ago people who graduated from high school knew 75% of what they should know to stay successfully employed until their retirement. In 1997 when this research on learning needs was repeated, this percentage was dropped to two percent and the last fifteen years this percentage can only have become smaller (Guglielmino, 2008).

The last development that makes self-directed learning important to address, are the problems on the human resource development side. The unprecedented growth in information and technology causes problems for creating solutions for those learning needs. The HRD professionals, educational designers and institutions cannot keep up with the growing learners needs and the supply of new information. This has large implications for the function of human resource development departments in organisations. They cannot train every person within the organisation to stay "*on the cutting edge of knowledge and skills needed to maximize productivity*" (Guglielmino, 2008, p. 6). So the task of learning lies in the hands of the person that needs to do it. He or she needs to take his or her responsibility to stay up-to-date. It is this person that needs to know what is essential to learn for his or her personal needs and the organisational needs he or she is working for.

This master thesis explores how persuasive technology can support the self-directed learning attitude and behaviour of people. Persuasive technology is all about "*computerized software or information systems designed to reinforce, change or shape attitudes or behaviours or both without using coercion or deception*" (Oinas-Kukkonen & Harjumaa, 2008, p. 202). Self-directed learning can be seen as an attitude towards learning. Furthermore it implies particular behaviour of people that are self-directed learners. As research has concluded that self-directed learning entails behaviour that cannot be forced to be done by someone (J. Kessels, 2001) and the nature of persuasive technology is to operate without using "coercion or deception", persuasive technology could be a very useful tool in supporting self-directed learning. This is the main reason for research to explore if the research field of persuasive technology could help to support self-directed learning of adults within organisations.

1.2 Research triggers

The triggers for this research arise from both theory and practice. From the application domain this master thesis was triggered by the question from Kessels & Smit; the learning company to improve their adult learning programs. These programs already use technology to improve self-directed and work-integrated learning. Kessels & Smit (from now abbreviated as K&S) is a company that exists of 50 people that help organisations with issues around learning and development. The main goal of the company is to create and facilitate powerful learning processes within organisations. They operate worldwide from their bases in The Netherlands, Belgium, South Africa, India, Germany and the United States of America.

Within the academic domain there is growing interest on the exploration of new application possibilities for persuasive technology and design. Recently Vassileva (2012) addressed the usage of persuasive technology for supporting self-directed learning as a future research trend. See 1.1.

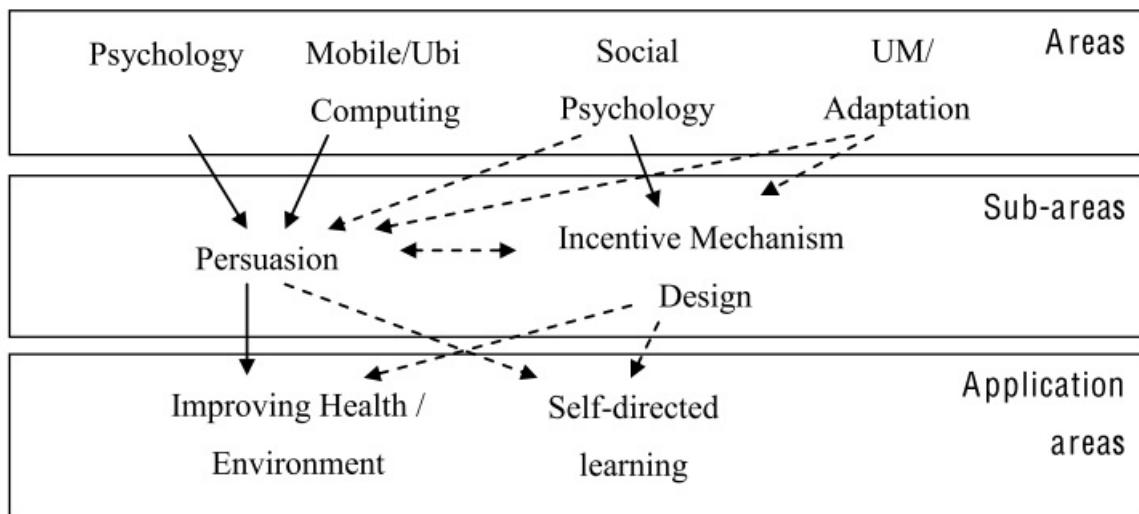


Figure 1.1: Describes the "existing (solid arrows) and the possible future influences (dotted arrows) between areas, sub-areas and application" (Vassileva, 2012)

The trigger from the academic domain for this thesis however is the paper of Seidman and McCauley (2008) from the Proceedings of the 4th International Conference on Persuasive Technology named Organisational Transformation: A new application for persuasive technology. Seidman and McCauley state that: "The requirement for large-scale individual change as the foundation for large-scale organisational transformation provides an ideal, though relatively unexplored, application for persuasive technology.". Because of the marginal body of academic literature on the organisational application of persuasive technology and the interest from the application domain this research is going to clarify the possibilities of persuasive technology to support self-directed learning.

Chapter 2

Research Design

This chapter describes the design of the research, starting with the problems from the application and academic domain. Research objectives are defined from these problem descriptions. When the research objectives have been presented the research questions will be defined. Hereby the relation is made between the main and sub-research questions to the already given research objectives. Furthermore the research model is defined that visualizes the activities that are necessary to answer the sub-research questions and the main research question . The last step in this chapter verifies if the research objectives and questions can answer the questions from the Hevner and Chatterjee (2010) design science research checklist. This proves that all the research activities contribute to a proper design science research project.

2.1 Relevance of Research

2.1.1 Research relevancy for academic domain

In the field human resource development field all issues relate to improving the performance of the current workforce by facilitating and supporting learning process . Companies specialized on human resource and development try to come up with an answer for these issues on learning and development of the workforce of the company in question. Many human development organisations offer solution by providing educational courses or other forms of formal education. They will teach people how to change their everyday work situations to improve their performance. The participants in the training courses learn new ways of thinking and acting upon and about their work situation to improve their performance. Unfortunately when the courses are finished and the participants of the courses return to their normal working environment, they notice that it is hard to apply the newly learned attitude and behaviour in their working environment. In the literature of human resource development this is known as the 'transfer problem' (J. W. M. Kessels, 2000; Saks & Belcourt, 2006).

K&S is a human development centre that is searching for ways to enable employees to retain and to apply this newly required knowledge into practice. To solve the transfer problem they have designed a learning program that is better merged with the working situation of the participant of the learning program. This way of learning is called 'Work Integrated Learning' (Choy, 2009). It requires a self-directed learning attitude of the participant of the learning pro-

gram. However, this is something most people are not familiar with and therefore the right participant's learning attitude is often lacking. The participants need to have a self-directed learning attitude because they cannot be helped or motivated by external trainers or coaches because they are not a part of the normal working situation.

Furthermore the self-directed learning attitude diminishes when people are in their daily working routine. People have a lot of tasks to do and those related to self-directed learning are often set aside for more urgent business tasks. These tasks have a larger impact on the short term goals of the participant. To help the participants in getting familiar with and creating a self-directed learning attitude, this thesis wants to research the application of persuasive technology that could persuade people to perform self-directed learning in their daily working routine.

An example of self-directedness in the learning programs of K&S is that participants need to be self-directed in creating learning experiences in their everyday working situations. These work situations are named 'critical incidents' in the learning program. A participant is responsible of changing his normal habits into new behaviour in 'critical incidents' so the outcome of this situation will improve. The participant is expected to have a self-directed learning attitude towards these critical incidents. He or she needs to create his or her own learning opportunities in which the 'critical incidents' will take place. For example the participants can use a business meeting to train their negotiating skills or a meeting with people higher in the hierarchy of the organisation to train their communication skills. At those moments people have to turn these situation into a learning situation by experimenting with new behaviour and reflecting on their behaviour after these situations. Persuasive technology could help K&S to persuade more people in becoming more self-directed learners and transform themselves and their organisation via self-directed learning.

An adult learning program that leans heavily on self-directed learning attitude of the participants and that already has been executed by multiple companies is the 'leadership journey' produced by K&S. The leadership journeys have been conducted at large companies for example Aegon and Ahold. For instance in the leadership journey of Ahold a group of 25 employees will be trained on their leadership skills and this requires a self-directed learning of the person participating.

2.1.2 Objective for the application domain

To solve the problem of participants in becoming self-directed learners within the adult learning programs of K&S, the possibilities of using persuasive technology (Fogg, 2002) in adult learning program of K&S are going to be investigated. The possibilities of changing the way-of-working and learning of employees within a company with the help of persuasive technology are of real value for K&S. Therefore the objective of K&S for this research is designing an ICT tool that can contribute to persuade people in becoming self-directed learners.

2.1.3 Research relevancy for academic domain

The research on persuasive technology started from 1997 onwards when researchers from the human-computer-interaction domain came up with the term "captology" which stands for "Computers as persuasive technologies" (Cheng, 2003). Captology is defined by Oinas-Kukkonen and Harjumaa (2008, p. 202) as "computerized software or information systems designed to reinforce, change or shape attitudes or behaviours or both without using coercion or deception". According to Fogg (1998) persuasion can be accomplished by using the three functions of computers; as a tool, a medium or a social actor. All these functions of a computer can help to persuade people into changing their attitude or behaviour. // In the last ten years more and more persuasive strategies are described and researched (B. Fogg, 2009b). B.J. Fogg an authority on 'persuasive technology' from Stanford university has introduced various tools for analysing persuasive systems (B. Fogg, 2009b; Fogg, 2009a, 2009b; B. Fogg & Hreha, 2010; B. Fogg, 2009a) and other researchers have also contributed methods for designing persuasive systems (? , ?). The difficulty with these proposed persuasive design methods is that some are often only theoretical and not tested in the application domain , for instance the method of Oinas-kukkonen and Harjumaa (2008).

In a literature study of Torning and Oinas-Kukkonen (2009) the necessity comes forth for doing research on "how to prescribe predictable persuasive designs and also methods for clearer measurement of successful designs". The need for empirically proven models is of great value and can only be satisfied by using these methods in the application domain.

Besides the lack of empirical proof on the persuasive design methods there is little evidence on the effects of the persuasive strategies that are being implemented as a result of the persuasive design process. In particular insight of how these persuasion strategies affect attitude change are lacking. In most definitions of persuasive technology there is the notion of 'change in attitude and behaviour'. Though only one article of Oinas-Kukkonen and Harjumaa (2008) address the topic of attitude change separate from behavioural change in respect to persuasive technology. In this one study of Oinas-Kukkonen and Harjumaa (2008), psychological theories have been addressed to estimate the effect on change in attitude by persuasive systems. By investigating the theories used in adult learning (Taylor, 2008), new ways of changing attitudes of people could be found. These strategies could integrated in persuasive technologies and the theory could give insights in better ways of measuring attitude change.

The most important problem to tackle in this research project is the problem of awareness on persuasive technology for the researchers in educational research discipline. Due to the multidisciplinary nature of persuasive technology there is a clear need for creating awareness on all the possible perspectives that look at the concept of persuasive technology or "design for behavior change" (Lockton, Harrison, Holley, & Stanton, 2009). This research attempts to conjoin those multiple perspectives and address their differences and similarities.

Another challenge in the field of persuasive technologies has to do with the number of persuasive strategies that exist. Although Fogg (2009a) and Oinas-kukkonen and Harjumaa (2008) discuss approximately 30 persuasion strategies this does not prove that no other strategies exist.

More research on persuasive strategies from other domains must be done and (Cheng, 2003, p. 6) states: "Researchers should pay more attention to adopting or borrowing the existing one (persuasion strategies) from other subjects such as psychology, communication, and media, since these subjects have a history of investigating the theories of persuasion.". While doing research on the persuasive strategies that are already used in the K&S domain, new strategies could be discovered that can be used by persuasive technology.

2.1.4 Objectives for academic research

The academic research objective concerns the four described challenges in the academic domain of persuasive technologies.

The first objective of this research is testing the described design methods and design tools for persuasive systems. In the process of evaluating the current system and developing a (part of a) new system that can give a better persuasive experience, the design method will be used described by Oinas-Kukkonen and Harjumaa (2008). The method "aims at discussing the process of designing and evaluating persuasive systems as well as describing what kind of content and software functionality may be found at the final product." (Oinas-Kukkonen & Harjumaa, 2008). The case study gives the opportunity to use this method in both evaluating the current system and creating a new persuasive system. Empirical evidence on the usefulness of this method will be generated.

The second objective is useful for expanding the academic body of knowledge on persuasive strategies. The possibility to look at new ways of persuading people to change a particular attitude or behaviour can provide new insights for the academic body of knowledge. The experts of K&S are experienced with getting people doing activities they never did before. These strategies can be a starting point to create new ways of persuading people via computers based communication.

The third objective of this research is to get a better overview on the different perspectives on persuasive technologies. This will be very useful because there is evidence that on other research domains, for instance within the research of technology supported learning, there has already been done research on persuasive design although without mentioning the concept as such (Glahn, Specht, & Koper, 2008)

The last objective concerns the effect of persuasive technology on attitude change. By zooming in on the aspect of attitude change a better distinction can be made between attitude change and behaviour change in relation to the use of persuasive technology.

2.2 Research questions

The main research question is created from the two triggers of this research. On the one hand Kessels & Smit is interested in how persuasive technology could improve their adult learning programs. On the other hand the interest from the academic domain on how persuasive technology and design can leverage self-directed learning makes it relevant to do research on this topic (Vassileva, 2012). Also the lack of empirical evidence on the result of design methods for designing persuasive technology gives proof for conducting this research. To achieve the earlier defined research goals the following main research question is going to be answered:

How can persuasive technology be used to support self-directed-learning behaviour in adult learning programs?

This question will be answered by answering the following sub questions:

1. What is self-directed learning?
2. What is persuasive technology?
3. How is self-directed learning supported via technology in the case study at Kessels & Smit?
4. What are the requirements for an information system that supports self-directed learning within an adult learning program?
5. Does an implementation of persuasive technology support self-directed learning in an adult learning program?

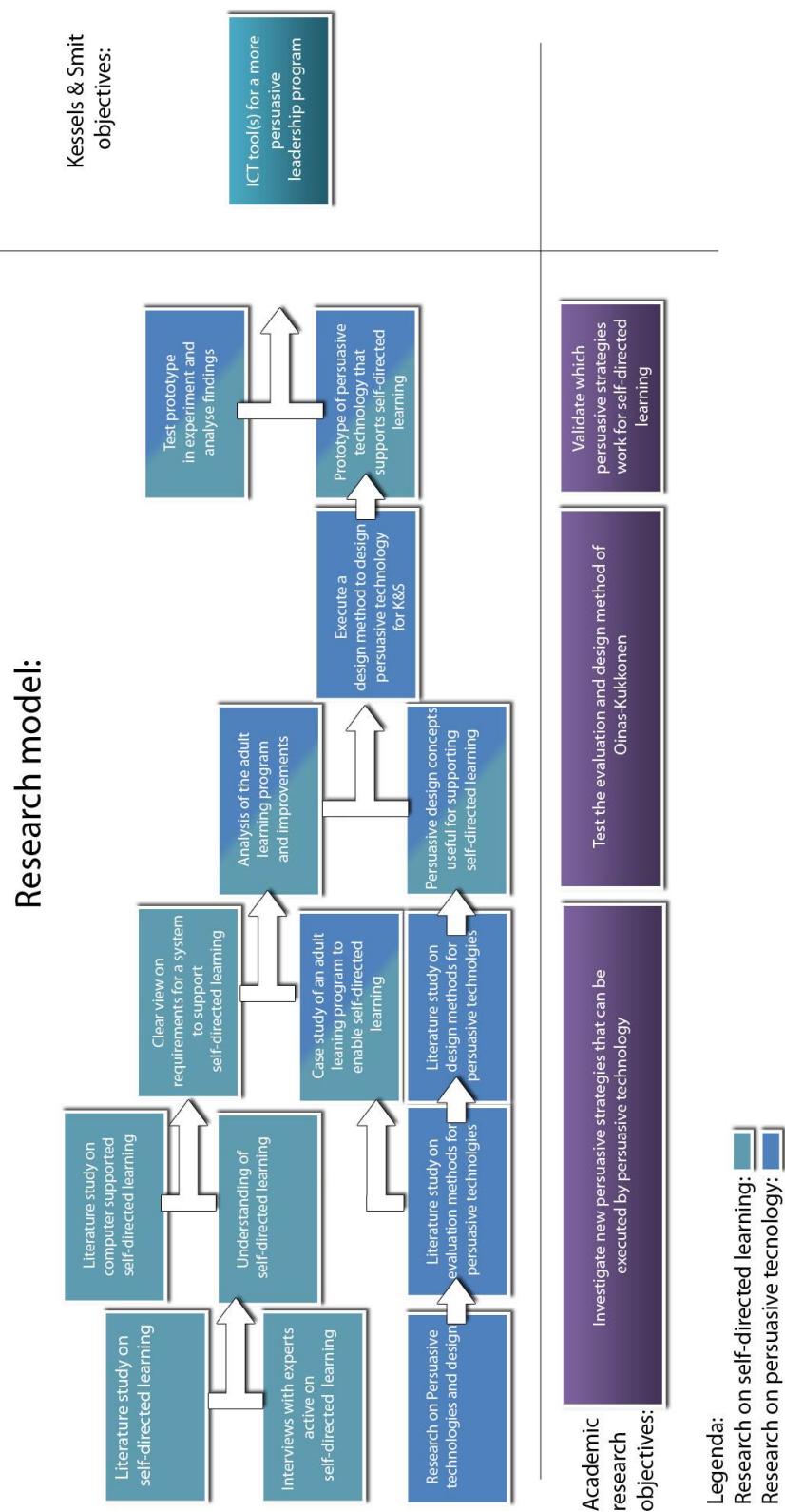


Figure 2.1: Researchmodel

2.3 Research Methodology

The research methodology that has been used to answer the main research question is design science research. There are two reasons for using the design science research methodology. The first reason for using design science research is related to goal of the research. The goal is to create a new type of artefact (persuasive technology that can support self-directed learning). The design science methodology is described by Hevner and Chatterjee (2010, p. 9) as a methodology "that supports a pragmatic paradigm that calls for the creation of innovative artefacts to solve real-world problems". Hence design science supporting the goal of doing research to be able to create new artefacts to solve real-world problems.

The second reason to use the design science research method are the positive findings on the usage of this methodology in the user experience research field. A recent study of Adikari, McDonald, and Campbell (2011) has shown positive results in using the design science research paradigm while designing and assessing user experience of IT systems. Doing research on persuasive technology puts a lot of emphasis on assessing user experience (Fogg, 2009a; Segerstahl & Oinas-Kukkonen, 2007) and the research of Adikari et al. (2011) shows that design science research methodology is suited for this task.

To perform correct design science research Hevner and Chatterjee (2010) have made a checklist that entails eight questions (see appendix A). All the questions need to be answered to check if the key aspects of design science research are met. These questions are related to the three cycles that have to be addressed while doing design science research. These cycles are the 'relevance cycle', the 'design cycle' and the 'rigor cycle', which are visualized in 2.2 below.

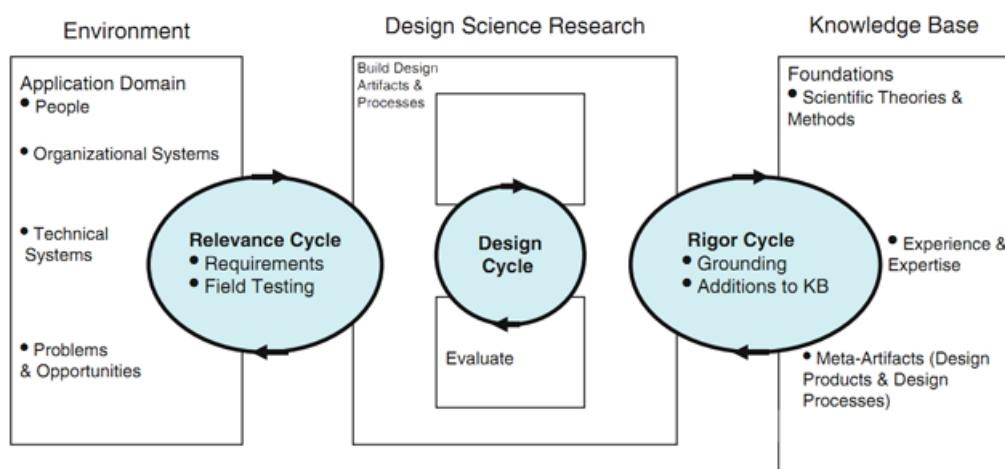


Figure 2.2: Design science research cycles

The relevance cycle extracts the requirements that need to be satisfied by to be designed artefact. In the rigor cycle the current knowledge base gives knowledge on how to improve the current application domain. In the design cycle the artefact is going to be designed, tested and implemented. The produced artefact will generate new knowledge that can be added to the knowledge base (Hevner & Chatterjee, 2010).

In the relevance cycle the main research question is created for this thesis project as it has been defined in the previous research question section. From this research question the sub questions are created, that need to be answered to get a better insight in the concepts of the main research question. Therefore the first question, *What is the research question?*, from the design science research checklist, is already answered in the previous section.

Research sub-questions one till three are related with the relevance cycle because they need to be answered for extracting the requirements for the to-be designed artefact. The questions are answered by the following research activities from the research model:

1. Literature study on self-directed learning.
2. Interviews with experts working on the improvement of self-directed learning in adult learning programs.
3. Literature study on computer supported learning environments.

#RQ	Research questions	Method	Chapter
1	What is self-directed learning?	Literature study on self-directed learning	3
3	What are the requirements for an information system that supports self-directed learning within an adult learning program?	Interviews with experts + Literature study on computer supported learning environments.	5

The second and third questions are related to the design cycle from the design science cycle checklist Hevner and Chatterjee (2010). The second question from this checklist is *What is the (to-be designed) artefact?*. To answer this question the second research sub-question, *What is persuasive technology?* is created. This will be done by the following research activities:

4. Literature study on persuasive technology and design.

#RQ	Research questions	Method	Chapter
2	What is persuasive technology?	Literature study on persuasive technology & design	4

The third question "*What design processes (search heuristics) will be used to build the artefact?*" is answered by the research activity:

5. Literature study on design and evaluation methods for persuasive technologies

This literature study is done simultaneous while doing the literature study on persuasive technology and design from research activity four. The design methods that can be used to build persuasive technology will be one of the results of this literature study. Performing the literature study answers the questions related to checkpoint four of the checklist. When the first four questions have been answered the rigor cycle is finished. This is necessary to ground all the findings to the academic knowledge base.

The fifth section of questions of the design science research checklist that need to be answered are "*What evaluations are performed during the internal design cycles?*" and "*What design improvements are identified during each design cycle?*".

The first question will be answered from the literature study on design and evaluation methods of persuasive technologies. The second question about the identification of improvements is done by evaluating the technology within the case study of an adult learning program of Kessels & Smit.

In this research it is only possible to perform one design cycle and evaluate on this cycle. Although only one design cycle can be made, there is the opportunity to evaluate the technology that is already in use within the current executed adult learning program. Within the case study the design decisions made in the past are being evaluated, this enables an evaluation on the whole design process. By doing a case study and evaluating the case with an evaluation method from the literature study improvements can be identified. The identified improvement can increase the support of self-directed learning by the used technology. By doing this the fifth sub research question can be answered.

#RQ	Research questions	Method	Chapter
5	How is self-directed learning supported via technology in the case study at Kessels & Smit?	Analysis of the technology in a case study at Kessels & Smit	6

Checkpoint five, on what kind of evaluation is performed during the internal design cycles, will be met when the following research activities have been done:

- 6. Literature study on evaluation methods for persuasive technologies.
- 7. Case study of an adult learning program to enable self-directed learning.

The two questions from point six on the checklist "*How is the artefact introduced into the application environment and how is it field tested?*" and "*What metrics are used to demonstrate artefact utility and improvement over previous artefacts?*" will be answered in chapter seven. Chapter seven will describe the prototype that will be field-tested. Furthermore a full description will be given of the experiment with the prototype, including the application environment and metrics to measure changes in comparison with the previous artefact. By doing this the final sub-research-question can be answered.

#RQ	Research questions	Method	Chapter
6	Does an implementation of persuasive technology support self-directed learning in an adult learning program?	Experiment with the designed artefact.	7

The results of the test with the prototype will be given in chapter seven. In the last chapter conclusions are drawn upon the results of the overall research and if the main research question is answered properly. Furthermore all the newly created knowledge from former research activities will be summarized. This will be done according to the three level-structure of knowledge that have been defined by (Iivari, 2007) to structure knowledge produced by IS research. This is the penultimate point from the design science research checklist because it answers the question "*What new knowledge is added to the knowledge base and in what form (e.g., peer-reviewed literature, meta-artefacts, new theory, new method)?*". Hereby the last chapter will answer the last question, "Has the research question been satisfactorily addressed?", from the list and this will provide the last information to complete a proper design science research cycle.

2.4 Thesis report structure

The introduction addressed the reasons why it is important to support adults in self-directed learning within their business organisation. The second chapter introduced the research method and the concepts of persuasive technology and self-directed learning. In the third chapter the main concepts behind self-directed learning process are explained. The fourth chapter describes three perspectives on persuasive technology to understand persuasive technology. In the fifth chapter the analysis is presented on the case study at KS. From this chapter issues around the used technology are identified. In the sixth chapter the requirements for information technology are presented that support concepts that constitute self-directed learning. In the last chapter, number seven, an implementation of the described requirement is prototyped. A test with two prototypes in an experiment is used to validate the proposed requirements.

The thesis ends with a discussion on the performed research and a conclusion is extracted from the findings from this research.

Chapter 3

What is self-directed learning?

In the research discipline of adult learning there is a lot of discussion about what self-directed learning is (Guglielmino, 2008; Merriam, 2001). On the relation of self-directed learning and supporting it with IT there is almost no literature to be found. A small amount of articles has been written on adult learning in combination with technology or work-integrated learning according to Stubbé and Theunissen (2008). They made the following observation "although self-directed learning has been an important topic in the educational field for quite some time, no reviews on adult learning in the workplace or technology-enhanced learning for adults could be found" (Stubbé & Theunissen, 2008, p. 23). In the description of this literature study the following sources have been used.

- The literature study by Stubbé and Theunissen (2008) on self-directed adult learning
- The research on Advanced Process-Oriented Self-Directed Learning Environments (APOS-DLE) by (Lindstaedt et al., 2009)

These sources answer the research question of this chapter, *What is self-directed learning?*

3.1 Findings from APOS-DLE research

In the study of the APOS-DLE system by Lindstaedt et al. (2009) all definitions the authors found to define self-directed learning can be related to the Knowles (Merriam, 2001). He introduced the term of self-directedness in adult learning in 1975. According to Knowles (Merriam, 2001) self-directed learning refers to a process "in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes".

To make the process of self-directed learning more specific, the researchers of the APOS-DLE project use the theory of Simons (2000) who has defined three groups of self-directed learning functions. The functions define the activities that are necessary to learn self-directed. The groups in which the functions can be divided are preparatory, executive and closing learning functions. In the following overview these cognitive and meta-cognitive functions are given:

Preparatory functions	Executive learning functions	Closing learning functions
Finding missing prior knowledge	Selecting information	Summing up new knowledge and skills
Getting an overview of knowledge, skills and attitudes to be learnt	Thinking about information	Thinking about future use and transfer conditions
Mobilizing prior knowledge and skills for the task at hand	Coming to conclusions and own opinions	Evaluating learning process
Finding connections between prior knowledge and new information and skills	Formulating conclusions verbally	Evaluating learning outcomes
Orientation on learning goals and sub goals	Getting overview	Reflecting
Choice of learning goals and sub goals	-	-
Choice of learning strategy	-	-
Planning of time, sequence and places for learning	-	-

The previous subdivision of activities helps to understand the concept of self-directed learning. These learning activities do not differ much from the learning activities that need to be done in formal learning. The significant difference in comparison with formal learning is that the people that need to be self-directed learners have to perform these activities by themselves (Lindstaedt et al., 2009). In the formal learning environments teachers or coaches are able to support learners in doing specific tasks. In self-directed learning it is up to the learner to perform these activities. Self-directed learning can be seen as "a situation in which the instructional part of the learning process is largely determined by the learner herself" (Lindstaedt et al., 2009).

Besides the emphasis on acquiring knowledge and information to be able to learn self-directed the APOSDE researchers conjointly acknowledges the importance of the social context in the learning process while people are at their work. The social process is relevant because people prefer interaction with other people while gathering information and knowledge instead of only using an information system to search for an answer.

There are several reasons for this preference (Lindstaedt et al., 2009):

1. The direct answer the knowledge seeker will receive.
2. The knowledge seeker receives a lot of meta-knowledge while communicating with the knowledgeable people. The meta-knowledge could be pointers to other information source like books, databases or people.
3. The knowledge person can help with problem reformulation helps the knowledge seeker with its quest for the right knowledge.
4. The validation of the plan of self-directed learner to come to the right information by another knowledgeable person.
5. The legitimization of the self-directed learning activity by a respected person.

To summarize the concept of self-directed learning from the perspective of the researchers on the APOSDE project the definition of Knowles (Lindstaedt et al., 2009, p. 25) is used again to come up with properties to identify if someone is a self-directed learner.

Property one: *an individual takes the initiative*, hence someone cannot be forced to learn. Property two: it can be done *with or without the help of others*, this emphasis on the social aspect of self-directed learning and shows that self-directed learning is not merely a solitary activity as the *self* would imply in the term of self-directed learning . Property three: an individual is able to perform the instructional part by performing the following behaviour, *to diagnose their learning needs, to formulate learning goals, identify human and material resources for learning, choose and implementing appropriate learning strategies, and evaluate learning outcomes*. These last activities is the instructional part of the learning process. This part has to be carried out by the learner himself while in formal education it is often done by a teacher supporting the learner.

To have a better understanding on self-directed learning another literature study is reviewed on self-directed learning in relation towards ubiquitous learning environments that has been performed by Stubbé and Theunissen (2008).

3.2 Meta-review on self-directed learning literature

The meta-review of Stubbé and Theunissen (2008) on the literature on self-directed learning gives an abstract view on the concepts that constitute self-directed learning. Furthermore this article can validate if the activities from the APOSDE research are consistent with the findings of this research. The aim of the research of Stubbé and Theunissen (2008) was to create a classification of elements that support self-directed learning.

In the study of Stubbé and Theunissen (2008) the authors find a multitude of definitions that can define self-directed learning. By classifying elements of self-directed learning the authors try to get a better insight in self-directed learning. From all the reviewed literature five elements where the most reoccurring:

1. Self-regulating learning strategies.
2. Reflection.
3. Interaction with the social environment.
4. Interaction with the physical environment.
5. Learner control.

Examples of self-regulating learning strategies are: setting goals, planning, self-monitoring, self-instruction, self-assessment, problem solving and learning strategies. However the difference between reflection and these strategies is the levels on which it can be applied. Reflection can be done on a cognitive and meta-cognitive level, and therefore steer further learning activities. While self-regulating learning skills a more on the cognitive level and is used to achieve learning goals.

