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Adoption and continuous use of mobile payment applications in Norway

A study of Vipps mobile payment application

Bachelor's thesis

NTNU
Norwegian University of Science and Technology
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Abstract

Purpose - This study aims to identify the key factors that influence the adoption of the Vipps mobile payment app in Norway.

Design/Methodology/Approach - The study used a sample of 151 respondents, from different counties in Norway, with a higher concentration in Møre and Romsdal, Akershus and Oslo. The survey presented statements designed to assess different factors created with insights from previous studies on technology adoption theory, placed in a digital questionnaire format. The survey was distributed at campus and through different online platforms such as social media, blogs and forums, employing a quantitative method for the research.

Findings - The thesis concluded with significant support of half of constructs that it hypothesized. The total being 12 hypotheses, six being on a and six on b hypothesis. Firstly, the result from testing the constructs "app innovativeness & novelty," "app system quality," and "app usage satisfaction" in predicting that they are positively related to dependent variable app adoption. Secondly, the constructs "service quality" and "perceived value" are positively related, while "perceived risk" is negatively related to the dependent variable continuous usage. Interestingly the impact of the independents variables on the dependent variables exhibited distinct patterns of influence. In essence, the factors that correlated significantly to app adoption differed uniquely from those that impacted continuous usage.

Practical implications - This study is important for a diverse set of stakeholders, from the private person, merchants, banks, and other providers of mobile payments apps. Given that this study reveals a further understanding of which elaborate factors might drive an individual to be influenced in the adoption and usage of mobile payment apps. The findings presents that effort and performance expectancy, innovation, good system, and usage satisfactions drives adoption. Service quality, perceived value and perceived risk influences continues use. This indicates how the mobile payment apps and banking industry will need to evolve should it continue to keep its users satisfied.

Originality/Value - The findings shed light on why people choose to adopt and keep using Vipps mobile payment app. This thesis therefore expands on previous studies, which primarily focused on adoption alone, by also focusing on the user's perspectives after the adoption stage. Furthermore, the study investigates a system, Vipps, that hold a dominant position in its home market despite not being directly affiliated with any major Norwegian banking institutions.

Table and Figures

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Preface

This bachelor thesis explores the factors influencing the adoption and continued use of Vipps mobile payment application in Norway. Our interest in the topic stems from our shared passion for the evolving landscape of the banking industry. Having both gained experience working in banks, we witnessed firsthand the use of digital payments solutions like Vipps. This personal connection, coupled with the ongoing discussion about the future of banking, fueled our desire to delve deeper into the factors driving Vipps success.

Within this thesis, we present the result of the analysis which explores the key drivers behind Vipps' adoption and continuous use. We hope that the research contributes to a better understanding of this innovative payment solution and its impact on consumer behavior in the banking industry. We invite you to explore the following chapters, which delve into the research question, methodology, findings, and conclusion.

With uncertainty for what to do in the final semester of our bachelor's degree in marketing, innovation and management. We were approached by our lecturer, in marketing research who presented a theme for a thesis. Sparking a truly fantastic idea, great cooperation, and teamwork between us the students and our supervisor. We are therefore ultimately grateful and would like to thank our supervisor Richard Glavee-Geo for the guidance and support he has given us during this experience. He supported us more than we could ever imagine, from providing valuable insights and incredible research, to giving us constructive feedback when necessary. We would also extend our thanks to the members and lecturers at the Faculty of Economics and Management at the Norwegian University of Science and Technology, in Ålesund.

André Bruås Olsen & Araz Falahat

Ålesund, May 2024

1.Introduction

1.1 Background for the thesis

Evolution in technology has brought forward a shift in the financial sector, where mobile applications have become essential tools for facilitating transactions, account managing, and access to a range of other financial services. For many countries, the innovation of mobile applications has shown a great impact on the banking industry (Shaikh, A. A. et al., 2018, p. 3). In this study, the Norwegian mobile payment app Vipps is the focal point, aiming to help provide insights that contribute to understanding reasons behind increased use of financial service apps by the banking industry and consumers. Mobile payment apps are the essential tools for managing one's finances. It allows the users to conduct various transactions through their mobile devices, such as checking balances, transferring funds, and paying bills. Its interface and personalized features give the consumer a convenient alternative to the traditional banking methods.

The population has shifted from cluttering their homes with an increasing number of devices for various media uses to consolidating everything onto their smartphones. Communication has become easier and notably quicker through digital means, and smartphones have facilitated activities ranging from grocery shopping to online purchasing. Over the last three years, the proportion of individuals owning smartphones has remained steady at 92-93 percent (Thormundsson, 2023), following significant increases from previous years. According to Statistisk Sentral Byrå, 99 percent of the population aged 9-79 now owns a mobile phone (Schiro, 2022).

1.2 Application Adoption and Continuous usage

Mobile application adoption has become a critical research area for understanding user behavior and the success of digital products. The growing trend of financial technology (FinTech)**,** particularly mobile applications designed for convenient financial management, highlights this need. These innovative apps have revolutionized how individuals manage tasks like paying bills and checking their balance. However, existing research on app adoption often emphasizes benefits for organizations rather than user experiences (Min et al., 2019).

This thesis aims to analyze this gap by examining app adoption through the lens of user perceptions. Analyzing user motivations and challenges in adopting financial applications, can gain us valuable insights into the impact of technology on everyday financial interactions across different geographic contexts. By understanding the factors influencing user engagement with these apps will shed new light on the financial interactions.

Popular mobile apps like Facebook, Instagram and VG are being used daily, research suggests that initial adoption of new app often involves brief exploration before uninstalling the app (Malik et al., 2017). This thesis will also investigate the factors that differentiate financial apps like Vipps from those relegated to the unused app graveyard. By exploring continuous usage on app adoption, we hope to shed light on the key drivers of continuous engagement with financial applications.

1.3 Research question

The research question "What key factors influence the adoption and continuous use of the mobile payment Vipps app in Norway?". is the main question to be answered in this thesis. This is investigated by examining the users of the applications perception and experiences before and after adoption. Identifying the factors which contribute to the success of mobile payment applications like Vipps in a landscape potentially saturated by larger competitors and traditional banking solutions.

1.4 Outline of the thesis

This thesis' overall aspects utilizes different literature that research topic of innovations adoption and the continuous use of mobile payments apps or systems (Karjaluoto et al. 2019; Shaikh, Glavee-Geo, & Karjaluoto 2018; Karjaluoto et al. 2020; Malik, Suresh, & Sharma 2017). To complement the theoretical literature, the implementation of a quantitative survey was done through the distribution of the survey questionnaire to a sizable population to get a direct perspective of the consumers viewpoints.

This paper follows a structured format to achieve a good overview, starting with an introduction which establishes the topic of the thesis. The justification and arguments in this part are

highlighted with relevant academic literature and presents the research question. Further the theoretical part, explains a few frameworks to help understand the research question and behavior of respondents. Following this the hypothesis part is presented, drawing upon the identified factors from literature on adoption and use of innovative technology. Subsequently, the papers methodology section details research design and the analysis present the results from the survey. Finally, the paper will conclude with a discussion, addressing any theoretical contributions, implications, limitations, future research, and recommendations pertinent to the adoption and further use of future banking technologies.

2.Theory

2.1 Theory of planned behavior (TPB)

Since Icek Ajzen introduced Theory of Planned Behavior (TPB) in 1985, TPB has become a widely cited theory for understanding and predicting human social behavior (Ajzen, 2011). The TPB suggests an individuals intention to perform a specific behavior is the strongest predictor of their actual behavior, or as Ajzen himself stated, "*TPB examines the relations between intentions and actions: The ways in which goals and plans guide behavior, and the factors that induce people to change their intentions or prevent successful execution of the behavior*" (Ajzen, 1985 p.11). According to Ajzen's TPB these three factors collectively influence an individual's **behavioral intentions**, which in turn serve as the strongest predictor of their actual behavior (Ajzen, 1985):

- **Attitude -** This factor represents an individuals personal feelings and beliefs towards a specific behavior. If they hold a positive attitude towards the behavior, they are more likely to engage in it.
- **Subjective Norms -** This factor reflects an individual's perception of social pressure to perform or not perform a particular behavior. If they believe that significant people in their lives approve of the behavior, they are more likely to adopt it themselves.
- **Perceived Behavioral Control -** This factor encompasses an individual's belief in their ability to successfully execute the behavior. If they perceive that they can overcome potential obstacles, they are more likely to pursue the behavior.
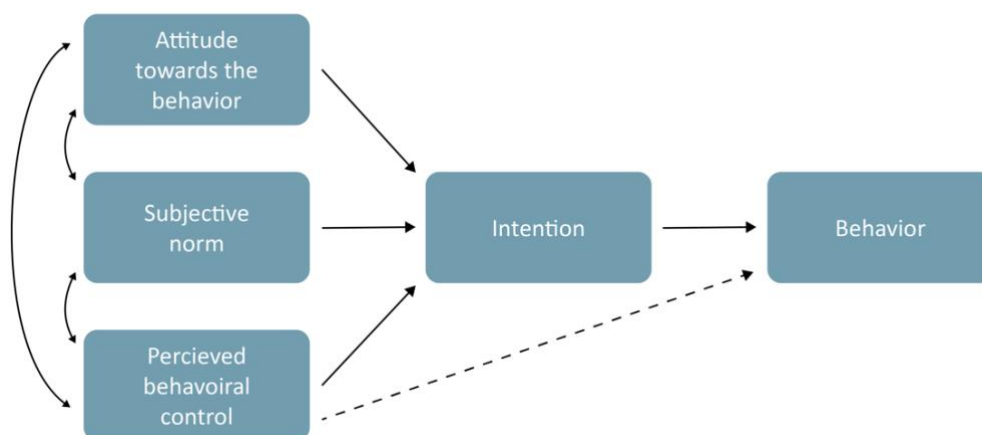
Figure 2.1 Theory of Planned Behavior (TPB) Source: (Ajzen, 1985, 2011)

TPB also faces criticism for being overly simplistic (Sniehotta et al., 2014). It focuses on just four factors and doesn't account for unconscious influences, emotions, or how past behaviors can impact future intentions. Some people also argue the theory is difficult to disprove and may prioritize explaining away conflicting data rather than refining the theory itself (Smedslund, 1978). TPB's ability to predict behavior is also limited, particularly for those who intend to do something but ultimately don't follow through (Sniehotta et al., 2014). Despite these limitations, the TPB can still be a useful tool when used alongside other theories and methods.

2.2 Technology acceptance model (TAM)

The Technology Acceptance Model (TAM), developed by Fred Davis in 1986, "*assumes that when users perceive that a type of technology is useful and easy to use, they will be willing to use it*" (Ajibade, 2018 p.3). Initially formulated to investigate the adoption of personal computers in the 1980s (Marikyan & Papagiannidis, 2023). TAM builds upon the Theory of Planned Behavior (TPB) discussed in the previous chapter. Our goal is to utilize TAM in conjunction with other theories to understand and address our research problem.

TAM's primary objective is to examine the underlying processes involved in accepting new technology to predict user behavior and provide a theoretical explanation for successful technology implementation (Marikyan & Papagiannidis, 2023). The core of the theory lies in the notion that an individuals perceptions influence their willingness to adopt new technology, comprising two key factors:

- **Perceived Usefulness:** This refers to the extent to which an individual believes the technology will help them perform a job or task better (Davis, 1989).
- **Perceived Ease of Use:** *The degree to which a person believes that using a particular system would be free of effort* (Davis, 1989 p.320).
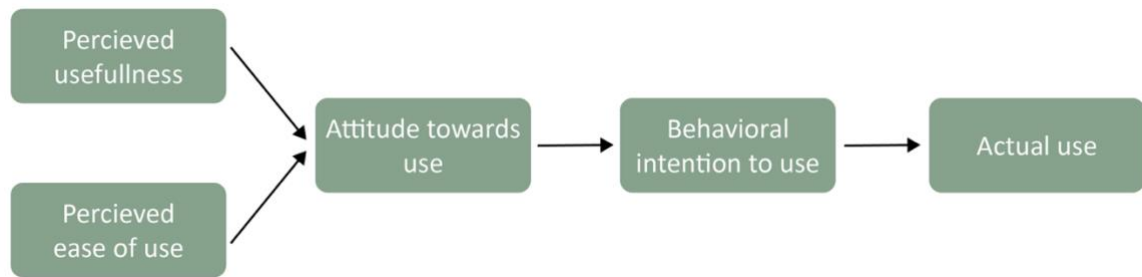
Figure 2.2 Technology acceptance model (TAM) Source: (Davis, 1986, 1989)

These factors align with the Theory of Planned Behavior (TPB), where elements influencing behavioral intentions significantly impact the willingness to adopt new technology.

