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Designing a Booking System for Media Agency Use

Ahonen, Riina

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Designing a Booking System for Media Agency Use

Riina Ahonen
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Degree Program in Entrepreneurship and Business
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Riina Ahonen

Abstract

Designing a Booking System for Media Agency Use

Year 2014 Pages 43

The aim for this Master's thesis is to describe how a user-friendly booking system can be designed. A booking system is a system used in media agencies which is used for booking TV advertising campaigns. The Finnish commercial TV sector is dominated by four major players: MTV, Nelonen Media, SBS Discovery Channels and FOX International Channels. Advertising accounts for an important part of commercial media sector's business.

My employer FOX International Channels (FIC) is a fairly new company in Finland. Its TV channel FOX was launched in Finland in April 2012. Since the launch FIC has established its position within Finnish TV market. FIC has transformed from a small player to a medium sized company. At the moment FIC does not have a booking system for media agency use. The current method used in campaign bookings is 'e-mail booking'. This method is time-consuming and fraught with error on either side of the trade.

During summer 2013 FIC replaced its internal advertising management system to a new one. A business-to-business module will be added into the system in spring 2014. This module will be a password-protected extranet, which will enable campaign booking.

The theoretical part of this study concentrates on two methods of system design; Interactive System Design and Contextual Design. The practical part concentrates on how a combination of these two system design methods can be used in a booking system design process. Research methods used in this study are semi-structured qualitative interviews and benchmarking.

The results for the study reveal different requirements that the booking system should have. The next step in the system development process is to start paper prototype testing on the basis of these requirements.

Key words: Booking System, Extranet, Media Agency, System Design, TV Advertising

Laurea-ammattikorkeakoulu **Tiivistelmä**
Kerava
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Käyttäjäkeskeinen suunnittelu
Tradenomi (ylempi AMK)

Riina Ahonen

Mainonnanvarausjärjestelmän suunnittelu mediatoimistokäyttöön

Vuosi 2014 Sivumäärä 43

Tutkimuksen tarkoitus on kuvata käyttäjäystävällisen mainonnanvarausjärjestelmän suunnitteluprosessi. Mainonnanvarausjärjestelmä on järjestelmä, jota mediatoimistot käyttävät varatessaan televisiomainoskampanjoita. Suomen kaupallisen televisiokentän suurimmat toimijat ovat MTV, Nelonen Media, SBS Discovery Channels ja FOX International Channels. Mainosmyynti on merkittävä osa kaupallisten medioiden liiketoimintaa.

Työnantajani FOX International Channels (FIC) on suhteellisen uusi yritys Suomessa. FOX-kanava aloitti lähetykset Suomessa huhtikuussa 2012. FIC on vakiinnuttanut paikkansa keskikokoisena kanavana. Tällä hetkellä FIC:lla ei ole tarjota mainonnanvarausjärjestelmää mediatoimistojen käyttöön vaan televisiomainoskampanjat varataan sähköpostin välityksellä. Tapa on hidas ja se lisää virheiden mahdollisuutta.

Kesällä 2013 FIC vaihtoi sisäisen mainonnanhallintajärjestelmän. Siihen lisätään kevään 2014 aikana moduuli, joka toimii kuten extranet. Tämä moduuli mahdollistaa kampanjabuukkauksen suoraan mediatoimistoista.

Tutkimuksen teoreettinen osa käsittelee kahta järjestelmäsuunnittelun metodia: Interactive System Design -menetelmää ja Contextual Design -menetelmää. Käytännön osassa käydään läpi, miten näiden kahden metodin yhdistelmää voidaan käyttää buukkausjärjestelmän suunnittelussa. Tutkimusmenetelminä on käytetty semi-strukturoituja kvalitatiivisia haastatteluja ja benchmarkingia.

Tutkimustuloksista käy ilmi, minkälaisia toiminnallisuuksia buukkausjärjestelmässä täytyisi olla. Seuraava vaihe buukkausjärjestelmän kehitysprosessissa on testaus paperiprototyyppien avulla.

Asiasanat: extranet, järjestelmäsuunnittelu, mainonnanvarausjärjestelmä, mediatoimisto, TV-mainonta

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1 Introduction

Every planning process should start with focusing on the users. No matter whether you are planning a service or a product, you should start with finding out users' needs and their desires. If you do not know what users need, you cannot invent.

Web was first introduced to public in the early 1990s. At that time the primary concern was to make sure that the technological infrastructure worked. Now that the infrastructure is stable the challenge is to design web sites that meet the needs of the people who use them. This does not concern only e-commerce, informational, entertainment and community web sites, but also Intranets and Extranets.

An extranet is a controlled private network that allows customers, partners, vendors, suppliers and other businesses to gain information about a specific company without granting an access to the organization's entire network. An extranet is often a private part of a web site. It is restricted to select users through user IDs, passwords and other authentication mechanisms on a login page. (Janssen 2013.)

Users want a website that is easy to use, loads quickly in their browser, and allows them to complete tasks without frustration. To create a site that meets the requirements of its users, a designer should focus on two factors: content and usability. The only way to know what users want is to get them involved in the development process. (Lazar 2005.)

It is important to involve customers in the design process also because several studies show that the more customer contact a project has, the more likely it is to be successful. (Keil & Carmel 1995, 33-44) It may not always be necessary that users are involved at every stage of the design process. But still designers need to put people rather than technology at the center of the design process (Benyon, Turner & Turner 2005, 3). In IT projects it is a tendency for developers to be focused on technology and forget about the needs of end users. The challenge is also to design for a population, but meet the needs of individuals.

The aim for this study is to describe how a user-friendly system, more precisely a user-friendly booking system, can be designed. The company involved in the design process is my employer FOX International Channels Oy. I chose this subject for the study because it is current and beneficial for FIC and also in the field of my studies in user centered design. During summer 2013 FIC replaced its internal advertising management system to a new one. An extranet module will be added into the system after it is developed. Extranet will work as a booking system for media agencies. The starting point for the study is that FIC wants to develop a better booking system than the existing ones.

This study is part of the first phase of the booking system development process. In this phase designing the new system is done with the help of interface design, benchmarking and interviewing future users. My role in the process is to collect information from the users and to turn this information into requirements. The design project is led from the United Kingdom. The software engineering will be done in Israel by SintecMedia, a provider of media business management solutions. This geographical setting and cultural differences set challenges for the project to be successful.

1.1 Case Company Background

FOX International Channels Oy is a fairly new company in Finland. Its TV channel FOX was launched in Finland on 16th April 2012. FOX International Channels (FIC) is 21st Century FOX's international multi-media business. FIC develops, produces and distributes over 300 pay-TV channels across Latin America, Europe, Asia, the Middle East and Africa. In Finland FIC distributes free-to-air channel FOX and three pay-TV channels.

In Finland large part of FIC's turnover comes from advertising sales. The majority of the advertising campaigns are booked through media agencies. At the moment the process of booking a campaign usually requires several emails between a TV buyer in a media agency and a contact person at FIC. It is time-consuming and fraught with error on either side of the trade. During the first fiscal year of FIC over 800 campaigns were booked and confirmed via e-mail. (Harjunkoski 2013) The number does not include campaign offers that were not confirmed. The current process of booking a campaign is described in Figure 1.

The campaign booking process starts with TV Buyer sending a campaign request by e-mail to Key Account Manager at FIC. Key Account Manager at FIC makes an offer which he then e-mails back to TV Buyer. At this point Key Account Manager also enters the offer to CRM system which works as FIC's sales management system. When TV Buyer wants to confirm the campaign she will e-mail a campaign confirmation request to Key Account Manager. After this Key Account Manager replies by e-mail that he has received the confirmation and the campaign is now confirmed. Then Key Account Manager forwards the confirmed campaign offer to Campaign Planner at FIC, who then books the campaign through FIC's internal booking system. Key Account Manager also has to confirm the offer in CRM system so that the offer converts into sales.

