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Digital Wayfinding in Multichannel

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To Whom It May Concern

This thesis has been produced for the Master's Degree program of Industrial Management, and as such is extremely academic in nature. The text itself is a nuisance to read for most of the people, but this shouldn't keep anyone from getting introduced to the topics of this thesis.

The main ideologies are multichannel, wayfinding and customer management in multichannel. All of them interesting subjects, with a lot of interesting details. I would advise anyone having issues with the academic writing to jump straight to the building of the model. All the ideologies mentioned earlier, work as their own entities, so even without the wayfinding need, the notions of multichannel and customer steering (between channels) are quite general for all types of activities. The research itself is rigorously executed and all the results point to the same way, although this might not come across from the text as much as it should. This could be a case where further clarification is needed on the subjects. In that case feel free to contact me for further knowledge.

I would like to express gratitude to all who participated in this project, you know who you are and I am grateful for all your efforts. Special thanks go to Mom, for always believing in me, even when no one else did. I feel privileged to have been accompanied by such an influence throughout my life. Happy mother's day, and sorry for missing it!

Try not to become a man of success, but rather try to become a man of value – Albert Einstein.

Samuel Pirinen
11.5.2015

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This study concentrates in building a digital wayfinding model for a multichannel environment. The study explores the building of the model through gaining understanding of multichannel design, wayfinding and customer steering in the channels.

This research conducts three discussions and observation to analyse the current state, the collected data is later analysed through qualitative methods.

The current state analysis examined the current solutions implemented by the case company and evaluated the individual approaches. Based on the evaluation, the study identified strengths as unambiguous, measurable, navigational and multichannel. Furthermore the study focused the best practice in wayfinding, multichannel concepts and customer steering and measurement.

Based on the above mentioned, the study suggests the case company actions on the identified issues. The recommendations are built for the model draft as effective wayfinding, creation of multichannel strategy and steering customers in multichannel environment.

The topics provided concrete actions for the case company. Found actions for the case company are to establish a multichannel strategy, determine the hierarchical division of the airport and measure the results.

Keywords	Multichannel, Wayfinding, Digital Signage

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1 Introduction

This study focuses on creating a model of a wayfinding solution for a multichannel environment, in order to guide customers at the Helsinki airport. The model proposed in this study takes advantage of the multichannel possibilities including the traditional signage, digital signage, web and mobile. The multichannel possibilities defined in this study can as well be adapted to additional digital channels, following the principles described.

Wayfinding is generally composed of three main processes, making a decision, executing the decision and processing information (Passini 1996: 322). The process of wayfinding can be described as follows. Firstly the decision to search for a particular item or place is performed. Secondly the execution of the decision, or finding the route is commenced. Thirdly the information is processed, thus creating the spatial knowledge on the surroundings. Subsequently the movement to the desired location can begin. While Passini (1996) and Darken et al. (2001) determine that wayfinding does not involve movement, Golledge (1999), as well as this study define the wayfinding to end once the desired destination is reached. The action of searching for a location is not tied to a time or place, due to the possibilities brought by the digitalization of services around. The process of wayfinding can be initiated while browsing the web at home, or through a mobile device while commuting to work. The starting place for wayfinding is therefore open and like the decision, the execution can further take place in any environment. This provides the grounds for this study to research wayfinding in a multichannel environment.

A multichannel environment consists from a variety of individual channels, such as traditional signing, digital screens, mobile application and the like. Commonly in large venues such as hospitals, shopping malls and airports, wayfinding is presented to assist visitors navigating the often complex buildings. The traditional signing is implemented in the forms of static signs, displaying arrows and maps, however in recent years the use of digital signage in wayfinding has been growing in popularity and is often available especially in complex buildings (Kim et al. 2011). The digital signage solution commonly consists of a digital screen with a

specific application. In this application users can search an object and find the route to that object. These two notions visualize two different channels of same purpose and different approach. A multitude of additional channels are as well available and the number is increasing.

1.1 Key Concepts

The key concepts for this study are *wayfinding*, *multichannel concepts*, and *customer steering*. Wayfinding is an action of finding a way to a particular location of interest. This incorporates the understanding of the location, where to start, the route to travel and the journey to the location. Static signs and maps are generally utilized in order to provide knowledge on the environment, as well as mobile phones, digital screens and a multitude of other approaches. In this type of multichannel environment, the *multichannel concepts* are discussed. The notion of multichannel is an interaction of the company and customer in more than one channel. These channels can be static signs, digital screens, mobile phones or any channel where the customer and the company interact. With the multitude of channels for interaction, the shifting of customers between the channels becomes important. The notion of *customer steering* means the steering of customers between the channels. Generally leading to increased benefits for both parties. The indicated benefits can be the increased usefulness of a channel to the customer and shifting the customer to the more useful channel is the steering effort.

1.2 Case Company Background

The case company of this study is Finavia and Helsinki Airport. Finavia is a public limited company and completely owned by the Finnish State. The main objective for Finavia is the development and maintenance of the airport infrastructure in Finland and in the heart of their strategy is the development of the Helsinki Airport, having a significant role in financing the airport network of the rest of Finland. Helsinki Airport is the largest airport in Finland, with more than 15 Million passengers travelling through the airport in 2013 (Finavia, 2014). Furthermore Helsinki Airport offers a multitude of services to customers. The services include the guidance of passengers, refreshments such as food and drinks, shopping possibilities and a

several additional services, ranging from book rental to parking services. Locating the services is important for the passengers and for the success of Helsinki Airport.

For the occasional passenger, the Helsinki airport is a fairly easy airport to navigate. The airport consists of two terminals, which are located within 250 meters of each other, and the terminals are linked by an indoor pedestrian connection. The airport is as a consequence completely accessible by walking (Finavia 2014). Currently Finavia utilizes a multitude of channels for customer interaction and the channels are an important source of information for many. Nevertheless, the channels provide insufficient wayfinding and as the business challenge suggests, a coordinated approach would presumably provide additional benefits.

1.3 Business Challenge

There are more than 15 million passengers travelling through the Helsinki Airport and every passenger requires wayfinding in order to reach their flight or exit the building. Currently the case company utilizes a multitude of independent approaches in the steering of travellers and a coordinated approach of the channels, as well as improvements in wayfinding has the potential of providing increased benefits to the case company and customers.

1.4 Objective and Scope

The objective of this study is to build for the case company a digital wayfinding model for the multichannel environment of the Helsinki Airport. First the study analyses the current state of the solutions and studies the best practice of *wayfinding*, *multichannel concepts* and *customer steering and measurement*. Secondly the study builds a model draft based on the findings and presents it for the case company. Thirdly the final model is built based on the company feedback.

The study is written in seven sections. In section 1, key concepts, case company background, objective and scope are introduced. Section 2 describes the research design, data collection methods and data sources. The section furthermore introduces the validity and reliability plan of the study. The current state analysis is assessed in section 3, where the findings are analysed and the strengths and

weaknesses outlined. Section 4 introduces the best practise of *wayfinding*, *multi-channel concepts* and *customer steering and measurement*, finishing to the conceptual framework of the study. Section 5 builds the draft of the model and section 6 finalizes the model based on the feedback from the case company. Section 7 discusses the summary, evaluation of the study, outcome versus objective and the reliability and validity of the study.

2 Method and Material

This section describes the research design, data collection and the validity and reliability plan is of this study.

2.1 Research Design

The research design of this study is organized in six stages with three data collection rounds. The research design is illustrated in figure 1.

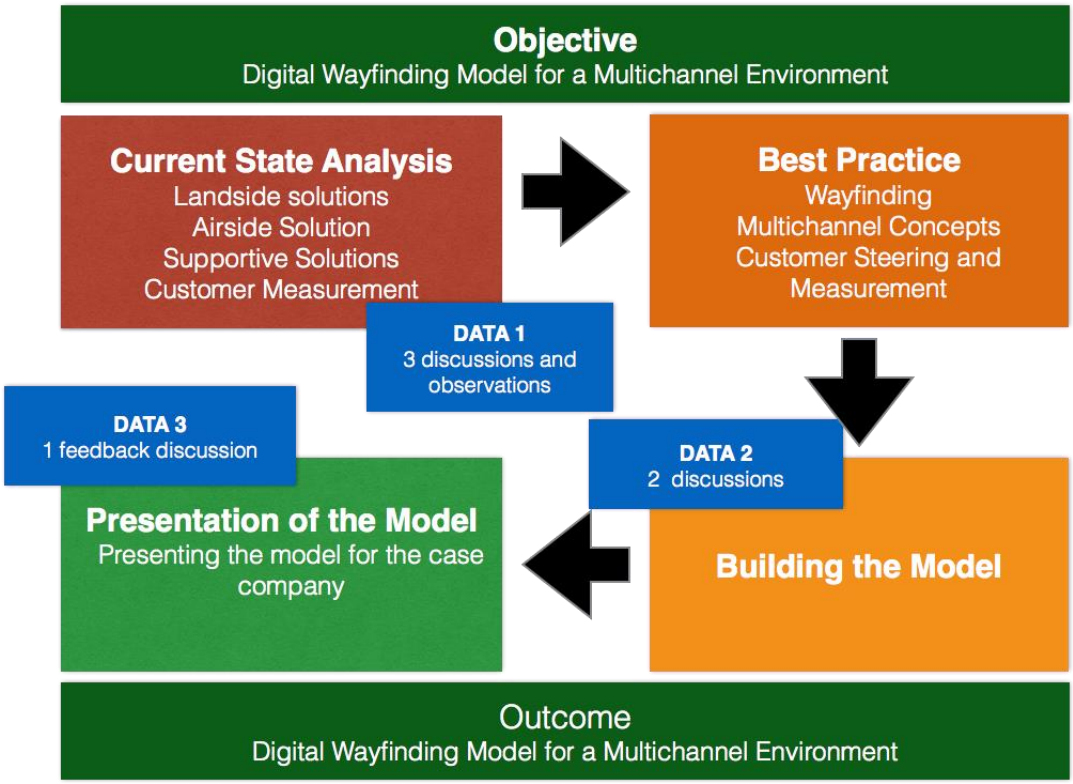


Figure 1. Research Design.

As visualized in figure 1, the objective for the study is the Digital Wayfinding Model for a Multichannel Environment. The approach to the research can be described as follows. First the current state analysis is conducted in order to gain knowledge on the strengths and weaknesses of the current solutions. Secondly the best practice is examined, where the objectives defined the topics as *wayfinding*, *multichannel concepts* and *customer steering and measurement*. Thirdly the model draft is

built. Here the best practice is used in conjunction with two discussions, in order to build the draft of the model. Fourthly the model is presented to the case company and feedback gathered. The final model is built based on the feedback and finally the outcome is reached. The three data collection rounds in this study include discussions and observations.

Data collection 1 was organized in order to gather knowledge on the solutions currently present at the airport and to gather information on the possibilities for the wayfinding. This data collection consists of three discussions and observations. The discussions were held face-to-face as open discussions. The purpose for open discussions was to create a trusting atmosphere of colleague-to-colleague discussion. Table 1 presents the participants, topics, date and documentation of data 1.

	Type of Data	Participant	Topic	Date	Documentation
1	Discussion	Analytics company, 1 person	Analytical data on tracking customer and their behaviour	17.2.2015	Field notes
2	Discussion	Case company, 1 person	Theme for the study, where to focus.	18.3.2015	Field notes
3	Discussion	Integrator, 1 person	Knowledge on wayfinding solutions, ideas and insights.	31.3.2015	Field notes

Table 1. Information on data collection 1.

The discussions were held during office hours as face-to-face meetings. First discussion was held with a company providing customer measurement solution. The discussion provided information on the analytics of customer behaviour, as well as understanding on the current technical possibilities. Second discussion was an open discussion with the case company representative, where the case company expectations and theme for the study were discussed. Third discussion was held with a digital signage integrator, having several years of experience in digital signage and wayfinding solutions. This discussion focused on the general applications of wayfinding and creating understanding towards the technical limitations of wayfinding. Data collection 1 consisted of observations as well. The researcher acted

as a consultant for the case company and observed the operations related to way-finding. The observations were documented as field notes and used in the creation of the current state analysis regarding the solutions presently at the airport. The project lasted a total of 4 months and previously the researcher has acted as a consultant in similar projects for several years. This project included non-participant observation.

