

Innovation in The Banking Sector - The Effect on Customers in The Netherlands

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Abstract

In recent years a new innovation has evolved itself, which has the potential to change the banking sector tremendously: The Mobile Banking App. Although the recent literature showed that the mobile banking app has settled itself as a widely used tool, there was conducted no research to the importance of the mobile banking app. Nor was there made a distinction between different financial activities. In consequence, this study examines the importance of the mobile banking app in several financial activities of people in The Netherlands. By adopting multiple factors from the literature, a research model was created. With the help of an online survey, 112 participants from The Netherlands were examined. The analysis of these responses shows that there is a low importance of the mobile banking on the domain of choosing a bank, and on the domain of applying for bank services and products. On the contrary, the analysis shows that there is a high importance of the Mobile Banking App on the domain of checking account balance and transferring money, and on the domain of making payments (online and physical). Moreover, it is found that a well Functionality and Credibility of the mobile banking app seems to be a preliminary condition in order for people to make use of the app and start value the importance of this tool in their financial activities. Personal Knowledge and Ease of Use are found to have a strong positive correlation with the importance of the mobile banking app in the different financial activities. These conclusions are valid for customers between the age of 18 and 62, who live in The Netherlands and are customer of ING, ABN-AMRO, SNS, or Rabobank. The results have several implications for scholars and practitioners. On the one hand this study provides new insights for scholars, into the phase of settlement of the mobile banking in the financial banking sector. While on the other hand it provides practitioners (banks) with insights on how to develop the mobile banking app further and which strategies to apply in this process, in order to yield a high usage and importance of the mobile banking app among customers in The Netherlands.

Key Words: Mobile Banking App, Innovation, Banking Sector, Technology Acceptance, Customers, Importance, The Netherlands, Financial Activities

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List of Abbreviations and Acronyms

3G	= 3rd Generation of Mobile Telecommunication Technology
4G	= 4rd Generation of Mobile Telecommunication Technology
ACH	= Automatic Clearing House
ANOVA	= Analysis of Variance
ATM	= Automatic Teller Machine
CEO	= Chief Executive Officer
CR	= Credibility
EDU	= Education
EU	= Ease of Use
FU	= Functionality
GDP	= Gross Domestic Product
GPS	= Global Positioning System
HBO	= Hoger Beroeps Onderwijs
IMPA	= Importance MBA in checking your account balance and transferring money
IMPB	= Importance MBA in choosing a bank
IMPS	= Importance MBA in applying for bank service and products
IMPT	= Importance MBA in making payments (physical and online)
IT	= Information Technology
LS	= Lifestyle
MBA	= Mobile Banking App
MBO	= Middelbaar Beroeps Onderwijs
PC	= Personal Computer
OLS	= Ordinary Least Square
PK	= Personal Knowledge
QR code	= Quick Response code
ROI	= Return on Investment
US	= United States
USA	= Usage
WO	= Wetenschappelijk Onderwijs

1. Introduction

1.1. Problem Definition and Relevance

In the last years, the influence of technology has increased rapidly. New innovations follow each other up at a rapid speed. Also in the banking sector this technological change is visible. Think of the closing of many physical stores, and offering these services now online, through their website. Since the introduction of the smart-phone, it even became possible to do banking activities everywhere you want (Zhou et al., 2010). In the train, in the bus, or even in an airplane. All of this became possible, because of the mobile banking app. In which you can easily transfer money, apply for loans and with which you can even pay in the shop. Without needing a bankcard or something else. Moreover, there is now even a bank which operates completely online (N26). Everything you want to do can be done through your mobile phone. Which is a major next step for the banking sector in providing new services to customers and taking advantage of the technological innovations in their business models (Riquelme and Rios, 2010).

While in the beginning the mobile app was something with which banks could profile themselves with. Now almost every bank has an own mobile app in the app-store. ING has her "ING bankieren App", ABN-AMRO has her "ABN-AMRO bankieren App", and so on. The availability of a banking app was thus not enough anymore. Therefore, the focus came to lay on the interface of the app, the options one could make use of in the app and the ease in using it. This competition led to incorporating the newest techniques in the banking app. Consequently, many people did download the banking app of their bank. Often this bears no direct costs for the customers (Al-Jabri and Sohail, 2012). When we look at the total amount of downloads for the ING bankieren App in the Google Play Store. We find that over 5.000.000 people downloaded the app and the app is the 4th most popular app in The Netherlands. The apps of Rabobank, ABN-AMRO bank and SNS bank and are on the 5th (1.000.000+ downloads), 6th (1.000.000+ downloads) and 15th place (500.000+ downloads) respectively (Google Play Store, 2019). These numbers are even without taking into account the total amount of downloads in the Apple App Store. Moreover, the CEO of ING announced on 15th March 2019, that every second almost 60 people are logging into the mobile app of ING (Lukkezen, 2019). So these numbers, very strongly, show that the scope of these apps is very wide and that the four main players in this market are ING, ABN-AMRO, Rabobank and SNS. Additionally, also companies like Apple and Google want to entry this new market (Ondrus and Lyytinen, 2011).

This raises the question of how secure this mobile banking apps actually are. Because when so many people are using it, the risk and consequences of a cyber-attack can be very high. Banks ensure that the safety of the mobile app is sufficient and data is well protected. Actually, on this moment, there is a campaign going on in The Netherlands. Its slogan stating: *"Paying with your mobile app, is just as save as it is on the web!"*. In Dutch: "Betalen met de app, is net zo veilig als op het web" (Veilig Bankieren, 2019).

1.2. Research Question

Although the safety of the app thus seems to be ensured and the app is used and accepted on a widely scale. There is less clear about the extent people value the mobile app as an important tool and how this importance of the mobile banking app is influencing the economic activities of the customers. Especially, since the mobile banking app is being used for quite a long time. This can namely be of large importance for a bank to know. A high importance of the banking app among customers can attract many customers to select your bank, if you design a highly sophisticated and modern app which

stands out from the banking apps of the competitors. Also the banking app can influence customers differently in their various financial activities, at which the bank has to anticipate. In this paper, that gap in the literature will be filled. Consequently, the main research question that will stand central in this paper is: *To what extent is the mobile banking app of importance in the financial activities of customers in the Netherlands?*

The research is conducted in The Netherlands, due to constraints in the ability to reach customers in other countries as well. Hence, only banks that play an active and significant role in banking sector of The Netherlands are taken into account. Furthermore, these banks must have launched a mobile app too. When making use of this criteria there remained only four banks. These banks are: 1. ING, 2. ABN AMRO Bank, 3. SNS Bank, 4. Rabobank. With the help of a survey the research was conducted over a large amount of participants, who were at least 18 years old and knew about the banking app. Factors of importance, coming from the literature (Ease of Use (Davis, 1989; Ng'ang'a, 2017), Credibility (Yu (2012), Functionality (Haque et al., 2009), Lifestyle (Cook and Goette, 2006), and Personal Knowledge (Laforet and Li, 2005), were taken into account. As well as two moderating variables (i.e. Age and Education (Abayomi et al., 2019)). The results were analyzed and tested with the help of descriptive -, regression - and rank analysis. Finally, conclusions and implications were made on the formulated research question. Which can help companies in developing their strategy plans for the future and can give scholars new insights on the topic of the mobile banking app.

1.3. Structure

The remainder of this research proposal will have the following structure. In chapter 2, the existing literature on the topic of technological innovations in the banking sector will be elaborated upon. The research problem will be handled in Chapter 3. Then in chapter 4 the research design of the research will be explained, including the hypothesis formation, methodology and data collection method. Chapter 5 will show all the results that were found after conducting the several analysis. In chapter 6 the results are discussed, resulting in practical and theoretical implications. Finally, chapter 7 will include the conclusion of this dissertation, presenting a summary and the recommendations for further research. After this final chapter, the references that have been used in this paper are showed. And in the end there are also appendices included, in which the used survey in English and Dutch is displayed.

2. Literature Review

2.1. Traditional Banking

Once the task of a bank was just to accept deposits and to lend money. Thus, bringing together people who wanted to borrow and people who could save. As Merton noted (1992), the primary function of a bank is to facilitate the allocation of economic resources across time. This made sure that there was a medium of exchange; that borrowers and savers could find each other; that the risk was diminished by giving an insurance to the customers and by making sure that the banks' assets were diversified; and to make sure that people could save money to spend later in their lives. Also called consumption smoothing. Nowadays, the traditional tasks of a bank have become far more complex and complicated. This is partly due to the ongoing technological innovations.

In the paper of Berger (2003), some of the most important changes in the banking system are elaborated upon. These changes developed because of technological innovations, especially in the field of information processing, telecommunications, and related technologies. Also called collectively under the definition of IT (Information Technology). He found out that over the period of 1984-2001 the amount of banking companies substantially declined, due to the fact that banks took a lot of extra tasks upon them. For banks it therefore became very profitable to merge, in order to acquire the resources and knowledge for additional activities. Also the physical stores declined relatively to the amount of self-service points (ATM's). In numbers, the amount of physical banking offices became outnumbered by ATM's by more than four to one (Berger, 2003). Another research by Mishkin & Strahan (1999) found out that the amount of ATM's in the U.S. had been doubled between the period of 1988 - 1998. Also the amount of transactions tripled in this period. Although the system of paper checks was still active in the U.S., the amount of electronic payments started to grow far beyond the old system of checks (Mishkin & Strahan, 1999). In a report of Deloitte (2014), about the way technology is threatening the traditional European retail banking system, the grow of this electronic payment is shown to have even increased further in recent years. In figure 1, it is clear that the amount of electronic transactions in the US has increased further in the period of 2008 - 2012 (Deutsche Bank, 2012). And has been remained to grow in this pace in the recent years. Moreover, it can be seen in figure 1 that the amount of electronic payments on a mobile device is growing at a rapid speed too.

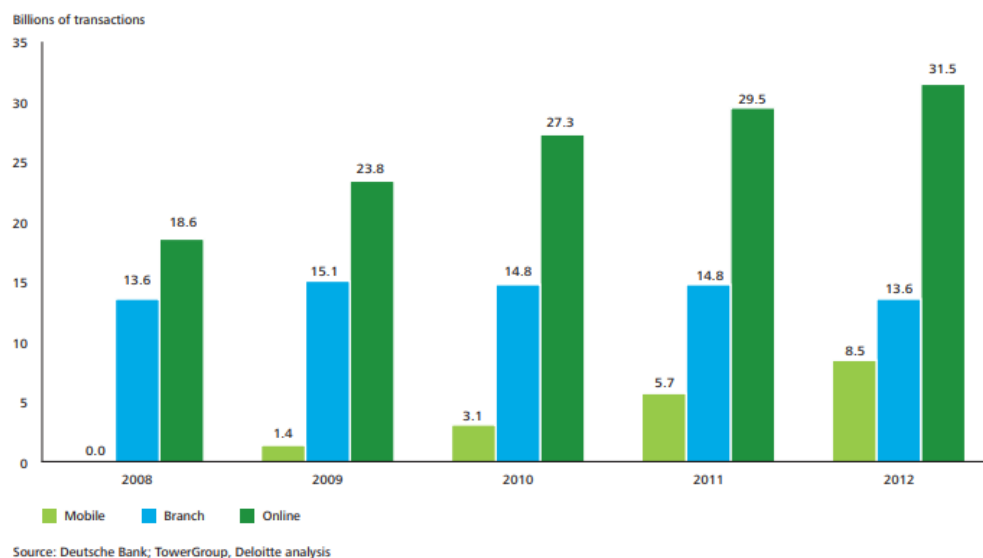


Figure 1 - Number of transactions online and through mobile phone in US (2008-2012) (Deloitte, 2014)

The traditional task of the bank, to deposit and to provide cash, has thus become less important (Berger, 2003). Customers find it now more convenient to pay electronically. Cash money thus diminished in value (e.g. utility) and use, leading to a further decrease of physical presence of the banks in the form of physical stores (Frame & White, 2014). This increase of electronic payments is not coming entirely from the banks itself. It is for a large part coming from non-banks, like Google, Pay-Pal and Apple. These companies offer clients an Online Wallet from which a lot of transactions can be made (Deloitte, 2014). These companies seem to have an own interest in the online banking as well. Payments done electronically are namely very attractive for them. By knowing the consumptions and transaction data of customers, analytic programs can extract value and use this for future consumptions (Deloitte, 2014). The drive of implementing the technological innovations (e.g. IT) is thus not coming from the banks alone.

Implementing important technologies, still has many benefits for the banks as well. The most important reasons are cost reduction, the increase in the ability to lend out money, the improved quality and productivity of current services, as well as new services (Berger, 2003). Also the importance of financial innovation for the whole economy is significant. Mainly, because finance is the facilitator of all the primary consumption and production capacities in the economy (Levine, 1997). An innovation in the financial sector, will thus have its direct effects on the whole economy. Another point Levine (1997) points out in his paper, is that when the facility of saving and investment is better managed by the financial sector. This will give another indirect stimulant to the economy, by better encouraging people to save and invest. Ultimately, leading to more productive investments and more jobs. In other words, technological innovation is very profitable for an economy as a whole (Miller (1992, 1986), Van Horne (1985)). In fact most of the literature on the topic of innovation assumes a pro-change bias, in which they assume innovations to be favourable and needed to be implemented as soon as possible (Laukkanen and Kiviniemi, 2010).

A slightly nuanced view is used by Frame & White (2014). They argue that these advantages for banks must be seen as a "net" benefit. They do not only bring benefits, but also have some downsides accompanied with them. This view is shared by Smith (2013) and Ackerman (2013) as well. Lerner and Tufano (2011) call financial innovation in their paper a process of trial and error. In which a failure can be very costly, but the benefits can be very high if the innovation turns out to be a success. Overall, innovations seem to lead to a higher GDP growth and a more fragile banking system (Beck et al., 2012). It creates conditions in which a large financial crisis can emerge, may the technological innovations be based on false assumptions or beliefs.

More research has tried to find out which factors play an important role in the upcoming of new technological innovations. In the papers of Cohen (1989, 1995) these factors are examined with the help of surveys among the most important players. He defines in his paper five highly important factors, that play a significant role in creating an atmosphere for technological innovations to emerge. These factors are: (a) Technological Opportunity, the practical issues of having the right tools, knowledge and money available. (b) Appropriability, the tendency in the economy of seeing innovation as something profitable and wanted. (c) The market Power of Enterprises, the force of certain players in the market to keep innovations going or to hold them off. (d) The Size of Players, how large are their economies of scope and scale. (e) Demand in market for new Products, do the customers accept these new products and services.

2.2. Technological Innovations

When looking at the most important technological innovations one can indicate two main innovations (Berger, 2003):

2.2.1. Internet Banking

Internet banking can be seen as one of the most important front-office innovations in the financial system (Claessens et al., 2002). It enables people to make transactions online from their chair at home. Hence, they do not have to come to a physical banking store anymore. Furst, Lang, and Nolle (2001) did research to the amount of banks implementing this new technology in the U.S.. They found out that of the 2000 banks they investigated 37.3% offered transactional internet sites and 27.7% offered informational internet sites. Another important finding they made, was that all of the big banks, more than \$10 billion in assets, had a transactional internet site.

Although the creation of a website is costly, the benefits of having internet banking seem to be large as well. In the study of DeYoung (2002), it can be found that the performance of banks offering internet banking is growing at a far more rapid speed than those banks that do not have internet banking available for their customers. However, an important nuance he makes in his paper is that this effect only holds for banks with assets higher than \$100 million. As a consequence, the largest banks adopted the internet banking. Thus, the majority of the customers had the possibility to make use of it, because the largest banks together had most of the people as their customers. Sullivan (2001) concludes therefore in his paper, that the innovation of internet banking is ultimately in the favour of the customers. Internet banking has namely evolved itself as a standard in the eyes of the public, due to the fact that all large banks have it. The technology of internet banking became necessary for banks to keep existing and to maintain their market share (Furst, Lang, and Nolle, 2002). This innovation did not cause a large increase in revenue to cover the costs, but rather as a tool to beat the competition and retain your customers (Sullivan, 2001). Nowadays, it is even valued as a condition in order for a bank to entry the market. An advantage flowing from this development, is that the sunken costs of a new entry in the market are greatly reduced (Corvoisier and Gropp, 2001).

2.2.2. Electronic Payments Technologies

A second large innovation in the financial banking sector is the use of electronic payment technologies, both front-office as back-office (Hancock and Humprey, 1998). With this development, paperwork was greatly reduced. Customers switched from purchasing goods with cash and checks to the use of credit - and debit cards. With the latter being completely electronic and thus removing all the paperwork in the process. In the paper of Gerder and Walton (2002), this decrease of the use of paper checks is extensively examined. They found out that the use of paper checks fell from 49,5 billion in 1995 to 42.5 billion in 2000. On the contrary, the amount of credit card transactions increased from 10.4 billion to 15 billion. The debit card transactions rose even harder in those years, starting with only 1.4 billion transactions in 1995 and ending with 8.3 billion transactions in 2000. They conclude in their paper, that the shift from cash and checks towards debit- and credit card is very significant. The total share of cash and checks fell in only five years time with almost 15% (i.e. from 80.8% to 64.6%). To illustrate this increase even more, one can look at the Annual Report of 2002, published by the Board of Governors of the Federal Reserve System. They announced in this report that the volume of transactions handled by the Automated Clearinghouse (ACH) had increased from 915 million in 1990 to 3.8 billion in 2000. The most important reasons for implementing this new technology seem to be the cost reduction and the convenience for customers by making transactions electronically.

2.3. The Mobile Banking App - Advantages and Disadvantages

The recently developed mobile banking app combines both the aforementioned technological innovations. It is the newest technological advancement in the financial sector and provides as the basis unit of research in this paper. It enables customers of banks to make electronic payments everywhere they want. If you at least have internet through Wi-Fi or 3G/4G. Also the banks itself obtain benefits from implementing a mobile app. In the following two subsections, the advantages and disadvantages of the mobile app, that are found in the current literature, will be elaborated upon. This will be done for the perspective of the customer as well as for the bank itself.

2.3.1. Customers

In various papers the most important customer advantages of the banking app, over the traditional banking system, have been examined (Tiwari and Buse (2007), Kemper and Wolf (2002)). They found out that there are mainly five factors that offer the greatest benefits. (1) Ubiquity, (2) Localization, (3) Proactive Functionality, (4) Immediacy, and (5) Instant Connectivity.

Ubiquity and Immediacy are defined as the ability to use the app every time you want, at any place. Furthermore, the app creates opportunities for time essential transactions like stock market transactions (Tiwari and Buse, 2007). Localization is the advantage of using GPS to find out where customers are, in order to apply communication and offers. Which are better aligned with the needs of the customer (Tiwari and Buse, 2007). Instant Connectivity is the advantage of checking your balance and other features without the need of connecting to a certain bank server. Thus, the use of the banking app becomes fast in its use. Lastly, the Proactive Functionality is the benefit of receiving information immediately when you need it. Hence, the bank can send information to your phone which is personal and of immediacy (Tiwari, Buse and Herstatt, 2006).

