Investigating omni-channel banking opportunities in Sweden: From a user perspective

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ABSTRACT
For three decades research has been conducted about the adoption of new channels and technologies within banking, examining the determinants for why people adopt a new channel or not. According to Mckinney [16], most bank customers prefer to perform as many of their transactions through one single channel and they only go to another channel when the preferred one fails. Meanwhile, a study by Google [14] showed that 46% of the users that conduct financial tasks switch device before completing the task. The contradictory data leaves the community with questions about how the users view and use different banking channels. This paper aims to provide a better understanding of user behaviour across channels in the banking sector. It identifies if, and which of, the omni-channel principles (seamless interaction, optimization and consistency) are relevant in the Swedish banking context.

A study took place over a three week period in Stockholm, based on a qualitative approach (interviews) and delimited to simple everyday banking tasks and to mobile and desktop channels. Results from the study show that users had a low need to switch between channels for the same task. Main reasons for choosing one device over the other were screen size, keyboard size, portability and availability which are physical characteristics that cannot change with omni-channel principles. The results suggest that a more unified user interface design based on the omni-channel approach lacks relevance for the simple everyday banking tasks, as users will probably not switch between devices even if the approach is applied. It also suggests that taking advantage of the strengths of each device is a good principle to follow when designing for cross-device systems like digital banking.

Author Keywords
Omni-channel; cross-device; cross-platform; digital banking; channel choice.

1. INTRODUCTION
When engaging with a company’s services, users move between devices more and more frequently [14] and as a company it is important to meet the expectancy of the customer and be able to serve them when and where they want it. The omni-channel approach can be explained as the evolution of the multi-channel. While a multi-channel company gives the user a diverse experience across channels, an omni-channel company is trying to bridge the gaps between different channels to create a seamless and consistent user experience. Three best practices about omni-channel have arisen and been promoted the recent years; 1) Seamless interaction across channels, 2) Optimized across channels and 3) Consistent experience across channels [16].

The omni-channel approach has its origins in the retail industry and e-commerce. The customer should for example be able to start their shopping on one device, continue it on another and then order the objects and pick them up in person or get it delivered to the front door. Everything should be doable in every channel, and purchase history and preferences follow from channel to channel. A good example is the fashion retailer Burberry that has focused on delivering a unified experience across digital and physical channels. They have a consistent look and feel across platforms, offer a seamless transition to other channels when limitations are encountered, and personal preferences and purchase data follow the customers when switching between channels [21].

The omni-channel approach is also an emerging concept in the banking industry, and some business researchers argue that in order to stay competitive, banks need to adopt this approach [13][15]. The banking industry however differs from the retail industry, which leads to the question of how the omni-channel approach could enrich the digital banking experience. For example, time spent online shopping or browsing retail products are much higher than the time spent on managing finances online which indicates differences in user engagement between the two industries [22].

Certain innovations have changed the banking industry over the last decades. The ATM machines changed the way money was handled. We could withdraw and deposit money whenever we wanted, not being limited to office hours. The accessibility of banking tasks increased which made us interact with the bank more often. Later came the online banking that made it possible for us to manage the bigger part of our finances at home. And today, many banks have launched mobile applications. Initially, it enabled us to conduct the easiest financial tasks like checking balance or transferring money between accounts, and later it has also let us accomplish more complex tasks like buying and selling stocks.
In general, new channels have been built as silos having little or nothing to do with the other channels. One reason why the banking industry is lagging in bridging channels is the legacy of the old systems, making the cost of renewal high [19]. As a solution to this, external companies have built user experience platforms (for example Backbase and Banktron [13]) on top of existing systems in order to provide a more unified and seamless user experience across channels. These platforms are not being used by Swedish banks, instead they are building their own software for greater control.

A study from Google with 1455 participants showed that 46% of these had started to manage their finances on one device and then continued or finished the activity on another device [14]. The devices included in the study were desktop, mobile and tablet. Which financial tasks that were included in “managing finances” were not communicated. It is easy to interpret these statistics as proof that the omni-channel approach and seamless interactions are something users demand, need and expect. However, the statistics only say that users move between devices when conducting financial tasks, not how often they do it, why they do it, if they want to do it and what kind of financial tasks this behaviour cover. The understanding of the user’s motivations and intentions across digital banking channels is not complete. Mckinney [16] says that most bank customers prefer to perform as many of their transactions as possible through one single channel, or maybe two, and that they only go to another channel when the preferred one fails. The contradictory data leaves the community with questions about how the users really view and use the different banking channels.

