Development of a multi-channel e-service design method

An extension for xQFD
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Preface

This report is the final thesis for my graduation project in the Master of Science program Systems Engineering, Policy Analysis and Management, taught at Delft University of Technology. I wrote this report during my internship at TNO Information and Communications Technology, in the department of Business Innovation and Modeling.

I would like to take this opportunity to thank Hans Kardol, the TNO representative in my graduation commission, in first place for the enjoyable way of working, but of course also for his useful feedback. Also, I would like to thank Luuk Simons, my first supervisor, for his supervision during the six months this research has been done, but also for the nice collaboration preceding the project. I should also show thanks to Jelle Attema, the secondary supervisor of my committee, in particular for his content related advices during the project. Also, I owe my gratitude to René Wagenaar, the chairman of my graduation commission.

Besides my graduation committee I would like to thank the people who helped me facilitating the design sessions, namely Joleen van Loon, Harry Bouwman, Klemens Karssen and Mark de Reuver. I also like to say thanks to the participants of the sessions, in particularly the Putman brothers.

During this research I interviewed many people. I would like to express my gratitude for their time and cooperation. I also would like to thank all employees of the department Business Innovation and Modeling for the pleasurable working period at TNO ICT.

Last but not least, I would like to thank my family and friends for their support during the project.

Delft, January 2006,

Ron Sperling
Executive Summary

Organizations have problems in designing Internet services, so called e-services, which have to fit in a multi-channel context. They are challenged to arrange their service delivery in such a way that all channels via which the service is delivered are complementary to each other. For designing e-services within a multi-channel context design support methods and structures are needed. For this reason a multi-channel e-services design support method has been developed: eXtended Quality Function Deployment (xQFD). Tests with this method revealed that the users were satisfied with it, however, they also indicated that the outcome of the method should be more concrete. Besides, it must become clearer which steps to take after the method.

TNO Information and Communication Technology wants to offer the xQFD method to its customers, however, first the method should be more ‘complete’. This has raised the question how the xQFD method should be extended. The goal of the research has been the following:

Develop an extension for the multi-channel e-services design support method xQFD that helps facilitating the next step in the design process in order to specify the service concept of an e-service (as defined during xQFD).

To achieve this goal, two sub questions have been defined:

- What is a suitable method, to elaborate the service concept of an e-service in a multi-channel context with a multi-disciplinary team?
- What added value does the developed method have for a design process of an e-service in a multi-channel context?

To answer these questions, firstly, requirements that the new method should meet have been defined. This has been done in two ways, by literature study and explorative research. Next, a test has been conducted to analyze whether the method meets the defined requirements. Based on the results of the tests, conclusions have been drawn and a number of recommendations have been given.

The xQFD method supports the start of an e-service design process, offered in a multi-channel context; it translates a concise e-service idea into a service concept. The method consists of three phases: intake (in which a service idea is discussed structurally), a design session, and a debriefing (in which the results of the previous phases are presented). During the design session four participants work through a predefined agenda, in half a day. The participants of the session all represent a different stakeholder perspective (customer (end-user) focus, marketing focus, channel focus, process/ICT focus). The method results in prioritized customer needs, functions and requirements, and a QFD matrix that helps justify investments decisions.

The new method had to meet a number of constraints that have been defined by TNO. One of these constraints is that it must be possible to apply the new method in the format of a design session (workshop). In the ideal situation the xQFD design session should be conducted during the morning and the afternoon is filled with the new design session. The participants of this session have to be the same as during the xQFD session.

The session has been designed based on several requirements for the initiation phase of a design process, which have been found in literature. These requirements aim at quality of design results and design process quality:

- Customer centricity
- Channel coherence
- Channel synergy
- Design process speed (time to market)
- Focused design process
- Cross-disciplinary team communication
- Promote concept coherence and communication during implementation

Also a number of requirements for additional design tasks for the new session have been defined, based on a literature study (analysis of existing design traditions) and on explorative research (the results of debriefings of xQFD sessions and interviews with a number of participants of xQFD sessions have been used for this). It has been checked whether these requirements do fit within the context and the constraints, defined by TNO. This resulted in the following list:
Based on the requirements an agenda for the new design session has been developed. Different methods have been used, in an iterative process, to do this: brainstorm sessions by the designer (author of this report), discussions with experts in the sub-fields of e-services design and tools out of literature. This agenda has been pre-tested with one case (fictitious case with a student group). Based on all this, the final agenda has been defined.

The method has been designed in such a way that it was expected to meet the listed requirements. The agenda of the session consists of different items. Each item has its own goal. For every item a certain time window exists to answer predefined questions. These questions help to come to the desired output. The agenda has been set up in such a way that the items follow on each other in a logical way. Often, the output of an item is used as input in a next item.

The agenda consists of the following items:
- Agenda Item I: Relation functions
- Agenda Item II: Personas
- Agenda Item III: Tasks
- Agenda Item IV: Storyboard
- Agenda Item V: Multi-channel (MC)
- Agenda Item VI: Technical integration
- Agenda Item VII: Roles/Parties
- Agenda Item VIII: Formulate project plan

The main purpose of the session is to specify the service concept, as defined during xQFD. Therefore, a visual representation of the service is created during the session. Design choices are made based on the customer priorities; this guarantees a customer-oriented design. The main outputs of the session are an e-service storyboard sequence, e-services screens with cross channel links and specification of back office connections and a project plan.

In September 2005 the method has been tested with four cases with business participants. Despite the fact that it would be interesting to analyze the differences between companies of different size, due to practical opportunities to find participants, mainly large firms have been used.

Every session has been conducted with a multi-disciplinary team, in which each person represented a stakeholder’s perspective. The participants were all employees of the company who designed the service. The intake was held with one person of the design team, several weeks before the design sessions. For every case a different facilitator has been used (except from two cases). All these facilitators had previous experience with facilitating groups.

The performance of the method, i.e. whether it meets the requirements, has been measured in several ways. Firstly, observations during the sessions have been used. Furthermore, all participants were asked to fill in several questionnaires (one between the xQFD and new session, one at the end of the day, one during the debriefing). Also, an interview with the participants has been held, based on the answers given in the questionnaires. Two persons (author and one of the facilitators) analyzed the output of all the sessions. Attention has been given to the quantity (e.g. number of screens) and quality (level of detail etc.) of the output.

Based on the results of the performed tests it has been concluded that a suitable continuation for the xQFD method has been designed during this research. The method meets most requirements as expected.

The main contribution of the method to the design process is the generation of a visual representation of the e-service (a prototype). Visualization of service concepts (making a prototype) generally helps in specifying and speeding up e-service innovations. It is always a challenge to cross the chasm between the specifications of a design and the real design. Making this step in the early phases of a design process is useful, because the list of specifications is relative small at that point. Based on a prototype, people find it easier to give feedback, and shortcomings of the design are noticed earlier. Besides, a prototype
makes it is easier and more precise to discuss multi-channel, technology and process issues, because the issues become more tangible.

Following the principals of existing design traditions it has been attempted to incorporate all different aspects of an e-service design (technical, organizational etc.) in the early stages of the design process. The designed method treats every aspect in a structured and quick scan way.

A strength of the designed method is the early involvement of different stakeholder perspectives during the design process. A multi-disciplinary design team is useful to elucidate all perceptions of different actors. Besides, it helps in taking supplier constraints into account.

It has been found that attention for other channels (during a design process) leads to a great number of new ideas, not only for the service that is designed, but ideas that cover the whole service delivery. It shows that when only one aspect (channel) of the service delivery is designed, it is always important to consider the wider context.

To ensure a user centered design during a design session the agenda item ‘personas’ proved to be a useful tool. A precise descriptive model of the user, what he wishes to accomplish, and why, is made in this item. According to observations, design choices are made based on the personas during the session, which helps making a user-centred design.

The main benefits of the method (xQFD and new session) may be obtained at the start of a design process. In one day only, a concise e-service idea is specified and visualized.

Based on observations it has been concluded that the method satisfies its participants even on the long run. An analysis has been conducted to see whether the designed method leads to satisfied participants. It is analyzed whether satisfaction is a function of input and output of a session or whether satisfaction is based on satisfaction with process, output, and a more independent arousal component. No unambiguous results were found, probably due to the limited number of participants.

Different facilitators can facilitate the designed session. No reason has been found that the facilitator has (significant) influence on the session. It has also been proven that the session format is transferable between different facilitators in a reasonable amount of time.

It is recommended to use this designed method (xQFD and new session) at the start of a design process when designing a new e-service. Main reason for this is that this method describes in more detail ‘what steps to take’ than other existing methods. The method has the most value when only a concise service idea exits. In a short and structured way, this is translated into a visualized service concept.

This method only covers the first step of the design process: it helps to create and specify a service concept. It is advisable to use other existing methods to cover the whole design process after this method.

For TNO this research resulted in an agenda for a design session, which can be added to the existing xQFD method. It has been proven that this new product contributes to a rapid, structured start of an e-service design process (in a multi-channel context). Besides, the product leads to participants, who even in the long run, feel satisfied. Due to this, TNO has a product that can be offered to its customers.
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1 Introduction

1.1 Problem description

Since a couple of years the Internet is seen as a new channel to deliver services, which offers new opportunities for organizations. Using this channel can for instance lead to cost reduction or service quality improvement. Nowadays, still new channels are emerging, for example the mobile communication channel. The rise of these new channels does not mean that the traditional channels are not needed anymore. Organizations are challenged to arrange their service delivery in such a way that all the channels via which the service is delivered are complementary to each other: they have to find the right channel mix.

It seems that organizations have problems in designing services that can be offered via the new technology driven channels, the so called e-services. For this reason a multi-channel e-services design support method has been developed by Delft University of Technology (TU Delft) and TNO Information and Communication (TNO). This method is based on QFD (Quality Function Deployment) and is called eXtended Quality Function Deployment (xQFD) (Simons and Bouwman 2005a). Tests with this method (the method will be described in the next chapter) revealed that the users were satisfied with the design process and the result. However, they also indicated that the outcome of the method is just one step in the design process towards the finishing line, but not yet the step over this line.

TNO Information and Communication Technology wants to offer the xQFD method to their customers. For TNO it is important to have the ability to offer a ‘complete’ method for the design of an e-service. TNO also wants to have the opportunity to offer the facilitation of the next step in the design process. Probably, it will result in more satisfied customers, when TNO can support making the next step of the design process.

The xQFD method helps to take a first step in the right direction within an e-service design process. The problem that is often seen when using the traditional QFD method also holds for xQFD (www1): what to do next? In order to develop a method that supports taking a next step in the design-process (which makes the output of xQFD more specified) research is necessary. This research will be presented in this report.

1.2 De Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek (TNO)

The research described in this report has been carried out on behalf of TNO Information and Communication Technology.

‘TNO Information and Communication Technology is a unique centre of innovation in the Netherlands that brings together the ICT and Telecom disciplines of TNO. TNO helps companies, government bodies and (semi-)public organizations to realize successful innovations in ICT. Value creation for clients is their priority, and their added value lies in the combination of innovative strength and in-depth knowledge. Their approach to innovation is integrated and practical. Their research involves more than the technologies themselves. Where necessary, they also focus on user-friendliness, financial aspects, and business processes. They support the implementation process by carrying out technical and market trials. They are also specialists in innovation strategy and policy, and their extensive ICT expertise is a valuable resource that can be used to address issues in the wider community.’  (www2)

TNO ICT consists of four business units, and Corporate is one of them. Corporate exists again of two departments: BIM en FES. The research described in this report has been carried out on behalf of BIM: Business Innovation and Modeling

‘TNO Information and Communication Technology builds the bridge between new technology and its application in the form of new products and services in the market. Their approach is based on methods developed by TNO for measuring and predicting customer
behavior in terms of the day-to-day needs of end-users. Here, the focus is on customer-centred products and processes.

**Market Research & Concept Development**

TNO studies the day-to-day needs of end-users and develops ICT solutions to create added value in that context. End-users are involved in the innovation process, which means that perceptions and criteria relating to the technology and company concerned can be developed and tested at an early stage. This enables the parties involved to steer the innovation process in order to maximize the success potential of new concepts. TNO’s products and services in this category include:

- Needs Research (qualitative) by means of interviews, group discussions or context research.
- Qualitative market segmentation and target-group profiling.
- Concept development for services, user-interface design, marketing propositions.
- Concept evaluation for services, user interfaces and marketing propositions.
- Short-term advisory projects (e.g. User-Interface Quick Scan, Creative Concept Design).

**Multi-channel Servicing**

Multi-channel Servicing uses and develops expertise in the area of channel service design in order to improve the channel performance and channel coherence of companies. The guiding question is: “how do companies establish and maintain contact with customers?” Our products and services in this category include:

- Market Watch: a bi-monthly newsletter with information about the latest developments in the field of customer interaction.
- Customer Barometer: methods and electronic tools for obtaining fast, detailed customer feedback about service processes.
- Multi-Channel Service Design.
- Channel Cost-Benefit Tool: a model designed for the retail sector to assess the costs and benefits of each customer-contact channel.
- Channel Services Workshops: designed to help participants formulate their strategy and vision for customer contact.
- Channel evaluation by experts: TNO can draw on its expertise in the field of channel best practices and customer-friendliness in order to evaluate web, telephony, e-mail and other channels.’ (www2)

Customer-centred design, concept development for services and multi-channel service design are important subjects of the Business Innovation and Modeling (BIM) department. To support these aspects BIM owns several tools. The xQFD method must become one of these tools, but before BIM adds it to its portfolio it has to be a ’complete’ method. Therefore BIM wants to extend the current xQFD method. The right filling-in of this session must be found.

### 1.3 Research Objective

The goal of the research project is:

| Develop an extension for the multi-channel e-services design support method xQFD that helps facilitating the next step in the design process in order to specify the service concept of an e-service (as defined during xQFD). |

- In this goal ‘develop’ refers to find out what extension is desired and to design a method that can be used after xQFD.
- ‘xQFD’ refers to the method that is defined by Simons (2005a).
- What ‘the next step’ should be is part of the research.
- ‘Specify’ refers to make the concept more concrete.
- The ‘service concept of an e-service’ is the output of the xQFD design session.
1.4 Research Questions

The research question that is answered is:

What is a suitable continuation of the xQFD method in order to specify the service concept of an e-service and what is the added value of this continuation?

In this question, 'continuation' is defined as:
• A next step in the e-service design has to be taken.

'Suitable' refers to:
• The output of xQFD session (service concept) should be used as input for the new method.
• Other constraints will be presented in paragraph 1.6 (defined by TNO).

'The 'xQFD method' is defined as:
• The method that is defined by Simons (see paragraph 2.2).

The answer to the question should be a tested method.

1.5 Research sub questions

To answer the research question, it has been divided in several sub questions.

What is a suitable method, to elaborate the service concept of an e-service in a multi-channel context with a multi-disciplinary team?

Firstly, it is important to define which aspects should be addressed during the design process after xQFD. These aspects can be found by studying literature, but also the explorative research will be used for this.

Which aspects should be addressed during the design process after xQFD?
- According to the literature?
- According to the explorative research?

Requirements will be designed to cover these aspects. A method will be developed based on these requirements.

What is a possible method?

When the method is developed, it is important to test whether the method meets the requirements. A testing methodology will be developed.

How can it be tested whether the developed method meets the defined requirements?

When the testing methodology is developed, the test will be carried out. The question will be answered whether the method meets the requirements.

Does the method suffice the derived requirements?

Based on these questions a method will have been developed and tested, and conclusions about the method itself can be drawn. However, also some high level conclusions will be drawn regarding the added value of this method.

What added value does the developed method have for a design process of an e-service in a multi-channel context?

1.6 Constraints TNO

This research is carried out for TNO. TNO defined several constraints, which the method should meet. This paragraph presents these constraints.

For TNO it is important that the method is scientifically based. Evidence must be generated that proves that the method does help in taking the next step. Therefore, two constraints towards the new method are:
• The method must be scientifically based.
• This step should have a valid value proposition within the design process.
More constraints for the new step are clear already. TNO wants to offer the new methodology to its customers in combination with the xQFD method. The idea behind this is that the design team gets through the xQFD agenda in the morning and in the afternoon the agenda of the extension will be completed. The transition between the two agendas must be seamless; for the participant it must look like one design session. This brings constraints for the new method.

- It has to be possible to apply the new method in the format of a design session (workshop).
- The output of the xQFD session has to be used as input for the new session.
- The maximum duration of the new session equals four hours.
- The line up of participants of the new session has to be the same as the one for xQFD.

One remark has to be made regarding this. The chain of events of the whole xQFD method can be presented like this (In chapter 2 this will be discussed in detail):

![Figure 1: xQFD methodology](image)

The new design of the combination of the two sessions will be:

![Figure 2: New chain of events](image)

It is not unlikely that the new session desires other input than the collected information during the regular intake and the xQFD session. So, it can be necessary that additional questions should be asked during the intake. Obviously, the debriefing will be adapted as well; not only the output of xQFD will be presented, but also the output of the new session. Preferably, the agenda of xQFD, as shown in table 1, should not be adjusted. However, when this seems necessary, adjustments will be kept as limited as possible.

- The ‘package’ of the xQFD session and the new session has only one intake and debriefing. This intake and debriefing will be adjusted to the new session.
- The agenda of the xQFD design session can be adjusted when this is necessary; the changes will be kept as limited as possible.

For TNO it is important that customers are willing to use the new method (next to the fact that the method is scientifically based). The participants must feel satisfied with the process and output of the session.

- The process and output of the new method must be satisfying for the participants.

### 1.7 Methodology and report structure

In chapter 2 of this report a theoretical framework is presented. This chapter gives a short description of the xQFD method. Thereupon, it describes where xQFD fits within the design process. Next, it gives requirements for the new method, which have been found in literature. This chapter answers the question which aspects should be addressed during the design process after xQFD, according to the literature. At the end of this chapter a description of the term satisfaction is given.

Not only literature has been used to find requirements, also the opinion of former xQFD participants has been used. This has been done based on the debriefing sessions held
during former xQFD session, and interviews with former xQFD participants. **Chapter 3** presents the results of this explorative research.

**Chapter 4** provides a possible agenda for the design session (for the continuation of xQFD.) This chapter presents the agenda that has been developed based on the constraints of TNO (see paragraph 1.6) and the requirements that are presented in chapter 2 and 3. Next to this, the chapter describes the pre-test that has been conducted.

**Chapter 5** describes the testing methodology that is used to test the developed method. **Chapter 6** presents the outcomes of the tests. Conclusions have been drawn with regard to the method performance based on the test results. **Chapter 7** provides a discussion with respect to the testing and results and an overall reflection on this study. This report ends with **chapter 8**, which presents the conclusions of the research, along with a number of general recommendations.

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**Figure 3: Research set-up**
Theoretical Framework

This chapter presents the theoretical framework on which the research will be based. Firstly, paragraph 2.1 describes the concept of services and e-services, and the ways they can be offered. Next, paragraph 2.2 explains shortly the xQFD method. Paragraph 2.3 describes existing design methods and it describes where xQFD fits within the design process. Next, paragraph 2.4 and 2.5 present important aspects of a design process, which results in a number of requirements that the new method should meet (next to the constraints defined by TNO, presented in paragraph 1.6). Paragraph 2.6 elaborates on one of these requirements. The chapter concludes with an analysis of the term satisfaction.

2.1 Service delivery types

The goal of this research is to develop an extension for the xQFD method. xQFD is an e-service design support method that takes the multi-channel context into consideration. This paragraph describes the concept of e-services and its relation to a multi-channel context.

2.1.1 Services

Before going into detail about the concept of e-services, this paragraph elaborates on services in general. In literature, different definitions are found. These definitions agree on the fact that a service is an activity that is intangible and that it takes place between more parties. Another characteristic of services is that, in contrast with products, the production, distribution and consuming take place simultaneously. A commonly used definition for the service concept is given by Grönroos (2000a):

‘A series of activities of more or less intangible nature that normally, but not necessarily, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems.’
An example of a service is the instruction about a product that is given by a salesman to his customer. This instruction is intangible, the transaction takes place between buyer and seller and it is produced, distributed and consumed on the same moment.

2.1.2 **Electronic channel**

In the previous paragraph an example of a service has been given. In this example, the transaction between seller and buyer takes place face-to-face. The transaction of a service can take place in many ways, via different so-called channels. Stern (1996) defines a channel in narrow sense as ‘a means to transmit a message’. In a broader sense it has been defined as ‘a set of (independent) organizations involved in the process of making a product or service available for competition or use.’ Examples of different channels are retail stores, personal sales and call centers.

Also, services can be offered via electronic channels. This process fits in the concept of e-business, which has been defined by Turban et al. (2004) as ‘the process of servicing customers, collaborating with business partners, and conducting electronic transactions within an organization via computer networks.’ A service offered electronically is called an e-service. Van der Kar (2004) defines an e-service as ‘an activity or series of activities of intangible nature that take place in interaction through an Internet channel between customers and service employees or system of the service provider, which are provided as solutions to customer problems, to add and create customer satisfaction.’ An example of an e-service is product information that is given via the Internet.

E-services can be offered via different electronic channels: via Internet, but also on mobile terminals, on the screen of a cash dispenser, and so on. All these ways of delivering an e-service have their own characteristics. When an e-service is used in public, privacy is an important aspect, when a service is received on a mobile device the location of the user can be used, but it must also be taken into account that the information must fit on a small display.

One of the ways to deliver an e-service is on a PC, via the Internet. In this case, most of the times the information is shown on a website. When speaking of a website, not only a traditional website that offers static information is meant. More often, a website is a complex system that consists of interactive information and functions.

2.1.3 **E-services as auxiliary services**

Sometimes, the core business of a party is the delivery of services or products via the Internet. However, many parties deliver a service or product via a traditional channel (retail stores). At the same time they deliver support to their product or service via other channels, like call centers and the Internet. This is referred to in literature as auxiliary services (Grönroos et al. 2000b, Normann 2000). Users do not pay directly for these services; in fact they are non-billable. However, when a customer has to make a choice for a core product, the choice can depend on the auxiliary services that are delivered next to the core product.

It is clear that when an auxiliary service is developed, the fact that it supports a core service must be taken into account. To create win-win situations between the different channels can lead to great advantages; for example cost reduction. As said the user does not pay directly for an auxiliary service.

2.1.4 **Conclusion**

E-services can be delivered via different channels. One of these channels is the Internet. In most cases e-services support other core-services or products, which are delivered via other channels. When designing such an auxiliary service other channels must be taken into account. xQFD is a design method that supports the design of auxiliary e-services.

2.2 **eXtended Quality Function Deployment (xQFD)**

The research that will be done builds on preceding research by Simons and Bouwman (2005a) on e-service designing. During this research Simons and Bouwman developed a multi-channel e-services design support method. This method is described in this paragraph. xQFD
is based on the Quality Function Deployment (QFD) design method. Therefore this method is described first.

2.2.1 **Quality Function Deployment**

Quality Function Deployment (QFD), which originated in Japan, is a user-centred design methodology for designing quality products and services (Akao 1997). It is based on the idea of Clausing (1994) that quality should be considered in an early state of a design process. It uses a matrix format, 'the House of Quality' that is filled in during the design process. One of the strengths of QFD is the fact that the House of Quality from QFD can be the center of the communication process. It helps a design team to communicate with each other, even when their background is in different disciplines.

![Figure 4 - The House of Quality](image)

The House of Quality (www3), as presented in figure 4, consists of eight rooms:

- **Room 1 – The "Whats" Room:** the user needs are defined is this room. An importance weight is given to each user need.
- **Room 2 – The "Hows" Room:** in this room the characteristics or attributes, which can fulfill the user needs, are named. These 'hows' are also called design requirements.
- **Room 3 – The Relationship Matrix:** this room scores the impact that the 'hows' have on the 'whats'.
- **Room 4 – Competitive Benchmarking:** the way that competing products and services score on the user needs is described.
- **Room 5 – Technical Benchmarking:** this room describes the technical implications of the defined characteristics or attributes.
- **Room 6 – The Roof:** In the roof the correlations between the attributes are identified. By doing this, potential design conflicts or opportunities are defined.
- **Room 7 – Importance Rating:** this room calculates the importance of each characteristic or attribute. This is done from the needs importance data in Room 1 and the scores in Room 3.
- **Room 8 – Performance Standards:** Performance indicators for the different characteristics or attributes are defined in this room.
2.2.2 xQFD

Taking QFD and the idea of a good channel-mix as starting points, Simons and Bouwman have developed a multi-channel e-services design support method, which partly uses the House of Quality and also focuses on multi-channel issues. This resulted in xQFD. This method consists of three phases: intake, design session and a debriefing.

During the intake the e-service idea is briefly discussed with the idea-owner. This has to be done to ensure that the method is suitable for this e-service. During this intake also the procedure of the method is explained. The third purpose is to get the information that is needed to prepare the session.

The design session lasts half a day. Ideally, there are four participants. Each of them represents a different stakeholder perspectives: customer (= end user) focus, channel focus, marketing focus and ICT/process focus. The agenda of the xQFD session is presented in table 1.

<table>
<thead>
<tr>
<th>xQFD session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
</tr>
<tr>
<td>- Short review of the results of the intake</td>
</tr>
<tr>
<td>Step I: Customer (user) needs and web functions</td>
</tr>
<tr>
<td>- Identify, cluster and prioritize customer needs</td>
</tr>
<tr>
<td>- Identify and cluster web functions</td>
</tr>
<tr>
<td>Step II: Generate a competitive e-service</td>
</tr>
<tr>
<td>- Evaluate functions with regard to needs and create an e-service matrix</td>
</tr>
<tr>
<td>- Define service slogan that summarizes the proposition</td>
</tr>
<tr>
<td>- Discuss solutions and constraints for functions</td>
</tr>
<tr>
<td>Step III: Tasks of other channels</td>
</tr>
<tr>
<td>- Check the desired support from other channels</td>
</tr>
<tr>
<td>- Check win-win options between e-service and other channels</td>
</tr>
<tr>
<td>- Extend matrix with needs and functions related to other channels</td>
</tr>
<tr>
<td>Step IV: Competition</td>
</tr>
<tr>
<td>- Discuss strong en weak points of the new e-service in relation to competitors</td>
</tr>
<tr>
<td>- Score the existing and new sites, as well as the competition’s web presence with regard to customer needs, and discuss the results</td>
</tr>
<tr>
<td>Evaluation</td>
</tr>
</tbody>
</table>

For most of the activities during this session a group support system is used. As can be seen when looking in this agenda, the service matrix (the House of Quality) is used through the whole agenda. This is also the most important output of the session. During the debriefing, this matrix (table 2) and other qualitative outcomes are presented and discussed.
2.2.3 Requirements

Before the xQFD method was developed, Simons and Bouwman (2005b) defined requirements (based on literature and case studies) for the initiation phase of a multi-channel e-service design process, which aim at design process quality and quality of design results.

Process requirements aimed at the quality of the end results:

- **Customer-Oriented Design (User-Oriented Design)**
  ‘Many services provided by channels are ‘additional’ (i.e. they are not included in the core ‘product’) and non-billable. Customer value has to be incorporated into the channel service design. Clear decisions have to be made regarding which service features to include in the total service offer.’

- **Channel Coherence**
  ‘The customer value provided by physical channels in addition to e-services has to be taken into account. Also, e-services must be developed that complement existing physical channels.’

- **Channel Synergy**
  ‘Channel synergy is the re-use of assets across channels. Re-use of assets must be stimulated while maintaining customer focus in designing the value proposition and service processes.’