Data collection 2 consists of two discussions. The objective of the discussions was to gather ideas, knowledge and understanding in order to build the model draft. Both discussions were conducted as open discussions where the current findings and best practice were introduced in the beginning of the discussion. The data was collected as field notes. First discussion respondent was selected due to the expertise and knowledge of online services. The discussion was carried out after office hours, face-to-face in the meeting room of the respondent company. The second discussion in data 2 was conducted through a teleconference call. The respondent was selected due to expertise in multichannel concepts and prior stake in an airport digitalization project. The discussion was held during office hours between the respondents meetings, thus being short in nature. Table 2 presents the participants, topics, date and documentation of data.

	Type of data	Participant	Topic	Date	Documentation
4	Discussion	Online services, 1 person	Model building discussion, gathering ideas and understanding.	22.4.2015	Field notes
5	Discussion	Multichannel concepts and airport digitalization, 1 person	Model building discussion, gathering ideas and understanding.	27.4.2015	Field notes

Table 2. Information on data collection 2.

Data collection 3 consists of a single discussion. The discussion was carried out as follows. Firstly the findings of the current state analysis were introduced. Secondly the conceptual framework and the grounding of the choices were introduced. Finally the model was presented in detail with the concrete steps for the implementation of the model draft included. Further the participant was encouraged to share opinions whenever they would come up.

The discussion participant is from the case company and has been the sole contact during the project. The discussion was carried out during office hours and face-to-face in the meeting room of the case company. The data was collected as field notes. Table 3 presents the participants, topics, date and documentation of data.

	Type of data	Participant	Topic	Date	Documentation
6	Discussion	Case company, 1 person	Presentation of the model draft and feedback for the model draft.	27.4.2015	Field notes

Table 3. Information on data collection 3.

Data collection 3 is the final collection of data for this study. From the feedback of the discussion, the draft of the model is developed to the final model.

2.2 Validity and Reliability Plan

Validity is generally defined as “the state or quality of being sound, just, and well-founded” (Whittemore et al. 2001). Further Whittemore et al. (2001) includes that the general components describing validity are equally reasonable in qualitative, quantitative or mixed studies. An important validity measure especially in qualitative studies is the process of gathering information from the interviews or discussions. A risk in qualitative studies is that the participant is expressing different views due to the discussion situation, opposed to real views based on their knowledge and experience (Silverman 2011:366). To increase the validity of this study, the discussions are held as open, colleague-to-colleague situations in order to ensure that the experiences and opinions of the participants reflect their true self, and are

not influenced by the discussion situation. Furthermore a chain of evidence should be visible to the observer. By creating a chain of evidence from the objective to conclusions, further validates a study (Yin 2003:34-39). To further increase the validity of this study, transparency of data from objective to outcome is established in order to create a valid chain of evidence and by ensuring that the outcome matches the objective. Additionally the data from discussions is validated against the best practice, in order to accomplish a triangulation of data as proposed by Maxwell (1996). Validity is reached by triangulation when two or more research methods provide the same results (Maxwell 1996).

Reliability of a study refers to the trustworthiness and consistency of a study. For qualitative research, Long and Johnson (2000) propose three tests of reliability. *"Stability* is established when asking identical questions of an informant at different times produces consistent answers. *Consistency* refers to the Rigor, reliability and validity in qualitative research integrity of issues within a single interview or questionnaire, so that a respondent's answers on a given topic remain concordant. *Equivalence* is tested by the use of alternative forms of a question with the same meaning during a single interview, or by concurrent observation by two researchers.*"* To increase *stability,* the discussions follow a common theme, within the discussions and between the discussions. Following the selected theme of the discussion and repeatedly iterating the notions against the grounding provided, improves the *consistency* of the study. Following common themes in the interviews increases the *equivalence* of the study, when the notions are cross-examined by different respondents. Additionally a clear chain of evidence is maintained throughout the study for external observer to follow the path from the initial objective to the conclusions (Yin 2003:105).

3 Current State Analysis

This section discusses the current state of the wayfinding at the Helsinki Airport. The findings are collected from three discussions and observations.

3.1 Landside Solutions

The observations take place in Terminal 2, due to the greater number of passengers and substantially larger area opposed to terminal 1.

Traditional signing, digital screens and a large Flight-Information-Display (later FIDS) can all be found from the main area of terminal 2. The main departure area of terminal 2 can be seen from picture 1.

Picture 1. The main departure area of terminal 2.

Picture 1 depicts the main departure area of terminal 2. The customers enter through the main doors located on left of the picture. As seen from the picture, the large FIDS monitor is in the centre of the terminal, and additionally has eight digital displays underneath.

In the entrance of the terminal, a digital screen is implemented to display the departing flights and their corresponding check-in counters. This is the start of the airport navigation. The digital screen is displayed in picture 2.

Picture 2. Digital flight information display.

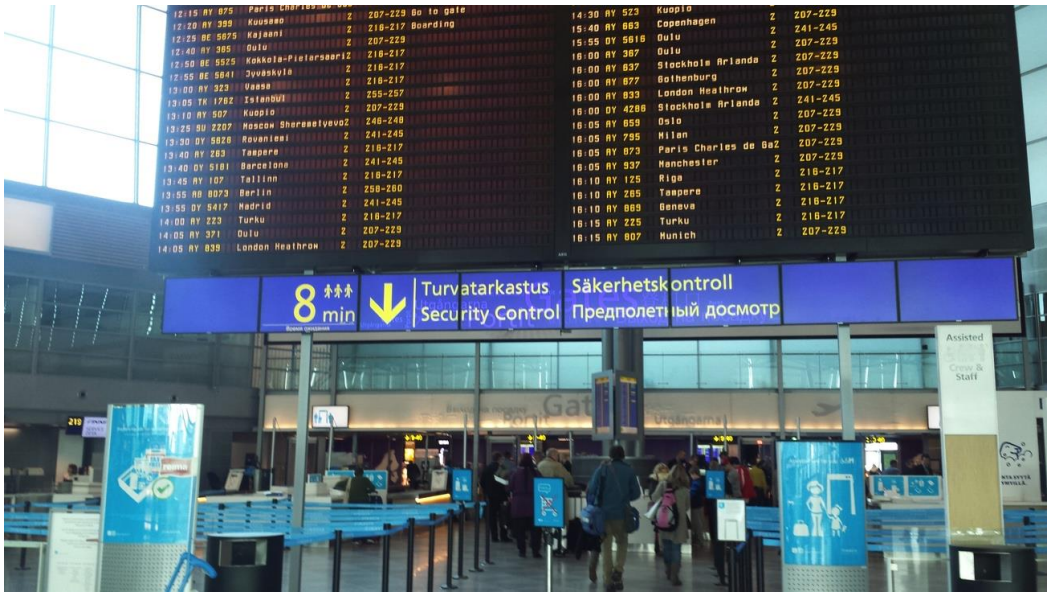
As observed from the picture, the digital screen includes information on the flight schedules, flight numbers, terminal identification and the check-in counters. The small arrow is showing the direction of the check-in counter relative to the screen.

After the digital screen, the second solution is the large FIDS monitor in the centre of the terminal. A close-up of the FIDS is displayed in picture 3.

Picture 3. The FIDS monitor in terminal 2.

As the picture visualizes, the FIDS offers information on flight schedules and check-in counters. The FIDS can thus be considered as a partial solution for navigating, due to the lack of any showing routes or directions.

Lower part of the FIDS incorporates eight small digital screens for additional information. The digital screens currently display the estimated queuing time at the security check, while additionally informing the customers of alternative, less crowded security checks in case of congestion. A close-up of the screens is displayed in picture 4.



Picture 4. The lower displays on the FIDS.

The estimated queuing time is based on the number of passenger at the security check. In the event of long waiting times, the screens inform the customers to an alternative security check.

Additionally there is standard signing for the customers. The signs are large in size and show the information in three languages as well as symbols. Standard signing is displayed in picture 5.

Picture 5. Standard signing.

The signing at the airport is particularly to the primary services, such as gates, check-in counter and for a variety of services associated with airport functions. As displayed by the picture, they are ubiquitous and static in nature.

The solutions present at the terminal 2 are visualised with red circles in picture 6.

Picture 6. The highlighted solutions of the main departure area of terminal 2.

As seen from the picture 6, a limited number of solutions exist currently. The summary of the landside solutions and features can be found from table 4.

Solution	Time	Flight	Check-in	Flight Status	Directions
Signs	-	-	-	-	X
FIDS	X	X	X	X	-
Digital Screens	X	X	X	X	X

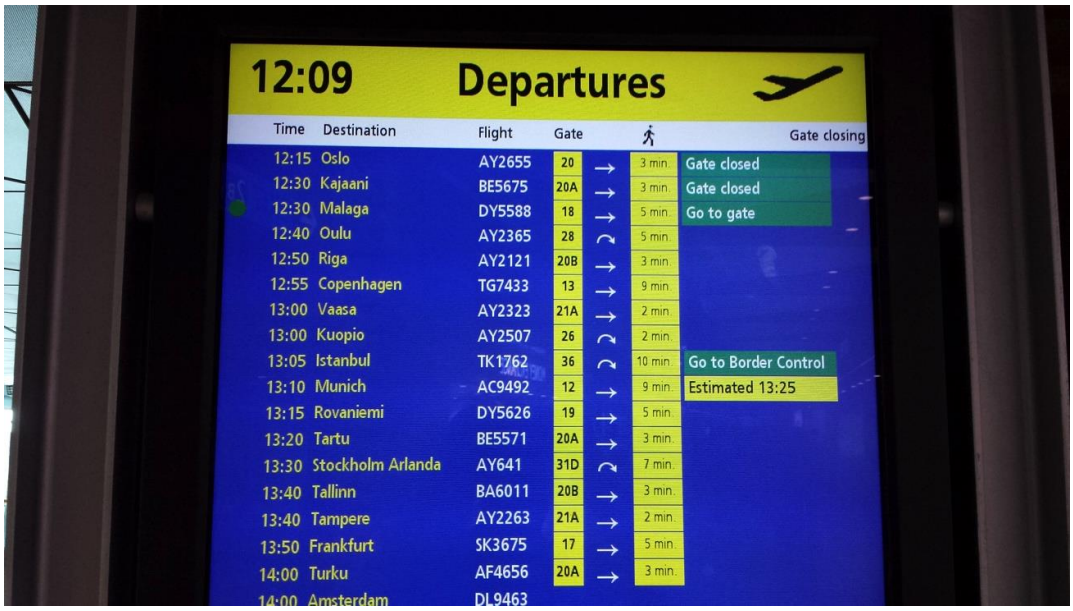
Table 4. Landside solutions and features.

Table 4 visualizes the solutions and their features together. The first four features are information about the travel. The time the plane leaves, flight number, check-

in counter and the status of the flight (go to gate, boarding or leaving). The last feature is the navigational feature, displaying the direction to travel. The solutions on the landside were presented in this section and the airside solutions are presented in the next section.

3.2 Airside Solutions

The security check is the division between the landside and the airside. Succeeding the security check, a digital screen is introduced to the passengers. The digital screen on the airside introduces two additional information fields compared to the digital screens on the landside. The layout of the screen is displayed in picture 7.



Picture 7. The digital screen on the airside.

In the digital screen the stick figure symbol is showing the direction of the gate similar to the screen on the landside. Additionally the information for the estimated travel time and the status of the flight is visible.

Due to the greater number of secondary services available in the airside, the signing is not as focused to primary services as on the landside. Picture 8 displays two different static signing solutions.

Picture 8. Map, sign and FIDS side-by-side.

As picture 8 displays, the solution on the left is displaying directions to a variety of secondary services. In the center of the picture, both primary and secondary services are listed jointly with the map of the airport. The digital screens discussed earlier are displayed on the right side of the picture. The summary of the airside solutions and features can be found from table 5.

Solution	Time	Flight	Check-in	Flight Status	Directions	Layout picture	Travel time
Signs	-	-	-	-	X	-	-
Maps	-	-	-	-	-	X	-
Digital Screens (airside)	X	X	X	X	X	-	X

Table 5. Airside solutions and features.