However, also some disadvantages have been found by the literature. The most important disadvantages turned out be: (1) Security, the risk of other people gaining access to your account and acquiring sensitive information. This can already be the case, by losing your mobile phone for example; (2) High Costs, the time and effort it takes to understand the app well enough. You have to learn how the app works in order to make use of it; (3) Less Comfort, the complexity of the mobile banking app and lack of physical contact. There is nobody who can answer your questions in the case of a problem.

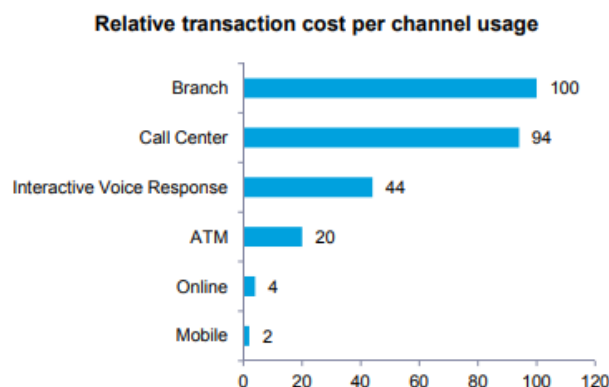
2.3.2. Banks

Other papers focused more on the perspective of the bank itself. In the paper of Rahmani et al. (2012), there are specified three benefits for the bank: (1) Customization, (2) Identify Ability, and (3) Localization. All of them are connected with each other, in the sense that they focus especially on the personalization of commercial and advertising activities from the bank. The collective goal of the three benefits, is to create a better customer experience. Therefore, one can argue that they describe more qualitative benefits.

With Localization, they mean the benefit that banks now can locate each customer with GPS. Enabling banks to apply mobile commerce instead of the general e-commerce. This has as a benefit, that providers can now receive and send information to a particular place (Rahmani et al., 2012). Hence, making it more relevant. In their paper they define Customization as the benefit of making more targeted advertisement. Hence, the shopping activities of the users can be used in order to provide better customized advertisements. Also they argue that the influence of the mobile phone is larger than personal computers. The Identify Ability benefit starts from this point and states that there is always

one person using a particular mobile phone. This again enables banks to make more personal-based marketing. Personal computers are namely often shared with multiple people, they argue (Rahmani et al., 2012). Thus, making it less effective for personal-based marketing.

Other papers took a more quantitative approach, focusing more on the financials of the bank. In the report of Deloitte (2010), it is shown that a mobile banking app can significantly decrease the overall costs. In figure 2, you can see that the costs of processing a transaction through the mobile banking app is 50 times lower than through a branch. Also it is still 10 times lower than a transaction done through an ATM.



Source: Tower Group

Figure 2 - Relative Transaction Costs per Channel Usage (Deloitte, 2010)

Another paper by Fiserv (2016) looked at the change in return on investments (ROI) for banks, when making use of a mobile banking app. He found out that there are several factors accompanied with introducing a mobile banking app, which result in a higher return on investments for the bank. These factors are: (1) Increased Product Holdings, (2) Increased Transaction Frequency, and (3) Lowered Attrition.

In the study of Fiserv (2016), the average number of products hold by customers increased with 12% after the adoption of the mobile banking app. This indicates that customers who make use of the mobile banking app feel themselves more connected with the bank. They engage namely in more activities, which results in a stronger relationship between customer and bank. Ultimately, this increase in provided services, like loans, credit cards and mortgages, will lead to a higher revenue at the bank.

Another factor which is pointed out by the paper of Fiserv (2016), is that the transaction frequency is significantly increased in the first three months of using the mobile banking app. Furthermore, the value of the transactions seem to increase as well. This effect holds for credit cards, debit cards and ATM's. Again, this increase in transactions will lead to higher revenue at the bank, the paper argues.

The final point which becomes clear in the paper (Fiserv, 2016) is that customers who use the mobile banking app are expected to stay with their bank longer. In the paper it is concluded that yearly 4.9% of customers using mobile banking leave their bank. While on the other hand, almost 13.4% of the customers who have no experience with mobile banking leave their bank. These numbers thus indicate that mobile banking users will remain at their bank almost three times as likely as non-mobile banking users.

2.4. Customer - Bank Relationship

The majority of studies have conducted research to the effects of technological innovations, like online banking and electronic payments, on the *banks*. Less emphasis has been put by the literature on the effects on the *customers*. However, with the introduction of the mobile banking app the relationship between the customer and the bank is shifting rapidly as well.

A Global Consumer Banking Survey among 55,000 consumers (EY, 2016) tried to find out the most important changes in the relationship between the customers and the bank. They found out that almost 40% of the current customers experienced a decreased dependency on the bank in the last 12 months for their primary financial services. On the contrary, nonbank providers increased their influence among the customers. Around 20% of the customers, who did not use non-bank services yet, planned to do so in the future. It is important for banks to keep their current customers, as it is five to 10 times more expensive to acquire a new customer than obtain business from an existing customer (Anbuoli & Thiruvén, 2014). The paper of EY (2016) continues with creating four areas in which the banks lost their traditional influence: (1) Customer Engagement, (2) Customer Understanding, (3) Trust, and (4) Customer Experience.

From the survey it turned out that customers still have trust in the banks to do their traditional tasks (e.g. keep money safe). Also 60% of the participants think that banks, with their expertise, have an important role in guiding people towards their life goals. However, non-bank organizations have acquired the same level of trust and are valued by the customers to give better strategic advices. In the sense, that non-bank organizations provide more unbiased advice in the eyes of the public. The trust resulting from the familiarity and visibility of the branches of traditional banks is thus not enough anymore (EY, 2016).

Another point the survey points out, is that customers want the bank to understand them better (EY, 2016). The traditional segmentation on the basis of age, financial parameters and geographic location does not fit anymore. Instead, insights into the life-style, behaviour and attitude is needed. This can be reached with the help of online and mobile banking (EY, 2016). This namely also improves the third area of importance: engagement. The survey concludes that people are willing to increase the engagement with banks more, but this has to be facilitated by providing the right content and preferences (EY, 2016).

Lastly, the survey points out that the view on traditional banks has been converged over the last years (EY, 2016). Nowadays, customers see traditional banks as all the same. In order to differentiate themselves from the rest, banks thus have to innovate (Anbuoli & Thiruvén, 2014). However, new market entrants have come on the market with a high level of experience on the latest financial fields, like FinTech. Thus, making it harder for the traditional banks to keep their position in the financial activities of the people (EY, 2016). However, The pressures of competitive and dynamic markets have contributed to the growth of Customer Relationship Management in the Financial Services Sector (Anbuoli & Thiruvén, 2014).

2.5. Acceptance and Important Factors

As mentioned in one of the previous subsection, there are several advantages and disadvantages for customers and banks resulting from the use of the mobile banking app. However, still the question remains if customers find the recently designed mobile banking app as an acceptable new technology. Otherwise, these possible benefits will never even be obtained. Furthermore, it is of importance to

determine which factors are of influence in this process. In the current literature, some research have been conducted on this next step. In the following two subsections, the factors that are of importance in determining the degree of acceptance are elaborated upon. Thereby, the distinction is made between external and internal effects.

2.5.1. External Factors

With external effects we include the aspects of the banking app itself. In other words, which characteristics of the app are of influence on people's acceptance when making use of the mobile banking app.

2.5.1.1. Ease of Use

In the paper of Davis (1989), he defines ease of use as "the degree to which a person believes that using a particular system would be free of effort" (p. 320). In general it has been significantly proven that when a product or service is easy in use this will enhance the acceptance and usefulness in the eyes of the users (Davis et al., 1989; Agarwal & Prasad, 1999; Kahandawa & Wijayanayake, 2014; Ng'ang'a, 2017). The opposite is also true, less users will adopt a new innovation when it requires more time and effort (Al-Jabri & Sohail, 2012). However, a few papers also found that there were no significant effect between the Ease of Use and acceptance of new technologies (Yu (2012), Zhou et al. (2010)). Still the majority of the literature finds different results, so in general one can argue that the more easy the mobile banking app is to use, the more likely it is that people accept the mobile banking app as a useful tool in their banking activities. Mobile banking apps should thus be clear in their layout and functions in order to make sure that people do not encounter problems.

2.5.1.2. Assurances or Insurances

When there is a new innovation introduced, the assurances are of large importance in making people accept the new technology and create trust among them (Pavlou, 2003). Hence, people have no experience with the new product of service. This makes it hard for them to assess the potential risks involved in the new technology (Koenig-Lewis et al., 2010; Kahandawa & Wijayanayake, 2014). In the paper of Kim and Prabhakar (2004), it is shown that there are possible information irregularities that can emerge in using the mobile app. This raises suspicion among customers and gives them incentives to think of the mobile banking app, as a tool containing too much risks. Yu (2012) goes even further and specifies in his paper three important determinants for creating trust in the mobile banking app, namely (1) Technical Reliability, (2) Privacy Protection, and (3) Security of The Banking Environment. Assurances in the form of laws, regulations, policies and agreements can help in fulfilling these determinants (McKnight et al., 1998). In the case of the banking app these are assurances, like privacy policies and the deposit insurance. Also more technical assurances can help in creating trust. In the paper of Bilal (2011) it is mentioned that the introduction of a finger print mechanism in the app, can increase the trust among customers. Thereby enhancing the use of the MBA by customers of the bank as well.

2.5.1.3. Transaction Speed

Within the literature it can be found that the speed with which transactions can be made is of importance as well. One of the most important advantages of the banking app, immediacy, is related to this factor as well (Tiwari and Buse, 2007). When the required time to make a transaction with your mobile banking app is low, it is expected to lead to a higher usefulness at customers. Consequently, the acceptance rate of the app will become higher as well. Overall, the time it takes to complete a transaction in a physical store is proven to be much more than the time it takes to complete it on your mobile app.

2.5.1.4. Pursuance

The scope and overview of the functions in the banking app is an important factor too. Also here, two of the most important benefits of the mobile banking app, Localization and Instant Connectivity, are related (Tiwari and Buse, 2007). Especially with the increasing technological innovation in the recent years and the speed at which this is happening, people now want to have excess on their mobile banking app everywhere. Furthermore, they want the app to have a comprehensive overview of all of their activities (Haque et al., 2009). The better the functions and the overview of the mobile app are worked out, the more easier people get to understand the app and the higher people value the mobile app (Ng'ang'a, 2017). Hence, people will adopt the new technology more easily.

2.5.2. Internal Factors

In the literature there can also be find certain factors, which are of internal importance process of accepting the mobile banking app by the customers. That is, characteristics of people itself that are of influence on the acceptance of the mobile banking app.

2.5.2.1. Personal Desire

People must feel the need of using the banking app or as stated in the paper of Cook and Goette (2006), "People must have the desire to make use of the mobile banking app". Hence, when people do not have the desire of making use of the mobile app, their opinion about the usefulness and their acceptance of the app will both be lower (Kahandawa & Wijayanayake, 2014). A very important factor influencing the personal desire, is social influence (Amin et al., 2008). In their paper, they examined 158 customers in Malaysia and concluded that there is a very significant effect between the attitude of people surrounding the participants and the personal desire of making use of the mobile banking app. Singh et al. (2010) confirms this, by arguing that one cannot detach the personal desire of embracing a new technology with the influences from family, friends, peers and the media. A slight nuance is made in the paper of Venkatesh et al. (2003). They argue that social influence indeed has a strong effect on the personal desire, but this effect is only significant in the early stage of new technologies. In this period the person's experience with the new technology is namely low. Hence, information of family, friends and the media is valued the largest in this time period.

2.5.2.2. Habit

The mobile app is a relatively new phenomenon and is not yet implemented in the habit of people. Many people have namely still the habit of doing their financial activities on paper and offline (Laforet & Li, 2005). When this habit is thus not changed, the use of the mobile banking app is expected to be not accepted (Koenig-Lewis et al., 2010). In other papers the importance of habit is examined as well (Ng'ang'a, 2017). In the paper of Chen et al. (2004), they argue that the extent at which new technologies are in line with common values, lifestyles, experiences and believes (i.e. habit), determines whether or not people accept the new technology. When the changes that people have to make, in order to be able to use the mobile banking app, are high. This will lead to a lower acceptance of the new innovation. To clarify this more, Laforet & Li (2005) found out that many people have the habit of doing their financial activities offline, by going to a physical banking store or ATM. These customers will be less likely to adopt the mobile banking app (Lu et al., 2011). However, those customers who already make use of electronic payment technologies and internet banking will have less resistance against the use of the mobile banking app (Lu et al., 2011). In the literature there is less clear about the spillover effect of customers who already make use of other mobile phone apps. Customers who already make use of other apps, could namely be argued to accept a mobile banking app more easier as well.

2.5.2.3. Resistance

In the literature more research has been conducted on explaining the resistance of people against the use of new technologies. In the paper of Rammile and Nel (2012) it is concluded that usefulness and ease of use of new technologies are two of the most important factors influencing the resistance. If it is clear how a new technological innovations works, trust will become higher and the resistance would decrease. When the resistance is higher, the acceptance and usefulness of the banking app will automatically be decreased (Barati & Mohammadi, 2009). Another approach for explaining a higher resistance among people is described by Laukkanen and Cruz (2010). They suggest that the functional and psychological barriers of people are key elements in the trouble of adopting new technologies. Alafeef et al. (2011) offer a possible third explanation for a higher resistance among people. They argue in their paper that culture has a great influence on the adoption of new innovations as well. This results in differences between countries in their implementation of information technologies (i.e. internet banking and the electronic payment system) (Srite, 2006). As a result, the majority of the literature examines only one particular country to control for the cultural factor. Morris & Venkatesh (2000) and found out that there is even a fourth important factor as well, namely age. Young customers are in general earlier in adopting a new innovation and, consequently, have a lower resistance rate (Blackburn, 2011)

2.5.2.4. Knowledge

Laforet and Li (2005) found out in their paper that when people have less knowledge and experience, about the functions and services of the mobile banking app. This has an important effect on the acceptance and usefulness of mobile banking. Corritore et al. (2003) went further and found out that a lack of understanding about new technologies, causes people to slowly adapt to these new products and services. Moreover, they will have the tendency to stick to their traditional tools, products and services. In order to determine the knowledge of people about the mobile banking app, the literature makes use of the term self-efficacy (Luarn & Lin, 2005). This term measures the subjective judgement of a person about the belief that he or she has the right abilities and skills to make use of the mobile banking app. The higher the perceived knowledge of a person the more likely this person is to make use of the new technology (Mathieson et al., 2001). Also there seems to be a link between the knowledge people have and the Ease of Use with which people value the banking app. Hence, when people believe they have enough knowledge about the mobile banking app. They are expected to value the costs (i.e. time and effort) of using the mobile banking app to be lower as well (Wang et al., 2006). Other papers confirm this causal relationship, by making use of empirical evidence (Vanketesh & Davis, 1996). In the paper of Ng'ang'a (2017) there is conducted research to the actual level of knowledge people have about the MBA in Sri Lanka. They found that people have relatively low knowledge about the new technology, but that they are willing to learn.

3. Research Problem

The financial banking system is changing at a rapid speed. Where once the functions of a bank were just to facilitate the allocation of economic resources across time (Merton, 1992). Nowadays, the functions of a bank have expanded across multiple services and products. Increasing the tasks, activities and scope of the banking sector. This change in the way the financial banking sector works, has been driven in essence by technological innovations. Two of the most important innovations that have been introduced in the banking sector, very recently, are Internet Banking and Electronic Payment Systems (Berger, 2003). These innovations enabled people to do their banking activities at home, on their desktop. They didn't have to come to a physical store anymore (Frame & White, 2014). Therefore, it changed the status-quo of how financial transactions were done until then.

Many research has been done, to find out the effects of these new innovations on the bank. Think of jobs that will disappear due to the increasing capacity of computers and the change in relationship between the bank and its customers. However, for banks these two new technologies offered also large benefits. The most important benefits for them are cost reduction, the increase in the ability to lend out money, and the improved quality and productivity of current services, as well as new services (Berger, 2003). Also private companies acquired large benefits from electronic transactions and internet banking. Payments done electronically are namely very attractive for them. By knowing the consumptions and transaction data of customers, analytic programs can extract value and use this for future consumptions (Deloitte, 2014). Due to the fact that there were benefits for banks, companies and customers, the implementation of the new information technology innovations was done very quickly (Laukkanen and Kiviniemi, 2010).

After the implementation of Electronic Payments Systems and Internet Banking in the financial banking sector, these two innovations came together in the form of the mobile banking app. With this banking app on your mobile phone, tablet or other device. People could now make transactions or payments everywhere and anywhere they wanted; Transfer money with just a push on the button; Trade stocks and bonds through their phone; Even make an application for various amount of services, which banks offer (i.e. a new bank card and/or loans). A new innovative step in the financial banking sector had been made. Offering customers various new benefits (Tiwari and Buse, 2007), as well as banks (Fiserv, 2016).

This technological innovation is expected to keep going in the future, and is often implemented by the bank as soon as possible. However, it is of the utmost importance for banks to find out if customers believe these technological changes to be favourable. Do they see these technological innovations as an improvement or as a downside. It questions the often heard slogan that technological change or progress will make us all better. Understanding what the reaction of customers is on new innovations, is namely crucial in the process of implementing and developing new technologies (Ram, 1987). Hence, if customers do not accept the new innovation in the form of the banking app. The possible advantages of the new technology will have no effect at all.

As a results, different scholars have been conducted studies to find out the acceptance of the mobile banking app among customers. They found out that external factors like Ease of Use (Davis, 1989), Assurances and Insurances (Yu (2012), Transaction Speed (Tiwari and Buse, 2007), and Pursuance (Haque et al., 2009) are of large importance. Also internal factors like Personal Desire (Cook and

Goette, 2006), Habit (Chen et al., 2004), Resistance (Rammile and Nel, 2012), and Knowledge (Laforet and Li, 2005) seem to matter in the determination of the acceptance rate.

Nowadays, the mobile banking app seem to be accepted largely among customers in the Netherlands. To illustrate, when we look at the total amount of downloads for the ING banking app. It can be found that over 5.000.000 people downloaded the ING banking app (Google Play Store, 2019). Which makes it the 4th most popular app in The Netherlands. Also the apps of Rabobank, ABN-AMRO bank and SNS bank and are on the 5th (1.000.000+ downloads), 6th (1.000.000+ downloads) and 15th place (500.000+ downloads) respectively (Google Play Store, 2019). Moreover, the CEO of ING announced on 15th March 2019, that every second almost 60 people are logging into the mobile app of ING (Lukkezen, 2019).

The way in which the innovation (i.e. the mobile banking app) reshaped the banking sector and its tasks has been made clear by the literature. Also the way in which customers accepted these new technologies, and the consequent advantages and disadvantages emerging from this, are elaborated upon in the literature. However, the next step in the process is to find out if the mobile banking app, as a tool which combines the two most important new information technologies, has established itself as an decisive factor in the banking sector. Or to state it otherwise, how important is the mobile banking app in the lives of people nowadays. The mobile banking app can namely function as a possibly highly relevant factor in the determination of customers for which bank to choose. As well, as in the way in which customers do their transactions and purchases. Finding out the answer on this question in this paper is thus very relevant and can have large consequences. Driving innovation further could namely mean, that more customers would choose for your bank or they will largely move away.