- **Competitive Positioning**
  ‘The starting point is an existing organization with a specific channel structure, a specific type of customers and a specific set of organizational capabilities. Hence, a multi-channel solution that would suit one firm in a specific market does not necessarily suit its competitors. Choices must be made as to what to retain, as a competitive asset or differentiator, and what to discard.’

- **Communication of Concept Coherence during Implementation**
  ‘During implementation, the balance between customer and supplier needs, and between one channel and the others, is easily lost. The coherence of the e-service design must be maintained and communicated during implementation and operation.’

Design process quality requirements:

- **Speed**
  ‘E-service concept exploration may only take a limited period of time, typically a few weeks. A fast, but thorough and systematic exploration is needed.’

- **Focused Design Process**
  ‘Although the number of available service options and channel combinations tend to explode, it is vital that the design process remains focused.’

- **Communication between Stakeholder Perspectives in Development Team**
  ‘A wide range of stakeholders is involved, ranging from CEO’s to channel specialists, sales and service processes and IT. A wide range of interests and perspectives must be supported while maintaining focus.’
2.3  **Design of services**

xQFD is a design method that supports the development of auxiliary e-services. In the literature more design methods can be found. Different methods are discussed in this paragraph. Next, it presents the phases of which existing design methods do exist. Based on this, it is described where xQFD fits into these processes.

2.3.1  **Different methods**

During the development process of an e-service everyone is working towards the moment of implementation: ‘going live’. There are different ways to achieve this.

Lee et al. (2004) distinguish two types of design methodologies: formal and informal. Formal methodologies describe the phases a design process should include. For each phase they prescribe what the input should be and how this can be translated to the desired output. Most of these methodologies use different kinds of modeling techniques throughout the different phases. On the other hand, informal methodologies do not give a detailed step-by-step plan, but prescribe for example a checklist for a design process.

Another important distinction that can be made is between waterfall models and spiral models (Van der Kar 2004). Waterfall models describe a number of stages that are passed step by step. When all the activities of one stage are completed a step is made to another phase. Spiral models include feedback loops between the different phases; due to this an iterative design process is created. An advantage of the waterfall model is the structured process. A spiral model tackles different phases at an early state in the design process. This reduces the change that there will be problems that cannot be tackled at the end of the design process. Besides, it can be the case that the outcome of one phase has influence on a previous phase. By means of an iterative process this can be handled.

xQFD can be seen as a formal method. For every step taken in the design process clear questions are defined. Also the output of each step is clearly defined.

xQFD can also be seen as part of a spiral method. A first iteration is made by defining the customer needs and the related functions. This can be seen as a high-risk phase; when there are no possible functions the continuation with the design will be useless. Later on, during the multi-channel steps, a new iteration takes place, in which new needs and functions are defined.

2.3.2  **Phases in design processes**

The xQFD method supports a part of the design process for e-services. It is useful to see what steps are taken in existing design approaches and how xQFD fits into these processes. Two design theories are analyzed. The first one, formulated by Alter, is a traditional design process for information systems. The second is a design process for e-services, described by Van der Kar.

Alter (1999) describes a design process for information systems that exists of three phases: initiation, development and implementation. The goal of the initiation phase is the understanding of the information system purposes and goals. The scope of the project is determined and the feasibility of the project (economic feasibility, technical feasibility and the organizational feasibility) is checked. The phase results in a functional specification and a project plan. Next, a detailed requirement analysis is conducted in the development phase. The final design is made, and programmed. After this, the system is implemented in the last phase.
Van der Kar (2004) describes a design process for mobile information systems, which exists of four phases: analysis, preparation, synthesis and implementation and test. Each phase exists of three so-called streams: value network, technology and service formula. In the analysis phase three outputs are desired: a letter of intention signed by all the actors involved in the design process, an overview of the technical options, and a rough service description. Based on these outputs a go / no go decision is taken. In the preparation phase the architecture of the system (e.g. technical issues, content, and navigation) are designed. In the synthesis phase the programming is started. At the end, the service is implemented and tested. Van der Kar notices that all this must take place in an iterative process.

xQFD is used at the start of a design process, when only a concise e-service idea exists. According to Tassoul (2003) it is important that during a creative process first lots of ideas are generated: divergence. The feasibility of the ideas is checked later. Next, the ideas are clustered, to end up with feasibility check of the ideas: convergence. During xQFD lots of ideas are generated. However, at the end there is no feasibility check. Obviously, the participants (particularly the participant with ICT/process focus) will keep this in the back of their minds.

2.3.3 Place of xQFD within design process

Two design traditions have been discussed in the previous paragraph: one for designing information systems and one for designing mobile services. Of course, more design traditions do exist. The question what the added value of xQFD is, is discussed in this paragraph.
A service idea must exist before xQFD can be used. The design session is the most important phase of the xQFD method. During this session, the e-service idea is translated into an ‘abstract service concept’. This is done in a structured and high-speed (half a day) way. The focus on customer (end-user) needs is one of the strengths of the method.

Figure 7: Steps and output of xQFD and new method

The difference of xQFD (and the new to be developed) method with other existing design processes is that xQFD does not describe a whole design process (which takes several months). It only exists of the described phases. However, these phases (intake, design session) have been defined in a very detailed way. The added value of the xQFD method is that it is a tool that can be used at the start of a design process (or existing design tradition), which leads to a rather complete service concept for a website.

Ideally, xQFD is used at the start of a design process. During the intake of xQFD (in terms of Alter) the goal and scope of the system are determined globally. During the design session the scope is redefined when this seems necessary. Next to this, the functional specification of the system (which functions to offer) is discussed. These activities fit in the initiation phase.

In terms of Van der Kar, during the xQFD method most of the attention goes to the stream of service formula. A rough service description is given.

2.4 Components of service design

It is clear that xQFD deals only with a limited part of the first phase in the design process. The question is what aspects must be dealt with next. In the Freeband project (www4) a model has been designed, which is called the ‘stof’-model (Steen 2005). This model
describes four components that need attention during the design of a new electronic service.

2.4.1 STOF Model

Faber et al. (2003) describe how to use this framework during the design of a mobile ICT service. Steen mentions that the framework is not only usable for mobile ICT services, but also for e-services in general (Steen 2005). The four components that Faber presents are:

- **Service design**: a description of the value that service offers to a specific target group of users, in particular in terms of a service offering
- **Organization design**: a description of the configuration of actors that is needed to deliver a particular service, the roles that each plays, making clear how the actor network creates value for end-users
- **Technology design**: a description of the fundamental organization of a technical system, the technical architecture, which is needed by the firms in the value network to deliver the service offering exhibited in the service design
- **Finance design**: a description of how a value network intends to capture monetary value from a particular service offering and how risks, investments and revenues are divided over the different actors of a value network

These components must be taken into account during the design of an e-service. During xQFD the service component is mainly addressed. Faber et al. state that the four components must be balanced. Choices made in one component, influences other components. That is why it is important to address all components at the start of the design process.

The next paragraphs describe the components, and whether, and how much, xQFD has attention for the components. At the end it can be concluded what components to address in the new method.

2.4.2 Service design

According to Faber the service concept describes the strategy by which a service proposes to create value for its user. It describes what the service should do. For which target group is the service intended? Which customer needs are satisfied by the service? How will the service achieve this? Which functionalities does the service have? Etc.

During the xQFD intake there is much attention for this component. The ‘product’ that is offered and the target group are defined. Also, the added value for users is analyzed. During the xQFD session the customer needs and the functionalities are defined. Other channels are taken into account. Also existing services are evaluated. (See also the agenda of the xQFD design session: table 1)
2.4.3 Organizational design

Faber et al. state that many methods assume that the service will be designed and offered by an individual firm, positioned in a traditional value chain. However, it is important to look beyond the individual firm. Attention is needed for how more companies can offer a joint proposition to its customers. The organizational design is ‘a description of the configuration of actors that is needed to deliver a particular service, the roles that each plays, making clear how the network creates value for end-users.’

Faber et al. say that multiple parties are involved when developing an e-service. These parties are grouped in a value network. De Bruijn and Ten Heuvelhof (1999) define a network as a ‘number of actors with different interests, who are dependent on each other to realize their goals.’ As one of the drivers behind the rise of networks they name the rise of information technology. De Montalvo et al. (2005) state that the delivering of an e-service is mostly done in a complex network instead of a traditional supply-chain.

The main goal of each party is a good implementation of the e-service. However, during the development every actor has its own interest. Even when a service is designed within one organization, different departments within that organization will have their own interest.

In contrast to a traditional supply-chain, parties need the resources of each other to offer the service. More so-called roles are needed. Examples are the service provider (internet branch) and content provider (other branch). Every role has its own responsibilities. The result of this is that parties within a network are dependent on each other. No actor has the absolute power in a design process. Other characteristics of networks are closeness, pluriformity and dynamics. Obviously these characteristics cause that traditional control, known from a hierarchical environment, is not suitable.

De Bruijn et al. (2002) state that during a process of change there is too much attention for content instead of the process in most cases. A project approach has attention for what changes are desired; less attention is given to how to achieve these. This is why a project approach does not fit in a network environment; a more process-oriented approach is needed.

As explained before, an organization on itself can be seen as a network. The e-service must fit in this network, the internal organization. The arrangements needed for this are also part of the organizational design. An example is the connection of the e-service on existing procedures and the way of working of an organization.

xQFD has a limited impact on the organizational design. To make use of xQFD participants must be found that form the design team. This is a first step to compose a value network. Also during the xQFD session relations between the participants (the value network) will become stronger. One of the strong points of the xQFD session is the service matrix that simplifies the communication. Because of this, it can have a great meaning in the value network.

QFD aims at customer needs. Simons and Bouwman (2004) state that these customer needs must be balanced with the organizational (supply side) needs and constraints. xQFD pays attention to this in such a way that the alignment of the different channels is discussed.

2.4.4 Technology design

Faber et al. describe the technology design component as ‘a description of the fundamental organization of a technical system, the technical architecture, which is needed by the firms in the value network to deliver the service offering exhibited in the service design.’

It is clear that when delivering an e-service, technology is needed. This paragraph will give an overview of the technical background of the use of e-services via the Internet.

The Internet

xQFD is a method that supports the design of e-services. These e-services are offered via the Internet. The Internet can be seen as a network that connects millions of computers around the world to each other. All these computers are connected to each other via local/regional networks (delivered by Internet Service Providers) and backbones (delivered by Network Service Providers).
To connect different computers with each other, agreements are needed how this is done; protocols are used for this. Stallings (2001) defined protocols as a set of semantic and syntactic rules that describe how to transmit data.

The Internet makes use of the TCP/IP protocol. The communication tasks for TCP/IP are organized in five relatively independent layers, which are presented in the next figure.

![TCP/IP Architecture](image)

### Application Layer

### Host-to-host Transport Layer

### Internet Layer

### Network access Layer

### Physical Layer

Each of these layers takes care of its own tasks:
- The physical layer takes care of the physical connection between the device (computer) that is going to send data, and the transmission medium (network).
- The network layer covers the exchange of data between the device and the network to which it is attached. This layer provides for example the address of the destination computer to the network.
- The Internet layer is concerned with the transfer of data between the source and the destination computers. The routing of the data is organized. Therefore, this layer makes use of the Internet Protocol (IP), which in fact is the heart of TCP/IP, and the most important protocol in the Internet.
- The Host-to-host Transport Layer can be seen as the bridge between the software layer and the hardware layers. It makes use of two protocols, namely Transmission Control Protocol (TCP) and User Datagram Protocol (UDP). TCP takes care of a reliable connection to transfer data between applications. Using this method a direct connection is set up, and stays connected for the duration of the transfer. It is guaranteed that the data arrives safely and correctly. With UDP the computer data is send in little packages. No direct connection is set up. It is not guaranteed that the data is received, but on the other hand, this method has a very low overhead.
- The application layer contains the logic needed for the different user applications.

It can be seen that every layer only takes care of a few functions or operations. As a result, application programmers are hidden from the complexities of the underlying hardware. The agreement and adoption of the use of the TCP/IP protocol is one of the causes that the Internet became a big success.

### Client-Server architecture

Perks and Beveridge (2003) define an architecture as 'a pragmatic, coherent structuring of a collection of components that through these factors supports the vision of the full 'user' in an elegant way.' The client-server architecture is the architecture that is most used within the Internet. In this architecture, two roles exist: the client role and the server role. The client is the party that requests for information. The server is the party that gives answer to this request and offers information. The main feature of the architecture is the allocation of application level tasks, between the server and the client. For the clients the applications are called web browsers and servers are simply called web servers. The platform and the operation systems of the different roles may differ. Communication finds place by the communication software. In the Internet environment this is TCP/IP (Walrand 1998).
Stalling states that the way the user interacts with the system is an essential factor of a client-server environment. Consequentially, the design of the user interface is critical.

**Web services**

In the early days of computing, no standards existed about how software had to be set up. Every system made use of their own non-standardized platforms. Because there was hardly any communication between systems, this was not a problem. As described in the previous paragraph, nowadays e-services are in most cases not delivered by one party, but by a number of parties, joined in a value network. All these parties do have their own systems, which must be linked, to offer the e-service. However, by the lack of standardization, it is hard to connect all these so-called legacy systems.

To make interoperability between different legacy systems possible, the web services technology can be used. Ferris and Farrell (2003) define a web service as a software application identified by an URI, whose interfaces and bindings are capable of being defined, described, and discovered as XML artifacts. A web service supports direct interactions with other software agents using XML-based messages exchanged via Internet-based protocols. The idea behind web services is that ICT-systems of a company can offer services to customers (or other systems) through the Internet.

Web services is a term that refers to all technologies that enable interoperability. The most important of these technologies are XML, HTTP, SOAP, UDDI and WSDL.

The communication in a web services architecture takes place with Extensible Markup Language (XML) messages. These messages are used for describing documents in a systematic way. Humans and information systems can read them. A great benefit of XML is that it separates the structure, content, and style of documents.

Before XML messages are sent, an envelope is put around them. SOAP (Simple Object Access Protocol) is used for this. It helps to exchange structured information and it also specifies what to do when a communication fails. SOAP messages are mostly transferred by the Hyper Text Transfer Protocol (HTTP). This protocol is based on the existing Internet infrastructure.

The web services architecture is visualized in the figure below. The architecture exists of a service provider and a service requestor. The service provider offers a service; the service requestor wants to make use of a service.
A service requestor can find a service by the use of an UDDI directory (Universal Description, Discovery and Integration). This can be seen as the ‘yellow pages’ for web services. The description of what a service can do is presented in a WSDL-document (Web Services Definition Language). How the service works is presented in a BPEL4WS document (Business process execution language for web services). Also these documents are based on XML.

Three-tier service architecture

There are many ways to organize information systems. The so-called three-tier model can often be used:

- Presentation layer
  This layer takes care of the presentation of the web-service. Most of the times the user will be a person who addresses the service via the Internet. That is why services need a nice and good user-interface. The communication will make use of the HTTP protocol, which is also used by the Internet browser of the user. However, the service can also be linked with other systems. The presentation layer also arranges the communication between these systems (services); SOAP/XML messages play an important role in this. Besides, this layer takes care of identification of the users and, when needed, a personalized interface.

- Business layer
  The business layer takes care of the ‘business logic’ of the service. Calculations and transactions are made in this layer. All requests from the presentation layer are addressed here in a consistent way.

- Data layer
  In this layer all data is collected. Databases and database management play an important role. Reproduction, backup and recovery of data are important tasks of this layer. When a
request comes into this layer, it delivers the right data to the business layer. Obviously, the business layer can offer data that must be stored in a right way in the data layer.

*Multi-Channel Architecture*

As said before, the presentation layer takes care of the presentation of the service to users. Users can be real persons, but also other systems. Particularly in a multi-channel context it is often the case that more ‘users’ make use of a system, which are users from different channels.

![Figure 13: Multi-channel architecture](image)

Of course, one user can also make use of different channels. In that case, it is important that the ‘look and feel’ of the presentation of information in the different channels is consistent (to guarantee a user friendly environment). The same holds for the presented information.

Figure 13 presents a relative ‘ideal’ situation, in which only one system is used, that serves more channels. However, in many cases, every channel has its own system. Coupling of these different systems is often necessary; information from a system owned and maintained by a particular channel is needed in another system, for another channel.

![Figure 14: Coupling of systems of different channels](image)

For every layer of the TCP/IP and three-tier layers choices have to be made during a design process of an e-service. xQFD does not pay any attention to this. Many choices are not relevant in this phase of the design process (it will only hinder the creative process). Besides, the participants do not have the right expertise for this. However, when a new service or channel is added to the existing service delivery environment, this service or channel must seamlessly fit with the existing way of service delivery. It seems useful to pay attention to what external systems must be coupled with the to be developed e-service.
2.4.5 **Finance design**

The finance design must give a description of how a value network intends to capture monetary value from a particular service offering and how risks, investments and revenues are divided over the different actors of a value network. Steen (2005) mentions that all the components of the ‘stof model’ do influence each other; however, the finance design can only be made well when all the other components are filled in globally.

During the intake of xQFD the finance design is addressed. The costs of the service and the expected profits are estimated globally. The reason for this is to investigate whether the service is economically feasible at first sight.

2.5 **User centred design**

One of the requirements for the new method is ‘Customer-Oriented Design’. This paragraph will elaborate on this requirement, by discussing tools and techniques, which can help to meet this requirement.

In the past users were only involved in a design process to test products. User centred design (or human-centred design) is a widely used term to refer to a development where users are involved early in the design process. A general definition of human-centred design is published as ISO 13407 (1999). ISO 13407 lists the following goals for User centred design (UCD):

- Making it easier to understand and use, thus reducing training costs.
- Improve the quality of life of users by reducing stress and increasing satisfaction.
- Significantly improve the productivity of users and the operational efficiency of organizations.
- Increase the competitive edge of the producers of the systems.

The principles of UCD are:

- The active involvement of users and a clear understanding of user and task requirements.
- An appropriate allocation of function between users and technology.
- The iteration of design solutions.
- Multidiscipline design.

During xQFD a service concept is designed based on user needs. The translating of this concept and the real design often leads to problems; in literature it is called ‘the gap’ (Cooper and Reimann 2003). With UCD, instead of spending time on setting up specifications, very soon a prototype is created. This is done to receive feedback from users and based on this, to improve the concept.

Cooper names drawing scenarios as a tool that can help in this translation. Cooper defines this tool as ‘making use of a specific story to both construct and illustrate design solutions’. The ultimate goal is to get more insight in which task a user must be able to carry out. It is also important how the user wants to do this (one of the principles of UCD). The drawing of scenarios is generally time-consuming. Task analysis can be seen as drawing very narrow scenarios.

The use of personas can be useful to define the tasks for a user. Cooper defines a persona as ‘a precise descriptive model of the user, what he wishes to accomplish, and why’. When a persona has been designed, design choices can be made based on the preferences of this persona during the design process. Because the persona is a symbol for the whole target group, choices are always made from the user’s perspective. Another advantage of a persona is that it simplifies the communication within a (multidisciplinary) team.
2.6 The next step

To develop the agenda for the new design session, first a number of requirements will be defined. The session should meet these requirements.

![Figure 15: Step in research](image)

As can be seen in paragraph 2.2.3 also for the development of the xQFD method a number of requirements have been defined. These requirements will be used again to design the new session:

- Customer-Oriented Design
- Channel Coherence
- Channel Synergy
- Competitive Positioning
- Speed
- Focus in Design Process
- Communication between Stakeholder Perspectives in Development Team
- Communication of Concept Coherence during Implementation

In this chapter different design traditions have been discussed. Based on this, requirements for design tasks will be defined.

In paragraph 2.3 an analysis has been carried out on existing design theories. The steps taken in existing design processes have been analyzed. According to the framework presented by Faber et al. (2003) attention should go to four components: service, organization, technical and financial design. It is clear that xQFD pays attention to the service design. However, this service concept, like also indicated by Alter (1999), must be developed further.

According to Van der Kar (2004) attention must be given on setting up a value network. Also a scan has to be made on all technical options. A remark has to be made with this. Van der Kar's method is developed to design mobile e-services. It can be doubted whether this is relevant for a website in this phase of the design process.

To wind up the initiation phase, according to Alter (1999) the service description must be filled in, in more detail. This will be addressed as the specification of the service concept. According to the principles of UCD the analysis of user-task is an important aspect in this. Also, making a visual representation of the e-service has added value. Besides, new functionalities can be defined, which will be named as the extension of the service concept. Also a project plan must be formulated.

According to Alter (1999) also the feasibility of the design must be checked. The framework of Faber (2003) confirms this. Whether the design is feasible is determined by the four components. By addressing these components the feasibility check is done. For this reason these requirements are not explicitly taken into account.

This all leads to the next requirements for additional design tasks for the new method:

- Specification of Service Concept
- Extension of Service Concept
- Formulate project plan
- Organizational design
• Finance design
• Technical design

2.7 Satisfaction

As said in the previous chapter, participants are satisfied at the end of an xQFD session. However, participants also mention that the output could be more concrete. Besides, participants find it hard to see how to proceed with the design process after the xQFD method. This could lead to a lower satisfaction. For TNO it is important that the participants (TNO's customers) are satisfied at the end of the method, and that they stay satisfied. This paragraph will elaborate on the term satisfaction.

Briggs et al. (2005) define satisfaction as an 'affective arousal with a positive valence on the part of an individual toward some object.' Affective arousal of satisfaction can also be called as delight. In this research the object is the design session. This leads to the question what causes people to feel satisfied with a session. Briggs et al. (2005) use the Satisfaction Attainment Theory (SAT) to answer this question. Satisfaction is ‘a function of changes in an individual’s assessment of the value that may be derived from, and the likelihood of attaining, a Set of Salient Goals.’ This makes the assumption that individuals automatically and subconsciously assign a value to attaining a goal and assess the likelihood of attaining goals. In the definition a goal is ‘an outcome or state that an individual desires to achieve’.

In this case the individuals are the participants of the session. The goal of most of them is to get the new e-service running. According to Briggs et al. ‘satisfaction is a positive function of perceived Shift in Value Assessment (SVA) of an individual’s Set Of Salient Goals.’

Briggs defines two aspects of a session with which a person could feel satisfaction:

• The outcome of a session
  ‘Satisfaction with meeting outcome (SO) is defined as an affective arousal on the part of a participant with respect to that which was created or achieved in a meeting.’

• The process of the session by which the outcomes were attained
  ‘Satisfaction with meeting process (SP) is defined as an affective arousal on the part of a participant with respect to the procedures and tools used in a meeting.’

According to Briggs et al. ‘the participant should experience satisfaction or dissatisfaction with the outcome of the meeting (SO) and meeting process (SP) proportional to the magnitude of, and in the direction of the shift when the outcomes of a meeting cause an SVA for a participant.’ This theory states that satisfaction with a session will be partly independent of the meeting process or the outcomes of the meeting. In other words: the changes proposed by a session meant to improve process or outcome do not necessarily lead to more satisfaction.

As said before, Briggs et al. state that satisfaction has to do with 'affective arousal'. Over time this affective arousal decreases, and due to this the satisfaction with an object decreases over time. When this is the case it can be hypothesized that, whatever the quality of the session, satisfaction during debriefing will be lower then immediately after a session. This means that even when the satisfaction during the debriefing is low; it still can have been a satisfying session.

Another view on satisfaction is equity theory: satisfaction is a stable determinant of behavioral intentions of customers (Oliver 1997, Szymanski 2001). Although there is much research on satisfaction on the short term, long term satisfaction is not very well researched. Szymanski concludes that (short term) satisfaction increases, when the outcomes of a session are increased in comparison with the inputs (based on an extensive survey of satisfaction research).

Following equity theory increasing the quality of the output of a session will lead to more satisfaction as the ratio of inputs and outcomes is changed and all other circumstances stay the same. Assuming that satisfaction has long-term effects it can be hypothesized that satisfaction response will be more positive and will remain more positive during debriefing when the quality of a session is increased.
2.8 Conclusion

In this chapter the theoretical framework on which this research is based has been presented. Firstly, the concept of e-services has been described. Next, the xQFD method has been described, also the requirements based on which the xQFD method was designed have been presented:

- Customer-Oriented Design
- Channel Coherence
- Channel Synergy
- Competitive Positioning
- Speed
- Focus in Design Process
- Communication between Stakeholder Perspectives in Development Team
- Communication of Concept Coherence during Implementation

Also different design traditions have been discussed. Based on this, requirements for additional design tasks have been defined.

- Specification of Service Concept
- Extension of Service Concept
- Formulate project plan
- Organizational design
- Finance design
- Technical design

The chapter ended with an analysis of the term satisfaction.

Requirements, which the session should meet, have only been derived from literature yet. In the next chapter requirements based on explorative research will be defined.
3 Explorative research

In the previous chapter a number of requirements have been defined (paragraph 2.5) which the method should meet. Before setting up the agenda for the design session, also explorative research will be used to define requirements. This will be done in two ways: firstly the results of the debriefing of xQFD sessions will be used. Next to this, interviews with a number of the participants of the xQFD sessions will be held, to go more deeply into this subject.

![Figure 16: Step in research](image)

This chapter will present the results of the debriefings (paragraph 3.1) and interviews (paragraph 3.2). Paragraph 3.3 will define the requirements that result from this.

3.1 Debriefing xQFD

During the development of xQFD, the method has been tested several times. At the end of the xQFD design session every participant was asked to fill in a questionnaire, which had the purpose to evaluate the session. Also during the debriefing of the xQFD method an evaluation of the session was done (following the presentation of the results of the session). The participants of the xQFD sessions were satisfied with the process and the outcome of the session. However, the question how to continue with this output remains. During the debriefing the 27 participants gave some possible aspects that can be addressed during the next step. A list of these options is presented below.

During debriefings it was not particularly asked to name a possible next step. Questions that were asked are for instance ‘do you think the designed service that comes out of the session is good?’ and ‘do you think this session is complete, given the time?’ These questions brought up some discussion about what a next step should be. When only one participant mentioned a possibility for a next step, it can be the case that more participants agreed on this / had the same idea (this is not taken along in the results).

The different options named by the participants can be clustered. Four of the options named have the goal to specify the e-service concept:

- Elaborate functions (3 times this option was mentioned)
- Build a prototype of the e-service designed during the session (2)
- Draw scenarios (2)
- Draw a flow of the interface of the e-service (1)

As described in the previous chapter, more parties play a role when designing an e-service. This results in political issues that play an important role in a design process. Three named options are about the alignment of the different interests, procedures etc, within the value network.

- Give overview of the alignment between the back-office and the e-service (2)
- Create support with other parties (2)
- Create support within own company (1)
Another cluster is the one in which the customer needs are further researched:

- Check the customer needs with real customers (2)
- Create support with users of service (1)

Two named options cannot be clustered:

- Detailed investment overview (2)
- Define a project plan (2)

It has been found that specifying the e-service concept is the most desired as next step. Also the tackling of political issues and making an organizational design is desired.

3.2 Interviews

With six participants of the xQFD sessions (of four different cases) an interview has been held to elaborate on what next step is desired in the design process (the interview protocol can be found in the appendix). One remark that has to be made is that the interviewees were also present during the debriefing. The choice of which participants were picked was based on availability of the participants and the way they presented themselves during the session and the debriefing. People who hold strong views and have a clear opinion were asked.