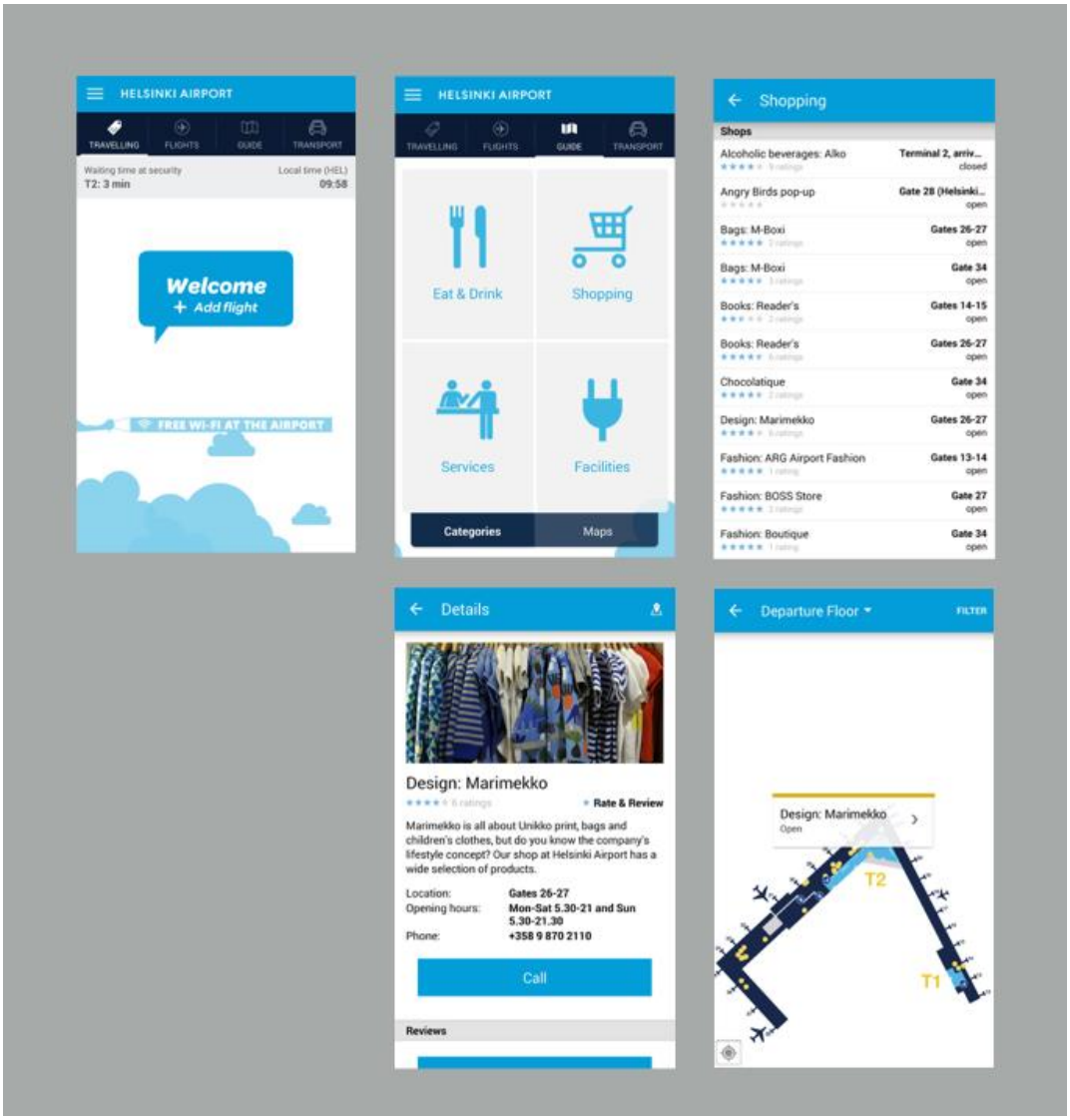
As displayed by table 5, the first five features for the solutions are same in table 5 as in in table 4. The additional features introduced by the airside solutions are the

layout picture and travel time. Firstly, the layout picture is a map in this context, however later it is discussed generally as an overview layout or overview picture. Secondly, the travel time is an extension to the directions and displays the estimated travel time to the location.

3.3 Supportive Solutions

The supportive solutions are the solutions of Helsinki Airport mobile application and Finavia website. The solutions incorporate elements assisting the navigation at the airport, as well as elements assisting in arriving and leaving the airport.

The *mobile application* of Helsinki Airport has a multitude of functions, however this study focuses only to the navigation features of the application. The main navigational feature of the application is the search of services and the placement of the services to a map. The application has the option of using the devices location services, although it lacks the possibility of providing a route between the two locations. The process of locating a clothing store in the application is visualized in picture 9.

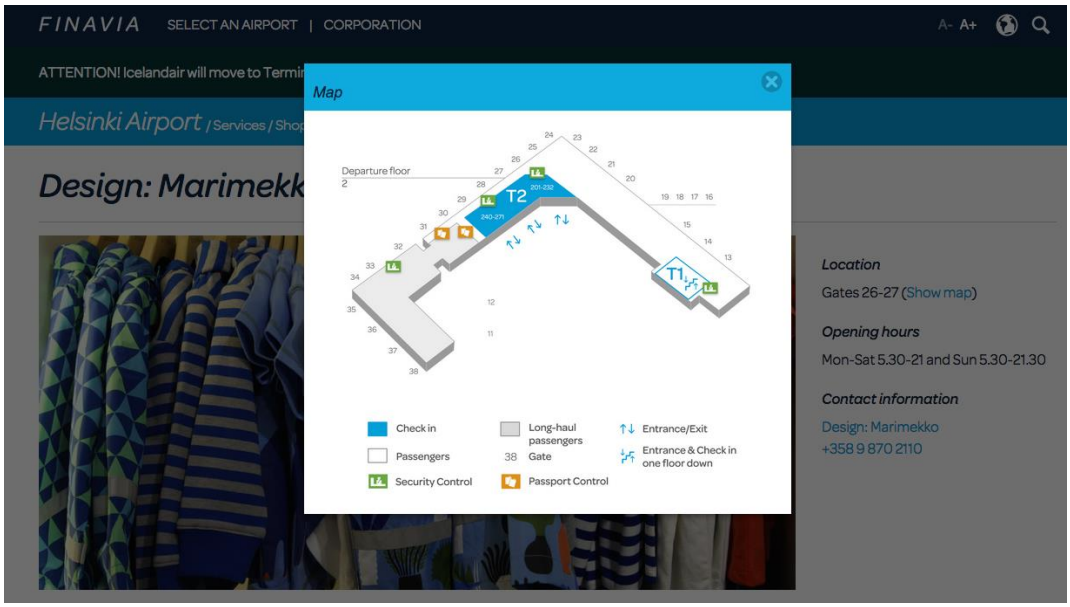


Picture 9. The process of locating a clothing store in the application.

The process starts with the landing page. Here the passenger is introduced the possibility of following a certain flight, as well as presented by the estimated waiting time at the security check. The waiting time of the security check is provided by the measurement of the customer flow presented in *chapter 3.1.4.* The search for the service is initiated in the guide section. Here the services are categorized in four different categories. The selection of shopping provides a catalog of the shops at the airport. After the selection of the shop, an information page with contact information for the shop is presented. A map of the terminal is provided from the contact information page, where the location of the store is displayed.

The Finavia *website* includes similar functionalities for searching and locating services at the airport as the mobile application. For this analysis, the same clothing

store is taken for evaluation as for the mobile application. The navigation within the website works similar compared to the application, however the presentation of the map has few differences. Picture of the map layout in the web site is displayed in picture 10.



Picture 10. Map layout in the website.

As displayed in the picture, the map visual is different compared to the mobile application. Furthermore the map layout provides no information either for the location of the user, or the location of the store.

3.4 Customer Measurement

Customer measurement is the tool providing data for the estimated waiting times to security checks, as introduced earlier. Furthermore the tool provides the information on passenger behaviour for Finavia, to assist in the development of the airport environment. The data on customer behaviour is gathered by collecting the wireless signals from the customer devices and further analysing the connection patterns based on previously created zones at the airport. Currently the solution requires customers to have a mobile device with the wireless services enabled, however no connection or user action is necessary. The customer actions are measured as routes from one zone to another. The airport is divided in to a number of zones and spending a specified amount of time in a zone, profiles the customer

there. From these zones the customer path can be outlined and processed to determine the congestion areas (Respondent 1).

3.5 Key Findings from the Current State Analysis

The data collection 1 consisted of three discussions and observations. Firstly the customer measurement solution was approached in discussion 1. The discussion provided understanding on the *customer measurement* solution at the airport and was explained in detail in section *3.5 Customer Measurement.* Secondly a discussion with the case company took place. This discussion approached the needs of the case company concerning the study and the interests were identified as *true multichannel operability* and the importance of *customer measurement*. The two notions from the case company are taken into account in the best practice selection. Thirdly a discussion with a digital signage integrator was held. The discussion provided understanding on the limitations and possibilities of digital solutions and wayfinding. The sections *3.2 Landside Solutions* and *3.3 Airside Solutions* are analyzed according to observations by the researcher. The summarized landside, airside and supportive solutions can be found in table 6.

Solution	Time	Flight	Check-in	Flight Status	Directions	Layout picture	Travel time
Signs	-	-	-	-	X	-	-
Maps	-	-	-	-	-	X	-
FIDS	X	X	X	X	-	-	-
Digital Screens (landside)	X	X	X	X	X	-	-
Digital Screens (airside)	X	X	X	X	X	-	X
Mobile application	X	X	X	X	-	X	-
Web Site	X	X	X	X	-	X	-

Table 6. Landside, airside and supportive solutions.

As seen from table 6, the digital solutions contain more information than analogue solutions and directions are only provided by two solutions, one digital and one analogue. Due to the similarities between the solutions, the solutions are grouped to *signage*, *digital signage* and *supportive solutions*. Additionally the features are grouped as *flight information* and *navigation information*. Table 7 presents the devised groups.

Solution	Flight information	Navigation information
Signage	-	X
Digital Signage	X	X
Supportive Solutions	X	X

Table 7. Solution groups.

In table 7, the notion of *signage* includes maps, posters and the traditional signing. *Digital signage* includes the digital screens at the airport, as well as the FIDS at the landside of terminal 2. S*upportive solutions* are as in the previous chapter, mobile application and website. *Flight information* contains the time the plane leaves, flight number, check-in counter and the status of the flight (go to gate, boarding or leaving), as introduced in previous tables. *Navigation information* includes direction of travel, overview picture and estimated travel time. This simplified table will be discussed further in the next chapter, *3.3 strengths and weaknesses*.

3.6 Strengths and Weaknesses

The assessment of strengths and weaknesses is based on the observed solutions as well as on the expertise of the researcher. The solutions are grouped based on the previous section and the strengths and weaknesses presented for the groups in table 8.

Solution	Strengths	Weaknesses
Signage	*Unambiguous* *Well established* *Simple*	*No interactivity* *Limited translations* *Limited information*
Digital Signage	*Multitude of information* *Large number of screens* *Content can be updated*	*Limited navigation* *Considered as informational* *No interactivity*
Supportive Solutions	*Personal experience* *Multitude of information* *Measured actions*	*Limited number of users* *Limited navigation* *Additional device required*

Table 8. The identified strengths and weaknesses.

As seen from table 8, *signage* is unambiguous and well established to assist in navigation, however it has limited possibilities for the amount of information it contains. *Digital signage* in contrary contains a multitude of information, yet is currently considered more informational and less navigational. The *supportive solutions* are as well strong in the multitude of information they contain and further provide a

personal experience. The weakness however is the limited number of users for the solution, due to the need of additional device for interaction with the service. The findings from the strengths and weaknesses are grouped to a table, where the existing, possible and impossible features of the solutions are assessed. Table 9 visualizes the solutions against the selected features based on the strengths and weaknesses, where green is visualising a feature currently available, yellow for a possible feature and red for an impossible feature.

Features	Signage	Digital Signage	Supportive Solutions
Unambiguous			
Information			
Personal			
Measurable			
Interactive			
Multilanguage			
Navigational			
Independent			

Table 9. Visualization of the strengths and weaknesses.

As seen from table 9, the features between the solutions suggest that no individual approach amounts as a complete solution. The features from the table that are a possibility in every solution are thus selected for further development. The selections for further development are visualized in table 10.

Features	Signage	Digital Signage	Supportive Solutions
Unambiguous			
Information			
Personal			
Measurable			
Interactive			
Multilanguage			
Navigational			
Independent			

Table 10. Selections for best practice focus areas.

Table 10 presents the selections for the best practice focus areas. The model based on the findings from the current state analysis is to be unambiguous, measurable and navigational. Furthermore the model should operate in a multichannel environment, in order to support the features of the existing solutions additional to the key items. The best practice section thus discusses *wayfinding*, *multichannel concepts* and *customer steering and measurement.*

4 Best Practice on Multichannel Wayfinding

This section overviews the best practice on multichannel wayfinding. First, it overviews wayfinding as a general concept and introduces models for efficient wayfinding. Second, it discusses multichannel concepts in general and multichannel strategy. Third, customer steering and measurement is discussed, where the elements of steering customers between channels and measuring the customer behavior are introduced.