In this paper, I will conduct research to find out the effect of the mobile banking app in the financial activities of people in The Netherlands. The main research question of the paper will therefore be:
To what extent is the mobile banking app of importance in the financial activities of customers in the Netherlands?

4. Research Design

In this section of the paper the hypotheses are formulated, that were tested in the result section of this paper. Also, the methodology is elaborated upon, as well as the data collection. Finally, there is included a short reflection on the used research method. In which the strengths and potential weaknesses are described and solved, in order to ensure the validity and reliability of the chosen research method.

4.1. Hypothesis Formation

From the literature review there have come forward multiple factors, which are of importance in influencing the result. These factors were included in the survey research in order to be able to give a consistent answer upon the main research question of this paper. Hence, the consequent hypotheses of these factors are described separately of each other below.

4.1.1. Age (AGE) (Moderating Variable)

Hypothesis 1: An increase in age is expected to have a negative influence on the importance of the banking app in financial activities.

I expect that older people value the banking app and its functions as a less important factor in their financial activities. Primarily because older people have larger experience with "older" techniques (i.e. physical stores and cash payments) (Laforet & Li, 2005). Their habits are thus very different than the newest financial innovations, making it harder to adopt the mobile banking app (Lu et al., 2011). For example, they are expected to buy more goods with cash money and go to physical bank stores when they need help of applying for new services. Their resistance against new innovations is also expected to be higher. Young customers are namely in general earlier in adopting a new innovation and, consequently, have a lower resistance rate (Blackburn, 2011). Furthermore it has been pointed out by the literature that when the resistance is higher, the acceptance and usefulness of the banking app will be decreased (Barati & Mohammadi, 2009). Also recent literature has pointed out that the demographic variable age has a significant negative effect on the adoption of the MBA (Govender & Sihlali, 2014; Tuj, 2014; Abayomi et al., 2019). Which all together makes it very plausible to expect the importance of the mobile banking app to decrease as well.

H₀ 1: A higher age has no effect on the importance of the banking app.

H_A 1: A higher age decreases the importance of the mobile banking app.

4.1.2. Education (EDU) (Moderating Variable)

Hypothesis 2: A higher completed education is expected to have a positive influence on the importance of the banking app in financial activities.

We expect that when people have completed a higher form of education, the banking app will be of a higher importance in the financial activities of these people.. When people have a higher education, they are expected to have better jobs and consequently have a higher disposable income (Goldin et al., 2009). This disposable income can be spent more easily on luxury goods, which often can be bought on the internet. In which a banking app can be very handy and efficient. Less educated people have, on average, less amount of money to spend (Gershon, 2016). So they really have to pay attention on which things to buy. Therefore, we expect that these people will more likely make use of cash money instead of a banking app. With cash money you namely see directly, which amount of money you still can spend. Although there has been a decline in cash payments(i.e down from 45% in 2016 to 41.4% in 2017 (DNB, 2017)), there still remains a significant percentage of cash payments. So it is of significance to examine this relationship as well.

H₀ 2: A higher completed education has no effect on the importance of the banking app.

H_A 2: A higher completed education increases the importance of the mobile banking app

4.1.3. Life-Style (LS) (Independent variable)

Hypothesis 3: A more materialistic lifestyle is expected to have a positive influence on the importance of the banking app in financial activities.

We expect that people who have the tendency to buy a large number of goods (e.g. are very materialistic in their lifestyle), will tend to value the banking app as a more important factor. When you namely buy a lot of goods, paying with cash in a physical store or logging into the computer on your bank-account takes a lot of time. From the literature it has become clear that transaction speed is a very important factor to include, because it is expected to lead to a higher usefulness among customers (Tiwari and Buse, 2007). The transaction time can be greatly reduced when making use of the banking app. Then you can just log-in into your app with a 5-digit password, scan a QR-code on the website and pay your transaction. All of this is done within a minute, creating a feeling of need among people to make use of the mobile banking app (Cook and Goette, 2006). This desire for the banking app is expected to stimulate the importance among people of this new tool further.

H₀ 3: A more materialistic lifestyle has no effect on the importance of the banking app.

H_A 3: A more materialistic lifestyle increases the importance of the mobile banking app.

4.1.4. Personal Knowledge (PK) (Independent variable)

Hypothesis 4: A higher personal knowledge about the mobile banking app is expected to have a positive influence on the importance of the banking app in financial activities.

When people think that they have the right abilities and skills (i.e. personal knowledge) to make use of a new technology. They will more easily adapt to these new products and services (Corritore et al., 2003). This is expected to be the same in the case of the mobile banking app. In other words, the higher the personal knowledge of a person the more likely this person is to make use of the new technology (Mathieson et al., 2001). We expect this relationship to hold for the importance of the mobile banking app as well. Mainly, because when people have a high personal knowledge. They will value the usage of the mobile banking app as a non-costly tool to make use of. Thus, they will more easier value it as an important factor in their financial activities.

H₀ 4: A higher personal knowledge has no effect on the importance of the banking app.

H_A 4: A higher personal knowledge increases the importance of the mobile banking app.

4.1.5. Ease of Use (EU) (Independent variable)

Hypothesis 5: A higher ease of use of the mobile banking app is expected to have a positive influence on the importance of the banking app in financial activities.

In the paper of Davis (1989), ease of use is defined as the degree to which a person believes that using a particular system would be free of effort. In the literature it is significantly proven that when a product or service is perceived easy in use this will enhance the acceptance and usefulness (Agarwal & Prasad, 1999). It is therefore expected that the more easy the mobile banking app is to use, the more likely it is that people accept the mobile banking app as a useful tool in their banking activities. Thus, increasing the value of the mobile banking app in the financial activities of customers.

Mobile banking apps which are clear in their lay-out and functions, and acquire limited time and effort to understand, are thus expected to increase people's importance of the mobile banking app.

H₀ 5: A higher ease of use has no effect on the importance of the banking app.

H_A 5: A higher ease of use increases the importance of the mobile banking app.

4.1.6. Functionality (FU) (Independent variable)

Hypothesis 6: A better functionality of the mobile banking app is expected to have a positive influence on the importance of the banking app in financial activities.

This hypothesis is about the functions and options of the banking app. Two of the most important benefits of the mobile banking app, Localization and Instant Connectivity, are related to this factor

(Tiwari and Buse, 2007). People namely want to have access to their app anywhere and everywhere they are. Furthermore, it is proven in the literature that people want their mobile banking app to include all of their financial services and products. So that they can see an overview of all of their banking activities (Haque et al., 2009). When the functions and the overview of the mobile app are thus worked out very well, it is expected that people will value the mobile banking app as a very useful tool. Increasing the importance of the mobile banking app in their eyes.

H₀ 6: A more sophisticated functionality has no effect on the importance of the banking app.

H_A 6: A more sophisticated functionality increases the importance of the mobile banking app.

4.1.7. Credibility (CR) (Independent variable)

Hypothesis 7: A higher credibility of the mobile banking app is expected to have a positive influence on the importance of the banking app in financial activities.

The last hypothesis is about the safety and trust of the mobile banking app. A new innovation needs namely good assurances in order for people to accept this new technology (Pavlou, 2003). When people have no experience with a technology, trust is of the utmost importance. As the risks cannot be accurately assessed by the early users (Koenig-Lewis et al., 2010). It is therefore expected that when the assurances and insurances of the banking app are worked out well, in the eyes of the users, this will increase the importance of the mobile banking app among customers. Consequently, the mobile banking app is expected to have a larger influence in the financial activities of people.

H₀ 7: A higher credibility has no effect on the importance of the banking app.

H_A 7: A higher credibility increases the importance of the mobile banking app.

All of the hypotheses mentioned above are tested on various financial activities, in order to examine if the mobile bank has become an important tool on all of the domains. The included domains are:

1. *Choice of bank (IMPB)*: With this domain, the researcher wants to find out how important the mobile banking app is for banks in attracting customers. In other words, we want to find out the extent of which the mobile banking app is of importance in the decision-making of people for which bank to choose. Do they see the Mobile Banking App as a decisive tool, with which banks can differentiate themselves from the competition.

2. *Way of making payments to buy goods and services (IMPT)*: Beforehand, there can be made a distinction in this domain. On the one hand, the way of making payments for goods and services in physical stores. On the other hand, the way of making payments for goods and services through the internet. In both categories the Mobile Banking App is a new way in which people can pay their transactions. In physical stores the Mobile Banking App can serve as an alternative for cash money or a bankcard, enabling people to leave their wallet at home. You only have to login into your app and you can pay with it in the shop. For transactions made through the internet (i.e. online) the mobile banking app can serve as an alternative for having to log-in into your bank account through the website. You only have to log-in into your app and scan the QR code on your PC/laptop at the checkout of the web-shop. Both methods save a lot of time and effort. The role of the Mobile Banking App in these processes is thus captured by this domain.

3. *Checking account balances and transferring money (IMPA)*: This domain is about the way people do their financial administration. Where in the past, one could only see his or her account-balance by going to the bank, login to an account on a PC, or look at paper bank statements. Nowadays, the mobile banking app allows people to look at their account balance everywhere and anywhere they want. The same logic can be applied for transferring money. Also this was in the past only possible by

going to a bank or login to an account on a PC. With transferring money, this research means the transfer of money from one person's bank account to another person's bank account or from one person's bank account to another of his own bank accounts. In other words, it is a movement of money where you do not buy something or receive something in return (e.g. making a gift to someone, transfer money from your saving account to your current account). The current importance of the Mobile Banking App in these activities is measured by this domain.

4. *Applying for bank services and products (IMPS)*: Applying for loans, requesting new bankcards, trading in stocks and bonds, asking for personal help, or advice about insurance options and savings opportunities. These are all activities in which the banks can help customers. Where in the past, the only way to arrange these activities was to go to a bank. Currently, the Mobile Bank App offers an alternative simple and fast way to arrange these activities from home. The importance of the Mobile Banking App in these activities is measured by this domain.

The Conceptual Model, as described in the previous paragraphs, is visualized in figure 3. In this figure all of the expected relationships are shown between the various variables.

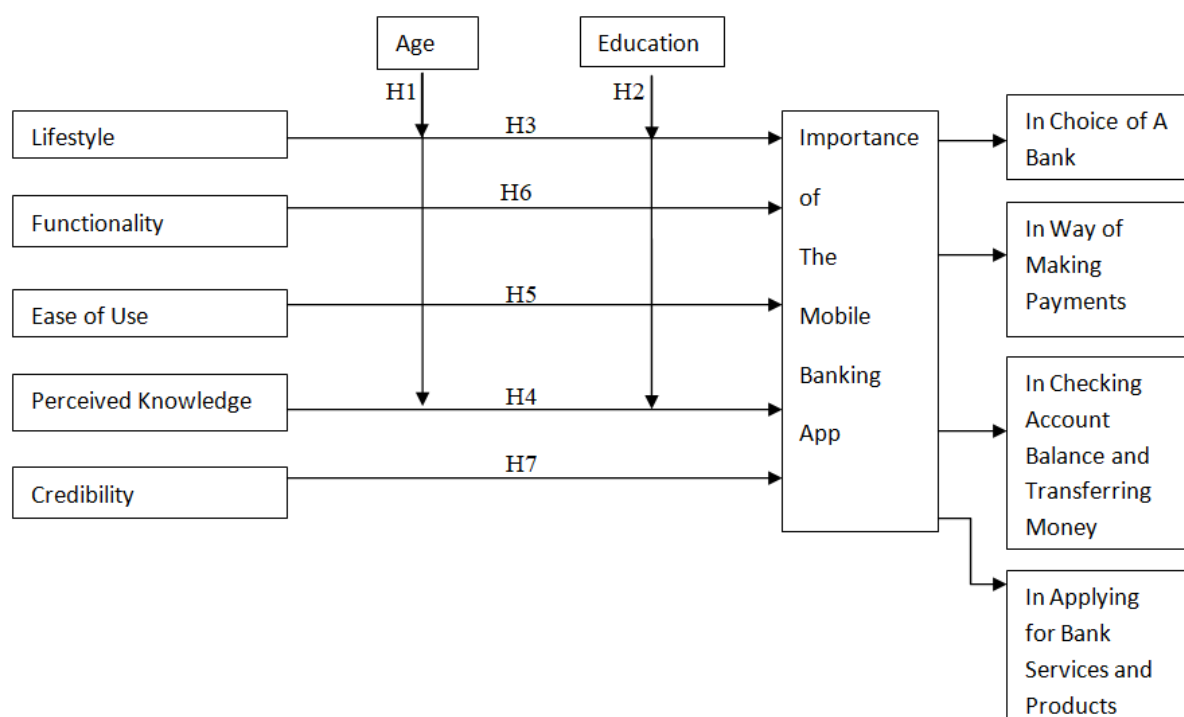


Figure 3 - Visualized Conceptual Model for Mobile Banking Importance

4.2. Methodology & Data

4.2.1. Methods of Data Collection

4.2.1.1. Survey

The approach that was taken in this paper is a quantitative one. In order to be able to give an answer on the research question, the paper made use of a survey as the primarily method of collecting information. In research about the mobile banking app, surveys have been widely used as a primarily basis for data collection (Venkatesh et al., 2003; Zhou, et al., 2010; Lin, 2011; Yu, 2012). Making use of a survey enabled the researcher to gather a large size of information in a relatively short amount of time (Wright, 2005). Furthermore, it could be held anonymous. Enabling people to give honest

answers, not based on socially expected beliefs. Another advantage is that it could be conducted rather cheap, as there were no large compensation schemes needed (Wright, 2005). The compensation scheme, used in this paper, is explained later in this section.

In the survey that was used (appendix A) participants had to answer various questions about the mobile banking app, which were based on the literature review. It took participants around 7 minutes to fill in the questionnaire. The survey was conducted electronically. This has as an advantage that you do not have the problem of an observer bias. Hence, because everything is done electronically, the influence of the observer on the participants is limited to a minimum or even zero. Another advantage is that it takes only a limited amount of time to fill in. So, it gives a stronger incentive for people to fill in the survey. Which leads to a larger response and thus more data. In the end, this enabled the researchers to make stronger and more relevant conclusions, and generalize the results more easily.

The survey was created in two languages, English and Dutch. This had been done, to prevent people to interpret a question in the wrong way. Limited ability in the vocabulary of a foreign language can namely lead you to answer questions differently than intended. In the end, this will lead to results which are falsely in line with the hypotheses or wrongly against it. The translation of the English survey to the Dutch was done through back-translation. This has been proven to be the best method in order to maintain the correct information (Douglas & Craig, 2007).

In designing the questionnaire from which the data was collected, multiple factors were taken into account. The first factor was the dropout rate. This is the amount of people, who do not complete the survey until the end. Which leads to incomplete data-sets and useless information. In the literature lots of studies have been conducted to find out the most optimal matrix scheme, in order to reduce the drop-out rate to a minimum. One of those studies found out that the most optimal matrix survey, contains 5 questions per page and has 5 possible answer columns (Grady et al., 2018). In the survey of this paper, this format was thus chosen as the most optimal. The second factor was the level of measurement. The answers participants could give in the survey were on a Likert scale between the number of 1 ("Very Little Extent") and 5 ("Very Large Extent"). This scale is also widely used in scientific papers on this topic (Dawes, 2008). In figure 4 you can see an example of a question-set containing five rows, five columns and an 5-point Likert scale.

	1	2	3	4	5
Data Question 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Question 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Question 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Question 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Question 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 4 - Data Questions in Survey

In order to keep the participants motivated in making the survey, they were given a monetary incentive. This was done in the form of a lottery. Participants who completed all of the question of the survey, received an extra question in the end. In this question, participants were asked to leave their e-mail address in order to make a chance of winning one of the two prizes (Appendix A, Question 19). These two prizes were a gift card worth €25,- from Bol.com, MediaMarkt, Intratuin or VVV. All of the e-mail addresses which were left behind, were put in a urn. From this urn, two e-mail addresses were picked randomly and independent of the answers given in the survey.

Participants did also have the option to be kept updated about the results and conclusions of the study, if they wanted to. Participants could agree or disagree to this option in another question (Appendix A, Question 20). Which became available after the compensation question. Both of the questions were not linked to the answers filled-in in the survey. Data was thus not combined, nor shared with third-parties.

The structure of the survey was divided into three parts:

In the first part the participants were introduced to the research subject. Furthermore, the structure of the remainder of the survey was outlined in this introduction. So that the participants knew which question types to expect, how to make a chance of receiving a compensation, and how to keep updated about the research. After the short introduction, question 1 to 8 asked for the age, gender, occupation, education, installation, bank, platform and usage patterns of the participant. This was done, in order to distinguish between different participants. This enabled the researcher to find out of there were significant moderating variables.

In the second part of the survey, participants had to answer questions measuring the key variables of this paper. Which were adapted from the literature review and converted into the respective designed hypotheses. The definition of the respective factor of each question was explained first, so that there was an equal understanding among all of the participants when filling in their answer. The chronological order of these questions was as follow. In question 9, participants had to indicate how important they value the mobile banking app on the four domains, as defined in this paper. Then, in questions 10 (lifestyle), 11 (Personal Knowledge), 12 (Ease of Use), 13 (Functionality), and 14 (Credibility) participants had to answer a question about the respective factors that could influence their importance of the Mobile Banking App on the four domains. Finally, the last four questions asked the respondents to rank the five factors for each of the four financial activities, from (1) highest influence on the importance of the Mobile banking App to (5) lowest influence on the importance of the Mobile Banking App. It enabled the researcher to found out if there were differences between the influences of the factors on the four domains. Consequently, answers on the hypotheses and main research question could be formulated.

In the third and last part of the survey, participants were asked to leave their e-mail address in order to make a chance of winning one of the two €25,- gift cards (Question 19). Also participants could leave their e-mail address in order to kept updated about the results of the research (Question 20). The precise questionnaire that was used, can be found in Appendix A (English) and Appendix B (Dutch).

In order to make sure the questionnaire was complete and data was processed in the right way, a pilot test was conducted among 5 test participants. With the help of the received feedback, slight changes were performed to the survey to make sure that the survey was ready to be implemented. This procedure has been used in other papers on this topic as well (Koenig-Lewis et al., 2010; Yu, 2012).

4.2.1.2. Target Group

In this paper the focus was on customers in The Netherlands. Mainly, because the ability of reaching customers in other countries was limited. Therefore, the amount of participants from other countries would become too small, so that the conclusions could not be generalized. Furthermore, cultural, legal and technological factors were held constant by limiting the research to The Netherlands. Therefore, only the banks that played an active and significant role in banking sector of The Netherlands were taken into account. Furthermore, the included banks had to have a mobile app available in the Google Store and / or App Store. The four banks that qualified for these two requirements were:

1. *ING*
2. *ABN AMRO*
3. *SNS*
4. *Rabobank*

These banks have a large amount of information available on their websites. From which could be found out that they made a significant amount of technological innovations in the last years. Moreover, the availability and openness of information allowed the research to collect complementary information about the banks.