After a short review on the xQFD session and the results, the question was asked if the xQFD session delivers indirect output. Three times (50%) it was mentioned that sitting around the table with other parties is useful to strengthen the relationship with these parties. These relations can be of enormous value during the development of the service. Also, the fact that the method is scientifically based was two times named as advantage. Because the participants know it is a ‘good’ method, there is more confidence in the output. The logo of the TU Delft has a big advantage as well: it is easier to convince other parties to join the value network. The session also helps to create an overview of the context in which the service is placed: what is going on in this context, and how do other parties look at this context.

It turned out that only one interviewee had used the output of the session during the design process (after the session). First, his company created a value network; at the moment of the interview the service was designed further (by external parties). One participant did not yet find the time to use the output. Another interviewee said he was not going to use it, because that is not his business. For the others it seemed that the service concept was too high level to precede the design based on the service matrix. This was the most heard criticism: the functions defined are too high level.

Four of the six interviewees (67%) said that an elaboration of (a number of) the functions would be most useful during the next session. Also two times it was mentioned that making an overview of the client process would be useful. This all can help to create a more concrete picture of the service. It was marked that during this process new functions can be added to the service concept. The new design session must help to make a more complete and specified design concept. Also, two participants said that it is good to make a list of all the parties that must be involved when designing the service. As last, five of the six participants said that the session should conclude with the setting up of a project plan. This should make it clear which steps the team must take after the session.

Finally, an overview of the costs and revenues must be made. The interviewees were doubtful whether this can be done in one day. Also they said that they are doubtful whether the participants do have the right expertise to do so.

Some attention was paid to the current design processes the participants use during the interviews. This was done to see what lessons can be learned from these processes. Five interviewees said that they never use a structured process. One participant said that the company he is working for uses a fixed structured procedure. The problems that occur are for all interviewees the same: the translation from ‘what’ to ‘how’, existing procedures and systems that do not align with the new service, and finding out, at the end of the process, that the service is not well designed. Because of these problems projects take longer and the costs are higher than planned.
3.3 Requirements

Requirements for design tasks can be derived from the debriefings and interviews. In the next table the requirements that can be derived are presented. Also the number of times the requirements are (indirectly) mentioned is given.

Table 3: Requirements for additional design tasks mentioned in debriefings and interviews

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Debriefing</th>
<th>Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specification of Service Concept</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Organisational Design</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Market Research</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Formulate Project Plan</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Finance Design</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Overview of Process</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Extension of Service Concept</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Requirements that were derived from the debriefing sessions are:

- Specification of Service Concept
- Organizational design
- Market Research
- Formulate project plan
- Finance design

Requirements that were derived out of the interviews are:

- Specification of Service Concept
- Overview of Process
- Extension of Service Concept
- Organizational design
- Formulate project plan
- Finance design

It turns out that the requirement: 'specification of service concept' has been mentioned most. The defined functionalities that were defined during the xQFD sessions are to high level. Participants did not have a concrete idea of what the functionalities are.

The next requirements have explicitly been named several times:

- Formulate project plan
- Organizational design
- Finance design

A remark has to be made with regard to the last requirement 'finance design'. Participants said that a go/no go decision will always be based on a financial overview. At the same time they said that they are doubtful whether it is useful to pay attention to this subject during a design session. They point at the lack of expertise in the design team, and the early stage in the design process.
3.4 Conclusion

Chapter 2 presents requirements derived from the literature. In this chapter requirements have been derived by explorative research: debriefings of the xQFD sessions and interviews have been used for this. Most of the requirements that have been defined in chapter 2 were also found during explorative research. Two new requirements have been found: define an overview of the client process and to conduct a market research.

All named requirements will be used in the next chapter. First a reflection on the requirements will be given. After that, based on these requirements, an agenda for the new design session will be developed.
4 Agenda Development

In the previous two chapters requirements have been defined which the new design method should meet. A reflection on these requirements will be given in this chapter (paragraph 4.1). Next, the requirements will be used to set up the agenda for the new session. This agenda has been tested during a pretest. This pretest will be described (paragraph 4.4). Based on this pretest the final agenda will be set up (paragraph 4.2).

![Figure 17: Step in research](image)

4.1 **Requirements**

Requirements have been collected in three ways. Not all requirements will be used to develop the agenda for the new design session. This paragraph discusses the requirements briefly, and it indicates if and how every requirement will be used.

4.1.1 **Reflection on requirements**

All requirements are presented in the table below. For every requirement it has been indicated where this requirement is found. Also it is indicated whether the requirements will be used to design the agenda (final list).
Table 4: Where are the requirements found?

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Literature</th>
<th>Debriefings</th>
<th>Interviews</th>
<th>Final List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer-Oriented Design</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel Coherence and Synergy</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitive Position</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focused Design Process</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specification of Service Concept</td>
<td>X X X X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension of Service Concept</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formulate Project Plan</td>
<td>X X X X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisational Design</td>
<td>X X X X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance Design</td>
<td>X X X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Design</td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overview of Process</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Research</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Customer-Oriented Design**

xQFD participants are satisfied because the xQFD session takes customer (end user) needs as starting point; xQFD is a customer oriented design method. A UCD must also be guaranteed in the afternoon; according to Cooper (2003) it is useful to make use of personas. Based on these personas tasks can be developed.

**Channel Coherence and Channel Synergy**

TNO wants to use xQFD as multi-channel design method. The most important tasks of other channels are mentioned during the morning session. The possibilities for win-win situations between the different channels are also discussed. The afternoon session should also pay attention to multi-channel aspects. The multi-channel tasks and situations discussed in the morning session must be taken along in the afternoon session.

In literature (Simons and Bouwman 2005) a distinction is made between channel coherence (connection with other channels) and channel synergy (re-use or channels). Both aspects are discussed in the morning. These aspects should be worked out in the afternoon. For this reason, for the new session both requirements are considered as one: developing multi-channel aspects. From now on only this requirement will be named.

**Competitive Position**

The strengths and weaknesses of the new e-service are discussed during the morning session. These strengths and weaknesses are discussed in relation to the services offered by competitors. The competitive position is particularly dependent of the strengths and weaknesses of the service concept. When the elaboration of the concept is made well during the afternoon session, this will not have any influence on the competitive position. For this reason this requirement will not be taken into account in this research. Of course, this requirement should be considered after the afternoon session, in a new iteration.

**Speed / Focused Design Process / Communication**

Like xQFD, also the new method must support the speed and the focus of the design process, and the communication between the participants as good as possible.

**Specification of Service Concept**

It has been found that it is important to specify the service concept (Alter 1999). This was also seen as the most important requirements during the interviews. The service concept must be specified, and made more concrete during the afternoon session.

**Extension of Service Concept**

The possibility exists that the service concept defined during the morning is not complete yet. Therefore, it is possible that new functions will be added to the service concept during the design process. In a ‘spiral model’ (Van der Kar 2004) it is possible that during a new
iteration new aspects are added to a ‘previous’ phase. During the afternoon session new function can be defined. These will be added to the service concept.

**Formulate Project Plan**
According to the former participants of the xQFD session, one of the weaknesses of xQFD is that is does not make clear what do to after the session. The session does not result in a project plan. The importance to formulate a project plan at the start of a design process has also been found in literature (Alter 1999). For this reason, a project plan will be formulated during the afternoon session. As result, the participants know what steps to take next after the session.

**Organizational Design**
A website will be developed and will be operational in a value network (Faber 2003, De Bruijn and Ten Heuvelhof 1999). This network has to be built. All roles, and the parties who can fulfill these roles, must be known. An agreement is needed between the parties about what the design process will look like, and which rules will hold during this process. De Bruijn et al. (2002) and Van der Kar (2004) state that making a list of all roles and parties that play a part in the development and operational phase of the design process should be the first step in creating a value web.

**Financial Design**
Attention must be given to the financial impact of the service, according to the framework of Faber (2003). This is already globally done during the intake of xQFD. In the xQFD design session no attention is paid to this subject. It can be doubted if it is useful to make a financial design in the new session. The first reason for not addressing the finance design is the feasibility of it. The other components of the Faber framework will only be addressed in a quick-scan-way. To make a finance design based of these quick-scans will not bare any meaning. Second, the participants of the xQFD method doubt whether there is enough expertise in the design team to make an estimation concerning the costs and revenues. For these two reasons this requirement will not be taken into account in the research.

**Technical Design**
The presentation layer, such as described in three-tier the model (Verbraeck 2004), does not only communicates with end-users; it also communicates with other systems. As stated in chapter 2, in most cases (particularly in a multi-channel context) an e-service presented on a website is not a stand-alone system. For offering the service, in many cases data of other (external) systems will be necessary. An example of this a link with a pay-desk system is, but also links with external databases will be needed sometimes. Attention must be paid to the technical design during the session; this will not concern the techniques used for the e-service, but the external links to other systems that the e-service should have.

**Overview of Process**
During the interviews it has been indicated that the client process (a high level description of the path a client follows when using the service) should be discussed. The reason for this is to see how the functionalities must be filled in. However, already another requirement ('specification of service concept') covers this. For this reason this requirement will not be included in the final list of requirements.

**Market Research**
During the xQFD session the participants give weights to the customer needs (see paragraph 2.2.1). It has been indicated, during interviews, that these weights should be checked with real customers during a market research. However, taking the constraints, defined by TNO, into account (a session with same line-up, directly after the xQFD session) a market research will not be possible. It is not stated that a market research is not important, only that it is not in this situation. For this reason this requirement will not be taken into account in the research.
4.1.2 Final requirements

All requirements (derived by literature study and explorative research) have been discussed in above paragraph. Some of these requirements are not included in the final list of requirements. Reasons for this have been given. The final list exists of requirements for additional design tasks and the overall requirements. Starting with the latter, the requirement are:

- Customer-Oriented Design
- Channel Coherence and Channel Synergy
- Speed
- Focused Design Process
- Communication
- Specification of Service Concept
- Extension of Service Concept
- Formulate project plan
- Organizational design
- Technical design

4.2 Agenda

Based on the requirements, discussed in the previous paragraph, an agenda for the design session has been designed. Different methods have been used, in an iterative process, to do this: brainstorm session by designer, discussions with experts in the sub-fields of e-services design and tools out of literature. This agenda has been pretested with one case. Based on this pretest the agenda has been adapted (see paragraph 4.4). This adapted, final agenda is presented in this paragraph. Also, in this paragraph attention is given to which agenda item has influence on which requirement.

4.2.1 Type of Agenda

Some choices 'on meta-level' must be made before the agenda is designed. This paragraph discusses these choices.

Formal method
In terms of Lee (2004) xQFD can be seen as a formal method; the session consists of a fixed agenda with detailed, sharp question. TNO wants that the new session fits seamlessly on the xQFD method. For this reasons also the afternoon session will be made as 'formal' as possible. This will be done by formulating questions that must be answered by the participants.

Iterative
As can be seen when looking to the requirements, there are many aspects that the session should address. Most of these aspects influence each other (think of the STOF model, Faber 2003). Therefore, each aspect will be addressed shortly: a quick-scan is made. Because of this, one iteration is made through the different aspects that should be addressed.

Diverge vs. converge
It is important that creativity plays a big role at the start of a design process according to Tassoul (2003): diverge. During xQFD this is the case. Also during the first part of the new session creativity will play a role. The formulated service concept will be expanded. Next, it is important to converge. This checks the feasibility of the designed service concept. Without this, it can be the case that participants go home with the feeling they did not made a feasible design (which can be the case).
4.2.2 Agenda items

The designed agenda consists of different items. Each item has its own goal. For every item a certain time window exists to answer predefined questions. These questions help to come to the desired output of an item (the time schedule and questions can be found in the appendix). The agenda has been set up in such a way the items follow on each other in a logical way. Often it is the case that the output of an item is used as input in the next item. This paragraph describes the agenda items. Next to the description of each item, it is also described what influence the items have on the different requirements.

Agenda item I: Relation functions
Functions the website should offer are defined during the xQFD session. These functions can be found along the x-axis of the service matrix. However, so far all functions have been discussed separately. The website offers all these together. In fact, there will be some kind of relations between the functions. For example, some functions will be used after that another function has been used.

The afternoon session starts with the creation of a hierarchical overview of the functions, which are defined during the xQFD session. This overview can be seen as a draft version of the map of the site (sitemap).

This item has been placed directly after the lunch. This has been done because the service matrix is the input for this item. For participants this will make it clear that the afternoon is a real continuation of the morning session. Besides, in this item, directly after the lunch, a first step towards a website will be made.

The input used for this item is the service matrix. The output is an overview of the hierarchy of the functions. This output will again be used in agenda item III. Based on this overview the tasks a user must be able to carry out will be defined.

It is expected that this item has a moderate influence on two requirements. During this item the concept is filled in in more detail. Next to this it is possible that during this item it turns out that functionalities are missing. In that case they will be added to the service concept.

Agenda item II: Personas
Obviously, an e-service will only be successful when it will be used. Therefore, it is important to take the user needs and the user behavior into account during the design process. During xQFD this is already done; functions are defined based on customer needs. The focus should also be customer oriented during the new session. According to Cooper (2003) the concept of personas can be helpful for this.

The output of this item is a description of a fictitious personage that symbolizes the target group (it is possible to design more personas). Design decisions that must be taken in the afternoon can be made based on these personas. It is possible that new customer needs arise during this item. Further in the session new aspects can be added to the persona, when this seems relevant.

The use of personas makes it easier to create a customer-oriented design. As result, this item has a great influence on this requirement. Also it contributes to simplify the communication between the participants. Next to this, as said before, new customer needs can arise, which helps to make the service concept more complete.

Agenda item III: Tasks
Almost every function will exist out of more web pages. To create an overview of these pages a sitemap (as made in agenda item I) is not enough. Further development of the functions is needed. This is done during this item. Based on the sitemap a task analysis will be made. First, the tasks that must be possible to carry out are listed. After this, the most important tasks are developed further. All this is based on the wishes of the designed personas.

This item results in a list of tasks that must be carried out, with the support of the website. The steps that must be taken for the most important tasks are also described.

This item takes care of a customer-oriented design because the steps will be defined, based on the persona. During this item the functions are further elaborated, this is why the concept is specified during this item. It can also be the case that functionalities are missing (to carry out the defined tasks). In that case new functionalities will be added to the service concept, which makes it more complete.
Agenda Item IV: Storyboard
As seen in the definition of an e-service given by Gronroos (2000), an e-service is always intangible. This is one of the causes that it is hard to design an e-service. Stalling (2001) states that the way the user interacts with the system is an essential factor for a client-server environment. During this item the first sketches of this user interface, the website, are made to get a visual impression of the e-service. These so-called storyboards will be made based on the tasks that are defined in the previous item. Of course, it can be the case that not every page can be designed; the most important ones must be chosen.

Obviously, the service is made more concrete (and tangible) in this item. Participants make the storyboards, and the design choices behind them, by their selves. This gives them the idea that it is ‘their’ design. This makes it easier for them to stand behind the idea, and defend it to others.

In this item it is important that the right level of detail is chosen. Font, colors etc. should not be discussed yet. The first reason for this is the early stage of the design process (details are not relevant yet). Besides, the participants do not have the right expertise for this. When these decisions are made (which can be the wrong ones) they want to stick to these choices in future.

The output of this item is a sketch of the most important pages of the website. This output can be presented to users after the session. These users can give their feedback on these pages, which makes the design process more customer-oriented (UCD).

This storyboard has a great influence on specifying the service concept. In this item the website becomes ‘visible’ for the first time. Also, the storyboard can simplify the communication between the participants. Besides, it has moderate influence on a number of different requirements.

Agenda Item V: Multi-channel (MC)
Services designed with the help of xQFD are always services that fit into a multi-channel context. During xQFD functions are named which other channels offer. Win-win situations that can occur between the different channels are also mentioned. To make it clearer where multi-channel issues play a role, this will be indicated on the storyboards.

The output of this item is again the storyboard. Now, the multi-channel spots are highlighted. The output will be used in the next item.

Obviously, next to some other relations, this item will have a great impact on the multi-channel requirements, as defined by Simons and Bouwman (2005).

Agenda Item VI: Technical integration
So far, the service concept has been made more concrete. Creativity has been hindered by constraints as less as possible. The constraints that play a role will be taken into account from now on.

In most of the cases a website will have links to other external systems (of course, this can be systems of the same company). To get an overview of these links, they will be indicated in the storyboards.

This item results in storyboards in which the technical links are highlighted. Also it is described which data is transmitted, why this is done, and if this system is available (under what conditions).

This item can be seen as the first quick scan of the technical design of the website.

Agenda Item VII: Roles/Parties
The implementation and exploitation of the website will not be carried out by one actor. According to De Bruijn et al. (2002) and Van der Kar (2004) it is important to make a list of all roles and parties at the start of a design process. The needed roles are listed during this item. Possible parties to fulfill these roles are also named. It can be the case that one party fulfills more roles.

This item results in an overview of the needed roles and possible parties. The item is the first quickscan of the organizational design, as described by Faber et al. (2003).

Agenda Item VIII: Formulate project plan
Also after the session steps should be taken before the service can go ‘live’. According to Alter (1999) it is important to formulate a project plan. The participants of xQFD also desire this. Therefore, a project plan will be formulated during the last item of the design session.
This is done by a brainstorm, after this brainstorm the produced list is ordered (what to do first, what next etc.)

This agenda item results in a project plan.

The project plan has also been mentioned as requirement. The relation between the requirements and the item is of course high. However, every agenda item can results in issues for the project plan.

4.2.3 Requirements

The agenda has been designed based on the requirements presented in paragraph 4.1.2. The agenda of the session consist of a number of items. In the next table the expected relation between the requirements and the items is given (the relations are described in the previous paragraph). The scoring system used in this table follows the scoring system that is also used in the xQFD session (service matrix), which is again based on the QFD matrix. A '9' means that there is a strong relation (the agenda item had much influence on the requirement). A '3' means that there is a moderate relation.

<table>
<thead>
<tr>
<th>Requirements functions</th>
<th>Person(s)</th>
<th>Tasks</th>
<th>Storyboards</th>
<th>Multi-Channel issues</th>
<th>Technical Integration</th>
<th>Roles</th>
<th>Project plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer-Oriented Design</td>
<td>9</td>
<td>9</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel Coherence and Channel Synergy</td>
<td>3</td>
<td>9</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>9</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focused Design Process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specification of Service Concept</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Extention of Service Concept</td>
<td>3</td>
<td>3</td>
<td>9</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisational Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Technical Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Formulate Project Plan</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

It must be noticed that the requirements speed and focus are not covered by one item in particular. In fact the speed and focus and communication must be good in every item.

4.2.4 Output of the method

A description of the output of the morning session has been given in chapter 2. Obviously, the new method results also in different outputs. In agenda item II one or more personas are designed. These personas are used during the session, but also after the session they can useful. Another output of the new session is a number of tasks the e-service should support. These tasks are expressed in the visual representation of the e-service: the storyboard sequence. Also a list with the main roles and parties is generated. This is used again to formulate a project plan.

The in- and output of the intake, xQFD session and new session are presented in the next figure.
4.3 Overall Method

As described in chapter 2 the xQFD method consists of the next steps:

- Intake
- xQFD session
- Debriefing

The method, after adding the new session will look like this:

The intake protocol has not been adapted for the new session. It must be said that the presentation of the results of the session during the debriefing will take some longer, than before. After all, there will be more output that must be presented after the new session.
4.4 Pretest

The agenda that has been presented in paragraph 4.2 was not the first designed agenda. The initially designed agenda has been tested within a pretest setting in July 2005. With the findings of this pretest the agenda has been adapted. This resulted in the final agenda that has been presented in 4.2. The agenda used during the pretest differs a little from this (the pre-test agenda can be found in the appendix). A description of the pretest is presented below.

4.4.1 Set-up

For the pretest a fictitious case has been formulated. To save time, only the new design session was conducted (the xQFD session was skipped). Of course, a service matrix was needed to hold the afternoon session. For this reason a service matrix of one of the test sessions of xQFD was used (selling site for mobile phones). The case was presented to the participants (background, service idea, intake results), after that the service matrix had been discussed. The main reason for this was to explain the customer needs, function etc. At the same time, the matrix must become 'their' service matrix. This was tried to achieve by keeping the case as close to the situation of the participants as possible.

There were only two participants during the pretest (normally there are four participants during a session). Two reasons for this can be given. Firstly, it was not possible to find more participants during this summer holiday period. Second, the facilitation of a smaller group is easier. Before this pretest it was not known whether the format of the session would work. If this was not the case, with a smaller group it is easier to improvise, and by the use of adjusting the agenda, make a useful session.

For the session four focus-roles are defined: general, multi-channel, ICT/process, customer. There were only two participants during the pretest. These roles were divided over the two participants. Every participant got a document with background information about his own roles. Both of the participants were student. One of them already participated in an xQFD session (the case that has been used in this pretest). The other participant was unfamiliar with the method. To check whether the participants were familiar in the field of web sites (website development and sites about mobile phones) a number of questions has been asked. The answers on these questions proved that both participants had a good idea about how a design process of a website works, and they both had recently (less than 3 months ago) visited a site about mobile phones. The author, who has little experience with facilitating xQFD sessions, has facilitated the session.

Before the session the participants were asked to fill in a questionnaire. It was asked how far they think they were in the design process (after xQFD). Also, some possible next steps were presented. It was asked how useful they thought these steps were. Also at the end of the day an evaluation was done, by means of a questionnaire and an interview. It was asked what items they found useful, and which not. Also a general mark for the session was asked (scale 1 to 10). The questionnaire ends with the question how far the participants think they are in the design process again.

4.4.2 Pretest findings

The pretest made it clear that the agenda of the session is workable; this can be done in the prescribed time window. The participants were satisfied with the session and the results that came out of the session are seen as useful.

Agenda Items

- During the first item (relation of the functions) the first minutes the filling in of the functions was already discussed, this is not the intention of this item. Only the relation between the functionalities must be discussed. The facilitator solved this problem.

- During agenda item II (personas) the participants were very enthusiastic. It has to be taken care of that the personas are going to 'live' for the participants. This can be done by mentioning the name of the persona, speak about it like it is a real persona, and not speaking about him of her in the third person.
A substantiated consideration had to be made what tasks are worked out, in agenda item IV.

During the sketching of the storyboards, the facilitator had to take care that the right level of detail was chosen. Participants had the tendency to discuss too many details (font, color etc).

Hardly any facilitating was needed during the items VI (technical integration) and VII (multi-channel issues) there was. Per page the participants highlighted the MC and technical links spots by their selves.

During item VI (technical integration) it was analyzed how the designed concept could be realized. In this item the services concept was converged. In the next item (VII, MC) new ideas were generated again.

The usefulness of agenda item IX can be doubted. The defined relations between the different roles were not used. Also it seemed hard to make this overview of the value web in a workshop setting.

The whole day the participants had to concentrate. Therefore, it is important that the session is 'pleasant' for the participants. It can be concluded that the participant did like doing the session. Letting them draw i.e. storyboards by themselves helped in this. At the end of item V (storyboards) the participants had problems staying focused.

**Time Schedule**

The pretest is used to find out whether the session (and the separate agenda items) can be carried out in the time that is reserved for this item. In the next table every item is presented. The time that was allocated for each item and the time it took in reality are given. The remark has to be made that this session was only done with two participants, instead of four.

<table>
<thead>
<tr>
<th>Agenda item</th>
<th>Allocated time (min)</th>
<th>Real time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (relation functions)</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>II (personas)</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>III (check customer needs)</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>IV (tasks)</td>
<td>45</td>
<td>43</td>
</tr>
<tr>
<td>V (storyboards)</td>
<td>55</td>
<td>50</td>
</tr>
<tr>
<td>VI (technical integration)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>VII (multi-channel)</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>VIII (roles)</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>IX (value-web)</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>X (parties)</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>XI (project plan)</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Only for item III there is much difference between the allocated and real time. The reason for this is that no new customer needs were found, based on the personas.

**Results of questionnaire**

As said before, the participants were asked to fill in a questionnaire. Participant I indicated before the session that all possible next steps were useful or neutral. Remarkable is that the possible steps that were scored with a neutral, were scored after the session as most useful (personas, storyboards, parties). Participant II scored personas and parties before the session as very useless, after the session he scored them, as most useful. It seems that only when these items are done, the participants see the usefulness of it.

Participant I did not find any item 'least useful' after the session. Participant II mentioned only item I (relation functions). The reason given for this was that it was less clear what the functions did mean. The cause of this can be that an existing service matrix was used. Also the fact that discussions were not really focused at the start of this item can have influence on the score of this item.
Progress
As said before, the question was asked how far the participants thought they were in the design process (service idea=0%, go live=100%) before and after the session. The results of this question are presented in the next table.

Table 7: Progress during session

<table>
<thead>
<tr>
<th>Percentage after</th>
<th>Percentage after</th>
<th>Percentage in</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>xQFD</td>
<td>afternoon</td>
</tr>
<tr>
<td>Participant I</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>Participant II</td>
<td>15</td>
<td>30</td>
</tr>
</tbody>
</table>

Participant I thinks that 20 percent of the work is done only after the xQFD method. Participant II thinks 15 percent. After the afternoon session participant I thinks 35 percent of the work is done, and participant II 30 percent.

Both participants scored the method in general as useful. As mark they both scored an 8 (scale 1 to 10).

4.4.3 Lessons from pretest
It has been concluded that the agenda of the session is workable and that the participants were satisfied with the process and the output. The general mark that was given for the session was high. However, some lessons can be learned from the pretest. The pretest implies the following for the agenda:

- Agenda item III (check customer needs) has been deleted out of the agenda. The question (are there new customer needs?) has been moved to the previous item. The reason for this is that a separate item is not necessary.
- The items technical integration and MC have been switched from order. In the item MC new ideas can be generated. During the technical integration item the feasibility check of the designed service concept starts.
- The item value-web has been deleted. The result of this item was not used in the session. Still it is useful to create an overview of the value web, but this can better be done after the session.
- The items roles and parties have been taken together as one item. A reason for this is that the participants do not use the terms (role and party) separately.
- A coffee break has been inserted between agenda items IV en V.

4.5 Conclusion
In this chapter first a reflection on the found requirements has been given. Based on this reflection, the final list of requirements has been formulated. Based on these requirements an agenda has been designed. This agenda has been tested during a pretest. Based on the findings in this pretest, the agenda has been adapted. This final agenda has been presented in this chapter.

This final agenda will be tested. In the next chapter it will be described how this will be done.
Testing Methodology

TNO defined the constraint to design a design session (workshop). In the chapters 2 and 3 requirements, which the session should meet have been defined. An agenda for a design session has been designed based on these requirements. This agenda should be tested. The way this will be done is described in this chapter.

5.1 Testing

Testing of the design session can be done in different ways and on different levels. The main goal of the session is to support the design process of an e-service (specifying an e-service concept). Problems that often occur during a design process can be prevented by the use of this session at the start of a design process (and due to this to make a structured design start).

A test to prove the use of the method can be carried out in the following way: two homogeneous design processes must be carried out (parallel and separately). In one of the two processes the session will be used (experimental group), while the other process will use a traditional way (no session, control group). Performance indicators should be defined (time, costs, quality of output) and measured. The measurements of the different processes can be compared. Hypothesizes would be that the experimental group (in contrast to the control group) will deliver on time, for less costs, with a better quality of the output. This extensive test will not be carried out due to practically reasons (time, participants).