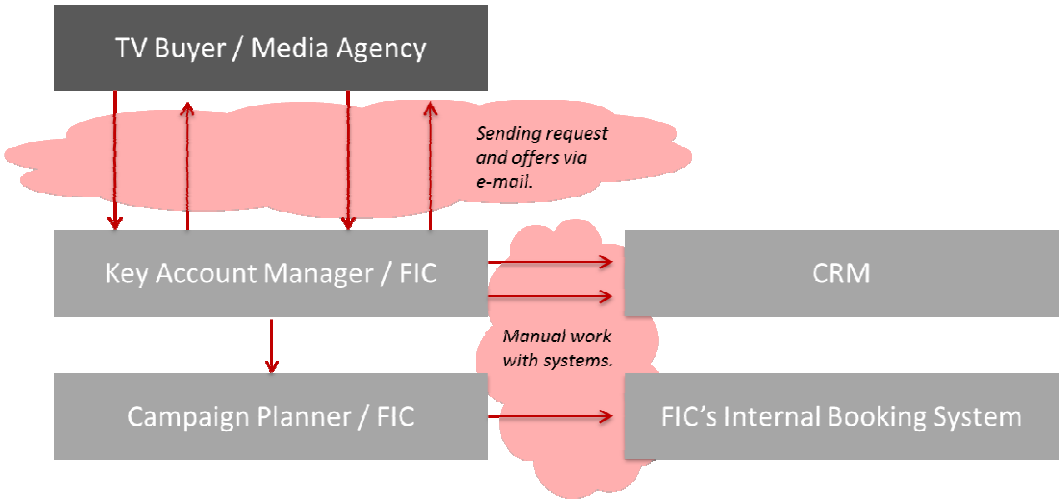

Figure 1: The current process of booking a campaign.

FIC replaced its internal advertising management system to a new one in Finland during summer 2013. A business-to-business module will be added into the system in the spring 2014. This module will be a password-protected extranet, which will work as a campaign booking system for media agencies. The booking system could be described as an automated version of the actual human exchange between FIC's Key Account Managers and TV Buyers in media agencies.

The focus for this study is to find out what FIC's booking system should be like. The starting point for the study is that FIC wants to develop a better booking system than the ones competitors are using. Figure 2 shows the process of booking a campaign after the booking system is in use. Then the process of booking a campaign will start with TV Buyer logging into booking system and placing a request for a campaign. Key Account Manager will receive a notification of campaign request which he will then approve. The system then automatically updates the offer into the CRM system. When TV Buyer wants to confirm the campaign she will do that in the booking system. When the campaign is confirmed the system sends a notification to both Key Account Manager and Campaign Planner at FIC. The system also converts the offer in CRM system into sales.

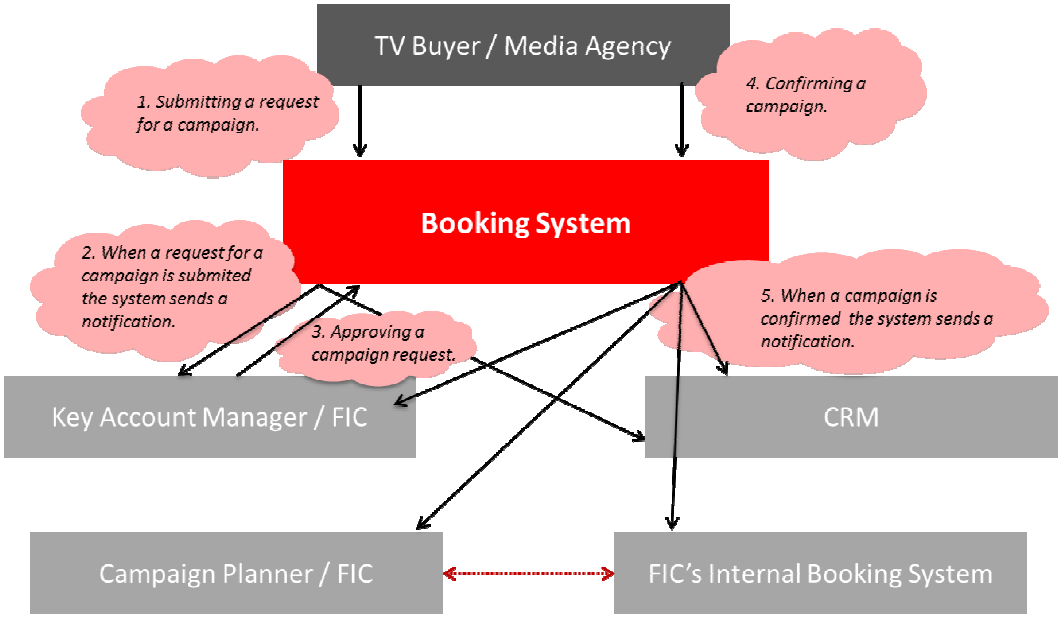

Figure 2: The process of booking a campaign after the development process is successfully completed.

1.2 The Objective

The aim for the study is to describe the process of designing a booking system on the basis of user needs. Another important objective is to make guidelines which to follow for the system designers so that the ready booking system would be user-friendly.

Summarizing, the research framework is made of two parts: the theoretical background on system design and the practical part on how to design a booking system for media agency use. The practical part is based on using a combination of two system design methods.

The system design process is represented in Figure 3. The first three phases are conducted in this study. The fourth phase "Paper prototype interviews" will be covered in theory.

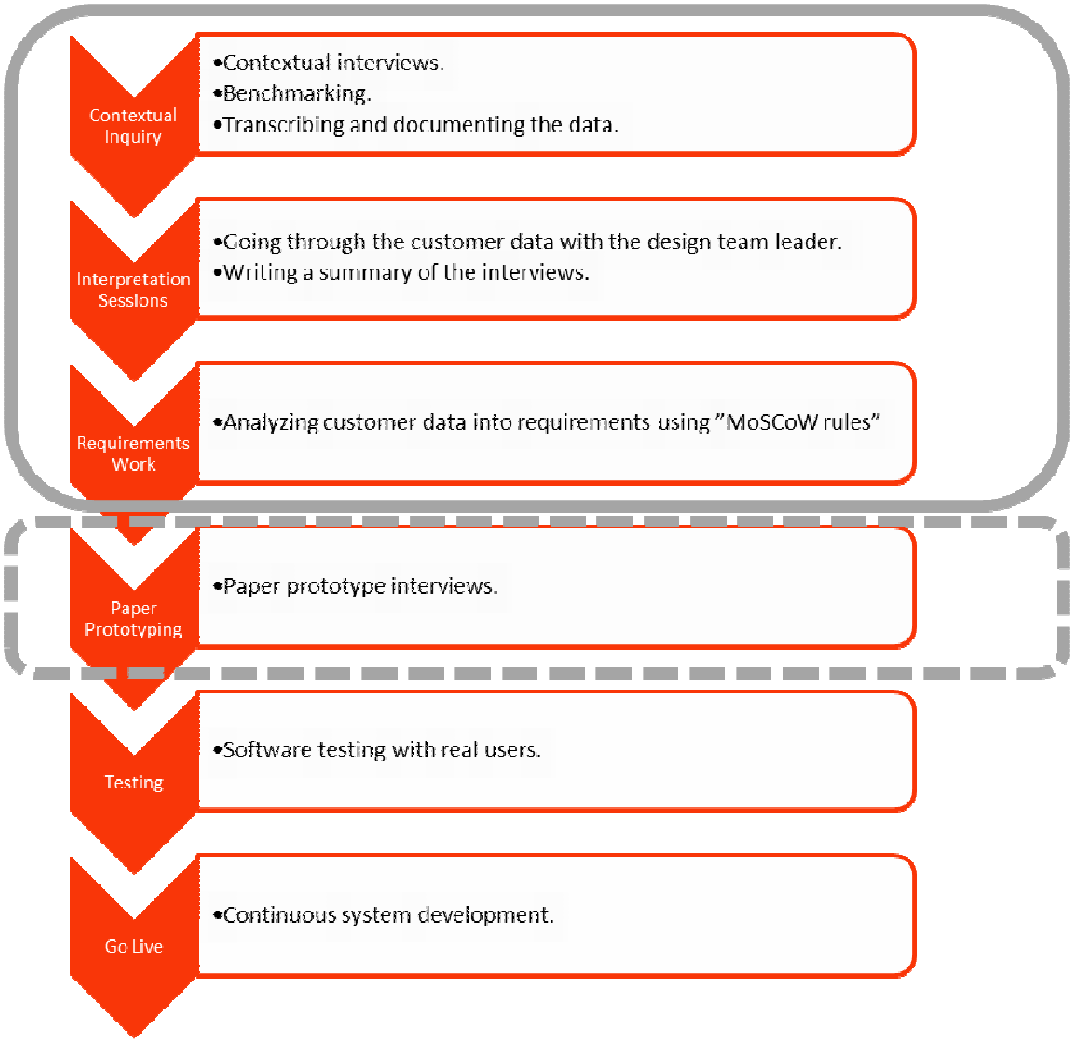

Figure 3: The steps in the booking system design process.