4.1 Wayfinding

Wayfinding is defined as a process of determining and following a path or a route between an origin and destination. Whether it is navigating to work, school or any other place, wayfinding is an integral part of that action. Golledge (1999) defines wayfinding as a process of determining and following a path, while Darken et al. (2001) argue that motion itself is not part of wayfinding, but is another task that happens after the wayfinding. Darken et al. (2001) suggest that wayfinding is only the cognitive element of navigation and does not "involve movement of any kind but only the tactical and strategic parts that guide movement". For this study, wayfinding refers to the complete action of finding a route and navigating there. The two distinct notions in this study are *wayfinding*, which is the planning and executing a route, and *wayfinding solution*, which is the ubiquitous solution, assisting customer to reach their desired destination. Wayfinding in general requires spatial knowledge, and in order to gain spatial knowledge in wayfinding, Hölscher et al. (2006) propose three strategies: "landmarks identify one's own position and relevant navigational choice points, route knowledge connects distinguishable landmarks, while survey knowledge integrates routes and guides high-level decisions for route selection and general direction. This study builds on the strategies introduced by Hölscher et al. (2006) by focusing the best practice of wayfinding as limiting information to assist in survey knowledge, landmarks as introduced points of interest and the hierarchical structuring to guide the high level decision for the route selection.

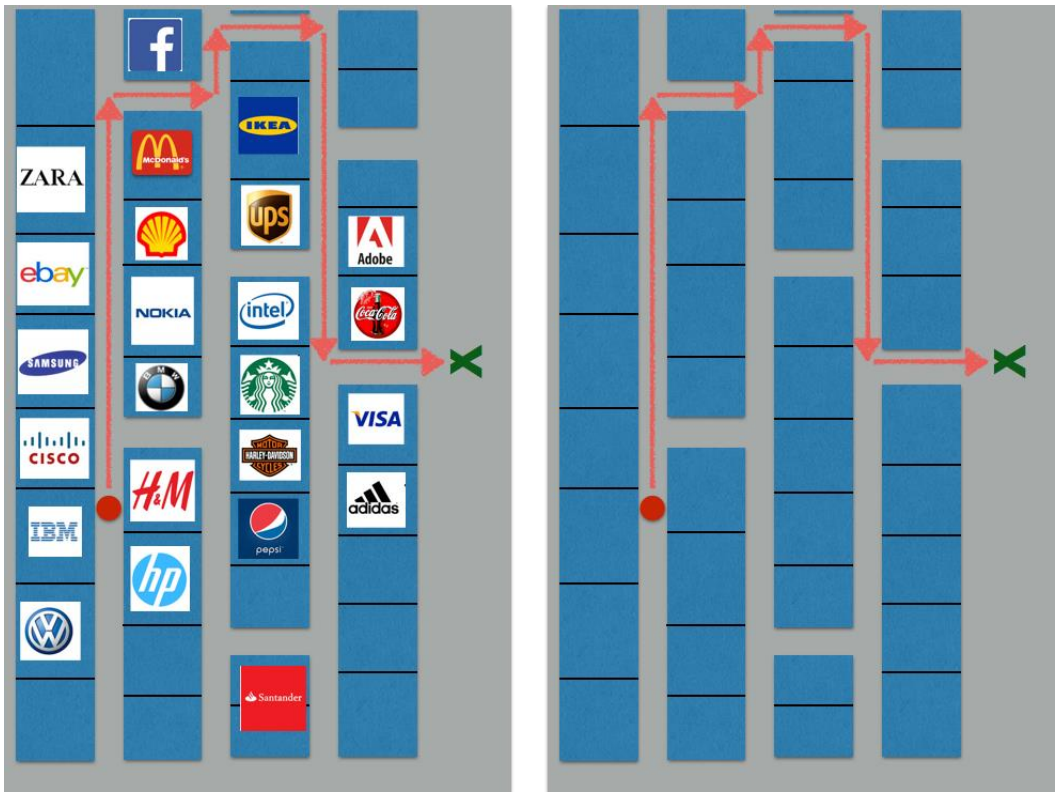
Wayfinding is defined as a process of determining and following a path. In order to determine a path, the surrounding environment needs to be known, much as the

visuals on a map. The map can either be a physical map or a cognitive map, considered as a mental map or a picture in the head. Cognitive map is the representation of spatial knowledge of the environment, and is based on all senses, such as smell, hearing or even feelings (Darken et al. 2001; Golledge 1999). To gain spatial knowledge of an environment, external information is required and Norman (1988) refers to this as *knowledge in the world.* The knowledge of the world provides the concept of the space and the relative locations of objects and places for navigation. This spatial comprehension involves the ability to perceive, understand, remember and recall information (Darken et al. 2001). In picture 11, a generic map is introduced. The map is an example map, with simple navigation instructions.

Picture 11. Map of an imaginary location with navigation.

The red dot represents the starting point, while the green X marks the end point for the navigation. The companies in the picture are part of the top 100 brands in the world, chosen randomly. The visualization presents an imaginary location, possibly a shopping mall or an airport. The function of the map is to show the floor plan and the route to a location and as a consequence create the cognitive map.

To guide the high level decision for the route selection, Hölscher et al. (2006) propose hierarchical structuring of the environment. Hierarchical structuring is a common scheme visible in the design of city structures. The notion of hierarchical structuring encompasses two major ways to create the scheme. Either a larger area is divided in smaller parts, such as districts, quarters and blocks (Freksa 1999), or the complexity of the problem is reduced by cutting down the problem space (Car 1998). The two approaches are as well recommended by the Transportation Research Board of the National Academies (2011) for the traditional signing placement in an airport environment. Limiting the information at the airport by sections, such as the baggage claim, provide hierarchical structuring. The information on the signing would be limited to information only concerning the landing passengers claiming their bags, and not contain information for the leaving passengers, such as the location of flights and gates (Transportation Research Board of the National Academies 2011). The study further adds the notion of consistency for the signing and that a hierarchical division of primary (security check, gates) information and secondary (frequent traveler lounges, stores) information would be established as well. The hierarchical division of objects to structured entireties can be accomplished as logical sectors, need-base sectors, or by primary and secondary information. In their study, Hölscher et al. (2009) found that the approach of hierarchically organized navigation plan was superior when comparing route decision choices in complex buildings, as Voicu (2003) proposed that when learning unstructured environment information, humans still encode the information as hierarchical representation of space. The creation of the cognitive map requires information on the surroundings, and a study by Meilinger et al. (2006) determined in an experiment that participants with a simple map, found wayfinding information and their self-location faster than participants who had a more informational map with complete floor plans. According to the study, more complete floor plans require more time to extract the relevant information (Meilinger et al. 2006). Similar conclusion was reached in a study examining the relations of different genders and physical environment in gaining spatial knowledge. The study suggested that simple layouts provide improved spatial knowledge with both genders (Cubukcu 2005). Based on the studies, the transition from more informational to a simple map is shown in picture 12.

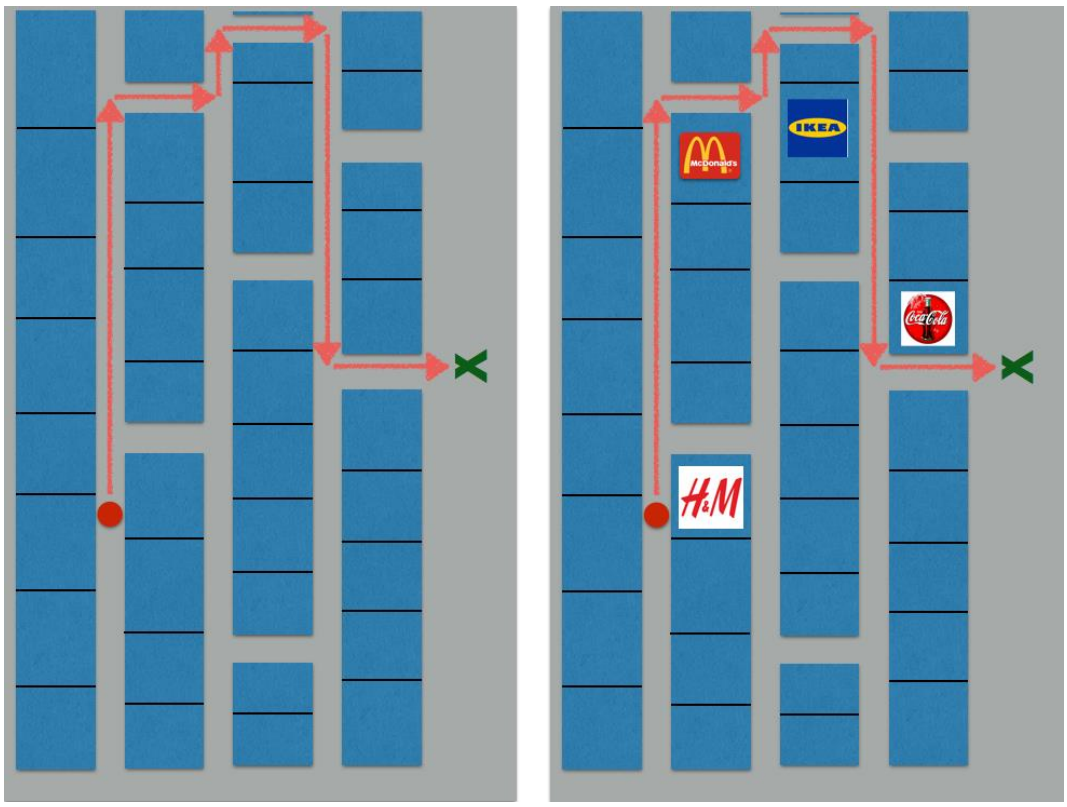


Picture 12. Transition from more informational to a simple map (Based on Meilinger et al. (2006)).

Picture 12 visualizes the simple layout opposed to the complex. The base of the picture is the same as picture 1, however it has been rotated in order to visualize the orientation of the customer and reflect the direction to travel. The rotation and the lack of brands in the picture enable a more efficient to comprehension of self-location and the direction to travel.

Hölscher et al. (2009) proposed the use of landmarks as one of the three wayfinding strategies, as: “landmarks identify one’s own position and relevant navigational choice points, “. According to a multitude of studies, the use of landmarks is effective in creating the spatial knowledge of an environment (Darken et al. 2001; Golledge 1999; Portugali 1996; Chebata et al. 2005). Large recognizable buildings or areas are considered as landmarks in urban environments, while in an airport environment landmarks can be any commonly known location, such as a particular gate, cafeteria or a bookshop. The notion of utilizing landmarks in the navigation is uniform among humans, however there are distinct differences on the method. Men are more accurate in locating landmarks, while women recall them more and use them more. Chebata et al. (2005) argues on the following. “While women tend

to explore the environment and rely on landmarks more than men do, men tend to rely more on their sketch map ability". Picture 3 visualizes the transition from a simple map to a map with landmarks introduced. The landmarks are selected for this particular route to map the decision points on the route.



Picture 13. From simple to landmarks. (Based on Meilinger et al. 2006; Darken et al. 2001).

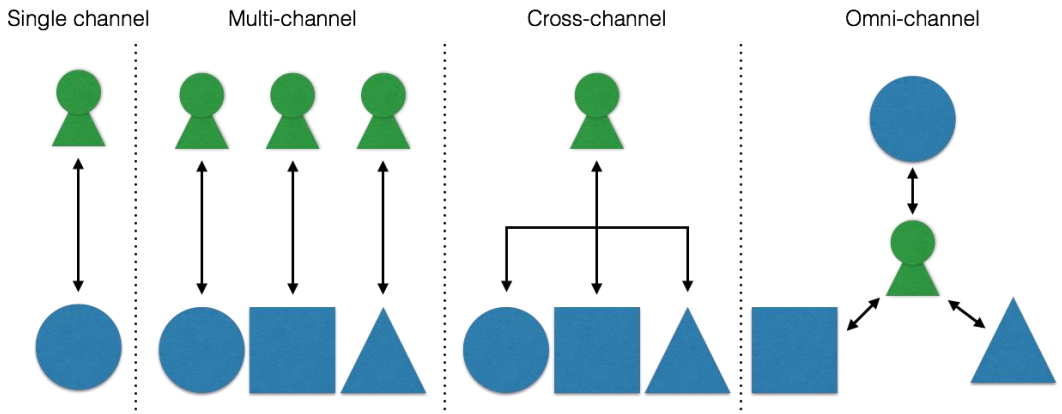
In picture 13, landmarks are introduced to the simple map, in order to highlight the decision points. The landmarks can be determined in correlation with the route design, or fixed positions, or the combination of both.