A number of requirements have been derived by literature study and explorative research. It is stated that, when the design session meets these requirements, the session delivers a useful support during the design process of an e-service. It has to be tested whether the session meets these requirements as expected. The use of a control group stills seems useful. Two sessions can be held in parallel. One of these sessions must follow the new agenda, while the other session must follow a ‘placebo’ agenda. Both sessions will have their own influence on the requirements. A significant difference, in the advantage of the new design session, is expected.

There are two reasons why this test setup is not chosen. Firstly, it is hard to develop a good placebo session. There are no existing sessions that take the situation after xQFD as starting point. The second reason is the lack of enough participants. When the ‘placebo setup’ would be used, for every design process two homogeneous design teams must be found. Also because the test has to be carried out in the summer holidays period, this could not be realized.
Eventually, a test set up has been chosen in which the session is carried out several times. During these sessions different services are designed. Because of this, it can be tested whether the session meets the defined requirements. At the same time it can be checked whether the session is ‘multi-usable’. In the next paragraph this will be described further.

A number of test sessions will be held. These sessions are held with real business partners that stand at the start of a design process. During each session the same agenda will be used. The used agenda has been presented in paragraph 4.2.

5.1.1 What to measure?

Requirements
As said in the previous paragraph one of the main issues during the test will be to check whether the design session meets to the defined requirements. However, also other aspects will be tested.

Agenda
It must be checked whether the agenda of the session has a workable format, and as a result of this, whether TNO can offer the method to its customers. The participants must have the feeling that the day consists of one session. In the morning, during xQFD, the GDR system is used; in the afternoon this will not be the case. It will be checked whether the afternoon session fits well on the xQFD session. The agenda has been designed in such a way that the output of an item is used in another item. The agenda has been set up in a logically way. The test must prove that this also works out practically. The test will also focus on the items separately. It will be tested what items are most and least useful, and which items create new insights for the participants.

Output
So far, all tests do only consider the process of the method. The session will eventually result in an output. The quality of this output says in an indirect way something about the quality of the session. Therefore also the outputs of the different cases will be analyzed.

Satisfaction
As said in chapter 2, there exist multiple perceptions on the term satisfaction. According to Briggs et al. (2005) during the debriefing the satisfaction will decrease. Others (Oliver et al. 1997) see satisfaction as a more stable factor. It will be tested whether the satisfaction will increase after the afternoon session and whether the satisfaction has in- or decreased during the debriefing.

5.1.2 Variables

The xQFD method has been designed to support the design of every auxiliary e-service. Because the new session is a continuation of xQFD, also this session must be able to support the design process of different auxiliary services. In the paragraph 5.1 the term ‘multi-usable’ has been mentioned. It will be test whether the session can be used for different cases.

Two variables are defined that can have influence on the quality of the session.

Facilitator
The quality of the session can depend on the facilitator. When a facilitator who has much experience with facilitating sessions facilitates the session, instead of an inexperienced facilitator, it can be the case that the quality is better. Also, a facilitator with a great expertise on the field of service development can influence the session in a positive way.

The agenda has been set up in such a way that it is expected that the facilitator does not have a significant influence on the quality of the session (e.g. detailed question has been formulated for every agenda item). To test this, different facilitators will be used for the different sessions.

For TNO this set up has two more advantages:

- It is for TNO important that more people in the organization know how the method works, and that more people are able to facilitate the session.
- For TNO it is important that the method is transferable from one person to another (which is also tested using this set-up).
Company size
It can be that the session has other added value for a big company than for a smaller company. Like Simons and Bouwman (2005b) say that namely large organizations benefit from multi-channel design support methods. It is expected that companies appreciate the fact that a design problem is tackled with four employees of different disciplines. Smaller companies (SME: <250 employees, www5) like the fact that a structured way of designing is used.

For TNO it is good to know for which companies the method is useful. This information can be used to decide to offer the method to a certain party. Therefore, it is interesting to test the differences between small and big organizations. For this reason it will be tried to do at least one session with a small, and one with a big party.

5.1.3 How to measure?

In the previous paragraph it has been described what test set up will be used and what will be tested. This paragraph describes the way the test data is collected. In this research two ways to do so will be used:

- Facilitators’ observations
- Questionnaires filled in by participants

Facilitators’ observations
Every session is facilitated by one person (during the xQFD session also an operator for the GDR is used). During the day also an observer (the author) will be present. This observer will pay attention to how the process takes place and whether the method meets the requirements.

The facilitators’ observations are also used for analyzing the output of the different sessions. The observer and one of the facilitators (involved in the research) will give a meta description of the output of the session. Attention will be given to the quantity (e.g. number of screens) and quality (level of detail etc) of the output.

The observer will write a report about the process of the afternoon and the output. The facilitator will check this report; he will review this report. It has to be noticed that the opinion of the observer and facilitator is subjective.

Questionnaires filled in by participants
For this research the participants must fill in three questionnaires. During the overall method, the participants will fill in two questionnaires; one after the xQFD session (1) and the other one at the end of the day (2). Approximately two weeks after the session (during the presentation of the results) the last questionnaire will be filled in (3).

An interview will be held with the participants at the end of the day (based on questionnaire 2). Next to this, the day ends with a plenary evaluation.

Questionnaire 1 consists of the next items:

- Background questions: working field, experience in service design etc.
- Subjective judgment: usefulness and quality of the xQFD session
- Desired next steps: what steps shall be taken?
• Insight in aspect: how much insight do you have in different aspects
• Satisfaction questions

Questionnaire 2 consists of the next items:
• Subjective judgment: usefulness and quality of the afternoon session
• Insight in aspect: how much insight do you have in different aspects
• Agenda questions: usefulness of items, logical structure of agenda
• Requirements: which items have influence on requirements
• Satisfaction questions

Questionnaire 3 consists of the next items:
• Subjective judgment: usefulness and quality of the session.
• Satisfaction questions

Briggs et al. (2005) formulated the satisfaction questions that will be used. These questions make a distinction between SVA (perceived Shift in Value Assessment), SP (satisfaction with meeting process) and SO (satisfaction with meeting outcome).

The questionnaires have been set up before the pretest (which has been described in chapter 4). The two participants filled in the questionnaires. Due to this, it has been checked whether the questions are understandable for the participants. The questionnaires can be found in the appendix.

5.1.4 Measurements comparison

In the previous paragraph it has been described how data will be collected. These data will be analyzed in different ways. The description of these ways is given in this paragraph.

The use of test sessions has similarities with the use of case studies. Every case that is conducted is unique on itself. The participants, the service that is designed and the facilitator are different in every case. It seems interesting to analyze every case separately.

Also a cross case analysis will be carried out. As said before, the difference between a big and small company can be analyzed. Also the facilitator can have influence on the quality of the session. The cases will be compared to each other.

Of course, also all the cases together will be analyzed. This will lead to conclusions about the method in general.

5.2 Cases

The design session has been conducted five times. Two parties have been found by the use of contacts of TNO. Three sessions have been found via the TU Delft.

The two parties found by TNO (case A and B) were asked whether they wanted to make use of a design session, which is still in the developments phase. It was known by TNO that one of these parties had a service idea. Of the other party this was not known.

Also a third party was asked. With the three parties an intake was held. Unfortunately, the third party had to cancel the session (this was the smallest party: 7 employees). To participate during the session is a big investment for a company. Four employees (participants) must be available for one day. This party got a new order of a customer. Therefore it was not possible to make four persons (of the seven) available for one day. This resulted in the fact that the session could only be held with two parties.

The sessions arranged via the TU Delft were part of a two-day-course. Sixteen men, out of one company, participated in that course. The second day of that course a fictitious service idea was taken. This idea was used in three parallel sessions (case Ca, Cb and D).
An overview of the sessions is given in the next table:

<table>
<thead>
<tr>
<th>Case</th>
<th>Sector</th>
<th>Date</th>
<th># of Participants</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Employment agency</td>
<td>09-20-2005</td>
<td>4</td>
<td>Employees Portal</td>
</tr>
<tr>
<td>B</td>
<td>Insurance</td>
<td>09-28-2005</td>
<td>4</td>
<td>Secure Message Portal</td>
</tr>
<tr>
<td>Ca</td>
<td>Insurance</td>
<td>09-20-2005</td>
<td>4</td>
<td>Mortgage Calculation</td>
</tr>
<tr>
<td>Cb</td>
<td>Insurance</td>
<td>09-20-2005</td>
<td>4</td>
<td>Mortgage Calculation</td>
</tr>
<tr>
<td>D (*)</td>
<td>Insurance</td>
<td>09-20-2005</td>
<td>8</td>
<td>Mortgage Calculation</td>
</tr>
</tbody>
</table>

(*) Excluded from analysis

Remarkable in this table is that a case Ca and a case Cb are mentioned, both with four participants. These two design teams did the xQFD session in the morning together. In the afternoon the group was split up, and two sessions were conducted parallel.

As can be seen, four sessions have been held on the same date. Case A was already planned on this day, when it seemed that also the course took place on that day. As a result case Ca, Cb and D must be held on that day as well. The observer could not be present during these cases. An observer, not involved in the research, observed these sessions.

Facilitator
Four facilitators have been used for the five sessions. For reasons of practically, the same facilitator facilitates case Ca and Cb. All the facilitators had experience with facilitating sessions. For all of them it was the first time the facilitated an xQFD session. Of course, this also holds for the afternoon session.

Company size
As said before, at the end no small party could be found, to test the session with. Case A has been conducted with a company of 450 employees. Case B, Ca, Cb, and D have been carried out with companies that do have several thousand employees.

Questionnaires
Already it has been said that case Ca, Cb and D have been held during a two-day course. For these sessions no official intake was organized. Questionnaire one was cut down, also no debriefing was held. As a result, for this cases questionnaire three could not be filled in. Also it must be said that the questionnaires of case Ca and Cb are analyzed together, because after the sessions it was not possible to make a distinction between the questionnaires.

5.3 Conclusion

In this chapter it has been argued that the method should be tested. This testing has been done by the use of five test sessions. Different aspects have been tested. Focus has been on the requirements, the process and the output of the method. Three ways have been used to collect data: questionnaires filled in by the participants, observations done during a session and analysis of the output of the sessions.

The next chapter will describe the results of the tests that have been carried out.
Testing and Results

In the previous chapter it has been described how the method has been tested. The results of the tests will be described in this chapter. A factual description of each session will be given in the first paragraph. Next, it will be checked whether the method meets the constraints defined by TNO. After this, the observations of the observer will be discussed and the results of the questionnaires will be presented. Also, an analysis of the satisfaction will be given. The chapter will end with an interpretation of all the results.

6.1 Sessions in general

Five sessions have been carried out. These sessions are discussed globally in this paragraph.

Case A
A service has been designed with an employment agency during this session. For this company two things are changing: the company style is changed and a new information architecture is implemented. Because this, they decided that the website has to be renewed as well. The agency wants to stay in contact with their temporary workers, when they are working for a company. Some kind of portal should be used for this. The session has been used to design this portal.

Case B
Session B has been conducted with a big insurance company. The customers of this company are intermediaries. For these intermediaries the company offers a portal. This portal must offer the opportunity to send policies and quotations within a secure environment.

Case Ca and Cb
These sessions have been carried out with an insurance company as well. Sixteen employees followed a two-day course ‘customer oriented innovations’. The sessions were carried out the second day of this course. A fictitious service idea was used for this. The service was about the offering of mortgages to end-customers. The xQFD session has been conducted with eight people. Every focus-role was taken by two persons. After the lunch the group was divided into two groups. One facilitator facilitated the two groups. Because of the fact that the day could not last till five o’clock, the agenda items were shorten a little. There was no way to see which questionnaires belonged to which group, after the sessions. That is why, after that the observation report is presented, the sessions will be analyzed as one.
Case D
Session D has also been carried out during the described course. This group was not divided after the lunch. This made that the session was conducted with eight participants. During the session it seemed that the participants were not familiar with the context of the service. The facilitator decided to pay some attention to the context of the service, before going on with the session. This took a lot of time. It made that there was not enough time to conduct the whole session. Some items were skipped, some others were done very quickly. Based on the report of the observer, this session was not representative. The only reason for this is the fact that the participants did not have the good knowledge for the designed service (7 of the 8 participants worked at the ICT departments of the organization). This is why this session will not be taken further into account in this research.

6.2 Situation after xQFD

Four cases will be analyzed in this chapter. During all sessions four participants were present and every time the same agenda has been followed. During every session a different service has been designed, and a different facilitator facilitated the session (except from case Ca and Cb).

Before every afternoon session, the xQFD session has been conducted. The objective of this research is to develop a suitable continuation for xQFD. A continuation can only be carried out when the start situation is the same as the situation after an xQFD session. When the xQFD is not carried out properly, it can be that the new session will automatically be bad.

In this paragraph it is checked whether the xQFD sessions indeed had the same quality as the xQFD sessions that were held in the past. If this is the case, it is assumed that the afternoon session has the same starting situation as the situation in which a usual xQFD session ends.

In questionnaire 2 it was asked what mark the participants give to the morning session. The average mark given is 7.2 (on the scale from 1 to 10, presented in figure 13). During the development of xQFD also test sessions were conducted. The average mark given for the session was a 7.8. Based on these results it looks like there is a little difference in the sessions. However, because of the limited number of respondents this cannot be tested statistically. During the test session of xQFD (six in total) the author of this report was present, as observer. It is concluded that there is no significant difference between the sessions, based on his observations.

6.3 Constraints TNO

The object of this research is to design a suitable continuation for xQFD. The constraints that have been defined by TNO were mentioned in chapter 1. The method should meet these constraints. No explicit test was set up for this. Nevertheless, they are discussed in this paragraph.

- The method must be scientifically based.
- This step should have a valid value proposition within the design process.
  It is analyzed what steps existing design processes do take, during a literature study. xQFD has been placed in these processes. This has been done to find out what next steps should be taken. Requirements have been derived out of the literature. Based on these requirements the session has been designed.
- It has to be possible to apply the new method in the format of a design session (workshop).
  The whole research has been based on the design of a new session. The agenda of this session has been presented in chapter 4.
- The output of the xQFD session has to be input for the new session
  The method uses the output of xQFD. No new input is needed.
- The maximum duration of the new session equals four hours.
  The session can be carried out in four hours (one afternoon).
- The line up of participants of the new session has to be the same as the one for xQFD.
During the afternoon session the same participants can be present as during the xQFD design session.

- The ‘package’ of the xQFD method and the new session has only one intake and debriefing. These intake and debriefing will be adjusted to the new session. The new method exits of: intake, xQFD session, new session, and debriefing. The intake did not change.

- The xQFD agenda can be adjusted when this is necessary; the changes will be kept as small as possible. The xQFD session has not been adapted.

- The process and output of the new method must be satisfying for the participants. Taking care of this has been done by the deriving of requirements, not only out of the literature, but also by explorative research. Whether the participants are really satisfied will be analyzed in this chapter.

6.4 Observations

This paragraph starts with the descriptions of the observations made during each session. As said in chapter 5, for case A and B the observer wrote this report. After that, the facilitator reviewed it. The facilitator of the sessions Ca and Cb has written the report of case Ca and Cb. The observer has reviewed these reports. After the descriptions per case, an overall reflection is given.

6.4.1 Case A

The participants of this session were very enthusiastic (they were exited about doing a session, and being one day out of the office, and regular business) and had lots of ideas. There were discussions, but in all cases a solution was found quickly. All participants had an equal contribution to the session.

The participants were enthusiastic about the GDR system, during the morning session. The fact that this system was not used after the lunch was seen as a disappointment. However, also in the afternoon session the enthusiasm of the participants kept the same.

During the first item one of the participants wrote on the flip-over. All functions that were defined during the morning were placed in hierarchy. Participant did agree on this aspect soon. There was only little discussion and the end results were achieved very quickly.

For the second item the group was split up into two groups. The design of a persona was easy for the groups; especially after some questions of the facilitator (what kind of hobbies does he have? Etc.). One of the two groups had already a good persona after ten minutes. In the interview after the session it was mentioned that this item could be a little shorter in time. The output of this item was two totally different personas; for the portal these personas did have totally different wishes. After the presentation of the personas it was decided that the portal must satisfy the wishes of both personas.

Tasks were defined during agenda item three: logging in, filling in of the ‘werkurenbriefje’ and applying on new jobs. It was remarkable how easy the group spook in terms of the personas. Based on these personas it was decided that the portal needed some kind of layer structure. Persona I wanted all the information that is interesting for him on one page. Persona II wanted to have the possibility to click and find more detailed information about a subject.

The facilitator mainly did the drawing of the storyboard. One of the participants was somewhat quieter during this discussion. At the end of the session he gave two reasons for this: He was the manager and was curious how his employees would design the website. Next to this, he mentioned the fact that the tasks were discussed several time (first in item I, than III and than again during the storyboards item). Every time the discussion goes some deeper, but it makes it hard to stay focused.

One of the participants said that it would be useful to check were other channels played a role, at the end of the item storyboards. The facilitator could use this remark to make a bridge to the next item. During this MC item, lots of new ideas were generated. It was a creative process, and also the ideas named in the morning session, were made more concrete.
The item technical integration had another purpose than expected on forehand. As said before the company gets a new information architecture. All legacy systems are replaced by a new system. For most participants it was not clear what this new system could do, and what not. When the storyboard was discussed again, the participants shared lots of information about the new system.

The final two items were carried out in a less active way. The participants took place on a couch, where a brainstorm was held. The facilitator wrote down what was mentioned by the participants. This is how the list of roles and parties, and the project plan were designed.

After the session the participants were very enthusiastic about the method. The manager said that is was worth doing this, with four people for one day. Another participant mentioned that the enthusiasm of the facilitator had also influence on the group. One participant, that was relatively less enthusiastic after the morning session, said she liked the results of the afternoon session more. This was because of the fact that they were so concrete.

6.4.2 Case B

The line up of session B had some influence on the process of this session. One of the participants was a trainee. He did not have much knowledge of the context of the service. His supervisor was also one of the participants. This made it hard for the trainee to go into discussion with another perception than his supervisor. The participant with the ICT/process focus was skeptical about all ideas of the participants. This hindered the process a little.

Different functions were defined during the xQFD sessions. During lunch it seemed that the focus of the morning session was too wide. One of the functions defined appeared to be more important than the others. For the morning session, the focus had to be on that function. The cause of this wide focus can be the effect of the fact that the intake is not hold with the real problem owner.

The participants were very enthusiastic during the first item. This was because of the fact that the relations between the most important function and the other functions were designed. This placed the important function in a wider context.

The group was split up for the persona item. The facilitator took care that the trainee and supervisor were not placed in one group. Remarkable during this item was that the participant with ICT/process focus was very enthusiastic, while till so far he was relative skeptical and quiet. His group made even a picture of the persona. The other group designed two personas.

Tasks were defined next. It was not hard which task should be discussed in depth. These were the tasks in which the important function played a role. Three tasks were defined in which this was the case. The tasks were discussed based on the three personas. During this assignment the facilitator wrote down the ideas of the participants.

Next, the storyboards were sketched. One of the participants, who took the pencil, could draw well. In a short time, nice, detailed storyboards were sketched. During the drawing of the different tasks, it seemed that the structure of the pages could be relatively simple. This was noticed, based on the wishes of the personas.

During the MC item it seemed that multi-channel thinking was a new way of thinking for most of the participants. It was seen as ‘out-of-the-box thinking’. It was analyzed were other task were needed, and what the task of this channel were.

The next round looked a little like a one-man show of the participant with the ICT/process role. According to him everything would be very hard to realize. Because there was a great difference in expertise between the participants, the communication was hindered. During this item lots of issues were mentioned that has to be taken care of after the session.

The creation of a list with required roles and parties was done very quickly. During the formulation of the project plan the participants indicated that this item and the previous item were not that useful. The reason for this is the fact that the company has some standard procedures for this.

The trainee indicated that the contribution of the participants was not equally devided, after the session. It was hard to follow the discussion for him. This was not a big problem during the xQFD session. He could submit his own ideas anyway (in the GDR). The participant who
represented the ICT/process stakeholder’s perspective said that many issues were discussed too shortly. He admitted that is was useful to address them now shortly, and tackle them in a later stadium. The other two participants were very enthusiastic. The reasons for this were the good focus (the important function) and the concreteness of the output.

6.4.3 Case Ca and Cb

The participants of team Ca were pro-active, experienced and professional. In this group the business manager and the senior IT-manager had a dominant role. The members of the other group had less expertise. Also some people found it hard to focus during the session; this had to do with their expertise (one participant worked in the field of asset management, and this had nothing to do with the service).

It already became apparent that the level of expertise varied in the group during the morning session (in which was worked as one group).

The first group designed a persona based on a real person. It seemed hard to do this. The other group had no problem in designing a fictitious persona.

Analyzing of the task was carried out quickly in group a. The business manager delivered lots of input in this item. The tasks and steps were formulated quickly, even as the drawing of the storyboards. The fact that the company has a clear style in their web pages, and that the participant knew this, made it easier to draw the storyboards. The MC item resulted namely in call-me-now spots in the storyboards. The group quickly analyzed the technical architecture, and solutions were already designed. Also the links to systems of other channels was easy for this group. The reason for this was that one participant is responsible for these systems, and had all the expertise. Roles and a project plan followed quickly out of the output of the previous items. Overall it must be said that facilitating this group was hardly needed.

The second group (Cb) spent a lot of time to analyze the tasks. One of the participants had a dominant role. This was the manager of two other team members. His dominance was a result of his detailed expertise. Because of this the process was hindered, especially during the sketching of the storyboards. The multi-channel item was carried out in the same way as the other group. Because of a lack of time, the IT architecture was made very briefly. The roles and project plan were formulated extensively.

The facilitator facilitated the groups in parallel. His main task was making bridges between the different agenda items. It is clear that this was easier in the first group than in the second. According to the facilitator it is possible that professionals can work trough the agenda, without being facilitated.

6.4.4 Overall

Considering all sessions, it can be said that participants are enthusiastic during the session. The participants see not using the GDR in the afternoon as a pity. However this disappointment is not noticeable during the afternoon session. The energy level of the groups becomes even larger in the afternoon.

When the cases are compared, it seemed that group A was the most enthusiastic group.

Considering the agenda, it seemed that in all cases the time schedule was workable. Only in case Cb, the schedule was a little overrun, at the end of the afternoon. The facilitator has to facilitate on the time strictly.

Every agenda item resulted in the outcome that was asked for. In the next paragraph this will be discussed in more detail.

Some remarkable issues:

- Participants became very enthusiastic during the design of the personas. Even when they did not see the usefulness of the item yet, they like to do it. The level of energy is very high during this item. Only in case Ca, the session in which a real persona was put into a persona, this was less the case.

1 Written by Harry Bouwman (facilitator of the workshops)
• The item MC was seen as something new (out-of-the-box thinking) in case B and C. In case A this was not the case.

• It was remarkable that the last items were not seen as useful during case B, according to the participants. While in session A these items were received with big enthusiasm.

When looking at the requirements the following remarks can be made:

Customer-Oriented Design
Overall it seems that when the tasks are defined, this is based on the wishes of the end user. For this, the personas are used several times. Also during the MC item lots of design choices are made. Also these choices are based on the perception of the end user.

Channel Coherence and Channel Synergy
This has been addressed in the items MC, technical integration and roles, in all cases.

Speed
The speed was good in every session. During case Cb it was some lower, this was because discussions went into much detail. In case A the atmosphere was very relaxed. The participants were serious, but now and then some jokes were made. This had a good influence on the atmosphere in the group. All this did not have a bad influence on the speed (and focus) of the session.

Focused Design Process
The focus in case Cb was a little less than in the other sessions, however, still it was good. It seemed that overall the focus becomes a little less in the last two agenda items. The unstructured way of doing this item can be a cause of this. Also the fact that these items are carried out at the end of the day can have some influence.

Communication
One participant had significant more expertise than other participants in the design team, during case Ca and Cb. It seemed that this could have a positive influence on the group (Ca), but also a negative (Cb). In case Ca the expertise was used to make decisions more quickly. These decisions were based on facts. In case Cb the expertise was used to go into very detailed discussions, which were not relevant in this phase of the design process. In case B the communication was hindered in the technical integration item. Also a different level of expertise by the different participants caused this.

Specification of Service Concept
The specification of the service concept is mainly done during the item tasks. In the item storyboard this specification becomes visual.

Extension of Service Concept
In none of the cases a new functionality has been defined in the afternoon session.

Formulate project plan
The item technical integration has a big influence on defining roles and parties. This item again has great influence on formulating the project plan.

Organizational design
This has been addressed in the items ‘roles and parties’ and ‘formulating project plan’ in all cases.

Technical design
In all case this has been addressed in the item technical integration.

6.4.5 Output

The output of the sessions has been analyzed after the sessions. Remarkable aspects are mentioned below: (A presentation of the output of session A can be found in the appendix.)

Relation Functions
In case A this item resulted in an overview of the hierarchy in functions. Also how to ‘surf’ through this hierarchy has been described.
In case Ca and Cb the function has been placed in structure by the use of the client process. In fact the results look more like a list than a real structure.
Persona
In case A only the questions that were asked by the facilitator were answered. In case B one persona has been designed extensively. Lots of extra information has been given. Even a picture of the persona has been made. In case Ca and Cb a concise persona has been designed.

Tasks
During case B and Ca a very extensive, clear description of the task has been given. In case A en Cb this item resulted in a less structured output.

Storyboard
In case A and B many screens have been designed. For each screen it is said what must be on these screens, not yet how. During case B also ‘nice details’ have been added. As result, the screens look already very nice. In case Ca and Cb less screens have been sketched. However, they have been sketched in more detail.

Multi-Channel
It has been highlighted where other channels play a part during all cases. In case A and B also the roles of the other channel have been defined.

Technical Integration
During case A only the new information system has been mentioned. During case B and Ca, also a scheme of the technical architecture behind the site has been made.

Roles and Parties
In case A this item resulted in a detailed list. This has also been done in case B. Here the roles have been split up in external and internal roles and roles needed during the implementation phase and operational phase. During case Ca and Cb a briefer list has been defined.

Project Plan
During case A, this item resulted in a detailed list. The right order of the activities has even been discussed. In case B and Ca a concise list has been produced. The output of case Cb cannot be found.

Overall can be concluded that case A, B en Ca delivered the same kind of output. While during case Cb less output has been produced (less quantity, and less details).

6.5   Participants’ Assessments

An evaluation of the questionnaires filled in by the participants has been made (next to the described observations of the observers and facilitators). This paragraph describes the results of this. The questionnaires can be found in the appendix. As said before, the questioners of case Ca and Cb have been put together. From now on, these will be named as case C.

The answers with regard to the overall session, the agenda, the output and the requirements will be analyzed. Every aspect has been analyzed for each session separately, a cross case analysis has been carried out, and the overall results have been described.

6.5.1   Overall

Participants were asked to give a mark for the morning session, after the session (xQFD). The same question was asked after the afternoon session. At that moment, a mark for the afternoon session was asked, but also for the whole day. The results are presented in the next figure.
For all sessions, all given marks are good. The figure illustrates that the marks given for the different parts of the day are almost the same (considering the cases separately). Comparing the sessions, session A scores about one point higher than the others.

To get a better idea of the variation of the marks, in the next table the standard deviations are presented.