The target group consisted of participants, who needed to qualify for certain requirements:

1. *Be customer of one of the four banks mentioned earlier.*

This was of importance, because the research was limited to these four banks which made substantial technological innovations. The intention of the research was not to measure the effect on all of the banks in The Netherlands.

2. *Have experience with the banking app on their mobile devices (i.e. smart-phone or tablet).*

Of course, participants needed to know about the banking app in order to find out the importance of this tool in their decision-making. Meaning that participants at least had to know what the mobile banking app was and which functions it had. It was not necessary that they had downloaded the app on their device on the moment when they filled in the questionnaire. It could namely be a rational choice for them to do delete the mobile banking app.

3. *Have at least an age of 18.*

Many of the services provided through the mobile app are not available for people under the age of 18 years old. So, in order to keep the treatment equal among all of the participants, only people above the age of eighteen years old could participate in the research.

In order to reach participants in The Netherlands, who classified for the requirements mentioned in the above paragraph, a convenience sample technique or also called an availability sampling was used. This means that data was collected from population members who were conveniently available to participate in the study. Therewith, this paper follows a common method used by other research papers on this topic (Wu & Wang, 2005; Chen, 2008; Amin et al., 2008; Koenig-Lewis et al., 2010). The questionnaire was sent to various contacts and relations through the social network. By doing so, a snowball sampling was created in which more and more people could be reached to fill in the questionnaire.

4.2.2. Methods of Data Analysis

4.2.2.1. Data Preparation

The estimation is that around 400-500 people were reached and asked to fill in the questionnaire. From these people, a total of 136 individuals actually filled in the survey. Which comes down on a response rate of 27.2%. After checking for missing data, in order to achieve a more precise and accurate data set, a total of 112 complete surveys remained. An overview from the characteristics of the sample is given in table 1.

Measure	Choice Item	Frequency	Percentage
Gender	Male	61	54.5%
	Female	51	45.5%
Age	18-21	23	20.5%
	22-28	25	22.3%
	29-37	12	10.7%
	38-47	14	12.5%
	48-52	14	12.5%
	53-62	21	18.8%
	63-72	2	1.8%
	73-85	1	0.9%
Occupation	Student	40	35.7%
	Full-time employee	34	30.4%
	Part-time employee	25	22.3%
	Self-employed	8	7.1%
	Unemployed	0	0.00%
	Other	5	4.5%
Education Level	Primary School	1	0.9%
	Secondary Education	34	30.4%
	MBO	24	21.4%
	HBO	28	25.0%
	WO	25	22.3%
Installation	Yes	107	95.5%
	No	5	4.5%
Bank	ING	44	39.3%
	ABN-AMRO	16	14.3%
	SNS	17	15.2%
	Rabobank	35	31.2%
Platform	Only Smartphone	84	75.0%
	Only Tablet	3	2.7%
	Both	25	22.3%
Usage Pattern	Never	2	1.8%
	Less than 1 time per week	14	12.5%
	1-3 times per week	27	24.1%
	4-6 times per week	25	22.3%
	6-9 times per week	23	20.5%
	More than 9 times per week	21	18.8%

Table 1 - Sample Characteristics

From all of the complete responses, 54.5% were male and 45.5% were female. Which is an indication that the data is well balanced across gender.

With respect to age the majority of the participants were between 22-28 years old (22.3%), followed by the group of 18-21 years old (20.5%) and 53-62 years old (18.8%). The reason why these three groups are relatively the largest, might be due to the author's network. The study used the method of convenience sampling, with which a large amount of fellow students was reached. As well as parents from these students. However, with the help of the snowball sampling technique, a large amount of colleagues, friends and family members could be reached as well. Which resulted in 10.7% of the responses in the group 29-37 years old, and 12.5% of the responses in the group 38-47 years old and the group 48-52 years old. In the groups 63-72 years old (1.8%) and 73-85 years old (0.9%) there were reached very few participants. This might again be the cause because of the author's network. Although another reason might be that these people do not use the mobile banking app to a large extent. Thereby, making it harder for the study to find a larger amount of participants in these groups. Combined with the fact that younger customers are concluded to adopt new technologies earlier (Blackburn, 2011), the low responses in these groups seem to be logical. Hence, when the Mobile Banking App was firstly introduced in The Netherlands, the people in these groups were very much used to their own habits. Which could explain the possible resistance against the use of the new technology in these groups.

However, due to the very few responses in these two groups, this study did not make predictions and conclusions about the groups 63-72, and 73-85 years old. Especially, since the very few data points would not be representative for these parts of the population. Hence, the total of 3 responses in these groups were not taken into account in the data analysis of the age hypothesis. It is not expected that this will have a large effect on the explanatory power of this study, even on the contrary. People who are still included in the data analysis of the Age hypothesis have now namely an age between 18-62. Hence, they are all part of the legal potential work force of the Netherlands. Therewith, controlling for this factor and enabling the paper to make even more precise conclusions in the end. However, there are still differences between the included age groups. Which is the reason that the study chose to construct the age distributions as shown in table 1. The reasons for these distributions are explained shortly below:

1. 18-21: Mostly students, who are still studying for their MBO, HBO or WO diploma.
2. 22-28: Students who are almost finished or are recently finished with their educational programme. They stand at the beginning of their careers.
3. 29-37: People who have finished their educational programme and are already working for a few years. Thereby earning the starting salary. Also the chance is very likely, that they will have young children. Who will go to the primary school.
4. 38-47: People who are settled at their job, thereby earning a higher salary or had a promotion. Also the children will go to secondary school by now.
5. 48-52: People from which the children are very likely studying on MBO, HBO or WO. For which some have to leave their parental home. With respect to the work of the parents, they will earn towards their maximum salary.
6. 53-62: Most of these people are settled and receive a stable income. Children will most likely have left the parental home by now.
7. 63-72: People who will go with retirement or have recently went with retirement. Therewith, earning their pension salary. Enjoying their large amount of spare time.
8. 73-85: People who are already quite some years with retirement. They are likely to have no large expenses anymore.

The obtained sample contained mostly students (35.7%), followed by full-time employees (30.4%) and part-time employees (22.3%). Again, this might be the case because of the author's network. The two smallest groups were self-employed (7.1%) and Other (4.5%). Nobody of the participants was unemployed on the moment of filling-in the survey. This indicates that overall a well-diversified amount of responses has been collected on the field of occupation. In which not the student, nor the employees have a large majority.

The sample is also well diversified on the field of education. 30.4% of the respondents completed secondary education, 21.4% completed MBO, 25% completed HBO, and 22.3% WO. This indicates that the study acquired a good sample across all of the education levels in the Netherlands. Only the category "Primary School", has very few responses. However, this was expected as children in the Netherlands have a learning obligation until the age of 18. This means that when children leave the primary school, they are obliged to go to secondary education. When they complete this secondary education, without large delays, they will have completed these educational programmes before or on the age of 18. Which is the minimum threshold for participating into this study. Therewith, explaining the fact that only one respondent has primary school as his or her highest education.

The far majority of the participants in the sample (95.5%) has the mobile banking app currently downloaded on their mobile device(s), against 5 people (4.5%) who have not. Again, this makes sense since the target group of this study were people who had an experience with the mobile banking app. Naturally, most of them would thus still have the mobile banking app downloaded on their mobile phone or tablet. The most of these mobile banking apps were from ING (39.3%) and Rabobank (31.2%), followed by SNS (15.2%) and ABN-AMRO (14.3%). This is logical, because in total the ING and Rabobank apps are downloaded by more people than the apps from ABN-AMRO and SNS. Overall a well distribution across the several banks has been achieved. Most of the people use the mobile banking app only on their smart-phone (75%), followed by both (22.3%), and only tablet (2.7%). It was a requirement to use the mobile banking app on one or both of those two devices, in order to qualify for the survey.

Finally, the distribution of usage patterns from the sample is also well diversified. With the majority of the participants using the mobile banking app 1-3 times per week (24.1%), followed by 4-6 times per week (22.3%), 6-9 times per week (20.5%), more than 9 times per week (18.8%), less than 1 time per week (12.5%), and never (1.8%). Another important notice is that from the 5 people who do not have the mobile banking app anymore, four used the mobile banking app less than 1 time per week or never.

4.2.2.2. Data Processing

In analysing the data, the research made use of the statistical programme STATA (Version 15.1). With this software program, a descriptive analysis was conducted. Firstly, a test was conducted to find out the average mean of the sample questions. Then, these averages were compared with the value of the scale midpoint. Hence, the higher the calculated average mean of the question is in comparison to the scale midpoint, the more important this factor is. Of course, the opposite is true as well. Due to the fact that a five point Likert scale was chosen, the scale midpoint is three (i.e. $(1+5)/2=3$). The variables of Age and Education were used as moderating variables. Thus, changing the strength between the independent and dependent variables (see figure 3). Furthermore, a regression analysis and rank analysis were performed in order to find out the effects and decisiveness of the independent variables on the four dependent variables.

In the regression analysis there has been made use of an ordered logistic regression. The main reason for this was that other analysis methods did not fit the data of this study. The Ordinary Least Square regression was problematic because the data of this study did not have all the characteristics of interval level. Which is necessary in order to make use of the OLS regression. ANOVA analysis could be another approach, but this was also not possible due to the fact that this study did not have only one predictor variable. Moreover, none of the included variables was a continues factor. These conditions are necessary in order to "flip" the model around and make use of a one-way ANOVA to explain the model. Lastly, a multinomial logistic regression was assessed, but also this analysis failed because of the fact that the data of this study did have an ordering. Answers were coded from 1 to 5, with 5 being the highest and 1 the lowest. This finally brought the study to make use of the ordered logistic regression. It did fit the data perfectly, as it allowed for the ordered characteristic of the data. Both for the independent, as well as for the dependent variables. Furthermore, it does not need a continues variable, nor does it demand the data to be on a ratio level. Also there is required no linear relationship

between the dependent and independent variables, error terms do not have to be normally distributed, and homoscedasticity is not required (Schreiber-Gregory, 2018).

However, the model still has a few other assumptions. First, the data has to be on an ordinal level, which was the case in this study. Categories were ordered, but the distance between the categories were not equal for each individual (i.e. ordinal level). Second, the observations have to be independent of each other. As this study made use of an online survey, this assumption could be assumed to be fulfilled as well. Hence, there was very little to no influence from the researcher on the participants. Third, there has to be no multicollinearity between the independent variables. As our validity analysis showed, this was the case in this study. None of the included independent variables did have a correlation higher than 0.8 (Schreiber-Gregory, 2018) with any of the other independent variables. Lastly, one has to fulfil the proportional odds assumption in order to make use of the ordered logistic regression. This assumption was tested with the help of two statistical tests. First an omnibus test was conducted, which was then accompanied by a Brandt test in case the results indicated that there was needed additional analysis. Both tests are in support of the assumption when they are insignificant. In all of the four models of this study (i.e. IMPB, IMPT, IMPS, and IMPA) the proportional odds assumption was met. Thereby, this study fulfilled all the assumptions of the ordered logistic regression, and hence this analysis could be used to find results.

In order to confirm the reliability of the questions, so that they all measured the importance of the mobile banking app, a Cronbach's alpha test was conducted over the 112 observations. Hence, a Likert scale can only be constructed when this relationship between the variables holds. For the validity, this paper conducted tests to ensure both the construct and content validity. In the end, all these statistical tests were conducted in order to find out if the expected effects were significant or not, so that the null hypotheses could possibly be rejected.

4.2.3. Reflection

In examining the main research question, a survey was chosen as the main research instrument. Besides the fact that a survey was used in many other papers on this topic, as stated earlier in this chapter. There were other reasons as well, why a online survey was the most optimal and efficient instrument to use for this paper.

First of all, the main research object of this paper was the mobile banking app. Consequently, the research had already a very technological and online approach. Also, the participants had to have experience with the mobile banking app on their mobile devices in order to fill in the questionnaire. As a consequence, our target group thus must have had access to a mobile phone or tablet. Otherwise, they would not apply for the requirements as designed in the previous paragraph. The use of an online survey was thus the most optimal way of collecting data. The problem of leaving hard-to-reach respondents out of the research was thus eliminated.

However, some people could have had experience with the mobile banking app on their mobile phone or tablet, but now not use these devices anymore. To solve this potential problem, the online survey had a multi-mode capability. This enabled participants to fill-in the questionnaire not only on their mobile phone or tablet, but also on their computer, laptop or any other device connected to the internet. Participants who had a mobile phone or tablet with the mobile banking app installed on it in the past, could be reached by this method as well. Thus, solving the problem of potentially leaving those respondents out of the research, who deliberately chose to delete their mobile banking app and even stopped with using a mobile phone or tablet. Only potential participants who deliberately chose to completely stop with using internet connected devices, could not be reached. However, this group was expected to be very small. An analysis of the Statistics Netherlands (CBS, 2017) namely found out that The Netherlands leads Europe in internet access. In 2017, 98% of all the Dutch households had internet access at home. Also 87% of the people in the Netherlands, between the age of 16 to 74, has access to the internet through a mobile phone (CBS, 2017). Therefore, it was concluded that the small group that has no internet access at all (e.g. 2%) would have no significant effect on the research.

Secondly, a survey enabled the research to collect large amount of data in a relatively short amount of time. Mainly, because the paper had to be written in half a year this time reduction served as a large advantage in the favour of making use of a survey. Interviews, experiments or observations were thus not suited for the goal of this paper. Furthermore, the survey gave the researcher a large flexibility in data analysis, so that a broad range of data could be collected. An accompanied advantage of making use of survey software, was that advanced statistical techniques could easily be used in order to examine the reliability, validity and statistical significance of the questionnaire.

However, also some weaknesses had to be solved in order to create a valid survey that could be generalized in the end:

Firstly, the potency of large data errors due to non-responses on questions. As stated already earlier in this chapter, this problem was minimized by making use of a scheme from which the dropout rate was concluded to be the lowest (Grady et al., 2018). Secondly, people may not understand the subject of the survey well. In order to solve this potential problem, a short introduction was created in which the subject and the most important variables were explained to the participants. Thus, a wrong interpretation of the questions or a lack of understanding on the topic would be eliminated. Thirdly, questions could influence each other. In other words, participants could be influenced in giving their answer on one question by their answers on previous questions. To minimize this risk each variable and its consequent questions were separated from each other, instead of putting them all beneath each other in one list. This made clear to the participants that it was a completely new question. Furthermore, some of the questions in part 2 of the survey were automatically and randomly shuffled. This ensured the research that on an aggregate level the questions would have no effect on each other.

Fourthly, participants could interpret the answer options of the survey differently. For example, for one person "highly agree" could mean something different than to another person. However, to minimize the problem this research made use of a standardized five-point Likert scale (Likert, 1932). Although the distance between the five points in the Likert scale is still not the same for each person. This scale is the most comprehensive one and the most easy to understand for participants. Still, it did not enable the researcher to draw conclusions on an individual level and compare these with each other. However, as the goal of the paper was to make general statements, this scale does provide significant insights on the group level. Hence, the ordinal level of measurement of the Likert-scale will begin to take on properties that resemble an interval scale when looking at aggregate levels (i.e. means). As already mentioned, this can be of use in the descriptive analysis. For the regression analysis there still has to be taken into account the ordinal nature of the data. Mainly, because the assumptions of many regression types require complete ratio level data. Performing these regressions with ordinal level data would lead to false and invalid results.

Finally, there is the problem of people filling in an answer, although they may not have enough information or experience in order to give an answer. Which ultimately leads to false data points and a distortion in the analysis. To solve this, one can include an option in the survey which says "Don't know" (Bogart, 1972; Converse & Presser, 1986). However, in this survey there is chosen to not include such an option into the survey. In more recent literature it has namely become clear that "Don't Know" options do not improve the measurement. Papers from Krosnick et al. (2002), McClendon and Alwin (1993), and Berent (1993) found evidence that answers were no more reliable when "Don't Know" options were included in questions, than in the case that these options were not included.

In the paper of Krosnick et al. (2002) there are even mentioned certain problems arising from using a "Don't Know" option. According to their findings, an inclusion of "Don't Know" in your survey can lead to second-stage responses. Meaning that people do not choose the option because of a lack in necessary information or experience, as intended, but rather because of other reasons. For example, people might prefer the "Don't Know" option to offering meaningful opinions, because they believe that they do not have enough knowledge about the subject in order to defend their opinion. Therefore they decide to withheld their opinion rather than report it. Other reasons might be that people are less

motivated in the end of the survey and decide to choose "Don't Know", so that they do not have to think about it. Further reasons are that people might not be sure which of two scale points to choose, so they decide to choose the "Don't Know" option instead. Or people do not directly understand the question in the right way and choose the "Don't Know" option even before retrieving relevant information. Hippler and Schwarz (1989) offer another reason why "Don't Know" options can discourage people to fill in their actual attitude. They argue that the inclusion of a "Don't Know" option might suggest that a lot of information is needed in order to answer the question. Thereby intimidating people who feel themselves not adequate of defending their opinion.

All in all, there is large evidence that the inclusion of a "Don't Know" option can lead to various types of responses that are not related to a lack of experience or information. Moreover, when people are asked to their reasons of filling in the "don't know" option, they rarely mention lack of information or experience at all (Krosnick et al., 2002). But rather mention the reasons as explained in the previous paragraph. Together with the fact that in this research the participants at least had to have experience with the Mobile Banking App in order to be allowed to take the questionnaire, made that the "Don't Know" option was not included.

5. Results

5.1 Reliability

A high reliability refers to the situation in which a variable's measurement is stable or constant. In other words, when the measurement procedure would be done again, with the same individuals and conditions, it would lead to the same, or almost the same, results as before. A common method to test for the reliability of a questionnaire is the use of a Cronbach's alpha test.

5.1.1. Cronbach's Alpha

With the Cronbach's alpha test one can determine the internal consistency of items in the questionnaire. It measures whether or not several individual parts together can measure one overall construct. The alpha can differ between 0 and 1. Overall, it is argued in the literature that the Cronbach's alpha should be larger than 0.5 for two indicators, 0.6 for three and 0.7 for more than three indicators (Peterson, 1994). In this study there was used a threshold of 0.7, to make sure that the internal consistency would be high enough.

In table 2 you can see the results of the Cronbach's Alpha test for the three variables (Ease of Use, Functionality and Credibility) that measure the overall construct: internal performance of the Mobile Banking App. The alpha of 0.8624 is higher than the threshold of 0.7, which shows a high internal consistency. This means that by measuring these three variables, the study acquires a reliable picture of the before mentioned construct.

Observations	Cronbach's Alpha	Variables
112	0.8624	3

Table 2 - Cronbach's Alpha between variables Ease of Use, Functionality, and Credibility

With respect to the two other variables, Lifestyle and Personal Knowledge, it should be the case that they both measure another construct and hence the alpha would thus not be significant. The amount of electronic transactions and the amount of people's knowledge about the bank app, should namely have no very large construct in common. As you can see in table 3 this is also not the case. Hence, 0.4937 is lower than the threshold of 0.5.