Similarly, to the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM) has also been criticized for some aspects. One of the criticisms is that TAM relies on people's intentions to predict their behavior. This means we ask people if they'd use something new, but that doesn't always translate to them doing it.

Even though both Theory of Planned Behavior (TPB) and the Technology Acceptance Model (TAM) have been criticized, they are still useful tools for understanding technology adoption. Together with the Information Systems Success Model (ISSM), they will help us to get a more comprehensive picture of technology adoption.

2.3 Information System Success Model (ISSM)

Information System Success Model (ISSM) was developed by DeLone and McLean in 1992 and is a model that describes system quality and information quality as having a common or partial influence on user satisfaction and system use (Martono et al., 2020). The model consists of 6 dimensions:

- **System quality –** Defined as "*the desired characteristics of the information system itself, which produces the information*" (Ali & Jaafreh, 2017 p.832). This refers to the technical aspect, including whether it is easy to use and whether the system is reliable.
- **Information quality –** Defined as "*Desirable characteristics of the system outputs*" (Ali & Jaafreh, 2017 p.832), focused on the accuracy, relevance, and timeliness of the information

provided by the system. Information quality affects both user satisfaction with the system and user intentions to use the system.

- **Service quality** – Defined as *"Quality of the service or support that system users receive from the IS organization and IT support personnel in general or for a specific IS. For example, Responsiveness accuracy, reliability, technical competence, empathy of the personal stuff»* (Ali & Jaafreh, 2017 p.833). Service quality directly affects user intentions to use and user satisfaction with the system.

- **System Use/Usage intentions** – Defined as *"Intention to Use, or the users' belief about their likelihood to use the IS"* (Ali & Jaafreh, 2017 p.833). This dimension measures how often users engage with the system. It also assesses their willingness to continue using it in the future.

- **User satisfaction** – Defined as *"Users' level of satisfaction with the IS. Single item to measure user satisfaction, semantic differential scales to assess attitudes and satisfaction with the system, multiattribute scales to measure user information satisfaction"* (Ali & Jaafreh, 2017 p.833). This captures the overall feeling users have towards the system. Are they satisfied with the functionality and performance? User satisfaction is often linked to system and information quality.

- **Net Benefits** – Defined as *"Extent to which IS are contributing to the success of individuals, groups, organizations, industries, and nations"* (Ali & Jaafreh, 2017 p.834). This can include improved decision-making, increased productivity, cost savings, or a competitive advantage.
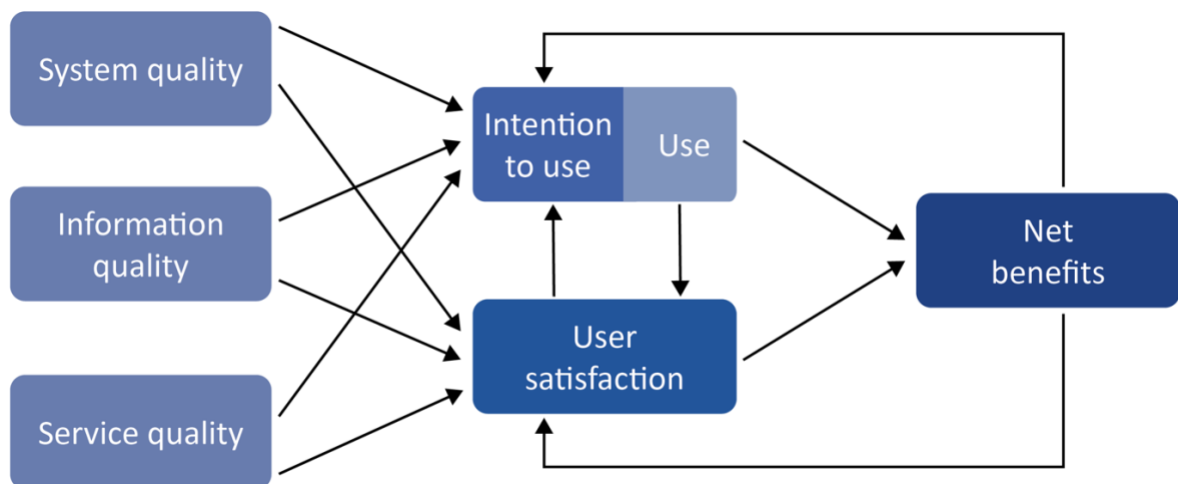
Figure 2.3 Information System Success Model (ISSM) Source: (DeLone and McLean in 1992)

2.4 Hypotheses

2.4.1 App innovativeness & novelty

In the world of financial services mobile banking apps innovation and novelty are crucial tools to drive user adoption and achieve industry differentiation. Karjaluoto et al. (2019) define product novelty as the extent to which users perceive it as distinct from existing offerings in terms of newness and uniqueness. In this context, innovations within mobile banking apps do not need to be entirely groundbreaking for the broader market, but rather represent a fresh approach within the financial services industry. Hossein Mohammadi (2014) did research on mobile banking loyalty in Iran and found out that innovativeness has a positive effect on loyalty to mobile banking. Therefore, we want to propose the following hypotheses:

H1a: *App innovativeness & novelty is positively related to app adoption.*
H1a: *App innovativeness & novelty is positively related to continuous usage.*

2.4.2 App system quality

The success of mobile banking (m-banking) applications hinges on their ability to meet user needs and expectations. This perceived service quality is a crucial factor influencing user adoption and continued use (Ennew et al., 2013). Extensive research on service quality within the banking industry led to the development of the SERQUAL scale by Parasuraman, Zeithaml, and Berry in the late 1980s (Parasuraman, Zeithaml, & Berry, 1988). This scale provided a framework for measuring service quality across different industries. Subsequently, researchers like Cronin and Taylor (1992) proposed the E-S-QUAL scale specifically tailored to assess electronic service quality. Recognizing the unique needs of mobile banking users, Sharma and Malviya (2011) further developed a measurement tool focusing on m-banking service quality.

Prior research investigating branded sports apps has identified a positive correlation between users' perceptions of system and information quality and their perceived enjoyment, usefulness, and ease of use. In other words, users who find these apps to be well-functioning and provide accurate information are more likely to find them enjoyable, beneficial, and simple to navigate (Won, Chiu, & Byun, 2023). Therefore, the following hypotheses are proposed:

H2a: *System quality is positively related to app adoption.*

H2b: *System quality is positively related to continuous usage.*

2.4.3 App usage satisfaction

User satisfaction with mobile applications is a critical metric for assessing how effectively an app fulfills user needs. It reflects the users overall positive experience with the app, encompassing factors such as usability, functionality, performance, information quality, and enjoyment (Agarwal & Prasad, 2000). While consumer satisfaction is generally understood as a cumulative evaluation based on the long-term experience with a product or service (McAlexander et al., 2003), app usage satisfaction is distinct. In the context of financial service apps, we posit that user satisfaction with the app directly influences its adoption and continued use. Thus, we hypothesize the following:

H3a: *App usage satisfaction is positively related to app adoption.*

H3b: *App usage satisfaction is positively related to continuous usage*

2.4.4 Perceived risk

Perceived risk refers to the user's uncertainty and the anticipated potential for losses associated with using a product or service (Karjaluoto et al., 2020). In the context of financial service apps, perceived risk can be defined as the user's apprehension about encountering financial losses or security breaches while using the app to achieve their desired financial goals. While prior research suggests a negative association between perceived risk and technology adoption intentions (Akturan & Tezcan, 2012), the specific influence of perceived risk on both the initial adoption and continuous usage of financial service apps remains an under-explored area. To address this gap, the following hypotheses are proposed:

H4a: *Perceived risk is negatively related to app adoption.*

H4b: *Perceived risk is negatively related to continuous usage.*

2.4.5 Perceived value

Understanding user perceptions of value is crucial in the context of mobile banking app adoption. Zeithaml (1988) defines perceived value as a consumers post-purchase assessment of a product

or service, considering both benefits and costs (Lin et al., 2020). In the context of mobile banking apps, perceived value can be influenced by factors such as:

- **Perceived Usefulness:** The extent to which users believe the app can efficiently manage their finances and complete desired tasks.
- **Perceived Ease of Use:** The users perception of the apps user-friendliness and ease of navigation.
- **Perceived Fees:** User perception of the associated costs, including monthly fees or transaction charges, compared to the perceived benefits.

Building on prior research by Kim et al. (2007), who explored the impact of these factors on mobile network service adoption, we can hypothesize that:

H5a: *Perceived value is positively related to app adoption.*

 H5b: *Perceived value is positively related to continuous usage.*

2.4.6 Service Quality

We want to investigate whether perceived service quality has an impact on app adoption and continuous usage. Service quality is defined as *the users impression of the overall excellence or superiority of any service* (Li et al., 2022). Perceived usefulness is one of the key factors in the Technology Acceptance Model (TAM), which we discussed briefly in the theoretical section. If users perceive the service to be of high quality and meet their daily needs, they are more likely to adopt it. A reliable and consistent service builds trust with consumers, which can in turn influence their willingness to continue using the app. Thus, we hypothesize the following:

H6a: *Service quality is positively related to app adoption.*

H6b: *Service quality is positively related to continuous usage.*

2.4.7 Conceptual Model
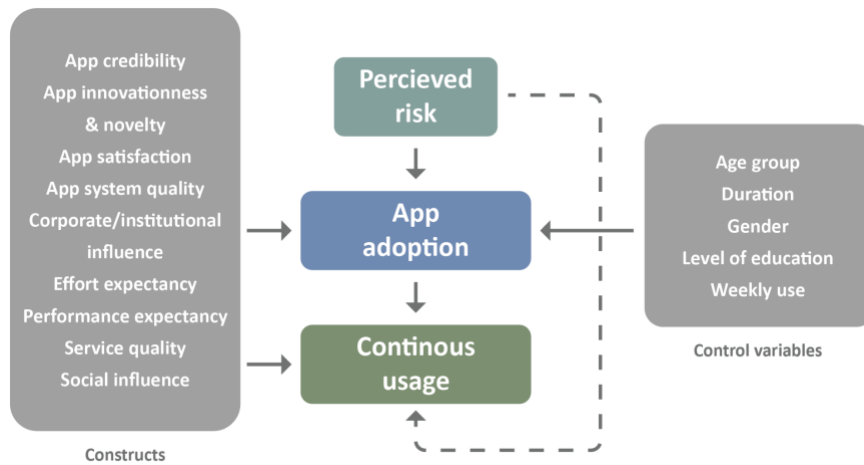
Figure 2.2 : Conceptual Model

3.Methodology

3.1 Introduction of the methodology

Methodology refers to the systematic procedures to gather empirical data, also known as "evidence," about the real world (Jacobsen, 2022). In essence, methods serve as a tool for describing reality. *A researchers preconception about the nature of reality will influence the research question, and consequently, the methods they deem most suitable"* (Jacobsen, 2022 page 23).
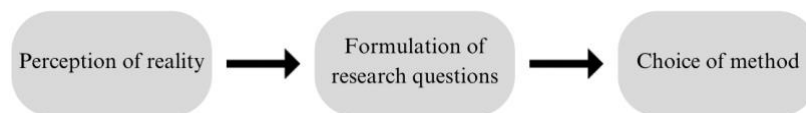
Figure 3.1   How perception of reality determines method

Or: *The researchers formulation of research questions and choice of method will shape the type of information that is collected, which in turn determines how reality is presented and thus how the researcher perceives it* (Jacobsen, 2022 page 23).
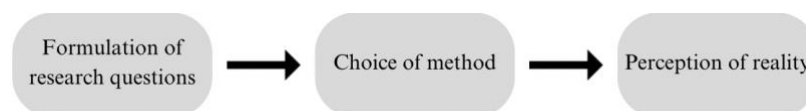
Figure 3.2   How choice of method determines perception of reality

We are very fortunate to have a bachelor's advisor who has conducted research on risk and performance expectations in mobile banking adoption, providing us with valuable insights into a market we were previously unfamiliar with, beyond our own daily experiences. While we had some prior assumptions, our advisor's work laid a solid foundation for our thesis, and the research question we have chosen is not only highly relevant to us but also genuinely interesting.