This paper aims to provide a better understanding of the user behaviour across channels which will help determine what practices of the omni-channel approach are relevant within the Swedish banking context. It investigates if and in what ways the users move between channels and why they choose different channels when it comes to managing their finances.

The contribution of this work to the HCI community is twofold. First, by building on prior work regarding multi-channel user behaviour [1], it will provide an understanding of the user’s motivations behind channel choice. Second, it explores design implications based on the findings of the users’ digital banking experiences and practices across channels.

2. RELATED WORK

In this section I bring up prior research within the areas of digital banking adoption, banking in a multi-channel context, device characteristics and omni-channel principles which all are relevant in the context of this study.

2.1 Digital Banking Technology Adoption

Much research has been done about the adoption of new channels and technologies within banking over the recent three decades, examining the determinants for why people adopt a new channel or not [17]. Trust and security are considered to be prominent factors determining if people would start to use a new digital banking service, hence these are widely covered topics in the research community, also within HCI [4]. Other contributing factors that determine if the user is likely to adopt a new digital channel within banking have also been discovered. Among these are “ease of use”, attitude (positive/negative) towards the channel, perceived usefulness, perceived risk of loosing money and that the channel is accessible and convenient to use [17]. These studies are looking at factors that determine if a user will adopt a new technology or not, but still there is a lack of research concerning the individual’s everyday usage of digital banking channels after they have adopted the technology of both mobile and Internet banking and how they perceive the differences between them [17].

2.2 Multi-channel context

Hoele et al. [17] found that most studies researched digital banking channels separately and that few have attempted to understand individual’s decision-making concerning their use of multiple digital channels to manage their finances. Van Dijk [1] stated the importance of not isolating different channels when studying user behaviour in a multi-channel context, concluding that the multi-channel use is a day-to-day reality for many consumers. If one chooses to study a channel separately, it may omit the full picture of the user’s behaviour and some of the important motivations behind their choices. While many researchers have focused on separate channel studies, this paper contributes to the small collection of studies that looks at behaviour in multiple banking channels.

Laukkanen [18] is one of few researchers who have studied multiple banking channels by comparing customer value perceptions between mobile and Internet banking. He suggests that efficiency, convenience and safety are determining factors in the usage of the two channels. He analyzed what device attributes were causing these factors to be determining. For example, the efficiency factor of Internet banking is connected to the user’s interest in saving time, which is realized by “not having to leave the home or office to perform the service”, which is enabled by the attribute of “home access”. The safety factor is connected to the devices physical attributes of screen and keyboard size. Because of the smaller screen on the mobile the user gets less information and cannot see the entire page which makes it more difficult to use and do not get the full picture as on the desktop with a bigger screen. Added to that, the small keyboard on mobile phones makes the users feel more clumsy than with a full size desktop keyboard. With these two device attributes it is easier to make mistakes on the mobile which affects the perception of safety. Laukkanen is suggesting in-built barcode readers to make it easier for the mobile user to get the information from the bill into the phone without having to type it themselves. Today, five years later, this feature has been on the market for a few years, making it interesting to see how the users are perceiving this change and if there are other factors that stands out as determinants of channel choice today.
2.3 Difference in characteristics between mobile and desktop

There are differences between mobile and desktop that affect the interactions and hence the experience. Some of the differences are physical, concerning hardware, and points out differences in device characteristics like portability and screen size and then there are non-physical differences, concerning software, which includes interaction design and graphical interface design. Many times the non-physical software differences follows on the physical hardware differences. For example the smaller screen (physical) of the mobile device has lead to the development of new best practices and design guidelines for the mobile graphical user interface (non-physical).

Andersson [6] has developed a set of ‘accentuated factors of handheld computing’ to help design information systems for mobile workers. The factors point out the attributes of the mobile that is of extra importance when designing mobile information systems, and has focused on the attributes that makes the mobile different from the desktop. The small form factor concerning hardware is one of them; The smaller hardware causes a limited hardware capacity which affects for example the processing and storage space capability.

The small form factor concerning the interface is another factor; The mobile has a smaller screen and a limited virtual keyboard compared to the desktop [6]. The latest report on the topic of mobile user experience from the Nielsen/ Norman group [7] are stating consequences of the smaller screen. Like for example the higher interaction cost [8] to access the same amount of information and that the user needs to use their short-term memory to refer to information that could not fit on the screen. The small virtual keyboard with crowded keys and lack of haptic feedback also makes it easier to touch the wrong target and make input mistakes.

Security issues specific for the mobile is another factor. Andersson [6] suggest that the risk of interception like masking, listening, browsing and distortion is higher when using mobile wireless communication. He also suggests that the small form factor causes a greater portability and exposure in foreign environments which means that the risk for the device to be stolen is higher which is an issue of security.