The second element necessary to achieve self-directed learning is reflection. Reflection is a two-folded concept. First of all it is used for self-assessment and self-evaluation on the performance and learning process the learner is in. This enables to evaluate goals and this can be used as input for the further learning. However the reflection can be used to guide the direction of future learning. In this way it can be seen as self-managing learning skill.

The third element is interaction with the social environment. The social environment will be identified when interaction with people occurs, for example fellow students, teachers or coaches. This interaction can be used to determine what kind of goals will be set, discuss how these goals can be achieved or to collaborate during the learning process.

The element of physical environment is acquired when the learning experience is situated in the real-world. For example a problem is encountered by the self-directed learner in his or her work situation. This problem will be used as fundament on which the learning process is established.

Learner control is on a two-folded concept that is necessary for the learner to be in control over all educational decisions and on the other hand specifies that the learner can manage his/her own learning.

All the five activities; performance of self-regulating learning strategies, reflection, interaction with the social environment, interaction with the physical environment and learner control enable people in self-directed learning if the activities are used in a combined fashion. All these five concepts have been tested in experiments in which learners were explicitly trained in relation to these concepts . The results showed that learners improved their performance and turned in to more strategic and effective learners (Stubbé & Theunissen, 2008). This proves that the concepts are of real value when investigating which behaviour is necessary for people to become self-directed learners.

The research of Lindstaedt et al. (2009) and Stubbé and Theunissen (2008) resulted in many different types of behaviour that are mandatory for self-directed learners to perform. The description of the behaviour varies in granularity between the different studies. For instance reflection is one of the main concepts in the study of Stubbé and Theunissen (2008) while Lindstaedt et al. (2009) describe it as one of the many closing learning activities. Although some differences in granularity of the described behaviour is detected a great resemblance is identified between the proposed behaviour from both studies.

Chapter 4

What is persuasive technology?

After the description of the behaviour related to self-directed learning this study zooms in on how technology could persuade people in changing or adapting their behaviour. This gives us a perspective that can help to design an information system that could persuade people to be self-directed learners. First the main theory on persuasive technology will be discussed introduced by B. Fogg (2009a). After this description the most prominent criticaster of the theory of Fogg, Deterding (2012a) will be described. At the end the last model on persuasive technology, the PSD model will be explained.

4.1 The behavioural model

The first model to discusses is the behaviour model of Fogg (2009b). This model lies at the base of understanding the concept of persuasive technology as it is described by Fogg in 2002. The model consists of three factors that need to be present to let people perform the target behaviour that the producer of the technology is aiming at.

4.1.1 Motivation

The first factor that is needed is motivation. The motivation of a person describes the reason he or she wants to do particular behaviour. Fogg zooms in on motivation and explains it by addressing three concepts that can motivate humans and calls them 'core motivators'. The three core motivators are Pleasure/Pain, Hope/Fear and Social Acceptance/Rejection.

Pleasure/pain as a core motivator differentiates itself from the other two core motivators, according to Fogg (2009b), because of its direct results. This motivator is based upon the primitive response of people to respond to pain or pleasure direct on what happens in the moment.

The second core motivator describes hope and fear. The characteristic has mostly to do with anticipation of the outcome of a particular event. People will be motivated to do activities with the hope for a good outcome or they will not do them because of the fear of a bad outcome of an event. Fogg (2009b) points to the fact that sometimes hope and fear can overrule the motivator pleasure or pain. For example taking a flu shot is motivated by the hope of a good outcome (not getting ill) and overwrites the demotivator of the pain that is caused

by the flu shot itself. In his opinion hope can be seen as the most ethical and empowering motivator of all the three motivators.

The third core motivator has to do with social acceptance. Fogg (2009b) refers to the social nature of human beings as the reason for this hardwired motivator inside all of us. The fear of social rejection can be seen as a great motivator for behaviour. With the rise of social networks on the internet, like Facebook, ways of persuading people via social acceptance or rejection flourishes recently.

The three core motivators are according to Fogg the best method for analysing persuasive design. He clearly states that other models exist on regarding motivation that could be used. However this remark cannot resolve the critic of Deterding (2012a) who address the motivation concept of the behaviour model as the first critic on the model out of three. Fogg (2009b) uses the concepts of pleasure/pain, hope/fear, acceptance/rejection to describe why someone is motivated to do a particular action. According to Deterding (2012a) this theory does not align with any of the motivational research from the psychology research discipline. Therefore Deterding (2012a) states Fogg's theory on motivation as a "personal private theory of Fogg" and he is missing concepts as attitude, affects and intentions which are very common in motivational research.

4.1.2 Ability

The second variable in the model of Fogg is ability. The reason Fogg employs this variable has to do with the fact that people are resistant to change or as Fogg described it "people are fundamentally lazy". Ability could be increased by learning people how to do or use new things. However the general resistance against teaching and training to use anything new often creates failure for methods or artefacts that require this. Noticing this, B. Fogg (2009b) comments that designers of persuasive systems should focus on making behaviour more easy to do instead of trying to increase the ability of the people that are going to use the system. So instead of focussing on the ability of people he wants to focus on the simplicity of the target behaviour.

The notion of simplicity is explained by Fogg with six concepts that are related to each other as a chain, if one concept is not present the whole idea of simplicity is failed to keep. The first concept is "*time*" that is necessary to do the target behaviour. Fogg claims this concept is intertwined with the second concept of "*money*". If the money that is required for the target behaviour is not available again the simplicity concept is broken. Some people can afford it to pay other people to do particular behaviour which shows the relationship between time and money.

The third and fourth concept of Fogg are "*physical effort*" and "*brain cycles*". Lowering the requirement for physical effort enables more people to execute the target behaviour because it costs less energy. The concept of brain cycles has to do with mental power of people. Some people are good at thinking, especially in deep and new ways of thinking yet the majority of people find this difficult. Lowering the necessity for 'hard thinking' lowers the amount of brain cycles which will lead to increased simplicity.

The last two concepts that are necessary to constitute simplicity are "*social deviance*" and "*non-routine*". Fogg (2009b) describes social deviance as " going against the norm and breaking the rules of society". The simplicity of the target behaviour will vanish when people need to go against social norms and rules. Related to this is the notion of non-routine, which emphasis that people find behaviour they do often more easier then behaviour they never do. The routine behaviour could have been shaped because it has the least social deviance and people stick to it because they are familiar with it and it has become a routine.

The second critic is on theory of Fogg by Deterding (2012a) has to with described ability concept of the model. Fogg ignores concepts as self-efficacy, learning and mindfulness, the statement of Fogg that says "that humans are fundamentally lazy" therefore is rejected by Deterding (2012a). Deterding mentioned that the humans loves to learn, however learning "in the industrialized and institutionalized" fashion as regular encountered now a days does not encourage this love for learning because it is designed poorly. Deterding (2012a) refers to the rise of games and the evolving trend on gamification to refute the notion of humans that are fundamentally lazy, they love to learn however the learning process has to be properly designed.

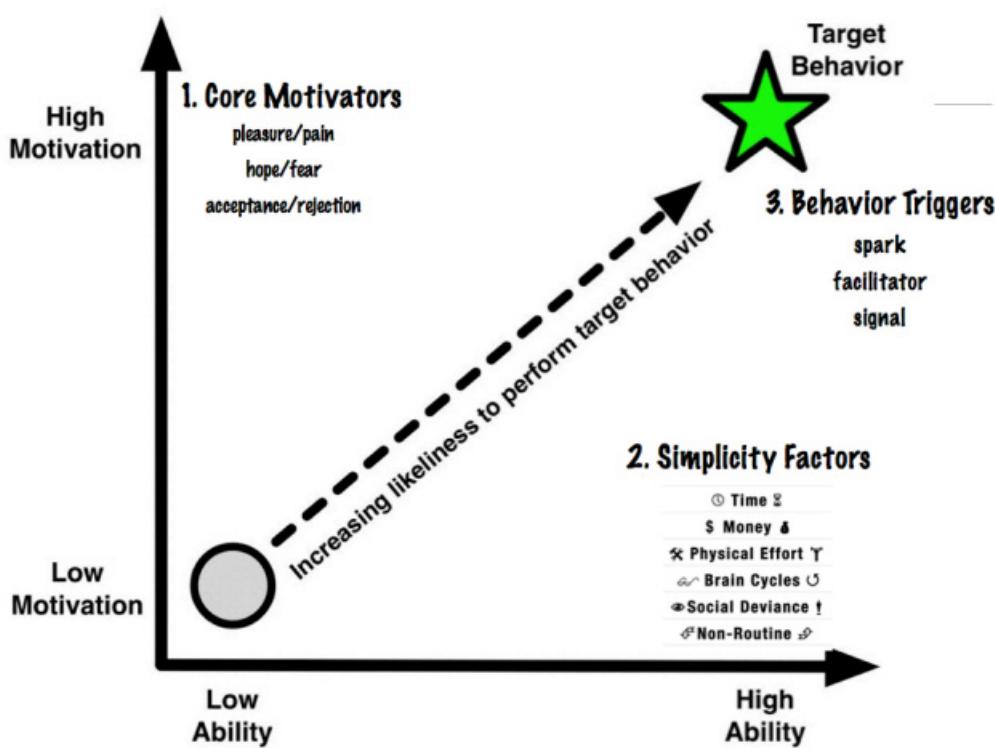


Figure 4.1: Behaviour model

The explained concepts of motivation and simplicity are at the base of a persuasive experience. The concept of simplicity however is, according to Fogg, more of importance because it succeeds faster in getting people to conduct targeted behaviour. Increasing motivation of people is often resisted, whereas increasing the simplicity of performing the target behaviour will be embraced by your audience that needs to be persuaded. Furthermore the context in which the behaviour takes places is important for the simplicity factor. The simplicity factor is defined by Fogg (2009b, p. 5) "as a function of the scarcest resource (one of the six simplicity factors) at the moment a behaviour is triggered". Every simplicity factor therefore is of importance, if one is missing the behaviour the persuader has been planning for will not be triggered. This leads us to the last concept in the behaviour model of B. Fogg (2009a), namely triggers.

4.1.3 Triggers

In the perspective of B. Fogg (2009a) a trigger can be seen as "something that tells people to perform a behaviour now" B. Fogg and Hreha (2010). Triggers enable people to react on impulse which enlarges the chance of success for the target behaviour. In the theory of B. Fogg (2009a), triggers come in three types: the spark, the facilitator and the signal.

Firstly the spark can be used when the subject has a lack of motivation. This is done by sending a message with a motivational element into it. It can be text that addresses a particular fear of people or a video with a hope generating story. The goal of the message is to address one of the early mentioned core motivators.

Secondly the facilitator can be a trigger for people who have a high motivation nevertheless lack ability to perform the behaviour. The best facilitator trigger tells the user that the target behaviour is not hard to do and shows the subject that he or she has already the resources to perform the behaviour. In software products for example this often achieved by telling the user that he is only a few clicks away from reaching his or her goal.

Thirdly there is the signal as trigger that is appropriate when the person that is persuaded is motivated and has the ability to perform the target behaviour. The signal only has to remind someone of doing the behaviour instead of motivating him or showing that he is capable of doing a particular behaviour.

The widespread usage of smartphones nowadays can give a great improvement in the usage of triggers. These mobile device can have many sensors which enable a more context-aware triggering system which will lead to more performances of the target behaviour. B. Fogg (2009b) mentions to use most of the time signal or facilitator triggers. Sparks can annoy users at much faster rate because of their intent to motivate people of doing behaviour they had not planned to do.

The last critic of Deterding (2012a) on the theory of Fogg has to do with the concept of triggers. From the perspective of Deterding (2012a) the concept of 'triggers' is the result of too behaviouristic perspective that Fogg adheres and by which he misses the concepts of intention, goal-setting and again mindfulness. Especially intention are of importance because this can be an internal trigger for a human to do particular behaviour and it is too simplistic to state that behaviour would only be performed when an external triggers tells you so.

With all the elements of the behaviour model of Fogg and the general critic on his theory explained, two other important models in the field of persuasive technology will be used to explain the concept of persuasive technology and design.

4.2 The Motivation Ability and Opportunity (MAO) model

Deterding (2012a) refers to 'persuasive design' as design that changes attitudes and behaviours instead of persuasive technology. The perspective Deterding (2012a) uses to explain how human behaviour is driven from the inside, he refers to Haidt (Bauer, 2007) who has made the model of 'the rider and the elephant' as a metaphor for the human brain.

The elephant stands for the old brain of the human that is close to the spinal column and is referred to as the limbic system. This part of the brain manages the front sensory organs are responsible for motivation, memory, emotional learning and response (Bauer, 2007). The new brain which surrounds the old brain is seen as 'the rider'. This part of the brain is not function specific besides the front part which is the orbitofrontal cortex and helps the limbic system to decide which action it should make.

In the metaphor of Deterding (2012a) the rider and the elephant both travel through a jungle of external triggers on which both need to react upon. Most of the time the elephant is automatically reacting on events from 'the jungle' because the rider cannot decide exactly what the elephant needs to do because it costs too much energy to steer every action of the elephant . This can be seen as habits that people have and other behaviour that happens almost automatically.

The elephant, the old brain, often immediately behaves to a situation before the rider can get grip on the automated behaviour. This can be changed by learning the unconsciousness (the elephant) by using the consciousness (the rider) to change particular habits and actions. This metaphor is used by Deterding (2012a) to think about persuasive design and how particular persuasive strategies can influence the rider, the elephant or perhaps the jungle they are in, which provides all kinds of triggers that try to influence the behaviour of the rider and the elephant.

From this perspective Deterding (2012a) argues that the real problem with persuasive design is that although all the tool sets are available for designing persuasive design, designers cannot pin point which persuasive strategy persuades people in doing particular behaviour. He states "that there is no construction plan on how to build a persuasive design".

He argues that the behaviour model of Fogg is lacking too much detail to be used as a construction plan for persuasive technology or design. Deterding (2012a) address the problem that in general the model is good because it is easy to use and address the three key components of motivation, ability and triggers. However in the details of this concepts there is a too behaviouristic perspective which flaws the model in being an useful one. To sum up all the critic on Fogg, Deterding (2012a) refers back to the model of 'the rider and the elephant' and says that in the behaviour model of B. Fogg (2009b), there is no attention for the rider on the elephant only for the elephant and how he reacts.

The last critic on the model, which is generalizable for all models and toolsets on persuasive design and technology, is the fact that it does not give insight into the question "What are the relevant motivators, enables, triggers for person X to do behaviour Y in situation Z?".

The model which does give these specific answers according to Deterding (2012a) is the MAO model which stands for Motivation, Ability and Opportunity. The model is made in 1995 by Ölander and Thøgersen (Graml, Loock, Baeriswyl, & Staake, 2011) and resembles the model of B. Fogg (2009b) however in the details all the concepts are based on scientific research from biological, cognitive, social and psychology studies. Deterding (2012a) has taken this model as basis for his own version of the MAO model that is better suited for designing persuasive designs.

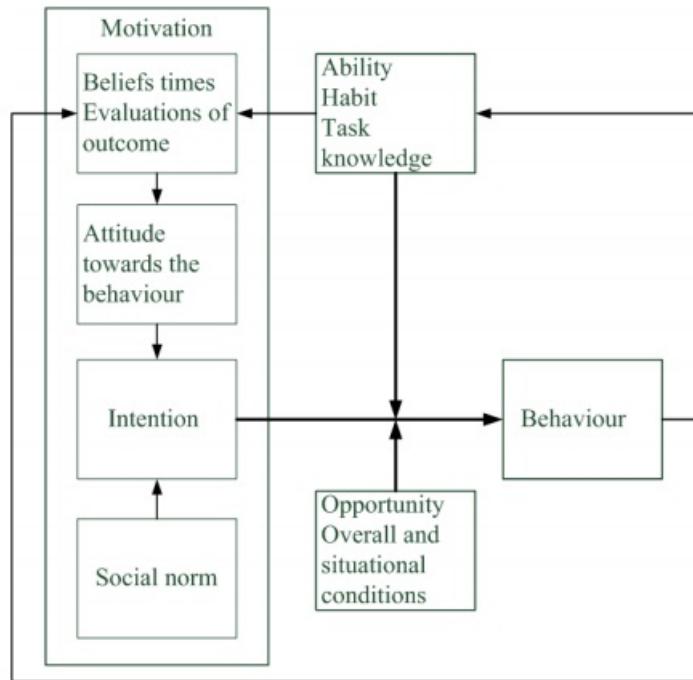


Figure 4.2: The MAO model

4.2.1 Motivation

In the MAO model version of Deterding (2012a), he first addresses the motivation aspect. The first phases in persuasion process is to get grip on how you first convince, than motivate your target audience and energize them to do particular behaviour. To convince people you first have to make them aware of the behaviour they perform. After you have made people aware of the behaviour they perform, you need to make clear why this is problematic or good behaviour. People need to have an understanding of the behaviour and incorporate this understanding within their existing mental models. This can be done by role play or simulation. If these steps are taken and people start to be convinced, the next step is to use the persuasive principles that are already described in the literature on persuasive technology (for examples

see appendix B). By doing this you are influencing the levels of "knowledge, beliefs and attitudes" according to Deterding (2012a). The third step in creating motivation, after you have made people aware and understand the problem, you need to make them care about it. This can best be done to address "motivational needs" of the person that needs to be persuaded.

Deterding (2012a) uses the "motivational needs" from Reeve (2004) from the book 'Understanding motivation and emotion'. Reeve addresses all the studies that are performed on motivational research till 2004. He explains that the current view on motivation is explained by the concept of "needs" that people have and which they constantly have to satisfy. When "needs" are satisfied, they deplete after certain period of time. The needs Reeve (2004) describes are of physical, psychological or social nature.

The physical needs are for instance the need for food, the need to drink or the need for sex. The psychological needs have to do with competence, the feeling that you are able to achieve something. Secondly, autonomy, the feeling that you kind decide for yourself what you want to do and that these actions are in line with your own values and believes. The last of the psychological needs is the need for relatedness; that you are connected to others. The last component of motivational needs from Reeve (2004) is the social component. Everyone has needs for belonging, recognition and power and all these needs cannot be satisfied without the presences of people to interact with.

After addressing a particular need of the target audience, the following step into motivating users in doing behaviours is, acknowledging fears of the same users. When doing this you try to "defuse the fears" that are present at the users, as Deterding (2012a) explains. In the last step of the motivational design process you try to align with or change social norms of your target audience in favour of the target behaviour. From the five steps on motivation Deterding (2012a) comes with five concepts that influence the motivation of the people that are being persuaded. Some concepts are present in the original MAO model and some are newly introduced. The concepts are knowledge (to create awareness), attitudes & emotion (to make it meaningful for the user), motivations (address the motivational needs of a user), fears (acknowledge them and deal with them) and social norms (that influence the target behaviour). From these five concepts Deterding (2012a) moves to the Ability part of the MAO model.

4.2.2 Ability

The ability part of the MAO model is on making it easier for the persuadee to perform the target behaviour or training him or her so it will become easier to perform. The following three aspects influence "the rider" within the person. The first aspect that increases the ability for users is when he or she will be supported in "*goal setting*". Creating concrete goals helps people to get things done. The second aspect that creates ability to do, or not to do behaviour is *willpower*. Research on willpower reveals that it can be trained so you will have more of it and that willpower is a resource which can become depleted (Heath & Anderson, 2010). Willpower makes people decide to do or resist needs that emerge in a moment in time.

The last concept that is related to influence "the rider" is the aspect of *self-efficacy*. This concept is on how people perceive their own ability to perform behaviour. With low self-

efficacy a person will believe that he or she is not able to perform particular behaviour however he or she is able to do. This highlights the importance of the concept because it can have major influence on the ability aspect of a person when its perception on his or her own ability is not aligned with the real ability of this person. The first method describes Deterding (2012a) as "*strengthen self-efficacy*". This is done by showing the target behaviour being executed by people that are quite similar to the target audience that needs to be persuaded. Moreover you need to make clear to the target audience that they have started to perform the right behaviour and therefore they are successful, this can be done with immediate positive feedback when a person had done something correctly.

The last aspect that can improve self-efficacy is by "*defusing guilt and frustration*" of the person trying to perform the behaviour. If a person does something wrong you do not send negative feedback yet you try to take away the shame of the person doing something wrong. Hereby the person will try it again, instead of abandoning the process of trying the behaviour you are targeting for.

The remaining attributes related to the concept of ability address more "the elephant" within human being. This is where the theory of B. Fogg (2009b) becomes more applicable. First of all, making things easier to perform enables us to perform the behaviour more quickly and is conceptualized in usability. However when you are on the level that particular skills are needed, make explicit what these skills are, so people can acquire them.

The second aspect that is influencing behaviour of people are the habits they have. When something becomes a habit it means that a person has automated the behaviour and that it will not cost as much energy to do so. The concept of habits enables to focus on other behaviour of the target audience that need to change. Training other habits help to battle 'bad habits' that are working against the behaviour you are targeting on.

The last concept of ability that has major influence on the unconsciousness is the presence of social support. If social support is present to help the person to perform the target behaviour, this will increase the ability factor of the person.

These six concepts make up the overall concept of ability and the first three; goals/plans, willpower/mindfulness and self-efficacy are concepts that are related to the consciousness decisions people make. While on the other hand the other three concepts of skills/usability, habits and social support are influencing the unconsciousness behaviour of people.

4.2.3 Opportunity

The last overall concept from the MAO model is the opportunity part in which the right moment is chosen to persuade people to perform target behaviour. "The opportune moment" is defined by Deterding (2012a, T.33:01) as: "Providing a 'catalyst' when people are motivated, able and have the 'opportunity' to act". In this definition the catalyst relates to the trigger concept from B. Fogg (2009b). In the MAO model these catalysts are about creating self-created cues to do behaviour, remove the unwanted cues to distract the persuadee from doing other behaviour and the last are re-minders that help you to think twice about something you are doing, because it is a habit.

The 'opportunity' concept from the definition of opportune moments deals with more than only time and space. Deterding (2012a) has divided these opportunities in four different levels, from a macro to a micro opportune moments. The most macro perspective on opportunities is by looking at someone's biography and check when it will be best suited to persuade someone in to new behaviour based on change in particular life events. For instance Deterding (2012a) gives the example of changing commuting behaviour by addressing new ways of commuting when someone is just recently moved. The person than already has to change its commuting behaviour. That can be seen as an opportune moment in the biography of a person to try to persuade him to change his or her commuting behaviour. One step closer to actually using the service that is persuading people, is the moment that they first come in to contact with the service. This has all to do with getting clear when the opportune moment arrives for people to get involved in the service that will change their behaviour. The following step is to look at the routines of people, to check when it is the best time to use the provided persuasive service according to the already established routines of the target audience. The last micro moment is how the user is interacting with the service that needs to persuade them. These micro moments are on finding the right moment to help in motivating or creating ability at the persuadee side.

The opportune moments concept concludes the Motivation, Ability and Opportune moments model of Deterding. The biggest difference between Deterding and Fogg model is caused by the behaviouristic approach of Fogg while Deterding has a more holistic approach that is based on the most up to date scientific research on motivation and ability creation.

4.3 The Persuasive System Development model

Oinas-kukkonen and Harjumaa (2008) have developed a more specific framework for evaluating and designing persuasive systems. The argument of Oinas-kukkonen and Harjumaa to develop this model is that from their standpoint the model of Fogg is only useful for understanding persuasive technology. The framework of Oinas-Kukkonen et al. "aims at discussing the process of designing and evaluating persuasive systems as well as describing what kind of content and software functionality may be found at the final product." Oinas-kukkonen and Harjumaa (2008).

Furthermore Oinas-Kukkonen and Harjumaa (2008) define persuasive technology in a broader perspective. B. Fogg (2009b) sees persuasive technology only when computer-human persuasion takes place while the authors of the persuasive system development framework also look at computer-mediated persuasion in which people persuade people by communicating with others through the use of computers, like for instance forums, e-mail, social networks or instant messaging.

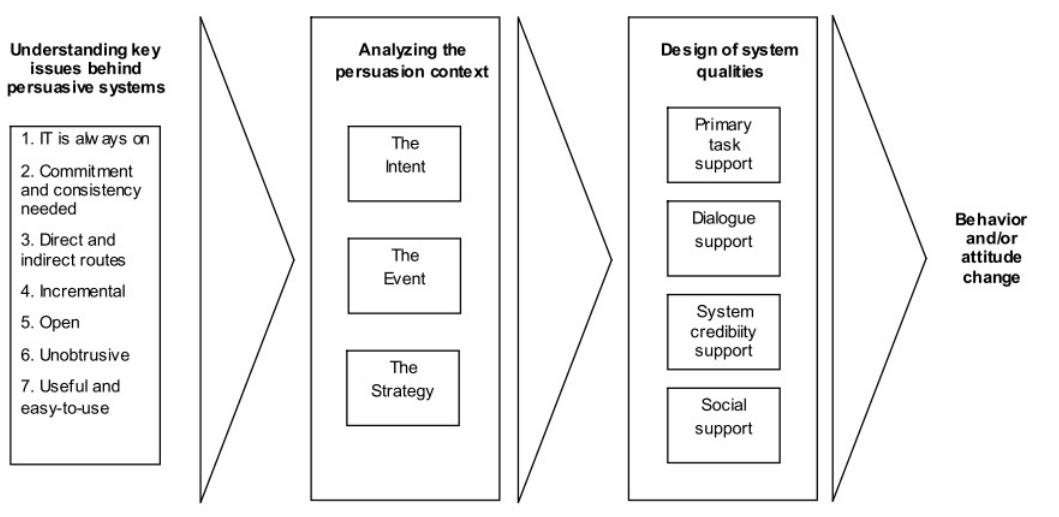


Figure 4.3: The persuasive system development model

The framework of Oinas-kukkonen and Harjumaa (2008) exists of three phases, "understanding the key issues behind persuasive systems", "analyzing the persuasion context" and if the system is going to be built the "design of system qualities" phase (see figure 4.3).

The first phase is on the "key issues of understanding a persuasive system". This is an explanation about understandings on persuasive systems which are divided in seven statements. The first statement is about the fact that "information is never neutral" and therefore every information exchange will influence a person. Every information exchange can be used to persuade people. Often a persuasive act will not be completed via one message thus persuasive acts have to be seen as processes instead of a single event.

The second statement is that "people like their views about the world organized and consistent". This statement is based on the theory on persuasion introduced by Cialdini (2001)

who has described the concept of "commitment and cognitive consistency". If a persons makes a commitment to perform behaviour, they are less likely to do opposite of their already made a commitment towards the initial behaviour.

The previous two statements described the general user and the following two statements are more about the persuasive strategy that can be used within a persuasive system. The first statement declares that "direct and indirect routes are key persuasion strategies". On the one hand you have people that will be persuaded via the direct route, they will "evaluate the content of persuasive message" and based on this message they will be influenced in their behaviour. Others could be persuaded via the indirect route in which the persuadee is evaluating the message via rules of thumb or other stereotypic properties for evaluating persuasive messages.

An example of people who evaluate a persuasive message via the indirect route is the case of a person who is receiving a message from an expert. The notion that the sender is an expert, the receiver is more likely to believe the content of the message. The sender is somebody with authority and this is a property from the sender of the message that makes the message more believeable. Therefore the receiver will be persuade more easily by the content of its message.

The usage of direct or indirect evaluation for (persuasive) messages is not mutual exclusive, people could be persuaded by both routes or in one situation use the direct route and in another situation use the indirect route. Oinas-kukkonen and Harjumaa (2008) suggest that when the persuadee has a high motivation and a high ability it will be more likely evaluate the message through the direct route instead of the indirect route. In situations that will challenge the ability of people to evaluate with the message, they will more often use the heuristics to evaluate the message and therefore use the indirect route. Oinas-kukkonen use the elaboration likelihood model to clarify this phonemena, this model can be seen in figure 4.4 below.

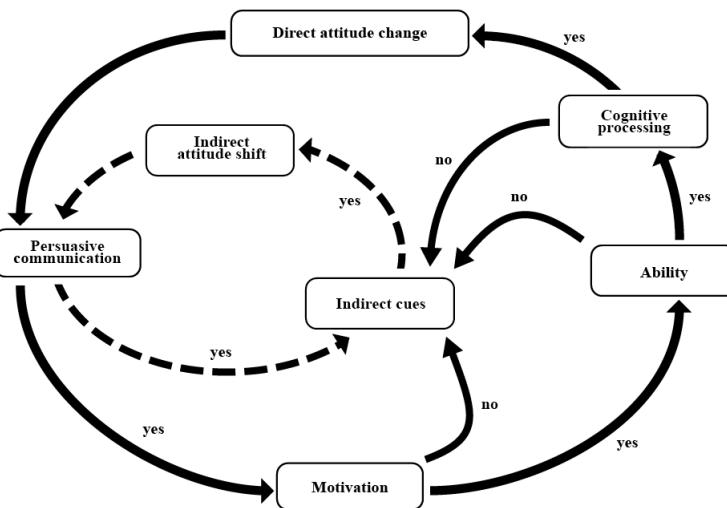


Figure 4.4: Two key spirals in the Elaboration Likelihood Model (Lehto, 2010)

The second statement on persuasive strategies is that "persuasion is often incremental". This statement explains that in order to persuade somebody via a system it needs to support steps that incrementally persuade someone to perform the target behaviour.

The last three statements for 'understanding the key issues behind persuasive systems' are about properties of the system itself. "Persuasion through persuasive systems should always be open" which means it always has to be clear for the user of the system what the purpose is of the system designer and what the overall goal is of the persuasion.

Secondly "persuasive systems should aim at unobtrusiveness". If the system is disturbing the user in executing their primary task it is very likely that this will diminish the persuasive effect of the system.

Thirdly the "persuasive systems should aim at being both useful and easy to use" and this statement is seen as a general software quality by Oinas-kukkonen and Harjumaa (2008). They give as examples "responsiveness, ease of access, lack of errors, convenience, and high information quality, as well as positive user experience, attractiveness, and user loyalty" as properties of a system that is useful and easy to use.

These seven postulates on persuasive systems are necessary for understanding the nature of a persuasive system according to Oinas-kukkonen and Harjumaa (2008). The next phase on the other hand is used for analyzing the context in which the persuasion is taking place. The phase described as "analyzing the persuasion context" exists of three components shown in Figure 4.5.