The rapid rise of mobile technology has revolutionized how people manage their finances. Financial service applications offer convenient and accessible tools for tasks like banking, online payment, and investing. However, app adoption and continuous usage vary significantly among users. Understanding the factors that influence these behaviors is crucial for financial institutions aiming to increase engagement and user base.

This study investigates the factors of initial adoption and sustained use of Vipps as a financial service app. The study explores how user perceptions, demographics, and technological background contribute to these outcomes. Through this research, we aim to identify key factors that can be leveraged to enhance the functionality, and user experience of Vipps, ultimately promoting greater financial inclusion and engagement.

The following sections outline the research methodology, including the research questions guiding the study, the chosen research method and design, and the implementation details. By presenting a clear and replicable research approach, this study contributes valuable insights into the factors influencing the adoption and continuous usage of financial service applications.

3.2 Research question

As Dag Ingvar Jacobsen states, *most studies begin with an observation or experience – something seen or read – that sparks curiosity* (Jacobsen, 2022, p. 73). Further, when we choose a research question, we make a choice that consciously and unconsciously limit the focus of our research. This limitation is due to several factors, including resource constraints and data availability. As previously explained, we are fortunate to have a wealth of data on m-banking adoption and usage, but little on Norwegian usage of Vipps and other similar services. Consequently, the formulation of our research question is based on both prior research and assumptions or "prejudices" that arise from a *lifetime of socialization where we learn to view the world in specific ways* (Jacobsen, 2022 p.74).

The first phase of the research process involved developing a research question that was relevant to the topic of Vipps user behavior: "What key factors influence the adoption and continuous use of the mobile payment Vipps app in Norway?". The research question is descriptive in nature, as it aims to describe the key factors which affect app adoption and continuous usage of Vipps.

We made a descriptive research question to investigate the correlation between our dependent and independent variables in our data. To achieve this, we made a quantitative approach with a closed ended questionnaire, which we will justify later. The questionnaire was designed using Google Forms and were distributed to a sample of friends, family, and colleagues, as well as fellow

students. We acknowledge that this sampling method might limit the generalizability of our findings to a broader population.

3.3 Research design

Having now defined our research question, we must choose an appropriate research design. It is crucial to select a design that aligns with our research question, as this can significantly impact the validity of our study, which we will explore further later. Our thesis aims to investigate the factors that influence individuals' willingness to adopt and continue using Vipps as a mobile payment app. Since we are examining factors at a specific point in time, a cross-sectional study/correlational design would be the most suitable approach. This choice can be justified by the fact that such studies provide a snapshot of reality and are conducted at a single point in time (Jacobsen, 2022). They offer a precise description of a state at a given moment, and they are also a cost-effective research method, as the researcher does not have to wait long for data collection (Jacobsen, 2022). We will employ a sample survey within this research design, where we will question a mixed group of individuals about our research question, ensuring that they represent the entire population.

3.4 Research method

A quantitative research methodology was chosen for this study as it best aligns with the research question and the standardized nature of the data. Quantitative data is significantly easier and faster to process compared to qualitative data. Additionally, a quantitative approach allows for precise descriptions of the frequency or extent of a phenomenon (Jacobsen, 2022). It also facilitates the identification of correlations between multiple variables and the structuring of this information. Due to the time-efficient nature of quantitative methods, data can be collected from a larger sample size, enabling broader generalization of the findings, to the extent possible. Data was directly imported from Google Forms into the statistical analysis software SPSS. Jacobsen also acknowledges some limitations of quantitative methods, including *the potential for superficiality in the data* (Jacobsen, 2022, p. 147). This implies that a quantitative approach may not provide in-depth insights.

3.5 Implementation of the methodology

By asking specific questions, we transform abstract, theoretical concepts into concrete and measurable ones (Jacobsen, 2022, p. 268). In practice, this means that our research question can be concretized to the extent that we can ask precise questions with precise and limited answer options. This can be a lengthy process that requires a lot of knowledge and, not least, imagination. So how did we do this? It is natural to think that people respond differently to the same question, some are fond of mobile payment solutions, others not so much. Since people respond differently and have different opinions, we can differentiate between units and thus open for a comparison between several groups. In our survey, we based the questions on both previous studies and what we believe is relevant. The answer options are based on both nominal, ordinal, and metric measurement levels. The different factors we have developed can be seen in table 3.1 For more detailed explanations, you can find such information in the codebook see appendix 8.1.

Constructs	*Indicators/Items*
App credibility	APC1, APC2, APC3, APC4
Service quality	SQ1, SQ2, SQ3
App system quality	ASQ1, ASQ2, ASQ3, ASQ4
App usage satisfaction	AUS1, AUS2, AUS3, AUS4
Performance expectancy	PE1, PE2, PE3, PE4
Effort expectancy	EE1, EE2, EE3
Social influence	SIF1, SIF2, SIF3
Corporate/institutional influence	COP1, COP2, COP3
App innovativeness & novelty	AIN 1, AIN 2, AIN 3, AIN 4
Perceived value	PEV1, PEV2, PEV3, PEV 4
Perceived fee	FEE1, FEE2, FEE3
Perceived risk	RISK1, RISK2, RISK3, RISK4 RISK 5
App adoption	AAD1, AAD2, AAD3
Continuous usage	USE1, USE2

Table 3.1 Constructs and their indicators

3.6 Reliability and validity

Ideally, any research conducted should be both reliable and valid. A reliable study means, among other things, that respondents answer questions of a similar nature consistently. If a respondent gives completely contradictory answers to two near-identical questions, there's a high chance the

test is not reliable. Reliable measurements will yield identical or very similar answers from the same respondent (Burns & Bush, 2010). On the other hand, validity refers to the truthfulness of a response. This means it's entirely possible to have a perfectly reliable test that isn't valid. For example, we asked if Vipps' service fee is a barrier to using the app. A respondent might answer "no" because it seems like a "better" answer for the survey, even though they think Vipps' fee is too expensive. If the same question is asked later, the respondent might still answer the same way. This demonstrates reliable responding, but not valid information. To guarantee that survey questions accurately assess the intended concepts, they must also exhibit empirical coherence. This can be evaluated using correlation analysis (Jacobsen, 2022) alongside other methods. If a strong and clear correlation exists between the questions, it can be inferred to some extent that they are measuring the same phenomenon. To investigate this further, we can link the various questions to a factor and then run a factor analysis to aid in assessing the validity of the survey.

3.7 Data Collection

As mentioned earlier, we have conducted a quantitative research method by developing a questionnaire with given response alternatives. We based our questions on operationalized questions from previous studies to ensure that they measure what we want them to measure, but we adjusted them somewhat to better fit our research question. To better adapt the questionnaire to the respondents, we chose to translate it from English to Norwegian. Our supervisor then reviewed the translated questions and approved them. We then sent out the questionnaire to a small selection of people to get feedback before launching the survey. Finally, we launched the survey to the public. The data was collected via Google Forms and then exported to SPSS for further analysis. Due to resource constraints, we chose to mass-distribute the link to our questionnaire. This was done via social media and posters on campus with QR codes. However, this is a method that gives one little control over who responds (Jacobsen, 2022). *Respondents choose themselves whether to participate, which makes it very likely that the sample will be systematically skewed* (Jacobsen, 2022, p. 289). To mitigate this somewhat, we chose to issue the questionnaire in a more controlled manner. We first started by issuing it to friends and acquaintances of our own age, but living in different parts of the country, with different backgrounds. We then distributed it further to family and older respondents, such as grandparents. Since this did not give us enough respondents, we chose to hang up posters around

the school for a very limited period and stopped the survey when we reached our target of about 150 people. Of course, if we had the opportunity, we would have liked to design a kind of population list and distribute it directly via email or SMS.

3.8 Ethics

A crucial aspect of trust is ensuring that the information provided remains confidential (Selnes, 1999). We have placed a particular emphasis on conducting this survey in an ethical manner. There were several dilemmas we had to carefully consider. At the very beginning of the survey, we thoroughly explained the purpose of the study, the intended use of the responses, and confirmed that the entire survey was anonymous. Some of the questions could be perceived as sensitive, making it particularly important to emphasize anonymity. However, we never asked for sensitive information such as personal identification numbers, email addresses (anything of that sort). All data was directly transferred to SPSS, which also helps to maintain anonymity. However, since we distributed the survey on a large scale, there are some ethical concerns. We have very limited control over who responds, some may be particularly interested in the topic, and others may struggle with the language or understanding the questions themselves, which could lead to some bias in the responses. We will address this in more detail at the end of the study.

4. Analysis and results

4.1 Descriptive

First step of quantitative analysis is to investigate the data itself. To inspect and initially clear data for any errors or outliers we first employ the use of univariate analysis (Jacobsen, 2022). At this stage it is important checking that the main premises of the data is not obstructed. This involves testing the previously made assumption by looking at the descriptive statistics obtained from this analysis (Pallant, 2016, p. 53). Helping us avoid any errors later and potentially save time later when running the other analysis.

We started by running the descriptive analysis frequencies to look at the categorical variables and the descriptive for the continuous variables. Searching for any potential outliers or if any data is missing. The analysis gave clear indication there were no errors which sublimated us with the result of 151 valid responses, and no missing values.

4.1.1 Key concepts

The output obtained from the descriptive analysis can be interpreted by presenting the values in its mean score, standard deviation, and skewness/ kurtosis. The mean score represents the typical score given by the respondents to each statement, calculated by summarizing all responses and divining them on the number of responses (Jacobsen, 2022). For example, by looking at variable "EE1" the mean score is 6.62 which indicates that the typical response given for this was positive. On the other hand, the variable (RISK3) shows the lowest mean score at 1.54 representing that the typical response for this statement was negative, see appendix 8.3.

The next step in the analysis is standard deviation which determines how much the average of the responses might differ from the mean score. A higher score on the standard deviation indicates more variability, while lower represents more consistency from the variables (Oppen, Mørk & Haus, 2020, p.146). This analysis shows low standard deviation of 1.007 and high standard deviation of 1.965. The difference in standard deviations reflect that there is a high level of

agreement or consensus among the respondents regarding the given statements (Oppen, Mørk & Haus, 2020, p.146).

The descriptive analysis will also provide insight into how the scores of the variables are distributed, something that is done by looking at the skewness and kurtosis (Pallant, 2016, p. 57). Consensus on where the limit for both the skewness and kurtosis should be about +/- 2 for both categories (Oppen, Mørk & Haus, 2020, p.146). The items that are considered to be outside this range are not normally distributed.

4.1.2 Demographics

For our categorical variables we need to first understand the gender and age of our respondents. The gender distribution shows us that the majority of respondents identified as female, consisting of 58.3 percent of the total sample. While the male respondents were fewer in number, but still made up a substantial portion, having 41.7 percent of the total Overall, the data provides a degree of gender diversity, with both male and female respondents contributing to the sample, see table 2.