The portability of the mobile is in itself a factor that lets the user use the device anytime and anywhere to a greater extent than with a desktop. This leads to usage in a bigger variation of contexts and situations which makes it more likely that the user gets distracted and interrupted having to continue the task at another time or/and another place and sometimes also on another device [7][8]. Another thing that differentiate the mobile from the desktop is the varying connectivity that is caused of the variation of context [7][8].

The above mentioned differences and factors could be playing a role when looking at how bank customers are using the mobile and desktop channels to manage their finances. Some of them may have greater importance than others in the context of digital banking, and some of them might serve as part of an explanation to why users choose to do as they do.

2.4 The omni-channel principles

As mentioned in the introduction, the omni-channel principles consist of consistency, optimization and seamlessness across channels and devices.

Consistency in a multi-channel context can be divided into two categories: low-levels such as presentation and language; and high-levels such as task consistency, meaning that task models are found consistent over different devices [9].

The principle of optimization is about designing tasks and functionalities for different devices adapted to their unique context and strengths [10]. This principle is at times in a trade-off relation with the principle of consistency [9], which is one of the things this paper is looking at in the context of digital banking.

The principle of seamlessness is about offering a seamless transition to a second channel, enabling continuation of what was already started in a first channel. Pasman [11] is arguing that it is important to make this transition as easy and seamless as possible to prevent the users to get “lost in transition”. Wäljas et al. [9] and Pyla et al. [12] refer to this principle as continuity, stating that continuity is established through synchronization of data and content, and by supporting users in migrating their tasks across platforms.

By studying bank customers’ behaviour across multiple channels and finding patterns of how and why mobile and Internet bank platforms are used in their respective ways, this study aims to answer the question: How can the omni-channel approach be applied to enrich the digital banking experience in the Swedish banking context?

3. METHOD

The study took place over a three weeks period in Stockholm, Sweden. A qualitative approach (interviews) was chosen to explore the motivations behind people’s behaviour across channels more in depth. Due to time and resource constraints, the study was delimited to focus on day to day banking tasks, such as paying bills, checking balance and transferring money [20]. The study was also delimited to the two most common channels for conducting day to day banking tasks, which is the desktop and the mobile phone [21] (could also be named as Internet- and mobile banking).

3.1 Participants

The participants were recruited through a Facebook event page that described this project and what participation would imply. Colleagues and friends invited their acquaintances to this page to participate. Six people were interviewed, ranging from university students in their early twenties to working parents in their mid thirties. Table 1 displays more information about the participants. In this paper the participants are named after the order of interview (p1 is the first interviewee and p6 the last). All participants had downloaded and used their bank’s mobile application...
before they were asked to participate in the study except p2 who had downloaded it but not used it yet. The participants represent different banks, namely five different banks, so that results would not be bank specific but reflect digital banking in Sweden more generally (see Table 1).

<table>
<thead>
<tr>
<th>Participant</th>
<th>Profession</th>
<th>Bank</th>
<th>Gender</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1</td>
<td>Studies economics and financial</td>
<td>Swedbank</td>
<td>M</td>
<td>23</td>
</tr>
<tr>
<td>p2</td>
<td>CEO-assistant</td>
<td>Länsförsäkringa</td>
<td>F</td>
<td>31</td>
</tr>
<tr>
<td>p3</td>
<td>Studies law</td>
<td>Skandia Banken</td>
<td>M</td>
<td>25</td>
</tr>
<tr>
<td>p4</td>
<td>Java developer</td>
<td>Handelsbanken</td>
<td>F</td>
<td>34</td>
</tr>
<tr>
<td>p5</td>
<td>Studies media technology</td>
<td>Nordea</td>
<td>F</td>
<td>27</td>
</tr>
<tr>
<td>p6</td>
<td>Chef</td>
<td>Swedbank</td>
<td>M</td>
<td>31</td>
</tr>
</tbody>
</table>

Table 1. Table of participants

3.2 Simple diary
Prior to the interviews, the participants reported information about their Internet- and mobile bank usage during a two weeks period at the end of a month (the period included salary payout and bill payments). This information was used as prompts in the interviews to extract more information about their behaviour and interactions with the two channels. The diary made the participants more conscious about their usage of different channels in banking, serving as a good basis for the interviews. The diary study technique is often used to gather in situ information in contexts where it is difficult for the observer to be present [5]. An advantage with this method is that the validity of the data gets higher because observer presence does not affect the participant behaviour. At the same time the burden of gathering data shifts from the observer to the participant. However, if this burden gets too big, there is a risk of omitted diary entries. Therefore, an elicitation diary approach was chosen for this study, to lower the burden for the participants. An elicitation diary is when the participants report small snippets from their experience so it can be explained more in detail at a later occasion, in this case the interviews [2][3].