4.2 Multichannel Concepts

Multichannel is defined as an interaction of the company and customer in more than one channel. The channels discussed in this study are signage, digital screens and the online channels of mobile application and website. The multichannel concepts are currently under discussion by businesses everywhere, most notably in retail. A study by Ansari et al (2008) presents that customers who use more

than one channel, buy more than the single channel customers. Macy's discovered similar results, discovering that customers who used both online and offline channels were five times as profitable as those who shopped online only (Rigby 2014). Furthermore Neslin et al. (2009) found out that alongside the share of wallet, multichannel approach further increases customer loyalty.

The concept of a *single channel* is a starting point in understanding the forthcoming concepts. A channel is a brick-and-mortar shop, television, web site or a mobile application. It can be defined as any media or medium, online or offline, where a business connects with a customer (McGoldrick and Collins, 2007). Second approach is the notion of *multi-channel*, which refers to the interaction of the company and customer occurring in more than one channel, such as a brick-and-mortar store with an online e-commerce site. This would be a company in a multi-channel model with two distinct meeting points for customer contacts, while in a multi-channel concept, the channels each would have individual strategies (van Delft 2013). The third notion is *cross-channel*, which refers to multiple channels with a coherent strategy between the channels. The strategy is coherent, while the differences between the channels are not taken into account (van Delft 2013). The most recent addition to multichannel concepts is the omni-channel approach, which is a concept for a unified experience across the multitude of channels. In omni-channel approach, the customers use any online or offline channels and can easily and continuously switch between them. To customers, the channels together form one coherent channel (van Delft 2013). The differences in the multichannel concepts are visualized in picture 14.



Picture 14. Multichannel concepts in brief (Based on McGoldrick and Collins 2007; van Delft 2013:11).

Picture 14 visualizes the differences in the multichannel concepts. In single channel, there is only one point of contact, whereas in multi-channel there are many channels for many individuals. The cross-channel customer is introduced a multitude of coherent channels for interaction, while in omni-channel the customer is always be in the channel.

A multitude of channels generates challenges in the creation of channel strategy (Rosenbloom 2007). Further according to Sharma and Mehrotra (2007), multiple channels raise conflicts and lead to multiple members calling on the same channel. This is equal in external and internal multichannel approaches (Stone et al. 2002). The six stages of formulating a multichannel strategy are introduced in figure 2.

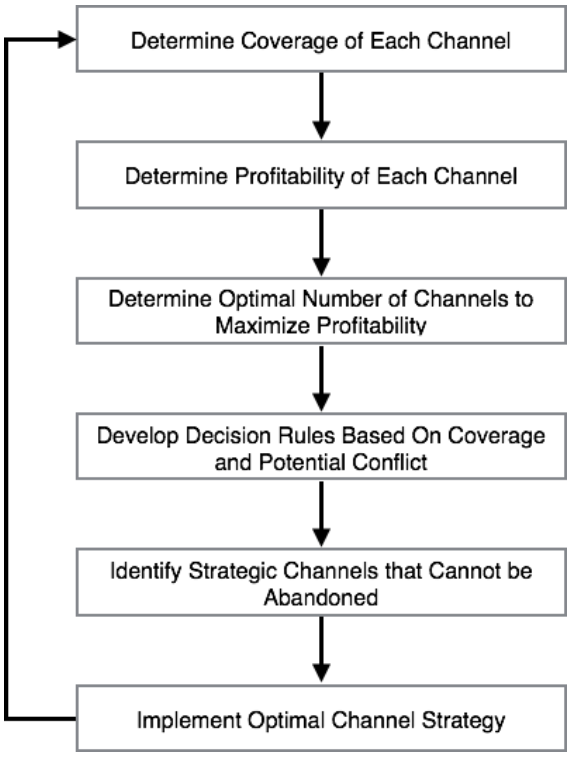


Figure 2. The six steps of multichannel strategy (Sharma and Mehrotra 2007).

In figure 2, the suggested steps for multichannel strategy are introduced. *First*, the coverage of each channel is evaluated, in order to create synergies and not cannibalize each other (Kollmann et al. 2012). *Second*, the profitability of each channel is determined, for evaluating potential channels to eliminate. *Third*, the optimal number of channels is defined, in order to limit the unprofitable channels. *Fourth*, the rules to avoid conflicts between the channels are defined. *Fifth*, the key strategic channels are identified. *Sixth*, the strategy is ready for implementation, and another cycle through the steps can commence (Sharma and Mehrotra 2007).

As companies are expanding to multichannel environments, the customer management in multichannel environment is becoming increasingly important (Herhausen et al. 2009). Neslin et al. (2006) define multichannel customer management as “design, deployment, coordination, and evaluation of channels to enhance customer value through effective customer acquisition, retention, and development.” For improving the customer management, Neslin and Shankar (2009) propose a customer management framework for multichannel environment. The study proposes five steps to assist in the development of a multichannel customer management strategy. The proposed multichannel customer based segmentation framework is presented in figure 3.

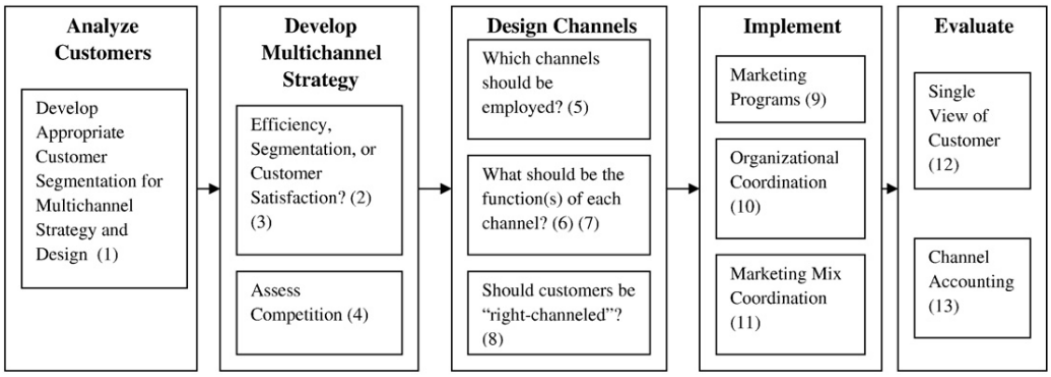


Figure 3. Multichannel customer based segmentation framework (Neslin and Shankar 2009).

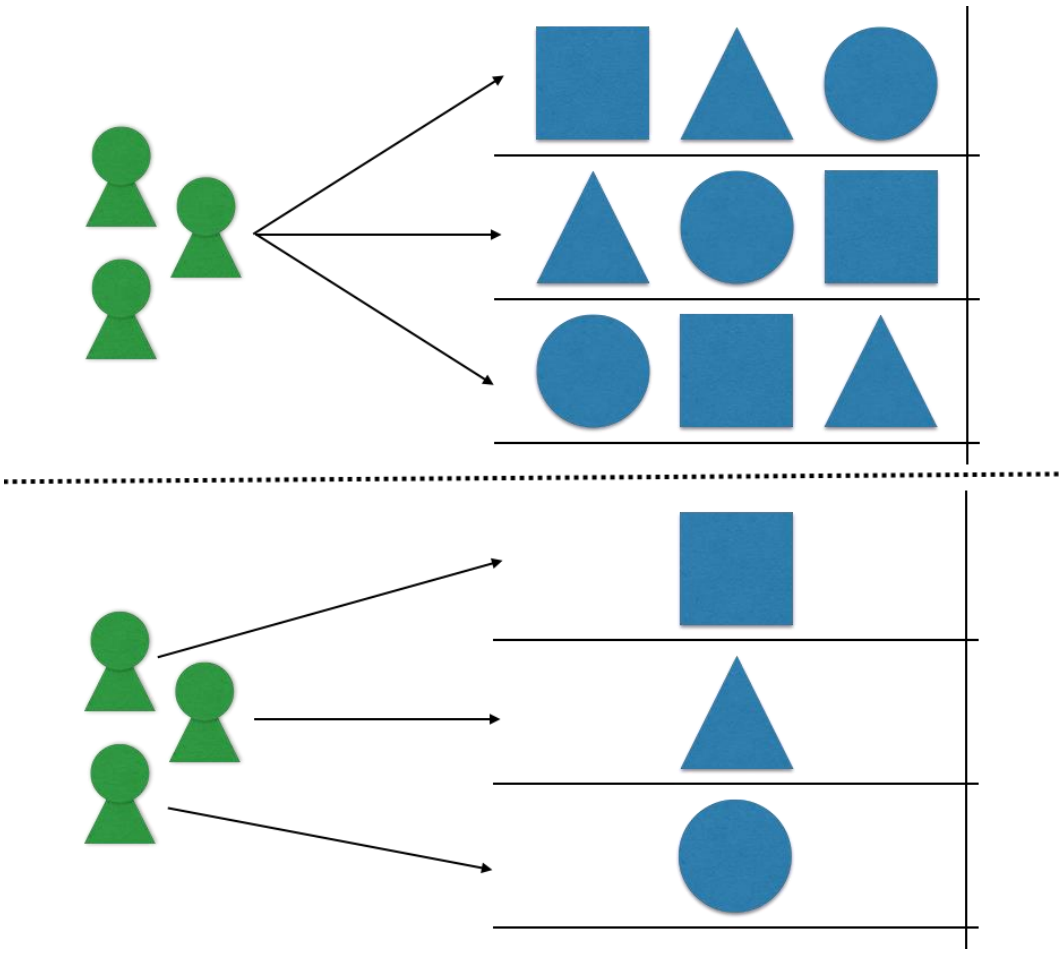
First the model starts by analyzing the customers and developing appropriate customer segmentation, where the channel usage of customers is applied for the segmentation (Dholakia et al. 2010). Secondly the efficiency and customer segmentation is taken under consideration and the competitive advantage of the strategy assessed. Thirdly the channels to deploy are selected, and the functionality of each channel defined. Furthermore the customer steering efforts and method are defined. Fourthly the solution is implemented for the marketing programs and organizational structure. The fifth and final stage is the evaluation of the customer utilization of each channel and the measurement of the channel use. The study by Neslin and Shankar (2009) comes to the conclusion "that customer management is an important consideration throughout the process of developing and implementing multichannel strategy. " As such, the customer management is a part of the strategy, not a complete solution.

4.3 Customer Steering and Measurement

The notion of steering customers has two different meanings. First it is either the steering of customers between multiple channels (Herhausen et al. 2012), or the physical steering of customer in an environment. This study discusses the steering between the channels and the physical steering of customers is not discussed.

The preferred channel for a customer depends on the perceived value of the channel. In retail environment customers can be steered from one channel to another by modifications of the assortments in selected channels (Neslin et al. 2006). By

growing the assortment of a channel, the service performance of the channel increases, resulting in a higher perceived value for the customer (Herhausen et al 2012). In turn, the assortments of a channel can as well be reduced. The reduction of the assortments can lead to a lower perceived value and steer customers to use other channels. Montoya-Weiss et al. (2003) discovered that when a channel performance matches the expectations of the customers, the reduction of the assortments is acceptable. Devlin and Yeung (2003) made a similar discovery in the banking industry. As long as the customers benefit from a particular service level in another channel without difficulties, they are willing to accept a service level reduction in another channel. Reducing the assortments in the channels and defining a specific purpose for the channels, guides the customers to specific channels. The assortment reduction is visualized in picture 15.



Picture 15. The reduced assortment in channels. (Based on Herhausen et al 2012)

In picture 15, the assortment reduction is visualized. As seen from the top, every channel has every element in them. For the customer there is no preference on the channel to choose, as the elements can be found from any of them. In the bottom, the elements in the channels are different and vary depending on the selected channel. A study by Balasubramanian et al. (2005) notes that when each channel has a unique offering, the customers will seek specific channels to use.