Further, we looked into the respondents' age or age range, where we chose to split this question response into five separate categorical groups. Making it easier for us to understand and inspect the data for the categorical variable when running the frequencies analysis. As illustrated in table 4.1, each group covered a certain range for example 18-24, 25-30 and the last one being over 61. From the respondents' age we can see that the age group of 18-24 emerged as the most common among all the respondents, being a significant 26,5% of the total. Something that suggests a strong presence of young adults within the surveyed population. After the group 18-25, respondents identifying themselves with being aged 25-30, represents 18,5% of the response. Signifying a notable transition from the younger adults to individuals in their late twenties and early thirties.

Demographics	Category	Frequency	Precent
Gender	Male	63	41.7
	Female	88	58.3
Age group	18-24	40	26.5
	25-30	28	18.5
	31-40	15	9.9
	41-50	11	7.3
	51-60	33	21.9
	Over 61	24	15.9
Education	Primary school	4	2.6
	High school	49	32.5
	Vocational school	17	11.3
	Bachelor's degree	55	36.4
	Master's degree	25	16.6
	Ph.D	1	0.7
Weekly use	Less than 3 times	54	35.8
	3-4 times	55	36.4
	5-6 times	20	13.2
	7-8 times	13	8.6
	9-10 times	7	4.6
	More than 10 times	2	1.3
Duration	1-2 years	3	2.0
	2-3 years	9	6.0
	3-4 years	12	7.9
	4-5 years	28	18.5
	5-6 years	26	17.2
	6-7 years	30	19.9
	Over 7 years	43	28.5
N = 151			

Table 4.1   Demographics

When the age brackets progress beyond 30 the analysis shows there is gradual decrease in frequency, indicating that there's a decline in representation of middle-aged respondents. This changes at the age range 51-60 where higher frequency is exhibited compared to middle aged and other older age ranges, comprising 21.9 percent of the response. Although smaller in comparison, the last category age range "Over 61" still accounted for 15.9 percent of the response indicating a significant representation of senior respondents.

Other important demographics that should be mentioned from the frequency analysis is the level of education, duration of use and weekly use. Level of education shows a majority of respondents identify at 36.4 percent having completed a bachelor's degree, followed by high school graduates

at 32.5%. Smaller portions had completed master's degree (16.6%), vocational school (11.3%), primary school (2.6%), or held a Ph.D. (0.7) %.

Lastly the duration and weekly use are included with the majority of respondents having been using the Vipps digital app for over 7 years, showing to be 28.5 percent of the total. Also, a substantial portion of the respondents had used it for 6-7 years at 19.9 percent and 4-5 years at 18.5 percent. Regarding weekly use, the most prevalent response was using the app 3-4 times a week, representing 36.4 percent of the total. This was closely followed by those who use the application less than 3 times a week being at 35.8 percent.

4.2 Factor analysis

For each of the constructs we created multiple statements, with the purpose being to collectively cover more nuances of a singular topic or factor. This stems from the interest in understanding the whole concept, something that is measured by employing multiple statements in the dataset. Allowing us to maximize the understanding of the practical and theoretical events that we are focusing on (Oppen, Mørk & Haus, 2020, p.146). Therefore, Factor analysis involves extracting these individual variables from the dataset and reducing the data by creating smaller and concise components (Pallant, 2016, p. 182). Narrowing this data assists in identifying the related variables making them more manageable, prior to being used in other analysis such as multiple regression. (Pallant, 2016, p. 182). Before conducting the factor analysis, it is important to assess if the dataset is suitable. A suitable dataset should have strong enough sample size, with the general accepted consensus between researchers that the bigger sample the better. Widely recommending that a sample size greater than 150 be recommended for any analysis to give reliable results (Pallant, 2016, p. 182). Our sample size happens to be 151 responses, something that meets the minimum of 150 for the represented sample.

After the preliminary consideration for the factors analysis is done, we can start the analysis by examining both the Kaiser Meyer-Olkin Measure of Sampling Adequacy (KMO) and the Bartlett's test of Sphericity. The KMO should preferably have a value of . 6 or above and Bartlett's test value shows significance with the value of . 05 or smaller (Pallant, 2016, p. 193). The result from the test

shows a KMO-value of .880 which is good compared to the minimum of .6. In addition, Bartlett's test is significant at .001, staying under the limit of .05, see table 3.

When the factor analysis is validated, significant and reliable we can look at what variables are composed together and how many components are extracted. Something that starts by looking at the Total Variance Explained table. When looking at the components, the Initial eigenvalue on the total of the 11 first shows to be above 1. Showing that these 11 components retain a total of 74.9 percent of the variance (Pallant, 2016, p. 193).

Factor analysis											
	Components										
	1	2	3	4	5	6	7	8	9	10	11
EE1	0,860										
EE2	0,734										
EE3	0,847										
PE1	0,761										
PE2	0,717										
PE3	0,746										
PE4	0,790										
SIF1						0,915					
SIF2						0,880					
SIF3						0,865					
AAD1			0,710								
AAD2			0,779								
AAD3			0,755								
COP1											0,758
COP2											0,632
COP3										0,839	
COP4										0,747	
AIN1		0,584									
AIN2		0,791									
AIN3		0,679									
AIN4		0,681									
APC1		0,404									
APC2		0,574									
APC3								0,728			
APC4								0,749			
SQ1		0,504									
SQ2		0,474									
SQ3	0,492	0,415									

	C1	C2	C3	C4	C5	C6	C7	C8
ASQ1						0,623		
ASQ2						0,714		
ASQ3			0,419			0,537		
ASQ4						0,532		
AUS1		0,419	0,528					
AUS2			0,532					
AUS3	0,414	0,409						
AUS4	0,514							
RISK1					0,546			
RISK2					0,681		-0,401	
RISK3					0,768			
RISK4					0,792			
RISK5					0,749			
PEV1				0,620				
PEV2				0,747				
PEV3				0,722				
PEV4				0,635				
FEE1								0,876
FEE2								0,927
FEE3								0,787
USE1				0,692				
USE2				0,585				
KMO - measure of sampling adequacy:								0.880
Sig. (Bartlett's test of sphericity):								<.001

Table 4.2   Factor analysis

The factor analysis (see Table 4.2) suggests there are 11 components, but upon further examination of the rotated components matrix, we understand that the first 7 variables are grouped into one singular component, although the first three statements contribute to explaining a different factor than the following four. This outcome was unexpected prior to running the analysis. After this discovering we proceed to run a second analysis on the 2 factors that combined into 1 component, namely "effort expectancy" and "performance expectancy". Additionally, these 7 statements combine components in a reliability test, which is an exception because the reliability analysis is used to assess the reliability of the individual components composed from the factor analysis. Reliability test will be presented in the next section.

Factor analysis EE+PE	
Components	
EE1	0,876
EE2	0,773
EE3	0,859
PE1	0,850
PE2	0,838
PE3	0,821
PE4	0,862
KMO - measure of sampling adequacy:	0.851
Sig. (Bartlett's test of sphericity):	<.001

Table 4.3   Factor analysis EE+PE

For the second factor analysis (see Table 4.3) covering the factors effort expectancy and performance expectancy shows us a KMO at .851 and Bartlett's test significance at .851, see table 4. Concluding that it will be acceptable for us to combine the two into a singular construct and total variable prior to regression analysis. This value will now be named effort and performance expectancy and abbreviated as EFE, leaving us with a total of 11 constructs

4.3 Reliability analysis

In this section we present the result of the reliability from the analysis, see table 5.

Constructs	Indicators/Items	N	Cronbach's alpha
App credibility	APC1, APC2, APC3, APC4	4	.789
Service quality	SQ1, SQ2, SQ3	3	.874
App system quality	ASQ1, ASQ2, ASQ3, ASQ4	4	.860
App usage satisfaction	AUS1, AUS2, AUS3, AUS4	4	.875
Effort and Performance expectancy	EE1, EE2, EE3 + PE1, PE2, PE3, PE4	7	.906
Social influence	SIF1, SIF2, SIF3	3	.934
Corporate/institutional influence	COP1, COP2, COP3	3	.752
App innovativeness & novelty	AIN 1, AIN 2, AIN 3, AIN 3	4	.836
Perceived value	PEV1, PEV2, PEV3, PEV 4	4	.856
Perceived fee	FEE1, FEE2, FEE3	3	.879
Perceived risk	RISK1, RISK2, RISK3, RISK4 RISK 5	5	.826
App adoption	AAD1, AAD2, AAD3	3	.903
Continuous usage	USE1, USE2	2	.745

Table 4.4   Reliability analysis

When the individual items are correctly compressed into components from factor analysis, we need to look at each of the components' reliability. Checking the reliability of a scale on each of the reported components (Pallant, 2016, p. 101). One of the most common issues that troubles the scale in which each item is measured against is the internal consistency. Internal consistency

explains to which degree the items that make up the individuals construct are comprehensible when grouped.

Moreover, when testing the internal consistency, the most used indicator would be the Cronbach alpha (CA), which should ideally be above .7 on the scale (Pallant, 2016, p. 101). It will also be useful to check if the inter-item correlation measures a value between .2 to .4. The reliability varies for each construct, making it important for us that we choose to run tests on all of them (Pallant, 2016, p. 101). All the different constructs and their items show the appropriate CA value of .7 and above, see table 5. We can summarize the final results and see that the constructs are reliable in scale, making it possible for us to combine the items to create total-variables to be used for additional analysis.

4.4 Regression Analysis

The final analysis that is used is the multiple regression, where we test two or more independent variables against one dependent variable. This will assist us to understand the causal relationships between the variables, emphasizing the existence of a connection between cause and its effect (Oppen, Mørk & Haus, 2020, p.201- 202). While using SPSS we had to perform two separate linear regression covering the relevant dependent variables, first using the variable app adoption as the dependent variable, and then running a second regression using continuous usage as a dependent variable. Moreover, testing the correlations between dependent variables against all the independent variables represented in the conceptual model (Pallant, 2016, p. 159).

4.4.1 Model 1 - App adoption

When testing the first model (Model 1), we applied linear regression intended to investigate the causal relationship in the dependent variable by a set of independent variables, noted as H1 to H6. This allowed us to test particularly "a" part of the six AB hypotheses, as illustrated in figure 4.1.
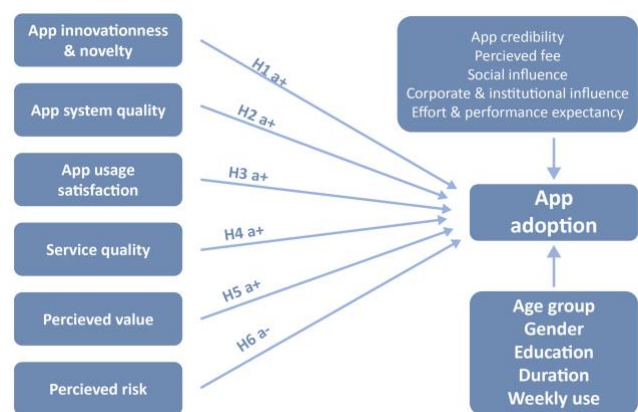
Figure 4.1   App adoption

Predicting and explaining the degree of if the 151 respondents are likely to adopt the Vipps application.

Before looking at how the hypotheses tested on app adoption, it's valuable to conduct some preliminary checks on the output, such as looking for any signs of multicollinearity. Multicollinearity assists in understanding if the independent variables are highly correlated with the dependent variable, this could not be explained by just a singular independent, enforcing the choice of including multiple (Oppen, Mørk & Haus, 2020, p.235). Multicollinearity will be determined firstly by checking the model of correlation, where each of the independent can show some relationship to the dependent by having a Pearson correlation value above .3 (Pallant, 2016, p. 159).

Multicollinearity will be more precisely represented through assessing the Tolerance and VIF values from the Coefficient table, see table. Tolerance tests the variability of the chosen independent not affected by the other independents from in the model. If the value is less than .10 the independent indicated high multiple correlation, implying the possibility for multicollinearity (Pallant, 2016, p. 159). VIF is the inverse of the Tolerance value by being 1 divided on the Tolerance. VIF values being above 10 would be a concern and indicating multicollinearity. For our coefficient table both the VIF and Tolerance stay inside the limit for us to conclude there is no sign of multicollinearity in the regression testing app adoption.