After every Internet- or mobile bank usage the participants were to report four things in total; What they did, in what context they were, what device they used and some extra media that gave more detail to the event. The extra media could be pictures, audio recordings or text that captured complications they encountered, thoughts about the context, something unusual in their behaviour or anything else that characterized that specific event. The reporting was done with smartphones, via Facebook Messenger, WhatsApp or SMS/MMS. On average, the participants reported five interactions each during the two weeks period.

3.3 Interviews
The semi-structured interviews were the main method of this study, in which the participants could express thoughts and motivations behind different channel choices. The interviews were held at convenient places for the participants and all interviews were recorded and transcribed. The interviews lasted for 1,5 hours each and were held in the next coming days after the two weeks of reporting.

The goals with the interviews were: 1) Getting a rich understanding of how the participant’s use the different channels, 2) Understand why they use the channels as they do and 3) Find out how future hypothetical omni-channel design would be received by the participants and how that would affect their usage.

The interviews were divided into two parts. The first part focused on the participant’s current usage of channels, consisting of questions about reported events. It also covered usage of less frequent banking tasks, to obtain an overview of usage that would reflect a longer period of time. The diary entries were analyzed and illustrated onto a paper in order to elicit the participant’s memories of the reported events during the interviews (Figure 1 shows an example). The illustration included a timeline, information about what they did on what device and in what context. The second part consisted of questions about hypothetical scenarios and an omni-channel design suggestion. Figure 2 shows a simple sketch that was used as trigger material, inspired by omni-channel principles and systems like Banktron [13]. Read more about the use of the sketch in section 4.3.
3.4 Data analysis
All interviews were coded and analyzed to find concepts about channel usage and implications for an omni-channel design. This was done by mapping out which tasks where conducted on which device, and motivations behind their behaviour.

The suggestions and conclusions brought in this study are based on the thorough interviews with six participants and should not be considered exhaustive. Although the results lack statistical significance, it contributes with qualitative insight.

4. RESULTS AND ANALYSIS
In the introduction, examples of some business researchers believing omni-channel design is optimal for the banking industry based on the belief that users conduct the same banking tasks on many devices and usually switches while doing so were brought up. However, during the analysis of this study, I found that:

1. The participants in this study does not show a need to switch between channels: different channels preferred for different tasks
2. The determinants for using different channels depend on both physical (hardware) and non-physical (software) differences
3. Designing the software alike across channels would not be enough to make the participants use them more equally
4. Hence, one should focus on enhancing and utilizing the differences and strengths of each device instead of trying to make them more alike

These results are only applicable for simple tasks, which was a delimitation for this study. I will go through each of these areas in more detail in the following sections.

4.1 Low need to switch between devices
The participants showed a low need to switch between devices when conducting the same banking task. This was due to the preference of using different devices for different tasks.

4.1.1 Different devices are used for different tasks
Table 2 shows the participants’ usage of different devices. After analyzing the diaries and the interviews, this is the result showing how the users were using the different devices for different tasks on a high level.

The complexity ratings in Table 2 is an estimation of how complex the tasks are according to the following parameters: a) How time consuming they are, 2) How information-rich they are, c) Level of analysis needed. For example, the task of checking balance and transferring money to another account is a quick task that is over in seconds and is not requiring much information or analysis. This kind of task is therefore considered to have low complexity. The task of buying funds is more complex because it needs more information and time to analyze if it is a good investment or not. The participants tended to do the less complex (simpler) tasks on the mobile and the more complex tasks on the desktop.

<table>
<thead>
<tr>
<th>Task</th>
<th>Complexity</th>
<th>Mobile</th>
<th>Desktop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checking balance</td>
<td>High</td>
<td>![High]</td>
<td>![High]</td>
</tr>
<tr>
<td>Paying bills</td>
<td>Medium</td>
<td>![Medium]</td>
<td>![Medium]</td>
</tr>
<tr>
<td>Checking funds</td>
<td>Medium</td>
<td>![Medium]</td>
<td>![Medium]</td>
</tr>
<tr>
<td>Selling funds</td>
<td>High</td>
<td>![High]</td>
<td>![High]</td>
</tr>
<tr>
<td>Buy funds</td>
<td>High</td>
<td>![High]</td>
<td>![High]</td>
</tr>
</tbody>
</table>

Table 2. Participants usage of different devices
The participants showed a tendency to use the mobile and desktop in complementary ways, not using both devices for doing the same task. For example a participant could use the mobile application for checking balance and transferring money between private accounts but pay bills on the desktop. In the few cases a participant did use different devices for the same task, one of the devices would be their preferred choice and usage of the second device would occur rarely.