The customers in multichannel environment can further be steered by shifting their perceived benefits of the channels. This approach can be called a use of incentives and reductions, as a study by Myers et al. (2004) suggests, or a push-pull method suggested by Herhausen et al. (2009). In the study, Myers et al (2004) proposes the incentives as a faster check-in at self-service station and reductions, as fewer personnel at check-in counters between the traditional face-to-face and self-service channels. Additionally for this type of approach, instead of solely communicating the benefits of the desired channel, Falk et al. (2007) suggests that the disadvantages of the less-desired channel should be brought to attention simultaneously with the benefits. By the gradual communication of the disadvantages of the channel to customers, the perceived usefulness of desired channel can be increased. Although Myers et al. (2004) and Falk et al. (2007) have concerns in the reduction method of steering customers, Herhausen et al. (2009) discovered that even as the pull (incentives) have a significant positive impact on customers, the push (reductions) do not affect the customer satisfaction for the company. Due to the relatively high risk in the reduction of certain services (Falk et al. 2007; Herhausen et al. 2009), Myers et al. (2004) introduces a notion of a safety net to help customers deal with the change. A safety net can be considered as a gradual approach from face-to-face service to self-service, or by a gradual limitation of features in a channel. This notion would ideally affect mostly the customer segment more comfortable in the higher status quo bias. The incentives for different channels can be convenience, broader selection and greater access to information (Chen et al. 2002), when for the reductions it can be the laborious search for information (Verhoef et al. 2007) or the lack of security and privacy in another channel (Chen et al. 2002). In order to find out the most efficient steering efforts, a variety of customer actions need examining, thus the customer actions need to be measured.

The customer behavior can be measured in various points during the multichannel journey of the customer. The measurements can be provided by web analytics (Burby et al. 2007), mobile analytics (Barnes 2002), footfall analytics, (Kirkup 1999) or by the tracking of customer movement through wireless network (Respondent 1; Cisco 2012). The footfall analytics have been incorporated by large to the wireless network analytics, but the solutions have their downfall in the need of smartphone or other smart device with a turned on Wi-Fi for the customer (Respondent 1). In web analytics the primary method of collecting the data is by tracking and recording the user actions (Kim et al. 2008). The wireless analytics has relatively the same possibilities (Respondent 1) and so does the mobile analytics (Google, 2015). In a study on the performance of deploying marketing analytics, Germann et al. (2012) discovered a correspondence that most companies deploying the marketing analytics can expect a performance boost. The study however found that some companies did not receive this performance boost and continued to suggest that this can be result of internal issue in the company. The persons who perform the marketing analytics (marketing analysts) are not the ones who implement the insights gained from the marketing analytics (marketing executives). This suggests that with the measurement, action is as well important, as Burby et al. (2007) is propose as a first law of web analytics. “For every action, there is an opportunity for an intelligent reaction”. This notion encompasses the objective behind the reason of measuring – being able to react on it.

4.4 Conceptual Framework of This Thesis

The main elements of the conceptual framework were identified as *wayfinding*, *multichannel concepts* and *customer steering and measurement*. The best practice on the topics was discussed and the key topics based on them are presented in the conceptual framework of this study in figure 4.

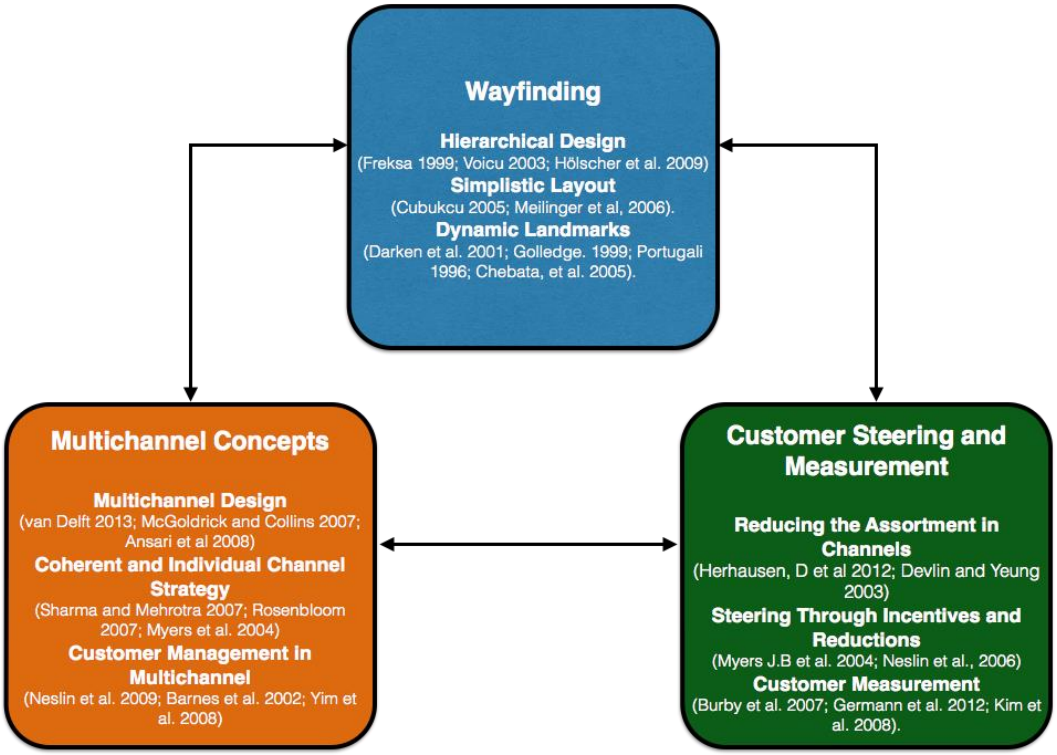


Figure 4. The conceptual framework of this study.

First best practice discussed was *wayfinding* and especially the focus is on what is the most efficient way of creating spatial knowledge. From this the most relevant topics were identified as *hierarchical design*, *simplistic layout* and *dynamic landmarks*. The selected topics were studied for best practise and used in building the model.

In the *multichannel concepts*, the focus was firstly on gathering information and understanding the varieties and possibilities in the different multichannel options. By studying a number of different approaches, a need for a multichannel strategy and customer management was discovered. The topics for *multichannel concepts* are *multichannel design*, *coherent and individual channel strategy* and *customer management in multichannel*.

After the revision of *multichannel concepts*, the *customer steering and measurement* best practice was examined. The objective was to study the customer steering between the channels. From this best practice the topics of *reducing the assortment in channels*; *steering through incentives and reductions* and *customer measurement* were introduced.

5 Building the Model for the Case Company

This section merges the findings of the current state analysis, best practice and data collection 3 for the building of the model draft.

5.1 Overview of Findings from the Current State Analysis

The current state analysis and the best practice revision offered a number of alternatives for a creation of a multichannel wayfinding model. The conclusion of the current state analysis was a table where three items were picked for closer inspection. Below is the table from the conclusions of current state analysis.

Features	Signage	Digital Signage	Supportive Solutions
Unambiguous			
Information			
Personal			
Measurable			
Interactive			
Multilanguage			
Navigational			
Independent			

Table 11. Selections for development.

From table 11, the topics chosen were *wayfinding*, *multichannel concepts* and *customer steering and measurements*. The information for the building of the model was gathered from best practice and data collection 2. First this study will discuss the *wayfinding*, next the *multichannel concepts* and lastly the *customer steering and measurement.*

5.2 Findings of Data Collection 2

Data collection 2 was carried out as two discussions with two experts of online services and multichannel concepts, in order to do find out ideas and understanding based on the findings from the current state analysis and best practice. Both discussions were conducted as open discussions. The current state findings and the best practice were introduced to the participants at the beginning of the discussion and the data was collected as field notes. The discussions resulted in new ideas and insights for the model draft. The key findings from the data collection 2 are presented in table 12.

Wayfinding	*Multichannel Concepts*	*Customer Steering and Measurement*
In the hierarchical approach there should be two views for the people who want the simplistic view and for people who want the overall view.	The roles for the different channels could be defined according to layouts. Overall picture, landmark picture and a close picture.	Key issue is to link analytics to the mobile application for location-based marketing.
The overall view could have advertisements in it, while the close-up screen is more personal.	The strategy creation should include customer segmentation and the customer experience should be taken into account. The customer experience should be easy to use and intuitive.	Measurement tool is imperative and when there is change, on needs to react quickly.
The message towards the customers' needs to be personal and intimate.	Strategy needs to be brand driven. Omni-channel approach incurs a multitude of internal restructuring in a company that is demanding, but not visible to customers.	Customers differ widely and many do not want any advice or steering. This comes of importance in situations where there is a multitude of nationalities to service.

Table 12. Key findings from data collection 2.

In table 12 the discussion topics have been divided according to the topics of the study. *Hierarchical design* was found as an effective way of creating the cognitive map in best practice and for this notion the respondent suggests advertisements, while further close-up view of the wayfinding could be utilized as a more personal approach. Other respondent as well added the notion of a personal and intimate message. For the personal approach, a respondent further noted the need for *customer segmentation* in the strategy creation, while the other respondent noted

about the wide diversity of customers, especially in a multinational environments. The *omni-channel* approach was noted as one respondent to require a great deal of internal restructuring in a company that is not visible to the customers. The key issue in the customer steering and measurement was the linkage of analytics to the mobile application, which would effectively result in location-based marketing possibilities. Furthermore a measurement tool and reactions to the measurements were further deemed important. Other respondent added that many customers do not want steering or advices.

The findings from the discussions are taken for the model draft as follows. Firstly, the hierarchical design is introduced, adding the complete layout and other relevant information selectable by the customer. Secondly, the notion of the internal efforts incurring to the case company in omni-channel approach are taken as part of the strategy design. Thirdly, the customer segmentation and measurement are noted.

5.3 Model Draft: Part 1. Effective Wayfinding

The effectiveness of wayfinding depends on how quickly a route is found, oneself located and the navigation to the desired location accomplished. The best practice provided multiple examples on how customers create the cognitive map of a location, whether more information is better and why landmarks are an integral part of the navigation process. The model is built on the findings of current state analysis, existing knowledge in best practice, data collection 2 and researchers conclusions.

According to the findings from current state analysis and best practice, in order to limit the information for the solution, a hierarchical structuring for the map layout should be taken up. The hierarchy should work in a way that layout is divided in sectors at the airport and only the relevant information from different points is visible. A multitude of wayfinding chains needs to be considered in limiting the objects shown to customers, including the separation of primary (security checks, gates) and secondary (frequent traveler lounges, stores) information, thus creating a hierarchical layout design of wayfinding. Respondent 4 agreed as follows:

> *There should be multiple elements, but they each should have a role. They can be hierarchically divided in completely different channels and to different locations (Respondent 4).*

The hierarchical separation of services should be differentiated by sectors of the airport, as well as by the primary and secondary information. Potentially this could mean two screens side by side at the airport, where the other has a close-up and other an overall view (Respondent 4). It can further be incorporated in the design of the solution, by visualizing a more abstract overview layout at the start and providing a possibility for more precise information additionally.

Meilinger et al. (2006) introduces the notion of simplicity on the map layout, by making the notion that people locate themselves and the wayfinding information faster when the information is simplified. Airport is an environment where the customers frequently have limited time to locate the right gate and as a result could find complex information as an inconvenience. Respondent 4 stated the following:

> *I want to see the overall picture, so I can navigate and so that I can see in quick glance how far for example a gate is (Respondent 4).*

The information provided should be overall, abstract and the objects shown limited in the beginning. This notion facilitates the gaining of spatial knowledge and accelerates the task.

A multitude of studies suggested that landmarks are an important part of gaining spatial knowledge of the environment (Darken et al. 2001; Golledge 1999; Portugali 1996; Chebata et al. 2005). The notion of landmarks should be utilized as dynamic resources, providing key points for a journey. These landmarks would be defined based on the customer, either based on the choice of navigation or by measurement tool. The landmarks have a rule to be highlighted and the experience is personal, in conjunction with purpose and usability. Respondent 4 noted the following:

> *Customer experience usually starts from a wow-factor, and the topics of simple layout and landmarks are away from the wow. The best wow-effect for customers is working and easy to use solution (Respondent 4).*

The landmarks in the context of the case company are well-known brands, shops, gates or any recognizable location within the airport. In a model proposed, there is a rule for the companies and the division is equal to every party.

To summarize the Building of Effective Wayfinding, the needed guidelines for the case company can be stated as follows. Firstly the design of the default map layout in the digital screens should vary depending on the location. At the Schengen –side of the airport, the objects of interest are the objects that are located at the Schengen –side, so the objects in another sections of the airport are not essential. All the information should still be included for the customer to obtain, but by default this multitude of information could be hidden.

Secondly, when introducing the map, the visual objects should be limited. Even as every establishment on the map is known, most of them should be hidden. If all the items are visible, locating oneself and the desired route takes longer. As an example, if a customer is searching for a specific store, the establishments shown on the route could be based on that interest and there would be one key object displayed on the map every 5m to 10m.

Thirdly the landmarks, based on customer interest, should further be selected based on their locations for the route to be navigated. When a route to a specific location is shown, there should be landmarks introduced in strategic places. These can be well-known stores, gates or any noticeable object. As an example, when a customer searches for a route, the landmark should be introduced to every intersection or point where an action is needed on that route. This favors the use of dynamic landmarks, as in the digital channels they do not need to be fixed.