Table 9: Standard deviations

<table>
<thead>
<tr>
<th></th>
<th>Workshop A</th>
<th></th>
<th>Workshop B</th>
<th></th>
<th>Workshop C</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Morning</td>
<td>Afternoon</td>
<td>Day</td>
<td>Morning</td>
<td>Afternoon</td>
<td>Day</td>
</tr>
<tr>
<td>Grade</td>
<td>0.8</td>
<td>0.8</td>
<td>0.3</td>
<td>0.3</td>
<td>0.8</td>
<td>0.8</td>
</tr>
</tbody>
</table>

It has to be kept in mind that there were only four respondents per case. These numbers can only be used to state that there is no big variation in the given marks; the marks given by the participants did not differ a lot.

6.5.2 Agenda

Usefulness of agenda items

The participants were asked which agenda items they found the most useful after the afternoon session. The results are presented in the next table.

Table 10: Most useful items

<table>
<thead>
<tr>
<th></th>
<th>How many participants indicated the item as most useful?</th>
<th># participants in session A (n=4)</th>
<th># participants in session B (n=4)</th>
<th># participants in session C (n=8)</th>
<th>Indicated as useful by which % of all participants? (n=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relation Functions</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>69%</td>
<td></td>
</tr>
<tr>
<td>Persona</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>38%</td>
<td></td>
</tr>
<tr>
<td>Tasks</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td>Storyboard</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>MC</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>Technical Integration</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Roles</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Project Plan</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>38%</td>
<td></td>
</tr>
</tbody>
</table>
In case A the first and last item are seen as most useful (relation functions and formulate project plan). In case B and C this also holds for item I (relation functions) and item V (MC). Overall can be said that the majority sees three items as most useful: item I (relations functions), Item IV (storyboard) and item V (multi-channel).

The same question was asked for the least useful items. The results are presented in the next table.

<table>
<thead>
<tr>
<th>How many participants indicated the item as least useful?</th>
<th># participants in session A (n=4)</th>
<th># participants in session B (n=4)</th>
<th># participants in session C (n=8)</th>
<th>Indicated as useful by which % of all participants? (n=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relation Functions</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>6%</td>
</tr>
<tr>
<td>Persona</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>44%</td>
</tr>
<tr>
<td>Tasks</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>6%</td>
</tr>
<tr>
<td>Storyboard</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>25%</td>
</tr>
<tr>
<td>MC</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>25%</td>
</tr>
<tr>
<td>Technical Integration</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>31%</td>
</tr>
<tr>
<td>Roles</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>44%</td>
</tr>
<tr>
<td>Project Plan</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>31%</td>
</tr>
</tbody>
</table>

Considering this table, it is remarkable that in case B the last two items (roles and project plan) are seen as less useful by three of the four participants. Another noticeable aspect is that four participants of case C see the item persona as one of the least useful, while the other four find the persona one of the most useful. Overall can be said that the items II (persona) and VII (roles) are seen as least useful (both 44%).

Structure of Agenda
Beside asking for the usefulness of the different items, it was also asked whether the participants found the structure of the session logical. The output of an item is used as input for other items, as described in chapter 4. Every item must make it easier to carry out a next item. It was asked whether the participant did notice this. All the answers that were given were neutral or higher. It can be concluded that the structure of the agenda is logically for the participants. (The graph with answers can be found in the appendix).

Continuation of xQFD
For TNO it is important that the participants have the feeling that the day consists of only one design session. It was checked whether the participants thinks that the afternoon session fits well on the xQFD session. The scores are presented in the figure below.

From this figure, it can be concluded that the majority answered this question with ‘good’. Some participants answered ‘neutral’ or even ‘very good’.

Insight in aspects
Before the sessions of case A and B, the participants were asked how much insight they had in certain aspects regarding to the e-service. The same questions were asked after the sessions. The difference in the insight is gathered during the session. (The graph with answers can be found in the appendix.)
Considering both cases, it can be said that after the session the insight of all aspects is higher than neutral. Before the session this was not the case. During session A the insight in what should be taken next is increased more, than during session B. The same holds for the links with other systems. In case B the insight in this aspect is decreased.

Considering both sessions it seemed that the method helps most to get more insight in:
- the way the functions work, by defining tasks
- how the most important screens globally look
- on which screens the most important design choices have to be made

In four aspects the insight is not increased much:
- which fictitious personage is a symbol for the target group (persona)
- which task the user must be able to walk through
- where other channels play a role
- if the needed external systems are available

It was asked whether the participants think that the (gathered) insight has some added value. These questions were asked before and after the afternoon session. The perceived value of insight in two aspects is increased much:
- how the most important screens globally look
- on which screens the most important design choices have to be made

It is remarkable that also the real insight in these two aspects is increased a lot. It seems that for almost every aspect the perceived value increases, when an item, in which that aspect is addressed, is executed. The opposite holds for persona and the definition of roles needed during the implementation phase.

6.5.3 Output

The participants were asked how useful they think the output of the session is, and if they are satisfied with the output. Scored could be given from 1 to 5. The answers are presented in the next figure.

![Usefulness and satisfaction of/with Output](image)

This figure shows that the majority of the participants were satisfied with the output, and think that this is useful. A small number answered these questions with a 'neutral'. All these 'neutrals' were scored in session C.

For three of the agenda items it was asked whether the output of that item is useful. It is asked if:
- it is expected that the storyboard helps a web site designer to design the site
- the persona can be useful in the further design process
- the project plan makes it clear what next step should be taken

The answers are presented in the next figure.
The majority thinks the storyboard and the project plan are useful. There is a difference in opinion about the personas, which will be discussed later.

6.5.4 Requirements

Requirements, which the method should meet, have been defined in chapter 2 and 3. An agenda has been developed based on these requirements. The participants were asked which items do contribute to which requirements. (Graphs can be found in the appendix.)

Customer-Oriented Design
When looking to all three cases it seems that, according to the participants, the next items take care of a Customer-Oriented Design:
- Item I (Relation function) (according to 70% of the participants)
- item III (Tasks) (60%)
- item IV (Storyboards) (70%)
- item V (MC) (50%)
This means that according to the participants four of the eight items do contribute substantially to a customer-oriented design.

The functions are ordered to see how these will be presented on a website during item I. This is done in such a way the customers want this. Item II discusses how the users carry out certain tasks. During item IV (storyboard) choices are made about how the function will be presented to the user. Item V takes care that a channel-mix is made that fits to the customer needs as much as possible.

It is remarkable that the item persona is not explicitly mentioned by this requirement. On beforehand, this was expected. It can be the case that the participants do not think that the item itself does contribute to a customer-oriented design. The designed personas are namely used in the items tasks and storyboards. These two items are mentioned by this requirement.

Only looking at case A, it can be seen that in this case item V (multi-channel) is mentioned by three of the four (75%) participants by this requirement. As said in the report of the observer, during this item lots of new ideas about how to use other channels came up. In the other sessions this item was used to check where other channels play a part in the designed concept.

Channel Coherence and Channel Synergy
According to 94% of the participants item V (MC) does have a significant influence on this requirement. As expected, this item has the most influence on this requirement. However, also item VI (technical integration) is mentioned (56%).

Specification of Service Concept
It seems that the service concept, as designed during the morning session, is specified during three items: tasks (70%), storyboards (56%) and MC (50%). It seems that there is enough attention for this requirements.

Extension of Service Concept
The extension of the service concept is namely done during the item tasks (according to 60% of the participants). Besides, the first item (relations functions) is mentioned by 50%.
Organizational design
Overall, the items tasks (50%), technical integration (70%) and listing roles and parties (60%) have most influence on this requirement.

It is remarkable that in session An agenda item VII (roles) is not mentioned (by no participant). According to them, to define roles has no influence on the organizational design. The item is well executed; therefore, no explanation can be given for this.

Technical design
As expected, item VI (technical integration) has the most influence on this requirement (100%). Also item V (MC) item has been mentioned (55%).

Formulate Project plan
It seemed that the items technical integration and defining roles have the biggest contribution to the project plan (both 70%). 60% of the participants also mentioned the influence of the last agenda item (formulating project plan) on this requirements. A 100% score would be expected. This lower score can be a result of the way the questions were formulated in the questionnaires.

Speed and Focused Design Process
Communication between Stakeholder Perspectives in Development Team
It was asked during which items the speed, the focus and the communication of the design process was good. These requirements score well on the first five items (above 50%), and less on the last three.

When looking to item VI (technical integration) an explanation can be given by the fact that there is often one participant who has more expertise in this field than others. This hinders the design process. The reason that item VII and VIII score not well on these requirements can be that the items are executed in an unstructured brainstorm, or because the participants get tired at the end of the day. Also, it is remarkable that in session C all items score lower on these requirements. The reason can be that only one facilitator facilitated those two groups.

6.6 Satisfaction
The participants of case A and B answered the questions about satisfaction, as said in chapter 5. These questions make a distinction between SVA (perceived Shift in Value Assessment), SP (satisfaction with meeting process) and SO (satisfaction with meeting outcome). Each, so-called, construct exists of four questions (as defined by Briggs 2005), which could be answered on a scale from 1 to 7 (1=strongly disagree, 4=neutral, 7=strongly agree). The results of these answers of the two cases are presented here. (The graphs of each case can be found in the appendix).
It seems that the satisfactions on all the constructs are high at all moments. Also, it can be seen that the satisfaction increases during the afternoon session. During the debriefing the construct SVA has increased a little, while the other two constructs (SP and SO) have decreased.

The differences between the session and times of measurements are not statistically significant. The cause of this can be the limited number of respondents.

6.7 Interpretation of results

Different results have been presented in this chapter. These results have been found by the observations and the questionnaires (and interviews). The interpretation of the results will be given in this paragraph.

All the participants are very enthusiastic during the session. The grades given for the sessions are high. Case A scored almost one point higher, than the other sessions. The energy level of this design team (of case A) was higher during the session. This can explain the higher mark. The reason for the higher energy level can be the fact that the participants were relatively young. Also the fact that the company they are working for is in the middle of some positive changes can be a reason for their enthusiasm.

Three items were scored as most useful by more than 50 percent of the participants. These are item I (relation functions), item IV (storyboards) and item V (multi-channel). Reasons were given during the interviews after the session. During item I the first step towards a website is made. The reason given for the storyboard (item IV) is that the output becomes very concrete. Remarkable was that a small number of participant saw this as a drawback; this was too early in the design process. The fact that the MC item is found in the ‘top 3’, is because during session B and C this item was seen as one of the most useful (in case A this was not the case). The difference between Case A, B and C can be caused by the difference in company size. Case A is held with a smaller company: an employment agency in which the offices play an important role. They are used to think in term of other channels. For cases B and C, both big companies, this was seen as ‘out-of-the-box’ thinking.

Looking to the least useful items the items II (persona) and VII (roles) are most mentioned. Participants gave as comment that these scores are relative: no item is totally useless.

Item VII is mentioned because of the 'unstructured' way this item is executed. It is useful to make a list of the roles and parties. However, there is no check whether the list is complete. This leaves the participants with an unsatisfied feeling. Besides, in session B also another reason is given (The same holds for the item of formulating a project plan.) Because the company of case B uses standard procedures for this, these items were less useful for this company.

The item designing personas is also seen as one of the least useful items. However, it seems that the opinions of the participants are divided. People do not see that during the session many design choices are made based on the designed personas. Also during the debriefing it seemed that the participants do not notice the use of personas. It is said by the participants that the personas are not used during the session. However, observations proved that many design choices have been made based on the personas. When this is said to the participants, this is confirmed. It seems that the use of persona is mostly implicit: it is a trick to think in the way of the end-user. This can be the reason that according to the participants persona does not have a big influence on the requirement ‘customer centred design’.

Fifty percent of the participants say that the output of the item persona can be ‘useful’ till ‘very useful’ during the further development of the e-service. However, more than 20 percent states that the persona will be ‘useless’ till ‘very useless’. The reason that can be given for this is that a persona does not add anything concretes to the design (in contrast with the storyboard for example).

It seems that some people do appreciate this item, and some not. However, all the participants were very enthusiastic during this item. It must be realized that the session last a long day, in which is worked in high speed. Pleasure is an important factor. For this reason persona is a useful item.

During session C it was observed that for one group it was harder to design a persona, than for the other group. One reason for this can be that this group tried to design a persona based on a real person (a colleague). This item resulted in finding out what the facts were, instead of using creativity. When the results of the questionnaires were analyzed it was seen that four participants of case C see this item as most useful, the other four see it as least useful. It can be the case that the participants of the first group (who had problems in
designing the persona) all said that this item is least useful. However, this cannot be checked anymore.

It can be concluded that the method provides much insight in how the e-service will be visualized. The session makes it clear how the most important screens globally look, and on which screens the most important design choices have to be made.

In case A the insight in what steps to take next and where links with other systems are needed is grown most. This holds not for case B. The reason for this is that during case A much information about the new information system was shared by the participants. In case B, during this item it seemed that many issues had to be tackled after the session. Probably, participants became aware of the complexity of the system, and thought it is harder to design the service after the session than they thought it was on beforehand.

It can also be stated that the perceived value of activities for the participants increase once the activities have been carried out. The reason for this phenomenon could be that the activities raise issues that the participants were not aware of, prior to the session. As discussed earlier, the perceived value of two activities for the participants has decreased once they have been carried out. These are the persona and the definition of roles needed during the implementation phase. An explanation for this phenomenon cannot be given currently.

The agenda is structured logically, according to the participants. This has been said in several interviews after the session, but it was also found in the results of the questionnaires. It is remarkable that there is not much variation per participant in the answers on the questions about this subject. It looks like people only see whether there is a relation between items, and makes no distinction in how strong this relation is.

The output of the method in general is seen as useful. Reason for this is the concreteness of it. A small number of the participants scored this output as neutral. These were all participants from case C. It can be the case that these answers are all given in session Cb. According to the observer the output of this session was of less quality than the other sessions. This is probably caused by the fact that one participant had a detailed expertise, which initiated discussions that were not relevant.

The results (observations and questionnaires) with respect to the requirements mainly match with the relations presented in chapter 4. During the first part of the agenda (the part in which new ideas should be created) all of the items (I – V) have significant influence on the requirement customer-oriented design. Aslo further, the agenda mainly meets the requirements as expected. However there are some remarkable issues.

- According to the observations the item persona has influence on a customer-oriented design. According to the participants, this is not the case (as mentioned and discussed earlier).
- It has been found that the communication, focus and speed decrease during the session. For case B this can be explained easy; the last two items (make list of needed roles and formulate project plan) were less useful, because they have standard procedures for this in their company. Therefore, requirements were scored lower in these items. For the other cases two causes can be given. It can be caused by tiredness at the end of the day. Also it can be the case that these items are not well designed.
- A last remark is about the 'extension of service concept'. According to the participants several items do have an influence on this requirement. However, according to observations no new items have been added to the service concept. An explanation can be that the requirement is not well formulated.

The hypothesis that after the afternoon session the satisfaction of the participants does not increase does not hold. After the afternoon session all constructs (SVA, SP and SO) are increased (not statistical significant). Besides, based on the results there is no unambiguous support for the hypothesis that satisfaction decreases during the debriefing (Briggs 2005). The SO and SP are decreased, while the SVA is almost equal. Briggs states that an increase of SVA has positive influences on SO and SP. This is in contrast with the result found.

It seems that during the debriefing participants think that there is a bigger chance that they achieve their Set of Salient Goals (probably the realization of the e-service) in comparison with the moment direct after the session, while after the debriefing they are less satisfied about the process and the output of the session.

The results seem to support the hypothesis that satisfaction is a function of input and output a little more, than that satisfaction is based on satisfaction with process, output, and a more independent arousal component.
6.8 Conclusion

In this chapter the results of the research that has been done have been presented. In chapter 8 conclusions based on these results will be given. However, first a reflection will be given on the results and the research. This will be done in chapter 7.
Discussion

In the previous chapter it can be seen that most of the found results were expected. In this chapter a discussion of these results and other findings will be given.

7.1 Designed method

Contribution of different steps of method
As described in chapter 2, a number of requirements for additional design tasks have been defined, next to the main requirements. Design tasks have been defined based on these requirements. In the next table the design tasks, which are addressed by the xQFD method (intake and design session) and the new method are named. To create an overview of the contribution of the different phases (intake, xQFD session, new session) it is described how (and when) each design task is addressed.

Table 12: Design tasks and tools

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Intake</th>
<th>Morning Session</th>
<th>Afternoon Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specify Customer Needs</td>
<td>Define top 10, based on</td>
<td>Elaborate using personas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>votings of participants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specify Functions</td>
<td>List based on brainstorm</td>
<td>Elaborate based on user-tasks</td>
<td></td>
</tr>
<tr>
<td>Relations between Customer</td>
<td>Score in service matrix</td>
<td>Define user-tasks based on personas</td>
<td></td>
</tr>
<tr>
<td>Needs and Functions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specify Multi-Channel Relations</td>
<td>Most important functions of other channels, Win-win situations</td>
<td>Define tasks of other channels, based on and highlighted in storyboard</td>
<td></td>
</tr>
<tr>
<td>Compare with Competing Offers</td>
<td>Score based on customer needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visualize Service Concept</td>
<td>Draw storyboard based on user-tasks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisational Design</td>
<td>Choose participants for workshop</td>
<td>List roles and parties, based on brainstorm</td>
<td></td>
</tr>
<tr>
<td>Technical Design</td>
<td></td>
<td>List external systems, based on and highlighted in storyboard</td>
<td></td>
</tr>
<tr>
<td>Finance Design</td>
<td>Create high level cost revenue overview</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Research</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Plan</td>
<td>Plan xQFD workshop</td>
<td>List activities based on brainstorm</td>
<td></td>
</tr>
</tbody>
</table>

During the intake most attention goes to the e-service idea; what is the service that has to be designed. The organizational design is addressed by choosing the participants for the design session. Also a high-level cost revenue overview (viability check) is made (based on estimations of idea owner and intake interviewer).

During this research the morning session (xQFD) has proven its use. In a very short time, a customer (end-user) oriented service concept is designed. Functions are defined based on customer needs. This is done by a brainstorm and a number of vote-sessions. Furthermore, attention goes to specifying multi-channel aspects of new the service (how should the new service be combined with the existing service offering via other channels?). Finally, the service concept is compared with services offered by competitors. The session results in a service concept (service matrix). The session supports a quick, focused and very communication-oriented start of the design process. The approach helps to make design
choices explicit. Besides all this, xQFD appears to be a session in which customer centricity of the design is guaranteed.

The strength of the afternoon session resides in specifying the service concept, from a customer perspective. In a short time, a structured process, which consists of several steps, leads to a visual representation of the service. According to literature (ISO 13407) a useful way to specify a design concept.

A user centred design is guaranteed by the use of personas. These are used to translate the relative abstract list of customer needs into a 'real' person, which makes it easier to work with the customer needs.

The method pays attention to multi-channel aspects of the service. The issues discussed in the morning are made more specific, by highlighting them in the storyboard. The same holds for technical issues; they are highlighted and discussed based on the storyboard.

From the table above, it is noticeable that almost every task is addressed during the afternoon session; this illustrates the quick-scan character of the design session.

Three design tasks are not addressed during the afternoon session.
- Earlier is argued why no attention goes to services of competitors. Still it is advisable to compare the designed concept with competing offers several times during the design process (after the session).
- The lack of expertise of the participants is given as one of the arguments not to address the finance design. However, it is assumed that a person with the right expertise (e-services business models, IS development) can make a cost revenue overview (in a more detailed way than during the intake) after the session.
- A market research did not fit within the constraints defined by TNO. During the session design choices are made based on customer needs. However, the participants defined these customer needs. A check of these customer needs can be made by the involvement of real users during the design process. Also the storyboard will have added value in this: it will be relative easy for users to give feedback based on it. One extra remark has to be made: during the sessions no real users are present. However, during this research no reason has been found why this would have any negative influence on the sessions (and outcomes).

**Output of session**

One of the main objectives of this research was to develop a continuation session that results in a more specific service concept.

![Output of session](image)

The morning session results in prioritized customer needs, functions and requirements, and a QFD matrix that helps justify investments decisions.

The afternoon session results in an e-service storyboard sequence, e-services screens with cross channel links and specification of back office connections and a project plan that makes a structured follow up possible.

Participants see the persona(s) as a part of the output that does not add anything concretes to the service design. In fact they are right: personas only support the design process, and help to create a user centred design. Use of personas can be seen as a trick to think in terms of the end-user. Remarkable is that participants neither see this support function of the personas. At the end of sessions and at debriefings they state that the
Developed. The 'weakness' of the method is that it only describes how to come to the concept. In only one day, a visual presentation of the service (a paper prototype) is window a concise service idea is translated into a structured and relatively extensive service be stated that one of the strengths (and uniqueness) of the method is that in a short time when considering the new overall method (intake, two design sessions, debriefing), it can Place in design process holds for formulating a project plan. When participants finish to prepare for the item an overall check can be done whether all roles were mentioned. The same items 'roles and parties' and 'formulate project plan' are appreciated differently in the different cases. Therefore, it can be doubted whether these items must be executed in a design session, or in another format after the session. It is advisable to analyze whether, and how these items can be improved. Participants are not sure whether all parties are mentioned at the end of the item. It seems useful to create a checklist, such that at the end of the item an overall check can be done whether all roles were mentioned. The same holds for formulating a project plan.

Another important output of the method is the storyboard sequence. In the first part of the agenda is worked towards this storyboard. The functions defined during xQFD are specified in small steps, which result in a visual presentation of them. In the last part of the session, the storyboard is used to base discussions on. The participants scored the storyboard output mainly as 'useful' or 'very useful'. During this session participants draw the storyboard by themselves. As mentioned earlier, this has as big advantage that participants see the design as their own design, and are more willing to defend it. However, in most cases a design will be made during the session that must be improved on several aspects. Therefore it is important that a visual designer and a usability expert are involved in the design process. It is advisable to involve them soon after the session. In that case it will be easier for the participants to accept that their design is adapted.

As said, the storyboard is used to base discussions on, during the last part of the session. This results in a list of issues (MC, technical, organizational), in a list of roles and parties and in a project plan, which are the last concrete outputs of the method. The storyboard is not only useful during the session. It can also support communication within the (extended) design team during the design process after the session. Also, it will make it easier for the design team to express the idea of the e-service to a web-designer. As discussed earlier, for users it will be easier to give feedback on this visual representation (instead of giving feedback on a list of abstract system specifications).

Literature study and explorative research proved that an overview of needed roles and parties and a project plan are important at the start of a design process. However, the items 'roles and parties' and 'formulate project plan' are appreciated differently in the different cases. Therefore, it can be doubted whether these items must be executed in a design session, or in another format after the session. It is advisable to analyze whether, and how these items can be improved. Participants are not sure whether all parties are mentioned at the end of the item. It seems useful to create a checklist, such that at the end of the item an overall check can be done whether all roles were mentioned. The same holds for formulating a project plan.

**Place in design process**

When considering the new overall method (intake, two design sessions, debriefing), it can be stated that one of the strengths (and uniqueness) of the method is that in a short time window a concise service idea is translated into a structured and relative extensive service concept. In only one day, a visual presentation of the service (a paper prototype) is developed. The 'weakness' of the method is that it only describes how to come to the outputs discussed earlier. It does not describe what steps to take after this. Of course, the method results in a work plan, but this is only based on a brainstorm of four participants (a check seems necessary). Other existing design traditions do describe all steps that should be taken before the service 'goes live'. However, these steps are not described in detail. In the new developed method detailed questions are predefined (formal method). Four participants, who represent different stakeholders perspectives answer these questions to come to the desired output.

Based on this, it sounds logically also to design such a formal, detailed method for the next steps of the design process. However, it can be questioned whether this will have
any added value. To design a service concept for an e-service a number of basic questions must be answered (e.g. what is the target group, what are the customer needs to satisfy, what are the functions). These questions are answered during the intake and the morning session. In the afternoon session the concept is specified, but also a quick-scan on different aspects is made. Of course, new iterations over all these fields should be made during the further design process. However, for every e-service the amount of attention required for the different aspect differs. Therefore, a detailed method is probably not desired.

Overall can be said that (in comparison with other design traditions) the developed method only supports a first step of the design process. However, the uniqueness of this method is that it facilitates this step in detail. The method should be used at the start of a design process and can even be used to cover the first steps of existing design traditions.

**When to use this method**

Only considering the new developed session the question when to use this method can be answered relatively easy: one of the constraints of this research was to develop a design session that can be used after the design session of xQFD. Therefore, a method is designed that always can be used after the xQFD design session.

With regard to the overall method (intake, two sessions, debriefing) a number of remarks can be made:

- The method is ideally used at the start of the design process. When only a concise service idea exists, the method helps translating this into a visualized service concept. However, the method also proved its value for services that were already further in the design process. During such cases the method is used as a check to see whether the right design choices have been made.
- One of the strengths of the method is the customer (end-user) oriented approach. However, this does not mean that the method can only be used in B2C or C2C environments. Also in a B2B context, in most cases the end-user is eventually one (or more) person(s) who has to work with the system. The method can be used in all situations in which a real person is the end-user of the e-service.
- The designed service has to be an auxiliary service. The method is aimed to design services for known end-users (there has to be a relation with the end-user). Therefore, the service has to fit in a multi-channel context. During the sessions, much attention goes to multi-channel aspects. However, it must be kept in mind that in most situations multiple channels do play a role, even when the idea owner does not see this. Therefore, this is an important aspect during the intake.
- Only sessions in which one party participated have been conducted, during this research. However, it is also possible to design a service that is delivered by more parties during the method. The multi-disciplinary design team helps in this.

**Intake**

The protocol for the intake is not adapted during this research. However, some issues are highlighted here.

- One of the constraints of the xQFD session is a design team which consists of four participants who all represent a stakeholder perspective (focus-role). Also during this research it seemed that a good balance in the design team is crucial (namely session Ca and Cb). Otherwise this can result in a session in which one participant is too dominant, or a too dominant facilitator (regarding to context related issues) is needed. Therefore attention should go to select the right participants during the intake. Short intake-conversations with potential participants can be useful for this.
- It is important to see whether or not multi-channel issues play a part for the e-service. This is because the two sessions pay much attention to this. In fact, most of the designed e-services are placed in a multi-channel context.

**Method in format of design session**

TNO defined the constraint to develop a design session. This session had to fit seamlessly on the xQFD session (for the participants it must look like one session of one day). Therefore it was important to predefine also formal detailed questions for this session, which should be answered by the participants. As discussed earlier, at the start of a design process some general questions should be answered, independent of what e-service is designed. However, when going further in the design process every e-service requires another division of attention for the different aspects with regard to service design.

The constraint to develop a design session proved not to be a problem, during this research. It seemed that also another half-day session could be filled in, which adds value during the design process. However, the remark has to be made that it is advisable to place this session within a more high-level design tradition, which covers the design process till the end. In general it is unlikely that another formal design session will have any added value in this.
No new functions
No new functions are added to the service concept, during an afternoon session. This can prove that the XQFD is good enough to define all needed functions. It can also be that the afternoon session pays too less attention to the definition of new functions. It can be useful to add an extra item to the afternoon agenda, in which a brainstorm is held for new functionalities. It can also be useful to brainstorm for new functions some time after the session or with other people than the participants.

The agenda
It has been proven that the designed agenda meets almost all requirements, which a design process should meet (in this phase). It is important to pay attention to all these aspects, to take care that no unexpected problems occur during the further design process. It seems not sensible to skip certain items or adapt the designed agenda.
Case D is an example of a session in which items were skipped. According to the observations and results of the questionnaires of this case it seems that the quality of the session decreases. In case B the last item has been skipped. However, it must be realized that this item was addressed during the overall design process, but not during the session.