The Persuasion Context:

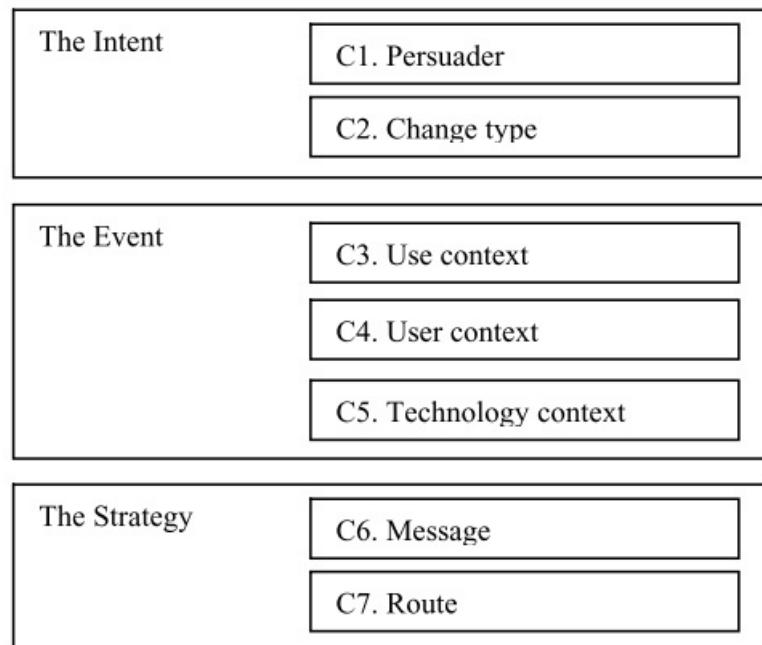


Figure 4.5: Second step of the Persuasive System Development model, the description of the 'Persuasion Context' from (Oinas-kukkonen & Harjumaa, 2009)

4.3.1 The intent

The intent component is about who is the person or entity that wants to persuade someone to change his or her behaviour or attitude. The persuasion can be done via the computer however the computer is not the actor who has the goal of persuading someone. Therefore Oinas-kukkonen and Harjumaa (2009) refer to the three different "sources of intention" for using persuasive systems mentioned by Fogg (1998). Fogg (1998) defines them as : "Those who create or produce the interactive technology (endogenous); those who give access to or distribute the interactive technology to others (exogenous); and the very person adopting or using the interactive technology (autogenous)". The question to be asked in this analysis is who has the intention to change the behaviour and attitude of the persons using the persuasive system?

The second component in the analysis is on the type of change the persuasive system targets. The options are; change in behaviour, in attitude or both. However the standpoint of Oinas-kukkonen and Harjumaa (2009) addresses the theory of McGuire which states that attitudinal change will be done more efficiently when it is done from behaviour to attitude as emphasized by the theory of cognitive consistency.

4.3.2 The event

The following component for analysis is 'the event' that can be split up in three parts, the use context, the user context and the technology context. For example in many cases of the PSD model the use context has to do with health care or solution for a more sustainable lifestyle. The use context describes "the features arising from the problem domain" (Oinas-kukkonen & Harjumaa, 2009).

The second part has to do with the user of the persuasive system. According to Oinas-kukkonen and Harjumaa (2009) the difference between the use context analysis and the user context analysis is that the use context analysis answers the question, what information is relevant for the user, while the user (context analysis) may be approached in a more holistic manner. This user context analysis in- the-large means analysing "the user's interests, needs, goals, motivations, abilities, pre-existing attitudes, commitment, consistency, compromises, life styles, persistence of change, cultural factors, deep-seated attitudes, social anchors, and perhaps even the whole personality." (Oinas-kukkonen & Harjumaa, 2009).

The second aspect of the user context analysis is analysing the goals of the users. The authors refer to the theory of Locke and Latham (2002) on goal setting to show the relationship between goals and performance to achieve those goals. The theory of goal setting by Locke and Latham (2002, p. 706) describes the following relationships between goals and performance "the highest and most difficult goals produce the highest levels of effort and performance; specific, difficult goals consistently lead to higher performance than urging people to do their best; when goals are self-set, people with high self-efficacy set higher goals than do people with lower self-efficacy; and people with high self-efficacy are also more committed to the assigned goals and to finding and using better task strategies to attain the goals as well as to responding more positively to negative feedback." Therefore analysing the goals of the eventual system users is of great relevance because the goals have a big influence on the

eventual behaviour.

The last part of importance for describing the event is the technology context. This part describes the strengths and weaknesses, risk and opportunities of technological platforms or application in use.

4.3.3 The strategy

The last component of the analysis is the strategy that will evaluate the 'routes' and message used to persuade someone. In the analysis of the strategy it is important to know if the direct or the indirect route is used when sending messages. As described in one of the seven statements for understanding persuasive systems, people can be persuaded via the direct route or by an indirect route. The direct route of persuasion is often based on using the right arguments to change the attitude or behaviour of a person.

In the literature there are some different views on when an information communication process is persuasion and when it is convincing. (Oinas-kukkonen & Harjumaa, 2009) mention the close relatedness between persuading someone and convincing someone. They use the theory from the book Persuasion Handbook: Developments in Theory and Practice by Miller from 2002 to make the distinction; "Persuasion relies primarily on symbolic strategies that trigger the emotions, whereas conviction relies on strategies rooted in logical proof and appeals to persuadees' reason and intelligence.".

The last phase of the PSD model is named 'Design of system qualities'. In this last phase (Oinas-kukkonen & Harjumaa, 2009) come up with a set of design principles for designing a persuasive system. Most of these principles are based on the theory of Fogg (2002). The principles are categorized in four groups of seven principles each.

The first principles are used to support the person in the primary task of the persuasive system. The second set of principles are on dialogue support which improves the persuasiveness of the dialogues between the system and the user. The third set of principles improves the credibility of the system. Improving the credibility of the system directly improves the overall persuasiveness of the system. The last set of principles is on social support and helps to improve the persuasiveness by enhancing computer mediated persuasion by connecting different people that are using the system, for example via competition or giving them the ability to discern the usage of the system by other users.

In appendix B there is a complete overview of the 28 persuasive principles including general requirement for the system and an example of a persuasive principle incorporated in a real system.

In the following chapter it is explained what is most important from the previous described theory for this research to analyse the adult learning program produced by K&S. Furthermore the results of the analysis will be given.

Chapter 5

How is self-directed learning supported via technology in the case study at K&S?

In this chapter the models of persuasive technology are described as a framework for analysing the use of technology in the leadership journeys developed by K&S. This conceptual framework creates a clear view on what type of learning activities take place in the adult learning program of K&S. At the end of this chapter the results of the analysis are given. The information used for the analysis can be found in appendix D.

5.1 Explanation of the evaluation method

The method to analyse the Ahold management program (AMP) is based on the Persuasive System Development model (PSD) made by Oinas-kukkonen and Harjumaa (2008). The model is originally made for "discussing the process of designing and evaluating persuasive systems as well as describing what kind of content and software functionality may be found at the final product." (Oinas-kukkonen & Harjumaa, 2008). Furthermore it is used for categorizing and mapping persuasive elements of systems and this has already been done within a study conducted by Torning and Oinas-Kukkonen (2009)

In comparison with the model of B. Fogg (2009b) this theory describes a persuasive system at a more generalized level. This makes it applicable to be used on other domains as well. The PSD model therefore is more suitable for this case study at K&S in comparison with the behaviour model of B. Fogg (2009b). The relation between the behaviour model and the PSD model is most salient in the last phase of the PSD model. This phase named 'design of system qualities' in which clear design principles for persuasive systems are described are based upon the theory of Fogg (2002). This relation between the principles and the theory of B. Fogg (2009b) reveal that it is more specific on the persuasive events. Therefore it is hard to apply the model in another domain.

The abstract level of the PSD model is an advantage in comparison with the behaviour model when evaluating the AMP as a persuasive system. The multitude of steps that are

taken within AMP asks for a method that can describe the bigger picture. The PSD model enables to do this because the model is focussing on the persuasive event and on the intent and the strategy of the persuasive technology.

After describing the AMP with the PSD model, all the individual steps of the program are evaluated, see appendix D. For each individual step (e.g. the introduction, the online intake, assignment one, etc.) the PSD model is used to describe 'the event' of this individual step. To understand the complete AMP every step has to be evaluated.

The evaluation can be done by the PSD model since evaluating a persuasive system is one of its three functions. However the individual steps are at a level which allows for more detail and specific actions. Therefore the behaviour model comes of use for analysing the individual steps. The PSD model describes all the contextual components in which the persuasion takes places. The persuasive act however is not as deeply examined compared with the behaviour model of B. Fogg (2009b).

The connection between the theory of B. Fogg (2009b) and Oinas-kukkonen and Harjumaa (2008) is seen in the goals both theories pursued. The three function of the PSD model defined by Oinas-kukkonen and Harjumaa (2008, p. 165) are "(1) discussing the process of designing and (2) evaluating persuasive systems as well as (3) describing what kind of content and software functionality may be found at the final product."

The three function correspond with the function of the behaviour model of B. Fogg (2009b). The goal of the behaviour model according to Fogg (2009b, p. 1) is that it "provides designers and researchers with a systematic way to think about the factors underlying behavior change.". So the model shows which factors influence behaviour change and how this can be affected by the usage of technology. Therefore both models can be used to evaluate the used technology.

A difference between the PSD model and the behaviour model observed in the evaluation of the persuasiveness of the information generated by the system via external persuasion related theory. For example in the research of Lehto (2010) they apply the PSD model and use the Elaboration Likelihood model to evaluate the persuasiveness of the messages that are send by the information system. In their study Oinas-Kukkonen and Harjumaa (2008) adopt a more classical view on persuasion. This perspective provides a general description of the persuasiveness of the content, instead of requirements of the system to successful persuade someone. There is no clear reason why Oinas-kukkonen and Harjumaa (2008) only evaluate all the message produced by the information system. B. Fogg (2009b) does the opposite, he only address the persuasive characteristics of the information system and does not zoom in the message generated by the system. The difference could originate from their different perspectives on persuasion. B. Fogg (2009b) only addresses human-computer-persuasion while Oinas-kukkonen and Harjumaa (2008) have included computer-mediated-persuasion.

The different perspectives between the PSD model and the behaviour model have a big influence on the way current technology will be evaluated by these models. Therefore these two perspectives are combined to analyse them both in the analysis of the adult learning program. A relation between the models have been identified in the common goals these models have. To better understand this relation between the theory of Fogg (2009) and Oinas-kukkonen and

Harjumaa (2008) the relation between the main concepts of these models are described in the following section.

5.2 Combination of the PSD en Behavioural Model

The 'user context analysis' from the model of Oinas-kukkonen and Harjumaa (2008) is the point in which the model of Fogg (2009) will be integrated. The user context analysis in the PSD model is about "user's interests, needs, goals, motivations, abilities, pre-existing attitudes, commitment, consistency, compromises, life styles, persistence of change, cultural factors, deep-seated attitudes, social anchors, and perhaps even the whole personality." (Oinas-kukkonen & Harjumaa, 2008, p. 490).

Oinas-kukkonen mentions motivations and abilities and these concepts are present in the behaviour model. Therefore the behaviour model can be integrated into the user context analysis of the PSD model. The concept of triggers from the behaviour model is incorporated into the event analysis because a trigger is an event.

The theory of Deterding (2012a) is not integrated into the analysis since at the time of analyzing the ahold management program (december- january 2011/2012) the theory of Deterding (2012a) was not yet available.

5.2.1 The intent

1. *The persuader*: is the entity behind the persuasive system that has the intention to persuade someone to do something. (Oinas-kukkonen & Harjumaa, 2009)
2. *The change type*: describes the change the persuasion is aiming for. This can be attitude change, behavioural change or both. (Oinas-kukkonen & Harjumaa, 2009)

5.2.2 The intent

3. *User context*: "a thorough understanding of what happens in the information processing event, namely understanding the roles of persuader, persuadee, message, channel, and context" (Oinas-kukkonen & Harjumaa, 2008, p. 168).
 - (a) Triggers are defined as "something that tells people to perform a behaviour now" (B. Fogg, 2009a, p. 5). The triggers are analysed in the event analysis since triggers are real events, compared to the concepts of motivation and ability that cannot be identified as a real life event.
4. *User context*: Describes the individual differences between people that can influence their information processing and the "user's needs, interests, motivations, abilities, pre-existing attitudes, persistence of change, cultural factors, deep-seated attitudes, social anchors and perhaps even the whole personality" (Oinas-kukkonen & Harjumaa, 2009, p.490).
 - (a) The *user context analysis* is extended with an analysis of the 'core motivators', 'simplicity factors' and 'Triggers' of B. Fogg (2009a). These first two factors can be

related to the concepts of motivations and abilities addressed by Oinas-kukkonen and Harjumaa (2009) as mentioned earlier. Fogg (2009b) does not provide any definitions for the concepts of motivations and ability, instead he gives two frameworks that explain these two concepts.

- i. Motivation is explained via the framework of Core motivators. Motivation can be created by using the following three core motivators: Pleasure/Pain, Hope/Fear and Social Acceptance/Rejection.
 - ii. Ability is explained via the framework of simplicity: when one of the following concepts is or is not available when behaviour needs to occur, the behaviour cannot be seen as simple. The simplicity factors are: time, money, physical effort, brain cycles, social deviance and non-routine.
5. *Technology context*: describes the strengths, weaknesses, risks and opportunities of specific technical platforms, applications and features.

5.2.3 The strategy

6. *The message*: The analysis of the message determines if the message convinces the person to change or tries to persuade the person to change. "Persuasion relies primarily on symbolic strategies that trigger the emotions, whereas conviction relies on strategies rooted in logical proof and appeals to persuadees' reason and intelligence" Oinas-kukkonen and Harjumaa (2008).
7. *The route of the message*: The route of the message can be direct or indirect. Which route is taken is determined by the person that is receiving the message. This is very closely related to the analysis of the message. The analysis of the message evaluates if the message tries to persuade or convince a person. The indirect route of the message can be linked to persuasion, via indirect cues is a person indirectly influenced by the message. If the message is analysed via the direct route the person will be convinced to change his or her attitude.

In the strategy component of this analysis only the message is described. There is no evaluation performed on the route of the message since it was not possible to determine how the participants have received the message via the indirect or direct way. To determine the route of the message contact with the participant was mandatory to question them on how they perceived the message. This was unfortunately not possible due to time constraints on the participants side.

This analysis focusses on one particular adult learning program of K&S, the AMP that was executed in 2011. In interviews with the producers of this program it is determined that the AMP can be seen as the most mature version of this adult learning program concept. The particular activities and the effect they have, are become more clear for the producers and the program has grown to a bigger variety of activities.

A holistic approach is used to describe the whole AMP according to the persuasive design model . The first step is describing the context in which the persuasion is taking place via the

three main components of the PSD model . These are the intent, the event and the strategy. Secondly, the event analysed which exist of the three contexts namely the use, user and technology context. The last component of the analysis is the strategy, in this part message will be described.

5.3 Results of the intent analysis

5.3.1 The persuader

In the AMP there are multiple actors that have the intention of persuading people to change their attitude and behaviour. First actor is the board of Ahold, that wants to change the behaviour of their managers and therefore hires K&S to achieve this change. In this case the company has the intention of supporting their managers in their role of being better leaders in their organisation. The consultants at K&S that produce the adult learning program are the other actors that have the intention of changing people's attitude and behaviour, this is the primary goal of their jobs.

To decide on what kind of intention the technology is used, within the AMP, the perspective of Fogg (2002) on persuasive intentions is used. As mentioned in chapter four, technology can have an endogenous intention for persuasion if the intention to persuade was already clear when the technology was designed. When the technology is used to persuade people in changing their behaviour or attitude while the technology was not designed for it is seen as an exogenous intention for persuasion, the intention comes from the distributor of the technology instead of the designer of the technology. The last possible intention is the autogenous intent when the intention to be persuade by technology lays at the user itself. In this last possibility it is the user that decides if he or she is going to use the technology that tries to persuade the user in change his or her behaviour.

At K&S they use the following types of technology in the AMP, MP3 players (via iPods), websites (via the computer) and mobile phone devices. The MP3 player is used to persuade people to do the assignments. This is not the goal where the designer of the MP3 player (Apple) intended for. The goal of Apple was to change the way people listened to music (Corporate, 2012) not how people will be instructed to do assignments for a learning program. Therefore the use of the MP3 players has an exogenous intention for persuasion. The people at K&S are the people "who give access to or distribute the interactive technology to others" (Oinas-kukkonen & Harjumaa, 2008). Consequently they use a product to persuade people while this product was not intended to be used as a persuasive technology . They give an exogenous persuasive intent to the technologies that are in use, because "the product is adopted for a persuasive goal the designers had not planned for." (Fogg, 2002).

The other two technologies that are used, the website and the cell phone, have a different kind of persuasive intent. Both technologies are (co)-designed by K&S and therefore these technologies can already be designed with the persuasive intent in mind. The website is made entirely by K&S and therefore it has a endogenous intention to persuade. The question is what the goal was for designing the website and if it was already clear at K&S if they could persuade people with the website in doing particular activities.

The usage of the cell phone has a exogenous intention to persuade, because it was not designed by K&S with the their persuasive goal in mind. However the system that is used to generate interaction via the cell phone with the participants of the AMP has. The usage of the cell phone therefore can categorized as an endogenous intention to persuade, the system to interact with the participants of the AMP was specifically made for persuading people to get evolved in the learning process. This system furthermore brings a third actor to the stage because it was designed by an external company named Sparckl, specialized in providing 'mobile learning experiences' via the mobile phone. In three activities of the AMP the technology created by Sparckl is used to generate interactions with the participants of the AMP. Sparckl can be seen as designers of persuasive technology and therefore they have a "endogenous intent" of the technology they create. The intention to persuade people to become more engaged in the learning process was already clear while producing the technology.

To conclude an overview of all involved actors is given.

Actor	Intention	Influences via
Ahold	Changing attitude and behaviour of their managers	Consultants at K&S
Consultants at K&S	Changing attitude and behaviour of their clients (the managers of Ahold)	The Ahold Management Program and the technology used in this program (exogenous intention)
Sparckl	Getting customers involved in the learning activities and guide the participants towards self-directed learning	Endogenous intent of persuasion is identified via technology designed by Sparkcl

Now all *the persuaders* are described and the intentions they have, the change type they are after can be described.

5.3.2 Change type

To express the change type the three different possibilities of change are used, introduced by Oinas-kukkonen (2010). The first change possibility is compliance-change, in which the system persuades the user to comply according to a system. The second is behavioural change in which the system strives for a more enduring change in users behaviour. The last is attitude-change that needs to influence or change the attitude of the user of the system. All these three change types can have positive outcome according to Oinas-kukkonen (2010). These outcomes are defined as formation, alteration, or reinforcement of a compliance-, behaviour- or attitude-change.

The change that is strived for in the AMP can be seen as a formation of an attitude and forming and altering behavioural change. The producers of the program strive for "reflection and personal change" as they describe it in the documentation of the AMP. The ultimate goals is to change the behaviour of the organisations and on a micro-level this means the behaviour of the people that work for the organisation needs to change. Furthermore the attitudes of

the participants towards self-directed learning have to be formed or changed. By doing this the participants will continue with self-directed learning after the AMP has finished.

5.4 Findings from the analysis of events

Next *the event* is described which consists of the *use context*, *user context* and *technology context*. First the overall event is described to get a good overview of all the different phases and activities. According to (Oinas-Kukkonen & Harjumaa, 2008) you need thorough understanding of what happens in the information processing event for describing the *use context*. The information processing event can be seen as the whole AMP in which participants are given information to evaluate, moments of reflection and assignments to perform. The whole AMP exists of the four phases, which are divided in three activities each. In the appendix F you will find a detailed description of the activities and used technology. In the next section the findings of the events analysis are presented.

5.4.1 Findings from the analysis of use context

The first finding in the use context is on the clear distinction in the activities that are executed in the beginning of the AMP and in the end. The first three phases have to do with reflection and getting to know the participant better while the activities in the fourth phase are related to executing particular actions that will change the behaviour and attitude of the participant.

Half of the program consists of activities that help the participant to reflect on their own abilities as a manager, on Ahold or on their goals. This reveals the importance of supporting the reflection process while changing the attitude and behaviours of the participants.

In the learning program there are different approaches in supporting the reflection process. In the second phase, 'the bigger picture', the first and second assignment help the participant with creating a reflective conversation with a trusted person. By providing question like *how is it for you that I have been named as a talent within Ahold? What do you think about that? What do you see as my strengths? What do you see that I am good at? And what do you like me to do more?* the producers of the program give a starting point for a conversation with others. This has to increase the ability of the participants to have such a conversation. The result of this method is good because every participant has made one or more conversation with trusted persons and has reflected on his or her goals.

A different approach for persuading the participants to reflect on their work has to do with the fourth assignment from phase three. On a random time interval the participants will receive several text messages via their mobile phones during a working day. In these messages there are questions about the current work situation the participant is in. The participant has to answer the question by sending back a rating between 1 and 10. This has to be done for three questions per session and there are four sessions in total. Every time they receive a message the participants have to write down a short description of what he or she is currently doing. By sending these messages people are triggered to reflect on their current work situation and this information is used to have a group's reflection in the bigger picture meeting.

Both approaches worked however the second approach did not receive many positive reactions, according to the producers of AMP. Most of the participants were distracted from their work or could find the time to answer the question. The moment of reflection therefore could be improved.

From all the activities that were supported by technology, one activity can be seen as a failure in persuading people to perform particular behaviour. The activity in the last phase of the program had to support the phase in which participants had to organize three tests for themselves. When they had accomplished a test they could share their results and findings by texting to a number that will put the information on a website on which it can be reviewed by other participants. When they posted a message on the website, three other participants would be triggered via a SMS message to contact the person that recently had posted a message.

The producers of the program tried to persuade people in getting in contact with each other by introducing this tool. However the usage of the this system was low, only one of the twenty-five participants has used it to post a message. The attempt to use this tool to improve social interaction therefore is a major failure of technology used in the AMP to persuade people in interacting with each other.

Looking at the overall information events there is a difference in interactive communication via the technology compared to only broadcasting information . In the activities from phase two and three the information technology is used as a medium with no interaction. Only assignment four uses the interactive possibilities via SMS and the Sparckl engine. The Sparckl engine enables the producers of the AMP to create scenario's in which a dialogue can be made with the participants. This is a finding which can have a negative influence on the persuasiveness of the AMP.

In the assignments for the participants the goal is to find your inner self but the information generated in this assignment is not directed back to the system. If this information was saved and could be monitored, it could be used for a much deeper analysis of the person that is participating in the AMP. Motivation could become more clear but furthermore the information could be used to adapt the following exercises for the person.

The AMP resembles much of a persuasive system itself. The second and third phase have the purpose of finding out what the participants want to achieve in the AMP. As a result the second and third phase of the AMP can be compared to the user context analysis of the PSD method. The activities from the AMP to analyse the context of the participants within the AMP are very similar to how users are analysed in the user context analysis of the PSD model. According to Oinas-kukkonen and Harjumaa (2008) the user context in-the-large has to do with analysing the factors in why people behave as they do like "*user's interests, needs, goals, motivations, abilities, pre-existing attitudes, commitment, consistency, compromises, life styles, persistence of change, cultural factors, deep-seated attitudes, social anchors, and perhaps even the whole personality.*"

Most of these concepts are consulted in second and third phase of the AMP. However the information generate only exists at the side of the participant. This view will influence the participants behaviour and attitude. However it could provide the producers of AMP val-

able information on the participants. This information allows them to better change their behaviour and attitude because they know what the motivations and abilities are of the participants of the AMP.

5.4.2 Findings of the analysis of the user context

To analyse the user context a general user profile has been made of the participants of the AMP. This profile describes what kind of people are participating and what their goals, motivation and abilities are. The profile has been built upon the experience of the producers of the AMP and the characteristics described by the participants themselves in the intake of the AMP.

With this profile all the events that used technology are analysed. This has been done to find out how the messages and the moment and form of the messages could have helped to motivate or increase the ability at the participants to do their tasks.

The profile exist of three main properties that almost all the participants have:

- The participants are almost fulltime occupied with their jobs and therefore have no time left for other activities.
- All the participants work in different location within the Ahold organisation. Therefore there is little social activity among the participants besides the few gatherings within the AMP.
- Most of all the participants are ambitious our motivated to succeed within their career.

With this profile the concepts from the behaviour model are analysed if they were present in the multiple events that constitute the AMP.

Core motivators

The concept of core motivators was not present in most of the messages. Only in the introduction, that welcomed the participants who joined the AMP, the message appears to address core motivators of the ambitious participants. Furthermore there is no evidence on messages that incorporate core motivators to improve the motivation of the participant. The cause of this could be the assumption that the participants of this learning program are ambitious enough and therefore motivated enough to perform all the assignments.

Simplicity factors

On the concept of ability, the factor time, is the most reoccurring resource that is missing. The technology cannot enable people to perform activities faster, hereby the used technology cannot have positive influence on the scarce resource of time . Furthermore most of the activities are on communication, which hard to speed up via technology. Only a-synchronous communication could be used to improve the communication in moments where time is lacking at participants. Besides a-synchronize communication the participants all use an digital agenda to keep track of the many activities they have to execute and this could be used to support the

planning of time more easily. The triggers for instance could be based upon agendas of the participants and therefore it would improve the moment on which the participants are tolled to do something. With the current technology it is only possible to postpone certain triggers.

The activity with the most issues on the simplicity factors is the reflection assignment (appendix F, description 7). In this assignment the participants receive three messages on three moments in time during a working day. The messages asks the participants to write down their current activity and rate this activity by answering three multiple choice questions.

Information provided by the experts gives clear evidence that this assignment is perceived as very intrusive and time consuming by the participants. The participants are working and suddenly they have to switch from task and start reflecting on their current activity. This affects several simplicity factors by which this assignment becomes hard to accomplish. Already the factor of time was mentioned, however the simplicity factors of physical effort, non-routines and social deviance also have a big influence on the behaviour of the participants while performing this assignment.

First of all the activity can be seen as non-routine because reflecting on work activities while performing them is not a common activity in working situations. Often reflection is done after a certain project or period of time in which certain activities are evaluated and reflection upon.

Secondly the activity can have a big social deviance when cooperating with others. For example it is not usual to suddenly put your work on hold to reflect (especially when a participant is cooperating with others). This can easily cause the participant to postpone the reflection.

Furthermore the physical effort for taking a moment to describe the current situation can create a barrier for performing the activity. The participant needs to be able to save his description and thoughts on the current activity. If this resource is not available the participant needs to take physical action to acquire this resource and this lowers the simplicity of the behaviour.

5.4.3 Analysis of the used technology

In the analysis of the used technology the key advantages and issues of the used technology are given. Besides this aspect the overall usage is evaluated of the technology throughout the AMP.

In the overview of the activities the used technology is mapped upon the activities.

1. First phase name: Preface: stimulating curiosity

- (a) *The phone call - Introduction - Supported by cell phone*
- (b) *Online intake - your answers will be used to map out the journey to your requirements and needs. Supported by computer -*
- (c) *Favourite Music - Get to know your fellow AMP participants. - Supported by cell phone*

2. *Second phase name: The bigger picture*

- (a) *Assignment 1* - is about who you are as a talent within Ahold. - *Supported by an iPod*
- (b) *Assignment 2* - is about Ahold's DNA: What's the bigger picture of Ahold? - *Supported by an iPod*
- (c) *Blind Date* - you will deepen your findings about yourself as a talent in relation to Ahold. - *Supported by an iPod*

3. *Third phase name: Challenges*

- (a) *Assignment 3* - is about your professional quest and what you want. - *Supported by an iPod*
- (b) *Assignment 4* - you will answer several text messages at various moments at work. - *Supported by cell phone*
- (c) *Bigger Picture meeting* - inspiring meeting about Ahold's strategy and patterns. - *No support via technology*

4. *Fourth phase name: Test, shift gift*

- (a) *Test 1* - This test consists of a situation at work that is challenging for your colleague and in which he or she can use his or her talents in order to create shift in his or her way of working. *No support via technology*
- (b) *Test 2* - With the second test, you involve the manager of your candidate, and you raise the bar a bit further. *No support via technology*
- (c) *Test 3* - The final test from your fellow participants. *No support via technology*
- (d) *Shift meeting* - Three days in which ideas for change are given by K&S and preparation is done for the following activity.
- (e) *Slice of Work* - The participant of the AMP will be taking a slice of work of someone who is working on a higher level within Ahold. This activity will be closed with a conversation of truth in which the owner of the slice of work will be reflecting on this last period with the participant of the AMP. - *Supported by cell phone & computer*

The first finding for the used technology context is the decline in the use of technology in the AMP, the first three phases mostly depend on technology and in the last phases there is hardly any technology used. This is not an important issue but it has to be notified. Hereby the last phases could be addressed in more detail and by doing this new scenarios could be found in which technology could help to motivate or increase the ability of the participants to perform the assignments.

The second finding discloses that the technology that has been chosen to support the participants in their program is chosen well. All the devices do not affect the simplicity factors to use them. Participants already know how the devices work or can easily learn it. The cell phone and personal computer are devices that are very common in the business context of Ahold. This does not create any barriers on the ability side of the participants.

The iPod is a device not everyone is used to work. However the iPod is known for its ease of use and has a reputation of creating a positive user experience. This is also noticed in the interviews with the producers of the adult learning program. They have not seen or heard any complaints about the use of the iPod.

Furthermore they stated that many of the participants started to see the iPod as a trademark of the adult learning program. If others saw you with an iPod during working hours it revealed that you were part of the AMP. Hereby the iPod was not only just a piece of technology to support the participants but symbolized even more the participation of the people who are conducting an exclusive learning program. It has become a status symbol among the managers of Ahold.

The last finding is not on the a specific device but on the co-existence of the multiple devices within the program. Especially the website in relation with the iPod or telephone assignments are interrelated. The website shows all the available information, functions (like listening to an audio message) and current status of the adult learning program. However this information and functions are sometimes also available on either the iPod or the users telephone.

Therefore it is important to be aware of the concept of a distributed user experience that has been introduced by Segerstahl and Oinas-Kukkonen (2007). In their research they come up with three concepts of consistency, composition and continuity to explain the notion of distributed user experience. By doing this they try to "draw attention how service composition and continuity of interactions influence user experience of cross- platform web services". To create a system that can optimal persuade people it is of essence to also be aware of the relatedness of the used technology that create a combined overall user experience at the participants side that has to be positive.

Chapter 6

What are the requirements for an information system that supports self-directed learning within an adult learning program?

The previous chapters have gained insights into the target behaviour the system needs to persuade, how this can be done with technology and how technology is being used already in current adult learning programs. The models of B. Fogg (2009a) and Oinas-kukkonen and Harjumaa (2008) were used as a tool to analyse the current situation. The previous chapter in which the current situation was analysed, the result has shown situation in which the process of persuading people in doing particular behaviour failed. Before a description is given from a system that improves these situations an overview is given that shows all requirements that have to be incorporated in to the system.

This chapter synthesizes all the requirements gathering activities which have been executed. The three activities that have been used to gather the requirements are; interviews with experts active on self-directed learning, a literature study on self-directed learning and a literature study on computer supported self-directed learning. The second requirements gathering activity, the literature study on self-directed learning , has already been used as a source for chapter one, in this chapter activities one and three are addressed .First the result are given from the interviews with the experts from KS that are active on self-directed learning.

Three experts from KS have been interviewed on learning and especially self-directed learning to gain knowledge about the requirements of the system that needs to persuade people in behaviour that enables self-directed learning. First the reasons are described why it was important for the experts to integrate more technology within adult learning programs like the AMP. These interviews furthermore gave an additional insight in the participants of the AMP who have used the current technology and who resemble the further users of the to be designed system. Because of time constraints at the side of the participants of the AMP these people could not be interviewed themselves and therefore this research is based upon the findings of the experts who have worked extensively with the users.