Model Summary			
Dependent variable: App adoption			
R	R^2	Adjusted R^2	Std. Error of the estimate
0.738	0.544	0.486	3.09925

Tabell 4.5   Model summary – App adoption

The preliminary check of the Model summary and ANOVA is to verify our assumption about the model's functionality, see model 4.6 and 4.8. The model summary value on R-squared (R^2) represents how much the portion of variance is in the dependent variable (app adoption), being interpreted with the help of the independent variables (Pallant, 2016, p. 163). Firstly, the R^2 being measured 0.544 suggests that 54.4% cover the variation in app adoption. Something that's calculated by dividing the residual sum of squares on the total sum of squares, revealing for us the

model deviations which the regression line cannot normally account for (Oppen, Mørk & Haus, 2020, p.221).

ANOVA					
Dependent variable: App adoption					
	Sum of Squares	DF	Mean square	F	Sig.
Regression	1524.883	17	89.699	9.338	<.001[b]
Residual	1277.514	133	9.605		
Total	2802.397	150			

Table 4.6   ANOVA – App adoption

Next, the ANOVA shows a Sig value of .001, indicating the model to significance, and usable for our intention (see table). The significance value of less than .001 suggests a highly significant relationship between the predictors and the dependent variable (Pallant, 2016, p.162).

Regression Coefficient (Dependent: App adoption)					
	Standardized Beta	T	Sig. value	Tolerance	VIF
(Constant)		-2.167	0.032		
App innovativeness & novelty	0.209	2.345	0.020	0.431	2.321
App system quality	0.204	1.983	0.049	0.325	3.082
App usage satisfaction	0.373	3.213	0.002	0.254	3.938
Perceived risk	0.140	1.889	0.061	0.627	1.596
Perceived value	-0.009	-0.111	0.912	0.473	2.114
Perceived fee	-0.001	-0.021	0.983	0.784	1.275
Service quality	-0.204	-1.774	0.078	0.259	3.858
Effort and performance expectancy	0.238	2.772	0.006	0.465	2.151
Continuous usage	0.039	0.492	0.624	0.552	1.810
Gender	-0.017	-0.274	0.785	0.912	1.097
Age range	-0.037	-0.529	0.598	0.691	1.448
Education	0.046	0.679	0.499	0.760	1.315
Duration	0.071	1.105	0.271	0.834	1.200
Weekly use	0.041	0.656	0.513	0.889	1.125

Table 4.7   Regression Coefficient (Dependent: App adoption)

When considering previous values and concepts for the variables, predictors "App innovativeness & novelty," "App system quality," "App usage satisfaction," and "Effort and performance expectancy" show statistically significant relationships with app adoption, as validated by their T-value is greater or less than-2, indication that levels of innovativeness & novelty, system quality, ,usage satisfaction significant and effort and performance expectancy at the 95% confidence level and affects the greater app adoption. Respectively the p-values for these three variables represented as sig. values less than 0.05, also confirms that they are statistically significant predictors of the dependent variable (Pallant, 2016, p.162-163), see table 4.7.

Variables such as "Perceived risk," "Service quality", "Gender," and control variables "Age range," "Education," "Duration," and "Weekly use" do not show statistically significant relationships with app adoption, as their p-values are above the typical significance threshold of 0.05 and not inside a 95% confidence level.

4.4.2 Model 2 - Continuous usage

When testing model 2 (see figure 4.2), we applied a second linear regression intended to investigate the causal relationship in the dependent variable by using the same independent variables H1 to H6. Making it possible for us to test the B hypothesis of our six AB hypothesis, as illustrated in figure. Our aim for this model is to predict
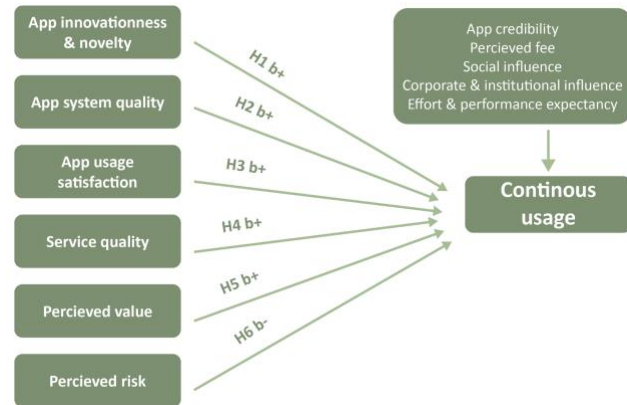
Figure 4.2   Continuous usage

and explain the degree of which the 151 respondents likely are to continue using the Vipps application. We apply the same procedure as in the last model as we utilize the same values for interpreting the results. However, for this model, we choose to exclude the control variables or demographics statements. When we first included the control variables, the new variable "Total_EPE" showed an error (as presented in appendix 8.11) on the unstandardized coefficient B, this was when the control variables were excluded.

ANOVA					
Dependent variable: Continuous usage					
	Sum of Squares	DF	Mean square	F	Sig.
Regression	340.363	12	28.364	8.150	<.001[b]
Residual	480.272	138	3.480		
Total	820.636	150			

Table 4.8   ANOVA - Continuous usage

We first observe that the ANOVA yields a significant value of .001, while the Coefficient model reveals the tolerance and VIF values to be within the preferred limits. Respectively demonstrating that model 2 is significant and has no indication of multicollinearity.

Model Summary			
Dependent variable: Continuous usage			
R	R^2	Adjusted R^2	Std. Error of the estimate
0.644	0.415	0.364	1.86554

Table 4.9   Model summary - Continuous usage

Further, model 4.9 shows us a R squared value of 0.415. Meaning that the independent variables explain 41,5 percent of the variance in the dependent variable of app adoption.

Regression Coefficient (Dependent: Continuous usage)					
	Standardized Beta	T	Sig. value	Tolerance	VIF
(Constant)		4.990	<.001		
App innovativeness & novelty	-0.134	-1.334	0.184	0.423	2.365
App system quality	-0.188	-1.666	0.098	0.334	2.994
App usage satisfaction	0.106	0.796	0.428	0.238	4.198
Perceived risk	-0.272	-3.533	<.001	0.716	1.397
Perceived value	0.419	4.913	<.001	0.582	1.717
Service quality	0.284	2.297	0.023	0.277	3.613
Effort and performance expectancy	-0.007	-0.073	0.942	0.454	2.202
App adoption	0.074	0.777	0.438	0.467	2.141

Table 4.1011 Regression Coefficient (Dependent: Continuous usage)

When considering previous values and concepts for the variables in model 2, predictors "Perceived risk" "Perceived value," and "Service quality" show statistically significant relationships with the dependent variable continuous usage, as validated by their T-value is greater or less than-2, indication that levels of these independent variables are significant at the 95% confidence level and affects the independent continuous usage. Respectively the p-values for these three variables represented as sig. values less than 0.05, also confirms that they are statistically significant predictors of the dependent variable (Pallant, 2016, p.162-163), see table 4.10.

Variables such as "App innovativeness & novelty," " App system quality," "App usage satisfaction," do not show any statistically significant relationships with continuous usage, as their p-values are above the typical significance threshold of 0.05 and not inside a 95% confidence level.

4.5 Summary of the findings

Results are visualized below with the hypotheses conclusion, see table 4.11. This table includes these studies 12 "a" and "b" hypothesis conclusions, their effect and significance based on the thesis conceptual model.

Hypotheses			Beta.	Sig.	CONCLUSION
H1a	App innovativeness & novelty	+ ➞ *app adoption*	0.220	0.018	**Supported**
H2a	App system quality	+ ➞ *app adoption*	0.203	0.051	**Supported**
H3a	App usage satisfaction	+ ➞ *app adoption*	0.372	0.002	**Supported**
H4a	Service quality	+ ➞ *app adoption*	-0.205	0.077	Rejected
H5a	Perceived value	+ ➞ *app adoption*	-0.004	0.964	Rejected
H6a	Perceived risk	— ➞ *app adoption*	0.139	0.063	Rejected
H1b	App innovativeness & novelty	+ ➞ *continuous usage*	-0.093	0.366	Rejected
H2b	App system quality	+ ➞ *continuous usage*	-0.165	0.149	Rejected
H3b	App usage satisfaction	+ ➞ *continuous usage*	0.117	0.379	Rejected
H4b	Service quality	+ ➞ *continuous usage*	0.251	0.049	**Supported**
H5b	Perceived value	+ ➞ *continuous usage*	0.424	<0.001	**Supported**
H6b	Perceived risk	— ➞ *continuous usage*	-0.237	0.004	**Supported**

Table 4.11   Hypotheses

5. Discussion

For the past twenty years, there have been a widespread implementation of new innovative banking systems and a variety of payment functions. Transitioning away from the traditional banking system and more recently towards markets assisted by mobile applications and systems (Glavee-Geo, Shaikh, & Karjaluoto, 2017). The purpose of this study has evolved to provide insight into the factors that affect the consumers' decision to adopt these new innovative applications, and the reasoning behind why the individual would continue to use them.

The result from the analysis reveals distinct patterns in what influences app adoption and continuous usage of mobile payment apps. App adoption was examined through the hypotheses of H1a, H2a, H3a, H4a, H5a and H6a. Subsequently, continuous usage was explored through the hypotheses H1b, H2b, H3b, H4b, H5b and H6b. Despite the consistency in the data testing, different constructs emerged as influential for each of the two dependent variables. While the conceptual model proposed a potential direct effect from app adoption on continuous usage, the analysis results did not validate this. This highlights the complexity of the user behavior in the context of mobile payment applications. Moreover, separating the continuous use from the prior adoption gives the perspective that they should be interpreted individually rather than two symbiotic principles of understanding.

Firstly, app adoption supports the hypothesis H1a, H2a and H3a. These were the constructs of app innovativeness and novelty, system quality, effort and performance expectancy (not hypothesized) and app usage satisfaction. Proving that for app innovativeness that users are attracted to applications offering some unique and fresh features. High app usage satisfaction suggests users find the app to be a positive overall experience. Lastly, the app system quality shows that an application which is able to ensure the user good functionality and helps in adoption. These three factors are key to driving mobile payment app adoption.

Additionally, continuous usage, as mentioned, is understood to not be directly influenced by app adoption remains relevant to the study. Because the analysis supports the hypotheses H4B, H5B and H6B, indicating that the constructs' service quality, perceived value and perceived risk have an impact on users' continuous usage after the adoption itself. These are the factors that play a

crucial role in shaping the users' perceptions of the app over time after the adoption itself. Service quality gives us the indication that the user will continue using, based on if the application is reliable on time, but also if it provides in their own perspective professional service. Additionally, the perceived value demonstrates to us that the value obtained from the application plays a pivotal role, not only in terms of monetary benefits, but also on a personal basis.

Interestingly, perceived risk showed to have a different effect on app adoption compared to continuous usage, again separating the two. While H_{6A} was not supported, indicating perceived risk will not affect the initial adoption, H_{6B} was supported, suggesting perceived risk influences the continued usage of mobile payment apps. Further, helping to explain the user's interest to adopt new and innovative projects, but also reveals how the same individual might perceive risk in future changes or situations while these innovations are in use.

5.1 Theoretical contribution

This study presents a conceptual model which presents both the adoption and continuous usage for a mobile payment application. Drawing insight from previous studies on innovation adoption, this study included continuous usage as a concept that is affected by the initial adoption period. By comprehending the results from the analysis, which shows a separation of the two concepts. Given there was no significant relationship presented between app adoption and continuous usage on our study, the other studies applying the same topics, might use these insights to their advantage. Further assisting in building the theory and opening interesting directions for future research when exploring the adoption of innovations

Additionally, regarding how the respondents perceived the risk factor on the continuous use of mobile payment applications. Opens a discussion about consumer behavior, while they may initially be enthusiastic about adopting new technologies, subsequently ignoring any risk, their long-term usage pattern might be affected by skepticism on if the system is secure or not. Further studies explored how perceived risk affects mobile payment apps and other systems (e.g., Karjaluoto et al., 2019). Perceived risk refers to some possible negative effects the user associates with both adoptions and the usage of product or service. In the context of technology acceptance, perceived risk might proceed to probabilities of outcomes that are unknown.