My research questions in my design process are:

1. What is a user-friendly booking system like?
   The purpose is to find out, what should be taken into account when planning a user-friendly booking system.

2. How other TV broadcasters' (MTV Media, Nelonen Media & SBS Discovery Media) booking systems are working?
   With this question I want to know what TV buyers think about the existing booking systems: What is working, what is not?

3. What other features and functionalities should a booking system have?

1.3 Keywords

Below is the list of the key words used in this study.

Benchmarking is the process to compare companies or applications with each other.

The **Booking system** refers to an Internet-based media buying system ‘, which media agencies use for booking an advertising campaign on television for their customers.

Contextual design is one method used in system design.

Extranet is a controlled private network allowing customers, partners, vendors, suppliers and other businesses to gain information, typically about a specific company or educational institution, and do so without granting access to the organization's entire network. An extranet is often a private part of a website. It is restricted to select users through user IDs, passwords and other authentication mechanisms on a login page. (Janssen 2013.)

Interactive system design is another method used in system design.

A **Media agency**’s role is to advise customers on media planning and to negotiate competitive prices for media space.

A **TV buyer** is a person in a media agency who is responsible for buying television advertising airtime.

User interface (UI) is the part of the system that the user comes into contact with.

2 The Media Sector in Finland

The media sector – or media and entertainment sector as it is often called - serves consumers, businesses and public administration. The sector provides products and services for production and distribution of information, opinions and experiences. Typical media operators include publishers and producers of printed and electronic content, such as

- The printing industry, whose products include newspapers and magazines, books and printed advertising material;
- Electronic mass media produced by television, radio and Internet companies;

- Recorded media including recordings, videos and motion pictures. (Viestinnän keskusliitto 2013.)

The media sector in Finland is a diversified and both socially and culturally important actor. Its strengths are high-quality contents, good accessibility, technological competence and its importance in people's daily lives. The use of media has become more like a part of daily life instead of being a leisure time activity or a tool for entertainment as it was in the past. Finnish people spend time with different media total 8 hours 39 minutes per day. Figure 3 shows how the time is divided between different media groups. (TNS Gallup 2013.)

Television is the biggest media with its 30 % share when compared the daily time spent. Internet continuously increases its share. It is now 26 %. Radio is the third largest media with 19 % share. The next largest media groups are in descending order newspapers (6 %), books (6 %), audio recordings (6 %), magazines (4 %), DVD (2 %) and free newspapers (1 %). (TNS Gallup 2013.)

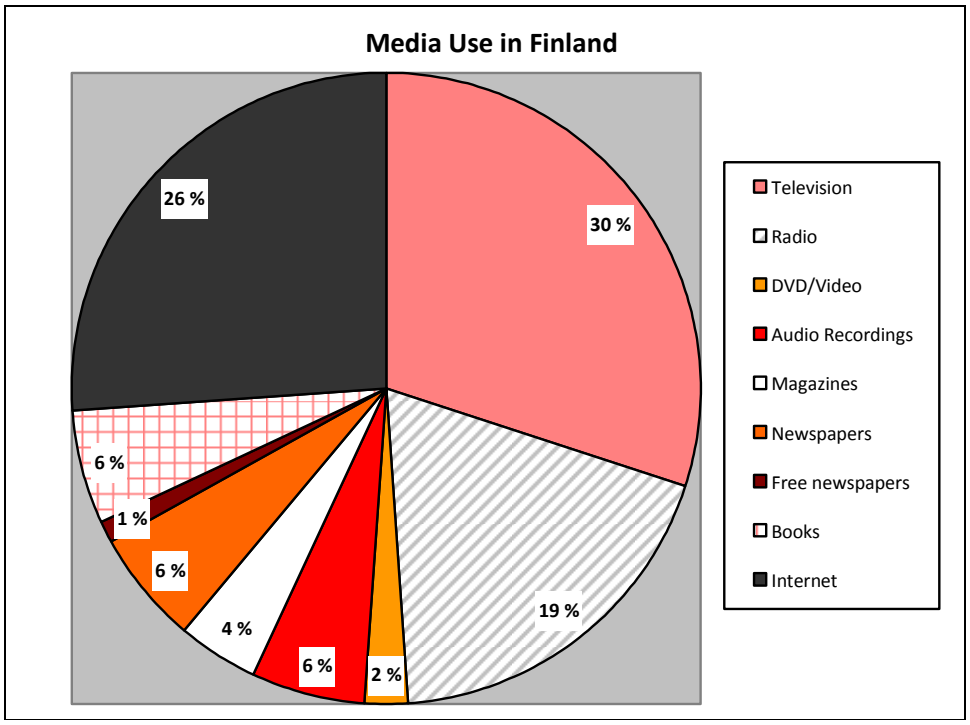

Figure 4: Daily time spent with different medias in percentages, total 8 h 39 min. (TNS Gallup 2013)

The media sector is in a phase of major transition. Digitalization, the Internet and globalization are affecting it. Changes happen both in consumer behavior and the role of media as an advertising vehicle. Although the situation in which the media sector finds itself right now is challenging, it gives companies an opportunity for restructuring and creating new businesses.

The biggest media companies in Finland are Sanoma, Yleisradio, Alma Media, Otava and MTV. Advertising sales is the number one revenue model for most media companies. (TNS Gallup 2013; Viestinnän keskusliitto 2013.)

2.1 Television Media in Finland

In Finland there are four major commercial players in television media. They are MTV, Nelonen Media, SBS Discovery Channels and FOX International Channels. MTV distributes three free-to-air channels, which are MTV3, Sub and AVA. Nelonen Media has also three free-to-air channels: Nelonen, Jim and Liv. SBS Discovery Channels has two channels TV5 and Kutonen and FOX International Channels has one free-to-air channel: FOX. Yleisradio's channels are not listed here because they are not commercial TV channels.

Finnpanel Oy measures TV viewing in Finland. Television viewing research has been conducted since 1960. In the beginning the panel members kept diaries of their television viewing. Now measuring is done through metering devices. A meter is installed to each TV set in the household. The meter uses a remote control that has a push button for each member of the family. Finnpanel polls the stored meter data daily in the early hours of the morning and the first overnight reports are published at 7 a.m. The information is then sent to TV broadcasting companies and other relevant stakeholders. The meter registers all TV viewing around the clock. The panel size is 1100 TV households (about 2300 persons) and it represents Finland's population in mini size. (Finnpanel 2013.)

2.1.1 Television Advertising in Finland

Advertising accounts for an important part of the media sector's business. New technologies, especially the Internet and mobile, are making it possible to raise personalized and contextualized advertising into a new level. At the same time more traditional medias such as print advertising (newspapers and magazines) are losing their accounts. The role of television has remained steady. TV is still the only real mass media. Advertising on TV provides immediacy, mass coverage, flexibility and accountability.

More and more companies use the expertise of media agencies to support their marketing decisions. A media agency is responsible for planning of media activities for customer's campaigning as well as media buying. The planning process involves analyzing the audience objectives and balancing the reach, frequency and costs of media options to deliver a detailed media plan. There are 11 media agencies in Finland.

In the market there are two main buying methods for TV advertising campaigns. They are program specific buying and RBS (Run By Station). In program specific buying a program is chosen in conjunction with which the advertisement is transmitted. The rate is based on issues including audience estimates, program environment and program desirability. A spot price is based on program-specific rates per 30 seconds. In targeted RBS buying, the commercials float during the campaign period and the final number of showings, programs and specific days cannot be determined in advance. In RBS the pricing is based on the impressions of selected target audience. TV buyer in a media agency is responsible for planning and buying a desired TV campaign. In most cases the campaign is planned, booked and confirmed using booking systems. It is a standard in Finland that every TV broadcasting company has its own booking system. They are all browser-based extranets. (MTV 2014.)

3 System Design

When humans design something they put thought into it. The key issue is the thought that goes into the process all the way from planning it, mapping it out and evaluating it. A design does not have to be a tangible object; computer languages, economic policy, the rules of laws are also designed. Designing becomes more complex when people are involved as one of the factors. The designer is not designing according to his own wishes, he is designing for someone else – the user. The designer must carry out the design process in a way that he respects the needs of the user. (Barfield 2004, 13-24.)

There are various ways of classifying and describing systems. Systems can be divided in 'static' and 'dynamic' systems. A static system does not change where as a dynamic one does. Beside the classification of static and dynamic, systems themselves can be further broken down into two groups: interactive and non-interactive systems. An interactive system is a system that can be influenced by a person using them. Non-interactive systems change their state without a user being able to influence these changes. In this study the concentration is on a design process of an interactive system, more precisely on a design process of an interactive system to be used in media agencies for booking TV advertising campaigns on FIC's channels. An interactive system was chosen because it provides a tool for accomplishing tasks as well as it receives and displays output. (Barfield 2004, 29-32.)