As Table 2 shows, none of the participants were using the two devices equally for the same task. For example, three of the five participants (p1, p5, p6) that had tried to pay bills with the mobile did not return to pay bills on the desktop. The two participants that returned to pay bills with the desktop did so because of the better overview, the habit of doing so (p4) and because it felt more safe and efficient (p3). Referencing to Table 2, p6 and p4 are using both channels for paying bills, but their second channel of choice they use very seldom, only once or twice a year.

From Table 2 we can also read that p1 is using both the mobile and desktop to check stock growth and sell funds. In this case the goal with the usage is what is determining the channel choice. He is using the mobile when he wants a quick check of stock growth, and sometimes to sell quickly in the case of high urgency, but this happens very seldom. He uses the desktop when he wants a better overview to analyze the stock change and for buying and selling stocks. p3 sometimes also uses both channels for checking transactions. He sometimes uses the mobile only to check the latest transactions, but normally he uses the desktop to get a better overview of all his transactions.

4.1.2 Low switching between devices for the same tasks
No participant were using the two devices in an equal way to conduct the same task. The participants also had their preferred channel choice for certain tasks and there was no switching between devices to finish a task. This does not necessarily challenge the claim of the Google report [14] that says that 46% of the users have switched device before completing financial tasks since that report includes all...
tasks that could go under the task category of managing finances, which is a broader range of tasks than this study includes.

One reason for my results could be that the simple tasks of checking balance, transferring money and paying bills are very short in time and the likelihood that the user gets interrupted to continue the task at a later occasion is very small. The person has also already chosen a particular device for a reason, and the benefits of the other device have already been given lower priority, so there might be a lack of motivation and reason to switch to the other device because of this. Several participants expressed this, like p1 who said: “I never switch directly from the mobile to the desktop to get a better overview. Because I already know that I can get a better overview on the desktop. So I choose a device depending on what I want to see. If I only want to see the growth [of funds] I choose the mobile, if I want to see more I choose the desktop”. It could also be that the simple tasks that are part of this study does not require the benefits of a desktop, as for example the better overview possibilities with a bigger screen, because there is not much information that must be considered while conducting these tasks.

4.2 Determinants for using different devices

The material collected from the interviews suggested various reasons for why the participants choose to use the different devices. The reasons and motivations to choose a specific device is presented below, first for the mobile and then for the desktop. These are also presented in Table 3.

4.2.1 Determinants for using the mobile

The participants used the mobile application mainly because it is easier and quicker. Most banks have prioritized to make the most common tasks very easy and quick for the user to conduct with the mobile device. One does not even have to log in to check balance and transfer money between private accounts. To pay a bill you have to log in, but that you can do easily with the mobile BankID. The participants mentioned these shorter processes with fewer steps than on the desktop as a reason to use the mobile instead of the desktop. The participants also mentioned solutions like scanning the OCR number from a paper invoice with the mobile camera instead of having to type it in by hand as contributing to the shorter process, making it more easy and quick.

A third reason for using the mobile is that it is more available, which makes it the preferred channel for tasks that needs to be done “on the go”. As participant p5 puts it: “I always use the mobile to check balance and transfer money because you need it on the run”. None of the participants log in with the desktop only to check their balance or transfer money between private accounts, but it could happen in combination with other tasks that they want or need to do on the desktop.

4.2.2 Determinants for using the desktop

The desktop was mentioned to provide a better overview when paying bills, checking transactions, dealing with funds, etc. As participant p1 put it: “It is easier to get much information quick on the desktop than the mobile, it gives me a better overview”, referring to the bigger screen. This was the most commonly mentioned reason for choosing the desktop instead of the mobile.

Another reason for choosing desktop is because it is perceived as being more safe, mainly due to the smaller risk of pressing the wrong buttons or miss some important information because of the smaller screen and keyboard. Three participants mentioned that the human error was perceived as being bigger on the mobile. There was also a general feeling that some information was rationalized away on the mobile because of the smaller screen. According to the participants, this made them do “bigger things” on the desktop, for example paying an expensive trip in order to feel more safe. Notice that safety in terms of IT related security issues were not given any weight in the participants’ channel choice. p6 said that “I do not think about any security issue. I guess it feels secure until something happens” and p2 said that “Maybe the desktop feels more secure, but the mobile is quicker and easier and that outweighs the security issue”.