5.4 Model Draft: Part 2. Multichannel Strategy

Creation of a Multichannel Strategy is an important part for companies in multichannel environments. The importance is in the selection of the appropriate approach from the different multichannel concepts, then creating the strategy for the implementation and finally applying the customer management as an integral part of the selected strategy. The model is built on the findings of current state analysis, existing knowledge in best practice, data collection 2 and researchers conclusions.

In the multichannel design, the most important concepts for the case company are the cross-channel and omni-channel concepts. These concepts were selected as

part of the model for their inherently strategic nature. The case company can presently be seen operating in a multichannel environment, and the objective of a unified design was an objective for this study. The difference with the notions of cross-channel and omni-channel is both internal and external. Externally the customer experiences multiple channels in the cross-channel, whereas in omni-channel the channel is constant and takes different forms of interaction. Internally the omni-channel approach requires more changes, as the channels need to be operated as one, where in cross-channel they are independently operated. According to respondent 5:

> *For the company to fully realize omni-channel approach, it means that they need to switch their internal organization completely (Respondent 5).*

Thus the case company should place the target (visible towards customers) to omni-channel approach and move the company (internally) to that direction gradually through cross-channel approach.

In the channel strategy, Sharma and Mehrotra suggested a number of steps from determining the coverage of the channels to reduction of potentially conflicting channels. The profitability of channels should be identified as a unit of customer satisfaction for the measurement. This would provide basis for the strategic management of the channels. Kollmann et al. (2012) brought up the point of the need for the channels to create synergies amongst them in order to not cannibalize each other. Respondent 4 had an insight on this:

> *There could be different roles for different layouts by channels. Overall picture, landmark picture and a local close-up – it can be a street map style (Respondent 4).*

From these findings the suggestion is that the building of the strategy should follow the guidelines. *First*, determine the purpose of the channels. *Second*, determine the profitability of the channels. *Third*, determine the optimal number of channels. *Fourth*, reduce the channels to only profitable ones. *Fifth*, identify the key strategic channels. *Sixth*, implement the created strategy. Additionally for the first step, the purpose of the channels should be defined by the layouts needed. This indicates

that in one channel there is an overall view, while in another there would be the close-up (Respondent 4).

The strategy creation needs to include the notion of customer management in multichannel environment. The customer management is an action that happens simultaneously with the strategy and is as such taken into the model. The proposed model by Neslin and Shankar (2009) should be the basis for building the customer management strategy. Furthermore the customer segments and channel design were notions that respondent 4 was concerned about:

> *Customer experience should be taken here at least in some element, but how? Have they been thinking about different customer/user segments? Who are the individual channels servicing (Respondent 4)?*

This suggests that the especially important notions of the following model are the customer segmentation and the segmentation plan. The model includes five steps. *First*, create customer segmentation. *Second*, develop a plan according to the customer segmentation. *Third*, design the channel functionalities. *Fourth*, implement the created strategy to the company structure. *Fifth*, evaluate the customer behavior in the environment.

To summarize the Creation of Multichannel Strategy, the needed actions for the case company can be stated as follows. Firstly the selected multichannel concepts should be cross-channel and omni-channel. The approach for the case company should be to gradually move from the current multi-channel concept to cross-channel concept. The omni-channel approach should be examined for complementing elements to implement, but the complete implementation of the concept is too massive to undertake.

Secondly the multichannel strategy should be designed. The strategy should incorporate the steps as introduced earlier, with the addition of customer management. The strategy is created as follows. *First*, establish the customer management initiatives introduced in the next paragraph. *Second*, determine the optimal number of channels. Third, reduce the channels to profitable ones. Fourth, identify the key strategic channels. *Fifth*, implement the created strategy. This process should be constant, at minimum take place yearly.

Thirdly the customer management needs to be taken as an integral part of the multichannel strategy process. It should be the first action when the strategy work is started. The customer management is managed as follows. First, create the customer segmentation. Second, develop a plan according to the customer segmentation. Third, design the channel functionalities. Fourth, implement the created customer management approach to the strategy. Fifth, evaluate the customer behavior in the environment constantly and repeat the process when necessary.

5.5 Model Draft: Part 3. Customer Steering in Multichannel

Customer steering is an action of steering the customers between the channels to the potentially more beneficial channels. Further the section includes the notion of measuring the customer actions after the steering activity. The model is built on the findings of current state analysis, existing knowledge in best practice, data collection 2 and researchers conclusions.

Customers can be steered between the channels by increasing or reducing the assortments between the channels. Montoya-Weiss et al. 2003 found that customers do not necessarily view reduction of assortments in a channel as negative condition, especially when the customers benefit from the same service level in other channels (Devlin and Yeung 2003). This would suggest that the assortments of the channels could be modified without reduction in overall customer satisfaction. However, Respondent 5 had a warning on the steering measures:

> *Be aware that a lot of people are really careful on making their own decisions. I have seen situations where customers simply refuse for anyone to make any decision for them, even the simplest decisions (Respondent 5).*

This would strongly suggest that the assortment in the channels should be designed according to the customer segmentation in the strategy, created in previous section. Each channel and the assortment in them should be specifically designed in correlation to their purpose and for the desirable customer segment. This way the channels should be able to match customer expectations more accurately.

The use of incentives and reductions (Myers et al 2004) and push-pull (Herhausen et al. 2009) approaches are means to make the customers perceive increased value in one channel over another. In order to make sure that customer's use the channels intended by the strategy, the incentives need to be defined according to the customer segmentation and channel design. This would include limited information for the channels used specifically at the airport, such as the digital screens, while providing more convenience in use of other channels, such as the mobile and web channel. The communication of the benefits and limitation between the channels, for shifting the perceived value, need to be introduced as proposed by Falk et al. (2007). Accordingly this message and the complete experience should be made personal:

> *There are so many channels around everyone these days, that intimacy is what separates businesses (Respondent 5).*

The incentives should be created based on the individuals and customer segmentation, in order to create the incentives based on the needs of the customers.

Customer measurements are vital in order to confirm that the customers are using the channels as intended and to be able to react to changes in customer behavior. A study by Germann et al. (2012) found that companies who react to analytics seem to gain a performance increase, while the companies not reacting do not. The data of customers can be collected presently from various sources by the means of web analytics, mobile analytics and physical customer tracking. From the discussion, a notion of location-based marketing came up as important:

> *Key issue is to link the analytics to mobile application. Location based positioning marketing is important (Respondent 4).*

This was not a notion that other analytic solutions would be less important, but assumedly an indication of the importance of targeted advertising. This was furthermore continued for actions on the measured data:

> *There can be no measurement if there is no measurement tool. In the digital world you have to be able to react quickly to changes and the inputs come either from external sources or based on the analytics on customer*

> *movements. If there are three planes from china landing, you have to know about it and be able to move them in the right direction (Respondent 4).*

From these findings, it can be concluded that the data from the all the possible analytic tools should be collected and processed in conjunction with the objectives derived from the multichannel strategy. Additionally a strategy and actions based on the measurement data should be introduced.

To summarize the Steering of Customers in Multichannel Environment, the needed guidelines for the case company can be stated as follows. Firstly the assortment in the channels should be defined according to the customer segmentation based on the channel strategy. The assortment in every channel should be specifically designed in correlation to their purpose and for the desirable customer segment. This would match the channels to customer expectations and potentially create a natural shift between channels. In the design for the approach, the difference in customers should be noted and the exposure of the steering action avoided.

Secondly the incentives and reductions for channels should be used to entice customers to switch between the channels. The incentives should be mapped according to the channel strategy. This should be done in a way that there is an incentive to switch a channel, such as a more convenient access to information or functions in one channel contrast to another channel. These incentives and possible reductions should be communicated as they are, with the positive and the negative aspects, in a personal and intimate manner.

Thirdly there is a need to have the measurement tools established. The data then needs to be collected, analyzed and act upon. Especially after the implementation of the created strategy, the usage and customer patterns in every channel should be evaluated and additionally actions to react on it outlined. These actions should be the fine-tuning of the strategic elements, as well as possible reaction to individual customer behaviors.

5.6 The Proposed Model for Multichannel Wayfinding

The proposed model was built in three parts: *effective wayfinding*, *creation of multichannel strategy* and *steering customers in multichannel environment*. From these parts, the proposed model is presented. Figure 5 illustrates the selected components of the model in short.

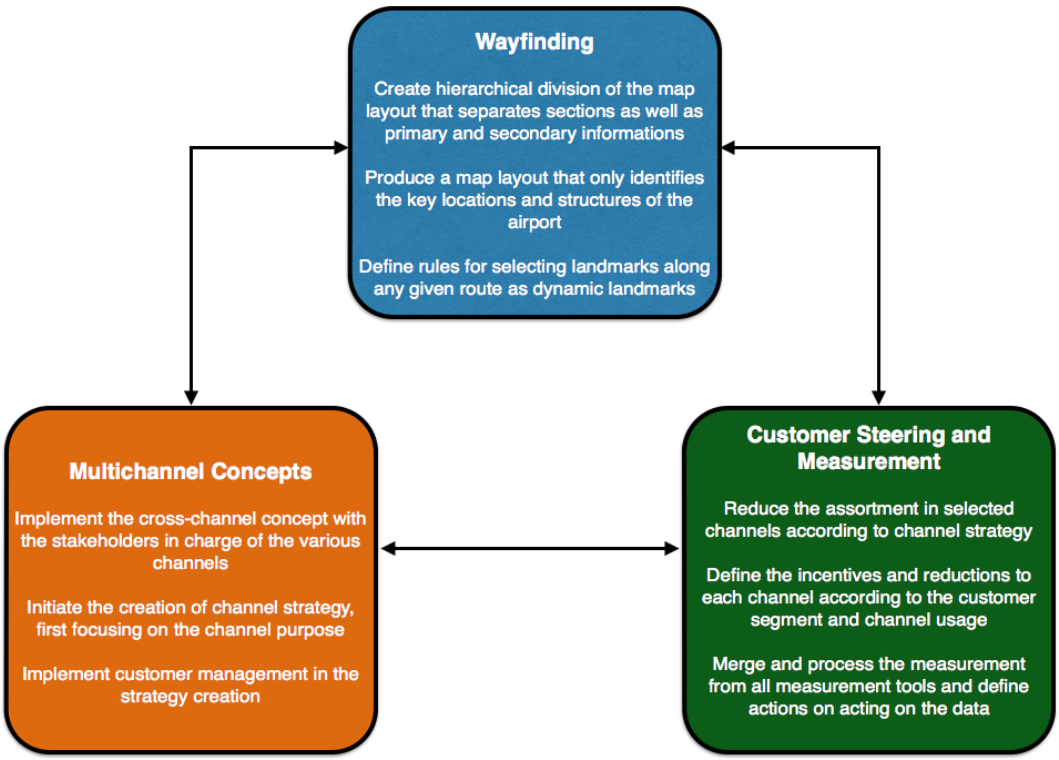


Figure 5. Visualization of the model draft.

In figure 5 the recommendations are visualized based on the visualization of the conceptual framework. As seen, the *wayfinding* has emphasis on the earlier introduced hierarchical structuring, simplistic layout and dynamic landmarks. The *multichannel concept* recommends the creation and implementation of the channel strategy with the help of the channel stakeholders. Additionally the customer management concerning the channels should be taken as part of the strategy. In the *customer steering and measurement* the focus is on the channel design according to the channel strategy, and steering customers according to the customer segments. Additionally the measurement tools need analyzing and action plans

mapped. The concrete actions concerning these topics have been built by analyzing the current state, best practice and by gathering insights from the data collection 2.

6 Validation of the Model

This section discusses the validation of the model from the feedback gathered in data collection 3.

6.1 Findings of Data Collection 3

The data collection 3 was carried out by a single discussion. The discussion was carried out as follows. Firstly the current state analyzing method and results were introduced. Secondly the conceptual framework and the grounding the choices made there were introduced. Finally the model was presented with the concrete steps for the implementation of the model included. The participant was encouraged to share opinions and ideas whenever they would come up.

The general feedback from the case company to the model was positive, and the notions proposed in the study matched the needs of the case company. The key feedback from the case company is presented in table 13.

Wayfinding	Multichannel concepts	Customer Steering and Measurement
The idea of dynamic landmarks is great.	The commercial services currently make the wayfinding confusing, so dividing it to different channels could simplify the wayfinding.	The analytic elements for web, mobile and physical are in use. There are additional analytic tools as well.
The dynamic landmarks can be used in promoting the commercial businesses at the airport.	The web site already has some hierarchical design built in it. Same approach can be brought to wayfinding.	
	The gradual approach of cross-channel to omnichannel is good.	