As stated earlier in any design process it is important to define the user group. Who are the targeted users and what we know about them? For some development projects such as intranet and extranet projects, the population is very well defined. Only limited group of users have access to the site. The dividing line between users and nonusers is clear. (Lazar 2006, 3-12.)

In order to develop a system that really works FIC will involve users in media agencies into the design process. According to Lazar (2006, 9-10) when users are involved in system development, they are more likely to use the system because it is hard for them to reject a system that they helped to build. Therefore while using the system on a daily basis it is also the users' best interest to make sure that the systems meets their needs and is easy to use.

There is no 'one right way' or any 'golden rules' to guide how to design a brilliant user interface. But there are several techniques which can be used for human centered design. Some of which are so obvious that there is not really a point using them while others are so vague that they are not worth of using at all. These techniques and guidelines do have some part to play, but the right technique must be carefully chosen to fit to a particular design project in question. In this study I have chosen to use combination of two different design methods; interactive system design and contextual design. (Barfield 2004, 135-140.)

There is no point in gathering customer data if it is not used for design. When a design team invents a system, they are not just putting bits of software and hardware together to make a new gadget. The real invention is creating a new way for people to work. When building a system for internal use or for cooperation, the goal is to transform the business through the appropriate use of technology. This new technology must fit into the larger work practice. What makes a system interesting to its users is the new work process it makes possible. (Beyer & Holtzblatt 1998, 216.)

According to Beyer & Holtzblatt (1998) the requirements embody the design. Figure 4 shows Beyer & Holtzblatt's description of a system development process. The model is based on Keller and Shumate's book, Software Specification and Design (1992). According to Beyer & Holtzblatt a development of a software product starts with "System Requirements Analysis" and "System Design". The system requirements analysis itself depends on understanding the user needs the system is to meet. Analysis is not included as a step in the standard software life cycle models.

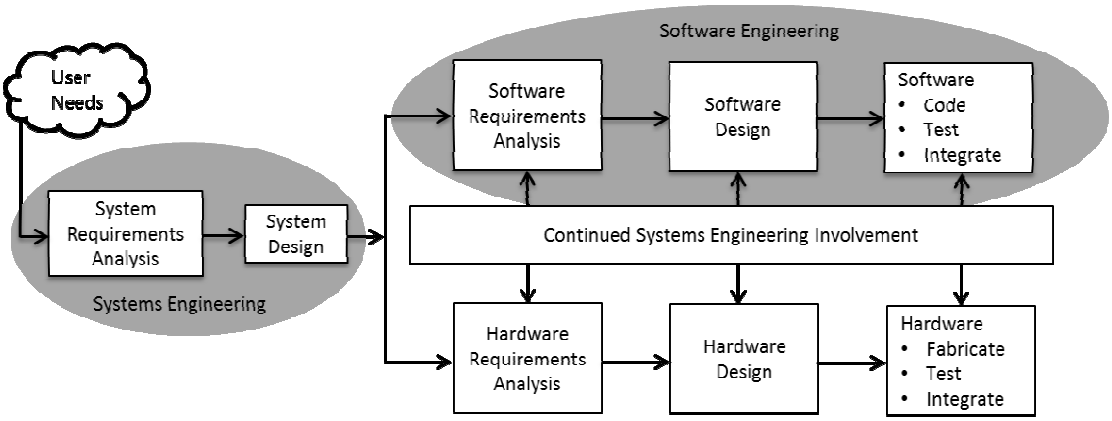

Figure 5: A system development process. (Beyer & Holtzblatt 1998, 222)

4 Interactive System Design

Benyon, Turner & Turner's (2005, 29-39) approach to interactive system design puts people first. System design should be human-centered. Before a process of system design can start it is important that the designer develops a clear understanding of the people who will be involved with the system. Also the activities that are the focus of the design, the contexts in which those activities take place and the implications for the design of technologies need to be understood.

According to Benyon, Turner & Turner (2005, 40) system design process can be characterized in terms of five activities, which are represented in Figure 5. These activities are Requirements, Envisionment and Prototyping, Evaluation, Conceptual Design and Physical Design. Evaluation is situated at the center because it is done at every step of the process. The process can start at any point. Also the activities can happen in any order.

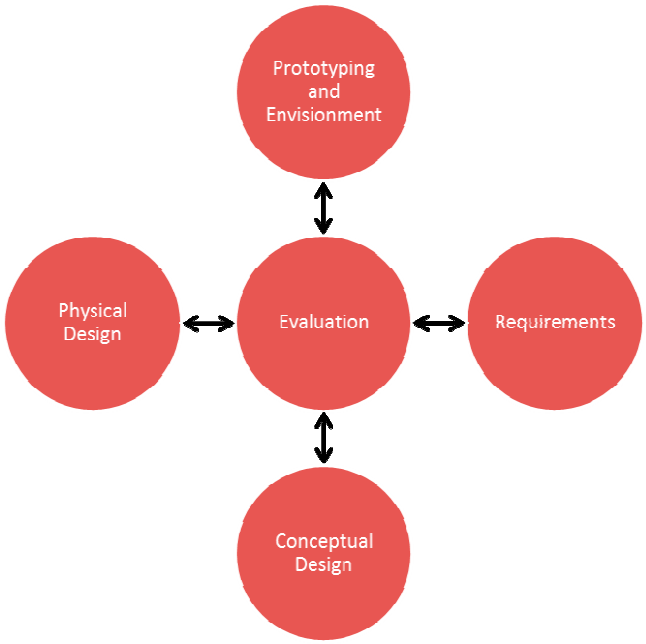

Figure 6: Activities in Interactive System Design. (Benyon, Turner & Turner 2005: 40)

4.1 Requirements

Requirements define what the system has to do and how it has to fit in with other things. Requirements can be functional or non-functional. Functional requirements are concerned with what the system must do while non-functional requirements are a quality that the system must have concerning the way the functionality operates. Requirements are generated through discussions with future users of the system. This can be done through working with people for example in focus groups or in design workshops. The goal is to collect and analyze information. When designers have this information they can develop technologies that make every day work more efficient. (Benyon & al. 2005, 40-41; 210-213.)

The reason for requirements is to understand what people do and how they do it. Furthermore they are about finding out if there is something they might want to do and if they are having any problems with the current system. After information is gathered the next step is to turn it into requirements for a new system. This can be very straightforward, but sometimes it requires a creative process. For both functional and non-functional requirements, it should be noted that how the technology will meet the requirements is not specified. This will be done in a later part of the design process. It is not unusual that additional requirements will emerge as the process continues. (Benyon & al. 2005, 210-213.)

After requirements have been gathered they should be reviewed with users and modified as necessary. Requirements are often listed with illustrations of scenarios to communicate requirements more easily. Scenarios can be described as a narrative version of the requirements specification. The next step is to prioritize the requirements and document them. Prioritizing can be done in many ways. Benyon & al. (2005, 214) represents "MoSCoW rules" where requirements are classified into:

- **Must have.** These requirements are fundamental. Without these the system is unworkable.
- **Should have.** These requirements are essential, but the system will be useful also without them. They can be taken into account if more time is available.
- **Could have.** These requirements are of lesser importance. They can be left out of the current development.
- **Want to have but Won't have** this time round. These requirements can wait till a later development.

These rules are part of the DSDM (Dynamic Systems Development method), which was introduced in 1994. DSDM is a project delivery framework, primarily used as a software development method. (Benyon & al. 2005, 214.)

To find out what people want you have to talk to them. User stories are gathered through interviews. Designers very frequently use semi-structured interviews. Interviews are covered in more detail in Chapter 6.1 of this study. Other methods for obtaining information are questionnaires, probes, focus groups, observation and collecting artifacts. These other methods are not covered in this study. Using more than one technique helps to compensate for techniques' individual limitations. (Benyon & al. 2005, 220-227.)

4.2 Envisionment and Prototyping

Envisionment is about making ideas concrete and visible. All aspects of the system should be envisioned: concepts, functions, structure and interactions. There are many envisionment techniques such as prototyping, storyboards, different forms of sketch, snapshots, mood boards, navigation maps and concrete scenarios. The goal is to represent aspects of design. Different forms of presentation are more or less useful at different stages in the design process. One form may be useful when communicating with design team, but it may not be so useful when presenting the idea to a client. Not any envisionment technique will lead to the perfect design, but they give some documentation, which can be used in the process of communicating with clients, users and colleagues. Design solutions will rise through communication. The "right" technique to be used depends on many factors. These include for example

the working style of the design team, the type of the project and the resources available. More than one technique can be used in the same project. (Benyon & al. 2005, 233-250.)