Facilitators
Three facilitators have been used to facilitate the sessions (four, when case D is taken into account). For every agenda item predefined questions, which the participants should answer, are defined. This makes it easy to transfer the way of working of the method between different facilitators, which is important for TNO. Another advantage of this method is that it does not make use of the GDR, which makes training of a GRD operator not needed.
The facilitator that facilitated case Ca and Cb noticed “when professionals are working based on this agenda, men can work reasonably independent”. Based on this remark and observations during the session, it seems that the facilitator has no significant influence on the quality of the session.

Satisfaction
During this research an analysis has been conducted on the term ‘satisfaction’. Measurements of the satisfaction of the participants have been conducted. After the afternoon session all three constructs are scored higher than before the afternoon. This was not expected on beforehand, because the ‘affective arousal’ would already be high after the morning session. The afternoon session could not add something to this. This seems not the case.

In the previous chapter it has been noticed that the data shows that during debriefing the SVA decreases, while the SO and SP increase. The last measurements took place two weeks after the session. It can be possible that these constructs also decrease on a longer run.
The questions for measuring satisfaction have been defined by Briggs (2005). It can be that these questions do not exactly measure the satisfaction of which Oliver (1997) and Szymanski (2001) speak.
Also the number of respondents was too little to find statistically significant results.

7.2 Research

Added value of debriefings and interviews
During explorative research two requirements have been found, which were not found during the literature study (client process and market research). These requirements were not taken into account in the research, for given reasons.
The added value of the debriefings and interviews is not found in the finding of new requirements. However, explorative research has been used for testing the requirements found in the literature: do the participants agree with the found requirements?
A useful remark heard during explorative research is the fact that participants do not think that making of a finance design is possible with only the expertise of a design team. This remark has been used as one of the arguments not to make technical design part of the agenda.

Added value of pre-test
During this research a pretest has been conducted, with an agenda that had been set up. The difference between the pretest and the other tests is that the pretest has been used to adapt the agenda. Based on the pretest some adaptations to the agenda have been made. There was enough confidence in the ‘second’ agenda to use this agenda during the ‘real’ test. The choice not to conduct a second pretest has proven to be right. During the real tests no reasons to make big changes in the agenda were found.
**Number of cases**

During the six months in which this research was carried out, four cases were conducted. As a result, the number of respondents is too low to find any statistically significant results. The questionnaires have been used in addition to the qualitative description of the cases (observations).

**Company size**

It has been argued that it will be interesting to analyze the differences between sessions conducted with big and small companies. It has not been managed to find a real small company during this research. This research proves that the session has added value for big companies. Especially during case B it seemed that working with different disciplines is seen as a big advantage. The question remains whether this also holds for smaller companies.

During the design of the agenda, it was not aimed to make an agenda for big companies in particular. Requirements that a design process of e-services in general should meet have been defined. It has been proven that the session meets most of these requirements. These requirements are also important for design processes of smaller companies. Knowing this, it can be assumed that the session is also useful for small companies.

**Course setting Case C**

Case Ca and Cb have been held during a two-day course. A 'fictitious' service has been designed. The question can be asked whether the participants did fill in the questionnaires with the course setting in the back of their minds, or indeed the e-service design method. A question like 'did you think the session has been useful?' should be interpreted like 'did you think the session has been useful to design an e-service' instead of 'did you think the session has been useful to learn something about customer-oriented thinking'. The answers did not differ significantly from the other cases. This is why the assumption has been made that the participants did interpret the questions right.

**Case D**

During session D (during the xQFD session) it became clear that most participants did not have the right expertise to design the service. It was decided to discuss the context of the service before going on with the session. This made it impossible to work through the whole agenda of the session. This makes it clear that it is important to select the right participants during the intake (no intake was held for this session). 'Right' means that the participants do have the relevant expertise and that a good mix is found between the different focuses.

**Output of sessions**

The observer (and one facilitator) analyzed the output of the different sessions. This has been a qualitative analysis. It can be imagined that in literature requirements, which the output of a session should meet, can be found. However this is not used during this research. A reason for this is the time window in which this research had to be carried out.
8 Conclusions and Recommendations

In this chapter the conclusions that can be drawn from the research will be presented. The chapter will end with a number of recommendations.

8.1 Conclusions

The research that has been presented in this report had as goal to develop an extension for the multi-channel e-services design support method xQFD that helps facilitating the next step in the design process in order to specify the service concept of an e-service (as defined during xQFD).

xQFD is a method that supports a structured start of an e-service design process, in which a multi-channel context plays an important role. The xQFD design session results in a global service concept (prioritized customer needs, functions and requirements and a matrix that helps justify investments decisions). The extension that has been designed had to meet a number of constraints, defined by TNO. One of these constraints is that it must be possible to apply the new method in the format of a design session (workshop). In the ideal situation the xQFD session is held in the morning while the afternoon is filled with the new session. The participants of this session should be the same as during the xQFD session; four people who all represent a different stakeholder perspective (customer (end-user), marketing, multi-channel, process/ICT).

Based on results (of the performed tests) it can be concluded that during this research a suitable continuation for the xQFD session has been designed. The new method had to be developed for different purposes. In first place the method should have a valid value proposition within the design process; it must help specifying the service concept of an e-service. Also it must lead to satisfied participants. The results of this study suggest that these purposes are supported by the method. The method helps specifying the service concept (as designed during the xQFD method), by making a visual representation of the service. A feasibility check of most important aspects is done in a quick scan way. The method ends with formulating a project plan, such that participants know what steps to take following the session.

The method results in a specified customer-oriented service concept, which meets constraints of several aspects with regard to e-services design (multi-channel, technical, organization). In a focused, high-speed and structured session a multi-disciplinary team works towards the main outputs: an e-service storyboard sequence, e-services screens with cross channel links and specification of back office connections and a project plan that makes a structured follow up possible.

The main contribution of the method to the design process is the generation of a visual representation of the e-service (a prototype). Visualization of service concepts generally helps in specifying and speeding up e-service innovations. In every design process it is a challenge to cross the chasm between the specification of a design and the real design. Making this step in the early phase of a design process is useful, because the list of specifications is relative small. The result of this step is a concise prototype. Based on this prototype, people find it easier to give feedback, and shortcomings of the design are noticed earlier. Based on a prototype it is easier and more precise to discuss multi-channel, technology and process issues, because the issues are more tangible. During the developed method a visual representation, a prototype, of the e-service concept is made in a short time and in a structured, focused way: a so-called storyboard of the e-service. The screens of the websites are globally sketched on this storyboard. Places where design choices have to be made are highlighted. The storyboard is the base on which new steps are made during the design session.

Following the principals of concurrent engineering it has been attempted to incorporate all different aspects of an e-service design (technical, organizational etc.) in the early stages of the design process. Generally, during an e-service design process many unexpected problems occur. These are problems with regard to all different kinds of aspects of an e-service (technical, organizational etc.). The developed method addresses every aspect in a structured and quick scan way. Issues of every aspect that must be tackled during the
process are mentioned. Because of this an overview of important issues is created. Due to this, it is expected that less unexpected problems occur during the further process, than without the use of this method.

A strength of the method is the early involvement of different stakeholder perspectives at the start of the design process. Generally, different actors are involved in an e-service design process, particularly when this service is designed in a multi-channel context. A multi-disciplinary design team is useful to elucidate all perceptions of different actors. During the designed method much attention goes to the development of a user-centred design. However, designing from the user perspective only seems unrealistic: it leads to a user-centred design, which can probably not be realized in practice. Therefore, also supplier constraints must be taken into account. A multi-disciplinary design team seemed useful to support this.

It became clear that multi-channel thinking is a relatively new way of thinking for participants of design processes. However, attention for other channels during the design process leads to a great number of new ideas. These are ideas not only for the service that is designed, but these are ideas that cover the whole service delivery. The developed method is used for designing e-services in a multi-channel context; therefore attention goes to multi-channel thinking during this method. It became clear that it is necessary to push participants to think in a multi-channel way, they are not doing this by themselves.

To ensure a user centred design during a design design session ‘personas’ proved to be a useful tool. A user-centred design is crucial to ensure customer value into a channel service design. The designed method supports the design process of auxiliary services. These non-billable, additional services support core products. However, customers (end users) partly base their choice for a core-product, on ‘total’ service delivery. During the developed design session one or more personas are designed. A persona can be seen as a precise descriptive model of the user, what he wishes to accomplish. According to observations design choices are made based on the personas during the session, which helps making a user-centred design.

The main benefits from the method may be obtained at the start of a design process. A concise service idea is specified and visualized in one day. The uniqueness of this method is its formal character. Detailed questions are defined, which should be answered by the participants of the session. However, only a (first) part of a design process is covered by this method. Therefore, it is suggested to use this method at the start of a design process. After this, the design process should be supported by another more high-level design tradition.

During a design process attention must be paid to several aspects. No existing design tradition, used for the design of e-services, treats these aspects. However, all existing design traditions have their own strengths. In this research it has been tried to develop a method that combines the strengths of these traditions, in the early stages of the design process. To achieve this, it has been tried to create a bridge between theory and real-life. With the realization of the method it has been illustrated that the requirements, which have been used during this research, can be used to develop a design method; as result, it has been proved that the requirement can be used in practice. Next, it is suggested that existing design traditions can be improved by paying attention to these requirements.

For TNO two important issues did exist: the method should lead to satisfied participants (customers of TNO) and the method should be facilitator independent. Based on observations it can be concluded that the method leads to participants, who are even on the long run satisfied. Also it became clear that not using the GDR during the afternoon session is seen as a pity (during lunch), but in the afternoon session participants do not miss it. During this research also a quantitative analysis has been made of the concept of satisfaction. This did not result in statistically significant unambiguous results, which is probably caused by the limited number of cases. Also, the conclusion can be drawn that different facilitators can facilitate the design session. During the tests three different facilitators facilitated four sessions. There was no reason found that the facilitator has (significant) influence on the session. Also it has been proven that the method is in a reasonable time transferable between different facilitators.

For TNO this research resulted in an agenda for a design session, which can be added to the existing xQFD method. It has been proven that this new product contributes to a good start of an e-service design process (in a multi-channel context). Besides this the product leads to participants, who even in the long run, feel satisfied. Due to this, TNO has a product that can be offered to its customers.
8.2 Recommendations

Using the designed method
It is recommended to use the overall method (xQFD and the new session) when designing a new e-service. Main reason for this is that this method describes in more detail 'what steps to take' than other existing methods. However, this method only covers the first step of the design process: it helps making a prototype based on a service concept. It is advisable to use other existing methods (discussed during this research) after this method to cover the whole design process.

The method should be used at the start of a design process. The method has the most value when only a concise service idea exits. In a short and structured way, this is translated into a visualized service concept. However, the method can also be used when a service concept already exists; by using the method it is checked whether a right service concept has been made so far.

During the intake the right participants should be chosen; a balanced design team must be realized. It is important that participants do have the right, specific expertise. However, they must also be able to consider the whole context of the service. Therefore, to guarantee the right participants, a short intake (e.g. by telephone) with every potential participant is advisable.

After the method
Using this method within a more high-level service design tradition is advisable. As said before, the method only covers the first part of the design process. During the design session a project plan is formulated. However, apart from this formulated project plan, some general next activities can already be formulated (based on existing design traditions).

It is advisable to involve real users in the design process as soon as possible. Designing a prototype early in the design process has a number of advantages. Involving real users as soon as possible derives the most benefits from these advantages. Firstly user can react on the defined customer needs, but also give feedback on the designed storyboard; in this stage it will be relative easy to adapt this design.

It will be useful to make a financial design after the session. A global finance design is made during the intake, however, during the design session no attention is paid to this aspect (for given reasons. E.g. participants do not have the right expertise). However, it is assumed that a person with the right knowledge can make a relative detailed cost revenue overview, which will provide insight whether the service is economically feasible.

Attention should be paid to the services offered by competitors during the design process. As said, the method supports design of auxiliary services. In many cases, the end-user bases his decision for a core product on the additional, auxiliary services. This makes it important to offer 'better' auxiliary services compared to competitors. During the afternoon session (for given reasons) no attention goes to competitors. In the morning session this is done, however, in many cases participants do not have the right expertise for this. It will be useful to compare the developed design with services offered by competitors during the further design process. A person who knows what other companies do offer should handle this. When this knowledge is not present, this can be researched.

A usability and design expert should give their reaction on the storyboard; based on this, the storyboard should be adapted. During the design session, the participants make a storyboard. However, the participants are no design or usability experts. 'Mistakes' can be made in this design. Therefore, experts should review this. This can best be done as soon as possible; it will be easier to adapt the design (no lock-in yet). Adaptations should always be made in cooperation with the participants.

TNO
The advice for TNO is to offer xQFD always in combination with the designed session to its customers. The reason for this is that the marginal costs of this new session will be relatively low for TNO, while the new session leads to satisfied customers, also on the long run (as has been proven during this research).

Besides, it is advisable not to adapt the method for a specific case (service). One of the strengths of the designed method is that it pays attention to all important aspects, in a quick scan way. Because of this, it is sure that every possible aspect is addressed, and fewer surprises will occur in the further design process.
**Multi-channel Design**

During an e-service design process attention should be given to the multi-channel environment. During this research several times new, useful ideas were generated when discussing other channels. These were ideas for the designed e-service, for one specific other channel, but also for the whole service delivery. Therefore, when only one aspect (channel) of the service delivery is designed, it is important to consider the wider context.

**Improving the method**

It seems useful to find out why the communication, the speed and the focus of the design process decreases in the last three items of the day. Two possible reasons have been given during this research: tiredness of participants and the unstructured way of working during the items. By splitting the design session it can be tested which reason the most influence has. The original xQFD session can be carried out on day one, the designed continuation the next day. As result, the tiredness of the participants will be less during these items. If the requirements still score lower, the structure of the items must be improved.

Extra research seems needed to find out whether the design session should be adapted such that the requirement 'extension of service concept' will be met. During this research it has been proven that during the new session no new functions are defined. Adding an extra item to the agenda in which this requirement is addressed can solve this. However, this should only be done, when during xQFD not all needed items are defined.

**Further research**

The method should be tested with more parties. This will help to find statistically significant results. It is also expected that the analysis of the concept of satisfaction will results in less ambiguous results, if the number of respondents is increased.

It will be useful to set up an extensive test of the method. It is supposed that by a structured start of the design process (supported by the designed session) fewer problems occur during the further process. This can be tested by the use of two parallel design processes. One of these processes makes use of the xQFD and new session. The other one uses only the xQFD session. It must be evaluated which process is best (on long run) and which process leads to the best e-service.

It is interesting to test whether the method can be used for e-services that are not delivered by the Internet. During this research (and during the development of xQFD) only websites were developed. However, no reasons have been found that this method is not (or less) useful to support the design process of for example mobile services.

The method should be tested with a small company. During this research it was not feasible to arrange a session with a real small party. However, it has been argued that the method can have a different value for a small company, than for a bigger company. Conducting the method with a smaller company can prove this.

**Lessons learned**

It is recommended to make use of a pretest during the development process of a design session. During this research an agenda for a design session has been designed. The pretest proved that some adaptations to this agenda were necessary, despite of a careful design process.

It is advisable to make use of the requirements that are listed in this research, when a new design tradition is developed or started. The requirements have been found by a literature study, and checked during explorative research. As result, it provides a complete list of requirements for an e-service design tradition (in a multi channel setting).

Not only questionnaires should be used when testing a design session; observations are of equal importance. During this research, for example, it seemed the participants use personas implicit. The added value of this item has only been noticed by observations.
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10 Appendices

10.1 Scientific Paper

Multi-channel e-service design method
- designing and testing –

Abstract

Designing successful e-services, which have to fit in a multi-channel context, is problematic for organizations. It seems that a structured design method that supports the start of a design process is useful. Based on QFD, UCD and other traditions we developed a method for designing e-services in a multi-channel context, with a multi-disciplinary team. Our method has been tested with three cases with real business partners. We determined the strengths of our method based on several design support requirements. Our observations suggest that our method supports making a customer oriented service design, in which also supplier constraints are considered. In a short time and on a structured, focused way a visual representation of an e-service is created. Visualizing of services helps in specifying, and speeding up e-service’s innovations. The main benefit from our method may be obtained at the start of a design process in which customer centricity, multi-channel context and competitive realism should have a central role.

1. Introduction

Organizations have problems in designing Internet services, so called e-services, which have to fit in a multi-channel context. Different reasons exist; time pressure, ill-structured design process, hard to ensure customer centricity, etc. This all leads to service failures or loss-generating services. Besides, organizations are challenged
to arrange their service delivery in such a way that all the channels via which the service is delivered are complementary to each other: they have to find the right channel mix. For developing e-services within a multi-channel context better design support methods and structures are needed (Simons and Bouwman). Our aim is to develop and test such a design support method.

In this paper we present the development and testing of a fast and effective e-service multi-channel design method. This paper should answer the question whether it is possible to support a design process of an e-service with a structured method that meets requirements for speed, robustness and practicality for example, in which a multi-disciplinary design team makes a visual sketch of the e-services, taking the multi-channel context into account.

The method is based on different design traditions like Quality Function Deployment (QFD), the so-called STOF model, User Centred Design (UCD), and other methods. These traditions, and the implications for our method, will be described in the theory section of this paper. Based on these theories we developed our method. This method is tested with three cases, as described in the methodology section. Finally, the results of the test are discussed. Based on this, our conclusions are drawn for management.

2. Theory
Our method is designed based on certain design traditions. In this section we discuss the main traditions we used.

Alter (1999) describes a traditional design process for information systems (IS), which covers the whole design cycle. The process exists of three phases: initiation, development and implementation. The first step in designing an IS is the understanding of the purposes and goals of the system. The scope of the project has to be determined and the feasibility of the project (economic feasibility, technical feasibility and organizational feasibility) has to be checked. The first phase, the initiation phase has to result in a functional specification and a project plan. Next, in the development phase a detailed requirement analysis has to be done. The final design has to be made, and programmed. After this, the system can be implemented.
Design Traditions

Quality Function Deployment (QFD), which originated in Japan, is a customer-centred design methodology for designing quality products and services (Akao 1997). It is based on the idea of Clausing (1994) that quality should be considered in an early state of a design process. QFD, which can be used at the start of a design process, uses a matrix format, ‘the House of Quality’ that is filled in during the design process. In this matrix customer needs are used to define functions for the artifact that has to be designed. The weight of the customer needs and the influence of the function on these customer needs are combined to see which functions are most important. One of the strengths of QFD is the fact that the House of Quality from QFD can be the center of the communication process. It helps a design team to communicate with each other, even when their background is in different disciplines.

Faber et al. (2003) describe a framework, the so-called STOF-model, which consists of four components that need attention during the design of a new electronic service, namely:

- **Service design**: a description of the value that is offered to a specific target group of users, by means of a service offering
- **Organization design**: a description of the configuration of actors that is needed to deliver a particular service, the roles that each plays, making clear how the actor network creates value for end-users
- **Technology design**: a description of the fundamental organization of a technical system, the technical architecture, which is needed by the firms in the value network to deliver the service offering exhibited in the service design
- **Finance design**: a description of how a value network intends to capture monetary value from a particular service offering and how risks, investments and revenues are divided over the different actors of a value network

Faber et al. state that the four components must be balanced. Choices made in one component, influence other components. That is why it is important to address all components at the start of the design process.
According to and Faber (2003) and De Bruijn and Ten Heuvelhof (1999) an e-service will be operational in a value network. De Bruijn et al. (2002) and Van der Kar (2004) state that making a list with all roles and parties that play a part in the design process is the first step in creating a value web.

User centred design (UCD), or human-centred design, is a widely used term to refer to a development where users are involved early in the design process. A general definition of human-centred design is published as ISO 13407. It lists the following principles for user centred design (UCD):

- The active involvement of users and a clear understanding of user and task requirements
- An appropriate allocation of functions between users and technology
- The iteration of design solutions
- Multidisciplinary design

The translating of a design concept and the real design often leads to problems; in literature this is called ‘the gap’ (Cooper and Reimann 2003). In a UCD process, instead of spending time on setting up specifications, early in the design process some kind of prototype is created. This is done to receive feedback of users and based on this, improve the concept.

Cooper mentions drawing scenarios as a tool that can help in this translation. Cooper defines this tool as ‘making use of a specific story to both construct and illustrate design solutions’. The ultimate goals are to get more insight in which task a user must be able to carry out and how the user wants to do this. However, because of the fact that the drawing of scenarios is time-consuming a task analysis can be an alternative.

To define the tasks for a user it can be useful to make use of personas: ‘a precise descriptive model of the user, what he wishes to accomplish, and why’ (Cooper). When a persona is drawn, during the design process choices can be made based on the preferences of the persona. Because the persona is a symbol for the whole target group, choices are always made from the user’s perspective. Another advantage of a persona is that it simplifies the communication within a (multidisciplinary) team.
3. Development of Design sessions

Our method consists of an intake plus two half-day design sessions: a morning and an afternoon session. These sessions are based on the design traditions from our theory section. In this section firstly we describe the requirements the sessions should meet, next we describe the agenda of the sessions.

Requirements

The session has been designed based on several requirements for the initiation phase of a design process, which aim at design process quality and quality of design results (Simons and Bouwman):

- Customer centricity
- Channel coherence
- Channel synergy
- Competitive positioning
- Design process speed (time to market)
- Focused design process
- Cross-disciplinary team communication
- Promote concept coherence and communication during implementation

These eight requirements have been confirmed as important for high-level e-service definitions in a multi-channel context in a multiple case study across 19 cases (Simons and Bouwman).

Agenda of sessions

The sessions have been designed in such a way that we expected they would meet the listed requirements. The session’s agendas consist of different items. Each item has its own goal. For every item a certain time window exists to answer predefined questions. These questions help to come to the desired output. The agenda has been set up in such a way that the items follow on each other in a logical way. Often, the output of an item is used as input in a next item. Most items are based on existing design traditions.
**Morning session**

The morning session is called MuCh-QFD, which stands for ‘Multi-Channel QFD’, since the method uses several QFD elements and also pays attention to multi-channel servicing. The main purpose of this session is to create a high-level functional e-service definition, including cross channel connections and explicit links with customer priorities and competitive positioning. The agenda of the morning session is presented in table 13.

**Table 13: the agenda of the morning session**

<table>
<thead>
<tr>
<th>Agenda item</th>
<th>Connection to QFD or extensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td>- Short review of the results of the intake</td>
<td></td>
</tr>
<tr>
<td>Part I: Customer needs and Internet functions</td>
<td></td>
</tr>
<tr>
<td>- Identify, cluster and prioritize customer needs</td>
<td>Room 1, House Of Quality (HOQ)</td>
</tr>
<tr>
<td>- Identify and cluster Internet functions</td>
<td>Room 2, HOQ</td>
</tr>
<tr>
<td>Part II: Define e-service</td>
<td></td>
</tr>
<tr>
<td>- Evaluate functions with regard to needs and create an e-service matrix</td>
<td>Rooms 3 &amp; 7, HOQ</td>
</tr>
<tr>
<td>- Define service slogan that summarizes proposition</td>
<td>Service Concept Definition</td>
</tr>
<tr>
<td>- Discuss solutions and constraints for functions</td>
<td>Explore solutions &amp; constraints</td>
</tr>
<tr>
<td>Part III: Tasks of other channels</td>
<td></td>
</tr>
<tr>
<td>- Check the desired support from other channels</td>
<td>Room 1 &amp; 2 for multi-channel service</td>
</tr>
<tr>
<td>- Check win-win options between e-service and other channels</td>
<td>Room 2 (&amp; 6) for multi-channel service</td>
</tr>
<tr>
<td>- Extend matrix with needs and functions related to other channels</td>
<td>Rooms 3 &amp; 7 for multi-channel service</td>
</tr>
<tr>
<td>Part IV: Competitive position</td>
<td>Prepare room 4 &amp; explore constraints</td>
</tr>
<tr>
<td>- Discuss strong and weak points of the new e-service in relation to competitors</td>
<td></td>
</tr>
<tr>
<td>- Score existing, competitors’ and new e-service on customer needs &amp; discuss results</td>
<td>Room 4, HOQ</td>
</tr>
</tbody>
</table>

In part I of the agenda the participants generate a list of the most important customer needs and Internet functions that would fulfill those needs to a certain extent. Part II consists of three elements. First, the team starts with evaluating the extent to which the functions contribute to the customer needs. This is done by filling in a so-called e-service matrix. Second, the team summarizes the e-service proposition for
customers in the form of a service slogan. As a third element of this agenda part, the main constraints and specific solutions are identified for the different functions. Part III of the agenda also consists of three elements. First, the team assesses the desired support of the customer segment via other channels, like retail shops, call centers etc. Second, the team assesses win-win potential between the e-service channel and other marketing channels. The third element is to extend the e-service matrix with multi-channel needs and functions. Part IV is the final phase of the session. The team starts by discussing strong and weak points of the new e-service in relation to competitors. Then, electronic group votes are performed again on how the old (e)-service, the new e-service, and the competitor e-services score in relation to customer needs; this is plotted as extension to our service matrix

For most of the activities during this session Group Systems™ is used to generate inputs, to cluster inputs and to rank these clusters by votings of the participants. With these inputs the MuCh-QFD service matrix is filled in. This matrix is the most important output of the session.

*Afternoon session*

The main purpose of the afternoon session is to specify the service concept, as defined in the morning. A visual representation of the service will be created. Also during this session design choices will be made based on the customer priorities; this guarantees a customer-oriented design. The main outputs of the session are a storyboard (sketches of most important screens) and a project plan. The agenda of the afternoon session is presented in table 14.
Table 14: Relation of Agenda Items (afternoon session) and Design Traditions

<table>
<thead>
<tr>
<th>Agenda Item</th>
<th>Design Tradition</th>
</tr>
</thead>
<tbody>
<tr>
<td>I: Draw relations between Functions</td>
<td>-</td>
</tr>
<tr>
<td>II: Designing one or more persona(s)</td>
<td>UCD, Cooper</td>
</tr>
<tr>
<td>III: List and elaborate Tasks</td>
<td>UCD</td>
</tr>
<tr>
<td>IV: Drawing of Storyboard (sketches of screens of e-service)</td>
<td>UCD</td>
</tr>
<tr>
<td>V: Highlight Multi-Channel issues (where are other channels needed, what is their role)</td>
<td>Simons and Bouwman</td>
</tr>
<tr>
<td>VI: Technical Integration – Highlight where other external systems are needed</td>
<td>STOF, Faber, Verbraeck</td>
</tr>
<tr>
<td>VII: Define Roles and Parties for actor network</td>
<td>STOF, Faber, De Bruijn and Ten Heuvelhof, Van der Kar</td>
</tr>
<tr>
<td>VIII: Formulate Project Plan</td>
<td>Alter</td>
</tr>
</tbody>
</table>

The afternoon session starts with the creation of a hierarchical overview of the functions that were defined in the morning session. Relations between the functions are defined. Next, one or more personas are designed. Design decisions are made based on these personas. These personas are used to make a task analysis. During this item the tasks that an end user should be able to carry out, are defined. For most important tasks the steps that should be taken to carry out the tasks are defined.

Following the principles of UCD it is important to make a tangible ‘prototype’ of an artifact as early as possible. Grönroos (2000) defines an e-service as ‘A series of activities of more or less intangible nature that normally, but not necessarily, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems.’ The intangible character of an e-service is one of the aspects that makes it hard to design a service. To get a visual impression of the e-service, the first sketches of this user interface, the website, are made. This is done based on the tasks (and steps) that are defined in the previous agenda item. For every step a screen is drawn. By this, a storyboard is created.