5.2 Practical implications

Understanding the factors that affected the adoption and use will help new and existing stakeholders to change the banking environment and give improved technology innovation. By identifying the trends of consumers using technologies as mobile payment applications and more, the stakeholders in the industries could further develop new or existing products and services to address unfulfilled needs. If the growing segment of the population does not perceive that traditional bank are meeting their needs, the fintech companies in the process of wanting innovation can lead to the creation of more effective financial solutions that broaden the range of consumers and subsequently fulfill their needs.

Secondly, Vipps convenience has also made it a target for fraudsters. While Vipps bears primary responsibility for protecting its users from scams, individuals also have a crucial role in safeguarding their accounts by activating 2FA (two-factor-authentication) and to never share their password with anybody. Our study found a strong correlation between perceived risk and continuous usage of Vipps. Users who perceive Vipps as less secure are more likely to reduce their app usage or discontinue it altogether. This highlights the importance of both Vipps' and users' efforts in combating fraud to maintain user trust and continuous app adoption and usage.

6. Concluding remarks

Over the past decade, there has been significant progress in the realm of payments, whether through cards or cash. The population have transitioned from always carrying cash in our wallet to affixing our credit cards to a separate compartment on the back of our mobile phones. Consequently, we often find ourselves not carrying our wallets to stores anymore, as *everything* is now accessible through our mobile phones. The Covid-19 pandemic has had a profound impact on the global community, leading to unforeseen consequences such as high inflation and increased unemployment in various countries. One notable consequence is the shift away from cash transactions towards digital payments, particularly through mobile payments. In Norway, where 96 percent of the population now owns smartphones, the usage of Vipps has surged. According to a report of market trends for Q3 2023 (Innsikt og Utsikt: Q3 2023, n.d.), there are over 4.4 million Vipps users in Norway, representing over 80 percent of the smartphone-owning population. These

figures highlight the rapid growth of the mobile payment market in the country. However, despite this growth, the industry is still in its early stages, suggesting significant potential for further development and advancement. Therefore, this led to our research question *"What are the key factors that influence the adoption and continuous usage of the mobile payment Vipps App in Norway".* Previous research provided us with a theoretical and nuanced view to help us understand and further extend our research question to a conceptual model and 12 specific hypotheses consisting of both "a" and "b" hypothesis.

The Theory of Planned Behavior (TPB) has emerged as a prominent framework for understanding and predicting human social behavior (Ajzen, 1985). This theory has been extensively applied in various studies investigating technology adoption, including (Glavee-Geo et al., 2017; Shaikh et al., 2018). To gain a more nuanced understanding of app usage behavior, we have explored integrating TPB with complementary models such as the Technology Acceptance Model (TAM) and the Information System Success Model (ISSM). This research aimed to investigate the factors influencing the adoption and continued use of the Vipps mobile payment application. By drawing upon the TPB framework and insights from prior research, a conceptual model was developed to guide the exploration of user behavior towards Vipps.

Moreover, the analysis provided support for six (6) hypotheses out of the twelve (12) we hypothesized. Firstly, respondents' adoption of the mobile payment app comes from the apps perceived innovativeness, satisfaction, and quality of its systems. Contrary to the hypothesis, effort and performance expectancy were found to also affect the adoption of the system highly. Further, the conceptual model looks into if the adoption affected continuous usage, which It did not. Additionally, the hypothesis for continuous usage suggests that consumers will use mobile payment apps over time. Should the system provide good value, service and understand that consumers might believe there is a higher risk after longer use.

6.1 Limitation and future research

In terms of this study limitations, firstly, there was a sample which is generally considered small sample size at 151 respondents. The limited number of participants will reduce the generalization of the finding and may not provide accurately represented data to be used on the broader population. Secondly, we focused exclusively on the context of Vipps mobile payment app, which

is specific for the Norwegian market. This might be different in the case of other mobile payment systems or in different contexts, limiting the scope of the conclusions. Moreover, this study might assist in developing the research further, by looking at the limitations where it should be as mentioned, include a larger sample size, or even apply the context from multiple countries. Future studies that apply multiple contexts and a larger sample size will be able to enhance the reliability and validity of the results, allowing for a more robust statistical applicability of the findings. As stated in Shaikh, Glavee-Geo, & Karjaluoto (2018) this limitation can be solved if longitudinal studies are employed in multiple context environments. Addressing these points in future research endeavors could significantly enhance the depth and breadth of understanding in the field of mobile payment app adoption and consumer usage behavior.

It is also worth mentioning the limitation regarding a quantitative research method. This method focuses on numbers and measurements (Jacobsen, 2022). It is a good method for understanding the broader picture but misses the "why" behind the data. In other words, a quantitative research method struggles to analyze the nuanced and intricate human experiences. The method is perfect for answering "what" and "how much" but struggles with "why" and "how". For further research it is advised to better combine the quantitative with a qualitative research method.

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8. Appendix

8.1 Codebook

SPSS name	Description of variable	Values
GEN	How do you describe yourself?	0: Female 1: Male
AGE	What is your age range?	1: 18-24 2: 25-30 3: 31-40 4: 41-50 5: 51-60 6: Over 61
Profession	What is your current/primary profession?	1: Student 2: Unemployed 3: Employed/professional 4: Entrepreneur 5: Retired
Education	What is your current level of education (Completed)?	1: Primary school 2: High school 3: Vocational school 4: Bachelor's degree 5: Master's degree 6: Ph.D
County	What county do you live in?	1: Finnmark 2: Troms 3: Telemark 4: Nordland 5: Vestfold 6: Buskerud 7: Møre og Romsdal 8: Østfold 9: Agder 10: Innlandet 11: Trøndelag 12: Rogaland 13: Vestland 14: Oslo 15: Akershus

Totaluse	How long have you been using the Vipps digital payment APP?	1: Less than 1 year 2: 1-2 years 3: 2-3 years 4: 3-4 years 5: 4-5 years 6: 5-6 years 7: 6-7 years 8: Over 7 years
Weeklyuse	On average, how many times do you use your Vipps APP in a week?	1: Less than 3 times 2: 3-4 times 3: 5-6 times 4: 7-8 times 5: 8-9 times 6: 9-10 times 7: More than 10 times
Services	Which is the most common service you use the Vipps App for?	1: Fund transfer 2: Paying bills 3: Receiving money from friends and family 4: Balance inquiry 5: Cardless payment/transfer 6: Important notifications/alerts
CSF1	I use the Vipps App as a complementary (Vipps + bank account) financial service.	1: Strongly disagree 2: Moderately disagree 3: Slightly disagree 4: Neither disagree nor agree 5: Slightly agree 6: Moderately agree 7: Strongly agree
EE1	I find it easy to use Vipps digital payment APP to do what I want it to do.	1: Strongly disagree 2: Moderately disagree 3: Slightly disagree 4: Neither disagree nor agree 5: Slightly agree 6: Moderately agree 7: Strongly agree
EE2	Vipps digital payment APP is flexible to interact with.	
EE3	It has been easy for me to become skilled at using Vipps digital payment APP	
PE1	I think that using Vipps digital payment APP would enable me to accomplish my financial tasks more quickly.	1: Strongly disagree 2: Moderately disagree 3: Slightly disagree 4: Neither disagree nor agree 5: Slightly agree 6: Moderately agree 7: Strongly agree
PE2	I think that using Vipps digital payment APP will make it easier for me to carry out my financial tasks.	
PE3	Vipps digital payment APP is useful.	
PE4	Overall, I think using Vipps digital payment APP is advantageous.	

SIF1	People who influence my behavior think that I should Vipps digital payment APP.	1: Strongly disagree 2: Moderately disagree
SIF2	People who are important to me think that I should use Vipps digital payment APP.	3: Slightly disagree 4: Neither disagree nor agree
SIF3	People whose opinions are valued by me would prefer that I use Vipps digital payment APP	5: Slightly agree 6: Moderately agree 7: Strongly agree
AAD1	I would use the Vipps APP for my payment needs.	1: Strongly disagree 2: Moderately disagree
AAD2	Using the Vipps APP for handling my transactions is something I would do.	3: Slightly disagree 4: Neither disagree nor agree
AAD3	I can see myself using the Vipps APP for handling my transactions.	5: Slightly agree 6: Moderately agree 7: Strongly agree
COP1	My bank influence my behavior to use Vipps digital payment APP.	1: Strongly disagree 2: Moderately disagree
COP2	Companies who are important to me influence me to use Vipps digital payment APP.	3: Slightly disagree 4: Neither disagree nor agree
COP3	Most organizations have payment options that influence me to use Vipps digital payment APP.	5: Slightly agree 6: Moderately agree 7: Strongly agree
COP4	Most voluntary organizations (football club, handball, boxing, gyms, etc.) prefer its members to use Vipps digital payment APP.	
AIN1	I see the Vipps APP as very innovative.	1: Strongly disagree 2: Moderately disagree
AIN2	I think the Vipps App is revolutionary (one of its kind in Norway).	3: Slightly disagree 4: Neither disagree nor agree
AIN3	Vipps digital payment APP offers something rarely seen in other applications you use.	5: Slightly agree 6: Moderately agree
AIN4	The Vipps APP has unique features which I like.	7: Strongly agree
APC1	I favor Vipps digital payment app over other applications because it reflects my values.	1: Strongly disagree 2: Moderately disagree
APC2	Being a user Vipps digital payment APP feels correct because of the applications credibility.	3: Slightly disagree 4: Neither disagree nor agree
APC3	I am not worried about my personal information and data when I use the Vipps APP.	5: Slightly agree 6: Moderately agree 7: Strongly agree
APC4	Using the Vipp App is safe.	
SQ1	Vipps digital payment APP provides its services on time.	1: Strongly disagree 2: Moderately disagree
SQ2	The Vipps digital payment APP serves my financial needs promptly.	3: Slightly disagree 4: Neither disagree nor agree

SQ3	I am OK with the services I get from the Vipps APP.	5: Slightly agree 6: Moderately agree 7: Strongly agree
ASQ1	My Vipps APP is always up to date	1: Strongly disagree 2: Moderately disagree 3: Slightly disagree 4: Neither disagree nor agree 5: Slightly agree 6: Moderately agree 7: Strongly agree
ASQ2	My Vipps APP provides me with accurate information	
ASQ3	My Vipps digital payment APP is helpful in navigating payments.	
ASQ4	Overall, my Vipps APP is of high quality.	
AUS1	Vipps digital payment APP will be important to use in my daily life	1: Strongly disagree 2: Moderately disagree 3: Slightly disagree 4: Neither disagree nor agree 5: Slightly agree 6: Moderately agree 7: Strongly agree
AUS2	Using Vipps digital payment APP will help in accomplishing my payment goals.	
AUS3	I am happy with the services provided by my Vipps digital payment APP	
AUS4	Overall, I am satisfied with my experiences with the Vipps APP.	
RISK1	I would be afraid that Vipps digital payment APP would not provide me the benefits I expected.	1: Strongly disagree 2: Moderately disagree 3: Slightly disagree 4: Neither disagree nor agree 5: Slightly agree 6: Moderately agree 7: Strongly agree
RISK2	I would be concerned about security risks.	
RISK3	Vipps digital Payment APP are dangerous to me.	
RISK4	I am sometimes scared to make payments with the Vipps APP	
RISK5	Using Vipps digital payment APP exposes me to overall risk.	
PEV1	The Vipps APP Mobile service offers value for money.	1: Strongly disagree 2: Moderately disagree 3: Slightly disagree 4: Neither disagree nor agree 5: Slightly agree 6: Moderately agree 7: Strongly agree
PEV2	Considering the effort I expend; the use of Vipps APP service is beneficial to me.	
PEV3	Considering the time I need to spend; the use of the Vipps APP is worthwhile to me.	
PEV4	Overall, the Vipps APP provides me with good value.	
FEE1	I consider the Vipps APP service charges to be high.	1: Strongly disagree 2: Moderately disagree 3: Slightly disagree 4: Neither disagree nor agree 5: Slightly agree 6: Moderately agree 7: Strongly agree
FEE2	It costs a lot to use the Vipps digital payment APP services	
FEE3	I consider high services charges to be a barrier of using the Vipps APP	