A prototype is a concrete but partial representation or implementation of a system design. Prototypes are used widely in most design domains. They can be used in early design to test details as well as at the final stage as a specification for the final product. One of the main purposes of prototyping is to evaluate designs with users. A prototype can be anything from a sketch on a paper to a full-size cardboard representing a new model of a BMW. One thing that is in common is that prototypes are always interactive. Low fidelity (lo-fi) and high fidelity (hi-fi) and are the two main kinds of prototyping. Lo-fi prototyping explores initial concepts and broad ideas while hi-fi prototyping is more suitable for detailed evaluation of "look and feel" and functionality. (Benyon & al. 2005, 253-265.)

4.3 Evaluation

Evaluation is reviewing, trying out or testing a design to discover whether the application fits for its purpose and is learnable, effective and accommodating for its user population.
To meet human-centered approach in design evaluation should be done right from the earliest idea of designs to near-complete product or system and several times between. (Benyon & al. 2005, 268-269.)

Heuristic evaluation is the most widely used form of expert review. It involves experts checking the application systematically against a list of guidelines or "heuristics" for good design. Expert review is a reasonable first step but it is important to complete the picture with some real people trying out the interaction design. The aim is to trial the design with people who represent the future target group in as realistic situation as possible. (Benyon & al. 2005, 272-274.)

Factors to take into account in user testing can be summarized into an acronym "IMPACT". Acronym is made of words intention, metrics, people, activities, context, and technology.

- **Intention**
  Often used to determine why one is evaluating. What the individual intends to seek out in their evaluation becomes essential to this step. The data is largely qualitative at this stage.
- **Metrics**
  What is to be measured and how it is measured? Common usability metrics consist of effectiveness, efficiency, and satisfaction of the individual or intended audience of it.

- **People**
  Users are the most important people in evaluation, but sometimes you will have to work with designers to obtain this information. One would have to determine their interactions with the product. One should ask the designer for information about the intended audience of the product and how they intend to incorporate it into their lives. Nielson recommends a sample of 3-5 users. Testing such a small number makes sense only if you have one main type of target user.
- **Activities**
  Scenarios of usage are considered to be the standard for analyzing the activities involved. How the design is used by the user is of great importance. Both typical uses of the technology and rare but critical events should be covered.
- **Contexts**
  The context takes into account the wider social and physical context in which the product is to be used in. This may include patterns of activity, assistance, the physical set-up of technology and social norms. These contribute to the understanding of the context of the activity in question.
- **Technology**
  Near the end of the development process for networked applications, you should take into account issues such as network speed and reliability. Also decide the technology to support the user test. How is it evaluated? What is the technology that is to be used in order to determine the success of the product's design? Is the data recorded in a spreadsheet, or just written on a piece of paper? There are several ways in which the data can be technologically analyzed in order to determine trends and the necessary metrics.
  (Benyon & al. 2005, 275-279.)

Reporting usability evaluation results completes the evaluation. At least an organized list of findings should be done to help prioritizing. (Benyon & al. 2005, 283-285.)

4.4 Conceptual and Physical Design

Conceptual design and physical design are fundamental part of system development process. Both conceptual and physical design needs to be completed in order to have a system that is understandable. A conceptual model, a set of use cases and a design language, is the minimum system specification. Conceptual design is an abstract description of the proposed system in terms of a set of integrated ideas and concepts about what it should do, behave, and look like, that will be understandable by the users in the manner intended. Conceptual design is often considered as the most critical and central stage in the design process. This is because conceptual design is the stage where the product's fundamental features are deter-

mined. Decisions made early at this stage have significant impact on other aspects of product's life cycle such as quality and cost. Conceptual design process is knowledge intensive and it requires collaboration of expertise from different disciplines. (Benyon & al. 2005, 289-294.)

Physical design is concerned with how things are going to work. Physical design also deals with how the product will look and how it will behave. Physical design turns the abstract design of a product into concrete designs. Physical design can be divided into three components. **Physical design** is about specifying how everything works and how content is structured. **Representational design** is concerned with the look of a product; colors, shapes, sizes and layout. **Interaction design** is about structuring and sequencing of the interactions. Limitations of people, such as memory capacity, have to be taken into account. (Benyon & al. 2005, 297-298.)

5 Contextual Design in System Development

Another method which can be used in system design is contextual design. It was developed in 1998 by consultants Hugh Beyer and Karen Holtzblatt. Contextual design is a practical design method which focuses on fitting software and hardware solutions to the environment. The method combines series of techniques such as: 1) familiar techniques with a new twist, 2) established techniques integrated into the method, 3) novel modeling techniques for representing work practice and the new design and 4) team building and data sharing techniques. In an ideal case contextual design is a team activity where participants share their skills. (Benyon, Turner & Turner 2005, 451-452.)

"Context is often defined as the 'human, physical, organizational, historical and social environment in which a technology is used'. (Benyon & al. 2005: 452)" The strength of contextual design is that it tells people what to do at each point so that they move smoothly through the design process. It is a very practical design method and it works like a backbone to which other tools and techniques can be added. It can be tailored easily to the needs of companies and adopted one technique at time. (Benyon & al. 2005: 452-453.)

It is essential that designers understand the customers and their work practice to be able to design a system that meets customers' real needs. Usually designers are not familiar with the work they are supporting. But they are generally more tolerant of technology that average users. Requirements gatherings means understanding how a practice is structured and imaging what technology might do to improve it. Those improvements are what is required of the system. (Beyer & Holtzblatt 1998, 21.)

The contextual design process consists of the following steps: contextual inquiry, interpretation, work models and affinity diagramming, visioning, storyboarding, user environment design and paper mock-up interviews. Each step is covered in more detail in Chapters 5.1-5.5. Contextual design has successfully been used in large, complex projects as well as on small projects as well. (Beyer & Holtzblatt 1998, 21.)

5.1 Contextual Inquiry

Contextual inquiry is a field data gathering technique that allows designers to go out into the field and talk with people about their work while they are observing them. It is essentially a combination of a focused interview and observation. One-on-one field interviews with customers are conducted in customers' work place. The contextual interview starts with a brief overview of the work and then shifts to ongoing observation and discussion with the user about the relevant aspects of work that matter for the project scope. The intent of the contextual interview is to help designers get low-level design data, which is detailed data about the structure of the practice and the use of technology within the practice. (Benyon, Turner & Turner 2005, 453; Beyer & Holtzblatt 1998, 37-39.)

The number of people that should be interviewed is directly related to the project scope. The wider the scope is, the more people should be interviewed to cover the scope. The more interviews, the more time it takes to conduct and interpret them and to consolidate the data. The goal is to get a good cross-section of the target group with a small number of participants. As long as you have overlap, you will be able to find the common structure and key variations in the work practice. (Holtzblatt, Wendell & Wood 2005, 63-69.)

The number of people to interview should be chosen by balancing several variables such as job roles to be supported, industries, and product use. The number of job roles needed to cover the design scope determines how many people per job role. According to Beyer & Holtzblatt (1998, 76) a sufficient number of interviews is six to ten people if there is only a single job role that is being studied.

If the system that is being designed will be commercial, you should go to at least four to six businesses to see variety. Office work is done very similarly in all modern corporations. These different types of companies will not give substantially different perspectives. In order to get different work practice, look for different business strategies, cultural differences, different physical situations, differences of scale. If the customer is internal, try to find similar work practice in other companies. After this people who will be interviewed should be chosen. The first round of interviews reveals the basic structure of work and needs for the new system. (Beyer & Holtzblatt 1998, 76-77.)

5.2 Interpretation Session

Within 48 hours of each customer interview the design team should meet to go through the customer data in an interpretation session. Each member of the team brings a different perspective to the data, whereas open discussion enables the team to arrive at a shared understanding. It is not enough that a member of a design team understand only the customers they visited and talked to individually. The team needs to understand every customer as though they had been present in every interview. (Beyer & Holtzblatt 1998, 127-128.)

The interpretation session is a structured way to ensure that all relevant information from the interviews is captured and shared with team members. The team develops understanding of all their customers and how they work through conversation. After shared understanding is built the information can be used in the design process. (Beyer & Holtzblatt 1998, 127-128.)