6.1 Interviews with the experts on the adult learning program

The users of the to-be designed information systems are adults in the learning programs who have the function of managers within a company. The people are highly occupied with management tasks and therefore it is hard for them to make time for learning activities besides their normal business tasks.

The experts of K&S have noticed that creating an unique learning experience by using modern technology will lead to more willingness and engagement of the managers of the companies to the learning program. One of the producers of the AMP described it as follows "We are constantly struggle with getting the attention of the participants who are super busy with their normal jobs. The usage of technology, sending text message, audio messages via iPods, assignments description via audio messages, etc., persuades people to get engaged with the learning program".

However the current used technology does not support users to become social interactive within the group participants of the AMP. Improving the social interaction of the participants is the main goal of the design process the experts are currently involved in. One of the experts, addresses the fact that social interactions can have a major influence on the responsibility for learning. If participants have an active social environment in which the participants themselves and his fellow participants are learning, they will be more pro-active in their learning process. This is at the same time acknowledged by the literature on self-directed learning, in both studies of Lindstaedt et al. (2009) and Stubbé and Theunissen (2008).

The experts on the self-directed learning program want to tackle the current problem which is the lack of a social environment in which people can cooperate. All the participant are geographically separated or work on different departments of the company which has as consequence that regular face-2-face communication is not possible. In the AMP the participants are only seeing their fellow participants on the live moments within the journeys.

There are only three moments over a time span of a year in which the participants will see each other in a live setting. Hence there is no on-going social environment among the participants of the AMP. Some people have the advantage that they have closer relation to other participants because they do cooperate more often while executing their business tasks as a manager for Ahold. However the majority of the group does not get to know the other participants better or has easy opportunities to interact with other participants.

Therefore the most important requirement formulated by the experts on self-directed learning of K&S for the information system is the support of social interaction between participants in the time between live moments. One of the experts expresses that the future information system has to have elements of a social medium to support this social environment more than it is done by the technology in previous leadership journeys.

The findings from the used technology analysis reveal there has been one attempt to support social interaction and to create a social environment between the live moments. The technology unfortunately did not achieve the goal of letting the participants actively have social interactions. Details of this attempt can be found in chapter five in the section on "*The slice of work*".

This finding is a second argument to put the requirement of "supporting social interaction among the participants of the leadership journey" on top of the list of functional requirements of the to be build information system.

The further requirements for the information system will be elicited from the literature on information systems to support self-directed learning and persuasive technology and design. The experts themselves report that their knowledge on the technology side is lacking too much to give more specific requirements or envision them with current technology.

After the first activity has been addressed for the elicitation of the requirements for the persuasive information system, the literature on computer supported self-directed learning is discussed. In chapter one this literature was used to explain the essential components of the concept of self-directed learning. The following section elaborates on the requirements for a computer system that supports this type of learning.

6.2 Requirements from the literature study on computer supported self-directed learning environments

In the literature study on self-directed learning from chapter one three sources have been used. The first two researches are the one on the APOSDE system from Stubbé and Theunissen (2008) and the second is the meta-review of literature on ubiquitous learning environments for self-directed learning done by Stubbé and Theunissen (2008). Both articles try to specify a list of requirements to create a system that supports self-directed learning.

The third article of Ogata and Yano (2004) on "Context-aware support for computer-supported ubiquitous learning" is used to define the possible states a computer supported learning (CSL) environment can be in. This classification helps to identify what kind of learning environment is being researched in the two literature studies and helps to classify the learning in the AMP.

6.2.1 Literature on ubiquitous learning

Ogata and Yano (2004) use the properties of technology on embeddedness and mobility to divide CSL environments into four categories, that both support a different type of learning.

The most common CSL is based upon 'traditional business computing' (Lyytinen & Yoo, 2002). It is identified by a low level of embeddedness, the computer system is not embedded into real-life (the system does not know anything on the context the user is learning in) and has a low mobility (the system cannot be moved to other environments). This system therefore supports 'desktop-computer assisted learning'.

The second category supports the 'mobile learning' by using 'mobile computing' technology (Lyytinen & Yoo, 2002), the mobility of the technology is high however the embeddedness is low. The technology allows the learner to learn anytime and anywhere. However the system is not aware of the context of the learner and the information cannot be seamlessly adjusted to the context of the user.

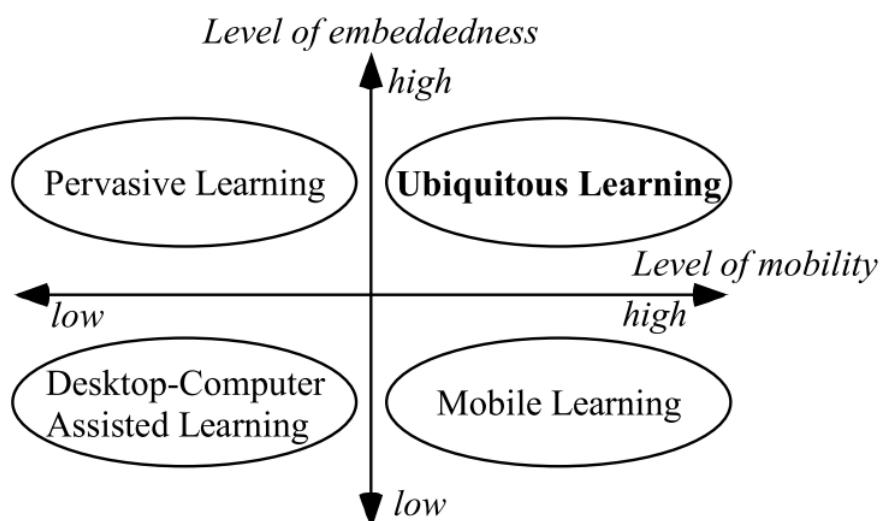


Figure 6.1: Quadrant of concepts on ubiquitous learning from Lyytinen and Yoo (2002)

If the embeddedness is high and the level of mobility is low, a system supports 'pervasive learning' which is enabled by the use of 'pervasive computing'. Pervasive computer systems are created "by embedding models of specific environments into dedicated computers or, more generally, by building generic capabilities into computers to inquire, detect, explore, and dynamically build models of their environments" (Lyytinen & Yoo, 2002, p. 64).

When embeddedness and mobility are combined by the use of 'ubiquitous computing', 'ubiquitous learning' can be supported. According to Ogata and Yano (2004, p. 2) 'uniquitous learning' occurs when the ubiquitous system allows the learner to move with his/her mobile device and the "system dynamically supports his/her learning by communicating with embedded computers in the environment". However Ogata and Yano (2004) acknowledge that pervasive and mobile learning are often categorized as ubiquitous learning.

The classification helps to identify what kind learning environments have been investigated in the research of Lindstaedt et al. (2009) and Stubbé and Theunissen (2008). By comparing the different environments, it is possible to determine which requirements from both researches are applicable to the construction of a new system. Next the differences are described of the two research projects.

6.2.2 Literature on computer supported self-directed learning environments

In the APOSDE article the authors try to support the self-directed learners by an information system that supports the users in doing the self-directed learning activities. This would suggest that this information system and this research could help in finding an answer on the sixth sub-research question: "*What are the requirements for an information system that supports self-directed learning within an adult learning program?*". However there are some critical differences between the users that meet suitability criteria of the APOSDE system and the participants of the adult learning programs at K&S.

The main difference is the learning domain and task domain in which the two system need to operate. The users of the APOSDE system "are knowledge workers whose predominant work medium for the learning domain in focus is the computer." (Lindstaedt et al., 2009). The consequence of this is that the users of the APOSDE system execute their learning and working tasks in a computational environment. Hence the opportunity for the researchers to link these working tasks directly to learning tasks, because they can connect the APOSDE system to the already used computational system the knowledge worker is working on.

This is big contrast with the work and learning tasks of the participants in the AHOLD program who are mostly not executed in a computational environment. The learning programs mostly address problems in leadership skills and management of people. This is in most cases done via face-to-face contact and less in a computational environment. Therefore the suitability of APOSDE system within the KS domain and the findings of the APOSDE research are less applicable to this research.

The elicitation of the requirements for the information system continues by discussing the research on self-directed learning in ubiquitous learning environments. According to the literature study of Stubbé and Theunissen (2008) the definition of ubiquitous learning environments is 'characterized by providing intuitive ways for identifying right learning col-

laborators, right learning contents and right learning services in the right place at the right time'. They use the list of six characteristics of an environment that supports ubiquitous learning from their literature study. These characteristics are then related to the elements of self-directed learning as described in chapter 3.2 of this thesis, see the table below for the overview.

Characteristics of elements of self-directed learning	Elements of self-directed learning	Elements of ubiquitous learning	Characteristics of elements of ubiquitous learning
Control over all educational decision	Learner control	Permanency	Work is recorded continuously, saved until deleted
Control over own learning process	Learner control	Accessibility, Immediacy	Anytime, anywhere. Immediate access to information
Setting goals, planning, self-instruction, self-monitoring, problem solving, strategy use	Self-regulating learning strategies	-	-
Self-evaluation of performance and learning process	Reflection	-	-
Cooperation and collaboration	Interaction with the social environment	Interactivity	Synchronous and Asynchronous interaction with expert, peers and teachers
Learner should be allowed to explore and manipulate the real world, authentic problems	Interaction with the physical environment	Situating of instructional activities	Learning embedded in real-life
-	-	Adaptability	Work is recorded continuously, saved until deleted

The six element of ubiquitous learning can be used as a non-functional requirements that have to be incorporated in to the system that needs to support self-directed learning because these elements almost support every element of self-directed learning. However a gap is seen in the support of two element of self-directed learning, the 'self-regulating learning strategies' and 'reflection' are two elements that are not supported by characteristics of the ubiquitous learning environment from the research of Stubbé and Theunissen (2008). Therefore this gap shows that ubiquitous learning environments do not support self-directed learning completely and that there is a demand to satisfy the requirement of supporting 'self-regulating learning strategies' and 'reflection'.

Furthermore from the analysis of the use context indicates that also attempt have been done to support reflection by the usage of technology within the AMP. Some of these attempt worked, like for instance the question via SMS on the activities the participants were active

with. However it was noticed these activities were sometimes to obtrusive for the participants and this needs to be improved.

6.3 Overview of requirements

At the end of this chapter an overview is given of the requirements for the information system that needs to support self-directed learning. The most important requirement comes from the experts who are involved in the process of building the information system. They define the most important requirement as follows "the system needs to have elements of a social medium to support the social environment within the learning program". The importance of this requirement is acknowledge by the literature. In both studies on computer environments build to support self-directed learning, the requirement of supporting the social environment is mentioned explicitly. The request to integrate elements of a social medium into to be built artefact therefore can be seen as a implementation of the requirement of 'supporting the social environment'.

Furthermore the characteristics of an ubiquitous learning environment can be used as requirements that need be incorporated into the system. The system therefore has to satisfy the non-functional requirements of permanency, accessibility, immediacy, interactivity, situating of instructional activities and adaptability. These six characteristics have proven that they enable a system to support self-directed learning and this make them important requirements (Stubbé & Theunissen, 2008).

The last requirement for the system is the support of 'self-regulating learning strategies' and 'reflection' because these two concepts of self-directed learning are not satisfied by characteristics of an ubiquitous learning environment according to the research of Stubbé and Theunissen (2008). Therefore the to be build artefact can satisfy this unfulfilled requirement by adding functionalities to that can satisfy the requirement of supporting 'self-regulating learning strategies' or 'reflection'.

In the fourth chapter it is explained how persuasive technology and design can persuade people in doing particular behaviour. This resulted in an overview of 28 persuasive principles that can be used in the design process. Chapter five gave insight in how the current technology is used in the case-study at K&S. From this case study situations where identified in which there were problems with persuading people in particular behaviour.

The biggest problem was persuading people to socially interact with other participants via a computer supported social environment. This chapter combined all the findings from previous chapters, from the interviews on the expert of self-directed learning and by the literature on computer supported self-directed learning. In the following chapter an information system is designed that supports the above mentioned requirements and thereby supports self-directed learning.

Chapter 7

Supports an implementation of persuasive technology self-directed learning in an adult learning program?

The previous chapters answered the questions on what kind of behaviour is necessary for self-directed learning, how persuasive technology/design can persuade people in performing behaviour and what the actual requirements are for a system that persuades towards self-directed learning.

In this chapter these findings are used to come up with a prototype of an information system that can support this type of behaviour within adult learning programs. The prototype will be tested in a real-life situation to check if the proposed requirements and concepts are correct.

First of all an explanation is given how the prototype meets the previously described requirements. As Iivari (2007) states, the construction process should be made as transparent as possible while conducting proper design science research. He suggests to clearly describe the practical problems, opportunities, existing artefacts, analogies, metaphors and theories which have contributed to the design process. As the practical problems, opportunities and theories already have been described in previous chapters the next section will emphasize on existing artefacts, analogies and metaphors that served as a source of inspiration for the designed artefact.

7.1 Description of the construction process

The most important requirement the information system needs to satisfy is that it has "elements of a social medium to support the social environment within the learning program". The literature acknowledges this requirement because two independent studies on self-directed learning address the importance of "supporting the social environment".

7.1.1 Support social environment

Only embedding common functionality of social media would not be enough for the participants to start communicating with each other. The findings from Kreijns (2004) have shown that taking social interaction for granted between participants in a digital collaborative environment is proven to be a widely made mistake.

Participants that use a social medium have to be persuaded in communicating with each other to eventually reach the goal of supporting the social environment within the learning program via an information system. Communication is most of time used by humans to achieve another goal (getting information, debate about subjects or just as pastime) and cannot be seen as an independent process. There has to be a trigger for communication between people. An activity had to be found that would trigger people to communicate with each other so the information system would support social interaction and therefore the social environment of the learning program.

For inspiration the common social media like Twitter and Facebook were investigated. These social media triggered people to post something by asking them the question 'What are you doing?' or 'What is happening?'. These messages people post on these questions eventually trigger people to start communicating, therefore these are good examples of how social interaction are bootstrapped on social media. This shows how important triggers are to start social interaction. Therefore a trigger is needed to be integrated in to the design that would persuade people in posting a first message that could serve as a starting point for a conversation.

A function is incorporated into the design that satisfies on the one hand the 'trigger requirement' as described in the above paragraph. On the other hand it supports a specific activity related to self-directed learning. In the requirements gathering phase two elements were found of self-directed learning who were not support by ubiquitous learning environments as described by Stubbé and Theunissen (2008). These elements were self-regulating learning strategies and reflection.

7.1.2 Reflection

In the learning activity reflection a possibility was detected to use the process of reflection to come up with triggers for social interaction in to the future information system. A system by which people were helped to reflect on their learning activities that were present in the learning program. The support of the reflection process is done by answering three questions on every learning activity. The answers on these questions would be revealed to the other participants via the information system. Fellow participants could react upon these 'reflection

posts'. By doing this a system is made that persuades people in doing two types of behaviour that both support self-directed learning. On the one hand the support of the reflection process would help people reflect on their learning and on the other hand these reflection could serve as triggers for social interaction.

The behaviour of reflecting on the learning activities, which can be seen as the primary function for which the information system can be used, is supported by the persuasive principle of tunnelling. The questions for the participants help to guide them through the reflection process.

The screenshot shows a web-based form titled "Eerste check-in". The instructions at the top read: "Kijk terug op blok 9 en wat daar allemaal aan bod is gekomen... *Vereist". There are two text input fields. The first is labeled "Wat is je het meest bijgebleven uit blok 9? *". The second is labeled "Hoe krijgt dit nu betekenis in je werk? *". At the bottom left, there is a dropdown menu with the visible option "Ik ben *".

Figure 7.1: Screenshot of the question that guide the reflection process.

7.1.3 Social support principle

The possibility of viewing each other's reflections enables new persuasive possibilities because the behaviour of others can be monitored. This opens up the possibility of using 'social support' principles as defined by Oinas-kukkonen and Harjumaa (2008) like social learning and social comparison. There has been chosen to integrate the persuasive principles of social comparison and social learning because of the social nature of these two principles. This makes it easier to integrate these principles with the requirement of supporting social interaction of the people within the learning program.

The requirements for social comparison states that "a system that should provide means for comparing performance with the performance of other users" (Oinas-kukkonen & Harjumaa, 2009). The social learning principle demands for "means to observe other users who are performing their target behaviour and to see the outcomes of their behaviour" (Oinas-kukkonen & Harjumaa, 2009).

To compare the persuasive principles of social learning and social comparison two designs were made. One of the designs builds more on social comparison and the other emphasizes on social learning to compare the persuasiveness of the two principles in an experiment. In the PSD model there is no comparison or classification of the persuasive principles and situation in which they can be best applied. Therefore it is useful to compare these two principles in this situation to get some empirical data on the usage of these two principles.

7.1.4 Non-functional requirements

From the literature study six non-functional requirements have been identified. All non-functional requirements are integrated except one. The requirement of permanency could not be integrated in to the information system because of technical constraint. The requirements of accessibility and immediacy is fulfilled by the used technology (iPad) that makes the system accessible anytime, anywhere and hereby the immediacy is granted. Interactivity is accomplished by the possibility of posting messages that can be used to communicate synchronous or a-synchronous with fellow participants. Situating of instructional activities, is done by integrating the content of the course and the order of content as close as possible into the prototype.

7.2 Description of the experiment

18 people have participated in the experiment. They were divided into two groups. The first group existed of eleven participants who used the prototype based upon the social comparison principle. The second group exists of seven participants who used the prototype based upon the social learning principle. The timespan of the experiment with the prototypes covered 35 days in which people could access the prototype via an internet browser.

During the experiment the focus was on the usage of the information system via an iPad because it lowers the barrier for using the information system via a devices that is 'always-on' and it is easier to access than a regular desktop or laptop computer. Hereby the iPad can satisfy the non-functional requirements of accessibility and immediacy. Two other reasons for using the iPad were the availability of the device on the side of the participants of the experiment and the de facto usability standard the iPad has as a tablet computer device.

7.2.1 The participants of the experiment

The experiment was executed in two adult learning programs that are facilitated by the Foundation of Corporate Education, a spin-off company of KS. The adult learning program is about corporate learning and the people who enrol in this course are professionals in human resource development in organisations like consultancy firms, health-care or educational institutions and commercial enterprises. All the participants have in common that they are responsible for the learning programs within their organisation.

The division of the 18 participants into separate groups is made based on the year in which the participants are active. The course has a length of two years. Group 1 is in year one of the corporate learning course and group 2 is in the second and last year of the course.

All participants have an iPad, these are acquired at the beginning of course year (in September 2011), therefore everyone has more than half a year experience with the usage of the iPad. All participants are instructed to create a shortcut of the website of the information system on the top screen of their iPad, which makes it easy to access the system. Furthermore all the participants have to create an account by which they can access the site. All these steps are explained within an introduction of 20 minutes at the beginning of the last period of both groups.

7.2.2 Explanation of the concepts and the context of the experiment

As explained previously the participants had to perform particular learning activities that were part of the learning program. In both groups there were two mandatory learning activities. The first was creating and handing in a portfolio of all the learning activities of the last year. The second activity was a defence of their created portfolio, towards their executives and learning program coach. To make the conditions of the experiment more like the Ahold Management Program, in which there are more learning activities involved, more assignments were introduced that were related to the two already present learning activities.

The following overview shows the learning activities on which participants had to reflect:

1. Reflect on the previous bloc (bloc 9) of the learning program.
2. Upload a photo that could be used as metaphor for your portfolio.
3. Ask feedback of fellow participants on your participation in bloc 9.
4. Hand in the portfolio.
5. Prepare the defence of your portfolio.
6. Think about the future of your learning.

The reflection process will be guided by the following question, made by the facilitators of both learning groups:

1. (a) What was the most memorable experience of bloc 9?
(b) How has this influenced your current way of working?
2. Why did you choose this image as metaphor for your portfolio?
3. (a) How did this feedback influence you?
(b) What was the most appealing in the feedback of your fellow participant?
(c) What are you going to change after you have received this feedback?
4. (a) How do you look back at the process of writing a portfolio?
(b) Which activity did you had to do, to write the portfolio, which you hope you never have to do again?
(c) What gave you the energy to finish the portfolio?

5. (a) What would you like to highlight in your portfolio defence?
(b) How are you going to make sure this subject will be highlighted?
6. (a) What will be your next step in your learning life?
(b) What do you require to achieve this next step?
(c) Who is going to support you in this process?

7.2.3 Prototypes

Prototype based on social comparison

The prototype based on social comparison was used by group one. The prototype can be seen as a digital common ground that shows which activities have to be done, which participants already have reflected upon the learning activities by posting a reflection and the communication among the participants. In the lower part of the interface the communication will be visualized by exclamation marks or question marks, which visualize a comment or a question.

The persuasive principle of social comparison is integrated by providing the timestamps of posted reflections comparing the time when participants have posted a reflection. The information is visualized on a ranking board, if someone posts a reflection at one of the learning activities (i.e. "introductie", "foto", "feedback", "portfolio", etc.). His or her avatar will be shown above the activity in the order of when someone has posted a reflection. The first person posting a reflection is at the bottom of the stack and the last person that posts a reflection is on top. In the screenshot below the person with the turquoise avatar for example has reflected upon the "introductie" as third person, while he was the first person to post a reflection on the "foto", "feedback" and "Portfolio" activity.

By visualizing the reflection posts on a ranking board based on when someone reflected upon an activity, you can see in an instance if other participants are behind or ahead of you with completing learning activities (because if they did not complete the activities they would not post a reflection). By visualizing it as a ranking board, the requirement that is related to the social comparison principles is incorporated. The requirements state that "a system that should provide means for comparing performance with the performance of other users" (Oinas-kukkonen & Harjumaa, 2009).

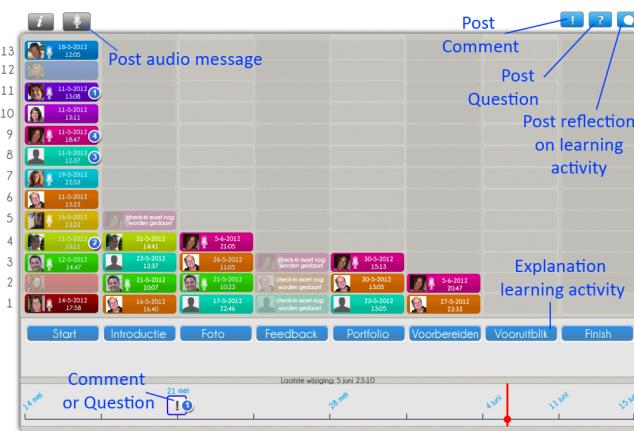


Figure 7.2: Screenshot of social comparison prototype interface.

Prototype based on social learning

The prototype based on social learning was used by the second group and can be seen as a digital common ground that shows who has reflected upon an activity in a chronological order. On the upper part of the line all the reflections will be made visible (visualized by the squares with faces on them of the person who posted the reflection) and beneath the timeline all the communication will be visualized by exclamation marks or questions marks.

The social learning principle is incorporated in the second version of the prototype via the visualization of all the reflections on a timeline. The prototype reveals when someone has done a reflection (visualized by a square with the photo of the participant) yet it does not directly reveal on which learning activity has been reflected. To reveal on which activity has been reflected, the user has to click on the reflection post, to get this information. Hereby the focus is on that someone has posted a reflection instead of when someone has posted a reflection in comparison with the other participants.

The functionality for the user to view every reflection on the timeline enables the participant to view the outcomes (the reflection posts) of the behaviour of others (the reflection process of other participants that is guided by the questions asked by the information system). By doing this the persuasive principle of social learning is incorporated within the second prototype by creating "means to observe other users who are performing their target behaviour and to see the outcomes of their behaviour".

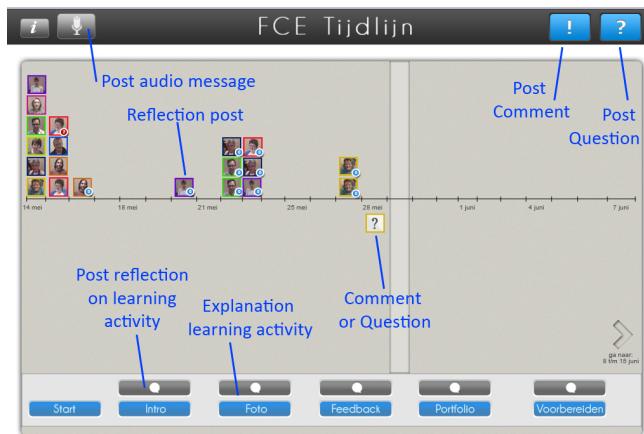


Figure 7.3: Screenshot of social learning prototype interface.

Functionalities of both information systems

1. The system helps the user to reflect by questioning the user.
2. The user can communicate with each other by commenting on reflections, asking questions or posting general comments.

There are two possibilities to use the above described functionalities. The participants can give textual input via the keyboard and hereby answer the questions and writing their reflections, comments or questions. Or they could use the audio input functionality which

makes it possible to post an audio message of one minute on the social learning- or social comparison-prototype as reflection post, comments or question. However these audio message have to be recorded with an external program on the iPad. The recordings are made by an iPad application called 'FreedomMic' which could be used for free and enables the participant to send an audio message via mail to the back-end of the server.

In group one there were seven people that could use the audio function and the other six were not allowed to use it. In this way, the effect of the usage of the function can be compared to the number of reflection posts made by the participants. Because of the smaller size of the second group, all the participants were allowed to use the audio function.

7.2.4 Hypotheses to test

In the experiment the two prototypes are used to measure if the designs based on different persuasive principles have different effects on the behaviour of the participants. Group one will be using the prototype which emphasis on the persuasive principle of social comparison while group two will use the design that will be built upon the principle of social learning. Our hypothesis is that social comparison will motivate more to post reflections on the social comparison prototype.

Hypothesis 1: The possibility to compare the performed behaviour more easily with others, motivates participants more than when it is only possible to observe the behaviour of others.

The hypothesis is validated by comparing the numbers of reflections from both groups. Besides looking at quantitative results , every participant is interviewed to find out if the results were influenced by the designs our by other hidden aspects that could not be measured via the logs on the usage of the information system. The questions in the interview will be based on the Motivation, Ability and Opportunity analysis made by Deterding. The guideline questions can be found in the appendix C and the actual question from the interviews in appendix D.

The second hypothesis tests the increase in 'ability' of participants to post reflections, comments or questions via a microphone function. In group one, one-half of the group is given the possibility to post audio messages while the other half of the group is not able to do this. In the second group everybody is allowed to post audio messages due to the smaller number of participants in this group. The assumption is that by letting participants talk instead of writing a message it increase their ability factor. The function to post audio messages makes it more easier for participants to post messages.

Hypothesis 2: The possibility to post reflections, comments or questions by posting an audio message has a positive effect on the number of messages (reflections, comments or questions) a person posts.

To verify this hypothesis the average of messages posted by participants is calculated that had the possibility to post audio messages and those who did not have this possibility. After this both numbers are compared and checked if those who could use the audio functionality have posted more messages. Again, besides the quantitative results every participant is inter-

viewed to find out if the results were influenced by the designs or by other hidden aspects that could not be measured or have foreseen.

The last hypothesis is on the last target behaviour defined as 'social interaction via the information system'. The third hypothesis is created to find out if the reflections that are going to be placed on via the social learning or comparison prototype, will induce the participants to start communicating with each other. This will reveal if the reflection posts can be used as triggers for social interaction between the participants in a learning program.

Social interaction is considered to be a (minimal) dialog. If someone posts a reflection and someone else is reacting on this reflection there is no dialog because the initial poster did not reply on the comments of the person whom reacted. The social interaction does not necessarily need to take place via the information system. It can also be accomplished by other media like telephone, email or instant messaging.

Hypothesis 3: The reflection posts serve as a trigger for a dialog between participants via the information system or other types of media.

To verify this hypothesis the number of reactions on reflections messages are counted and the number of comments and questions that are posted and refer to one of the reflection messages. All the participants had to log their interaction with other participants, hereby an overview of the social interaction of the participants outside the information system is created. In the interviews the users will be asked on how much they have communicated with other participants of the learning program and if this was triggered by information on the activity- or timeline.

7.3 Results of the experiment

Here are the results presented of the experiment with the persuasive principles integrated in the designed information system.

7.3.1 Quantitative results

Hypothesis one

As first result an overview is presented of when people have viewed the social learning or social comparison prototype and when they posted a reflection on one of them (see next page). With this data the number of reflection posts is compared, made by the users while using the two prototypes. This comparison enables us to verify or falsify the first hypothesis. The behaviour of posting a reflection is visualized by a yellow square. An orange square indicates that a person has posted two reflections. The number in the square indicates the number of views on the website that day.

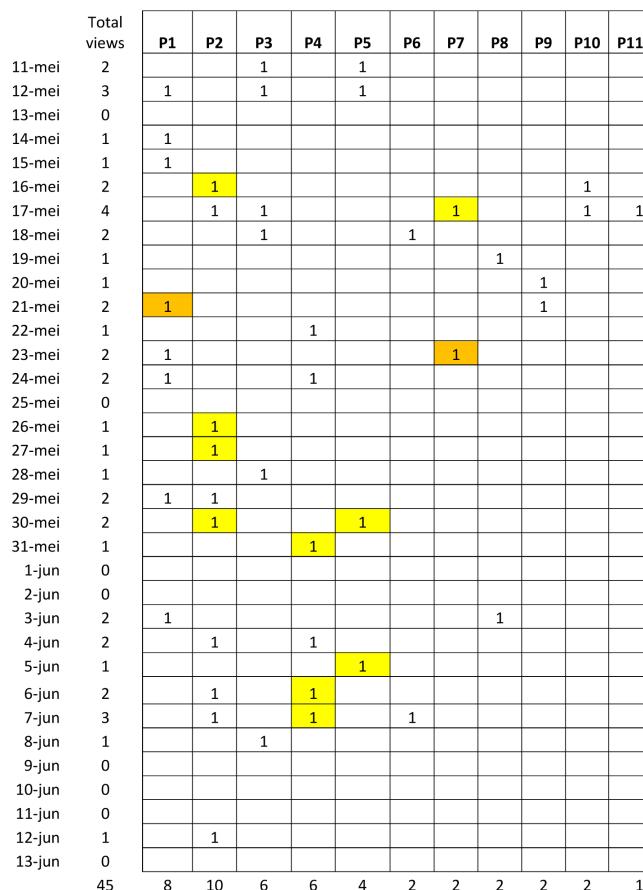


Figure 7.4: Overview of group one, the users of the social comparison prototype.

Number of posted reflections: 14.

Total views	P1	P2	P3	P4	P5	P6	P7
11-meい	3	1					1
12-meい	0						
13-meい	0						
14-meい	1	1					
15-meい	3	2				1	
16-meい	3	2				1	
17-meい	1	1					
18-meい	1	1					
19-meい	2	2					
20-meい	2	1	1				
21-meい	1	1					
22-meい	3		1	1	1		
23-meい	5	2	1	1		1	
24-meい	2	1					1
25-meい	0						
26-meい	1			1			
27-meい	2				2		
28-meい	1						
29-meい	2	1			1		
30-meい	0						
31-meい	1		1				
1-jun	3	1			1	1	
2-jun	0						
3-jun	2		1		1		
4-jun	3	2					1
5-jun	1				1		
6-jun	1		1				
7-jun	2			1			1
8-jun	1	1					
9-jun	0						
10-jun	2		1	1			
11-jun	0						
12-jun	0						
13-jun	1	1					
Total views:	50	23	7	3	3	6	4

Figure 7.5: Overview of views and posted reflections of group 2 (the social learning prototype)

Total number of posted reflections: 19.