When the total interaction time with the bank was high, the participants showed a tendency to choose the desktop instead of the mobile. The interaction time was driven by number of bank tanks conducted at the same time and the level of research required. If these were high, the desktop was perceived as a more efficient choice, mostly because of the bigger screen.

A final reason to use the desktop was the habit to do so. Some of the participants mentioned that they had been paying bills on the desktop for the last 15 years and that they felt comfortable doing it the way they had always done it.

4.2.3 Determinants connected to physical (hardware) and non-physical (software) characteristics

Some of the determinants that were found in the analysis above are directly connected to physical device characteristics, and some of them are connected to differences in software, such as how the interface and interactions are designed.

<table>
<thead>
<tr>
<th>Complexity of task</th>
<th>Determinants for channel choice</th>
<th>Connection to device characteristics</th>
<th>Possibility to design alike across channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (Mobile)</td>
<td>Easy</td>
<td>UI design (software)</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Quick</td>
<td>UI design and Portability (soft/hardware)</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Available</td>
<td>Portability (hardware)</td>
<td>Low</td>
</tr>
<tr>
<td>High (Desktop)</td>
<td>Better overview</td>
<td>UI design/Bigger screen (soft/hardware)</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Safe</td>
<td>Bigger screen and keyboard (hardware)</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>High interaction time</td>
<td>Bigger screen (hardware)</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Habit</td>
<td>No</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 3. Table over determinants connection to physical or software characteristics.
Table 3 is showing if the determinants are connected to a hard- or software related characteristic and the possibility to change these factors to become more alike across the channels. What device characteristic each determinant is connected to was found in the analysis of the interviews. For example, the determinant “Easy” for the mobile channel is connected to the software factor of a simple UI design and simpler processes like logging in for instance. Both of these are things that could be designed equally as good for the desktop but are not. The determinant “Available” for the mobile channel is more difficult to replicate on the desktop since it is dependent of the size of device, which is a fixed and unchangeable device characteristic.

4.3 Would a more unified software design change user behaviour?

The participants were asked about how their behaviour would change if the mobile and the desktop channels were designed in a more similar way, imagining that the changeable software factors (see 4.2.3) like graphical design, information architecture, functionalities, processes, etc. would be more alike. The advantages of the mobile (except the ones depending on fixed and physical characteristics) would also be present on the desktop and vice versa. For example it would be as simple to log in to the desktop as on the mobile and the overview would be improved on the mobile to get closer to the overview of the desktop. The sketches in Figure 2 was presented to help the participants imagine what an omni-channel design could look like. The expected result was that when the channels were designed more similarly, the participants would use the channels in a more similar way. However, most participants said it would not change their channel choice much.

Only one of the participants (p1) said it would affect how he would use the channels. Greater emphasis would be placed on context, time and place when choosing channel, according to himself. He saw the benefits of being able to make his bank tasks as simple and quick on the desktop as on the mobile since he is working much on his desktop, and he saw the benefits of getting a better overview of his funds on the mobile to use it when he was on the move. He thought that a more similar design would increase the switching between channels in his case.

The other five participants said that an omni-channel design would not make a big difference in their usage of the two channels. p3 explained that he would continue to use the desktop more because it would still be easier to make mistakes on the mobile because of the smaller screen and keyboard. p5 said that she mostly conduct bank tasks while she is on the move and therefore she would continue to use the mobile because of its portability and availability. p6 said that he would continue to do the simpler day to day tasks on the mobile because it feels closer and quicker (availability) and the more complex tasks on the desktop because of the better overview with a bigger screen, just as he uses the channels today.

Another common opinion for the participants was that they would like to have all features on the mobile as a backup if they would need to do something more complex but had no access to a desktop, but on a regular basis they would not use these features. p5 put it like this: “You seldom have a rush to make these complex tasks on the go, so then you can do it on the desktop when you have time and then also get a better overview” and p4 said that “I expect that I should be able to do all on the mobile and it would not hurt, but that is not something that I am in desperate need of”.

4.4 Focus on enhancing and utilizing the differences and strengths of each device

Most participants in the study did not believe that their user behaviour would change much if the channels of mobile and desktop would be designed more alike (see 4.3). The reasons for this were because of physical device characteristics like screen- and keyboard size, portability and availability that could not change with the omni-channel approach. Even though the sketches (Figure 2) showed the participants how the two channels could be more alike and get each others benefits (except the ones depending on physical device characteristics), the characteristics that they thought would be determining for their continued usage was the physical, hardware related, ones that cannot change.