5.3 Work Models and Affinity Diagramming

What the design team should look for, and look at, in the data is the work model structure. Work models provide both a way to represent the data and a method to help people get the data they need for design. Choosing the work models depends on the project scope. Consolidating the work models enables teams to create one representation of a market so that the design addresses a whole population. (Beyer & Holtzblatt 1998, 84-87.)

There are five different models, which each represent a different facet of work. The models were developed by Beyer & Holtzblatt over the time to meet the needs of the design problems that encountered. Models represent the key aspects of work that design teams need to account for. Work models are fist built to describe work on the point of view of the one person interviewed to represent an individual perspective. (Beyer & Holtzblatt 1998, 89.)

- **The Flow Model**
  This is the best starting point for an overview of work practice and people's role's within it. The flow model also shows the information and artifacts which support the work process.
- **The Sequence Model**
  The sequence model details how tasks are performed. How people do their tasks in work reveal their strategy and intent. A system that builds on these most probably improves the work they do.

- **The Cultural Model**
  The cultural model reveals the structure and process of work. It also reflects values and attitudes. The cultural context includes also the formal and informal policy of an organization, the business climate and, government requirements. If the system which is built conflicts with its customers' values and attitudes it will not succeed.
- **The Physical Model**
  The physical model represents the physical environment where the work tasks are accomplished. The physical model is a drawing of the aspects of the environment that matter.
- **The Artifact Model**
  The artifact model embodies the structure of the work the artifact supports and the underlying intents. It also gives clues as to where the process does not work well. Artifacts are things which people create, use, and modify in the course of doing work. (Benyon & al. 2005, 257-289; Beyer & Holtzblatt 1998, 89-119.)

Each one of the five models represents a different perspective on the work. Contextual design requires consolidation of all five models. Looking at the models together reveals all the different aspects of work and how they relate to each other. Consolidation creates a coherent understanding of the work in an affinity diagram and consolidated work models. During consolidation process, designers are looking for ways in which the system can be redefined. The goal of consolidation is to generate new insights about customers and how they structure their work. (Beyer & Holtzblatt 1998, 120-123.)

An affinity diagram is an effective way of designing information architectures. It was structured to tell the story of the customer. An affinity diagram organizes the individual notes from interpretation session into a hierarchy revealing common issues and themes. The affinity shows the scope of the customer problem and key elements of work practice relevant. After creating an affinity diagram designers begin to see the features, properties and expected behaviors of parts of the new system. (Benyon & al. 2005, 481-483; Beyer & Holtzblatt 1998, 140-143; 151-163.)

5.4 Visioning and Storyboarding

Visioning is about invention. It is a technique in contextual design which helps the team to tell that story. Visioning ensures that the team concentrates on making a clear picture of how its solution will fit into the whole of the practice. Visioning's primary intent is to redesign the work practice. Usually vision is drawn as a story on a flip chart. It is a mixture of sketch and

text. The story describes the new work practice, showing people, roles, systems and anything else the vision requires. Practicality is not taken into account at this point. (Benyon & al. 2005, 489; Beyer & Holtzblatt 1998, 277-282.)

After a set of visions is created, the team evaluates each vision. Both the positive and the negative points are listed. The negative points are used to stimulate creative design ideas to overcome objections. Finally the best parts of each vision and solutions to objections are brought together into one, synthesized work practice solution. (Beyer & Holtzblatt 1998, 282-284.)

Storyboarding provides an opportunity to work out of the detail of the vision. A storyboard is a future scenario guided by the vision. Storyboarding ensures that the team does not overlook any intents and steps that are critical to the work. The design team draws step-by-step pictures of how people will work in their new world. Storyboards show what happens when the roles on the flow interact with the system and each other in a graphical way. It is not necessary to storyboard every sequence. The design team should only identify which sequences are relevant to the vision and storyboard only those. (Benyon & al. 2005, 490; Beyer & Holtzblatt 1998, 287-290.)

5.5 User Environment Design and Paper Prototype Interviews

The User Environment Design process is a collaborative way to define the purpose and functionality of each part in a system. User environment design enables the design team to view the whole system and the relationships between its parts. It forces the design team to focus on the system's function, which helps to ensure a workable and delightful user experience. An abstract representation of the whole system helps designers to get beyond thinking of the product as a list of functions and features. Because it shows all the parts of the system as the user experiences it, it becomes a tool for customer-centered system planning. Once the functionality is defined, paper prototypes can be built. (Beyer & Holtzblatt 1998, 317-322.)

To look at structure, the first prototypes are always paper. Paper makes it possible to express the structure of the system. When users interact with drawings on paper rather than fancy user interfaces they have to focus on structure. Contextual design uses paper prototypes as the means of communicating with users and bringing them back into the design process. (Beyer & Holtzblatt 1998, 371-377.)

Mock-up interviews using paper prototypes help designers understand why design elements work or fail. The paper prototypes should be tested with users in their own context. Users interact with the prototype by writing down their own content and modifying the prototype.

After the design has been tested with two to four users, it should be redesigned to reflect the feedback. (Benyon & al. 2005, 497; Beyer & Holtzblatt 1998, 371-377.)

Holtzblatt, Wendell & Wood (2005, 246) suggest "multiple rounds of interviews with two to four users to allow the team to iterate the design on user feedback". This allows testing in increasing levels of details. Prototype interviews are exciting and interesting for users. They can see progress and talk directly to developers. They can also see how their responses shape the design.

6 Research Process

Research methods used in this study are semi-structured qualitative interviews and benchmarking. Interviews were carried out over three week period in May-June 2013. A total of seven TV buyers from six different media agencies were interviewed in order to get a comprehensive sample. Although media agencies' role is similar when it comes to media buying there are some 'cultural differences' between media agencies. To ensure a good flow in the discussions the interviews were recorded by audio-recording.

Besides the interviews data was gathered through benchmarking. Although FOX International Channels operates in several countries besides Finland there is no booking system for media agencies in any other country. Unfortunately I could not get an access to competitors' booking systems so that I would have seen how they work. Luckily while I was interviewing TV buyers in media agencies I was able to gather some valuable data on competitors' booking systems through the interviews which can be used for benchmarking.

6.1 Qualitative Research Interviews

Interviews are useful tool for collecting information and are regularly used in traditional requirements gathering. Interviews can be categorized into three types based on the level of formality and structure. The three types are structured interviews, semi-structured interviews and unstructured or in-depth interviews. Structured interviews use questionnaires based on a predetermined idea and identical set of questions. They are used to collect quantifiable data. That is why they are often referred to as "quantitative research interviews". Both semi-structured and unstructured interviews are non-standardized. They are often referred as "quantative interviews" (Saunders, Lewis & Thornhill 2009, 320).

In semi-structured interviews the researcher has a list of themes and questions to be covered. Questions may vary from interview to interview. This means that you may leave out some questions in particular interviews, if they are not relevant. The order of the questions may

also be varied depending on the flow of the conversation. Additional questions may be required to explore the research and objectives within particular organizations. Unstructured interviews are informal. There is no predetermined list of questions to be covered, but you need to have a clear idea about the aspects you want to explore. Every qualitative interview is unique, shaped by the personality of the interviewer and the interviewee. (Saunders & al. 2009, 320-321).

There are two main key characteristic for qualitative research. The first one is that the researcher takes more detailed interest in human experiences. The second one is that less people are interviewed. With qualitative research the researcher is focusing on a particular subject of interest. The researcher wants to know everything concerning that specific subject to draw more accurate assumptions. The interviewee should be encouraged to share personal experiences. In order to get realistic answers there needs to be a relationship based on trust and confidentiality between the interviewer and the interviewee. (King & Horrocks 2010, 2-10.)

The success of a qualitative research interview is not only based on the fact how well the interviewer is able to ask questions and later on analyze the data. When designing an interview the importance of the questions is clear and how they will be presented to the participant have an effect how the answer will come out. (King & Horrocks 2010, 41.)

The structure of the interviews followed mostly the structure of contextual interviews except on that part that they were not conducted in the user's workplace and did not focus on observation of ongoing work. This was not possible, because of my current work role in advertising sales in FOX International Channels. It was not possible for me to see competitors' (other TV medias) booking systems and customer-specific information which is available in the systems. Only three out of seven interviews were conducted in the user's workplace, but still in a meeting room not at the workstation.