USE1	I intend to continue using My Vipps digital payment APP rather than discontinue its service.	1: Strongly disagree 2: Moderately disagree 3: Slightly disagree
USE2	My intentions are to continue using my Vipps digital payment APP	4: Neither disagree nor agree 5: Slightly agree
CREEP	Sometimes when I use my Vipps App, I feel I am being.	6: Moderately agree 7: Strongly agree
Total_EE	Total effort expectancy	
Total_PE	Total performance expectancy	
Total_SIF	Total social influence	
Total_AAD	Total app adoption	
Total_COP	Total corporate/institutional influence	
Total_AIN	Total app innovativeness & novelty	
Total_APC	Total app credibility	
Total_SQ	Total service quality	
Total_ASQ	Total app system quality	
Total_AUS	Total app usage satisfaction	
Total_RISK	Total perceived risk	
Total_PEV	Total perceived value	
Total_FEE	Total perceived fee	
Total_USE	Total continuous usage	

8.2 Operationalization, previous and new questions

Construct	SPSS name	Our Question	Source question	Source
	GEN	How do you describe yourself?		Own Questions
	AGE	What is your age range?		Own Questions
	Profession	What is your current/primary profession?		Own Questions
	Education	What is your current level of education (Completed)?		Own Questions
	County	What county do you live in?		Own Questions
	Total use	How long have you been using the Vipps digital payment APP?		Own Questions
	Weekly Use	On average, how many times do use your Vipps APP in a week?		Own Questions
	Services	Which is the most common service you use the Vipps App for?		Own Questions

	CSF1	I use the Vipps App as a complementary (Vipps + bank account) financial service.		Own Questions
Effort Expectancy	EE1	I find it easy to use Vipps digital payment APP to do what I want it to do.	I would find it easy to get m-banking to do what I want it to do	Shaikh, Glavee-Geo, & Karjaluoto, (2021)
	EE2	Vipps digital payment APP is flexible to interact with.	I would find m-banking to be flexible to interact with	Zhou, Lu & Wang (2010)
	EE3	It has been easy for me to become skilled at using m-Vipps digital payment APP	It would be easy for me to become skilled at using m-banking	
Performance expectancy	PE1	I think that using Vipps digital payment APP would enable me to accomplish my financial tasks more quickly.	I think that using m-banking would enable me to accomplish my tasks more quickly	Shaikh, Glavee-Geo, & Karjaluoto, (2021)
	PE2	I think that using Vipps digital payment APP will make it easier for me to carry out my financial tasks.	I think that using m-banking would make it easier for me to carry out my tasks	Zhou, Lu & Wang (2010)
	PE3	Vipps digital payment APP is useful.	I think m-banking is useful	
	PE4	Overall, I think using Vipps digital payment APP is advantageous.	Overall, I think using m-banking is advantageous	
Social influence	SIF1	People who influence my behavior think that I should Vipps digital payment APP.	People who influence my behavior think that I should use m-banking	Glavee-Geo, Shaikh, & Karjaluoto (2017).
	SIF2	People who are important to me think that I should Vipps digital payment APP.	People who are important to me think that I should use m-banking	
	SIF3	People whose opinions are valued by me would prefer that I use Vipps digital payment APP	People whose opinions are valued by me would prefer that I use m-banking	
App adoption	AAD1	I would use the Vipps APP for my payment needs.	I would use m-banking for my banking needs	Glavee-Geo, R., Shaikh, A. A., & Karjaluoto, H. (2017).
	AAD2	Using the Vipps APP for handling my transactions is something I would do.	Using m-banking for handling my banking transactions is something I would do	

	AAD3	I can see myself using the Vipps APP for handling my transactions.	I can see myself using m-banking for handling my banking transactions	
Corporate/institutional influence	COP1	My bank influence my behavior to use Vipps digital payment APP.		Own Questions
	COP2	Companies who are important to me influence me to use Vipps digital payment APP.		Own Questions
	COP3	Most organizations have payment options that influence me to use Vipps digital payment APP.		Own Questions
	COP4	Most voluntary organizations (football club, handball, boxing, gyms, etc.) prefer its members to use Vipps digital payment APP.		Own Questions
App innovativeness and novelty	AIN1	I see the Vipps APP as very innovative.	(Compared with other competing products, this application) Is radically different. Can be considered as revolutionary. Provides something not commonly found Has unique features.	Karjaluoto, Shaikh, Saarijärvi, & Saraniemi (2019)
	AIN2	I think the Vipps App is revolutionary (one of its kind in Norway).	(Compared with other competing products, this application) Is radically different. Can be considered as revolutionary. Provides something not commonly found Has unique features.	

	AIN3	Vipps digital payment APP offers something rarely seen in other applications you use.	(Compared with other competing products, this application) Is radically different. Can be considered as revolutionary. Provides something not commonly found Has unique features.	
	AIN4	The Vipps APP has unique features which I like.	(Compared with other competing products, this application) Is radically different. Can be considered as revolutionary. Provides something not commonly found Has unique features.	
App credibility	APC1	I favor Vipps digital payment app over other applications because it reflects my values.	I prefer X (contactless payment brand) to others because it stands for values that are important to me.	Karjaluoto, Shaikh, Leppäniemi, & Luomala (2020). Shaikh, A. A., Glavee-Geo, R., Karjaluoto, H., & Hinson, R. E. (2023).
	APC2	Being a user Vipps digital payment APP feels correct because of the applications credibility.	Because of the values X (contactless payment brand) stands for, being a customer feels like the right thing to do	
	APC3	I am not worried about my personal information and data when I use the Vipps APP.		Own Questions
	APC4	Using the Vipp App is safe.		Own Questions
Service quality	SQ1	Vipps digital payment APP provides its services on time.	LBS provides on-time services.	Wang, & Lin, (2017).
	SQ2	The Vipps digital payment APP serves my financial needs promptly.	LBS provides prompt responses to my questions.	

	SQ3	I am OK with the services I get from the Vipps APP.		Own Questions
App system quality	ASQ1	My Vipps APP is always up to date	The information provided by sports brand apps is up to date	Won, & Chiu, (2023). Wang, & Lin, (2017).
	ASQ2	My Vipps APP provides me with accurate information	The information provided by sports brand apps is accurate	
	ASQ3	My Vipps digital payment APP is helpful in navigating payments.	The navigation of sports brand apps is effective	
	ASQ4	Overall, my Vipps APP is of high quality.		Own Questions
App usage satisfaction	AUS1	Vipps digital payment APP will be important to use in my daily life	I find contactless payment useful in my life	Karjaluoto, Shaikh, Leppäniemi, & Luomala (2020).
	AUS2	Using Vipps digital payment APP will help in accomplishing my payment goals.	Using contactless payments increases my chance of achieving things that are important to me	
	AUS3	I am happy with the services provided by my Vipps digital payment APP	I am very satisfied with contactless payments	
	AUS4	Overall, I am satisfied with my experiences with the Vipps APP.		Own Questions
Perceived risk	RISK1	I would be afraid that Vipps digital payment APP would not provide me the benefits I expected.	I would be afraid that m-banking app (m-wallet app) would not provide me the benefits I expected.	Karjaluoto, Shaikh, Saarijärvi, & Saraniemi (2019) Karjaluoto, Shaikh, Leppäniemi, & Luomala (2020).
	RISK2	I would be concerned about security risks.	I would be concerned about security risks.	
	RISK3	Vipps digital Payment APP are dangerous to me.	Contactless payments are dangerous to use.	
	RISK4	I am sometimes scared to make payments with the Vipps APP	Using contactless payment would add great uncertainty to my bill paying.	

	RISK5	Using Vipps digital payment APP exposes me to overall risk.	Using contactless payments exposes you to overall risk.	
Perceived value	PEV1	The Vipps APP Mobile service offers value for money.	Mobile money service offers value for money.	Lin, Wang and Huang, (2020)
	PEV2	Considering the effort I expend; the use of Vipps APP service is beneficial to me.	Considering the effort I expend, the use of mobile money service is beneficial to me.	
	PEV3	Considering the time I need to spend; the use of the Vipps APP is worthwhile to me.	Considering the time I need to spend; the use of mobile money service is worthwhile to me.	
	PEV4	Overall, the Vipps APP provides me with good value.	Overall, the use of mobile money service provides me with good value.	
Perceived fee	FEE1	I consider the Vipps APP service charges to be high.	I consider the mobile money service charges to be high	Lin, Wang and Huang, (2020)
	FEE2	It costs a lot to use the Vipps digital payment APP services	It costs a lot to use mobile money services	
	FEE3	I consider high services charges to be a barrier of using the Vipps APP	I consider high services charges to be a barrier of using mobile money services	
Continuous usage	USE1	I intend to continue using My Vipps digital payment APP rather than discontinue its service.	I intend to continue using mobile money rather than discontinue it.	Shaikh, A. A., Glavee-Geo, R., Karjaluoto, H., & Hinson, R. E. (2023).
	USE2	My intentions are to continue using my Vipps digital payment APP	My intentions are to continue using mobile money rather than to use any alternative means	
	CREEP	Sometimes when I use my Vipps App, I feel I am being.		Own Questions
	Total_EE	Total effort expectancy		
	Total_PE	Total performance expectancy		
	Total_SIF	Total social influence		

	Total_AAD	Total app adoption		
	Total_COP	Total corporate/institutional influence		
	Total_AIN	Total app innovativeness & novelty		
	Total_APC	Total app credibility		
	Total_SQ	Total service quality		
	Total_ASQ	Total app system quality		
	Total_AUS	Total app usage satisfaction		
	Total_RISK	Total perceived risk		
	Total_PEV	Total perceived value		
	Total_FEE	Total perceived fee		
	Total_USE	Total continuous usage		

8.3 Descriptives – Key concepts

Descriptive Statistics						
	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
EE1	6,38	1,176	-2,816	0,197	8,923	0,392
EE2	5,98	1,219	-1,371	0,197	2,333	0,392
EE3	6,05	1,210	-1,636	0,197	3,413	0,392
PE1	6,03	1,373	-1,751	0,197	3,282	0,392
PE2	5,78	1,469	-1,302	0,197	1,501	0,392
PE3	6,62	1,025	-3,833	0,197	16,879	0,392
PE4	6,45	1,050	-2,983	0,197	10,967	0,392
SIF1	4,19	2,011	-0,193	0,197	-0,996	0,392
SIF2	4,43	1,965	-0,352	0,197	-0,920	0,392
SIF3	4,41	1,923	-0,338	0,197	-0,832	0,392
AAD1	5,38	1,441	-0,862	0,197	0,653	0,392
AAD2	4,79	1,690	-0,587	0,197	-0,374	0,392
AAD3	5,18	1,579	-0,937	0,197	0,501	0,392
COP1	2,67	1,656	0,836	0,197	-0,006	0,392
COP2	3,63	1,882	0,009	0,197	-1,114	0,392
COP3	4,81	1,735	-0,639	0,197	-0,164	0,392
COP4	4,55	1,750	-0,300	0,197	-0,592	0,392
AIN1	5,56	1,345	-0,878	0,197	0,752	0,392
AIN2	5,28	1,506	-0,675	0,197	0,008	0,392
AIN3	5,14	1,465	-0,657	0,197	0,084	0,392
AIN4	5,40	1,391	-0,817	0,197	0,612	0,392
APC1	4,05	1,750	-0,150	0,197	-0,712	0,392
APC2	5,09	1,634	-0,699	0,197	-0,089	0,392
APC3	5,39	1,514	-0,687	0,197	-0,368	0,392
APC4	6,00	1,007	-0,795	0,197	-0,088	0,392
SQ1	5,80	1,244	-1,006	0,197	0,776	0,392