It could be that the things the participants value the most and expect from the different devices lie in the characteristics that make them unique, which is the physical device characteristics. Therefore it might be better to focus on enhancing and utilizing the differences in device characteristics when designing cross platform solutions instead of trying to make them more similar and smoothen out the differences. This does not mean that the channels should communicate a different feeling or brand, or that the desktop must use a more complex GUI, only that the device characteristics should be utilized. None of the participants were against making the desktop banking experience easier and quicker, things that the mobile have succeeded with. Nor did they think that a more unified look and feel across channels would be a bad thing. These are good things that would improve the overall experience, but it would not be enough to change their choice of channel according to themselves.

Focusing on enhancing the differences and strengths of each device would mean that the user interface design takes advantage of the device characteristics to improve the user experience on that particular device. For the desktop this would mean a user interface design that gives the users an overview of their finances that would not be possible with a smaller screen. For the mobile it would mean a design that takes advantage of its unique benefits like accessibility on the run, location awareness (GPS), camera, etc.

5. DISCUSSION

The purpose of this study was to provide a better understanding of the user behaviour across channels which will help determine what practices of the omni-channel approach are relevant in the Swedish banking context. Even
though this study was relatively small and qualitative, it gives relevant suggestions based on the results from the six interviews. The results suggest that the omni-channel approach lacks relevance for the simple everyday banking tasks since the users probably will not switch between devices even if the approach is applied. This is because the channel choice for these tasks are primarily determined by physical device characteristics that does not change with the omni-channel principles applied. It also suggests that enhancing the strengths of each device is a good principle to follow when designing for cross-device systems like digital banking.

The determinants for channel choice identified in this study is supported by the determinants from Andersson’s [6] study, but there are some differences between mobile and desktop that were not identified as determinants for channel choice in this study, as for example the security issue of the mobile or the limitations in processing power and storage space.

5.1 Task characteristics needed to benefit from usage of multiple devices

The results suggest that an omni-channel approach lacks relevance for the simple day to day tasks which was the scope of this study. However, other areas of digital banking are still to be explored and further research has to be done in this matter. In this section, suggestions on areas where usage of multiple devices could enrich the user experience are put forward. This section lies outside the scope of this study but is still presented since it might be interesting for future research which could be relevant both for the industry and for the HCI community.

It is suggested in this study that users do not switch between devices when conducting simple tasks because of the short time it takes to complete those tasks and that they do not require much information and therefore would not benefit from the better overview of the desktop (see section 4.1.2). Based on these factors I suggest three task characteristics needed to generate benefit from using both the mobile and desktop that were

- **Longer time for completing task**
  - Tasks that are quick and completed within a few minutes have no need of recurrence, making the usage of multiple devices a non option (checking balance, transferring money, paying bills). The task needs to take longer time and have a long term goal to benefit from the usage of multiple devices.

- **Rich in information**
  - Tasks that are poor in information will not benefit from the bigger screen on the desktop which makes the incentive to use it instead of the mobile small. The overview that you can get from a bigger screen is the number one reason why people choose to use the desktop from time to time. Therefore, the task should be

information rich so that users would benefit from using the desktop.

- **Beneficial on the go**
  - The task should also have aspects that is beneficial to do on the go. This characteristic is needed since the portability and availability of the mobile is the main reason to why people use it.

The tasks of this study (checking balance, transferring money and paying bills) do not fulfill the above characteristics, but below I suggest task areas that potentially could. These could benefit both from the mobility and quick use of the mobile and the overview that they could get from the desktop. These task areas are more complex and could be divided to smaller subtasks.

- **Budgeting, planning and follow up on money spending**
  - When planning ones economy and creating a budget, a better overview could come in handy. To see different categories next to each other, obtain a more holistic view and to see trends in spendings may benefit from using a desktop with a bigger screen. However, subtasks of following spendings could suit mobile. For an example, it could give the user advice if the next purchase in store is a good choice economically or not, making use of the context mobile brings.

- **Savings, funds, stocks and analytics**
  - Savings, funds and stocks are also areas where a bigger screen with a better overview would be handy to efficiently compare and analyze different options. The mobile would then be a good channel to follow and check stock change, and quickly be able to sell stocks if noticing a bad trend in any investment.

- **Decision on type of insurance, mortgage and similar**
  - To make an informed decision about choice of insurance or mortgage, users need to browse information and make comparisons which takes more time than the basic banking tasks. According to Google’s report on multiple screen usage [15], browsing information is one of the top tasks that starts on the mobile. Hence, a user could browse information on the mobile and continue this task on the desktop when coming to a stage of comparison. Here, a seamless design could improve the experience.