Observations	Cronbach's Alpha	Variables
112	0.4937	2

Table 3 - Cronbach's Alpha between variables Lifestyle and Personal Knowledge

In table 4 you can see the Cronbach's Alpha test for the four importance scores on the four different domains (i.e. Bank Choice, Way of making Payments, Bank Services and Products, and Account Balance and Transfer Money). Together they form the construct: overall importance score of the mobile banking app in the financial activities of people. The Cronbach's alpha turned out to be 0.7139, which is higher than the 0.7 threshold. Therefore, the study can conclude that these four factors reliably measure the overall importance score of the Mobile Banking App (i.e. dependent variable).

Observations	Cronbach's Alpha	Variables
112	0.7139	4

Table 4 - Cronbach's Alpha between the variables of Importance on the four different domains

5.2. Validity

Validity refers to the correctness and quality of a measurement. In other words, it defines whether or not a test measures the right concept. Differences in observed data scores should reflect the true differences that one wants to measure (Churchill, 1979). However, one can make a distinction between two kinds of validity: Construct Validity, Content Validity.

5.2.1. Construct Validity (Empirical Construct)

Construct validity can be separated into two subparts: convergent validity and discriminant validity. With convergent validity one tries to find out if the variables, included in the study, relate to the constructs they are supposed to measure (Bolarinwa, 2016). With discriminant validity, one tries to find out if one variable does not measure a construct that is supposed to be measured by another variable (Bolarinwa, 2016). In order to know if this is the case, one can make use of a correlation matrix.

In table 5, you can see that Lifestyle has indeed no large correlations with the other constructs. The same can be said about Personal Knowledge. Both are beneath 0.8 for all of the other variables, which is considered to be the threshold in order to be concluded that they are strongly correlated (Schreiber-Gregory, 2018; Jose et al., 2017). Hence, both convergent and discriminant validity thus seem to hold for LS and PK. With respect to the variables EU, FU and CR we see that all their common correlations are beneath the 0.8 threshold as well. This confirms again that also these variables have convergent and discriminant validity. However, the correlation between FU and EU is 0.7625, which stands out from the rest. Nevertheless, the higher association between these two variables seems to make sense. If one has more options and functions available in the Mobile Banking App, this contributes to the Ease of Use of it. Also the fact that the variables EU, FU and CR are all related to the performance of the mobile banking app, explains why these correlation numbers are relatively higher than those of LS and PK. Still, they are all lower than the 0.8 boundary and are thus single variables.

	LS	PK	EU	FU	CR
LS	1.0000				
PK	0.3502	1.0000			
EU	0.3624	0.5437	1.0000		
FU	0.3293	0.5356	0.7625	1.0000	
CR	0.2040	0.4223	0.5719	0.5574	1.0000

Table 5 - Correlation Matrix between the independent variables

In table 6, the correlation matrix between the dependent variables is shown. From the results of this test, we can conclude that they all measure a different dimension. Hence the correlations are all very low (i.e. beneath 0.8). However, again one correlation points out. That is the correlation between IMPT and IMPA, with a value of 0.6490. Still this does not cause the convergent and discriminant validity of these two variables to fail. When people namely make a lot of electronic transactions, it is very likely that they also check their account balance often. The slightly high correlation can thus be explained, ensuring the convergent and discriminant validity for these two variables as well.

	IMPB	IMPT	IMPS	IMPA
IMPB	1.0000			
IMPT	0.3640	1.0000		
IMPS	0.4658	0.2750	1.0000	
IMPA	0.2373	0.6490	0.0836	1.0000

Table 6 - Correlation Matrix between the dependent variables

5.2.2. Content Validity (Theoretical Construct)

With content validity we measure the degree to which the instrument fully assesses or measures the construct of interest (Bolarinwa, 2016). In other words, it validates that the included variables are important in measuring your dependent variable. Furthermore, it also confirms that there are no large variables missing or stated in the wrong way. In order to ensure the content validity, one can let their questionnaire be reviewed by people before distributing it among participants. In this study, the concept questionnaire was sent to five people. From which three were familiar with the construct of using a survey instrument. Their feedback was retrieved and incorporated into the final questionnaire, in order to make sure that there were no mistakes in the survey and that the variables did measure the right concepts.

Furthermore, variables that are included into this study are related to earlier research, as stated in the literature review section of this paper. Most of the included variables have been adopted from earlier research papers, in which already has been shown that they play an important role on the topic of The Mobile Banking App. The included factors are thus not made up, but are included into this study after extensive research into the current literature. Thus, ensuring that the factors included are indeed of relevance and importance for this study. Combined with the earlier argument, we could therefore conclude that this study has achieved a sufficient level of content validity.

5.3. Structural Model

After the reliability and validity tests in the previous two sections confirmed the proposed model in this survey, the structural model could finally be assessed. This analysis has been divided into three parts. In the first part a descriptive analysis towards the means of the variables included into the model was conducted. Thereby, a moderating effect of the variables age and education was used. In the second part, a regression analysis was conducted in order to found out the effects of the independent variables Ease of Use, Lifestyle, Credibility, Functionality and Personal Knowledge on the dependent variable Importance of the Mobile Banking App (in all four domains). Lastly, an overall ranking was made to find out whether the people attribute different strength to the variables at different domains of the Importance of The Banking App. To ensure the right understanding of all of the Variables, a table has been included with all of the definitions (table 7).

Variable	Definition
AGE	Age
EDU	Education
USA	Usage
IMPB	Importance MBA in choosing a bank
IMPT	Importance MBA in making payments (physical and online)
IMPS	Importance MBA in applying for bank service and products
IMPA	Importance MBA in checking your account balance and transferring money
LS	Lifestyle
PK	Personal Knowledge
EU	Ease of Use
CR	Credibility
FU	Functionality

Table 7 - Definitions of the variables

5.3.1. Descriptive Analysis

In this part of the analysis a descriptive analysis was conducted to the means of the variables. This is of relevance as it gives information about the general importance score of the dependent variables on the four domains. As well as the general value of the independent variables. Then by controlling the sample for the variables Age (AGE) and Education (EDU), one can look at the effects on the means of the independent variables in order to conclude if there is a difference. Because the study made use of a five point Likert Scale, the scale midpoint of the questions was 3. This midpoint determines whether

the dependent variables have a high (> 3) or low (< 3) overall importance /value. The lowest category was coded as 1, and the highest category was coded as 5.

Although it was known that our data was not completely on ratio level, the used Likert-scale does have properties that refer to ratio type data. Especially because we look at aggregate levels, when analyzing the mean of the population. Therefore, it was decided to make use of a one-sample t-test. However, an overview of the percentages of the whole data is analyzed too. In order to prevent the study to make false interpretations on the distributions. Hence, when the t-test turned out to be very significant, this definitely indicated that there was a strong relationship going on. A look at the overview of the sample can confirm this to be true. Therefore, an analysis of the mean can be of large importance. This approach has been adopted from the paper of Alsamydai et al. (2014).

5.3.1.1. Means Dependent Variables

First the analysis was conducted over the dependent variables: IMPB, IMPT, IMPS, and IMPA. This analysis was conducted with a one sample t-test and a confidence interval of 95%. Which is in line with earlier performed research in this area (Alsamydai et al., 2014). The results can be found in table 8, 9, 10 and 11. As you can see in table 8 and 9, the means of respectively IMPT (3.92) and IMPA (4.18) are well above the scale midpoint of 3, and have small dispersion because of the standard deviation. The means turned out to be significantly higher than 3 as well, because the p-values (0.0000) of both are lower than the boundary of 0.05 (95% interval). Also these results are in line with the percentages of the data. Hence, only 27.68% of the data points are three or lower for IMPT, and only 18.75% of the data points are three or lower for IMPA.

Variable	Mean	Std. Deviation	T.	P-value (T > t)
IMPT	3.92	1.08	8.98	0.0000

IMPT	Frequency	Cumulative %
1	3	2.68
2	12	13.39
3	16	27.68
4	41	64.29
5	40	100.00
Total	112	

Table 8 - One sample t-test on the mean of variable IMPT and overview of data

Variable	Mean	Std. Deviation	T.	P-value (T > t)
IMPA	4.18	1.04	11.97	0.0000

IMPA	Frequency	Cumulative %
1	3	2.68
2	8	9.82
3	10	18.75
4	36	50.89
5	55	100.00
Total	112	

Table 9 - One sample t-test on the mean of variable IMPA and overview of data

On the other hand, the means of IMPB (2.54) and IMPS (2.30) are lower than the threshold of 3, again with small dispersion of the standard deviation. These means turned out to be significantly lower than 3. With IMPB having a p-value of 0.0002 and IMPS having a p-value of 0.0000, which are both lower than 0.05 (95% interval). The percentages of the data also indicate this relationship, with 72.32% of the data points below or equal to three for IMPB, and 83.93% of the data points below or equal to three for IMPS.

Variable	Mean	Std. Deviation	T.	P-value (T < t)
IMPB	2.54	1.30	-3.71	0.0002

IMPB	Frequency	Cumulative %
1	35	31.25
2	19	48.21
3	27	72.32
4	24	93.75
5	7	100.00
Total	112	

Table 10 - One sample t-test on the mean of variable IMPB and overview of data

Variable	Mean	Std. Deviation	T.	P-value (T < t)
IMPS	2.30	1.10	-6.72	0.0000

IMPS	Frequency	Cumulative %
1	35	31.25
2	27	55.36
3	32	83.93
4	17	99.11
5	1	100.00
Total	112	

Table 11 - One sample t-test on the mean of variable IMPS and overview of data

5.3.1.2. Means Independent Variables

Second the analysis was conducted over the independent variables: LS, PK, EU, CR, and FU. This analysis was again conducted on the 95% confidence interval, as also stated in the paper of Alsamydai et al. (2014). The results are shown in tables 12, 13, 14, 15, and 16. As you can see almost all of the variables have a significantly higher mean than the threshold of 3. The means of Personal Knowledge (3.77), Ease of Use (3.96), Functionality (3.88) and Credibility (3.93) are all well above the scale midpoint. However, Lifestyle is the only variable of which the mean (2.91) is slightly lower than 3. It can also be noted that the mean of Lifestyle is the only mean which is not significantly different than 3. However, the underlying question of Lifestyle was not asked in the form of a Likert scale. Hence, it only asked the amount of electronic transactions done by the participants. In other words, it was a Likert Type question. Therefore, the scale midpoint is not an effective measurement on this variable. Still the mean gives us some relevant information about the distribution of the amount of transactions. With respect to the standard deviations of the variables, it can be concluded that there are only small dispersions.

We checked these findings, by looking at the summarized data of the sample. This confirmed the analysis of the one-sample t-test. With a total percentage from the data equal or lower than three for PK, EU, FU and CR, of 29.46%, 16.96%, 22.32%, and 20.54% respectively. For LS this distribution is widely spread, which indicates why this variable turned out to have no significant mean.

Variable	Mean	Std. Deviation	T.	P-value (T < t)
LS	2.91	1.02	-0.93	0.1777

LS	Frequency	Cumulative %
1	2	1.79
2	45	41.96
3	38	75.89
4	15	89.29
5	12	100.00
Total	112	

Table 12 - One sample t-test on the mean of variable LS and overview of the data

Variable	Mean	Std. Deviation	T.	P-value (T > t)
PK	3.77	0.75	10.88	0.0000

PK	Frequency	Cumulative %
1	2	1.79
2	2	3.57
3	29	29.46
4	66	88.39
5	13	100.00
Total	112	

Table 13 - One sample t-test on the mean of variable PK and overview of the data

Variable	Mean	Std. Deviation	T.	P-value (T > t)
EU	3.96	0.76	13.24	0.0000

EU	Frequency	Cumulative %
1	0	0
2	8	7.14
3	11	16.96
4	71	80.36
5	22	100.00
Total	112	

Table 14 - One sample t-test on the mean of variable EU and overview of the data

Variable	Mean	Std. Deviation	T.	P-value (T > t)
FU	3.88	0.78	11.99	0.0000

FU	Frequency	Cumulative %
1	0	0
2	8	7.14
3	17	22.32
4	67	82.14
5	20	100.00
Total	112	

Table 15 - One sample t-test on the mean of variable FU and overview of the data

Variable	Mean	Std. Deviation	T.	P-value (T > t)
CR	3.93	0.74	13.21	0.0000

CR	Frequency	Cumulative %
1	0	0
2	6	5.36
3	17	20.54
4	68	81.25
5	21	100.00
Total	112	

Table 16 - One sample t-test on the mean of variable CR and overview of the data

5.3.1.3. Means Independent Variables: Sub-groups Age and Education

After the analysis of the means of the dependent and independent variables for the whole sample, a distinction was made with respect to Age and Education. This was done in order to find out if these variables have an effect on the means. From our conceptual framework it was hypothesized that AGE and EDU would have an effect on Lifestyle (LS) and (PK), thereby influencing the importance of the mobile banking app in the four domains. In table 17 you can see the mean, standard deviation, t-value and significance level of LS and PK, when controlling for all of the six AGE groups and the four EDU groups. The analysis was performed with a one-sample t-test and focused on testing whether or not the mean of the subgroup for age or education significantly differed from the overall mean of the whole sample. For LS the mean of the whole sample was 2.91, and for PK the mean of the whole sample was 3.77.

Control Group	Variable	Mean	Std. Deviation	T-value	Sig(2) Tailed
AGE (18-21) (N=23)	LS	3.13	0.92	1.15	0.2627
	PK	3.70	0.56	-0.64	0.5300
AGE (22-28) (N=25)	LS	3.00	0.96	0.47	0.6426
	PK	4.00	0.96	1.20	0.2414
AGE (29-37) (N=12)	LS	2.83	1.19	-0.22	0.8280
	PK	3.67	0.89	-0.40	0.6945
AGE (38-47) (N=14)	LS	2.79	1.05	-0.44	0.6654
	PK	3.71	0.47	-0.44	0.6639
AGE (48-52) (N=14)	LS	2.93	1.27	0.05	0.9572
	PK	3.57	0.85	-0.87	0.3988
AGE (53-62) (N=21)	LS	2.81	0.98	-0.47	0.6438
	PK	3.81	0.68	0.27	0.7926
EDU (Secondary School) (N=34)	LS	2.97	0.17	0.35	0.7260
	PK	3.71	0.52	-0.71	0.4805
EDU (MBO) (N=24)	LS	2.75	1.19	-0.66	0.5162
	PK	3.67	0.56	-0.90	0.3793
EDU (HBO) (N=28)	LS	3.11	1.07	0.98	0.3364
	PK	3.89	0.63	1.03	0.3104
EDU (WO) (N=25)	LS	2.80	0.82	-0.67	0.5070
	PK	3.84	1.18	0.30	0.7691

Table 17 - Results after One-sample t-test on the means of the subgroups from Age and Education

As can be seen in table 17, none of the results are significant. Which indicates that the means of LS and PK for the different subgroups, do not differ significantly from the overall group means (i.e. 2.91 for LS and 3.77 for PK). Therefore the null hypothesis cannot be rejected, because there is not enough evidence to accept the alternative hypothesis that there are different means in any of the subgroups. Thus, when controlling for Age and Education this does not significantly influence the mean of the variables Lifestyle and Personal Knowledge. Hence, Age and Education have no significant indirect effect on the importance score of the mobile banking app.

5.3.1.4. Means Dependent Variables: Sub-groups Age and Education

In order to double check if the Importance scores of the Mobile Banking App indeed have no significant change in their means when controlling for age and education. We performed a similar test as the one before, but now on the dependent variables IMPB, IMPT, IMPS, and IMPA. An advantage of this extra analysis is that we now take into account the dependent variables. Meaning that we measure the change in all of the variables that affect the importance score, by controlling for age and education. Hence, we can find out if there are maybe other (un)known factors, that are affected by age and education, which lead to a change in the importance score of the mobile banking app in the four different domains.

After conducting the tests, by controlling for education (EDU), we found no significant change in the dependent variables IMPT and IMPS. However, for IMPA and IMPB we found some significant changes in the mean. The mean of IMPA for the Secondary Education group was 4.41, which turned out to be significantly higher on the 95% interval than the overall sample mean of 4.18. For IMPB it was found that the mean from the HBO group of 3.07 was significantly higher on the 95% interval than the overall sample mean of 2.54.

After conducting tests, by controlling for age (AGE), we found no significant change in the dependent variables IMPT and IMPS. However, we did find a significant difference in the mean of IMPB and IMPA. The mean for IMPB from the 29-37 years old group was 3.17, which turned out to be significantly higher than the overall sample mean of 2.54. This significance could be explained by the fact that people with these ages are starting to settle themselves. Thereby applying for a loan or mortgage, to be able to buy a house. Also their income and expenses are expected to rise in this period, respectively to the period of 22-28 years old. All these changes could make it more attractable for people to have a modern and well-functioning Mobile Banking App that includes all of their activities. This could explain the higher importance of the MBA in the choice for a bank in this age category. For IMPA, the mean of the 53-62 years old group was 3.76. Which turned out to be significantly lower than the overall sample mean of 4.18. Indicating that people between the age of 53-62 value the mobile banking app as less important in checking their account balance and transferring money. This significance could be explained by the fact these people are still slightly more attached to their old habits than the lower age categories. They could attach more value to checking bank statements and going to physical bank stores. Hence, it is the oldest age category included into the analysis.

5.3.2. Regression Analysis

In order to find out the relationships between the independent variables (LS, PK, EU, FU, and CR) and the dependent variables (IMPB, IMPT, IMPS, IMPS), a series of multiple regressions was performed. In this analysis there was made use of a series of ordered logistic regressions. As already mentioned earlier, the Likert scale data of this study did take over some properties that resemble an interval scale when looking at aggregate levels. However, not all of the assumptions for an multiple ordinal least square regression were met, which disabled the study to use this type of regressions. Together with the fact that also the dependent variables were ordinal in its nature, it has been decided to make use of a ordered logistic regression. This type of regression could still give relevant information to answer the hypotheses, although the coefficient had to be interpreted differently. In order to test whether or not the assumptions of the ordered logistic regression were met, two statistical tests were conducted. These were the Brant test and the proportional odds test, both showed that the assumptions were met. In the following four subsections, the four regressions will be elaborated in more detail.

5.3.2.1. Ordered Logit Regression IMPB

In table 18 you can see the results of the regression for the variable IMPB. When we look at the coefficients of the regression it is only relevant to look at the sign, as the number itself gives no relevant information. It is noted that LS, PK, EU and CR all have a positive relationship. Meaning that when they increase with 1 (i.e. move up one category), the importance of the Mobile Banking App in choosing a bank (IMPB) is expected to be higher as well. For FU, the opposite is true. When looking at the significance levels, only the variable PK turned out to be significant in this analysis. When looking at the marginal effects of this variable it is confirmed that when personal knowledge (PK) increases with one, for example increases from category "Low" to "Moderate", you are 15.24% less likely to value the mobile banking app in choosing a bank as Not Important At All. The opposite is also true, when your Personal Knowledge increases with one category, you are 10.13% more likely to value the mobile banking app in choosing a bank as Very Important. In table 19 you can see all the likelihoods for the five categories of the dependent variable IMPB.