The method we developed must support the design of e-service in a multi-channel context. Therefore, also in the afternoon session the multi-channel issues, discussed in the morning, are highlighted in the storyboards. The roles of the other channels
are discussed per screen in the storyboard. The same is done for the technical integration of the e-services. Links with other, external systems are discussed. This is the first step in the technical design described by Faber (2003).

The high level Organizational design (Faber) is made in the next agenda item were roles and actors are listed. According to De Bruijn et al. (2002) it is important to make a list with all roles and parties at the start of a design process.

The session ends with the formulation of a project plan, which is according to Alter (1999) an important aspect at the start of a design process.

The overall design method

Our method consists of three phases: intake, morning session and afternoon session. During the intake the e-service ideas is discussed with the idea-owner. This has to be done to ensure that the method is suitable for this e-service. During this intake also the procedure of the method is explained. The third purpose is to get the information that is needed to prepare the sessions. Both design sessions last half a day. Ideally, there are four participants who represent different stakeholders perspectives: customer focus, channel focus, marketing focus and ICT/process focus.

4. Methodology

The methods have been designed based on interviews and discussions with experts in the design traditions from our theory section. The morning session has been pre-tested and tested several times (Simons and Bouwman). The afternoon session has been pre-tested with a student group.

In September 2005 the overall method has been tested with three cases with business participants. Despite the fact that it would be interesting to analyze the differences between companies of difference size, due to practical opportunities to find participants, mainly large firms are used.

<table>
<thead>
<tr>
<th>Case</th>
<th>Sector</th>
<th># of Participants</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Employment agency</td>
<td>4</td>
<td>Employees Portal</td>
</tr>
<tr>
<td>B</td>
<td>Insurance</td>
<td>4</td>
<td>Secure Message Portal</td>
</tr>
<tr>
<td>C</td>
<td>Insurance</td>
<td>8</td>
<td>Mortgage Calculation</td>
</tr>
</tbody>
</table>
The participants were all employees of the company who designed the services. During every session at least one person represented each stakeholders perspective. This means that every session was held with a multi-disciplinary team. The intake was held with one person of the design team, several weeks before the design sessions. For case C no real intake was held. The service that has been designed was shortly presented in a written document. For every case a different facilitator was used. All these facilitators had previous experience with facilitating groups.

We measured the performance of the method in three ways. Firstly, we did observations during the sessions. Besides, all participants were asked to fill in several questionnaires (one in between of the two sessions, one at the end of the day, one during debriefing). Also, an interview with the participants was held, based on the answers given in the questionnaires. Also two persons analyzed the output of the sessions. Attention was given to the quantity (e.g. number of screens) and quality (level of detail etc) of the output.

5. Results

Our case study experiment should answer the research questions, whether the sessions meet our requirements. This paragraph describes each case shortly. These descriptions are based on the observations, supported by the questionnaires (based on the answers given in the questionnaires no statistical significantly results were found). Also, some cross-case remarks are made.

Case A

During this case the design team was most enthusiastic. The participants were highly motivated, probably because the company is in de middle of some positive changes; the e-service that was designed was part of this. Also, the participants liked to be a day out of the office. Part III of the morning session (describe win-win between channels, and name tasks of other channels) seemed not hard for the participants. A reason can be the fact that ‘the offices’ of this party play a big role in its strategy. In the afternoon session these ideas were made more concrete, but also many new, original, ideas were generated.
The item ‘technical integration’ had another purpose than expected. By coincidence this company gets a new information architecture soon. For most participants it was not clear what this new system could do, and what not. During this item the participants shared much information about the new system.

What stands out in this case is that the last items of the day (define needed roles and parties, and formulation of project plan) were most appreciated by the participants. In the other cases, they were least appreciated.

Case B
In every case the participants were enthusiastic about the use of the Group Systems™ during the morning session. However, during case B this was most noticeable. A reason can be the fact that the participants work for a very big corporate company, where design decisions generally take much longer and are less focused that during our session. However, it also must be noticed that the focus of the morning session was a little too wide, according to the participants (this was solved in the afternoon, by discussing this problem during lunch). This can be the effect of not having performed the intake with the real problem owner.

Participants appreciated the multi-channel items (during morning and afternoon)), despite the fact that they were struggling at the start of these items. This multi-channel thinking seemed like ‘out-of-the-box thinking’ for the participants. This was especially remarkable because of the fact that one of the participants did work in the multi-channel department of the company.

The persona item showed that this item is useful to get the energy level of a group higher. One participant, who had been quiet and skeptical so far, became very enthusiastic during this item.

The last two items were not useful for this case. The company has its own checklist for defining the actor network. The same holds for the project plan; they make use of standard procedures.

Overall, the participants liked the session, but no kind of hurray feeling was noticed. The participants all acted relative formal. Still, this session resulted in the most concrete output of all three sessions. Many screens were designed, on a relatively detailed level. Probably, the reason for this is the ‘narrow’ focus of the afternoon session (only a limited number of functions and task were designed in detail).
**Case C**

This case was executed in a slightly different way. The morning session was conducted with a group of eight people. In the afternoon session, the group was split in two groups of four. These groups worked in parallel, and were facilitated by one facilitator. His main task was making bridges between the different agenda items.

In the afternoon session it became apparent that in both groups one person had significantly more experience with the context of this e-service than the others. In one group this experience was used to quickly obtain the information needed to make design choices. In the other group this lead to discussions on a too detailed level with limited relevance.

Some of the participants had limited experience with the context of the service; they mentioned it was hard to stay focused. The presence of these inexperienced participants was due to the fact that they had not been selected specifically for their experience, as in the other cases.

One of the groups tried to design a storyboard based on a real person, a colleague (who participated in the other group). This proves to be impractical: it resulted in finding out what the facts were, instead of using creativity.

Comparing the outputs it can be said that in one of these two groups less output has been produced, in comparison to the other groups (less quantity, and fewer details).

**Overall**

All sessions seem to support the creation of a customer oriented design. Design choices are always made from the perspective of the end-user. In fact, also the attention for the multi-channel issues makes that a more customer centred design is made. During the discussion of multi-channel issues, choices are made in such a way that the service delivery becomes more satisfying for the end-user. On the process requirements the sessions score well. However, at the end of the afternoon session the speed, focus and communication decrease a little. During the afternoon session the specifying of the service concept is mainly done during the task analysis and the drawing of the storyboard. The storyboard makes the e-service visual, which proved to have some advantages. First of all it helps to make a concrete representation of the service for the participants. Based on this, people find it easier to give feedback, and shortcomings of the design are noticed earlier. Based on this prototype it is easier to discuss certain issues, because the issues are more tangible.
The storyboard is the basis on which the organizational and technical designs are discussed, in a quick scan way, during the items VI and VII.

6. Discussion

During this study we used a relatively structured approach to test our design method. Based on the results (observations and questionnaires) it is possible to create an overview of the strengths and weaknesses of the agenda items. However, there are a number of limitations. Firstly, we did not make use of any control group during our research, which makes objective comparison with other methods impossible. Next, we did not evaluate the effect of our method on the long run.

We designed our sessions based on eight design requirements. Besides these, a number of requirements for additional design tasks have been defined during this research. In the next table all these design tasks, which are addressed by our method are named. For every task it is described how (and when) it is addressed.

Table 16: Design tasks and tools

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Intake</th>
<th>Morning Session</th>
<th>Afternoon Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specify Customer Needs</td>
<td>Define top 10, based on voting of participants</td>
<td>Elaborate using personas</td>
<td>Elaborate based on user-tasks</td>
</tr>
<tr>
<td>Specify Functions</td>
<td>List based on brainstorm</td>
<td>Elaborate based on user-tasks</td>
<td>Elaborate based on user-tasks</td>
</tr>
<tr>
<td>Relations between Customer Needs and Functions</td>
<td>Score in service matrix</td>
<td>Define user-tasks based on personas</td>
<td>Define tasks of other channels, based on and highlighted in storyboard</td>
</tr>
<tr>
<td>Specify Multi-Channel Relations</td>
<td>Most important functions of other channels, Win-win situations</td>
<td>Draw storyboard based on user-tasks</td>
<td>List external systems, based on and highlighted in storyboard</td>
</tr>
<tr>
<td>Compare with Competing Offers</td>
<td>Score based on customer needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visualize Service Concept</td>
<td>Choose participants for workshop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisational Design</td>
<td>List roles and parties, based on brainstorm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Design</td>
<td>Create high level cost revenue overview</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance Design</td>
<td>Plan xQFD workshop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Research</td>
<td>List activities based on brainstorm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Plan</td>
<td>Plan xQFD workshop</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
During this research the morning session has proven its use. In a very short time, a service concept is defined. Functions are defined based on customer needs. Furthermore, attention goes to specifying multi-channel aspects of new the service (how should the new service be combined with the existing service offering via other channels?). Finally, the service concept is compared with services offered by competitors. The session results in a service concept (service matrix). As proved in earlier research (Simons and Bouwman) the MuCh-QFD session adds value to the development of e-service concept in a multi-channel environment. The session supports a quick, focused and very communication-oriented start of the design process. The approach helps to make design choices explicit. Besides all this, MuCh-QFD appears to be a session in which customer centricity of the design is guaranteed.

The strength of the afternoon session resides in specifying the service concept, from a customer perspective. In a short time, a structured process leads to a visual representation of the service. A user-centred design is guaranteed by the use of personas. These are used to translate the relative abstract list of customer needs into a ‘real’ person, which makes it easier to work with the customer needs. Furthermore, a feasibility check of most important aspects is done in a quick scan way. The method ends with formulating a project plan, such that participants know what steps to take following the sessions.

Three design tasks are not addressed during the afternoon session. It is advisable to pay attention to these during the further design process. It seems useful to compare the designed concept with competing offers several times during the design process. By this, lessons can be learned from competing offers, and it can be ensured that a better service is designed.

The lack of expertise of the participants is one of the arguments not to address the finance design. However, to check the financial feasibility of the service, it is advisable to make a cost revenue overview as soon as possible.

During the sessions design choices are made based on customer needs. A check of these customer needs can be done by the involvement of real users in the design process. Users can also give feedback on the designed prototype. This all helps to make a better design.
Some remarkable aspects of the afternoon session are described next:
After the design session and during debriefings participants do not think that the item ‘persona’ helps making a user centred design. During this item a persona is designed, which can be seen as a precise descriptive model of the user, what he wishes to accomplish, and why. According to our own observations many design decisions are made based on the personas, and does this help in making a UCD. When this is presented to the participants, after the session, this is admitted. It can be concluded that the use of a persona is implicit. This can also be seen as one of the strengths of personas. The use of them feels ‘natural’.

We observed that the communication, focus and speed of the design process decreases during the last three items of the afternoon session. This can be a result of the tiredness at the end of the day. Also it can be that these items are not well designed, which is partly confirmed by observations. During agenda item VI (technical integration) the different level of expertise of the participants hinders the discussions. In particular the participant with ICT focus does have significantly more insight in technical issues, which cannot be matched by the other participants. During the last two items a relative unstructured brainstorm is held, to come to the expected output. This is more unstructured than during the other agenda items.

Some overall conclusions can be drawn, based on the tests.
Firstly, based on observations it can be said that this method leads to participants that are, even on the long run, satisfied; participants feel satisfied at the end of the day, and still during debriefing. It is also interesting to see that participants like the use of the Group Systems™. The fact that this is not used during the afternoon session is seen as a pity during lunch. However, during the afternoon session it is not noticed that participants do miss it. It seems that they understand that this tool is less useful during the afternoon session.
Secondly, our aim was to develop a fast design method, which succeeded. Three requirements have been used to check this: speed, focus and communication. During the morning session the use of Group Systems™ has a great influence on these requirements. However, also during the afternoon session these requirements score well (expect for the last three agenda items).
A third conclusion is that different facilitators can facilitate the sessions. During the tests three different facilitators facilitated the sessions. We found no indications that the facilitator has (significant) influence on the session. Also it has been shown that the session formats are transferable in a reasonable time between different facilitators.

7. Conclusions

Reflecting on the eight requirements on which our method is based, some remarks can be made. Customer centricity is guaranteed in our method by the use of different tools. These make that all design choices are made, based on customer needs. The multi-channel context is addressed extensively during our method, which makes that the designed service does fit well within the service delivery mix. Further, our method pays attention to competing offers. A comparison is made, which reveals the strengths and weaknesses of the designed concept.

Our method scores well on the process requirements. In only a short time, a detailed service concept made, which meets the constraints of different stakeholders.

During this research a structured design method is developed and tested, which takes care of a user-centred design. However, designing from the user perspective only seems unrealistic: it leads to a user-centred design, which may not be realized in practice. Therefore, also supplier constraints must be taken into account. The use of a multi-disciplinary design team is a useful way of guaranteeing this.

Following the principals of QFD and concurrent engineering we attempted to incorporate all different aspects of an e-service design (technical, organizational etc.) in the early stages of the design process. Our method treats every aspect in a structured and quick scan way.

It is also a challenge to cross the chasm between the specification of a design and the real design. We showed that making a visual representation in the early phase of a design process is useful. The result of this step is a concise ‘prototype’ of the service. Based on this, people find it easier to give feedback and shortcomings of the design are noticed earlier. Based on this prototype it is easier and more precise to
discuss multi-channel, technology and process issues, because the issues are more tangible.

During this research we found that attention for other channels leads to a great number of new ideas, not only for the service that is designed, but ideas that covers the whole service delivery. It shows that when only one aspect (channel) of the service delivery is designed, it is always important to consider the wider context.

Implications for management
Our developed method supports a structured start of an e-service design process. It helps speeding up making explicit design choices, based on customer priorities. An important aspect of our method is the intake. During this intake the right scope of the sessions should be chosen, but also the right participants must be picked. When this is done well, it seems that our method is useful for everyone who has an e-service idea. For those who want to make rapidly a visual representation of a new e-service in which customer centricity, multi-channel context and competitive realism should have a central role, our method is useful. It guarantees a fast and robust approach, which results in prioritized requirements, an e-service storyboard sequence, e-services screens with cross channel links and specification of back office connections, a project plan, and a QFD matrix that helps justify investments decisions, and it makes a structured follow up possible.

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10.2 Interview protocol

(In Dutch)

Dank voor uw medewerking.

Terugkijken:
- dag
- methode
- uitkomsten

Aanleiding onderzoek:
- debriefing

1) Heeft de workshop naast de service matrix ook indirecte output opgeleverd? (bv draagvlak, politieke problemen besproken etc).
2a) Was u tevreden met de output? (Service matrix en indirecte output)
2b) Wat vond u er goed aan?
3a) Hebt u iets met de output gedaan?
3b) Zo ja, wat?
3c) Zo nee, waarom niet?

4) Wat miste u in de output?
5) Wat zou een volgende stap moeten zijn in het traject van dienst ontwikkeling?

Uitleg nieuwe methode: workshop, nog eens een halve dag
6) Welke problemen moeten aangepakt worden?
7) Welke stap moet genomen worden?
8a) Hebt u het gevoel dat dit nuttig kan zijn in een workshop vorm?
8b) En haalbaar?
9) Zou het vervolg direct er na moeten, in de middag? Of bv een week later? Wellicht met wat huiswerk?
10) Zijn er nu andere acties nodig? (bv politiek; moet het binnen de organisaties besproken worden)

Dienstontwikkeling zonder gebruik van de workshop:

11) Welke stappen worden doorlopen?
12) Welke problemen komen voor?
13) Hoe worden deze aangepakt?

14) De indirecte resultaten die nu bereikt zijn, hoe worden die zonder deze workshop bereikt?
15) Hoeveel tijd kost dat?

16) Wat is de workshop waard voor uw organisatie?
17) Waar is dat op gebaseerd?
18) Is dit aan te geven in een percentage van projectbudgetten?
19) Over welke orde van grote praten we dan?
20) Stel: u gebruikt de workshop niet, maar u wilt hetzelfde resultaat hebben; kunt u schatten wat de kosten zullen zijn om dat te bereiken?
**10.3 Agenda of design session**

(In Dutch)

Input: Output van xQFD (service matrix)

**13:00 I: Relaties functies**

_Hoe zijn de functies uit xQFD gerelateerd?_  
_Welke functies volgen op andere functies?_  
_Welke zijn onafhankelijk van elkaar en kunnen in willekeurige volgorde plaatsvinden?_  
_Missen er functies?_

In agenda-item III worden de taken die de eindgebruiker moet kunnen uitvoeren met deze functies gedefinieerd.

Output  
Een overzicht van de hiërarchie in de functies.

**13:15 II: Persona’s**

_Welk fictief personage staat symbool voor de doelgroep waar voor de dienst wordt ontworpen?_  
_Geef het type persoon, de naam, leeftijd, woonsituatie, betrekking, computervaardigheid, motivatie voor gebruik van de dienst._  
_Heeft deze persona behoeftes die niet in de xQFD sessie genoemd zijn?_

Output  
Beschrijving van een fictief personage dat symbool staat voor de doelgroep. Het kan zijn dat er extra klantbehoeftes uit deze ronde komen.

**13:35 Koffie**

**13:45 III: Taken**

_Welke taken moet de persona kunnen uitvoeren bij bezoek aan de website?_  
_Welke stappen wil de persona doorlopen om deze acties uit te voeren?_

In de praktijk kan het zo zijn dat niet alle functies (en taken) uitgewerkt kunnen worden (in verband met de tijd). Als alle taken zijn genoemd die de persona moet kunnen uitvoeren dan zal een keuze moeten worden gemaakt welke taken het belangrijkst zijn. Deze taken worden verder uitgewerkt.

Output  
De taken die uitgevoerd moeten kunnen worden, inclusief de stappen hoe deze doorlopen moeten worden.

**14:00 Koffie**

**14:40 IV: Storyboard (schermen)**

_Uit welke onderdelen is het scherm opgebouwd dat de persona per stap ziet?_  
_Welke ontwerpkbeuizes spelen een rol bij elk scherm?_

Ook hier kan het zo zijn de er geen tijd voldoende is om alle schermen uit te werken. Enkel de belangrijke paden worden. Over de gekozen paden wordt een iteratief ontwerptrject gevolgd: eerst worden de schermen globaal besproken. Vervolgens kunnen schermen met belangrijke ontwerpkkeuzes verder worden uitgewerkt.

_Er wordt begonnen met het home-scherm. Welke schermen komen na dit scherm? (per mogelijk pad door de website uitwerken; de opeenvolgende schermen worden horizontaal naast elkaar geplaatst.)_

Output  
De schermen, en de globale indeling ervan, die de website moet bevatten.

**15:35 Koffie**
15:45 V: Multi-channel

Bij welk scherm speelt een ander kanaal een rol?
Wat zijn de acties die genomen moeten worden binnen het betreffende kanaal?

Output
In het storyboard staat aangegeven op welke plaats andere kanalen een rol kunnen spelen, en wat deze rol is. Deze output wordt meegenomen naar agenda-item VII.

16:00 VI: Techniek - koppeling externe systemen

Bij welke scherm wordt een extern systeem aangesproken?
Welke informatie wordt uitgewisseld?
Is dit systeem beschikbaar?
Onder welke voorwaarden is het systeem beschikbaar?

Output
In het storyboard staat aangegeven op welke plaats welke externe systemen nodig zijn, om wat voor informatie het gaat, of het systeem (en onder welke voorwaarden) beschikbaar is.

16:15 VII: Rollen/Partijen

Welke rollen zijn nodig om de dienst te ontwikkelen?
Welke rollen zijn nodig om de dienst te exploiteren?
Welke partijen kunnen welke rol vervullen?

Output
Een overzicht van de benodigde rollen.
Een overzicht met welke rol door welke partij wordt uitgevoerd.

16:30 VIII: Plan van aanpak

Gaan we verder?
Wat moeten volgende stappen zijn?
Welke partijen zijn bestrokken bij de volgende stappen?
Wat is de volgtijdelijkheid van de stappen?

Output
Een globaal plan van aanpak.

16:45 Enquête en Evaluatie
10.4 **Agenda used during pretest**

<table>
<thead>
<tr>
<th>Agenda item</th>
<th>Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (relation functions)</td>
<td>15</td>
</tr>
<tr>
<td>II ( personas)</td>
<td>20</td>
</tr>
<tr>
<td>III (check customer needs)</td>
<td>10</td>
</tr>
<tr>
<td>Coffee</td>
<td></td>
</tr>
<tr>
<td>IV (tasks)</td>
<td>45</td>
</tr>
<tr>
<td>V (storyboards)</td>
<td>55</td>
</tr>
<tr>
<td>VI (technical integration)</td>
<td>10</td>
</tr>
<tr>
<td>Coffee</td>
<td></td>
</tr>
<tr>
<td>VII (multi-channel)</td>
<td>15</td>
</tr>
<tr>
<td>VIII (roles)</td>
<td>10</td>
</tr>
<tr>
<td>IX (value-web)</td>
<td>20</td>
</tr>
<tr>
<td>X (parties)</td>
<td>10</td>
</tr>
<tr>
<td>XI (project plan)</td>
<td>10</td>
</tr>
</tbody>
</table>

10.5 **Questionnaires**

These are the questionnaires, which were filled in by the participants.
(In Dutch)

10.5.1 **Questionnaire 1 (lunch)**

1. Persoonlijk:
   a) Wat is uw naam?
   b) Bij welk bedrijf werkt u?
   c) Wat is uw functie binnen dat bedrijf?
   d) Hoe lang bent u al werkzaam in deze branche?

2. Van uit welke rol zat u in de workshop?
   Klantfocus / Ander kanaal / Algemeen / Operations & IT / Anders nl:

3. Heeft u eerder deelgenomen aan een workshop om een nieuwe dienst te definiëren? Ja / Nee

4. Bent u eerder betrokken geweest bij het definiëren van een nieuwe dienst die enigszins te vergelijken is met de dienst die vandaag is beschreven? Ja / Nee

5. Beoordeelt u svp onderstaande stellingen:
   a) Deze sessie heeft aan mijn verwachtingen voldaan
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   b) Als ik mijn ervaring met andere service design methoden meeneem, ben ik tevreden met de aanpak
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   c) De sessie voldoet aan het gewenste niveau
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   d) De gestructureerde voorbereiding van de workshop via de intake fase was nuttig
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens / nvt
   e) Deze workshop helpt om sneller een e-service te definiëren
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens

6. Verwachtte u voorafgaand aan de workshop dat deze zou kunnen helpen om de dienst snel te definiëren?
   Zeker niet / Waarschijnlijk niet / Neutraal / Waarschijnlijk wel / Zeker wel

7. Denkt u het resultaat van deze workshop in de toekomst te gaan gebruiken?
   Zeker niet / Waarschijnlijk niet / Neutraal / Waarschijnlijk wel / Zeker wel
8. Beoordeelt u svp onderstaande stellingen:
   a) Ik ben door de workshop de verschillende dilemma’s ten aanzien van het definiëren van deze dienst beter gaan beseffen
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   b) Innovatie in onze branche is een moeizaam proces.
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   c) Deze aanpak, om samen met andere stakeholders een dienst te definiëren helpt om succesvolle nieuwe diensten te initiëren.
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   d) Een zorgvuldige dienstdefinitie helpt om succesvolle nieuwe diensten te initiëren.
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens

9. Wat vindt u van de workshop in het geheel?
   Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig
   Welk cijfer, tussen 1 en 10, zou u geven?

10. Vindt u de workshop nuttig om:
    a) het ontwerp klantgericht te maken?
        Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig
    b) de website goed te integreren met de ondersteuning via andere kanalen (telefoon, face-to-face, etc.)
        Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig
    c) kosten te helpen besparen of opbrengsten te verhogen bij andere kanalen?
        Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig
    d) de concurrentiepositie te verbeteren via e-services?
        Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig
    e) relatief veel vooruitgang te boeken in het ontwerp van een e-service in een korte tijd?
        Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig
    f) een e-service ontwerp focus te geven?
        Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig
    g) interactie en communicatie tussen verschillende standpunten te verbeteren (klant, tussenpersoon, verzekeraar, operations&IT)?
        Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

11. Hoe efficiënt was de workshop volgens u?
    Totaal niet efficiënt / niet erg efficiënt / gemiddeld / efficiënt / zeer efficiënt

12. Was de bijdrage aan het proces gelijkwaardig voor de deelnemers?
    Totaal niet gelijkwaardig / niet gelijkwaardig / neutraal / gelijkwaardig / zeer gelijkwaardig

13. Had u het gevoel dat u uw ideeën, wensen en zorgen tot uitdrukking kon brengen?
    Zeer slecht / Slecht / Neutraal / Goed / Zeer Goed

14. Stel: we noemen het moment van het krijgen van het dienst idee 0% en het live gaan van de internetdienst zien we als 100%. Op hoeveel procent (van het gedane werk) denkt u nu te zijn?
    …… %

15. Wat lijkt u nuttig om als vervolgstap in de middag te doen?
    a) Functies verder uitwerken
        Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig
    b) Een samenhang aanbrengen in de functies
        Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig
    c) Gebruikersonderzoek: wie worden onze bezoekers?
        Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig
    d) Gebruikersonderzoek: wat willen onze bezoekers?
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

e) Checken klantbehoeftes bij klanten
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

f) Taken uitwerken die klanten willen uitvoeren
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

g) Scenario's uitwerken
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

h) Storyboard tekenen (schermen/webpages)
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

i) Financieel plaatje in kaart brengen
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

j) Bouwen prototype
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

k) Technisch concept uitwerken
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

l) Aangeven waar koppeling met andere systemen nodig zijn
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

m) Bespreken waar op de site andere kanalen (winkels, telefoon) een rol kunnen spelen
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

n) Definiëren welke externe rollen nodig zijn (bv website bouwer)
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

o) Aangeven wat de relaties tussen de rollen zijn (wie levert wat aan wie?)
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

p) Invullen van mogelijke partijen voor rollen
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

q) Opstellen van plan van aanpak
Zeer nutteloos / relatief nutteloos / neutraal / nuttig / zeer nuttig

r) Anders, namelijk:

..........
16.

Hoeveel inzicht heeft u in...