Average number of reflections:

Group one (social-comparison): $15/11 = 1,36$

Group two (social learning): $19/7 = 2,7$

On average the users of the social comparison prototype were not persuaded to post more reflections while using the prototype. The social learning prototype has on average a higher percentage of reflections posted. The observation therefore cannot state that the current implementation of the social comparison principle is more persuasive in this experiment than the implementation of the social learning principle.

However in both groups there are outliers that have a large influence on the average number of reflections. If the group one is divided in active participants, who have visited the site three times or more and non-active users those who visited the site less than three times, group one shrinks in size from 11 to five and group two stays unchanged with seven participants.

When the average reflection is calculated from active users in group one after the non-

active participants is removed, the average of group one would not exceed the average reflections of group two. The average would become $13/5=2,6$ reflection per person because two reflection will not be taking into account because they are also posted by someone who only visited the site twice. So if the users are active they post on average two and half reflections, regardless which prototype is used.

In group two there is one outlier with a total of 23 views and six reflections. If this participant is removed from the dataset the average reflection post will be $13/6=2,2$. Hereby the average number of reflections is lower compared to group one. However the average number between both groups is not differentiated enough to the stated hypothesis one as true.

The quantitative data does not indicate improvement of the target behaviour by a prototype with the social comparison principle when compared with a prototype that uses an implementation of the social learning principle. Furthermore the quantitative data cannot reveal causes that have created this observation. In the section on users interviews, the qualitative data is analysed for causes that can account for these findings.

Hypothesis two

The second hypothesis states: *The possibility to post reflections, comments or questions by posting an audio message has a positive effect on the number of messages (reflections, comments or questions) a person posts.*

The participants that were enabled to use the microphone function have never used the audio message functionality and therefore no results can be compared. The fact that nobody has used the functionality can be explained the effort that was necessary to post an audio message. The users had to install an external application to record messages. This appeared to be an enormous step that need to be taken before the participant could even try this functionality. Furthermore the functionality is not for filling the needs of the participants because they were not motivated enough to use this function.

Hypothesis three

Hypothesis three is validated by analysing the overview of communication between participants via both prototypes. The hypothesis states: *The reflection posts serve as a trigger for a dialog between participants via the information system or other types of media.*

The Green blocs visualize the post of a first message, yellow blocs visualize responses. Response Q means, the response resulted in a new question, response R is only in a reaction. Response on log-in posts can be compared with a normal comment. The log-in posts were on default visible for all the participants and cannot be seen as reflection posts. Overall there were three reaction that were triggered by a reflection post. The other twelve reaction can be seen as comments that were not triggered by a reflection post. Two of these comments were posted via the comment functionality and the other ten comments were posted in the log-in posts at the beginning of the activity-line.

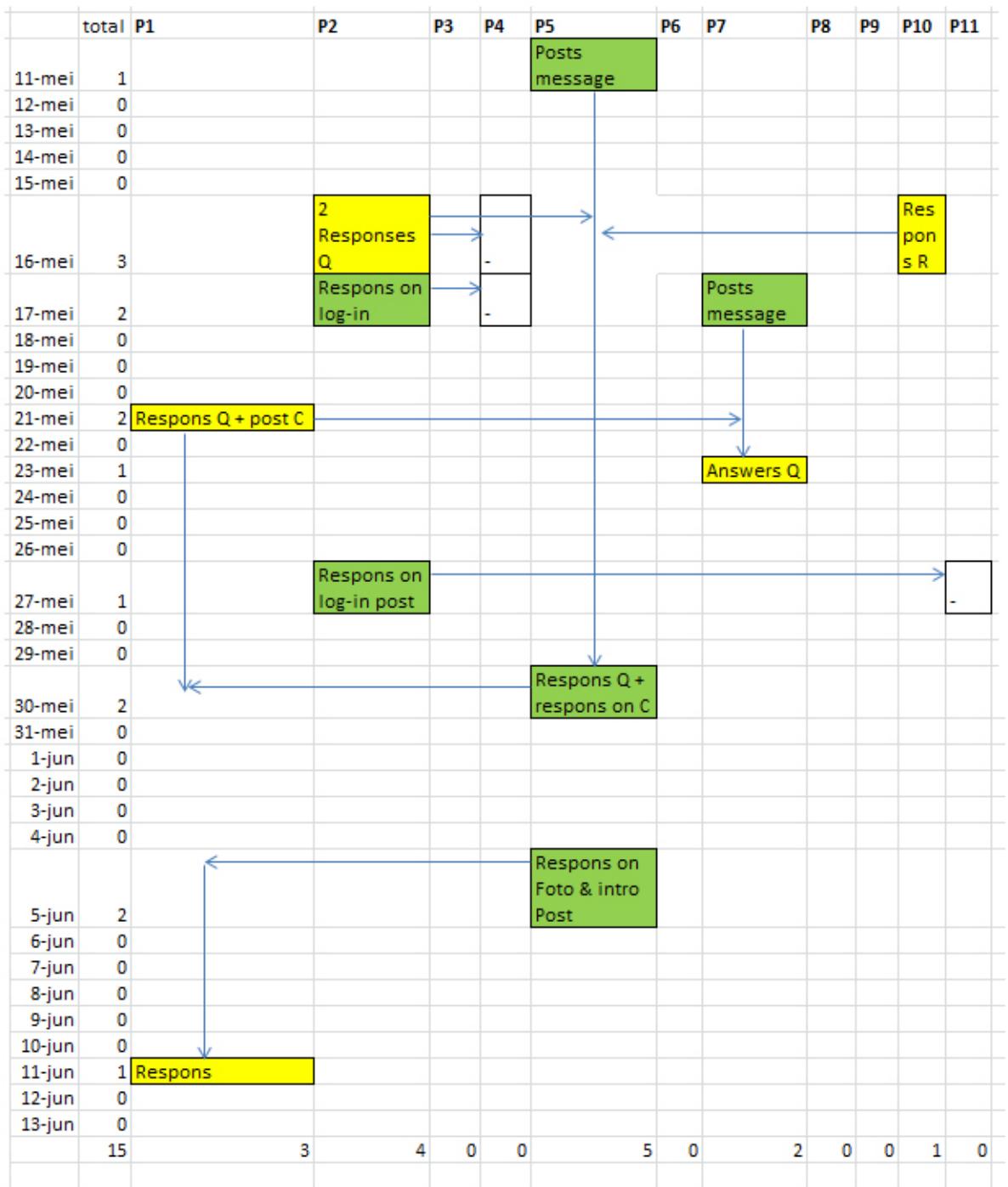


Figure 7.6: Overview social interaction group one (social comparison prototype).

Overview of communication between participants via the social learning prototype (group 2): Green blocs are a first messages, yellow blocs visualize responses.

	totaal	P1	P2	P3	P4	P5	P6	P7
11-mei	0							
12-mei	0							
13-mei	0							
14-mei	0							
15-mei	0							
16-mei	0	Response					Respon se on R	
17-mei	0							
18-mei	0							
19-mei	0							
20-mei	0							
21-mei	0							
22-mei	0							
23-mei	0							
24-mei	0							
25-mei	0							
26-mei	0							
27-mei	0							
28-mei	0						Asks Q	
29-mei	0							
30-mei	0							
31-mei	0							
1-jun	0							
2-jun	0							
3-jun	0							
4-jun	0							
5-jun	0							
6-jun	0		Response				-	
7-jun	0							
8-jun	0							
9-jun	0							
10-jun	0							
11-jun	0							
12-jun	0							
13-jun	0							
		0	0	0	0	0	0	0

Figure 7.7: Overview social interaction group two (social learning prototype).

Group one and two differ a lot in their communication behaviour. Group one had four people who have tried to communicate with others via the prototypes. As a results two additional people became engaged into a conversation. The content of the six (attempts for) conversations in in most cases just to tried the communication function of the prototype.

Only one post triggered an other participants to asks questions to get more information and on which the poster of the message answered in depth. From the six conversations two were triggered by a reflection, the messages were posted to admire the reflection that was posted.

If the communication behaviour of group one is compared with the communication via other media (see appendix E) of group one, there is more in depth communication behaviour. Most of the communication is done via e-mail. The total of ten emails sent by participants to other participants, eight are on tuning appointments made regarding the learning program, two are tips or sharing of valuable information between participants and one mail was used to give feedback on one of the assignments. Furthermore one telephone call was registered and one live event was organized on which four of the participants gathered. This reveals that the connectedness of the group is substantial and there are enough reasons to communicate.

In group two there have only been two participants that made use of the communication functionality within the prototype. One message was posted to give feedback on a reflection and the other message was posted to get an answer on a question related to the functionality of the prototype.

The communication behaviour via other media of group two was only performed by two participants. Seven email were sent by which three were sent to give feedback on an external assignment. Two were on information sharing and two were on making appointments regarding the learning program. Furthermore two phone calls were made to discuss an external assignment and one live gathering of four people of group two was arranged.

In total three conversation have been triggered by reflection that are posted. If this number is compared with the total number of conversation that are registered there is no significant effect seen by the reflection messages. Therefore there are no results that can falsify the hypothesis that states "reflection posts serve as a trigger for a dialog between participants via the information system or other types of media" .

7.3.2 Qualitative results

In this section the qualitative results are presented from the interviews that were held with the participants of the experiment. The quantitative results of the measurements related to three hypothesis presented in the previous section are evaluated against the findings from the qualitative results.

The interviews were semi-structured and the structure for the question was based upon the question guidelines given by Deterding, this can be found in appendix F. The overview of all the question that were used can be found in appendix G. All the given answers are categorized in the concepts of the MAO model. There are seven elements of ability, six elements of motivation and the opportune moments. The actually remarks made by the participants in the interviews can be read in appendix C.

Qualitative results on hypothesis 1

First the difference in remarks made by the active users in both the groups are addressed . While group one existed of eleven participants, only five of them have posted reflections with social comparison prototype more than two times. The interviews have given insight why this happened.

One of the users (P3, from group one) who viewed the social comparison prototype more than average (six times) has never posted any reflection. The reason for this is related to the factor on 'goal/plans' from the MAO model. She had in mind to only observe all the activities that would unfold on the social comparison prototype. She planned for herself to not participate in posting reflection. Her comments showed that she was also influenced by the social comparison principle. She did not want to be the first or last to post a reflection and therefore she waited repeatedly but did not act.

Other inactive users (P8 till P11 from group one) main reason to only view the social comparison prototype two times or less had to do with the little amount of time they had available. One person was on vacation, a second person was interested but could only be motivated to use it if there was a mandatory element into the usage of the social comparison prototype. The other two people both stated that the creation of the portfolio diminished every possibility to use the social comparison prototype.

The last inactive user had a motivation problem for using the social comparison prototype. The user acknowledge to have a great fear in posting his thoughts on a website on which others could read them later on. This fear kept him from posting reflection or others messages. Furthermore he was not interested in reading the thoughts of other people and therefore he only logged in twice.

Remarkably from the group of active users is that some were very motivated to use the prototype. P4 from group one for example had huge issues with the usability of the website. The reason was incompatibility of the used web techniques, that were not supported by here out-dated. She did not updated her iPad since she had receive him. However she managed to post reflection by using here iPad.

In comparison with group two major differences can be distinguished in the remarks made by the participants. In group one there were less usability/skill drivers, four drivers were mentioned, compared to the obstacles who were mentioned seven times. In group two the opposite remarks were made because four comments were on obstacles caused by usability or skills issues, while the users mentioned here seven drivers on this concept. Another difference in groups can be seen in the motivation component , group one did mention six drivers against nine obstacles. Group two however mentions ten drives for motivation against nine obstacles.

The differences between the number of views and reflections made between the two groups can be related to one person in group two, who has viewed the site more than 23 times which is three times more than the average number of views. Why she did view the site so many times has to do with the fact that she thought it was easy to access the website and that see created a habit in checking the website regularly. The person viewed the website often during the evenings when she was using here iPad to gather information on all sorts of interests. The qualitative data even shows that this person took her iPad to a foreign country

and checked the website also over there.

The last differences between the groups that could have a large impact on the usage of the prototype is related to the introduction of the two prototypes. The experiment in both groups started with an explanation of half an hour on how to use the prototype. However on the location of this explanation-meeting of group one there was no access to the internet and therefore no access to the prototype by all the participants.

The possibility of doing a live walkthrough with the participants of group one through the prototype diminished by this technical inconvenience. Only an explanation and some examples were given on how to use the prototype. In group two there was the possibility for all the participants to access the prototype and immediately try out the prototype and ask questions. This could have resulted in an overall increased ability of the participants of group two to use the prototype.

Qualitative results on hypothesis 2

During the interviews the participants did not mention anything on the microphone functionality. In the questions on usability and skills nobody referred to this function and therefore no results have been found that explain why people did not use this function. This shows that there was now awareness and interest in this functionality and that it has not helped to improve the ability factor of the users of the system.

Qualitative results on hypothesis 3

Results from the MAO analysis on the statements made by the participants in the interviews did not reveal findings that could have effect on the communication behaviour.

Qualitative results findings in general

In both groups the most active users have shown a clear reason why they checked the website more often than other users. The top user of group one did not use the iPad often. A function of his internet browser did trigger him to visit the website regularly. Every time he wanted to surf on the internet and he opened up his browser, it revealed an overview of the last visited websites. In this overview the link to the prototype was shown by which the user was reminded to visit the website.

The reason the top user of the second group visited the website so many times was foremost the intensive usage of the iPad. She was often triggered by the shortcut on the home screen of her iPad to visit the website, quite similar as the top user of group one. Furthermore the habit of checking the website in the evening while surfing the internet on her iPad seemed to have a great influence.

The attitude of a participant towards the technology used in this experiment plays a key role. One of the participants mentioned that he saw his iPad as a tool only used in relation with the learning program and work. Thus he associated work and learning with the usage of the iPad. He never used the iPad after working hours because his attitude was that he

did not want to work in the evening so therefore did not use the iPad as much. This scenario compared to the scenario of the top users immediately shows how an attitude towards technology can have impact on the usage of this technology. In the end it directly effects the usage of the information system build on top of this technology.

The most important key obstacle for not using the information system was the lack of time. Moreover many comments were made on answering the questions from the prototype was related to writing the portfolio. The portfolio was also a way for guiding reflection on the learning process. Therefore some participants had the feeling they were doing things twice.

However all who had addressed this issue stated that the prototype could serve as a new tool for guiding the reflection process. Many of the participants used own methods to log and reflect on events that happened during the learning program, if the prototype was available from the start of the learning program they could have used this a method to log and reflect on their learning activities.

These statements recognize that many participant already have methods to reflect or that they were in search for methods to reflect on their learning. This reveals the need to guide this process at the side of the participants.

Usability issues were reported by participants however the majority of the participants could work with the system without technical issues. The missing of the permanency functionality in the system caused some problems. First of all on the ability aspect because sometimes participants clicked on the wrong place by which their screen refreshed or went back to a previous page. When the participant had already typed some text input, this would result in loss of their already typed text.

Another major issue was the moment of introduction of the prototype. This could improve the usage of the prototype a lot. One of the participants from group two addressed this issue by declaring she was already in a state of 'saying goodbye'. Therefore she did not want to invest time in using the prototype. If it were available at the start the of the course, the prototype would have been of more valuable. Many other participants mentioned the bad point in time for introducing the prototype because of the portfolio that had to be written in the last month.

On the motivational aspect there are indicators that the persuasive principles influence the behaviour of the participants. Participants addressed this by saying "I saw a bunch of people posting reflections and therefore I felt an urge to do it also" or "It felt like some people drove me to place reflection". Besides positive influence also side effects were mentioned by the active users. The top user of group one stated that he eventually quit using the prototype because 'nobody' else was using it. An user from group two stated that he first enthusiastically placed reflections. However the fact that had placed so many reflection gave him the feeling to be ahead of what was normal. This attitude eventually caused him to pay less attention to the timeline and therefore becoming less active.

Chapter 8

Conclusion

This chapter summarizes the main findings of this research and opens up the discussion on these results. First all sub-questions will be addressed to sum up all the findings from these question. Therefore the first part of the conclusion is a summary of this thesis. Secondly the main research question will be answered and the research objectives are evaluated. In this evaluation the new knowledge is described that can be added to the knowledge base on persuasive technology and self-directed learning. At the end the findings will be discussed and implications for further research are given.

8.1 Summary

8.1.1 What is self-directed learning?

The definition of Knowles (Merriam, 2001) is the best answer to the first sub-question of this thesis. Knowles declares that self-directed learning is identified when "individuals (1) take the initiative,(2) with or without the help of others, (3) to diagnose their learning needs, (4) to formulate learning goals,(5) identify human and material resources for learning, (6) choose and implement appropriate learning strategies, and (7) evaluate learning outcomes".

More recent research done by Lindstaedt et al. (2009) and Stubbé and Theunissen (2008) does not reveal other properties of self-directed learning. Lindstaedt et al. (2009) describe the properties three till seven more specific , by elaborating on them via the theory on preparatory, executive and closing learning functions. Furthermore they make clear arguments why property two and five are important by addressing the social aspects that are crucial for self-directed learning.

The meta-review of Stubbé and Theunissen (2008) acknowledge all the characteristics of Knowles. Most important differences compared to the theory of Lindstaedt et al. (2009) is the emphasis on the physical environment and the learning function reflection. The first concept is not mentioned by other authors . Reflection is mentioned by Lindstaedt et al. (2009), however Stubbé and Theunissen (2008) put much more emphasis on reflection as Lindstaedt et al. (2009) name reflection only as one of the many learning activities.

8.1.2 What is persuasive technology?

This sub-research question is answered by addressing three perspectives on persuasive technology. In this research the focus is on computer technology as persuasive technology ('captology') and therefore the definition of Oinas-kukkonen and Harjumaa (2008) on 'captology' has been used throughout the research. They define computers as persuasive technology as "computerized software or information systems designed to reinforce, change or shape attitudes or behaviours or both without using coercion or deception".

The second perspective on persuasive technology is the behavioural model of B. Fogg (2009b). This model can be used best for explaining the concept of persuasive technology by using the three concepts of motivation, ability, and triggers to determine if someone is going to perform behaviour and show that these three concepts can be influenced by technology.

Fogg's theory is criticized by Deterding (2012a). According to Deterding (2012a) the concept of motivation is not based on proper motivational research from the psychology discipline, the concept of ability does not acknowledge the "love for learning" humans inherently have and the concept of triggers has a too behaviouristic perspective on when people perform behaviour. The Motivation, Ability and Opportunity model, the third perspective, is proposed by Deterding (2012a) which has a more balanced view based upon cognitive and behaviouristic psychology theory.

8.1.3 How is self-directed learning supported via technology in the case study at Kessels & Smit?

The analysis of the used technology within the case study at Kessels & Smit is performed by a combination of the PSD of Oinas-Kukkonen and Harjumaa (2008) and the Behavioural Model of B. Fogg (2009b). The PSD model of Oinas-Kukkonen and Harjumaa (2008) has a more holistic view on persuasive technology and therefore it was better suited as analytic tool for the already used technology in the case study of this research. However, to perform an analysis of the user context, the behaviour model has been integrated into the PSD model. How technology exactly supports the self-directed learning can be seen in appendix D. There are multiple findings as a result of this analysis.

Reflection plays a central role in a large part of the learning program of KS. The first three phases are on reflection and getting to know the participant better while only the activities in the fourth phase are on to executing particular actions that will change the behaviour and attitude of the participant.

Two methods to support the reflection process are identified. The first is supplying questions to guide the reflection process and the second is reflection during working hours supported by text messages with questions. Both approaches worked. However the second approach did not receive many positive reactions. Most of the participants were distracted from their work or could not find the time to answer the question. The moment of reflection therefore could be improved.

From all the activities that were supported by technology, one activity can be seen as a failure in persuading people to perform the target behaviour. A tool to improve social interaction

was a major failure of technology used in the Ahold Management Program (AMP) to persuade people in interacting with each other. This attempt however emphasizes the need for supporting the social environment within the adult learning program.

The AMP resembles much of a persuasive system itself. The second and third phase have the purpose of finding out what the participants want to achieve in the AMP. This information allows the producers of the learning program to better change the behaviour and attitude of participants because they know what the motivations and abilities are of the participants of the AMP. However in the overall information events there is only one event that makes use of interactive communication via the technology. If more information on the participants would be sent back, the participant's motivations could become more clear and this information could be used to adapt the exercises and assignments for the person.

8.1.4 What are the requirements for an information system that supports self-directed learning within an adult learning program?

The most important requirement comes from the experts who are involved in the process of building the information system. They define the most important requirement as "the system needs to have elements of a social medium to support the social environment within the learning program".

The importance of this requirement is acknowledged by the literature. In both studies on computer environments that support self-directed learning, the requirement of supporting the social environment is mentioned explicitly. The request to integrate elements of a social medium into the to-be built artefact therefore can be seen as a implementation of the requirement of 'supporting the social environment' from the literature.

Furthermore the characteristics of a ubiquitous learning environment can be used as requirements that need to be incorporated into the system. The system therefore has to satisfy the non-functional requirements of permanency, accessibility, immediacy, interactivity, situating of instructional activities and adaptability. These six characteristics have proven to enable a system to support self-directed learning and this make them important requirements (Stubbé & Theunissen, 2008).

The last requirement for the system is the support of 'self-regulating learning strategies' and 'reflection' because these two concepts of self-directed learning are not satisfied by characteristics of current ubiquitous learning environments according to the research of Stubbé and Theunissen (2008). This unfulfilled requirement could be supported by adding functionalities to the to-be designed system that can satisfy the requirements of supporting 'self-regulating learning strategies' and 'reflection'.

8.1.5 Does an implementation of persuasive technology support self-directed learning in an adult learning program?

The last chapter tests the requirements from chapter six by implementing persuasive technology in an adult learning program. Three hypothesis are tested to validate if the persuasive information system influences the motivation and ability of the participants towards the two

types of target behaviour. The target behaviours are posting reflections and communicating with others.

Hypothesis 1: The possibility to compare (social comparison principle) the performed behaviour (posting reflections) more easily with others, motivates participants more than when it is only possible to observe the behaviour of others (social learning principle).

The quantitative data does not indicate a difference of the target behaviour of the participants while using a prototype with the social comparison principle, compared the usage of the prototype with an implementation of the social learning principle. The qualitative data from the interviews with the participants however show that the participants experienced an influence created by the persuasive principles.

Besides positive influence also side effects were mentioned by the active users. The top user of group one stated that he eventually quit using the prototype because 'nobody' else was using it. The results from the interviews show no significant difference between the usage of the implementation of the social comparison principle and the implementation of social learning principle. Therefore this hypothesis cannot be verified.

Hypothesis 2: The possibility to post reflections, comments or questions by posting an audio message has a positive effect on the number of messages (reflections, comments or questions) a person posts.

During the experiment none of the enabled users has ever used the audio message functionality and therefore no results can be compared. The fact that nobody has used the functionality can be explained by the factor simplicity of the behaviour for posting an audio message. The usability was to low (an external program had to be installed) and there was no need at the participants side to post audio messages.

Hypothesis 3: The reflection posts serve as a trigger for a dialog between participants via the information system or other types of media.

In total three conversations have been triggered by reflections that are posted. If this number is compared with the total number of conversations that are registered there is no significant increase of communication detected triggered by the reflection messages. Therefore there are no results that can validate hypothesis three.

8.2 Main research question

The main research question that was defined from the problem statement of this thesis is:
How can persuasive technology be used to support self-directed-learning behaviour in adult learning programs?

In general the combination of findings provide support for the conceptual premise that persuasive technology can support self-directed learners. The literature study on persuasive technology has resulted in 28 persuasive design principles. These principles can motivate or

increase the ability for people to perform activities related to self-directed learning.

The literature on computer environments to support self-directed learning moreover provided six non-functional requirements for an information system to support self-directed learning. An experiment with a two prototypes of persuasive technology, based upon the social comparison or social learning principle from the 28 persuasive principles, has shown that it is possible to persuade people in doing learning activities that support self-directed learning.

From the experiences of the users the general conclusion can be drawn that the social persuasive design principles has a positive influence on the usage of a reflection tool. Unfortunately on the long run also effects of negative influence were identified by the participants. The top user from group one stopped posting reflections because others were not participating. A user from group two stated that the notion of being a head of the group caused him to lower his attention on the use of the prototype. The participant did not post any reflection after this moment.

The remarks of the participants in both groups reveal the influence of the persuasive principles. The evidence of the experiment cannot conclude that one of the two persuasive principles that have been used was more persuasive. The reason for this can be that the two implementations of the persuasive principles on social learning and social comparison did not differ enough. The implementation of the prototypes in an adult learning program resulted in positive reactions of the users who were themselves experts in supervising adult learning programs. Therefore the context in which persuasive technology can be used (an adult learning program) is suited for the application of such technology.

To conclude, the following requirements are summarized that need to be present by which persuasive technology can be used to support self-directed learning. Firstly, one of the learning activities that is related to self-directed learning (see chapter one for an overview of learning activities that enable self-directed learning) has to be supported by the information system. This can be done by increasing the ability of the self-directed learner while he or she is using the technology. In this research the activity of reflection has been chosen as learning activity that is supported by a set of questions to guide the person through the reflection process.

Secondly , the social environment of the self-directed learner has to be supported. Technology could support this by creating the ability to monitor actions performed by fellow participants in an adult learning program. This enables the participants to view performed behaviour from their social environment regarding the adult learning program. Besides this advantage, the support of the social environment can be combined with the persuasive principles that are related to social support principles defined by Oinas-kukkonen and Harjumaa (2008) The experiment has shown that these social support principles can have a positive influence on the behaviour of participants.

Thirdly, the content of the information system that is used as persuasive technology has to resemble the concepts from the adult learning program. By creating an information system that shows information on real activities from the physical environment of the learning program (for instance the assignments that have to be executed and the meetings that are planned) it immediately addresses the usefulness for the participants and in the end the overall persuasiveness.

8.3 Research objectives

This master thesis was set out to assess multiple objectives from the application and research domain. The following section will assess all the objectives and evaluate if these objectives have been met.

8.3.1 The objectives for the application domain

From the application domain there was a need for a tool that could support people in adult learning program in becoming and behaving like self-directed learners. This research resulted in a prototype of such a tool based upon the specified requirements. The prototype has become an information system that can be classified as persuasive technology because it enables the user of the technology to increase his or her ability and motivation towards a self-directed learning activity.

The results of the experiment with the prototype have been evaluated and incorporated in the following design cycle for the technology used in the adult learning programs at K&S. Therefore this can be seen as the first contribution to the knowledge base in the application domain. In the classification of knowledge that generated by design science research proposed by Iivari (2007), this knowledge can be classified as prescriptive knowledge. The prototype is a possible instantiation of the concepts of persuasive technology to support self-directed learning. Furthermore the requirements are results of this research that is also prescriptive knowledge, they describe the functionality of the system.

8.3.2 Objectives for academic research

Evaluation of design methods and design tools

The first objective was to evaluate the described design methods and design tools from persuasive technology domain. The following methods and tools were used during this research: the behaviour model of B. Fogg (2009b), the Persuasive System Development model (PSD) of Oinas-kukkonen and Harjumaa (2008) and the MAO model of Deterding (2012a).

To evaluate the used technology in the previous adult learning programs the Persuasive Development Model has been applied, the results can be found in chapter five and appendix D. The PSD model describes the context of the adult learning program in a structured way. The abstract perspective of the model enables it to be applied on a broad range of systems. This is a shortcoming of the behaviour model which is too specific to apply on larger systems in a more general context. In the analysis of the Ahold Management Program the behaviour model has been used to check if the used technology influenced the concepts of motivation and ability described in the user profile (the user profile can be found in chapter 5.3.2). The behaviour model furthermore comes of use for explaining the concept of persuasive technology and for evaluating the specific situation which can be approached with a behaviouristic psychology perspective (for instance small habit formation).

In the evaluation of the prototype the MAO model of Deterding (2012a) was deployed. This method has a more cognitive approach on the concepts of motivation and ability however it

also addresses the behaviouristic elements that are related to behavioural change. The MAO model addresses a broader range of factors that influence behaviour change and therefore it is the most applicable model that can be used in further research. Furthermore the question guidelines (see appendix F), enabled the researcher to better address the factors influencing the behaviour of people, in the interviews with the participants of the experiment. The MAO model itself (see appendix F) is a useful framework for evaluating the statements made by the participants in the interviews. It generates a clear overview of key drivers and obstacles for performing the planned behaviour.

The evaluation of methods and tools to design persuasive technology can be added to the knowledge base on persuasive technology as prescriptive knowledge classified as design process knowledge. Deterding (2012b) clearly identifies steps that can guide the process of designing persuasive technology that are based upon the MAO model. Furthermore conceptual knowledge can be added to the academic knowledge base because there is currently no scientific article that describes the concepts and constructs used by Deterding, Dixon, Khaled, and Nacke (2011); Deterding (2012a, 2012b).

Discover new persuasive strategies

The second objective for the academic domain was on finding new persuasive strategies that could be used by persuasive technology to persuade people in doing behaviour. The literature study and interviews with the experts did not reveal new persuasive strategies. The analysis of the adult learning program however revealed how closely related the adult learning program is to a persuasive system.

In the first half of the program the activities are used to 'analyse the persuasion context' and in the activities the producers of the journey try to get a grasp of the "user's needs, interests, motivations, abilities, pre-existing attitudes, persistence of change, cultural factors, deep-seated attitudes, social anchors and perhaps even the whole personality" (Oinas-kukkonen & Harjumaa, 2009). An improvement of this process could be to redirect the information on user's needs, motivations, etc., which stays at the participants in the current situation and is not sent back to the experts that guide the participants in the behavioural change process.

The only persuasive strategy that could be identified from the adult learning program which could be inspiration for a new strategy in persuasive technology was identified in the last phase of the adult learning program. In the last phase the activities focus mostly on changing behaviour from the participants. Remarkable about this phase is the order of activities. Instead of first informing the participants on how to behave differently in new situation at their work, the producers of the AMP urge the participants to do three assignments. The assignments are created by fellow participants. After these assignments there will be a day full of instruction on how to handle with the situation that occurred in the previous assignments. After this instruction day the participants will receive an assignment named 'a slice of work' in which they have to prove that they changed their behaviour.

The participants first experienced the behaviour they perform in a situation by doing three assignments. After these assignments it is easier to establish a behaviour change when information about, how to change, can be connected to experiences from the past. Apparently

the information has more impact when it can be related to previous experiences. This could also be used in persuasive technology.