IMPB	Coefficient	P-value
LS	+	0.729
PK	+	0.019
EU	+	0.369
FU	-	0.159
CR	+	0.992

Table 18 - Ordered Logit Regression for the dependent variable IMPB

Variable Personal Knowledge (PK)	IMPB
- 15.24%	1 (Not Important At All)
- 2.77%	2 (Slightly Important)
+ 4.03%	3 (Moderately Important)
+ 10.13%	4 (Very Important)
+ 3.85%	5 (Extremely Important)

Table 19 - Marginal Effects for PK on IMPB

Then finally we also checked the predictions of the model with the actual observations of the data. This turned out to be nearly the exact same. Which proved that the model gave good predictions about the real data. As can be seen in table 20 and table 21, the means of the predictions for each of the five ordinal scales are almost the same as the actual percentages when tabulating the data we have. Prediction variables were calculated for each individual and then summed up together in order to come up with the aggregate predictor and consequent mean.

IMPB	Mean
Probability 1 (plogit)	0.313
Probability 2 (p2logit)	0.171
Probability 3 (p3logit)	0.239
Probability 4 (p4logit)	0.213
Probability 5 (p5logit)	0.063

Table 20 - Means of the predictions from the model IMPB

IMPB	Frequency	Percentage (%)
1	35	31.25
2	19	16.96
3	27	24.11
4	24	21.43
5	7	6.25
Total	112	

Table 21 - Actual percentages of the data

5.3.2.2. Ordered Logit Regression IMPT

The results of the regression for IMPT can be found in table 22. The variables LS, PK and EU seem to have a positive relationship with IMPT. While FU and CR have a negative one. However, only the variables PK and EU are significant with a p-value of 0.001, and 0.049 respectively. When looking at their marginal effects, we found the results for PK and EU as stated in table 23 and 24 respectively. This clearly indicates that when the Personal Knowledge or Ease of Use goes up by 1 scale, this increases the likelihood of valuing the Mobile Banking App with Extremely Important, by 24.19% and 17.81% respectively. Furthermore, it decreases the likelihoods of all the others scales.

IMPT	Coefficient	P-value
LS	+	0.909
PK	+	0.001
EU	+	0.049
FU	-	0.448
CR	-	0.690

Table 22 - Ordered Logit Regression for the dependent variable IMPT

Variable Personal Knowledge (PK)	IMPT
- 1.28%	1 (Not Important At All)
- 7.55%	2 (Slightly Important)
- 11.47%	3 (Moderately Important)
-3.89%	4 (Very Important)
+ 24.19%	5 (Extremely Important)

Table 23 - Marginal Effects for PK on IMPT

Variable Ease of Use (EU)	IMPT
- 0.95%	1 (Not Important At All)
- 5.56%	2 (Slightly Important)
- 8.45%	3 (Moderately Important)
- 2.87%	4 (Very Important)
+ 17.81%	5 (Extremely Important)

Table 24 - Marginal Effects for EU on IMPT

The results of the predictions were also for this regression in line with the actual acquired observations, as can be seen in table 25 and table 26.

IMPT	Mean
Probability 1 (plogit)	0.024
Probability 2 (p2logit)	0.101
Probability 3 (p3logit)	0.148
Probability 4 (p4logit)	0.368
Probability 5 (p5logit)	0.359

Table 25 - Means of the predictions from the model IMPT

IMPT	Frequency	Percentage (%)
1	3	2.68
2	12	10.71
3	16	14.29
4	41	36.61
5	40	35.71
Total	112	

Table 26 - Actual percentages of the data IMPT

5.3.2.3. Ordered Logit Regression IMPS

When looking at table 27 for the results of the regression analysis for the dependent variable IMPS, only the variable PK turned out to be significant with a p-value of 0.010. PK has a positive relationship with IMPS, as have all of the other variables except FU. After analyzing the marginal effects of the variable PK it is indeed confirmed that there is a positive relationship in place (see table 28).

IMPS	Coefficient	P-value
LS	+	0.842
PK	+	0.010
EU	+	0.918
FU	-	0.178
CR	+	0.416

Table 27 - Ordered Logit Regression for the dependent variable IMPS

Variable Personal Knowledge (PK)	IMPS
- 16.52%	1 (Not Important At All)
- 3.08%	2 (Slightly Important)
+ 9.76%	3 (Moderately Important)
+ 9.22%	4 (Very Important)
+ 0.06%	5 (Extremely Important)

Table 28 - Marginal Effects for PK on IMPS

The results for the summarized predictions of the model and the actual percentages of the data can be found in table 29 and table 30.

IMPS	Mean
Probability 1 (plogit)	0.306
Probability 2 (p2logit)	0.248
Probability 3 (p3logit)	0.289
Probability 4 (p4logit)	0.148
Probability 5 (p5logit)	0.009

Table 29 - Means of the predictions from the model IMPS

IMPS	Frequency	Percentage (%)
1	35	31.25
2	27	24.11
3	32	28.57
4	17	15.18
5	1	0.89
Total	112	

Table 30 - Actual percentages of the data IMPS

5.3.2.4. Ordered Logit Regression IMPA

As can be seen in table 31, the variable EU is the only variable which is significant (i.e. p-value of 0.036). Furthermore, the variables LS, PK, EU, FU have a positive sign, while CR has a negative one. When analyzing the marginal effects from the variable Ease of Use (EU), the results in table 32 are found. From there it can be seen that if EU increases one scale, it is more likely that a higher importance is attached to the mobile banking app in checking account balance and transferring money.

IMPA	Coefficient	P-value
LS	+	0.237
PK	+	0.200
EU	+	0.036
FU	+	0.432
CR	-	0.367

Table 31 - Ordered Logit Regression for the dependent variable IMPA

Variable Ease of Use (EU)	IMPA
- 1.11%	1 (Not Important At All)
- 4.12%	2 (Slightly Important)
- 6.24%	3 (Moderately Important)
- 10.51%	4 (Very Important)
+ 21.98%	5 (Extremely Important)

Table 32 - Marginal Effects for EU on IMPA

Lastly, the model seems to fit the actual data well again. With the predictions close to the actual observed data points (table 33, table 34).

IMPA	Mean
Probability 1 (plogit)	0.024
Probability 2 (p2logit)	0.073
Probability 3 (p3logit)	0.097
Probability 4 (p4logit)	0.320
Probability 5 (p5logit)	0.486

Table 33 - Means of the predictions from the model IMPA

IMPA	Frequency	Percentage (%)
1	3	2.68
2	8	7.14
3	10	8.93
4	36	32.14
5	55	49.11
Total	112	

Table 34 - Actual percentages of the data IMPA

5.3.3. Rank Analysis

Then, this study asked participants to rank the variables in order of influence on their importance score in the four different domains, from 1 (most important) to 5 (least important). In the following four pie charts the total rank sum for each of the five variables is displayed as part of the overall ranking sum. This gives the study a good picture and indication on whether or not there are any (different) weights involved for the five variables in the four domains. The pie charts are to be interpreted in the way that the smallest part is the most important. Hence, a rank of 1 was the highest and a rank of 5 was the lowest. The total rank sum for each of the following pie chart is $(1+2+3+4+5)*112=1680$.

5.3.3.1. Rank Variables Bank Choice

In figure 5 you can see that in the domain of Bank Choice, the most important factor contributing to the importance score is Credibility (10.7%), followed by Ease of Use (14.7%), Functionality (18.0%), Lifestyle (27.1%), and Personal Knowledge (29.5%).

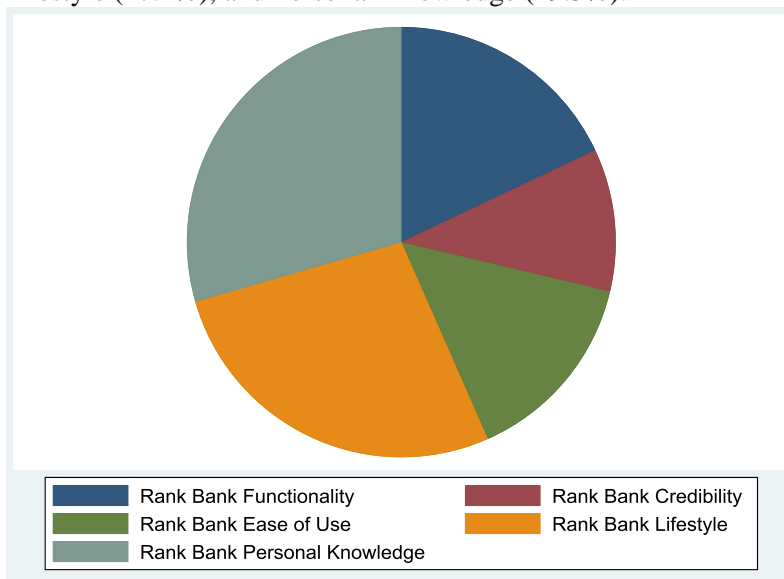


Figure 5 - Rank Variables Bank Choice

5.3.3.2. Rank Variables Transactions

In figure 6 it is shown that in the domain of Way of Making Payments, Credibility (12.2%) is the most influential factor, followed by Ease of Use (15.0%), Functionality (18.3%), Lifestyle (26.1%) and Personal Knowledge (28.4%).

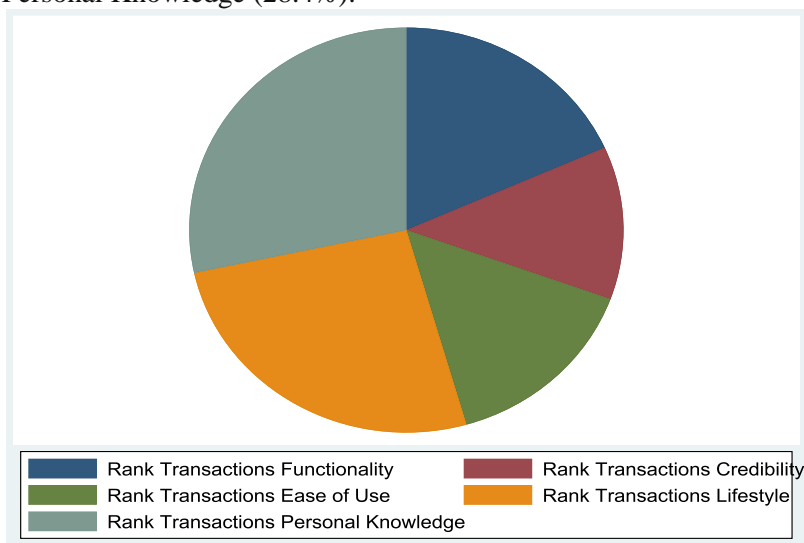


Figure 6 - Rank Variables Way of Making Payments (Physical and Online)

5.3.3.3. Rank Variables Services

For the domain of Applying for Bank Services and Products, the results are captured in figure 7. Also her the most important factor is Credibility with 13.3% of the overall rank sum. Following are the variables Ease of Use (14.9%), Functionality (17.6%), Personal Knowledge (26.8%), and Lifestyle (27.4%).

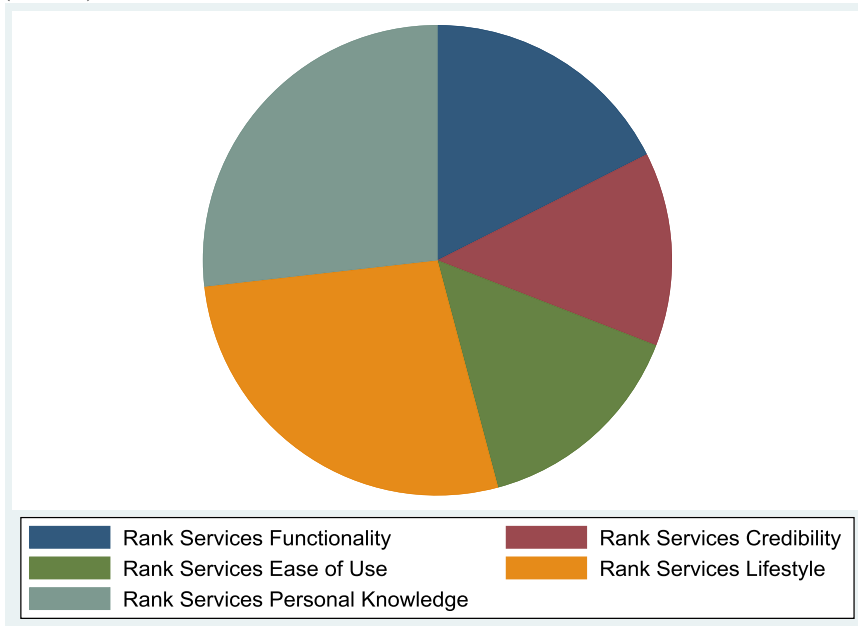


Figure 7 - Rank Variables Applying for Bank Services and Products

5.3.3.4. Rank Variables Account

Lastly, are the results of the ranking of the variables on the domain of Account Balance and Transferring Money (see figure 8). Most influencing factor on this domain is Credibility (13.4%), closely followed by Ease of Use (13.5%). With larger distance comes Functionality (19.2%), Lifestyle (25.5%) and Personal Knowledge (28.4%).

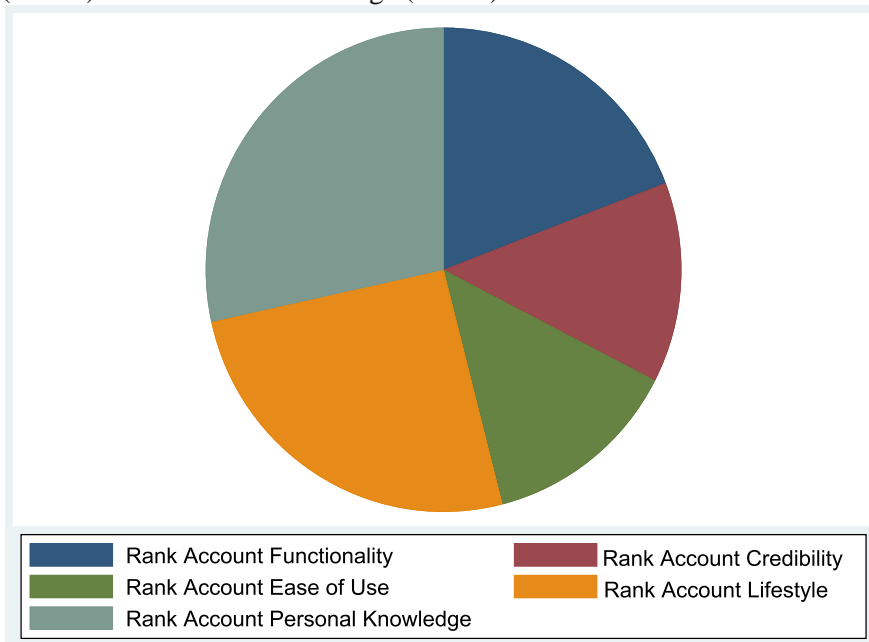


Figure 8 - Rank Variables Account Balance and Transferring Money

5.3.4. Extra Analysis

In addition to the previous analysis, which was conducted to be able to give an answer on the hypotheses. An additional analysis was performed in order to find out the relationship between the use of the app and the amount of personal knowledge people attribute to themselves. This analysis was performed with the help of a chi-squared likelihood ratio test. The results of this test can be seen in table 35, as can be seen in this table is that the p-value turned out to be significant. Hence, the value of 0.002 is lower than the chosen alpha level of 0.05 (i.e. 95% interval level). Therefore it can be said that there is a relationship between the amount of times people use the app and the amount of knowledge people attribute to themselves.

Usage	Personal Knowledge					Total
	1	2	3	4	5	
1	1 0.0	0 0.0	0 0.5	1 1.2	0 0.2	2 2.0
2	1 0.3	1 0.3	8 3.6	3 8.3	1 1.6	14 14.0
3	0 0.5	1 0.5	10 7.0	16 15.9	0 3.1	27 27.0
4	0 0.4	0 0.4	4 6.5	19 14.7	2 2.9	25 25.0
5	0 0.4	0 0.4	5 6.0	11 13.6	7 2.7	23 23.0
6	0 0.4	0 0.4	2 5.4	16 12.4	3 2.4	21 21.0
Total	2 2.0	2 2.0	29 29.0	66 66.0	13 13.0	112 112.0

likelihood-ratio chi2(20) = 43.2513 Pr = 0.002

Table 35 - Chi-squared Likelihood ratio test between the variables PK and USA

6. Discussion

After performing the analysis, an answer could be given on the hypotheses, as formulated earlier in the methodology section of this paper. In the following subsections, each of the hypotheses is described separately in order to give a clear picture about the meaning and implications of the results that were found.

6.1. Hypothesis 1: Age

Hypothesis 1: An increase in age is expected to have a negative influence on the importance of the banking app in financial activities.

The results, linked to this hypothesis, indicate that there is no significant effect from age on the variables personal knowledge (PK) and lifestyle (LS). This holds for all of the subgroups included in this paper. Therefore, it can be said that people from the age of 18 until 62 years old do not significantly differ from each other when it comes to their personal knowledge of the banking app, nor do they significantly differ in their use of the mobile banking app (i.e. Lifestyle). This gives us relevant information, because it points out that the Mobile Banking App has settled itself as a useful tool across the whole included age group in this paper (i.e. 18-62 years old). There is no information or usage gap between any of these age groups anymore, indicating that the resistance of these people in using and learning about the new innovation in the form of the mobile banking app is equally low. This is different than most of the previous literature, in which it was stated that older people would have a higher resistance rate against using a new innovation (Blackburn, 2011). Hence, they were less likely to accept a new technology and instead stick to their old habits (Laforet & Li, 2005). This research provides a new updated insight into this resistance rate. The findings are also in contrast to recent literature from Nigeria, in which it was found that age did have a significant negative effect (Abayomi et al., 2019). Nevertheless, people, in the Netherlands, across the ages of 18 until 62 do not significantly differ anymore in their knowledge or usage of the mobile banking app. Still, it has to be taken into consideration that people with an age above 62 were not included into the research. The formulated answer on the hypothesis, therefore, does not apply for them. It could namely be the case that they still have a high resistance rate and hence value the Mobile banking App significantly lower.

The importance of the mobile banking app in the financial activities is thus not affected by age, through the variables of personal knowledge and lifestyle, in The Netherlands. However, when the research looked at the dependent variables, it was found that the mean of IMPB was significantly higher than the overall sample mean for the 29-37 years old group. This indicates that there is a higher importance of the mobile banking app in choosing a bank, within the group of young adults. Also the mean of IMPA turned out to be significantly lower than the overall sample mean for the 53-62 years old group. Which indicates that the importance of the mobile banking app in checking account balances and transferring money is lower for the mature adults.

Although there thus seems to be a difference for these two groups on two of the financial activities, it is not enough to confirm the hypothesis that an increase in age negatively influences the importance of the mobile banking app. Hence, there can be seen no trend over the different age categories. Instead, they are more two outlier results. However, the found differences for the two age groups on IMPA and IMPB are somewhat in line with the proposed relationship. With the mean of the young adults being higher and the mean for the mature adults being lower for IMPB and IMPA respectively. Still, as said, this does not provide enough evidence to accept the alternative hypothesis.