<table>
<thead>
<tr>
<th>vraag</th>
<th>nieuwstein</th>
<th>neutraal</th>
<th>veel inzicht</th>
<th>ja/nee</th>
</tr>
</thead>
<tbody>
<tr>
<td>wat de samenhang is tussen de functies die tijdens de xQFD workshop gedefinieerd zijn?</td>
<td>☐ ☐ ☐ ☐ ☐</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vindt u dit nuttig om te weten?</td>
<td></td>
<td></td>
<td></td>
<td>ja/nee</td>
</tr>
<tr>
<td>welk fictief personage symbool staat voor de doelgroep waar voor de dienst wordt ontworpen?</td>
<td>☐ ☐ ☐ ☐ ☐</td>
<td></td>
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<tr>
<td>vindt u dit nuttig om te weten?</td>
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<td>ja/nee</td>
</tr>
<tr>
<td>welke taken dit fictief personage moet kunnen doorlopen?</td>
<td>☐ ☐ ☐ ☐ ☐</td>
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</tr>
<tr>
<td>vindt u dit nuttig om te weten?</td>
<td></td>
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<td>ja/nee</td>
</tr>
<tr>
<td>hoe dit fictief personage deze taken doorloopt?</td>
<td>☐ ☐ ☐ ☐ ☐</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vindt u dit nuttig om te weten?</td>
<td></td>
<td></td>
<td></td>
<td>ja/nee</td>
</tr>
<tr>
<td>doormiddel van deze taken, hoe de functies (die tijdens xQFD gedefinieerd zijn) verder vormgegeven zijn?</td>
<td>☐ ☐ ☐ ☐ ☐</td>
<td></td>
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<tr>
<td>vindt u dit nuttig om te weten?</td>
<td></td>
<td></td>
<td></td>
<td>ja/nee</td>
</tr>
<tr>
<td>hoe de belangrijkste schermen er globaal gaan uitzien?</td>
<td>☐ ☐ ☐ ☐ ☐</td>
<td></td>
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<tr>
<td>vindt u dit nuttig om te weten?</td>
<td></td>
<td></td>
<td></td>
<td>ja/nee</td>
</tr>
<tr>
<td>op welke schermen de belangrijkste designkeuzes gemaakt moeten worden?</td>
<td>☐ ☐ ☐ ☐ ☐</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vindt u dit nuttig om te weten?</td>
<td></td>
<td></td>
<td></td>
<td>ja/nee</td>
</tr>
</tbody>
</table>
10.5.2 Questionnaire 2 (end of day)

1. Wat is uw naam?

2. Beoordeelt u svp onderstaande stellingen:
   a) Deze middag-sessie heeft aan mijn verwachtingen voldaan
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   b) Als ik mijn ervaring met andere service design methoden meeneem, ben ik tevreden met
      de aanpak van vanmiddag
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   c) De middag-sessie voldoet aan het gewenste niveau
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   d) Deze middag-workshop helpt om sneller een e-service te definiëren
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens

3. Verwachtte u voorafgaand aan de middag-workshop dat deze zou kunnen helpen om de
   dienst verder, snel te definiëren?
   Zeker niet / Waarschijnlijk niet / Neutraal / Waarschijnlijk wel / Zeker wel

4. Denkt u het resultaat van deze middag-workshop in de toekomst te gaan gebruiken?
   Zeker niet / Waarschijnlijk niet / Neutraal / Waarschijnlijk wel / Zeker wel

5. Beoordeelt u svp onderstaande stellingen:
   a) Ik ben door de middag-workshop de verschillende dilemma’s ten aanzien van het
      definiëren van deze dienst beter gaan beseffen
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   b) Deze aanpak, om samen met andere stakeholders een dienst te definiëren helpt om
      succesvolle nieuwe diensten te initiëren.
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   c) Een zorgvuldige dienstdefinitie helpt om succesvolle nieuwe diensten te initiëren.
Evaluatie van de workshop


☐ Agenda item I: Relaties aangeven tussen functies
☐ Agenda item II: Opstellen persona
☐ Agenda item III: Taken opstellen
☐ Agenda item IV: Schetsen Stortboard
☐ Agenda item V: Multi-channel issues bespreken
☐ Agenda item VI: Koppeling externe systemen aangeven
☐ Agenda item VII: Definieren van benodigde rollen
☐ Agenda item VIII: Opstellen plan van aanpak


8. Hoeveel inzicht heeft u in…

wat de samenhang is tussen de functies die tijdens de xQFD workshop gedefinieerd zijn? □ □ □ □ □
Vindt u dit nuttig om te weten? Ja / Nee

welke fictief personage symbool staat voor de doelgroep waar voor de dienst wordt ontworpen? □ □ □ □ □
Vindt u dit nuttig om te weten? Ja / Nee

welke taken de persona moet kunnen doorlopen? □ □ □ □ □
Vindt u dit nuttig om te weten? Ja / Nee

hoe de persona deze taken doorloopt? □ □ □ □ □
Vindt u dit nuttig om te weten? Ja / Nee

doormiddel van deze taken, hoe de functies (die tijdens xQFD gedefinieerd zijn) verder vormgegeven zijn? □ □ □ □ □
Vindt u dit nuttig om te weten? Ja / Nee

hoe de belangrijkste schermen er globaal gaan uitzien? □ □ □ □ □
Vindt u dit nuttig om te weten? Ja / Nee

op welke schermen de belangrijkste designkeuzes gemaakt moeten worden? □ □ □ □ □
Vindt u dit nuttig om te weten? Ja / Nee
Hoeveel inzicht heeft u in…

waar andere kanalen een rol spelen?
Vindt u dit nuttig om te weten?

waar koppelingen met andere systemen nodig zijn?
Vindt u dit nuttig om te weten?

of deze systemen beschikbaar zijn?
Vindt u dit nuttig om te weten?

welke rollen nodig zijn om de dienst te implementeren?
Vindt u dit nuttig om te weten?

welke rollen nodig zijn om de dienst te exploiteren?
Vindt u dit nuttig om te weten?

welke partijen deze rollen gaan vervullen?
Vindt u dit nuttig om te weten?

wat de volgende stappen moeten zijn in het website ontwikkeltraject?
Vindt u dit nuttig om te weten?

welke partijen bij deze stappen betrokken moeten worden?
Vindt u dit nuttig om te weten?
9.

Helpt de samenhang in functies (zoals gedefinieerd in agenda item I) bij het opstellen van taken die de gebruiker kan doorlopen?

Helpt het gebruik van een persona bij het opstellen van taken die de gebruiker kan doorlopen?

Helpt het gebruik van een persona bij het opstellen van een storyboard?

Helpt het overzicht van taken (zoals gedefinieerd in agenda item III) bij het opstellen van het storyboard?

Maakt het storyboard het gemakkelijker om de plaatsen te bepalen waar interactie met andere kanalen plaatsvindt?

Maakt het storyboard het gemakkelijker om de plaatsen te bepalen waar interactie met (externe) systemen plaatsvindt?

Helpt het overzicht van interacties met andere kanalen om interacties met (externe) systemen vast te stellen?

Helpt het overzicht van interacties met andere kanalen om de benodigde rollen vast te stellen?

Helpt het overzicht van interacties met (externe) systemen om de benodigde rollen vast te stellen?

10.

Welke (output van) agenda items dragen bij aan het maken van een klant(eindgebruiker)gericht ontwerp?

Welke (output van) agenda items dragen bij aan het aanvullen/uitbreiden van het dienstconcept uit de ochtendsessie?

Welke (output van) agenda items dragen bij aan het invullen/verdiepen van het dienstconcept uit de ochtendsessie?
Welke (output van) agenda items dragen bij aan het ontwerpen van een dienst die aansluit bij andere kanalen?

Welke (output van) agenda items dragen bij aan het maken van een dienstontwerp dat aansluit bij de marketing strategie en verbetering van concurrentiepositie?

Welke (output van) agenda items dragen bij aan het maken van een dienstontwerp dat aansluit bij de huidige organisatie en bij de betrokken organisaties (denk aan procedures, werkwijzen ed.)?

Welke (output van) agenda items dragen bij aan het in kaart brengen van technische functies en architectuur die nodig is voor het realiseren van de dienst?

Welke (output van) agenda items dragen bij aan het opstellen van het plan van aanpak?

Tijdens een workshop is het belangrijk dat de communicatie goed verloopt tussen de deelnemers en tot overeenstemming over de discussiepunten wordt gekomen. In welke agenda items was dat het geval? (kruis deze agenda-items aan)

Tijdens een workshop is het belangrijk dat:
- het team beslissingen als geheel neemt en de discussies gestructureerd verlopen.
- het voor het hele team duidelijk was welke discussiepunten moesten worden behandeld en wat de wat de resultaten daarvan moesten zijn.

In welke agenda items was dat het geval?

11. Welke van deze aspecten zijn voor u belangrijk voor een nuttige workshop?

☐ het maken van een klantgericht ontwerp
☐ het aanvullen/uitbreiden van het dienstconcept uit de ochtendsessie
☐ het invullen/verdiepen van het dienstconcept uit de ochtendsessie
☐ het maken van een dienst die aansluit bij andere kanalen
☐ het maken van een dienst die aansluit bij de marketing strategie en verbetering van concurrentiepositie
☐ het maken van een dienstontwerp dat aansluit bij de huidige organisatie en bij de betrokken organisaties (denk aan procedures, werkwijzen ed.)
☐ het in kaart brengen van technische functies en architectuur die nodig is voor het realiseren van de dienst
☐ het opstellen van het plan van aanpak

12. Welke andere aspecten zijn voor u belangrijk voor een nuttige workshop?

Proces:

13. Hoe efficiënt was de workshop volgens u?
   Totaal niet efficiënt / niet erg efficiënt / gemiddeld / efficiënt / zeer efficiënt

14. Was de bijdrage aan het proces gelijkwaardig voor de deelnemers?
   Totaal niet gelijkwaardig / niet gelijkwaardig / neutraal / gelijkwaardig / zeer gelijkwaardig

15. Had u het gevoel dat u uw ideeën, wensen en zorgen tot uitdrukking kon brengen?
   Zeer slecht / Slecht / Neutraal / Goed / Zeer Goed

Resultaat

16. Denkt u dat het storyboard een website-ontwerper helpt bij het ontwerpen van de site?
   Zeker niet / Waarschijnlijk niet / Neutraal / Waarschijnlijk wel / Zeker wel
17. Denkt u dat het opgestelde persona voor de verdere ontwikkeling van de dienst nuttig is?
   Zeker niet / Waarschijnlijk niet / Neutraal / Waarschijnlijk wel / Zeker wel

18. Weet u, op basis van het plan van aanpak, wat de volgende stappen in het dienst-ontwikkeltraject moeten zijn?
   Nee, helemaal niet / Nee, niet echt / Neutraal / Ja, ongeveer / Ja, precies

19. Vindt u het overall resultaat van de workshop nuttig?
   Zeer nutteloos / Relatief nutteloos / Neutraal / Nuttig / Zeer nuttig

20. Bent u tevreden met het overall resultaat van de workshop?
   Zeer ontevreden / Relatief ontevreden / Neutraal / Tevreden / Zeer tevreden

21. Stel: we noemen het moment van het krijgen van het dienst idee 0% en het live gaan van de internetdienst zien we als 100%. Op hoeveel procent (van het gedane werk) denkt u nu te zijn?
   ...... %

**Methode/aanpak:**

22. Wat vindt u van de middag-workshop in het geheel?
   Zeer nutteloos / Relatief nutteloos / Neutraal / Nuttig / Zeer nuttig

   Welk cijfer, tussen 1 en 10, zou u geven?
   ............

23. Bent u tevreden met de middag-workshop?
   Zeer ontevreden / Relatief ontevreden / Neutraal / Tevreden / Zeer tevreden

**De hele dag:**

24. Wat vindt u van de dag in het geheel?
   Zeer nutteloos / Relatief nutteloos / Neutraal / Nuttig / Zeer nuttig

   Welk cijfer, tussen 1 en 10, zou u geven?
   ............

25. Bent u tevreden met de dag?
   Zeer ontevreden / Relatief ontevreden / Neutraal / Tevreden / Zeer tevreden

26. Hoe vond u de aansluiting van de middagsessie op de ochtendsessie?
   Zeer slecht / Slecht / Neutraal / Goed / Zeer Goed

27. Heeft u overige opmerkingen?

**10.5.3 Questionnaire 3 (debrieving)**

1. Wat is uw naam?

2. Beoordeelt u svp onderstaande stellingen:
   a) De workshop heeft aan mijn verwachtingen voldaan
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   b) Als ik mijn ervaring met andere service design methoden meeneem, ben ik tevreden met de aanpak van de workshop
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   c) De sessie voldeed aan het gewenste niveau
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   d) De workshop helpt om sneller een e-service te definiëren
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens

3. Verwachtte u voorafgaand aan de workshop dat deze zou kunnen helpen om de dienst snel te definiëren?
   Zeker niet / Waarschijnlijk niet / Neutraal / Waarschijnlijk wel / Zeker wel

4. Heeft u het resultaat van de workshop gebruikt?
Ja / Nee, waarom wel/niet?

5. Denkt u het resultaat van de workshop in de toekomst te gaan gebruiken?
   Zeker niet / Waarschijnlijk niet / Neutraal / Waarschijnlijk wel / Zeker wel

6. Beoordeelt u svp onderstaande stellingen:
   a) Ik ben door de workshop de verschillende dilemma’s ten aanzien van het definiëren van deze dienst beter gaan beseffen
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   b) Deze aanpak, om samen met andere stakeholders een dienst te definiëren helpt om succesvolle nieuwe diensten te initiëren.
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens
   c) Een zorgvuldige dienstdefinitie helpt om succesvolle nieuwe diensten te initiëren.
      Zeer oneens / Oneens / Neutraal / Eens / Zeer mee eens

Proces:

7. Hoe efficiënt was de workshop volgens u?
   Totaal niet efficiënt / niet erg efficiënt / gemiddeld / efficiënt / zeer efficiënt

8. Was de bijdrage aan het proces gelijkwaardig voor de deelnemers?
   Totaal niet gelijkwaardig / niet gelijkwaardig / neutraal / gelijkwaardig / zeer gelijkwaardig

9. Had u het gevoel dat u uw ideeën, wensen en zorgen tot uitdrukking kon brengen?
   Zeer slecht / Slecht / Neutraal / Goed / Zeer Goed

Resultaat

10. Denkt u dat het storyboard een website-ontwerper helpt bij het ontwerpen van de site?
    Zeker niet / Waarschijnlijk niet / Neutraal / Waarschijnlijk wel / Zeker wel

11. Denkt u dat het opgestelde persona voor de verdere ontwikkeling van de dienst nuttig is?
    Zeker niet / Waarschijnlijk niet / Neutraal / Waarschijnlijk wel / Zeker wel

12. Weet u, op basis van het plan van aanpak, wat de volgende stappen in het dienstontwikkeltraject moeten zijn?
    Nee, helemaal niet / Nee, niet echt / Neutraal / Ja, ongeveer / Ja, precies

13. Vindt u het overall resultaat van de workshop nuttig?
    Zeer nutteloos / Relatief nutteloos / Neutraal / Nuttig / Zeer nuttig

14. Bent u tevreden met het overall resultaat van de workshop?
    Zeer ontevreden / Relatief ontevreden / Neutraal / Tevreden / Zeer tevreden

15. Stel: we noemen het moment van het krijgen van het dienst idee 0% en het live gaan van de internetdienst zien we als 100%. Op hoeveel procent (van het gedane werk) denkt u nu te zijn?
    ......%

Methode/aanpak:

16. Wat vindt u van de workshop in het geheel?
    Zeer nutteloos / Relatief nutteloos / Neutraal / Nuttig / Zeer nuttig
    Welk cijfer, tussen 1 en 10, zou u geven?
    ............

17. Bent u tevreden met de workshop?
    Zeer ontevreden / Relatief ontevreden / Neutraal / Tevreden / Zeer tevreden

18. Heeft u overige opmerkingen?
10.6 **Satisfaction Questions**

Formulated by Briggs (2005).
(In Dutch)

Beoordeelt u svp onderstaande stellingen:

**SVA:**
- De sessie was mijn geleverde inspanningen waard.
- [zeer mee oneens - mee oneens - enigszins mee oneens - neutraal - enigszins mee eens - mee eens - zeer mee eens]
- De dingen die in de sessie bereikt zijn, rechtvaardigen mijn inspanningen.
- De resultaten zijn mijn geïnvesteerde tijd waard.
- De waarde, die ik heb gehaald uit de sessie, rechtvaardigt mijn inspanningen.

**SP:**
- Ik voel mij tevreden over de wijze waarop de sessie is uitgevoerd.
- Ik heb een goed gevoel over de sessie.
- Ik voel mij tevreden over de gebruikte procedures in de sessie.
- Ik voel mij tevreden over de wijze waarop we de activiteiten in de sessie hebben uitgevoerd.

**SO:**
- Ik vond de uitkomst van de sessie goed.
- Ik voel mij tevreden over de dingen die we bereikt hebben in de sessie.
- Toen de sessie afgelopen was, voelde ik mij tevreden over de resultaten.
- Ik ben blij met de resultaten van de sessie.

‘Analyses using correlations, inter-item reliability, exploratory and confirmatory factor analysis, suggest that the instrument can discriminate sufficiently among MSM constructs, and that the items within a given scale appear to reliably measure the same construct.’

‘The Cronbach’s Coefficient (Cronbach (1951) statistics indicated high inter-item reliability for the scale for each construct, ranging from 0.932 to 0.956 per construct.’

Cronbach’s α SVA=0.954
Cronbach’s α SP=0.932
Cronbach’s α SO=0.956
10.7 Output Case A

The results of case A, which were presented during the debriefing of this case.

Intake – dienst & doelgroep

- De e-service:
  - Portal ter verbetering van de interactiviteit met uitzendkrachten

- Doelgroep:
  - Uitzendkrachten met beschikking over internet

- Meerwaarde:
  - Binding met Olympia
  - Langere uitzendtermijn
  - Mindere administratieve kosten

Klantproces & focus van deze sessie

- Inschrijven
- Zoeken vacatures
- Match maken
- Aan het werk
Wat gebeurt er oa binnen deze fase?

- Werkurenverantwoording
- Salarisering
- Feedback over het werk
- Contact met uitzendkracht
- Ander werk zoeken/vinden

Huidige e-services

- **Olympia:**
  - Nieuwe vacatures via de site zoeken (bal ligt bij uitzendkracht)
- **Concurrenten:**
  - Bruto/Netto salaris bereken tools
  - Beschikbaarheidsregistratie
  - Rating geven aan bedrijf
  - Testjes: bv dienstverleningheidstest

Service Matrix

**Mijn perfecte match**

<table>
<thead>
<tr>
<th>Klantener needs</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inzicht Financieel</td>
<td>9.25</td>
</tr>
<tr>
<td>Solliciteren</td>
<td>7.75</td>
</tr>
<tr>
<td>Contact hebben met Olympia</td>
<td>7.5</td>
</tr>
<tr>
<td>Doorgeven beschikbaarheid</td>
<td>7.0</td>
</tr>
<tr>
<td>Carriere maken</td>
<td>6.25</td>
</tr>
<tr>
<td>Spelregels opdrachtgever</td>
<td>5.75</td>
</tr>
<tr>
<td>Contact hebben met andere uitzendkrachten</td>
<td>5.25</td>
</tr>
</tbody>
</table>

| 1. Inzicht Financieel | 9,25 | 99 | 3 |
| 2. Solliciteren | 7.75 | 33 | 93 | 9 |
| 3. Contact hebben met Olympia | 7.5 | 3399 | 3 |
| 4. Doorgeven beschikbaarheid | 7 | 93 | |
| 5. carriere maken | 6,25 | 33 | 33 | 3 |
| 6. Spelregels opdrachtgever | 5,75 | 93 | |
| 7. Contact hebben met andere uitzendkrachten | 5,25 | 3 | 393 | |

Functions importance rating: 83 63 52 65 63 38 89 125 47 101 106 116
Speerpunten

- Gebruikersgemak
  - FAQ's
  - Persoonlijk contact
  - Escalatie mogelijkheid
  - SMS
  - Internetzuil in vestiging

- Salaris
  - Uren administratie
  - SMS notificatie

- Solliciteren
  - Op basis van ‘mijn profiel’

Concurrenten

Sterkte:
Compleetheid en uitgebreidheid van de dienst

Zwakte:
Opvolging en workload

Persona I

- Koos Baanloos

- 38 jaar, gescheiden met vriendin
- Opleiding: Basisonderwijs en LTS
- Huurwoning in de Randstad
- Beperkte PC kennis
- Houdt van: vissen, voetbal en auto's
- Werkt al 15 jaar voor diverse UZB's
- Inzetbaar als: liftmonteur, verhuizer, inpakker
- Kan financieel net rondkomen
- Rookt zware shaq en vindt vrijdagmiddagborrel leuk
- Heeft passieve houding tov UZB's, behalve als het om zijn geld gaat
Persona II

- Bart-Jan van Velzen
- 25 jaar
- Opleiding: VMBO/MBO administratie
- Werken:
  - Horeca (tijdens studie)
  - Adm. med. produktiebedrijf
  - Call-center inbound
  - Werkzoekend
  - Nu: Olympia customer service waterbedrijf
- Prive:
  - Woont samen met vriend
  - Speelt veel computer games
  - Woont ver van vestiging

Opzet website

- Mijn Olympia
  - Mijn Financiën
  - Mijn Profiel
  - Mijn Agenda
  - Mijn Vestiging
  - Mijn OG
  - Status
  - Werkurenbrief

- OG
- E-Testen (chat, forum)
- Vermaak binding
- Solliciteren
- FAQ's

Taken

- Inloggen
- Werkurenbriefje invoeren
- Solliciteren

Storyboards

- Inloggen, uren invullen, checken status en nieuwe vacature zoeken
**Welkom op Mijn Olympia**

Goedemiddag Koos,

Persoonlijke bericht van zijn vestiging:
Vergeet niet je urenbriefje van week 36 in te leveren. Nu gelijk doen? [Klik hier.]

Vriendelijke groeten,
Team Olympia Breda

---

De laatste 5 berichten op het forum:

- **Mensen bij Ikea zin in borrel?**
- **Vorige week verdiend: 223,54 euro bij Janssen BV. (overgemaakt op 29 sept 2005)**
- **Poll Ga jij mee met het Olympia uitje? Ja / Nee**

---

**Werkurenbriefje**

Uitleg

- Bij inloggen伦 over functiebijdrage bij de firma.
- [Opdrachtgever], vestiging al maatjes al ingevuld zijn.
- Vers pas vir een briefje van ingevuld worden de vestigingen aan de internet-out.
Dankjewel Koos,

Je uren worden nu verwerkt. Als je OG ze goedkeurt wordt je salaris volgende week donderdag overgemaakt op jouw rekening. Uiteraard ontvang je dan weer een SMS van ons.

Vriendelijke groeten,
Team Olympia Breda

Zorg voor mijn Olympia

De laatste 5 berichten op het forum:

Mensen bij Ikea zin in borrel?

Vorige week verdiend:
223,54 euro bij Janssen BV. (overgemaakt op 29 sept 2005)

Meer…

Poll
Ga jij mee met het Olympia uitje?
Ja   Nee

Vriendelijke groeten,
Team Olympia Breda

Welkom op Mijn Olympia

Goedemiddag Koos,

[Persoonlijke bericht van zijn vestiging:]

Voor volgende week woensdag zoeken we een verhuizer voor Flipsen BV. Volgens je agenda ben jij beschikbaar. Heb je interesse? Neem contact met ons op.

Vriendelijke groeten,
Team Olympia Breda

Terug naar mijn Olympia

Tevens zijn van toepassing op de site waarop de bezoeker zich bevindt.
### Mijn financiën

<table>
<thead>
<tr>
<th>Week nr</th>
<th>Uur gewerkt</th>
<th>Verdien</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>6</td>
<td>61,35</td>
<td>Overgemaakt</td>
</tr>
<tr>
<td>34</td>
<td>10</td>
<td>108,54</td>
<td>Overgemaakt</td>
</tr>
<tr>
<td>35</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>312,54</td>
<td>Wacht op OG</td>
</tr>
</tbody>
</table>

### Solliciteren

**Zoeken op nieuwe vacatures:**

- [ ] Functie
  - [ ] Regio
  - [ ] etc...

**Voor volgende week zoeken we:**

- [ ] Verhuizers voor Flipsen BV (wo en do)
- [ ] Inspecteurs bij IKEA (hele de week)
- [ ] Glazenwassers (za en zo)

**Sorteren op:**

- [ ] Postcode, reistijd, etc.
Rollen en Partijen

- Verloningssoftware
- Netive
- Hosting/webbouwer
- Design/huisstijl
- Qlympia:
  - MT
  - Marktering
  - Vestigingen
  - Service Desk
  - Facility (ICT)
- OG’s
- ICT leverancier

Plan van aanpak

- Doelstelling / PvE opstellen
- Projectplan (tijd, wie doet wat?)
- Definitieve structuur bepalen
- Technische haalbaarheid
- Business case
- Definitieve ontwerp
- SLA afstemmen
- Bouwen
- Procedures/protocol uitschrijven
- Test
- Pilot
- Live
- Evaluatie (monitoren, bijsturen)
- Overall: contact medewerkers, UK’s, OG’s en MT.
### 10.8 Structure of agenda

(1 = No, not at all, 3 = Neutral, 5 = Yes, a lot)

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helpt de samenhang in functies (zoals gedefinieerd in agenda item I) bij het opstellen van taken die de gebruiker kan doorlopen?</td>
<td>3</td>
</tr>
<tr>
<td>Helpt het gebruik van een persona bij het opstellen van taken die de gebruiker kan doorlopen?</td>
<td>3</td>
</tr>
<tr>
<td>Helpt het gebruik van een persona bij het opstellen van een storyboard?</td>
<td>3</td>
</tr>
<tr>
<td>Helpt het overzicht van taken (zoals gedefinieerd in agenda item III) bij het opstellen van het storyboard?</td>
<td>4</td>
</tr>
<tr>
<td>Maakt het storyboard het gemakkelijker om de plaatsen te bepalen waar interactie met andere kanalen plaatsvindt?</td>
<td>4</td>
</tr>
<tr>
<td>Maakt het storyboard het gemakkelijker om de plaatsen te bepalen waar interactie met (externe) systemen plaatsvindt?</td>
<td>3</td>
</tr>
<tr>
<td>Helpt het overzicht van interacties met andere kanalen om interacties met (externe) systemen vast te stellen?</td>
<td>3</td>
</tr>
<tr>
<td>Helpt het overzicht van interacties met andere kanalen om de benodigde rollen vast te stellen?</td>
<td>4</td>
</tr>
<tr>
<td>Helpt het overzicht van interacties met (externe) systemen om de benodigde rollen vast te stellen?</td>
<td>5</td>
</tr>
</tbody>
</table>
10.9  Insight in aspects

Scores are based on a 1-5 scale. (1 = no insight, 3 = neutral, 5 = a lot of insight)

<table>
<thead>
<tr>
<th>Difference in insight in aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.5</td>
</tr>
<tr>
<td>-1</td>
</tr>
<tr>
<td>-0.5</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1.5</td>
</tr>
</tbody>
</table>

- wat de samenhang is tussen de functies die tijdens de xQFD workshop gedefinieerd zijn?
- welk fictief personage symbool staat voor de doelgroep waar voor de dienst wordt ontworpen?
- welke taken dit fictief personage moet kunnen doorlopen?
- hoe dit fictief personage deze taken doorloopt?
- doormiddel van deze taken, hoe de functies (die tijdens xQFD gedefinieerd zijn) verder vormgegeven zijn?
- hoe de belangrijkste schermen er globaal gaan uitzien?
- op welke schermen de belangrijkste designkeuzes gemaakt moeten worden?
- waar andere kanalen een rol spelen?
- waar koppelingen met andere systemen nodig zijn?
- of deze systemen beschikbaar zijn?
- welke rollen nodig zijn om de dienst te implementeren?
- welke rollen nodig zijn om de dienst te exploiteren?
- welke partijen deze rollen gaan vervullen?
- wat de volgende stappen moeten zijn in het website ontwikkeltraject?
- welke partijen bij deze stappen betrokken moeten worden?
10.10 Satisfaction

The graphs are discussed in paragraph 6.6.

Figure 27: Satisfaction Case A

Figure 28: Satisfaction Case B
10.11 Requirements

Percentages of participants who think that a certain requirement is influenced by agenda items.
(0=0%, 1=100%)

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**Customer-Oriented Design**

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**Extension of Service Concept**

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**Specification of Service Concept**
“Ladies and gentleman, it’s a wrap. Thank you.”

- FILMSET SAYING