Tasks that take longer time and require rich information are also the ones demanding a high engagement and motivation from the customers. This implies that it is primarily the highly engaged customers that will benefit from the omni-channel experience within banking. These customers are using the services frequently and will learn to draw the benefits from the different channels.

By producing simple, value creating and fun services, the bank could potentially increase the frequency of usage, which would tie customers closer to the bank and their own finances (as indicated through interviews). This would in turn create value to the banks through higher customer loyalty. Such services should be easy to use and take advantage of unique possibilities of each device. For example, how could the big screen be utilized to create an
experience of the customers’ finances that is out of the scope of the mobile?

5.2 Omni-channel principles

This section briefly discusses and summarizes which of the omni-channel principles (seamless, consistent and optimized) that are relevant for different banking tasks and if so, how. In general, digital banking channels would not hurt from applying any of these principles, but some principles are more relevant than others depending on type of task and user behaviour.

Consistency in look, feel and tone of language between the devices would help communicate a stronger brand identity through both channels. However, the consistency principle should leave room for the optimization principle when it comes to task design. According to this study, the users are choosing a specific device because they expect to draw from its benefits. Therefore the tasks should be optimized for that device, giving the users the best experience possible in that particular channel. If over-emphasizing the principle of consistency, it will not be possible to utilize the strengths of each device.

The consistency and optimization principles are applicable in the same way for both simple and complex tasks. With that said, applying these principles would probably have a higher positive impact for the more complex tasks, since the probability of using multiple devices when conducting these tasks are higher (see reasoning in section 5.1).

The principle of seamlessness is not applicable for the simple tasks since they often are conducted in separate channels, with low occurrence of switching. However, it could enrich the user experience for the more complex tasks (for example, areas mentioned in section 5.1), since usage of both devices seem to be more likely to occur when conducting these (more research has to be done to confirm this). A scenario could be a person checking stock growth on the mobile and suddenly needs a bigger screen to obtain a better overview. In this case, a seamless transition to the desktop would let him/her pick up where he/she left off, improving the user experience.

5.3 Method reflections

The chosen method of using a simple diary and semi-structured interviews suited the goal of this study, since it gave opportunity to evaluate the depth of usage over different digital channels. There is always a risk that participants in a qualitative interview give answers that is not entirely true when answers are retrieved from their own memory. However, the complementing diary hopefully attenuated this risk since it created increased awareness of their usage before the interview took place.

There was also a risk asking the participants about the omni-channel sketches and how that hypothetically would change their behaviour. It might change their behaviour more than they could see themselves or that their answers were affected of how they use the channels today. Due to the high level of hypothetical scenario posed to the participants, it is not possible to fully rely on these answers. Therefore the conclusions drawn from these answers should be taken with caution. However, it still gives a hint and a first glance of how the users could reason around these questions.

With a larger number of participants one could have stated the conclusions with greater confidence, but since the results are relatively consistent for all six participants one could assume that the results also could be applicable for a larger group of people.

5.4 Relevance for the future and further research suggestions

Many banks in Sweden are discussing the areas of multi-channel usage today, wondering how to build a relevant user experience for customers across multiple channels. This study provides insights that can help them decide how to design in the multichannel environment. More research could be done using quantitative methods that could verify the usage patterns between digital banking channels identified in this paper. In addition, further research of omni-channel banking could be done for a different scope of task areas, tentatively the ones identified in section 5.1. Further exploration could be done on multiple channel usage when conducting more complex banking tasks and to bring discussion about how to prioritize between consistency and optimization.

6. CONCLUSION

In the outset, I aimed to understand whether there is an omni-channel need within banking as indicated by previous research and statements. The 46% users switching between channels from the Google report, was it an indication of lack of possibility to complete the task in the same channel or do users change channel due to other reasons?

Based on this study, it has been clear that users seldom switch channel when conducting simple everyday banking tasks. Of the identified determinants for choosing a specific channel, it were the ones connected to physical characteristics (screen size, keyboard size, portability and availability) that played a more significant role. Even if addressing the software factors that differentiated mobile banking from Internet banking, the results hint that the choice of device still will remain the same. In the future when the physical device characteristics of mobile and desktop may diverge (e.g. screen size for mobile that has become larger), the behaviour of conducting the same task on different devices might become more common. Today, it still seems that mobile and desktop are more complementing than competing devices for simple banking tasks. Hence, one should focus on enhancing and utilizing the differences and strengths of each device. That would mean that the software design takes advantage of the device characteristics to improve the user experience on that particular device. Based on the study, that would generate more value to customers than trying to smoothen out the differences and making them more alike.
7. REFERENCES