Table 13. Key findings from data collection 3.

As seen from the table 13, there were items more interesting for the case company than others. Firstly the use of dynamic landmarks received most interest. According to the respondent, the case company has been contemplating on what basis to advertise the commercial businesses in the wayfinding solution. The notion of using the local businesses in key points of the route as landmarks is a solution that is taken into the final model. Secondly the notion of channel design for specific purpose channels raised interest as well. The idea of having the commercial services in one channel and the standard information in another was a specific example that came from the respondent. These findings are now merged with the draft proposed earlier for the final model. Furthermore the existing hierarchical design of the website is an information that is implemented to the final model.

6.2 Final Model

In this section, the key findings from data collection 3 are merged to create the final model. Based on the feedback of the presented model, the model is further clarified. The selected highlights selected based on the feedback are presented in figure 6.

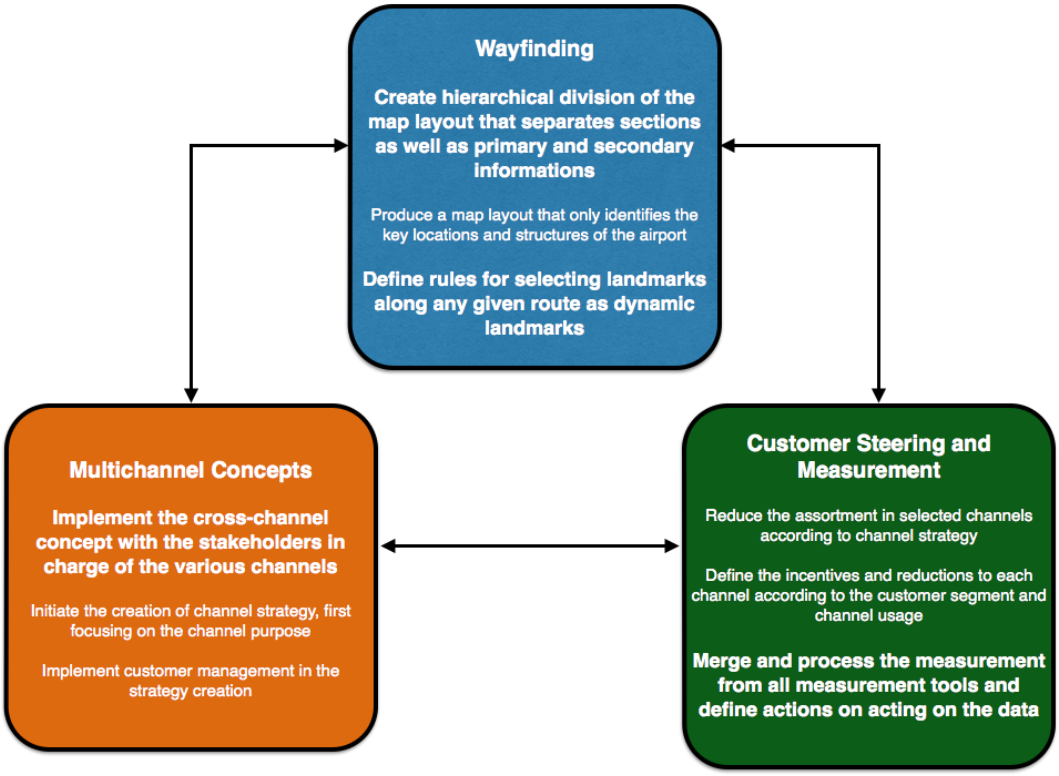


Figure 6. The emphasized elements for the model based on the feedback.

As seen from figure 6, a key action for the case company is to create the hierarchical division of objects, after which the landmarks are selected and the rules for selections are created. Further the implementation of customer measurement is important, however only after the wayfinding solution is established. Based on the feedback from the case company, the suggested actions proposed in the model draft are divided to first phase actions and second phase actions. These actions correlate the capabilities of the case company for the gradual implementation of the multichannel wayfinding model. The final model is introduced in figure 7.

Figure 7. The multichannel wayfinding model.

The wayfinding elements are included in the *first phase* actions, as well as the implementation of the cross-channel concept. The hierarchical design and the wayfinding implementation have impact on all the channels, thus the channel stakeholders are key resource in the planning phase. The cross-channel operations are introduced in larger scale only after the first phase has been implemented and the wayfinding solution established. The *second phase* includes the strategy creation, customer management and customer measurements, which are to be established after the channel coordination and the solution are established. This presented model is based on the current capabilities of the case company. As presented earlier in *5.4. Model draft: Part 2. Creation of Multichannel Strategy*, the objective for the company is to gradually aim for omni-channel operation, after the cross-channel has been implemented. In the scope of this study, the omni-channel operations are not implemented to the model, but according to the findings, they can be suggested to be an extra third phase, as visualized in figure 8.

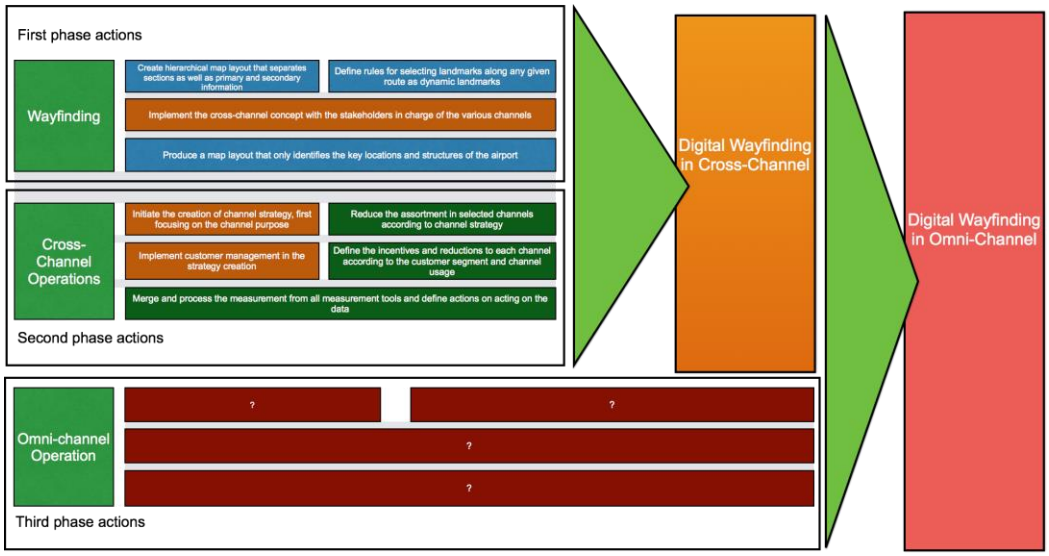


Figure 8. The multichannel wayfinding model with Omni-channel layer.

Figure 8 visualizes the additional layer for the implementation of the omni-channel approach. The case company can approach this additional layer after the initial model is implemented. The elements for the layer need revising after the initial model is implemented.

The wayfinding and cross-channel operations are implemented gradually and the gradual implementation plan is visualized in figure 9.

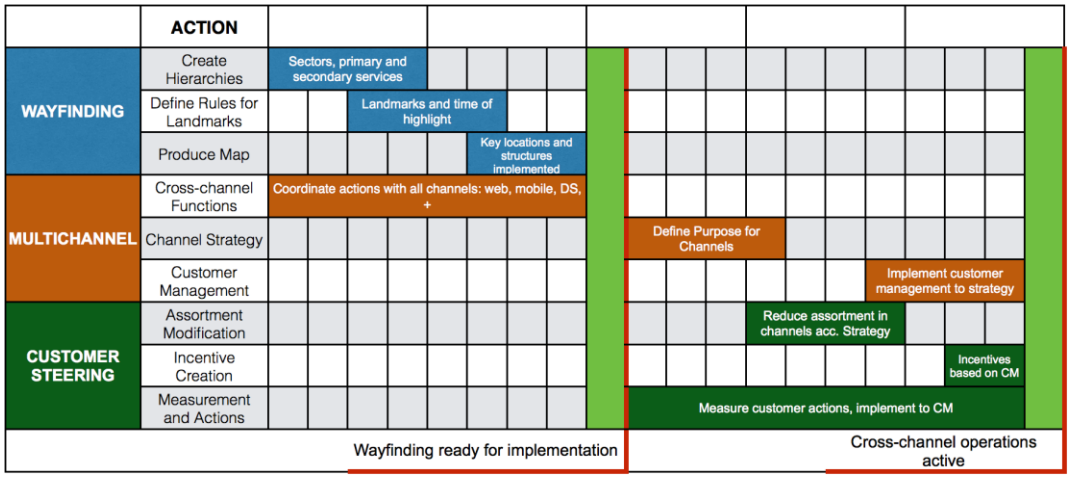


Figure 9. Implementation plan for the model.

The *first phase* is the wayfinding creation, which is co-created with the channel stakeholders. The wayfinding actions are performed gradually by first dividing the airport and the services hierarchically, next defining the landmarks and rules for

operating them. Finally the map layout with the defined key objects is produced. The *second phase* begins after the wayfinding is ready for implementation. First the channel strategy is created by defining the purpose for the individual channels. Here the assortment of the channels is reduced according to the purpose created in the strategy. Second the customer management is implemented to the strategy, while creating the incentives and reductions for the channels in accordance with the customer segments. The customer measurement and analytics are implemented from the start of the phase two, in order to gather data on customer behaviour and implement the data for the strategy creation process.

7 Discussion and Conclusions

This section discusses the content and outcome of the study. The section starts with the summary of the study, continues with the practical implementations and evaluation of the study. Next the outcome and objective are evaluated and finally the reliability and validity of the study are assessed.

7.1 Summary

This study concentrated on the building of a digital wayfinding model for a multichannel environment. The study explored the subject through gaining understanding of multichannel design, wayfinding and customer steering.

The current state analysis examined the current solutions implemented by the case company and evaluated the strengths and weaknesses of the individual approaches. Based on the evaluation, the focus for best practice was identified as *unambiguous*, *measurable*, *navigational* and *multichannel*. Therefore the study established the focused best practice as *wayfinding*, *multichannel concepts* and *customer steering and measurement.* The *customer steering* was chosen to focus on the virtual steering of customers between the channels, due to the importance of the steering measures related to multichannel environments.

Based on the best practice and data collection 2, the study creates a model for the case company to answer the identified issues. This model is built for the in three parts: effective *wayfinding*, *creation of multichannel strategy* and *steering customers in multichannel environment*. The topics provided concrete actions for the case company to follow. The found actions for the case company are to establish a multichannel strategy creation, define the hierarchical division of the airport and measure the results.

7.2 Evaluation of the Thesis

This section discusses the evaluation of the study. First the Outcome vs Objective is discussed and finally the reliability and validity of this study.

7.2.1 Outcome vs Objective

The objective of this study was to build for the case company a digital wayfinding model for a multichannel environment. The model presented in this study provides the necessary elements for the multichannel wayfinding by first addressing the issue of navigating in an environment through effective wayfinding. Next the study proposes the strategy creation for a multichannel environment, with concrete elements to include in the process. Finally the study proposes the customer steering and measurement in order to steer the customers in the multichannel environment. The result is a digital wayfinding model for a multichannel environment. In this sense, the outcome of this thesis reaches its objective.

7.2.2 Reliability and Validity

In the section *2.3 Validity and Reliability Plan,* the plans of securing the validity and reliability of this study were discussed. The discussions were planned as open and informal in order to ensure the reflection of the respondents' true self and avoid the influence of discussion situation. The gathered data was to be validated against best practice and the outcome of the study to match the objective. In order to create a clear chain of evidence, the transparency of data through the study from objective to outcome was as well promised. As presented in section *7.3.1 Outcome vs Objective*, the study outcome matched the objective created. Furthermore the clear chain of evidence and informal discussion can be seen as successful. Due to the nature of the discussions, the underlying question of qualitative research can be seen emphasised. The data can be seen as inaccurate by the observer, however the best practice and cross-reference of discussions validate the data. From these, it can be stated that the study is valid to the extent of what is essential.

Creating a clear chain of evidence from the current state analysis to the conclusions increases the reliability of this study. Furthermore the discussions introduced in the data collections were designed as consistent between the respondents in order to validate the issues introduced by the discussions. Additionally the study has been subjected for peer review, where the reliability is increased through the expertise of outside observers.

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