I do not necessarily see this being a major drawback. Referring back to Chapter 5 it is essential that designers understand the customers and their work practice for being able to design a system that meets customers' real needs (Beyer & Holtzblatt 1998, 21). Usually designers are not familiar with the work they are supporting but that was not the case for me as I was a design team member. After six years work experience in the media sector media agencies and their way of working have become very familiar to me. I also already had an idea of the key functionalities in the other competitors' booking systems.

I chose contextual interviews as a method because they produce large amounts of customer data. As mentioned in Chapter 5.1, the goal in contextual interviews is to get a good cross-section of the target group with a small number of participants. (Holtzblatt, Wendell & Wood 2005, 63.)

Contextual interviews included total 14 questions (Appendix 1) regarding Usability, Reports, Reminders, User Rights and Screen Layout Design. Questions varied little from interview to interview; some questions were already covered earlier at some point in the interview and for that reason were left out. In some interviews I also made some additional questions to explore particular subjects more in detail.

I recorded all the interviews. The data was then transcribed and documented. Transcribing is not something that contextual design suggests doing, but I chose to do it. The reason for this was that the interviews were conducted in Finnish and the language used among the design team is English. Analysis of the data was carried out qualitatively. Chapter 6.3 presents the analysis methods more in detail.

6.2 Benchmarking

Benchmarking was introduced by Xerox Corporation in the late 1970s but it has since become a common term and a popular method. Benchmarking is used to compare companies or applications with each other. The main idea is to familiarize with the competitor's products and compare them to your own to find out what the best and worst aspects are. The best ones can be copied and the worst should be avoided if possible. To be better than the existing ones there has to be something more to offer to be successful and to avoid the mistakes the competitors have made. (Coers, Gardner, Higgins & Rayborn 2001, 1-10.)

According to Coers & al. (2001, 8) benchmarking is about being humble and admitting that others do business as well as you. As a method benchmarking is an important tool in finding something that has already been invented and trying to pick the best practices. This reduces the efforts needed by the organization itself when it comes to developing something new.

Benchmarking always includes comparison and interest in what the other companies or organizations are doing and how they are functioning. The motivation for benchmarking arises from the motivation to maintain and improve competitiveness of the company. One of the explanations for the popularity of benchmarking is that the method gives a permission to be positively curious when following the actions and processes of competitors or another party. (Karjalainen 2002, 10-17.)

In this study benchmarking was used to support the booking system design process. It was not possible to get access to competitors' booking systems. Benchmarking was done through the interviews in media agencies. While I was conducting the interviews I also received a lot of information about the booking systems they are currently using in media agencies. Benchmarking was used in order to avoid the same mistakes than competitors have done with their systems.

6.3 Data Analysis Methods

In order to be useful qualitative data needs to be analyzed and meanings understood. There are several analysis methods from computer aided software to manual ones. In this study I chose to follow partly methods used in contextual design and partly the ones used in interactive system design.

Right after each interview I walked through the customer data with our design team leader. This is a step that belongs to contextual design. Beyer & Holtzblatt (1998, 127-128) suggest that these interpretation sessions should take place within 48 hours of each customer interview. In the meetings we went through the customer data. We discussed about some of the issues and the reasons why they are so vital in more detail. This was necessary because being a foreigner she does not fully understand business practices in media agencies in Finland. After the interpretation sessions I summarized the transcribed data and wrote a memo in English (Appendix 2, Confidential), which was then sent to all relevant people in our design team.

After the interpretation sessions I continued analyzing the data into requirements using 'MoSCoW rules'. MoSCoW rules area a method used in interactive system design process where they are used to prioritize the requirement as described in Chapter 4.1 of this study. I classified the requirements into 'Must have', 'Should have', 'Could have' and 'Want to have but won't have' requirements. Illustration 1 shows the final outcome of classifying: each color of Post-it® notes represent one type of requirement.

The requirements specification was also sent to the design team members. According to Benyon, Turner & Turner "Requirements should be expressed in clear, unambiguous language, and worded so that it will be possible to test whether the requirements has been met in the final product" (2005, 211).

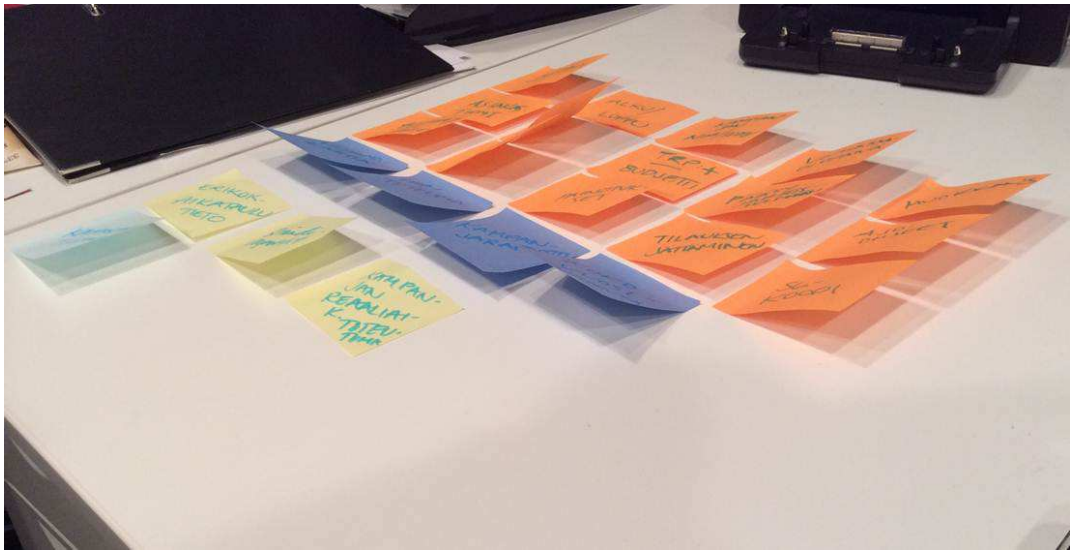

Illustration 1: Data analyzing with the help of MoSCoW rules.

The requirements were also sent to SintecMedia, the company responsible of the software engineering. They started to do some software development already at this stage.

7 Key Findings of the Interviews

In this chapter I will go through some of the findings of the interviews. A more detailed description was given to my employer.

Interviewing a total of seven TV buyers was a sufficient amount. After four interviews the content of the interviews started to repeat themselves; I did not receive any new information, only bits of pieces to complete the information I already had. Beyer & Holtzblatt (1998, 76) think a sufficient number of interviews is six to ten people if there is only a single job role that is being studied (see Chapter 5.1). That was the case here. The interviewed people represented different media agencies, but their job roles were similar. It was interesting to notice that only three out of seven interviewees named the company which booking system they referred to.

At the moment none of the booking systems which media agencies are using is ‘perfect’. Every booking system has its pros and cons. One interviewee thought that a booking system which would be a combination of the best aspects of different booking systems would be nearly perfect. Two of the interviewees mentioned a technical problem with one of the current systems in use. This problem was transmission time and speed of access while working with reports.

It came across very clearly that the main function which the booking system should have is campaign booking. That is why the system exists. All other functionalities are not that important. It would definitely be a good thing if reports (campaign reports, yearly follow-ups etc.) could be run out of the system.

In general the TV buyers are happy that FIC will have a booking system. They feel that the current 'e-mail booking' is working ok, but it is not reliable and sometimes the response time to a campaign request feels long. It is not unusual that people in media agencies work late hours. It might happen that after regular office hours a TV buyer needs some kind of client report that she does not currently have an access to herself. This information can be for example a client's past campaigning on FIC or a yearly follow-up report. At the moment a TV buyer has to wait until next morning when someone at FIC sends her the report.

A booking system will make a campaign booking process more structured and reliable and will save time. Three interviewees thought that the time used in the process of booking a campaign should not take longer than the current 'e-mail booking'.

It was clearly stated that the system should be kept simple. FIC should rather have a system that is simple and working than a system that is complex and full of bugs. It was clearly emphasized by all interviewees that before the system goes live it should be tested. All of the TV buyers said that their media agencies are willing to test the system. One interviewee also said that updates to the system should not be made constantly - at least not during the working hours which can be long in media agencies.

A research by Vlosky, Fontenont & Blalock (2000) on how extranets impact business practices and business relationships supports my findings. They examined the benefits of an extranet. The top five benefits are timeliness of information exchange, increased value to customers, improved service to customers, improved competitive position and increased access to industry information. They examined businesses of all sizes and across all industries.

8 Conclusions and Suggested Next Steps

The next step in the booking system design process is to start paper prototype interviews. How to use paper prototypes in contextual design was covered in the Chapter 5.5. Following gives more practical insight to the matter.