6.2. Hypothesis 2: Education

Hypothesis 2: A higher completed education is expected to have a positive influence on the importance of the banking app in financial activities.

From the results of the subgroups on Education, it can be concluded that there is no significant influence of education on the amount of digital transactions a participant performs (i.e. Lifestyle). Neither seems there to be a significant influence of education on the amount of people's personal knowledge about the Mobile Banking App. Thereby, it thus indicates that a higher education does not lead to a significant change in the variables PK and LS. Hence, it has no significant indirect and positive influence on the importance of the banking app in financial activities. The alternative hypothesis can therefore not be accepted. Instead it has to be concluded that people with different completed educational backgrounds make use of the Mobile Banking App to the same extent. Possible reasons for this could be that people with a higher income use the Mobile Banking App for only a few more expensive goods. While people with a lower income buy a larger amount of cheaper goods. Therewith, almost equalling the total amount of transaction and closing the hypothesized gap between different educational backgrounds. People with a different educational background, also have an equal amount of understanding and knowledge about the Mobile Banking App. The easy lay-out and rather simple control of the app could be possible reasons for this. These results are in line with prior research in which it was stated that educational level and income have no significant effect on the adoption of mobile banking, as a whole (Abayomi et al., 2019). This research adds to this knowledge by nuancing that there are indeed no effects from education or income on the knowledge and usage areas of the mobile banking app.

However, again a difference was found when examining the dependent variables closer. For the group of participants who had secondary education as their highest completed education, the mean of IMPA turned out to be significantly higher than the overall sample mean. This indicates that they value the Mobile Banking App as a more important tool in checking their account balance and transferring money. This can be explained by the fact that their income is expected to be lower, which was hypothesized to lead to a more precise and closer monitored expenditure pattern. It is therefore very useful and necessary to keep track of your account balance, which the Mobile Banking App can provide. Thereby, the significantly higher mean for this group on the domain of IMPA can be explained. Another difference was found on the dependent variable IMPB, this time for the HBO group. They were found to significantly value the Mobile Banking App higher in choosing a bank. A rational explanation for this relationship could not be formulated by the study, and rather it should be seen as an outlier result.

Although there were found two significant changes in the means of IMPA and IMPB for two groups. It cannot be concluded that there is a positive relationship between education and the importance score. Hence, the means of the other educational categories did not differ significantly from each other. Furthermore, there was no positive trend visible in the education categories. It has to be taken into account that the category primary school has not been included into the analysis, due to the limited amount of observations in this category. Hence, the formulated answer on the hypothesis does not apply for this group.

6.3. Hypothesis 3: Lifestyle

Hypothesis 3: A more materialistic lifestyle is expected to have a positive influence on the importance of the banking app in financial activities.

When analyzing the mean of Lifestyle, it was found that the mean of this variable is 2.91. Which is the lowest mean of the included variables. When analysing this further, it was found that in total most of the participants performed electronic transactions 1-10 times per month (40.18%), which was coded as 2. Followed by 11-20 times per month (33.93%), which was coded as 3. Together they form almost 75% of the participants, which explains the mean of 2.91. Another point that came forth from the data, is that 98.21% of the participants performed at least one electronic payment per month. The sample of this study existed thus mostly out of people who were familiar with doing electronic payments, both physical and/or online. This indicates that the large majority of the people cannot avoid electronic payments anymore, and thus needs to accept and use these new techniques. This could be voluntary, but could also be compulsory. Especially with the booming internet market and the reduction of the possibility to perform cash payments in physical stores, it is now even harder to not perform any electronic payments. These results are in line with the research of Deloitte (2014), in which it is shown that the total amount of electronic transactions increased rapidly since 2008. This paper adds to this knowledge, by showing that nowadays almost everyone performs electronic payments. Hence, the positive trend in electronic payments seems to be still going on.

Although most of the people thus seem to make use of electronic transactions, with one person more than the other. It was found that there is no significant relationship between this variable Lifestyle and the Importance of the Mobile Banking App on any of the four financial activities. This indicates that the total amount of electronic payments one performs does not influence the perceived importance of the Mobile Banking App. One possible explanation for this could be related to what people actually do. People could still prefer paying with their bankcard in physical stores, instead of using the Mobile Banking App on their smartphone. For online payments on web shops, an explanation could be that people still largely make use of the banks website to conform and pay their transactions, instead of again using the Mobile Banking App on their smartphone. This research thereby adds to the existing literature, by indicating that the time it takes to perform these actions (i.e. pay with a bankcard and log-in on a website) could already be low enough for participants. Thereby not creating the urge among participants to make use of the Mobile Banking App. Which is in line with the reasoning in the paper of Cook and Goette (2006). Another explanation could be related to what people think. Perhaps people do use the mobile banking app often for their transactions, but they do not perceive this app to be of large important in this process. The hypothesis of this study, in which it was stated that a more materialistic lifestyle would lead to a higher valuation of the importance of the mobile banking app, is thus not supported by the analysis. Therefore, we cannot accept the alternative hypothesis.

The results of the rank analysis confirmed the low importance of Lifestyle in determining the Importance of the Mobile Banking App. On average, the variable was on a fourth place for IMPB, IMPA, and IMPT. Moreover, Lifestyle was even the least decisive factor for IMPS.

6.4. Hypothesis 4: Personal Knowledge

Hypothesis 4: A higher personal knowledge about the mobile banking app is expected to have a positive influence on the importance of the banking app in financial activities.

The results from the descriptive analysis showed that the mean of the variable PK was 3.77, significant on the 95% interval level. This means that on average people perceived to have a higher than moderate understanding of the functions and working of the app. In other words, most of the people do think that they have the right abilities and skills to make use of the new technology in the form of the Mobile Banking App. The percentages of each of the categories confirmed this relationship, with 58.93% of the participants choosing the category High, which was coded as 4. The categories Very Low (i.e. coded as 1) and Low (i.e. coded as 2) only contained 1.79% of the participants each.

According to the literature (Corritore et al., 2003; Mathieson et al., 2001) this high perceived knowledge among participants, would lead them to think of the mobile banking app as a non-costly tool. This paper then moved further and hypothesized that thereby the importance of the Mobile Banking App would increase as well. In order to confirm the relation between Personal Knowledge and the Importance of the Mobile Banking App in the four financial categories, a regression analysis was conducted. Thereby it was found that personal knowledge has indeed a significant positive influence on the dependent variables IMPB, IMPS, and IMPT. In all of these financial activities a higher perceived knowledge will increase the likelihood that you will value the mobile banking app as a more important tool in the respective domain. Thereby, it confirms the alternative hypothesis of this study for the dependent variables IMPB, IMPS and IMPT. For those financial activities we can thus accept the alternative hypothesis.

However, for the dependent variable IMPA there was found no significant relationship with personal knowledge. Therefore we have to reject the alternative hypothesis on this domain. A possible reason for the insignificance could be that people do not require a lot of knowledge in order to check their account balance and transfer money. Hence, for checking your account balance one only has to click on the Mobile Banking App, there is no additional action necessary. For transferring money the same logic can be applied. A higher personal knowledge will then not lead to a more non-costly picture of the Mobile Banking App in the eyes of people. Therefore, the Mobile Banking App will not grow in importance as hypothesized by this paper.

Additionally, this paper tried to find out if the perceived personal knowledge of the participants can be seen as actual knowledge. In order to test this, participants were asked to fill-in a question about their actual usage of the Mobile Banking App per week. One can namely rationally argue, that when someone makes use of a technology more often, this will increase his or her ability and skills. Or in other words, this will increase the experience with the new technology. To test whether this was the case, a chi-squared likelihood-ratio test was performed. With this test it was found that there is indeed a significant positive relationship between the personal knowledge that people attribute to themselves and the total amount of times people make use of the Mobile Banking App per week. The results thus indicate, that the measured perceived personal knowledge could be replaced by actual personal knowledge about the Mobile Banking App.

6.5. Hypothesis 5: Ease of Use

Hypothesis 5: A higher ease of use of the mobile banking app is expected to have a positive influence on the importance of the banking app in financial activities.

After the descriptive analysis towards the mean of EU, it was concluded that the significant mean of this variable was 3.96. This turned out to be the highest mean of all of the included variables in this paper. This high number indicates that people value the Mobile Banking App as a very useful tool, which is easy to understand/learn and functions well. Furthermore, it indicates that the Mobile Banking App has a very high potential for banks. In which multiple financial services could be incorporated to save costs. As long, as this is done in a way that sustains the ease lay-out and accessibility of the app.

This high degree of ease of use would then, according to the literature (Agarwal & Prasad, 1999), lead to a free of effort picture in the eyes of the public, and increase the acceptance and usefulness of the new technology. This paper went further and then hypothesized that the importance of the Mobile Banking App in several financial activities would increase as well. With the help of a regression analysis it was found, that the variable EU has indeed a significant relationship with the dependent variables IMPT, and IMPA. This indicates that when people value the Mobile Banking App as a more easy to use tool. The Mobile Banking App will more likely be seen as extremely important in making transactions to buy goods and services, and checking the account balance and transferring money. This confirms the alternative hypothesis of the study, which means that for IMPA and IMPT the alternative hypothesis can be accepted.

For the dependent variables IMPB and IMPS there was found no significant relationship. Which means that the alternative hypothesis cannot be accepted on these two domains. One possible reason for this insignificance could be that, on the contrary for IMPA and IMPT, these two dependent variables are more related to external domains of the Mobile Banking App. The financial activities captured by IMPA and IMPT are all performed within the Mobile Banking App itself. Therefore, a higher ease of use is logical to have a positive influence on the importance. IMPB and IMPS capture financial activities which are, to a larger extent, performed outside the mobile banking app. Hence, choosing a bank and applying for services will be settled outside the Mobile Banking App. This lesser degree of completion within the Mobile banking App, could thus be a reason why EU has no significant explanatory value on IMPB and IMPS.

When analyzing the ranking questions from the survey, the high mean of EU was confirmed. The variable has a strong decisive influence in determining the importance of the Mobile Banking App. In each of the four financial activities, EU turned out to be the second highest decisive factor. Indicating that it is of large importance for banks to maintain a good Ease of Use of their Mobile Banking Application, in order to keep customers with them and to provide customers with strong incentives to make use of the app.

6.6. Hypothesis 6: Functionality

Hypothesis 6: A better functionality of the mobile banking app is expected to have a positive influence on the importance of the banking app in financial activities.

The mean of this variable turned out to be 3.88, and was significantly higher than 3 on the 95% confidence level. This variable has, thereby, the third highest mean of all the included variables. This high mean indicates that the functionality of the Mobile Banking App is perceived to be very good in the eyes of the participants. Which means that the amount of options and functions, that are now available in the Mobile Banking App, allow participants to perform all or most of the actions they want to perform.

Despite the fact that FU has a high mean, there was found no significant relationship of the variable Functionality on any of the four dependent variables (i.e. IMPB, IMPT, IMPS, IMPA). This thus means that we cannot accept the alternative hypothesis, as stated in the beginning of this subsection.

However, this does not mean that there cannot be inferred any knowledge from these results. The fact that there seems to be no significant relationship between the height of functionality and importance score, could indicate that there exists a maximum boundary. In other words, if a Mobile Banking App achieves a certain level of functionality. It does not increase the importance of this App very strongly anymore, in case it increases further. One could say that there exists some kind of diminishing marginal return or a preliminary requirement. For example, in the literature it has become clear that Localization and Instant Connectivity are two of the largest benefits in the eyes of the customers (Tiwari and Buse, 2007). If these two functions were not present in a Mobile Banking App this would definitely decrease the overall value of the App. Once they are present in the App this will initially increase the value of the App, but there is only small room for improvement on these two benefits further on. Also for customers, these small changes are barely visible. Therefore, they will not lead to an additionally large increase in the importance of the App. Also the fact that the basic functions of the app are used the most, and these are often already included in the Mobile App in an early stage, could provide an explanation why the addition of extra functions will not lead to a large and significant impulse on the importance of the Mobile Banking App.

The rank analysis provided evidence that pointed further in this direction. Functionality namely turned out to be the third most decisive factor on the importance of the Mobile Banking App, in all of the four financial activities. Which means that there is thus no difference in the degree of influence of this factor on the various dependent variables. The results also indicate that it is definitely of importance for banks to give attention to the amount of functions that are available in the App. Implementing support and updates to maintain the quality of the functions and options already in there, and to be on the frontline of innovation for new functions, is crucial. As long as these new functions are also very Easy in Use, as mentioned in the previous subsection, this will definitely enhance the overall quality and importance of your Mobile Banking App.

Another interesting point is that the results of this analysis seem to be related to the mean that was calculated in the descriptive analysis. With both the mean and decisiveness of FU being the third highest of all the included variables. However, for Ease of Use this relationship did not hold. Hence, it had the highest mean but turned out to be the second highest decisive factor. Nevertheless, the very small distance between the numbers 1 and 2 leaves room for interpretation.

6.7. Hypothesis 7: Credibility

Hypothesis 7: A higher credibility of the mobile banking app is expected to have a positive influence on the importance of the banking app in financial activities.

With a mean of 3.93, significantly different than 3 on a 95% confidence level, this variable has the second highest mean of all the included variables. However, the difference in mean between Ease of Use and Credibility is only 0.03. The high mean of credibility indicates that on average people value the mobile banking app as a very safe tool. Furthermore, it indicates that people in The Netherlands have confidence in the system and workings of the Mobile Banking App. According to the literature (Koenig-Lewis et al., 2010; Pavlou, 2003), this is a necessary condition in order for people to accept a new innovation/technology and make use of it. The high mean of credibility in this paper, combined with the earlier found result of this study that the Mobile Banking App is widely used between the age of 18-62, thus seem to prove this relationship. Additionally, also other scientific literature proved that the Mobile Banking App has become a broadly accepted and used technology over the years (Alsamydai et al., 2014; Rammile & Nel, 2012).

Although recent studies and this study together showed that the acceptance and credibility of the Mobile Banking App have increased over the last years. This study tried to extend this topic further, by examining the effect of the increase in credibility on the importance of the Mobile Banking App. Hence, if people value the Mobile Banking App as more safe, it was hypothesized that this would then lead to a higher importance of the App in the financial activities. However, in the regression analysis there was found no significant relationship on any of the four dependent variables (i.e. IMPB, IMPT, IMPS, IMPA). This indicates that a higher credibility of the Mobile Banking App does not significantly lead to a higher importance score of the MBA on any of the four included financial activities in this paper. One possible reason for this insignificance could again be that credibility is not additive in nature. Which means that once the app has achieved a sufficient amount of safety and trust for each individual, he or she will start to make use of this MBA. Thereby, initially increasing his or her usage and importance of the mobile banking app. However, once this level has been reached, a higher safety or trust in the MBA, later on, does not influence the usage patterns of the MBA very strongly anymore. Hence, the importance of the MBA would not increase significantly large enough with it.

With the help of the rank analysis, there was indeed found evidence which supports the reasoning as explained in the previous paragraph. Credibility turned out to be namely the most important factor in determining the importance of the Mobile Banking App. This indicates that credibility definitely is of importance in the eyes of the public. Furthermore, it indicates that it is of the utmost importance for banks to achieve a sufficient high level of credibility in the eyes of the public. As it is the most decisive factor, in whether or not people see the app as a useful and important tool in their financial activities. The recent campaign on television, radio, and social media, to make clear to people that making use of the app is safe, thus seems to be very logical.

7. Conclusion

In this chapter, the key findings of this study are summarized. Which then provides the basis in answering the main research question of this paper. Thereafter, directions of future research are provided.

7.1. Summary

The banking sector has experienced many changes during the years. Think of the introduction of ATM's, electronic payments and internet banking as the most influencing innovations. They changed the system as we once knew, and caused many people and organizations to adjust their activities. In recent years a new innovation has evolved itself, which has the potential to again change the banking sector tremendously: The Mobile Banking App. A tool which can provide banks with a high cost- and effort reduction and gives customers the potential of doing their financial activities everywhere and anytime they want (Deloitte, 2010).

The literature showed that the mobile banking app has settled itself as a widely used tool. This holds for banks (Fiserv, 2016) as well as for customers (Tiwari and Buse, 2007). Both parties namely acquire large benefits by making use of the Mobile Banking App (MBA). These benefits, together with other factors, made that the MBA has nowadays a high acceptance rate among customers (Alsamydai et al., 2014). However, in the literature there was made no next step towards the amount of importance of the MBA. Which is of relevance to examine, since the app is now widely accepted for a few years. Moreover, there was, to our knowledge, never made a distinction between different financial activities. Accordingly, this paper tried to fill this gap by answering the following research question: To what extent is the mobile banking app of importance in the financial activities of customers in the Netherlands? In order to give a precise and complete answer on this question, this study acquired multiple results.

First, from the literature a number of seven factors came forth that influence the acceptance of the Mobile Banking App, and were hypothesized to have an effect on the importance of the MBA as well. These are: Ease of Use (Davis, 1989; Ng'ang'a, 2017), Credibility (Yu (2012), Functionality (Haque et al., 2009), Lifestyle (Cook and Goette, 2006), and Personal Knowledge (Laforet and Li, 2005). Additionally, two factors (Age and Education (Abayomi et al., 2019)) were included as moderating variables in relation to the variables Personal Knowledge (PK) and Lifestyle (LS). As they were expected to influence the explanatory value of PK and LS through the mechanics of the resistance rate (Blackburn, 2011) and the income level (Goldin et al., 2009). With these factors a conceptual model was created (figure 3).

Second, an online survey was used to empirically test the structural model. In total a number of 112 participants filled in the questionnaire. They were all citizens of The Netherlands, were customer at the ING, ABN-AMRO, SNS, or Rabobank, and were at least 18 years old. The questionnaire was distributed with the help of convenience sampling and the snowball method. In total the survey contained 20 questions and took around seven minutes to fill-in. While the aim of the survey was to take into account the whole population of The Netherlands, a more narrow population had to be taken due to the limited ability to reach participants above the age of 62. However, this study still provides relevant new insights for the population with an age between 18 and 62 years old.

Next, based on the acquired data of the online survey, this study found new insights on the topic of Mobile Banking. After the descriptive analysis it could be concluded that the Mobile Banking App is of significantly high importance on the domain of checking account balance and transferring money (IMPA), and on the domain of making payments (online and physical) (IMPT). On the contrary, the Mobile Banking App is of significantly low importance on the domain of choosing a bank (IMPB), and on the domain of applying for bank services and products (IMPS). Additionally, Age and Education turned out to have no significant direct effect on LS or PK. Which indicates that people in The Netherlands between the age of 18-62 do not differ in their understanding about the MBA or amount of electronic transactions they perform. Further regression analysis made clear that perceived Knowledge has a strong and significant positive relationship with the variables IMPB, IMPA and IMPS. Ease of Use has a strong and significant positive relationship with the dependent variables IMPA and IMPT. Functionality and Credibility turned out to have no significant positive relationship with any of the dependent variables. However, with the help of the rank analysis it was found that they are valued as two of the most decisive factors in determining the importance score of the MBA.