Instead of directly increasing the ability of people to perform the behaviour (for instance via a tutorial) it could be better to let them experience a little bit of friction or failure in the current situation. This will increase the motivation to process the information that will follow up after this experience. Hereby increasing the impact of the given information. This order of providing information to users of persuasive technology could be used to make them more motivated to process information that is given. The previous described method could form a new strategy on how to present information towards users of persuasive systems. The new knowledge that can be added from this academic research objective is the previous described observational fact which is descriptive knowledge.

Overview on the different perspectives on persuasive technologies

The third objective of this research was to get a better overview on the different perspectives on persuasive technologies. At the beginning of this research it was difficult to get an overview of all the aspects that are related to persuasive technology and design. Literature mentioned the multidisciplinary nature of persuasive technology that caused this problem however no literature was found that gave a solution to this problem, for instance by creating a relational map of all the research fields related to persuasive technology and their concepts.

The concept of 'Design with Intent' has been taken as the most generalized view on behavioural change by technology. Lockton et al. (2009) have defined Design with Intent as "design intended to influence or result in certain user behaviour across a range of disciplines from architecture to software.". The notion of influencing behaviour is clear to let 'Design with Intent' be related towards Persuasive technology. The biggest difference between 'Design with Intent' and persuasive technology has to do with one of the perspectives that is introduced in the 'Design with Intent' theory. Lockton et al. (2009) come up with the security lens which is used to change "undesired user behaviour" because it "is something to deter and/or prevent though 'countermeasures'" (Lockton, Harrison, & Stanton, 2010). These countermeasures will be forced upon people which diminishes the possibility to use no coercion. Hereby an important property of persuasive technology is missing.

Persuasive technology can be seen as subset of 'Design with Intent' which stretches across a range of disciplines, however does not allow coercion for influencing behaviour. In the domain of persuasive technology three sub-domains are identified. The first is Captology defined by Oinas-Kukkonen and Harjumaa (2008) as "computerized software or information systems designed to reinforce, change or shape attitudes without the use of coercion or deception.". So in this persuasive technology research the focus was on captology. However the term persuasive technology in relation with ICT is much more used in the academic research than captology for some unclear reason. This has also been notified by Hasle (2011) who says "Fogg's work sparked off several studies and papers in the field of Persuasive Technology (PT), or Persuasive Design (PD), terms which eventually became more common than captology".

One of the two other subdomains within persuasive technology can be identified as gamification. The definition of gamification most widely used is "the use of game design elements in non-game contexts" (Groh, 2012). Gamification is mostly on creating motivation on the

side of the user by introducing game elements in processes which have a non-game context. Gamification can be applied in to information systems however also processes in which no ICT is used can be improved by gamification. In gamification the issue on increasing ability is not often or implicitly addressed.

The last sub-concept is on 'transformational products'. Transformational products have the following properties: they are "materialized arguments" (Redström, 2006), which "draws its users into a playful 'dialog loop' about their current self and potential alternative selves (...) this playful, positive confrontation (the 'dialog loop') with own attitudes and behaviour seems crucial" (Kehr, Hassenzahl, Laschke, & Diefenbach, 2012) to identify something as a transformational product.

Normal technologies are problem solvers, because they are "supposed to follow an according aesthetic of efficiency, ease and - ultimately - automation of behaviour" (Laschke, Hassenzahl, & Diefenbach, 2010). Transformational products are technologies that do not increase ability and are referred to troublemakers, designed to break up routines and to let people reflect on their attitudes and behaviour.

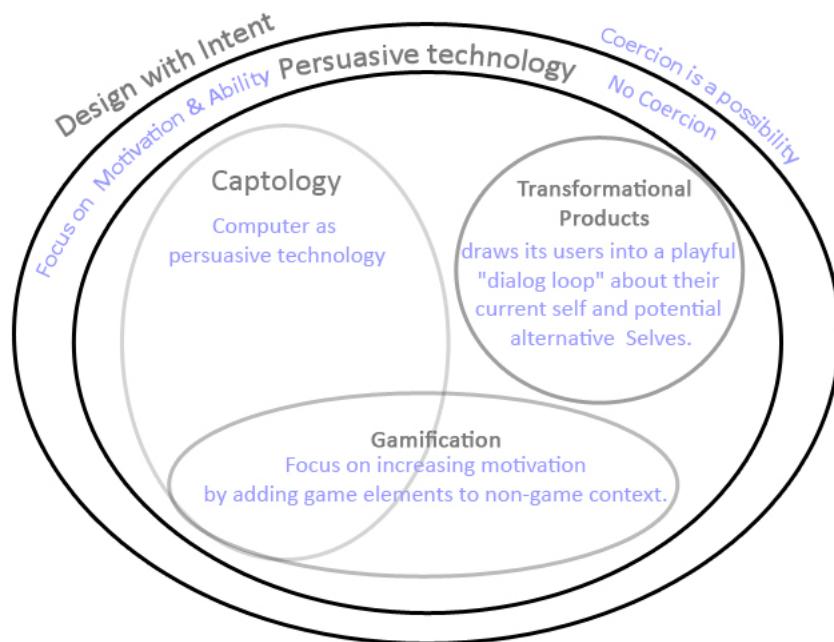


Figure 8.1: Overview of concepts related to 'behavioural change by design'.

Effect of persuasive technology on attitude change

The last objective concerns the effect of persuasive technology on attitude change. The study on the theory of adult learning did not result into findings that could be applied in the analyse of the effect of attitude change by the usage of persuasive technology. Only the MAO model of Deterding (2012a) incorporated the concept of attitude in relation with behaviour change. However no new knowledge can be added to the knowledge base from this research objective.

8.4 Discussion

Finally, several important limitations have to be considered. Firstly, the case study could have been more detailed when the real participants from the Ahold management program could have been interviewed shortly after they had used the technology described in the case study.

Secondly, the implementation of the different persuasive principles in the two prototypes could have been differentiated more. The technical constraints on the prototype had too much influence on the implementation of the persuasive principles. Also user testing of the prototype before the experiment started was limited to one person.

Differentiation between the principles could be achieved by giving more feedback towards the user while using the social comparison principle, that shows more explicitly the differences in behaviour between participants. This can be done for example by sending feedback messages that explicitly mention that a user has posted a first reflection, or he or she was last in posting a reflection.

In the analysis of the results from the experiment there are also weaknesses. The most important issue has to do with the interviews. Due to time constraints not all the participant could be questioned for half an hour, the time necessary to treat all the questions. This made some interviews more in depth and more structured than others which can have big influence on qualitative results overview.

Due to lack of time of time between the end of the experiment and the interviews no thorough analysis could be made from the qualitative data. Hereby the interviews missed the opportunity to compare the statements of the participants directly with the actual behaviour they had performed. The direct comparison of data with the actual behaviour could have triggered more interesting questions on the difference between the actual behaviour and the perceived behaviour of participants.

The last remark on the interviews is on the questions that were focussed too much on the behaviour of posting reflections and did not addresses the behaviour on social interaction. The target behaviour could have been differentiated better. A solution to this problem is to create questions that address all the aspect of the MAO model for every individual target behaviour. By doing this the questions for the participants would be more specified towards the target behaviour and none of the element influencing the target behaviour would be left out.

Another point for discussion is on the support of self-directed learning in the context of an adult learning program. It could be argued that the context diminishes the possibility for real self-directed learning. This type of self-directed learning within learning programs is also mentioned by Stubbé and Theunissen (2008). They describe the situations like the adult learning program from the case study is a good example of a '*directed-self-directed training*'. The company (Ahold) arranges the learning process via KS. However, in the learning process goals are being made with the participants while executing the learning program. In this situation the self-directedness of learning comes forth because the participants can determine their own goals and be self-directed learners. Furthermore accomplishing the journey requires a self-directed learning attitude to achieve all the goals that the participants themselves have defined.

8.5 Further Research

The results from the literature studies have shown the upcoming interest in the research on technology to support self-directed learning. In this research the addition of the perspective on persuasive technology towards the current used technology to support self-directed learning adds new insights towards the subject of self-directed learning supported by technology. In further research the primarily findings from this research need to be validated by using an improved version of the prototype in an adult learning program.

The validation could be improved by connecting the concepts from the MAO model to the target behaviour that needs to be validated. Hereby the hypothesis could become more clear and measurable and the answer on why behaviour is performed or not, could be addressed more easily.

Furthermore the comparison between the context in which the prototype is used could be of interest. The prototype has now been used in an adult learning program, however this could be identified as learning that is not truly self-directed. This remark has been made in the discussion section, the prototype supports 'direct-self-directed learning' instead of self-directed learning. Research needs to be done to use the prototype without the context of an adult learning program.

The results of this future research can tell more about the influence of the prototype on a self-directed learner without the influence of the learning program. The research question could be 'Is persuasive technology persuasive enough to persuade people to start learning in a self-directed manner without the context of an adult learning program?'.

The use of the MAO model during the design process of new persuasive system can also be investigated in future research. In this research the MAO model has been used to evaluate the two prototypes, this has shown that it is an improvement in comparison with the behaviour model and the persuasive development model.

However this research has not created empirical evidence on how the MAO model and the described design process method of Deterding (2012a) could improve the result of the persuasive design process. The detailed concepts on Motivation, Ability and Opportunity can have great influence on how an artefact is designed and introduced in his user context. This has to be investigated in further research to create a better design method for creating persuasive technology.

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Appendix A:

Question from the checklist of design science made by Hevner & Chatterjee (2010).

The number of the questions can be mapped to the number in the figure at the bottom of this page.

1. What is the research question (design requirements)?
2. What is the artefact? How is the artefact represented?
3. What design processes (search heuristics) will be used to build the artefact?
4. How are the artefact and the design processes grounded by the knowledge base? What, if any, theories support the artefact design and the design process?
5. What evaluations are performed during the internal design cycles? What design improvements are identified during each design cycle?
6. How is the artefact introduced into the application environment and how is it field tested? What metrics are used to demonstrate artefact utility and improvement over previous artefacts?
7. What new knowledge is added to the knowledge base and in what form (e.g., peer-reviewed literature, meta-artefacts, new theory, new method)?
8. Has the research question been satisfactorily addressed?

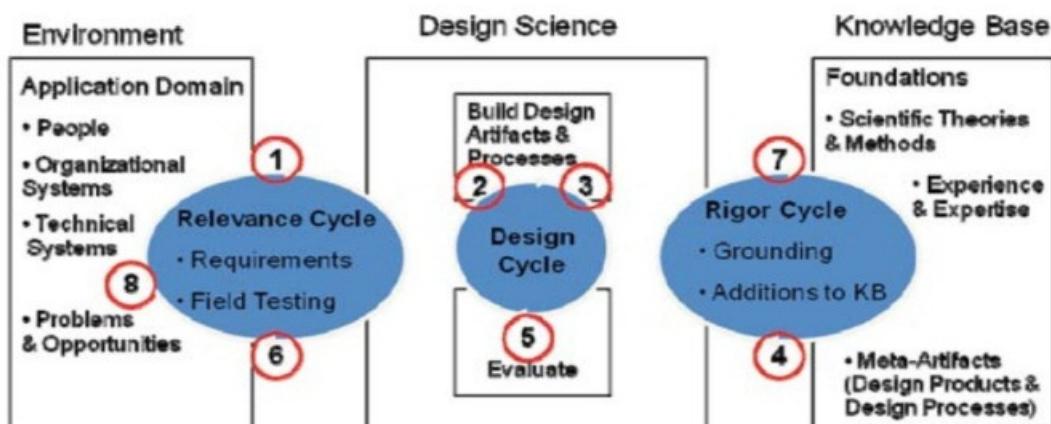


Fig. 2.3 Questions mapped to three design research cycles

Appendix B

Overview of persuasive principles

Primary task support:

#	Principle	Example requirement	Example implementation
1	Reduction A system that reduces complex behavior into simple tasks helps users perform the target behavior, and it may increase the benefit/cost ratio of a behavior	System should reduce effort that users expend with regard to performing their target behavior.	Mobile application for healthier eating habits lists proper food choices at fast food restaurants Smoking cessation Web site provides an interactive test that measures how much money a user will save with quitting.
2	Tunneling Using the system to guide users through a process or experience provides opportunities along the way to persuade.	System should guide users in the attitude change process by providing means for action that brings them closer to the target behaviour.	Smoking cessation web site offers information about treatment opportunities after a user has taken an interactive test about how addicted (s)he is on tobacco.
3	Tailoring Information provided by the system will be more persuasive if it is tailored to the potential needs, interests, personality, usage context, or other factors relevant to a user group.	System should provide tailored information for its user groups.	Personal trainer Web site provides different information content for different user groups, e.g. beginners and professionals. Website for recovering alcoholics presents stories that are close to the user's own story.
4	Personalization A system that offers personalized content or services has a greater capability for persuasion	System should offer personalized content and services for its users	Arguments most likely to be relevant for the user presented first on a professional website rather than in random order.
5	Self-monitoring A system that keeps track of own performance or status supports the user in achieving goals	System should provide means for users to track their performance or status	Heart rate monitor presents a user's heart and the duration of the exercise Mobile phone application presents daily step count.
6	Simulation Systems that provide	System should provide means for observing	Before-and-after pictures of people who have lost weight are presented on a

	simulations can persuade by enabling users to observe immediately the link between cause and effect.	the link between cause and effect with regard to users behaviour.	website.
7	Rehearsal A system providing means with which to rehearse a behaviour can enable people to change their attitudes or behaviour in the real world	System should provide means for rehearsing a target behaviour	A flying simulator to help flight pilots practice for severe weather conditions

Dialogue support principles:

#	Principle	Example requirement	Example implementation
8	Praise By offering praise, a system can make users more open to persuasion	System should use praise via words, images, symbols or sounds as a way to provide user feedback information based on his/her behaviours	Mobile application that aims at motivating teenagers to exercise praises user by sending automated text-messages for reaching individual goals.
9	Rewards System that reward target behaviours may have great persuasive powers	System should provide virtual rewards for users in order to give credit for performing the target behaviour	Heart rate monitor gives users a virtual trophy if they follow their fitness program. Game rewards users by altering media items, such as sound, background skin, or a user's avatar according to user's performance.
10	Reminders If a system reminds users of their target behaviour, the users will more likely achieve their goals.	System should remind users of their target behaviour during the use of the system.	Caloric balance monitoring application sends text-messages to its users a daily reminders.
11	Suggestion System offering fitting suggestions will have greater persuasive powers	System should suggest that users carry out behaviours during the system use process.	Application for healthier eating habits suggests that children eat fruits instead of candy at snack time.
12	Similarity People are more readily	System should imitate its users in some	Slang names are used in an application which aims at motivating teenagers to exercise.

	persuaded through system that remind them of themselves in some meaningful way.	specific way.	
1	Liking	System should have a look and feel that appeals to its users.	Web site that aims at encouraging children to take care of their pets properly has pictures of cute animals.
1	Social role	System should adopt a social role.	E-health application has a virtual specialist to support communication between users and health specialists.

System credibility support:

#	Principles	Example requirement	Example implementation
15	Trustworthiness A system that is viewed as trustworthy will have increased powers of persuasion	System should provide information that is truthful, fair and unbiased	Company website provides information related to its products rather than simply providing biased advertising or marketing information.
16	Expertise A system that is viewed as incorporating expertise will have increased powers of persuasion	System should provide information showing knowledge, experience and competence.	Company web site provides information about their core knowledge base. Mobile application is updated regularly and there are no dangling links or out-of-date information.
17	Surface credibility People make initial assessments of the system credibility based on a firsthand inspection.	System should have competent look and feel.	There are only a limited number of and a logical reason for ads on a web site or mobile application.
18	Real-world feel A system that highlights people or organisation behind its content or services will have more credibility.	System should provide information of the organisation and/or actual people behind its content and services.	Company web site provides possibilities to contact specific people through sending feedback or asking questions.

19	Authority A system that leverages roles of authority will have enhanced powers of persuasion.	System should refer to people in the role of authority	Websites quotes an authority such as a statement by a government health office.
20	Third-party endorsements Third-party endorsements especially from well-known and respected sources boosts perceptions on system credibility.	System should provide endorsements from respected sources.	E-shop shows a logo of a certificate that assures that they use secure connections.
21	Verifiability Credibility perceptions will be enhanced if a system makes it easy to verify the accuracy of site content via outside sources.	System should provide means to verify the accuracy of site content via outside sources.	Claims on a website are supported by offering links to other websites.

Social support principles:

#	Principles	Example requirement	Example implementation
22	Social learning A person will be more motivated to perform a target behaviour if(s)he can use a system to observe others performing the behaviour.	System should provide means to observe other users who are performing their target behaviour and to see the outcomes of their behaviour.	A shared fitness journal in a mobile application for encouraging physical activity.
23	Social comparison System users will have a greater motivation to perform the target behaviour if they can compare their performance with the performance of others	System should provide means for comparing performance with the performance of other users.	Users can share and compare information related to their physical health and smoking behaviour via instant messaging application
24	Normative influence	System should	A smoking cessation application shows

	A system can leverage normative influence or peer pressure to increase the likelihood that a person will adopt target behaviour	provide means for gathering together people who have the same goal and make them feel norms.	pictures of new-born babies with serious health problems due to the mother's smoking habit.
25	Social facilitation System users are more likely to perform target behaviour they discern via the system that others are performing the behaviour along with them.	System should provide means for discerning other users who are performing the behaviour.	Users of computer-based learning environments can recognize how many co-students are doing their assigned homework at the same time as them.
26	Cooperation A system can motivate users to adopt a target attitude or behaviour leveraging human beings natural drive to cooperate.	System should provide means for co-operation.	The behavioural patterns of overweight patients are studied through a mobile application which collects data and sends it to a central server where it can be analysed at the group level in more detail.
27	Competition A system can motivate users to adopt a target attitude or behaviour by leveraging human 's natural drive to compete.	System should provide means for competing with other users.	Online competition, such a quit and win (stop smoking for a month and win a prize).
28	Recognition By offering public recognition for an individual or group, a system can increase the likelihood that a person/group will adopt a target behaviour.	System should provide public recognition for users who perform their target behaviour.	Names of awarded people, such as "stopper of the month," are published on a Web site. Personal stories of the people who have succeeded in their goal behavior are published on a smoking cessation Web site.

Appendix C:

Group one:

Ability:

Goals, Plans:

Key drivers:

1	Cheyenna: het was wel dat je in het begin je als doel had genomen dat je het zou gaan gebruiken -Ja dat zeker.
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Key Obstacles:

1	Elisabeth had al besloten niet echt mee te doen en dan valt de vergelijking mechanisme ook wel een beetje weg. Het motiveert dan niet zo zeer meer.
2	Cheyenna: Ja ik heb het ook best actief gedaan in het begin maar ik merkte dat ik op een gegeven moment links heb laten liggen omdat de ik portfolio gewoon af moest maken.

Self-efficacy:

no experience where described that involved the concept of self-efficacy

Mindfulness, Willpower:

no experience where described that involved the concept of Mindfulness, willpower.

Skill, Usability:

Key drivers:

1	Bert: Nee ik heb er niet echt lang naar gekeken, ik heb een beetje aangeklikt, de fotootjes en de verhaaltjes. Dat begreep ik allemaal wel maar het is meer van wat zal ik er mee doen wat mij tegenhield.
2	Klaas: Of het nu via een Ipad gaat of computer maakt klaas niets uit Hij gebruikte het meeste de computer.
3	Nee k ben er niet tegen aangelopen dat de hele site er uit viel of dat ik er niets meer van begreep. Maar het is wel zo dat je eerst even je weg moet vinden. JE moest toch even op bepaalde dingen klikken om te kijken hoe ze werken.
4	Ja maar en dat werkt maar je moet gewoon even weten welke knop waar voor is.

Key Obstacles:

1	Masja kon niet scrollen op haar iPad door een oude versie van Safari, ze had hem nooit geupdate.
2	Masja: gebruikersnaam. Hoofdletters op ipad levert ook problemen op.
3	Masja: problemen met wachwoorden, Je weet niet wat je fout doet, of wachtwoord of username

4	Masja heeft dus falende bruikbaarheid door oude iPad. Daar begreep ze de site niet goed. Voor marja was het niet duidelijk. Je zou hem sneller open op iPad en het inloggen gaat niet goed.
5	Cheyena: Nee, het is meer de prioriteit, als je wil kun je de dingen echt wel vinden en ze uitvoeren. Ik denk wel dat daar verbeteringen gemaakt kunnen worden.
6	Cheyenna: het beginscherm; als je het fout doet en je moet het opnieuw doen dan krijg je niet automatisch het nieuwe inlogscherm te zien maar dan moet je weer het scherm naar beneden halen. Dat zijn kleine dingen.
7	Cheyenna: Ook de knoppen opzich zelf zijn beetje verwarring, het vraagteken verwacht je dat mensen antwoorden krijgen op vragen ipv vragen stellen. Het i-tje

Habits:

Key drivers:

1	Doordat er een shortcut automatische verscheen in de browser keek Klaas toch vaker op de website omdat hij snel even doorklikte.
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Key Obstacles:

1	Elisabeth: Daar hebben we de portfolio voor maar dat is ook zeer intensief, met deze vragen wordt je er wel steeds weer even bewust van.
2	Cheyenna: Het schrijve van de portfolio is echt het reflectie moment. Dat vind ik belangrijker en dat geeft voor mij het gevoel dat het extra werk is in plaats van toegevoegde waarde. Ook de feedback op de check-in vraag ik mij af of ik dat nodig heb.
3	Cheyenna: Het gevoel dat ik heb is dat het beantwoorden van die vragen eigenlijk al in je portfolio gebeurd meer op je eigen manier en dan is het eigenlijk een soort dubbelwerk.

Resources:

Key drivers: No key drivers where identified during the interviews.

Key obstacles:

1	en ik weet dus niet of dat in de andere periodes zal verschillen maar je zit zo in de waan van de dag, dat je hele tijd afvraagt waar leg ik mijn prioriteiten neer
2	Ton Tobi; ik heb er echt geen tijd voor gehad
3	Jeroen: ik had echt geen tijd, was op vakantie had dus geen ipad/internet etc
4	Elisabeth: Verder ook de portfolio die enorm veel tijd in beslag nam. Ik dacht toch wel van laat ik eerst zelf mijn portfolio afmaken voordat ik daar op in ga. In je hoofd kost het ook tijd en je wil het toch goed doen.

Social Support:

Key drivers:

1	Masja; ik heb Klaas gevraagd om te vragen hoe het precies werkte.
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Motivation

Awareness:

Key drivers:

1	Elisabeth: (Over of hetzelfde mogelijk is met de NING pagina) Dat kan wel maar dan moeten we daar afspraken over maken en concrete stappen over ondernemen. Hier krijg je SMSjes en is het meteen duidelijk wat je moet doen en dat is wel beter als bij de NING. Dat is gewoon een los instrument en dit is veel meer ingebakken.
2	Elisabeth: Daarom werkt mijn idee wel enigszins beter door de integratie met het werken, in de context.
3	Vindt je het interessant om te weten? Cheyenna :Ja dat vind ik interessant (...)
4	Ton Tobi; ik zou er graag een keer gebruik van maken.

Key obstacles:

1	Bert: Nee ik heb er niet echt lang naar gekeken, ik heb een beetje aangeklikt, de fotootjes en de verhaaltjes. Dat begreep ik allemaal wel maar het is meer van wat zal ik er mee doen wat mij tegenhield.
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Attitude/emotions:

Key drivers:

1	Cheyenna: Het delen van de berichten met de mensen uit de LCL vindt je geen probleem? Nee zeker niet. Want we volgen allemaal die opleiding maar ik vind niet dat andere buiten de opleiding dit hoeven te volgen.
2	Cheyenna: Nee je hebt ook persoonlijke berichten op facebook, maar ik zou het niet fijn vinden om dit op je facebook profiel te plaatsen. Niet iedereen hoeft lastig te worden gevallen met mijn bevindingen van mijn studie.

Key obstacles:

1	Bert: Nou meer net zoals met andere netwerk, niet echt diepgaand maar het zou eigenlijk tot een hoger plan moeten komen, maar daar ben jezelf debit aan omdat je er niets op zet. Maar het zou mooi zijn als dat meer zou zijn.
2	Bert: Sowieso dat het wel en dan ben ik eerder een volger dan trendsetter die in één keer mee gaat doen.

Motivations:

Key drivers:

1	Elisabeth: Combinatie van vragen zijn interessant genoeg en omdat andere het ook deden. Je vindt het interessant om dingen van andere te lezen dus dan doe je dat zelf ook.
2	Elisabeth; ik heb wel alles gelezen en dingen waren soms interessant en soms waren wel dingen al redelijk uit het verleden. Maar het is wel interessant om te zien waar mensen mee bezig zijn.
3	Elisabeth heeft geen reflectietool en daarom werkte dit wel heel goed werken om zo te blijven reflecteren.
5	Cheyenna: Motiveert het dat je andere ziet dat het gebruiken? Ik denk wel dat, dat wel een motivator is, je kan dan niet achterblijven. Dat zweeft elkaar toch op.
6	Elisabeth wilde gewoon ff kijken wat er dan gebeurd en ook wel benieuwd naar wat er daarna komt. Niet alles meteen blootgeven maakt nieuwsgieriger.

Key obstacles:

1	Klaas: (Over de SMS die hij ontving)Dat hij steeds als eerste werd aangemerkt motiveerde niet echt
2	Bert: Nee ik heb er niet echt lang naar gekeken, ik heb een beetje aangeklikt, de fotootjes en de verhaaltjes. Dat begreep ik allemaal wel maar het is meer van wat zal ik er mee doen wat mij tegenhield.
3	Elisabeth: Ik dacht toch wel van laat ik eerst zelf mijn portfolio afmaken voordat ik daar op inga. In je hoofd kost het ook tijd en je wil het toch goed doen.
4	Klaas: Hoofdreden om te stoppen was voornamelijk dat andere niet meer mee deden. De reflectie zij niet het leukste en gaan op gegeven moment vervelen. Juist de opgaves et de afbeelding vond hij het interessants aangezien mensen daar creatief mee om moeten gaan.
5	Elisabeth; Triggerde niet echt om daar echt op te reageren. Leuk om te lezen maar ik heb het nu te druk
6	Cheyenna: Als ik denk en kijk naar het beantwoorden van de vragen en dan dacht ik op een gegeven moment wel van 'hey dat heb ik al gedaan'. Voorbeeld bijvoorbeeld van die foto, die had ik al in mijn portfolio staan en heb ik toen ook op de activiteitlijn geplaatst. Bij mijzelf krijg ik dan het gevoel wat is de meerwaarde? aangezien ik het al in de portfolio stop.
7	Cheyenna: Nee, daar heb ik gewoon geen tijd voor gehad, als je het hebt over gezamenlijke opdrachten maken en zo, dan zou dat denk ik eerder gebeuren
8	Cheyenna: Ik heb dus wel paar keer een reactie gegeven, zoals op patrick maar op één of andere manier moet er voor mij wel iets zijn waardoor je verplicht wordt aan een einddoel waardoor je samen moet werken, dan hecht ik er meer waarde aan omdat te doen.
9	Cheyenna: Inderdaad in het begin gebeurde er iets maar daarna was er niets meer te halen. Het moet dan nog veel laagdrempeliger om het even te bekijken.
10	Cheyenna: Maar op het moment dat het gecombineerd wordt met informatie die ik echt nodig heb dan gaat dat makkelijker om het te doen en maakt dat het dat je het vaker gaat gebruiken.

Fears:

Key drivers: -

Key obstacles:

1	Bert: Eigenlijk moet het echt een netwerk worden maar mijn drempel is en dat merk ik bij mijzelf, want ik dacht ik ga er iets op zetten maar dan denk ik bij mijzelf 'ja maar dat ziet iedereen'. Dat is niet dat ik geheimen heb maar is jezelf zo blootgeven dus dat is wel iets waar ik ook overheen moet wil ik het echt gebruiken.
2	Elisabeth: Als je er mee bezig bent en je ziet dat er andere al iets hebben geplaatst dat je dan wel denkt van 'hey dat wil ik ook snel even gaan doen'. Maar ook andersom werkt het ook tegen je aangezien ik heb ook gehad dat ik dacht "ik wil niet als eerste zijn en ik wacht even". Eerst de kat uit de boom kijken en daarna wil ik er zo snel mogelijk bij zijn.

Social Norms:

No experience where described that involved the concept of social norms.

Opportune moments:

Service Lifestyle	<ol style="list-style-type: none"> 1. Ik denk dat we, want hadden het nu alleen maar gebruikt deze laatste periode, het laatste blok, dat je als je zoiets tijdens het jaar zou doen, dan heb je veel meer dat je mensen gaat volgen. Nu deed ik het op mijn manier en ik denk als het langer zou zijn dat je er ook meer energie instopt om werkelijk met elkaar iets te gaan doen. 2. Door het jaar zou het meer gewoon zijn en meer als instrument zijn. 3. Ik denk als tip dat wil je dit als instrument inzetten dan moet je het vooral vanaf het begin af aan inzetten. In het begin van de opleiding, dan komt de feedback functie veel beter uit te verf. Nu is het nauwelijks gebruikt. 4. Komt dit door een te kort en verkeerde periode? J; Ja precies.
Routines	<ol style="list-style-type: none"> 1. Lianne: die iPad die ligt bij mij op de tafel en dan 's avonds, denk ik nog ff kijken zo

Group two:

Ability:

Goals, Plans:

Key drivers:

1	Lian: Nou weet je ik ben mij sowieso al meer aan het verdiepen in het hele digitale wereldje want ik ben er niet heel erg handig in. Iedere tool die langs komt ga je toch even experimenteren, wat is het, wat kan het mij opleveren, kan ik er zelf iets mee in mijn eigen werksituatie.
2	Michael: Als het mij prikkelt dan ga ik er vanzelf mee aan de slag. Ik had geen idee of plan gemaakt van ik ga zo vaak kijken of ik ga het dan invullen, of ik doe het als iemand anders reageert

Key Obstacles:

1	Michael: Ik heb het gewoon in mijn hoofd gehad dat ik al die dingen ga gebruiken zoals ik dat bij alle apps en dergelijke gebruik, als ik er door geïnteresseerd raak dan ga ik er mee verder
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Self-efficacy:

Key drivers: no key drivers were identified during the interviews.

Key obstacles:

1	Lianne: Ik heb wel alles gevolgd maar ik ben niet zo'n technisch type en geef dan snel op,
2	Lian: Ja door die foto werd het te veel ik wist niet meer dat ik het moest mailen en ik kreeg het ding er dus niet op.

Mindfulness, Willpower:

Key drivers:

Key obstacles:

1	Lian: Nee daar was ik mee bezig maar toen ben ik daar toch mee gestopt Omdat er iets fout ging? J: Nee omdat ik het nicht helder had en toen heb ik toch weer weggelegd. Want je wil wel er iets goed opzetten.
2	Bart: De waan van de dag. Heel druk met portfolio en mijn eerste hoofdstuk heet de worsteling. En daarnaast gewoon veel tijdsdruk vanuit mijn werk en alle andere dingen.
3	Bart: Dat liep dus allemaal samen ik heb verschillende dingen samen gedaan. Maar dat viel allemaal samen met die activiteit, mijn focus was portfolio afgerond maar ik was daarna bezig met het MD traject.
4	Michael: ik heb wel gemerkt dat het in een periode was waarin de portfolio ingediend moest worden en het dat het gebruik wat minder maakte. Hierdoor heb ik er wel minder gebruik van gemaakt omdat ik door allerlei andere dingen afgeleid was.