As a paper prototype is a paper representation of a product it allows testing with users interactively. The paper prototyping process consists of three major steps which are preparation,

prototype building and changing the design based on the feedback. The process is described in Figure 6. The first step is “Preparation”. In preparation the rounds of iteration should be planned and data and space prepared. The second step is “Building paper prototypes” and the third step is “Changing the design based on user feedback”. (Holtzblatt, Wendell & Wood 2005, 246-247)

Figure 7: The process of paper prototyping. (Holtzblatt, Wendell & Wood 2005, 247)

Testing is an important part of any system development. The sooner possible problems are found, the less it costs to fix them. The objective of usability testing is to make real users try a new product or a prototype under detailed observation in order to reveal interaction problems.

In this project a minimum of three rounds of prototypes testing with three to four users should be conducted. In the **first round** the intention is to test the vision and the structure of the design. This should be done by using very rough prototypes with everything hand-drawn on a paper and Post-it® notes. An example of a prototype used in the first round is represented in the Illustration 2 below.

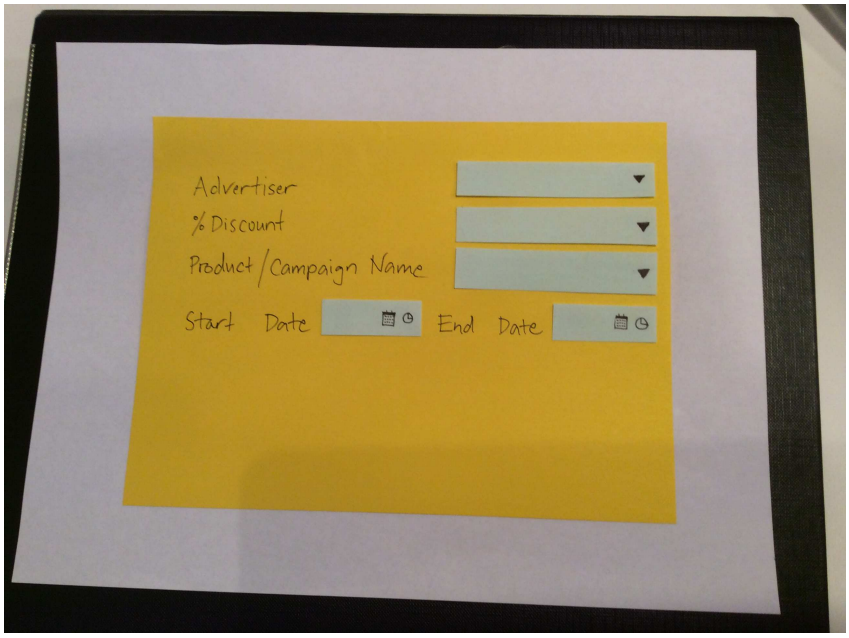

Illustration 2: A picture of a prototype which is used in the first round.

On the **second round** more processed, but still rough prototypes should be used. The intention is to clean up the structure of the design and also to speed up the creation process. On the **third round** prototypes have enough definition of the user interface to test it and the content of the prototype. The intent is to make sure that the user interaction design and words work for the user. (Holtzblatt & all. 2005, 247.)

When building prototypes various paper components should be used. Any part of the interface that might move or be moved has to be movable; for example buttons and pull-down menus. An example of how a pull-down menu can be created in a prototype is presented in Illustration 3. (Holtzblatt & all. 2005, 255.)

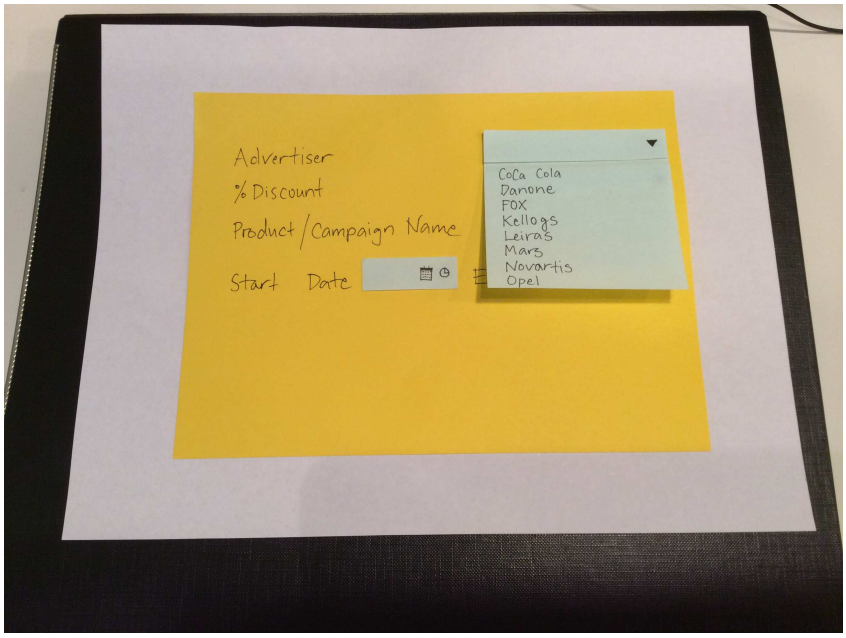

Illustration 3: An example of how a pull-down menu can be presented in a prototype.

A link for every major UI component you are testing should be created. Everything needs to be represented. This means that you should not have any hidden functions in the prototype UI. To give the user a sense of context and to help them map the prototype to their current work includes example data or content, but make it removable. Finally you should create stimulus areas for new content because sometimes the design implies presenting a new kind of content. (Holtzblatt & al. 2005, 255.)

Once all of the paper prototype interviews are completed and interpretation sessions are completed it is time to move on to the software engineering process. When the software is ready it should be tested again with some of the users. User testing with real users is the most fundamental usability method. It provides direct information about how people use computers and where the possible problems are. According to Nielsen (1993, 165) five users should be able to identify about 85 % of all usability problems. I suggest that this testing should be conducted with two to three people (total 4-6) from two different media agencies in order to get the system fully tested.

After software testing the system is ready to go live, but the development should continue. System development is an ongoing process which is never ready.

9 Discussions

At this point of the design process it is impossible to say how the project will succeed. Along the way the booking system development project has had its up and downs. The process which started as a booking system design project for media agency use in Finland has turned into something much bigger. The booking system will be brought into use in other FIC countries as well after the system has been successfully executed in Finland.

This project will most likely succeed but partial failure is possible. As I am a novice in system design there is a possibility that I might have made mistakes when dealing with system requirements work. The cultural differences and language barrier may also set challenges for the project to be successful. For example there might be some common practices in media buying which for some reason do not apply in Finland. If the software developers assume that these practices are used in Finland and they are not, this can cause that the system does not work properly. Also the English terminology may cause some human errors because the booking system design is done in multinational team in which the members are from Finland, Israel and United Kingdom.

The media agency booking system will be a module of FIC's internal advertising management system. This means that these two systems will share some information. FIC's internal advertising management system is a system, which contains data from several FIC countries beside Finland. This means that booking system developers have to find a way how to filter only the relevant information. If this is not done the result will be that the booking system is not user-friendly as it contains a lot of data that is not relevant.

The software engineering will be done in Israel by SintecMedia. The company is an established provider of media business management solutions for television world-wide. This expertise gives FIC complete confidence to believe that the project will be successful and the outcome will meet the user needs.

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Illustrations

Figures

Appendices

Appendix 1: Questions for Media Agency Interviews

USABILITY

1. What is important in the booking system? What should be taken into account (functionalities etc.)?

2. What is not important?

3. What pros and cons other booking systems have?

4. How long does it take to book a campaign approximately in other booking systems?
    - Are you experiencing some technical difficulties when booking?

5. Why do you see it as a positive thing that FIC will have a booking system?

REMINDERS

6. Are automatic reminders (concerning due dates etc.) a positive thing?
    - If yes, when/how often?
7. Are reminders regarding spot delivery / spot driving instructions necessary?

VIEW

8. What information should be seen in campaign booking window?
    - Is there any other wishes regarding it?

USER RIGHTS

9. How should user rights be dealed with?
    - Personal or one username per office?

REPORTS

10. Is it necessary to have a spot list of a campaign?
    - Should it be automated?

11. What kind of reports should be available?

12. Should some reports be 'automated' in that way that they would automatically be send to your e-mail when available?

13. How far behind should reports be available?

OTHER WISHES?

14. Is there some other hopes/wishes what we should know when designing our booking system?

Appendix 2 (Confidential)

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