In summary, this study contributed to the current literature by showing that a well Functionality and Credibility of the MBA seems to be a preliminary condition in order for people to make use of the app and start value the importance of this tool in their financial activities. Once these factors have not reached a sufficiently high enough level in the eyes of an individual, this would lead him or her to avoid making use of the Mobile Banking App. On the contrary, when they are on a sufficient level this would enable other factors, like EU and PK, to further influence the importance of the MBA in the financial activities. Age and Education do have no effect in this process. In the end, this has been showed to lead to a low importance of the Mobile Banking App on the domain of choosing a bank (IMPB) and on the domain of applying for bank services and products (IMPS). And it leads to a high importance of the Mobile Banking App on the domain of checking account balance and transferring money (IMPA), and on the domain of making payments (online and physical) (IMPT). Thereby, this paper has contributed to the current literature. Hence, there has now been made an extension from the adoption of the MBA to the importance of the MBA. Moreover, there has been made a distinction between multiple financial activities. Which can provide banks with more narrow directions on where to improve.

The findings in this paper provide insights for banks on how to plan and strategize the development of the Mobile Banking App. This study indicates that creating trust among new and current customers is of the upmost importance. The introduction of the media campaign "paying with the app, is just as safe as on the web" therefore seems to be a very good strategy. However, also the constant support of the app, in the form of updates, is required to maintain a good Functionality and Ease of Use. Lastly, information about the app should be distributed in a clear way to customers. So that most of the customers have a high Personal Knowledge about the app. The fact that after analysis all of these variables had a significant mean higher than 3, indicates that the four included banks are doing very well on all these four fields. This study therefore suggests that banks keep pushing the boundaries on these domains further, so that more people are persuaded to make use of the app. Especially in the domain of bank services and products there could still be made large steps. In the end, this will namely lead to benefits for both parties and to a more efficient and cost-saving financial banking sector.

7.2. Future Research

Based on the conducted research in this paper, there can be made several recommendations for future research in order to extent this research. First, further studies could take a more in depth look into the factors influencing people's importance of the mobile banking app. Think of interviews with

participants to enable other, still undefined, factors to come up as well. By doing so, further research could create a more sophisticated picture about the factors that are in play. Another interesting direction which further studies could take, is to look at other parties than customers. Views from other involved parties like, banks, governments and market authorities are of importance in understanding how the mobile banking app has settled itself in the economy as a whole. The interests of these agents could namely be divergent. Thus, affecting the future of the mobile banking app. The third recommendation for further research is to look at other countries, some with a lesser amount of internet access available in households. These studies could namely compare whether or not this has large effects on the importance of the mobile banking app. The included factors in this research could have a stronger or weaker effect because of this limitation of internet access. Fourth, future studies could take a focus on people above the age of 68. Or in other words, at people who are retired. Because of the lack of sufficient responses of these groups in this study, no conclusions could be made for these people. However, it is still interesting for further research to find out the importance of the mobile banking app for these people as well. Fifth, a distinction could be made between the four banks that are included in this paper. With the purpose to find out if there are significant differences between these included banks. Although they are included in this study because of their equal characteristics, there could still be significant differences in the valuation of people on the importance of the MBA. This could be interesting to know for banks, as it can situate their position in the market. Lastly, it could be interesting to look at the use and importance of the MBA when travelling abroad. Then you namely have to perform intra-European and other international transactions, which could change the relationships between the included variables in this paper.

When further studies take the above mentioned recommendations into account, this will nuance and expand the current literature on the importance of the mobile banking app. Furthermore it increases our understanding and picture of the influence of this app on customers, banks and other involved parties as well.

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Appendices

A. Survey (English)

Welcome to the survey! Thank you for your interest on this topic and your willingness to participate in the study.

In the following sections you will have to answer a total of 18 questions. The questionnaire will take around 8 minutes to fill-in. This survey is addressed to individuals with an age of 18 or higher, who are customer of ING, ABN-AMRO, SNS or Rabobank, and have at least some experience with the Mobile Banking App on their smart-phone or tablet.

After answering all of the questions in the survey, you will have the opportunity to leave your e-mail address in order to make a chance of winning one of the two €25,- gift cards of own choice. All collected data will only be used for statistical purposes and will not be shared with third-parties.

Part 1: Introduction

In this study we want to find out how important the Mobile Banking App (MBA) has become in the financial activities of people. With the introduction of the MBA, it namely became possible to use smartphones and tablets to access banking services as well. It enabled people to do their financial activities everywhere and anytime they want. In this study, we are interested in the following four financial activities:

1. Choice of bank
2. Way of making payments to buy goods and services (physical and online)
3. Checking account balances and transferring money
4. Applying for bank services and products (e.g. new bank card, loan, advice, stocks and bonds)

First we want to ask you, to fill in the following 8 questions:

Question 1: Age

How old are you?
(18-100)

Question 2: Gender

What is your gender?
(Male, Female)

Question 3: Occupation

What is your current occupation?
(Student, Full-time employee, Part-time employee, Self-employed, Unemployed, Other)

Question 4: Education

What is your highest completed education degree?
(Primary School, Secondary Education (VMBO, HAVO, VWO), MBO, HBO (Bachelor/Master), WO (Bachelor/Master))

Question 5: Installation

Do you currently have a Mobile Banking App installed on your mobile device(s)?
(Yes, No)

Question 6: Bank

(Q5: Yes) From which bank do you have the Mobile Banking App?
(Q5: No) From which bank did you have the Mobile Banking App?
(ING, ABN-AMRO, SNS, Rabobank)

Question 7: Platform

(Q5: Yes) Which of the following devices do you use for Mobile Banking?

(Q5: No) Which of the following devices did you use for Mobile Banking?

(Only Smartphone, Only Tablet, Both)

Question 8: Usage Patterns

(Q5: Yes) How often do you make use of the Mobile Banking App with your mobile devices?

(Q5: No) How often did you make use of the Mobile Banking App with you mobile devices?

(never, less than 1 times per week, 1-3 times per week, 4-6 times per week, 6-9 times per week, more than 9 times per week)

Part 2: Structural Model - Importance Factors

In this section we ask you to give answer on 10 questions.

The first question is about your general importance of the Mobile Banking App on the four financial activities.

The next five questions will ask you to give answer on five factors that can influence your importance of the mobile banking app in the four financial activities. Before each of these questions, the respective factor will be described first. Please read this description first, before answering the question.

The last four questions will ask you to rank the influence of the five factor, described earlier, on each of the four financial activities.

Question 9: Importance

To what extent is the Mobile Banking App of importance for you ...

(1) in choosing a bank?

(2) in making transactions (physical and online)?

(3) in transferring money and checking your account balance?

(4) in applying for bank services and products?

(Not At All Important, Slightly Important, Moderately Important, Very Important, Extremely Important)

Question 10: Lifestyle

(1) Lifestyle: the amount of electronic payment transactions you make to buy goods or to apply for services through the internet or in physical stores.

How would you describe your Lifestyle?

(0 transactions per month, 1-10 transactions per month, 11-20 transactions per month, 21-30 transactions per month, more than 30 transactions per month)

Question 11: Personal Knowledge

(2) Personal Knowledge: the possession of the right abilities and skills to make use of a new technology.

How would you perceive your Personal Knowledge about the Mobile Banking App?

(Very Low, Low, Moderate, High, Very High)

Question 12: Ease of Use

(3) Ease of Use: the degree to which a particular system is free of effort. In other words, how well a product or service is functioning in its use.

How would you value the Ease of Use of the Mobile Banking App from your bank?

(Refer to the Mobile Banking App you make use of most)

(Not Well at All, Slightly Well, Moderately Well, Very Well, Extremely Well)

Question 13: Functionality

(4) Functionality: the amount of functions plus options available in the Mobile Banking App.

How would you value the Functionality of the Mobile Banking App from your bank?

(Refer to the Mobile Banking App you make use of most)

(Not Well at All, Slightly Well, Moderately Well, Very Well, Extremely Well)

Question 14: Credibility

(5) Credibility: the safety and trust of the Mobile Banking App.

How would you value the Credibility of the Mobile Banking App from your bank?

(Refer to the Mobile Banking App you make use of most)

(Not Well at All, Slightly Well, Moderately Well, Very Well, Extremely Well)

Question 15: Rank Factors for Bank choice

Rank the following factors in order of influence on the importance of the Mobile Banking App in bank choice from 1 (highest influence) to 5 (lowest influence):

(Functionality, Credibility, Ease of Use, Personal Knowledge, Lifestyle)

Question 16: Rank Factors for Way of making payments

Rank the following factors in order of influence on the importance of the Mobile Banking App in the way of making payments from 1 (highest influence) to 5 (lowest influence):

(Functionality, Credibility, Ease of Use, Personal Knowledge, Lifestyle)

Question 17: Rank Factors for Checking account balances and transferring money

Rank the following factors in order of influence on the importance of the Mobile Banking App in checking account balance plus transferring money from 1 (highest influence) to 5 (lowest influence):

(Functionality, Credibility, Ease of Use, Personal Knowledge, Lifestyle)

Question 18: Rank Factors for Applying for bank services and products

Rank the following factors in order of influence on the importance of the Mobile Banking App in applying for bank services plus products from 1 (highest influence) to 5 (lowest influence):

(Functionality, Credibility, Ease of Use, Personal Knowledge, Lifestyle)

Part 3: Compensation / Updating *(Only if all previous 18 questions are filled-in)*

Question 19: Compensation

Thank you for filling in all of the questions of this survey!

In order to make a chance of winning one of the two €25,- gift-cards, please leave your email-address below:

.....

Your e-mail address will not be linked to your results. Also it will be handled according to the privacy rules active in The Netherlands. Personal Information will not be shared with third-parties.

The e-mail address is only used in order to draw two winners. This will be done independently of your answers.

Winners will be announced after 14/07/2019. They will receive a personal e-mail.

Question 20: Updates

Do you want to keep in touch with the study?

By leaving your email address below, you will receive an update about the conclusions of the study:

.....

B. Survey (Dutch)

Welkom bij de enquête! Bedankt voor uw interesse in dit onderwerp en uw bereidheid om deel te nemen aan het onderzoek.

In de het vervolg van deze vragenlijst wordt u gevraagd om in totaal 18 vragen te beantwoorden. De vragenlijst duurt ongeveer 8 minuten om in te vullen. Deze enquête is gericht aan personen met een leeftijd van 18 jaar of ouder, die klant zijn van ING, ABN-AMRO, SNS of Rabobank, en die op zijn minst enige ervaring hebben met de Mobiel Bankieren App op hun smartphone of tablet.

Na het beantwoorden van alle vragen in de enquête, hebt u de mogelijkheid om uw e-mail adres achter te laten om kans te maken op het winnen van een van de twee cadeaubonnen van € 25, - (Keuze: Bol.com, Mediamarkt, Intratuin of VVV-bon).

Alle verkregen data zal alleen worden gebruikt voor statistische doeleinden en zal niet worden gedeeld met derden.

Deel 1: Introductie

In deze studie willen we onderzoeken hoe belangrijk de Mobiel Bankieren App (MBA) is geworden in de financiële activiteiten van mensen. Met de introductie van de MBA werd het namelijk mogelijk om smartphones en tablets te gebruiken voor toegang tot bankdiensten. Vanaf dat moment konden mensen hun financiële activiteiten overal en op elk gewenst moment uitvoeren. In deze studie zijn we geïnteresseerd in de volgende vier financiële activiteiten:

1. Keuze voor bank
2. Manier van betalingen doen voor goederen en diensten (fysiek en online)
3. Saldo controleren en geld overmaken
4. Bank services en producten aanvragen (bv. nieuwe betaalpas, lening, advies, aandelen)

Eerst willen we u vragen om de volgende 8 vragen in te vullen:

Vraag 1: Leeftijd

Wat is uw leeftijd?

(18-100)

Vraag 2: Geslacht

Wat is uw geslacht?

(Man, Vrouw)

Vraag 3: Beroep

Wat is uw huidige beroep?

(Student, Full time medewerker, Parttime medewerker, Eigen baas, Werkloos, Anders)

Vraag 4: Opleiding

Wat is uw hoogste voltooide opleidingsgraad?

(Basisonderwijs, Voortgezet Onderwijs (VMBO, HAVO, VWO), MBO, HBO (Bachelor/Master), WO (Bachelor/Master))

Vraag 5: Installatie

Heeft u op dit moment een Mobiel Bankieren App op een mobiel apparaat geïnstalleerd?

(Ja, Nee)

Vraag 6: Bank

(V4: Ja) Van welke bank heeft u de Mobiel Bankieren App geïnstalleerd?

(V4: Nee) Van welke bank had u de Mobiel Bankieren App geïnstalleerd?

(ING, ABN-AMRO, SNS, Rabobank)

Vraag 7: Platform

(V4: Ja) Welke van de volgende apparaten gebruikt u voor Mobiel Bankieren?

(V4: Nee) Welke van de volgende apparaten gebruikte u voor Mobiel Bankieren?

(Alleen Tablet, Alleen Smartphone, Beide)

Vraag 8: Gebruikers Patronen

(V4: Ja) Hoe vaak maakt u gebruik van de Mobiel Bankieren App op uw mobiele apparaten?

(V4: Nee) Hoe vaak maakte u gebruik van de Mobiel Bankieren App op uw mobiele apparaten?

(nooit, minder dan 1 keer per week, 1-3 keer per week, 4-6 keer per week, 6-9 keer per week, meer dan 9 keer per week)

Deel 2: Structureel model - Belangrijke Factoren

In dit deel van de vragenlijst vragen we u om een antwoord te geven op 10 vragen.

De eerste vraag gaat over uw algemene belang van de Mobiel Bankieren App voor de vier financiële activiteiten.

De daarop volgende vijf vragen zullen u vragen om antwoord te geven op vijf factoren die uw belang van de app voor mobiel bankieren in de vier financiële activiteiten kunnen beïnvloeden. Vóór elk van deze vragen, zal de respectievelijke factor eerst worden beschreven. Leest u alstublieft eerst deze beschrijving voordat u de vraag beantwoordt.

In de laatste vier vragen wordt u gevraagd om voor elke van de vier financiële activiteiten de vijf factoren te rangschikken naar invloed op uw belang van de Mobiel bankieren App.

Vraag 9: Belang

In hoeverre is de Mobiel Bankieren App van belang voor u ...?

(1) bij het kiezen van een bank

(2) bij het maken van transacties (fysiek en online)

(3) bij het overboeken van geld en het controleren van uw rekeningsaldo

(4) bij het aanvragen van bankdiensten en producten

(Helemaal niet belangrijk, Enigszins belangrijk, Redelijk belangrijk, Erg belangrijk, Extreem belangrijk)

Vraag 10: Levensstijl

(1) Levensstijl: het aantal digitale betalingstransacties dat u doet om goederen te kopen of om diensten aan te vragen via internet of in fysieke winkels.

Hoe zou u uw levensstijl beschrijven?

((0 transacties per maand, 1-10 transacties per maand, 11-20 transacties per maand, 21-30 transacties per maand, meer dan 30 transacties per maand)

Vraag 11: Persoonlijke Kennis

(2) Persoonlijke Kennis: het bezit van de juiste vaardigheden en kennis om gebruik te maken van een nieuwe technologie.

Hoe zou u uw persoonlijke kennis over de Mobiel Bankieren App beoordelen?

(Heel laag, Laag, Matig, Hoog, Heel Hoog)

Vraag 12: Gebruiksgemak

(3) Gebruiksgemak: de mate waarin een bepaald systeem vrij is van inspanning. Met andere woorden, hoe goed een product of dienst functioneert in het gebruik ervan.

Hoe zou u het gebruiksgemak van de Mobiel Bankieren App van uw bank omschrijven?

(Refereer naar de Mobiel Bankieren App waar u het meest gebruik van maakt(e))

(Helemaal niet goed, Enigszins goed, Redelijk goed, Erg goed, Extreem goed)

Vraag 13: Functionaliteit

(4) Functionaliteit: het aantal functies plus opties beschikbaar in de Mobiel Bankieren App.

Hoe zou u de functionaliteit van de Mobiel Bankieren App van uw bank omschrijven?

(Refereer naar de Mobiel Bankieren App waar u het meest gebruik van maakt(e))

(Helemaal niet goed, Enigszins goed, Redelijk goed, Erg goed, Extreem goed)

Vraag 14: Betrouwbaarheid

(5) Betrouwbaarheid: de veiligheid plus het vertrouwen van de Mobiel Bankieren App.

Hoe zou u de betrouwbaarheid van de Mobiel Bankieren App van uw bank omschrijven?

(Refereer naar de Mobiel Bankieren App waar u het meest gebruik van maakt(e))

(Helemaal niet goed, Enigszins goed, Redelijk goed, Erg goed, Extreem goed)

Vraag 15: Rangschik Factors voor Bank keuze

Rangschik de volgende factoren in volgorde van invloed op uw belang van de Mobiel Bankieren App in de keuze voor een bank van 1 (hoogste invloed) tot 5 (laagste invloed):

(Functionaliteit, Betrouwbaarheid, Gebruiksgemak, Persoonlijke Kennis, Levensstijl)

Vraag 16: Rangschik Factors voor Maken van transacties

Rangschik de volgende factoren in volgorde van invloed op uw belang van de Mobiel Bankieren App in het maken van transacties van 1 (hoogste invloed) tot 5 (laagste invloed):

(Functionaliteit, Betrouwbaarheid, Gebruiksgemak, Persoonlijke Kennis, Levensstijl)

Vraag 17: Rangschik Factors voor Saldo controleren en geld overmaken

Rangschik de volgende factoren in volgorde van invloed op uw belang van de Mobiel Bankieren App in het controleren van saldo plus het overmaken van geld, van 1 (hoogste invloed) tot 5 (laagste invloed):

(Functionaliteit, Betrouwbaarheid, Gebruiksgemak, Persoonlijke Kennis, Levensstijl)

Vraag 18: Rangschik Factors voor Aanvragen van bankdiensten en producten

Rangschik de volgende factoren in volgorde van invloed op uw belang van de Mobiel Bankieren App in het aanvragen van bankdiensten en producten van 1 (hoogste invloed) tot 5 (laagste invloed):

(Functionaliteit, Betrouwbaarheid, Gebruiksgemak, Persoonlijke Kennis, Levensstijl)

Deel 3: Compensatie / Updates

(Alleen als alle 18 vragen zijn ingevuld)

Vraag 19: Compensatie

Bedankt voor het invullen van alle vragen in deze enquête!

Om een kans te maken op het winnen van een van de twee € 25, - cadeaubonnen, laat u hieronder uw e-mailadres achter:

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Uw e-mailadres wordt niet gekoppeld aan uw resultaten en wordt behandeld volgens de privacyregels die in Nederland gelden. Persoonlijke informatie zal niet worden gedeeld met derden.

Het e-mailadres wordt alleen gebruikt om twee winnaars te trekken. Dit gebeurt onafhankelijk van uw antwoorden.

Winnaars worden aangekondigd na 14/07/2019. Ze zullen een persoonlijke e-mail ontvangen.

Vraag 20: Update

Wilt u op de hoogte blijven van het onderzoek?

Door hieronder uw e-mailadres achter te laten, ontvangt u een update over de conclusies van de studie:

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