Skill, Usability:

Key drivers:

1	Lianne: Je hoeft er dan niet echt veel moeite voor te doen
2	Lianne: Er is niet echt iets geweest waardoor je het weerhield om de tijdlijn te gebruiken? . Lianne: Nee.
3	Lian: Want ik was eerst begonnen op mijn PC en toen dacht 'hoe zit het ook alweer met het wachtwoord' en toen bedacht ik mij dat ik mij op de iPad had aangemeld. Daar stonden ook de icoontjes op dus ik dacht laat ik het maar bij de iPad houden. Dan kon ik makkelijk inloggen en het was ook wel goed omdat gezamenlijk te doen zoals op de vorige studiedag. Dan heb je het sneller door. Want ik begon op mijn PC en toen zat ik alweer van 'hoe moet het ook alweer?' en dan wist ik niet en dacht ojja mijn iPad en dan gaat het.
4	Bart: Nee, het werkte allemaal goed, niets vreemds. Nou.. De eerste via de iPad en de tweede via de computer, maakte in feiten geen verschil.
5	Het gebruik van de website was dus oke? Bart: Nee daar was niets mis mee.
6	Bart: Wat ik het hier het mooi aan vond is dat direct als je de tijdlijn aan klikt je meteen krijgt, hey die heeft dat gedaan en die heeft dat gedaan. Dat zie je op NING dus heel anders. De vormgeving hier van wat mij betreft stimuleert meer. Zelfs nog beter, ik zit regelmatig op facebook. Ja dat stimuleert ondanks het feit dat je niet alles in één keer ziet en gezien had. Dat vind ik het mooie aan deze vormgeving, dat je het in één keer ziet.
7	Michael: Er is niet echt iets geweest dat door de bruikbaarheid je het links hebt laten liggen? M: Nee helemaal niet.

Key Obstacles:

1	Rik; heeft u ook dingen waar u met het gebruik tegen aan liep? Met de iPad tekst invoeren bijvoorbeeld? lianne: dat viel wel mee, ik heb , maar dat is mijn ongeduld, dat ik een tekstje aan het schrijven was en dan was hij zo maar weg, dat was wel een ding van verbeteren, want ik wist niet of de tekst al verzonden was of niet.
2	Lianne: Ik heb paar keer gehad van 'Is ie nu verstuurd? ' en dan dacht ik laat mar zitten maar gister kreeg ik inderdaad wel een bevestiging

3	Lian: ja ik heb er een paar geplaatst en op een gegeven moment ben ik gestopt. Dat had te maken met die foto er op te zetten, toen dacht, je bent toch al druk met van alles en nog wat. Het kostte te veel moeite om daar mee door te gaan.
4	Jos: Toen vond ik het toch wel minder gebruiksvriendelijk dan ik eerst had gedacht. Ja en toen lukte het een paar dingen niet en toen dacht ik laat maar.

Habits:

Key drivers:

8	Michael: Maar het is niet het nog een keer doen, dat vind ik helemaal niet erg (over dat vragen o de tijdlijn overeen kwamen met antwoorden die gegeven werden in de portfolio.)
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Key Obstacles:

1	Michael : Zodat ik een opmerking kan plaatsen over deze situatie die is gebeurd? Is dat wel eens voorgekomen? Misschien wel maar dat komt denk ik ook door de situatie hier waarin ik toch zit met twee andere LCL-ers en dat je dan iemand opzoekt in het huis. Waarmee je dat bespreekt, dus dan komt die vraag minder snel naar voren, dat je zo'n probleem op de tijdlijn plaatst.
2	Lianne: Mailen en telefoneren is nog steeds het communicatiemiddel voor mij
3	Lianne: Ik deed dit soort dingen altijd al, altijd even na ieder blok noteren van wat is nou voor mij echt blijven hangen. Dus dat deed ik al, alleen nu door die vraag geen heel specifiek vragen aan de ander en dat deed je normaal gesproken minder. Alleen na de afloop van een blok nog even bellen van 'hey jo, hoe is het nou?'.
4	Lian: R: Is er ergens een routine ontstaan om het te gebruiken? J: Nee meer sporadisch want daar is de tijdsspanne te kort voor. Er zit geen routine of ritme in nee.
5	Jos: Ja ja ik doe na elk blok altijd voor mijzelf via een modelletje wat ik ooit heb gevonden en die vul dan in, heel gestructureerd dingetje. Dat maakt de behoefte voor zoiets ook minder.
6	Bart: een stuk bescherming van mijzelf wanneer ik 's avonds aan het werk moet doe ik dat. Maar ik zit niet 's avonds op de bank en ga eens kijken wat doet een ander, dat doe ik met twitter ook niet, dat doe ik met Facebook wel, maar dat is vooral gerelateerd aan mijn kinderen die niet bij mij wonen en toch even wil zien via facebook
7	Is het een routine geworden? Bart: Nee portfolio zat in de weg.
8	Bart: Zijn er andere moment waarop je gedrag uitoefent met betrekking op reflectie op leeractiviteiten? B: Nee, nog niet, maar wat ik wel heb gemerkt, maar dat is ingegeven door het feit van het schrijven van de portfolio.
9	Michael: Die vragen moesten een opstap bieden om even te reflecteren op de activiteit die je gedaan hebt, doe je of deed je al zoiets in de LCL op een andere manier? Michael: Nou ik maak voor mijzelf een soort evaluatie notitie van de afgelopen twee dagen wat er nou gebeurde en wat ik voor mijzelf als belangrijk heb ervaren en dat zet ik wel op papier omdat je weet dat je een portfolio moet maken.

Resources:

Key drivers: -

Key obstacles:

1	Lianne: dat ik op mijn werk geen beschikking over de iPad heb, ik kan er daar niks mee
2	Lianne: je hebt de portfolio > geen tijd

	Lianne: Het is vrij zinvol om te doen en als ik meer tijd had om een fototje en een geluidfragmentje er op te zetten dan had dat zeker meer opgeleverd.
3	Lian: je bent toch al druk met van alles
4	Jos: ik had het druk, 400 man moesten een traject krijgen en ik had ook van dit is nu op het einde it had eigenlijk het eerste blok moeten hebben zodat je het ook gaat gebruiken.
5	Bart: Ja en in mijn specifieke geval te maken en dat ik de 27 ^{ste} pas begon aan mijn portfolio en 31 ^{ste} . In ieder geval enorm druk en geen tijd voor iets anders.
6	Michael: Het kan zijn dat ik door andere dingen afgeleid was maar het kan ook zijn dat ik het gewoon nog niet uitnodigend genoeg vond. Dat maakt ook dat ik de keuze maak om de portfolio in te leveren. Ik denk ook dat het ligt aan de aantrekkelijkheid dat, dat nog groter zou moeten zijn, zodat het niet uitmaakt dat het mij tijd kost, in een drukke periode.

Social Support:

Key drivers:

Key obstacles:

1	Lianne: Als je het door het jaar heen kan gebruiken, dan wordt het onderdeel van je manier van werken en dan daag je elkaar ook uit. Dat heb ik met die iPad ook gezien, ik ben niet zo'n techneut en heb een hekel aan dingen zelf uitzoeken maar hier zitten mensen (de LCL groepen en mensen van K&S) die het weten en kunnen en dan vraag je dat.
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Motivation

Awareness:

Key drivers:

1	Lianne: Is het relevant voor jou? Ja en de soort vragen die gesteld werden kwamen wel overeen met de fasen waar in je in bezig bent.
2	Lianne: Ja ja zeker, heb ik allemaal gelezen, bijvoorbeeld de vraag naar feedback had ook meer waarde en heeft mij wat opgeleverd.
3	Lian: Ik vond het relevante vragen, het zette mij wel aan het denken. Bijvoorbeeld de vraag van 'waar wil je nu op gaan focussen tijdens de proeve gesprek?'.
4	Lian: het is leuk om op die manier gebruiksvriendelijk om reactie van andere te lezen. Dat maakt het relevanter om te bekijken.
5	Lian: R: Verlaagd de koppeling tussen wat je moet doen en waarover je een bericht kan plaatsen ook de drempel? Ja zeker, het is heel concreet en relevante vragen.
6	het nodigt wel uit om daar ook in actief te zijn. Het is ook wel leuk die foto's dat maakt het speelser.
7	Jos: Maar ik denk wel dat dit waardevol iets kan zijn voor het opbouwen van je portfolio.
8	Bart: Zijn er andere moment waarop je gedrag uitoefent met betrekking op reflectie op leeractiviteiten? B: Nee, nog niet, maar wat ik wel heb gemerkt, maar dat is ingegeven door het feit van het schrijven van de portfolio. En ook nu weten dat het weg valt, merk ik wel dat wanneer dit weg valt na de opleiding ik hier wel iets mee moet.
9	Bart: Waren de vragen die gesteld werden relevant waardoor het beantwoorden er van als relevant werd gezien? Bart: Ja zeker relevant, waar ik zelf eerlijk bij moet zeggen dat ik zelf de relevantie redelijk nihil is geworden omdat ik niet heb door gepakt.

10	Bart: Met de notie dat je hiermee al bezig bent met het opbouwen van je portfolio, ja. Dan is het een tool en als ik nu nieuwe eerste jaars zou adviseren, ga dit gebruiken, ga er voor zorgen dat je na afloop van een blok iets naar je rond stuurt en of je nu wel of geen feedback krijgt dat maakt niet uit, maar je hebt heel helder die structuur van het jaar voor je. Even het programma;s terug kijken en dan kan dit een geweldig hulpmiddel zijn als een soort logboek.
11	Michael: Ik heb ze wel allemaal gelezen, en de vragen vind ik ook helemaal prima, het zijn gewoon goede vragen.heb ze gelezen, en ik heb op sommige (1 van lianne) gereageerd, maar duurt het toch weer lang voor je er iets op terug kreeg
12	Michael: (Awareness/Emotion) Nou als je het hebt over aantrekkelijk maken van zo'n tijdslijn en euh ja het principe vind ik echt fantastisch, want dit is al een veel beter en groter stap en initiatief dan het traditionele idee van reflecteren wat mij betreft.
13	Michael: Het is al een enorme stap vooruit om een manier te bedenken waarop je zou kunnen reflecteren. En dat dit veel laagdrempeliger werkt dan met elkaar afspreken, een ruimte zoeken zoals in een intervisie groepje. In de toekomst ga je toch krijgen dat mensen op één of andere manier portfolios gaan bijhouden tijdens hun werk en dat moet inzichterlijker worden en één manier om zaken zo inzichtelijk te maken is met reflectievoorbeeld op toe te passen en dan is zo'n tijdslijn en hoe je er mee omgaat heel erg prettig en laagdrempelig en dat vind ik ook wel de kracht er achter.

Key obstacles:

1	Bart: Ik heb daar heel duidelijk gezegd, vooral kijkend naar Lianne. Enorm groot verschil hoe zij om gaat met de iPad en ik zou dat nooit doen. Zij is heel bevlogen met het apparaat en dat heeft effect op het gebruik.
2	Michael:: Als die interactie mogelijkheid er niet zou zijn en je zou het zelf als gewoon als een soort logboek gebruiken, is het dan nog interessant genoeg?M: Nee dan zou hij voor mij wel weg vallen. Want dan wordt het gewoon een logboek en dat kan ik ook al zelf doen, met mij zit het hem niet name in de interactie.
3	Michael: Naja je zou kunnen zeggen dat wanneer ik een vraag heb over de LCL dat ik dat eerder op social media zet omdat dat een breedplatform heeft. Dan in een hele kleine groep waar de kans op antwoord kleiner is en misschien ook omdat ik daar misschien wel interessant invalshoeken krijg.

Attitude/emotions:

Key drivers:

-

Key obstacles:

1	Lianne die stelt vraagt hoe je een foto er op zet; dat wist ik niet dus heb ik het niet beantwoord. En dan ben ik heel lui en doe ik dat niet.
2	Lianne: Over het gebruik van andere sociale media: Gebruik ook maar is hetzelfde verhaal.. veel volgen weinig delen. Daar zou ik ook een splitsing in maken, werk prive
3	Jos: Ik zat nu eigenlijk na het vorige blok in een soort van afscheidsfase wat het is het einde en wat moet ik nu nog mee.
4	Jos: Ook de vluchtigheid met bepaalde media is ies waardoor ik het niet aangrijp, hyves is allang weer voorbij.. en ik heb daar ook opgezet, ach dat is al weer voorbij. Dan denk ik, ik heb niets gemist.

5	Bart: Dat ik mij eigenlijk er ook voor schaam dat ik het niet gedaan heb. Heel simpel, in die bijeenkomst hebben we gezegd ja leuk gaan we proberen en experimenteren met iets nieuws, en jou de mogelijkheid ontnemen om te kijken of het werkt.
6	Bart: Ik heb dit wel echt gezien als onderdeel van wat hoort bij werk, in ieder geval de fase waarin het geïntroduceerd werd. Ja ik moest hard werken omdat portfolio af te krijgen, ja k moest werken om en als ik niet hoeft te werken ga ik niet mijn iPad pakken maar ga ik iets anders doen.
7	Bart: Misschien is de omschrijving het duidelijkst; ik gebruik de iPad voor mijn werk. Dan is dat apparaat het werk/de opleiding. De iPad hier gekocht van uit de opleiding. Andere apparaten maakt dat verschil? Nee want ik maar één telefoon en die is van mij werk. Gebruik ik wel prive. Maar dat is ook gewoon ervaring die ik heb opgedaan en ok situatie die ik gecreerd heb. Ik gebruik mijn iPad alleen voor opleiding/werk.

Motivations:

Key drivers:

1	Lianne: voor mij wel, ik keek er regelmatig op als ik even op de bank zitten van 'is er iets gebeurd?'.
2	Lianne: Precies, als dit het hele jaar beschikbaar had gehad, zou ik dat kunnen gebruiken (in plaats van het kladblok). Ik geloof wel dat ik te dan zou kunnen gebruiken.
3	Lian: ik zag op een gegeven moment een heel koppeltje met mensen en toen dacht ik van 'hey nu ga ik er ook iets opzetten'
4	Lian: Nou weet je ik ben mij sowieso al meer aan het verdiepen in het hele digitale wereldje want ik ben er niet heel erg handig in. Iedere tool die langs komt ga je toch even experimenteren, wat is het, wat kan het mij opleveren, kan ik er zelf iets mee in mijn eigen werksituatie.
5	Lian: Niet 's avonds op de bank even kijken? Nou dat had ik wel, even 's avonds op de bank kijken wat andere er op hebben gezet. Die nieuwsgierigheid wekte het zeker op.
6	Bart: Enthousiast begonnen, dit begon al bij de introductie tijdens de vorige bijeenkomst
7	Bart: Het zien dat andere mensen check-ins plaatsen? Heeft dat gemotiveerd? B: In eerste instantie was dat voor mij wel de motivator om wat te doen de fotootjes, de check-ins van andere
8	Bart (usability/motivatie) Wat ik het hier het mooi aan vond is dat direct als je de tijdlijn aan klikt je meteen krijgt, hey die heeft dat gedaan en die heeft dat gedaan. Dat zie je op NING dus heel anders. De vormgeving hier van wat mij betreft stimuleert meer. Zelfs nog beter, ik zit regelmatig op facebook. Ja dat stimuleert ondanks het feit dat je niet alles in één keer ziet en gezien had. Dat vind ik het mooie aan deze vormgeving, dat je het in één keer ziet.
9	Bart: Ik vind het absoluut een voordeel dat ik weet dat alleen deze twaalf mensen er op kunnen kijken.
10	Michael: Nee voor mij geldt meer dat ik voor de eerste keer heel nieuwsgierig was en netjes de vragen heb ingevuld en netjes verstuurd heb.

Key obstacles:

1	Jos: wel nieuwsgierig naar wat andere er opzetten? J: Nee eigenlijk ook niet, laten we eerlijk zijn. Maar dat heeft ook te maken heeft, omdat ik in gedachten al afscheid aan het nemen ben.
2	Bart: Na jou eerste of tweede SMSje, oke ik zit bij de kopgroep en heb daar na niet verder gekeken. Want ik weet wel een beetje hoe dat bij mij werkt, van 'goh ben ik nu de enige maar daarna heb ik er niet meer na gekeken.'

3	Bart: De positieve feedback zorgt er dus voor dat je achter over gaat leunen? B: Ja dat is bij mij wel een beetje geweest.
4	Michael: En als ik dan voor mijzelf terug kijk en wat ik op facebook schrijf dan krijg ik daar negen van de tien keer binnen twee seconde maar maximaal binnen een uur een soort van reactie op terug en dat nodigt mij wel weer uit om opnieuw daar wat neer te zetten. Hiergaan dan dagen over heen
5	Michael: Naja kijk als je op dat moment Lianne meteen terug reageert dan gaat het voor mij heel erg leven en dan ben ik ook geneigd om constant er op te zitten en er op te werken en er iets mee te doen
6	Michael: Wat voor mij een reden zou zijn is (om te stoppen) dat de feedback lang duurt, waardoor je de aandacht ook weer verliest.
7	Michael: Bij de twee opdracht moest ik dan een foto op sturen en ik dacht dat komt dan wel maar dat stel je uit en dat verdwijnt. En op een gegeven moment denk je, mmm dat is nu ook niet meer helemaal relevant
8	ik denk wel, wat ook nog mee speelt dat de vragen die gesteld worden zoals 'welke stelling ga je meenemen op het proevegesprek?' Dat er ook een soort consequentie aan moet zitten. Waardoor het ook in het proevegesprek komt, ik snap dat dat niet kon hoor maar voor mij werkt dat wel heel sterk dat het ook echt real-life moet zijn.
9	Michael: dat eerste stukje is heel belangrijk. In ieder geval voor mij, als er toen een maximaal reactiepatroon was ontstaan was nieuwsgierig geweest om te weten wat er constant gaat gebeuren.

Fears:

Key drivers:

1	Dan wordt in plaats van een 'note-to-yourself' een check-in naar iedereen? Vindt u dat niet erg dat iedereen dat leest? Lianne: Nee nee, je hebt toch de keus wat je er op zet of niet. Ik denk dat je er meer reactie op krijgt en er daarna mee gebeurd. Ik kan mij voorstellen van, zo is het wel
2	privacy gevoeligheid? Lianne: Nee niet echt je bepaald toch zelf wat je er op zet. Wat ik er op zet is werk gerelateerd en ja . of dingen die ik gedaan heb, maar niet heel vaak moet ik zeggen.
3	Lian: Zou je dezelfde soort berichten ook op twitter of facebook zetten? Ik vond deze opstart zo wel vertrouwd, je weet wie jou berichten leest, ik vond het wel een veilige omgeving.

Key obstacles:

1	Michael: Jaa nee dat wel, ik zou het minder snel persoonlijk maken als ik het op twitter zetten, maar ik kan mij ook voorstellen dat je een afgeschermd community maakt op facebook en waar je wel weer zo in probeert
2	Jos: ik wil wel een evaluatie delen met mensen maar echt mijn persoonlijke reflectie, waar in ik beschrijf hoe ik dingen echt beleefd heb ga ik dat niet delen.

Social Norms:

Key drivers:

1	Ja, dat was afgelopen woensdag waren we uitgenodigd door monica om bij vrolijke opening van Volkers en Wessels te komen en Lianne en jos waren daar ook. En daar hebben we ook uit gewisseld van 'we hebben nog zo veel te doen' en het is leuk maar we komen er niet aan. We hebben het er wel over gehad, en waarom komt dat, door SMSje mailtje en die triggers die doen absoluut wat.
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2	Ook wordt er gewoon overgesproken en je merkt ' het doet echt wat de tijdlijn'.
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Opportune moments:

Service Lifestyle

1	Ik denk dat we, want hadden het nu alleen maar gebruikt deze laatste periode, het laatste blok, dat je als je zoiets tijdens het jaar zou doen, dan heb je veel meer dat je mensen gaan volgen. Nu deed ik het op mijn manier en ik denk als het langer zou zijn dat je er ook meer energie instopt om werkelijk met elkaar iets te gaan doen.
2	Door het jaar zou het meer gewoon zijn en meer als instrument zijn.
3	Ik denk als tip dat wil je dit als instrument inzetten dan moet je het vooral vanaf het begin af aan inzetten. In het begin van de opleiding, dan komt de feedback functie veel beter uit te verf. Nu is het nauwelijks gebruikt.
4	Komt dit door een te kort en verkeerde periode? J; Ja precies.
5	Jos: Als het eerder zou zijn geweest is het beter.
6	Bart: Nu komt het op het eind van het blok nog dit er even bij. Ik snap dat het moment van introductie, dat moet je niet in zo'n moment doen.

Routines:

1	Lianne: die iPad die ligt bij mij op de tafel en dan 's avonds, denk ik nog ff kijken zo
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Appendix D:

Description of *the event* per activity:

1. The phone call

Use context:

Description of the activity:

In this first activity the participants will receive a text message in which they are asked if they are ready for a phone call. If the participant is ready he or she can text the word READY back to the number and they will be called back, when the participant will take up the phone he or she will hear a pre-recorded message of the CEO of Ahold.

Goal of the activity:

Create excitement and arousal at the participants of the journey. Give them the feeling that they are going to experience something unique.

Message:

<SMS> Dear <participant>, Sander van der Laan wants to speak to you about the AMP 2011. When you're ready to receive his call, please text READY to <number>. </SMS>

<PRE-RECORDED MESSAGE> *"I'm very pleased to tell you something about the journey that's going to start in a very short time! A stunning program lies ahead of you. The Ahold Management Program! Ahold holds a top position in the retail world. The ambitions for further growth in Europe are very high! We need strong leaders to lead and realize these ambitions. We need YOU!"*

</PRE-RECORDED MESSAGE>

<SMS> Thanks for your time! Your next step will be to fill in an online intake form. You will receive an invitation for that early next week. </SMS>

Channel:

A combination of SMS and telephone communication via the participants cell phone.

Context:

The context in which this message is received varies. The only thing all the participants have in common while receiving the text message is that they are at their work in a normal working situation. Also the time at which they will receive the pre-recorded message will be depended by the participant. Only when they answer the text message their cell phone will ring and they are able to hear the audio message of the CEO.

The role of the persuader:

The pre-recorded message tries to motivate the participant and let him become interested. The persuader is not someone of Kessels & Smit but the highest chief within the Ahold organisation, this makes the message more credible and trustworthy because the sender of the message is someone from within the organisation.

Persuadee:

The persuadee needs to become interested and motivated for the whole journey. Furthermore the participant needs to be informed on filling in the intake form that he or she will receive.

As explained in chapter three we will extend the event analysis with an analysis of the core motivators , simplicity factors and the used triggers for every activity.

Triggers:

The triggers used in this activity is one SMS message and a phone call (*phone call is not a trigger, it does not tell you to do anything directly*). The first text message can be seen as a facilitator trigger which can be used for people with high motivation and low ability. The motivation for receiving a message from the CEO of the Ahold company by managers of Ahold will be high. An explanation how to receive the message therefore is the only thing necessary to persuade them to listen to the audio message. (The audio message can be seen as an Spark trigger which motivates people by addressing one of the three core motivators described by Fogg, this will addressed in the next section.) The last text message cannot be seen as a trigger because it does not correspond to the definitions which says a trigger is “something that tells people to perform a behaviour now”. It only tells the person that they have to perform a particular behaviour the next week.

User context:

Core motivators:

The message of the CEO of Ahold addresses a combination of core motivators. He says that “*A stunning program lies ahead of you*” which creates hope for a pleasurable experience ahead by the participant who is receiving the message. Also the demand from the CEO for strong leaders puts pressure on the participants, his message indicates that the CEO did put time in to these participants by recording this message and this automatically generates reciprocity at the side of the participants. He wants something in return, strong leaders and the CEO invested time in us, so now the participants will feel obliged to give him something in return, by attending on this leadership journey.

Simplicity factors:

Now we look at the simplicity factors that can prohibit the expect behaviour.

Time: This can be a problem although it is solved by giving the option to the participants to choose when they want to listen to the audio message.

Money: The costs for sending the text messages are affordable.

Physical effort: It does not costs much physical effort for the target audience

Brain cycles: texting and listing does not demand much brain cycles and are seen as regular activities.

Social deviance: texting and listing to your cell phone are social accepted activities within companies.

Non-routine: all the participants have a cell phone and therefore we can assume that texting and listing to an audio message is a routine task.

The strategy:

2. Online intake

Use context:

Description of the activity:

One week later after activity one the participants will receive an SMS with a link to the online intake form. It is requested to fill in the form so the ‘tour guide’ can map out the journey to the requirements and needs of the participant.

Goal of the activity:

Gathering true information about the participants from organisational level (telephone numbers, addresses and when they are available) to personal information (questions about their self and which people they already know who also attend in the leadership journey)

Message:

<SMS>

Dear <diver>, Please take 20 min in the next 48 hours to fill in the online intake questionnaire for the new AMP at <http://www.amp2011.eu>

</SMS>

<introduction of the intake form>

Welcome at the start of your AMP journey! An exciting program lies ahead of you: The Ahold Management Program 2011. This questionnaire will be the kick off. I need some information from you to map out the journey to your requirements and needs. That is why I ask you to fill in this form. I expect that this will take 15 minutes.

</introduction of the intake form>

<questions>

First Name (how you would like to be called)

Family name

Mobile phone number, including country code, e.g. +31..., +32..., +420...

E-mail address

How would you describe yourself in 3 words?

How would you describe your biggest talent?

What do you find difficult?

Which question would you like that someone once asked you?

What will you make sure you get out of the AMP? What do you want to realise in this programme, no matter what?

What poem or book do you like most? Why?

Tell something about yourself what colleagues don't know yet (but what they are allowed to know)

Please upload a picture of yourself that we can use to introduce you to your colleagues in the AMP.

With whom of your contacts within Ahold Europe did you have a good conversation about your strengths and talents recently?

In which places or environments do you feel comfortable and at ease?

Which one, two or three colleagues in the AMP 2011 are closest to you?

Which one, two, or three colleagues in the AMP 2011 do you not know (well) and are you curious to meet?

What is the location you work from most of the time? Please write an exact address if it is not on the list.

When will you be at that location for the first time after March 29th, 2011?

If you know already, when will you be on vacation between now and the end of the year?

</introduction of the intake form >

<SMS>

Thanks for filling in the intake form for the AMP 2011. You can pick up your welcome package some time in the week of March 28th. You will hear from me more details once your package is ready.

</SMS>

Channel:

SMS and a webpage to fill in the intake form.

Context:

The context in which the message will be received can be different for all the participants. After checking the geographical places (via IP address tracing) that were used to fill in the online form, we

can conclude that the majority of the people filled in the form during working time, while they were in their office. A small group of people (5 of the 23) filled in the form outside the office hours and on other location that the offices they could be assigned to.

The role of persuader:

In this activity the persuader is the ‘tour guide’ that assists all the participants along the journey. The tour guide in this activity persuades the people to fill in the question form that is necessary to collect the reliable information about the participants.

The role of the Persuadee:

The expectation from the persuadee is that it will fill in the form with correct and truthful information about its self.

Triggers:

The first SMS message can be seen as a facilitator trigger which gives the right information to be able to go to the form and fill it in. On the one hand we again see that the trigger does not tell to do the behaviour now and if we should stick strictly to the definition of a trigger it would not be qualified as one. On the other hand there is a clear description of when the behaviour should be performed in the message, it states '*Please take 20 min in the next 48 hours to fill in the online intake questionnaire*'. The introduction message of the intake form can be seen as a spark trigger which motivates people by telling that something pleasurable will happen if they perform the following behaviour. In this way they create a hope motivator at the participants that if they fill in the intake form they will provide the information to make the journey even more pleasurable.

User context:

Core motivators:

The first trigger is an facilitator trigger which provides the ability to perform the behaviour because it is assumed that the participants have enough motivation to fill in the intake form. In introduction text of the intake form we can identify a spark trigger which tells the participants to fill in the intake form now and therefore tries to motivate them.

Simplicity factors:

Time:

Time can be a resource that is not available at the moment the first trigger is send. By giving the participants a time-window in which they need to fill in the form they have the ability to use the resource time when it is available. Also giving time indication lets the participants better deal with the resource of time.

Money:

No costs have to be made when filling in the form or receiving the text messages.

Physical effort:

There is no need for physical effort in this activity.

Brain cycles:

The resource of brain cycles can be compromised when the participants need to fill in the intake form. Some questions require reflective thought or call for retrieval of past events experienced by the participant.

Social deviance:

Filling in the intake form is something that is socially excepted and therefore there is no social

deviance in this activity.

Non-routine:

Some questions within the intake form are very routine, question about name, address and phone numbers. Thinking about past experiences and goals you want to achieve in the future is not something you do every day or is part of another routine task. Therefore these question which are non-routine can become the bottleneck of performing the right behaviour, which is ‘filling in the form with correct and truthful information about him or herself’.

3. Favorite music:

Use context:

Description of the activity:

All the participants receive a letter in which they were asked to share their favourite music by leaving an audio message in which the participant tells why he or she likes this music. Later on the recorded message will be put on the iPods so the other participants can listen to them.

This activity was not performed by everyone, 15 out of the 23 participants did leave a message.

Goal of the activity:

This activity enables the participants to get to know each other via another relation instead of their work relation.

Message:

<website text message>

AMP 2011 PERSONAL HITRADIO

You've shared your favorite song to get to know your travel companions a little bit before we meet.

Please share your favorite piece of music by calling the following phone number: +31 88 774 64 74.

Clearly speak in the title of your favorite song, the name of the artist who sings it and the reason why you like this song.

Please know that I will use your voice recording for the hit radio.

</website text message>

Channel:

Letter and telephone

Context:

The context in which the participants will receive the letter varies.

The role of the persuader:

In this activity the 'tour guide' persuades the participant to leave a message on his or her favourite music.

The role of the Persuadee:

The persuade needs to leave a message via the given phone number.

Triggers:

In this situation the letter that is send to the participants is the trigger to perform the behaviour of leaving a message with your favourite music. This can be seen as a facilitator trigger because it signals the participant to do the behaviour and also makes the behaviour easier because it tells exactly what has to be done.

User context:

Core motivators:

No real motivators can be discovered in this activity. The producers of the leadership journey assume the motivation of the participants is high enough to perform the behaviour. Because there are no motivators in this activity, this could have been one of the missing factors for not performing the behaviour of seven of the 23 participants.

Simplicity factors:

Time:

The participant can decide at which time he wants to perform the behaviour. The behaviour should only take some minutes to perform. The process of choosing the right song could take longer.

Money:

The costs of performing the behaviour is of no influence on the behaviour.

Brain cycles:

This tasks does not put much emphasis on deep thinking or other demanding cognitive processing.

Physical effort:

The physical effort of the target behaviour is low and it is easily performed.

Non-routine:

Explaining why you like a song and presenting this to others is not something you do regular as a regular person. For people with a bigger interest in music it would be more easier than people who are not actively involved in the world of music.

Social deviance:

Talking about music is an activity that has a low social deviance. People are used to discussion about music (much excepted item in radio shows and on television). But often it is a select group of people with a clear opinion about music who does it. This makes it a non-routine task with a low social deviance character.

4. Assignment 1

Use context:

Description of the activity:

In this assignment the participants need to talk to others on the what the effects is upon the participants and there environment, now that they are assigned as talents within Ahold. In the assignment it is advised to the participants to talk first with people who they know the best and talk to the people which are in the direct working environment of the participants.

Goal of the activity:

Getting clear what kind of leader you are, what kind strengths you have. It is important to have develop thoughts about these assignments as preparation for the Blind Date activity. Questions that you need thoughts about are, what does it mean to be a talent? What does mean to you personally, your manager and you colleagues? Talk to people, ask for feedback. It can be hard and try first to talk with people you know well before you go on to others.

Message:

So, this is your first assignment, you have been spotted as a talent in Ahold, this assignment is on finding out what it is to be a talent. What does it mean to you personally, what does it mean to your manager and what does it mean to your colleagues. What I ask you to do is to talk to people around you at work and ask them for their thoughts and feedback. You can think of talking to your manager, to your colleagues in your team and people that report to you. Talk about yourself as a talent might not be as easy as talking about the weather. Sometimes labelled as talent, makes you or others uncomfortable, that's why talking about these things is often avoided. At the same time it can be liberating, to tell about this topic, what could have been in the air anyway. Heads on, my tip is that you just try out this conversation with someone you find it easy to talk to, to do just see how it goes. I suggest you to ask questions as; how is it for you that I have been named as a talent within Ahold? What do you think about that? What do you see as my strengths? What do you see that I am good at? And what do you like me to do more? The aim at these conversation is that you get a clearer picture at where you good at and what others see as your particular talent? I am curious what you will discover, enjoy the trip!

Channel:

Audio message via the iPod and the same audio message can be download from the website www.amp2011.eu.

Context:

The participant is able to listen to message at any given moment in time. The iPod makes him or her independent from time or space. The only requirement is having the iPod with you.

The role of persuader:

The 'tour guide' of the journey tries to persuade the participant in doing the assignment by explaining the goals of the assignment and what could be done to complete it.

The role of the Persuadee:

The participant needs to complete the assignment. The goal is to have developed thoughts about what is to be a talent and to have an insight on how your environment will respond on this.

Triggers:

For this activity no clear triggers can be defined. The iPods are handed to the participants, so it is up

to them to listen to the assignment to get informed about what they need to do.

User context:

Core motivators:

In the message no motivators are addressed, the core motivator to do this assignment is the hope to become a better leader and to succeed in the leadership journey. Most information that is given on how the assignment could be performed and the given information addresses more on the how, so the participant will be able to perform the assignment.

Simplicity factors:

Time & Money:

This assignment is time consuming and depends also on the agenda of others. Therefore this simplicity factor can be a constraint for performing the behaviour.

The further cost of time and money to this activity depends on the people who the participants wants to talk to. The request to speak to someone who you find it easy to talk to can mean the participant needs to travel to a person that is on a different geographical location but is an intimate of the participant. The request to talk to people at work is much easier to do, these people are much closer towards the participant in a geographical sense but are less close in a relational sense.

Speaking to someone you find it easy to talk to for instance can be a friend living on the other side of the country, which will cost more money to perform this task than talking to colleagues. Colleagues however could be people that the participant finds it harder to talk to on an intimate level.

Brain cycles:

This activity requests for hard thinking because of the personal and abstract concepts that are asked to reflect upon .

Physical effort:

No physical effort is requested from the participant when performing this assignment.

Non-routine:

This assignment can be seen as non-routine. Talking about yourself as a talent is not something that you do every day or even never did before because this leadership journey is the first time the participant is explicitly classified as talent.

Social deviance:

Talking to others about yourself as a talent can be seen as something socially not accepted. This is also regarded in the explanation of the assignment; "Sometimes labelled as talent, makes you or others uncomfortable, that's why talking about these things is often avoided.". The social deviance for this activity therefore is big importance for the simplicity of the task.

5. Assignment 2

Use context:

Description of the activity:

The second assignment is about finding out what Ahold is about and what is essential for this organisation. The participants need to get the bigger picture in which Ahold fits, but also where they as employees fit within Ahold.

Goal of the activity:

The goal of the activity is to find out what the core elements are that will always make up Ahold and what makes Ahold different from any other retailer. Furthermore the participants need to make the link between the bigger picture on what is Ahold about and where the participants themselves fit in to. If the participants are prepared enough for the blind-date activity that will succeed this activity, the goal is met for this assignment.

Message:

Ahold is on the move, the ambition for Europe are high and you are part of that story. I would like to invite you to find out more about this ambition, also in the overall context of what Ahold is standing, its history and development. What I ask you to do is to start your own little research project, you may want to read, search on the internet or even go to the Albert Heijn Museum shop. You may also want to talk to colleagues, superiors or people outside the company who have a formed perspective on Ahold. The questions I suggest you to focus on are, what is Ahold's DNA? What I mean by DNA are the core ingredients that will always make up Ahold. What is it that Ahold will always bring along, what makes Ahold different from any other retailer? What is Ahold's strategy about it, what is the bigger picture of why are we doing, what we are doing? As you find out about these questions, I invite you to also to make the link between this bigger picture and your place in it. If this is the bigger picture and if you are here with your particular talent, what is your contribution? How do you fit in? During the blind dates that I am organizing for you, this connection will be at the center of this connection. In the framework of the AMP this is all about laying the base, knowing where we are heading as a company and knowing your own strength. Creating the link between the two, having a sharper image of how you contribute from the bigger picture. Based on this bigger picture we will persuade you to take different paths and make a shift as a leader in our company. More to come in the next months, I wish you a good research and I am looking forward on the insights you have gathered during your blind date.

Channel:

Audio message via the iPod and the same audio message can be downloaded from the website www.amp2011.eu.

Context:

The participant is able to listen to message at any given moment in time. The iPod makes him or her independent from time or space. The only requirement is having the iPod with you.

The role of persuader:

The tour guide persuades the participant to prepare for the blind date meeting by giving this assignment. In the message the persuader explains a lot and does not

The role of the Persuadee:

The participant needs to complete the assignment.

Triggers: No triggers are used.

User context:

Core motivators:

No real motivators can be discovered in the message of this activity. The producers of the leadership journey assume the motivation of the participants is high enough to perform the behaviour.

Simplicity factors:

Time & Money:

The simplicity factor time can be compromised. Doing research costs time and it is also not clear in the description from the assignment when you are successfully completed the research. Also the interviewing people about Ahold is time consuming. However the demand on time as resources is somewhat more less than with assignment one because of the less necessary interactions with people. The simplicity factor of money depends on how the participant will conduct their research. If they are going to visit many physical places of Ahold and talk to a lot of people, this will cost more money for the research than when they will do a more literature study on Ahold.

Brain cycles:

This assignment does not call for as much reflection on the self as the previous assignment. This may ease the demand for many brain cycles somewhat. Doing research on the somewhat more clear and concrete topic as Ahold can be easier than finding out who you are and what talents you have.

Physical effort:

In this assignment there is no real demand for real physical effort

Non-routine:

Doing research on what is Ahold about will be somewhat more routine than understanding your own talents. Also doing research will be a somewhat more familiar process than reflecting on your own talents. Therefore this assignment will be somewhat more routine than the assignment one.

Connecting yourself with the bigger picture of Ahold will be more difficult and less routine than finding out what is Ahold about.

Social deviance:

The social deviance of this assignment is also less than that of assignment one. Doing research is a social accepted process and also talking to people about the topic Ahold is more accepted than talking about yourself with others. Therefore the social deviance of this assignment is lower than on assignment one.

6. Assignment 3

Use context:

Description of the activity:

In this activity the participant will reflect on the ambition they have and on what kind of professional quest they are. This assignment has many similarities with assignment one and is also reflective in its nature. Again the participants have to reflect together with someone who knows them well, on the ambition of the participant.

Goal of the activity:

The goal of the activity is to find out what the ambition are of the participant. Getting the personal goals clear and having a deeper understanding of the participants ambition.

Message:

The central question in this assignment is ‘What is your personal ambition?’, ‘What are your drives and challenges?’, ‘What is your quest as a professional within Ahold?’. Like in the previous assignments we have some sub-questions to support you in your thinking process. You could imagine the moment you retire, of course there will be speeches, what would you want to people to say about you. What do you want to have achieved in your work? What will it have all been about? You could also think more general, who would you like to be as a professional? What would be your added value? To your profession, to Ahold, to others, to the world? What kind of aims do you strive for? What does these aims so important? What is the destination of your personal journey? I realize that these question you do not ask yourself daily. My suggestion is that you make a moment with your partner or a good friend or someone who knows you very well and can give you some feedback on what they see is important to you. The aim of the reflection assignment this assignment is that you get a deeper understanding on your ambition, your challenges, your quest as a professional within Ahold. I am curious what you will discover...

Channel:

Audio message via the iPod and the same audio message can be download from the website www.amp2011.eu.

Context:

The participant is able to listen to message at any given moment in time. The iPod makes him or her independent from time or space. The only requirement is having the iPod with you.

The role of persuader:

In this activity the tour guide has the role of persuader. She tries to persuades the participant in reflecting on their personal ambition.

The role of the Persuadee:

The persuadee needs to deeper understand what his or her ambition are. Reflecting on them enables them to get them more clear and talking to intimae about them lets them better understand them.

Triggers:

The audio message can be seen as a trigger. This trigger would be identified as an facilitator trigger because of the attempts to making the requested behaviour more easy (the sub question that are

given make it easier to reflect on the your ambitions).

User context:

Core motivators:

In the message of the tourguide no real motivators can be identified. Alongside the audio description of the this assignment the participants can listen and view movies for inspirations. These are “inspiring talks and interviews with the world front runners” and can boost motivation because they are often a pleasure to watch and create hope because of the state of the art or important topics for the future they asses. However these core motivators do not boost the motivation to accomplish assignment three.

Simplicity factors:

Time & Money:

This assignment is time consuming and depends also on the agenda of others. Therefore this simplicity factor can be a constraint for performing the behaviour.

The further cost of time and money to this activity depends on the people who the participants wants to talk to.

Brain cycles:

This activity requests for hard thinking because of the personal and abstract concepts that are asked to reflect upon .

Physical effort:

No physical effort is requested from the participant when performing this assignment.

Non-routine:

The task that needs to be performed in assignment three is not a routine task. Discussing the topic with someone who knows the participant can help.

Social deviance:

This assignment will be of less social deviance than assignment one, which is all about the talent in the participant. The topic of which talent you have is harder to discuss because it can sound very overly self-confident which is often socially excepted. Talking with others on ambition and goals is somewhat easier because everyone has some sort of ambition or goal in his or her life.

7. Assignment 4:

Use context:

Description of the activity:

In a given time interval the participants will receive text message via their mobile phones. In this messages there are question about the current work situation the participant is in. The participant has to answer the question by sending back a rating between 1 and 10. This has to be done for three questions per session and there are four session in total. Every time they receive a message the participants needs to write down a short description of what he or she is currently doing.

Goal of the activity:

The goal of this activity is to create input for the bigger picture meeting. Also it creates awareness on the importance of the tasks the participant execute in their daily jobs.

Message:

Q1: To what extent is your work at this particular moment relevant for the Ahold Strategy? Reward from 1 to 10.

Q2: Would you label your work at this moment as 'routine' or as 'innovative'? Reward from 1 (very routine) to 10 (very innovative).

Q3: To what extent does your work at this moment connect to your personal quest? Reward from 1 to 10.

Channel:

The questions or answers are send via SMS to or from the participants.

Context:

The total number of participants are divided into three groups and all of them receive the message around the following points in time on different days and for each group in another order. The messages are received around: 11.30, 15.00, 09.30 and 16.00.

The role of persuader:

The 'tour guide' can be seen as the persuader but this is not as clear as in all the other activities. She has to persuade the participants of answering the question she will send to them.

The role of the Persuadee:

The role of the persuadee is answering the question.

Triggers:

The SMS messages that are sent to the participants are the triggers to tell that the participant needs to perform the behaviour. The type of trigger can be classified as a signal trigger. The SMS can be seen as a signal to answer the question. Classifying the SMS message as a facilitator trigger is somewhat awkward, the information in the message does not make it easier to perform the behaviour. In the other assignments most of the question helped to perform the target behaviour but in this activity without the question it is impossible to perform the target behaviour so it cannot be seen as something that makes it easier to perform the behaviour.

User context:

Core motivators:

In the message that are send we cannot identify the usage of any core motivators. Only the questions are send to the participants.

Simplicity factors:

Time & Money:

Time can be a resource that will not be available at the time the participants receive the question.

We know that it is in the middle of a working activity and therefore it is often possible that participants will receive and read it but not act to it.

Money for replying with a text message will not be of any big issue so this is not a constraint in the simplicity factors.

Brain cycles:

The amount of ‘brain cycles’ necessary to answer the question is much lower compared to the assignments one, two and three.

Physical effort:

It takes some physical effort to go to your notebook and write down the exact activity that is currently being done.

Non-routine:

Reflecting on your work while working cannot be seen as a routine and is distracting. Therefore this simplicity factor can prevent participants to execute the target behaviour.

Social deviance:

The social deviance of this task can also be high. This depends on the context in which the participant receive the question. If the participant is working together with others it will be against to norm to start texting and making notes about something else while you are in a conversation with others.

This may prohibit the participant of answering the question and even forgetting it when he or she will be concentrating on his or her current activity.

8. Slice of work:

Use context:

Description of the activity:

In the last activity the participant will receive a slice of work of a manager that is working on a higher level than the participant itself. The participants need to use the newly learned attitudes and behaviours to accomplish this task successful. To notify the other participants and the peers of the participant of this successes, K&S has developed a tool for revealing these success stories. The tool for sharing success stories is a combination between a web application and automatic SMS interaction.

At <http://sliceofwork.amp2011.eu/> all the participants can look at the stars that represent successful moments of participants in their slice of work. The stars can be launched by the participant by texting to a particular phone number. As the participant has send the message he/she will receive a cheerful audio message to reward the participant for his/her success. Furthermore the SMS that is send triggers the SPARCKL system to send two text message to the participant peers. They are invited to call the participant and to congratulate him with his or her success. Also other participant can react on the star via the website mentioned above. When a star is placed it has an initial size which will decrease every 24 hours. When somebody places a reaction at a star it will become bigger.

Goal of the activity:

The website needs to create positive feedback on tasks that are performed by the participants and tries to trigger social interaction among the participants. Furthermore this social interaction should lead to reflection on how the success moment was created by the participants.

Message:

The message that is send to the participant after he or she has send a text message to the slice of work website contains cheerful music and cheering people. The peers of the participant will receive a message that will persuade them to call the participant to congratulate him or her with the success. The message from the peer to the participant will be always different but needs to be positive feedback on what has been achieved by the participant that has introduced the star.

Channel:

The channels that are used are a website, text messages and telephone communication.

Context:

The context in which the messages are send will vary. In the most cases it will be during working hours and in an business office setting.

The role of persuader:

The participants will not perceive a clear role that gives insight in who is behind the messages. In this activity it is the producers of the leadership journey that try to create positive feedback between the participants of the leadership journey. The try to accomplish this by sending text message to the peers of the participant and the explicit show successful activities by illustrating them as stars in a sky.

The role of the Persuadee:

The persuadee in this activity is not only the participant itself. The peers need to be persuaded to make contact with the participant to congratulate him or her.

Triggers:

There has been informal explanations on how to use the slice of work but there is no message that triggers the participants to create stars on the website. The only triggers that are used in this activity are the text messages that are sent to the peers of the participant. These triggers can be seen as signal triggers because they only inform the peer about the star that has been created.

User context:

Core motivators:

In the text messages that are sent we could not identify core motivators for the participants.

Simplicity factors:

Time & Money:

Time can be the resource that is a constraint on simplicity for the peers that need to call the participant. The time constraint for the participant itself does not have to be big. The message of the star has only the length of 140 characters and therefore is not very time consuming to write.

Brain cycles:

This activity does not cost many brain cycles, the hardest part for the participant will be formulating his success in a short story of 140 characters. Also the peers only have start a normal conversation on the described success after they have congratulated the participant of achieving this success.

Physical effort:

The physical effort is not big. Sending text messages and making phone calls cannot be seen as very demanding physical efforts.

Non-routine:

Congratulating someone with his or her success can be seen as something common but often people do not take the time for it or do not know the successes of their colleagues. This is the reason why the producers of the leadership journey have created this tool.

Social deviance:

Congratulating somebody with a success can be seen as a social accept activity. However telling everybody that you have succeeded in something is not. Therefore placing your success on a website like the slice of work webpage, has a higher social deviance and can obstruct people of performing this behaviour.

Appendix E:

Overview of communication between participants via other media (group 1) :

Tijdstempel Via welk medium verliep dit contact?	Via welk medium verliep dit contact?	Ik ben:	Wat was de aanleiding van het gesprek?	Ik heb zojuist contact gehad met:	Wanneer vond dit contact plaats?
14-5-2012 18:11	E-mail	Ton Tobi	plannen intervisie	wieke, eva, belinda, katherine	-
14-5-2012 18:13	E-mail	Ton Tobi	contact met Vrijwilligersacademie amsterdam over gezamenlijk adviesvoorstel	Elisabeth Zomerman	-
16-5-2012 19:10	E-mail	Wiek Leonhard	Tip voor het werk en vraag voor werkopdracht	Cheyenna Toornent	-
16-5-2012 19:11	E-mail	Wiek Leonhard	Intervisie plannen	Ton Tobi	-
17-5-2012 11:46	E-mail	Eva Ouwerkerk	Afspreken wie nog een keer naar externe opdrachtgever meeging	Ton Tobi	-
17-5-2012 22:47	E-mail	Cheyenna Toornent	Een nieuwsbrief die ik van Emerce ontving over een seminar die volgens mij voor Wieke interessant was.	Wiek Leonhard	-
5-6-2012 20:31	E-mail	Titia Terpstra	Horen hoe het met portfolio ging en of we nog naar theater van Klaas zouden gaan. Gezamenlijk contact gehاد met Elizabeth, Klaas en masja. Is ook intervisie groepje. Gr. Titia	Elisabeth Zomerman	31-5- 2012
5-6-2012 20:33	E-mail	Titia Terpstra	Zie opmerking idem bij Elizabeth. Horen hoe het met vorderingen portfolio ging. En om afspraken te maken voor theater Klaas. Daarna ook contact gehad om een etentje te regelen met intervisiegroep.	Masja Sjerp Bijman	31-5- 2012
5-6-2012 20:33	E-mail	Titia Terpstra	Zie opmerkingen idem aan Elizabeth en masja	Klaas Visser	31-5- 2012
5-6-2012 20:34	Telefonisch	Titia Terpstra	Iets leuk regelen voor module 10. Even afstemmen	Jeroen Kristian Spijkerman	1-6-2012
8-6-2012 23:23	E-mail	Elisabeth Zomerman	Jeroen heeft mij gevraagd feedback te geven over zijn Sterke Punten generator. Dat heb ik per mail gedaan, zodat	Jeroen Kristian Spijkerman	29-5- 2012

			hij dit kon opnemen in zijn portfolio.		
8-6-2012 23:25	Face-2-Face	Elisabeth Zomerman	Nog even een keer bij elkaar komen met intervisiegroepje. Lekker eten in Bolsward.	Titia Terpstra	6-6-2012
8-6-2012 23:25	Face-2-Face	Elisabeth Zomerman	Nog even een keer bij elkaar komen met intervisiegroepje. Lekker eten in Bolsward.	Masja Sjerp Bijman	6-6-2012
8-6-2012 23:25	Face-2-Face	Elisabeth Zomerman	Nog even een keer bij elkaar komen met intervisiegroepje. Lekker eten in Bolsward.	Klaas Visser	6-6-2012

Overview of communication between participants via other media (group 2) :

Tijdstempel Via welk medium verliep dit contact?	Via welk medium verliep dit contact?	Ik ben:	Wat was de aanleiding van het gesprek?	Ik heb zojuist contact gehad met:	Wanneer vond dit contact plaats?
15-5-2012 21:07	E-mail	Lianne	Terugkoppeling van Bart over het gesprek dat hij gevoerd heeft met directeur over advies. Doende een gesprek te plannen met Bart, saskia	Bart	-
15-5-2012 21:13	E-mail	Lianne	Mail naar Marleen, Miriam, Maikel,kemp over terugkoppeling van het gesprek met c. Opdrachtgever advies in een dag. Afspraken: nieuwe afspraak met c en w om advies in een dag als werkform voor anders te leren te onderzoeken.	Miriam	-
16-5-2012 9:25	Telefonisch	Lianne	Ingesproken berichtje over namen die hij zou kunnen gebruiken voor aquisitie doeleinden	Bart	-
16-5-2012 9:26	E-mail	Lianne	Informatie over stappen Marleen in haar werk	Marleen	-
16-5-2012 16:16	E-mail	Lianne	Plannen afspraak om advies in een dag Avans succesvol af te ronden.	Bart	-
21-5-2012 23:36	E-mail	Lianne	Utube link doorgeven	Lian	-
22-5-2012 14:51	E-mail	Bart	We zijn aan het proberen een afspraak te plannen naar aanleiding van het praktijkbezoek aan Avans+!	Lianne, Saskia	-
4-6-2012 17:18	Telefonisch, E-mail	Lianne	Advies in een dag	Bart	1-6-2012
4-6-2012 17:18	Telefonisch	Lianne	Bijstelling advies in een dag	Bart	23-5-2012
12-6-2012 20:21	Face-2-Face	Lianne	Opening Volker Wessels academy vorige week woensdag.	Bart, Monica, Jos	6-6-2012

Appendix F:

Motivation Ability Opportunity Analysis

Key drivers	Behavior	Key obstacles
	Ability <i>Goals, plans</i> <i>Self-efficacy</i> <i>Mindfulness, grit</i> <i>Skill, usability</i> <i>Habits</i> <i>Resources</i> <i>Social support</i>	
	Motivation <i>Awareness</i> <i>Attitudes/emotions</i> <i>Motivations</i> <i>Fears</i> <i>Social norms</i>	
Opportune Moments		
<i>Biography</i>	<i>Service lifecycle</i>	<i>Routines</i>
		<i>Service episode</i>

Motivation Ability Opportunity Analysis

Motivation Ability Opportunity Analysis

Motivation	Ability	Opportune Moments
<i>Awareness and knowledge</i>		
<ul style="list-style-type: none"> • What do you know about X? • Do you think X is relevant for you? Why? • Do you know how (often) you do X? (How do you know?) 	<ul style="list-style-type: none"> • Have you made goals or plans in relation to X? (Describe.) • Self-efficacy <ul style="list-style-type: none"> • Would you say you can solve most problems with X if you invest the necessary effort? • Would you say it is easy for you to stick to your aims and accomplish your goals with regard to X? • Would you say you're confident you could deal efficiently with unexpected events with regard to X? 	<p>General</p> <ul style="list-style-type: none"> • Did you ever think: »Now I'd like to do X!« When was that? (Describe.) Were there other moments? • In general, how do you remind yourself to do things like X or related to it? Does that work well? Why (not)?
<i>Attitudes and emotions</i>		
<ul style="list-style-type: none"> • How do you feel about X? Can you tell me what created that impression? • (If brand/product): How trustworthy is X? 	<ul style="list-style-type: none"> • Would you say it is easy for you to stick to your aims and accomplish your goals with regard to X? • Would you say you're confident you could deal efficiently with unexpected events with regard to X? 	<p>Biography</p> <ul style="list-style-type: none"> • In your life, has there been a period or moment when you did X a lot? Or in hindsight, think that X would have been good and/or easy to do? Why?
<i>Motivations</i>		
<ul style="list-style-type: none"> • Have you done or tried X recently? Describe: How did that go about? Why did you do it? (Follow with laddering: Why was that important? ...) • Where there other reasons why you did it? (Follow with laddering) • Was there something that spoke against doing X? What? (Follow with laddering) • Do you remember doing something else or using something else that served the same needs for you as X? (Describe.) 	<ul style="list-style-type: none"> • Mindfulness, willpower <ul style="list-style-type: none"> • Do you sometimes find yourself doing X without paying attention? Can you describe a typical instance? • Do you sometimes find that new interests or plans distract you from X? (Describe an instance.) • Did you sometimes not finish something you began with regard to X? (Describe an instance.) • Knowledge, skill, usability <ul style="list-style-type: none"> • Remember the last time you tried X: How hard or easy was doing X for you? What made it easy or hard? • Did you once wanted to do X, but did not or aborted? Why – what happened? (Were there other times?) 	<p>Service lifecycle</p> <ul style="list-style-type: none"> • (If participant has used service or embarked on longer attempt to tackle X): If you look at your history with service/attempt, when in that history did you do X? Why then?
<i>Fears</i>		
<ul style="list-style-type: none"> • Have you had some bad experience with X? (Describe.) • Is there something that could go wrong with X? (Describe.) 	<ul style="list-style-type: none"> • Would you say X is part of a routine for you? (Describe the routine.) • Is there something you already do regularly that stands in the way of X: Or that fulfills the same needs for you? (Describe.) 	<p>Routines</p> <ul style="list-style-type: none"> • Could walk me through your (day/week/year) and tell me: When do you do X? (Why?) • Looking back on your (day/week/year): Would there be an optimal time to do X? (Why?)
<i>Social norms</i>		
<ul style="list-style-type: none"> • How do your friends and colleagues think about X? Is that important for you? Is there someone else you'd like to know if you did X? Or someone you'd like to hide it from? Why? 		<p>Service episode</p> <ul style="list-style-type: none"> • Can you remember the last time you did X when using the service? When in the course of using the service did you decide to do X? What triggered it? • Was there a moment during using the service that you thought »Now I'd like to do X«, but couldn't? (Describe.)
<i>Resources</i>		
	<ul style="list-style-type: none"> • Was there a moment when you didn't do X or found it difficult because you lacked some resource – money, devices, ...? (Describe.) 	<p>General notes</p> <ul style="list-style-type: none"> • See these questions more like a check list than a full interview guideline. • Always ask for memories of <i>actual</i> moments the interview partner tried or completed the behavior X in question. • If the interview partner has no memories of the specific behavior, slowly broaden towards comparable behaviors and contexts. • When asking for motivations, use laddering. Repeatedly ask: Why did s/he do X? Why was that important? – until you arrive at an underlying motive.
<i>Social support</i>		
	<ul style="list-style-type: none"> • Are there others who could help you do X? How? Have you asked them for help? Why (not)? 	

Appendix G:

Overview of the questions used in the interview with the users of the two prototypes.

1. Wat vond je van het gebruik van de tijdlijn?
2. Waren relevante vragen om te beantwoorden?

Het reflecteren op die activiteiten is wel iets goed om te doen?

3. Doe je dit normaal ook al voor jezelf?
4. Zijn er andere rituelen of handelingen die u gebruikt om te reflecteren op leeractiviteiten?
Bijvoorbeeld een kleine reflectie schrijven als memo voor jezelf oid?
5. Vond je het relevant om te zien wat andere doen?
6. Maar de andere (check-ins) van andere mensen zijn relevant en interessant om te lezen?
7. Ben je wel nieuwsgierig naar wat andere er op zetten?
8. Wat doet het met u dat u andere mensen een check-in ziet maken? Heeft dat invloed op u?
9. Had u plannen omtrent het gebruik van de tijdlijn om het te gebruiken, of was het meer sporadisch?

Als meer mensen het zouden gebruiken vindt je het dan van belang om het zelf ook meer te gaan gebruiken?

10. Is het ook wel een beetje een gewoonte geworden om de tijdlijn te gebruiken?
11. Is er ergens een routine ontstaan om het te gebruiken?
12. Vond u het een aantrekkelijk site om te gebruiken?
13. Kwam de site betrouwbaar over?
14. Verlaagd de koppeling tussen wat je moet doen en waarover je een bericht kan plaatsen ook de drempel om het te gebruiken?

Sociaal:

15. Enig idee hoe andere collega's hier over het concept denken?
16. Vindt u dat van belang hoe andere mensen over de tijdlijn denken?
17. Heb je nog veel onderling communicatie gehad met andere?

---- ability ----

18. Heeft u het vooral op de iPad gebruikt?
19. Was het makkelijk om een check-in te plaatsen?

Was het makkelijk om op iemand te reageren?

20. Heeft u ook dingen waar u met het gebruik tegen aan liep? Met de iPad tekst invoeren bijvoorbeeld?
21. Begreep u de knoppen en waar ze voor diende?
22. Was informatie snel te vinden?
23. Er is niet echt iets geweest waardoor je het weerhield om de tijdlijn te gebruiken?

24. Heeft u wel eens gehad dat u iets aan het doen was op de tijdlijn, een bericht plaatsen of reactie lezen en dat op één of andere manier mee gestopt bent, omdat er iets mis ging of er iets anders tussen kwam?

Triggers:

25. De email en dergelijke (triggers) had dat nog effect op u?
26. Zo'n SMSje triggerde komt dat anders over dan email?
27. Bent u wel eens afgeleid door de tijdlijn of één van de smsjes of mailtjes. Dus dat je ergens mee bezig was maar toch even op de tijdlijn ging kijken?
28. De check-ins specifiek op de dingen die moesten gebeuren (inleveren portfolio & voorbereiden proeve) waarom die check-ins niet gedaan?
29. Wat deed het SMSje over 'jullie hebben nu het portfolio ingeleverd' met je?
30. De triggers zijn duidelijk zoals mail en smsjes zijn direct. Maar de snelkoppeling als indirecte trigger werkt dan niet echt ?

Opportunities:

31. Ooit een moment gehad van nu zou ik de tijdlijn wel eens willen gebruiken?
Wat zou voor jou het beste moment zijn om op site te kijken als u nu terug kijkt op de afgelopen weken? waarop je het beste de site kan bekijken?
32. Kunt u zich herinneren wanneer u de tijdlijn voor het laatst gebruikt heeft? Wanneer tijdens het gebruik besloot u om een check-in te plaatsen of was dat al vooraf bepaald? Wat was hiervoor de aanleiding?
33. Zou het gebruik van de tijdlijn op een ander moment beter uit komen?

Vragen over andere vormen van social media:

34. Hoe zit het met u en ervaring met andere sociale media?
35. Deelt u op facebook/twitter wel eens iets over de LCL?
36. Vindt u het wel fijn dat het meer gerelateerd is aan de activiteiten die deelnemers van de LCL moeten doen? Heeft dat ook een meerwaarde?
37. Maar je zou dezelfde informatie ook kunnen delen via twitter?
38. Maar de specifieke vragen van de tijdlijn, de antwoorden daarop, zou je die op twitter zetten?
39. Door dat je ziet dan andere de informatie openbaar maken doe jij dat dan ook?
40. En facebook, gebruik je dat?

Vraag als begeleider van lerende volwassenen.

41. Zou u dit concept van de tijdlijn gebruiken wanneer u in de rol van begeleider zou zitten?