SQ2	5,72	1,313	-1,069	0,197	0,744	0,392
SQ3	6,07	1,108	-1,933	0,197	5,574	0,392
ASQ1	5,68	1,387	-0,976	0,197	0,506	0,392
ASQ2	5,61	1,371	-0,885	0,197	0,442	0,392
ASQ3	4,53	1,821	-0,350	0,197	-0,825	0,392
ASQ4	5,75	1,291	-1,398	0,197	2,598	0,392
AUS1	5,48	1,487	-1,267	0,197	1,592	0,392
AUS2	4,77	1,863	-0,595	0,197	-0,652	0,392
AUS3	5,93	1,198	-1,521	0,197	3,120	0,392
AUS4	6,21	0,991	-1,772	0,197	4,850	0,392
RISK1	2,36	1,397	1,197	0,197	1,367	0,392
RISK2	2,88	1,518	0,656	0,197	-0,194	0,392
RISK3	1,54	1,018	2,859	0,197	10,489	0,392
RISK4	1,70	1,124	2,094	0,197	4,870	0,392
RISK5	1,89	1,206	1,499	0,197	2,005	0,392
PEV1	4,41	1,638	-0,434	0,197	-0,274	0,392
PEV2	5,38	1,385	-0,534	0,197	-0,317	0,392
PEV3	5,72	1,334	-0,950	0,197	0,301	0,392
PEV4	5,87	1,174	-1,006	0,197	0,963	0,392
FEE1	3,16	1,682	0,377	0,197	-0,643	0,392
FEE2	2,62	1,544	0,820	0,197	0,046	0,392
FEE3	2,60	1,736	0,971	0,197	-0,025	0,392
USE1	5,93	1,532	-1,836	0,197	3,082	0,392
USE1	6,28	1,078	-1,837	0,197	4,046	0,392
Valid N (listwise)	151					

8.4 Pie chart - Gender
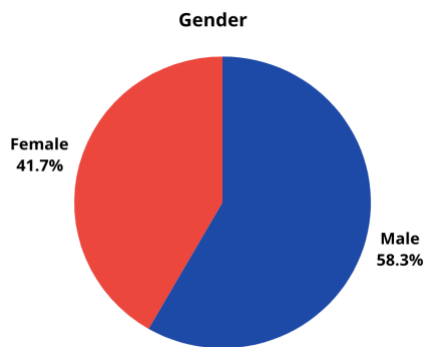
8.5 Pie chart – Weekly use
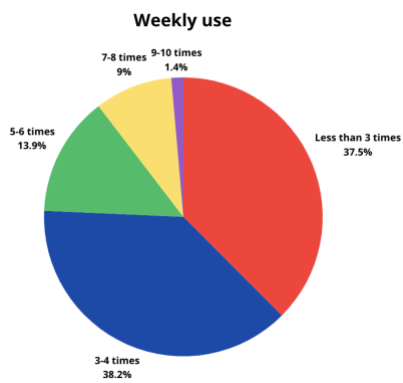
8.6 Pie chart – Age group

8.7 Pie chart - Education

Education

- Master's degree 15.1%
- Ph.D 0.6%
- High school 29.5%
- Vocational school 10.2%
- Bachelor's degree 42.2%

8.8 Pie chart - Duration

Duration

- 2-3 years 6%
- 3-4 years 7.9%
- 4-5 years 18.5%
- 5-6 years 17.2%
- 6-7 years 19.9%
- Over 7 years 28.5%
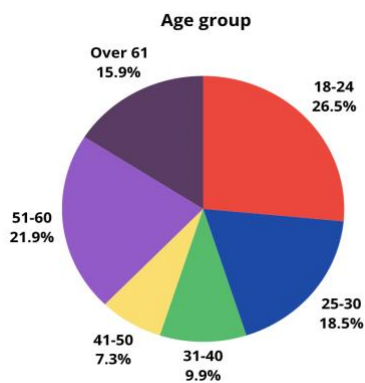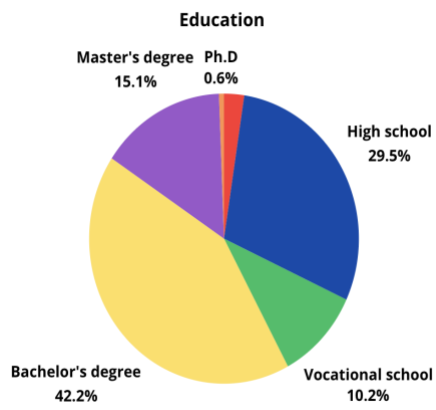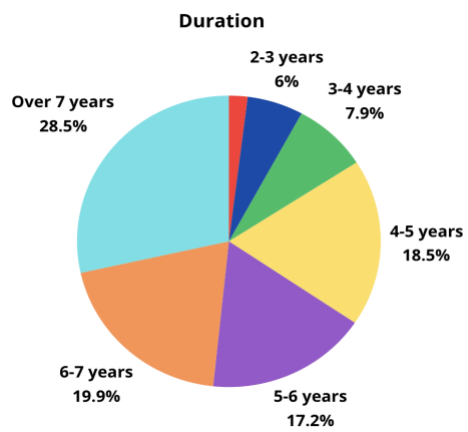
8.9 Correlation: App adoption

		Total AAD	Total SIF	Total COP	Total AIN	Total APC	Total SQ	Total ASQ	Total AUS	Total RISK	Total PEV	Total FEE	Total EPE	Total USE	Gender	Age	Educ	Duration	Weekly use
Pearson Correlation	Total_AAD	1,000	0,335	0,301	0,564	0,454	0,535	0,582	0,677	-0,164	0,432	-0,169	0,537	0,324	-0,063	-0,141	-0,004	0,066	0,031
	Total_SIF	0,335	1,000	0,488	0,302	0,369	0,239	0,226	0,308	-0,082	0,358	-0,010	0,138	0,177	-0,062	-0,296	0,003	0,066	-0,008
	Total_COP	0,301	0,488	1,000	0,340	0,446	0,246	0,322	0,308	-0,027	0,246	-0,043	0,221	0,153	-0,016	-0,207	-0,210	0,072	0,055
	Total_AIN	0,564	0,302	0,340	1,000	0,555	0,680	0,588	0,670	-0,320	0,504	-0,168	0,504	0,348	-0,120	-0,127	0,006	0,000	-0,027
	Total_APC	0,454	0,369	0,446	0,555	1,000	0,604	0,608	0,639	-0,303	0,448	-0,197	0,333	0,339	-0,084	-0,189	0,030	-0,024	0,038
	Total_SQ	0,535	0,239	0,246	0,680	0,604	1,000	0,738	0,761	-0,277	0,545	-0,214	0,630	0,463	-0,149	-0,122	0,041	0,041	-0,056
	Total_ASQ	0,582	0,226	0,322	0,588	0,608	0,738	1,000	0,757	-0,293	0,508	-0,207	0,548	0,349	-0,026	-0,075	-0,037	-0,008	-0,032
	Total_AUS	0,677	0,308	0,308	0,670	0,639	0,761	0,757	1,000	-0,285	0,569	-0,287	0,630	0,439	-0,094	-0,143	0,016	0,003	-0,032
	Total_RISK	-0,164	-0,082	-0,027	-0,320	-0,303	-0,277	-0,293	-0,285	1,000	-0,257	0,350	-0,350	-0,387	0,146	-0,033	-0,175	-0,160	0,039
	Total_PEV	0,432	0,358	0,246	0,504	0,448	0,545	0,508	0,569	-0,257	1,000	-0,262	0,405	0,554	-0,033	0,006	0,090	0,047	-0,037
	Total_FEE	-0,169	-0,010	-0,043	-0,168	-0,197	-0,214	-0,207	-0,287	0,350	-0,262	1,000	-0,268	-0,231	0,137	0,001	-0,128	0,008	0,078
	Total_EPE	0,537	0,138	0,221	0,504	0,333	0,630	0,548	0,630	-0,350	0,405	-0,268	1,000	0,370	-0,083	-0,019	-0,043	0,007	-0,034
	Total_USE	0,324	0,177	0,153	0,348	0,339	0,463	0,349	0,439	-0,387	0,554	-0,231	0,370	1,000	-0,144	0,017	0,049	0,198	0,087
	Gender	-0,063	-0,062	-0,016	-0,120	-0,084	-0,149	-0,026	-0,094	0,146	-0,033	0,137	-0,083	-0,144	1,000	0,006	-0,071	0,046	0,064
	Age_group	-0,141	-0,296	-0,207	-0,127	-0,189	-0,122	-0,075	-0,143	-0,033	0,006	0,001	-0,019	0,017	0,006	1,000	0,330	-0,163	0,146
	Education	-0,004	0,003	-0,210	0,006	0,030	0,041	-0,037	0,016	-0,175	0,090	-0,128	-0,043	0,049	-0,071	0,330	1,000	-0,012	-0,021
	Duration	0,066	0,066	0,072	0,000	-0,024	0,041	-0,008	0,003	-0,160	0,047	0,008	0,007	0,198	0,046	-0,163	-0,012	1,000	0,163
	Weekly_use	0,031	-0,008	0,055	-0,027	0,038	-0,056	-0,032	-0,032	0,039	-0,037	0,078	-0,034	0,087	0,064	0,146	-0,021	0,163	1,000
Sig. (1-tailed)	Total_AAD		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,022	0,000	0,019	0,000	0,000	0,222	0,042	0,482	0,210	0,353
	Total_SIF	0,000		0,000	0,000	0,000	0,002	0,003	0,000	0,159	0,000	0,451	0,046	0,015	0,223	0,000	0,487	0,212	0,463
	Total_COP	0,000	0,000		0,000	0,000	0,001	0,000	0,000	0,373	0,001	0,298	0,003	0,030	0,423	0,005	0,005	0,189	0,251
	Total_AIN	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,020	0,000	0,000	0,071	0,060	0,472	0,498	0,369
	Total_APC	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,008	0,000	0,000	0,153	0,010	0,358	0,384	0,323
	Total_SQ	0,000	0,002	0,001	0,000	0,000		0,000	0,000	0,000	0,000	0,004	0,000	0,000	0,034	0,068	0,309	0,307	0,248
	Total_ASQ	0,000	0,003	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,005	0,000	0,000	0,377	0,179	0,325	0,462	0,348
	Total_AUS	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,125	0,040	0,421	0,487	0,349
	Total_RISK	0,022	0,159	0,373	0,000	0,000	0,000	0,000	0,000		0,001	0,000	0,000	0,000	0,037	0,343	0,016	0,025	0,317
	Total_PEV	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,001		0,001	0,000	0,000	0,344	0,473	0,136	0,285	0,328
	Total_FEE	0,019	0,451	0,298	0,020	0,008	0,004	0,005	0,000	0,000	0,001		0,000	0,002	0,047	0,494	0,059	0,462	0,169
	Total_EPE	0,000	0,046	0,003	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,154	0,410	0,300	0,468	0,337
	Total_USE	0,000	0,015	0,030	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,002	0,000		0,039	0,416	0,274	0,007	0,144
	Gender	0,222	0,223	0,423	0,071	0,153	0,034	0,377	0,125	0,037	0,344	0,047	0,154	0,039		0,469	0,192	0,288	0,219
	Age_group	0,042	0,000	0,005	0,060	0,010	0,068	0,179	0,040	0,343	0,473	0,494	0,410	0,416	0,469		0,000	0,023	0,037
	Education	0,482	0,487	0,005	0,472	0,358	0,309	0,325	0,421	0,016	0,136	0,059	0,300	0,274	0,192	0,000		0,443	0,399
	Duration	0,210	0,212	0,189	0,498	0,384	0,307	0,462	0,487	0,025	0,285	0,462	0,468	0,007	0,288	0,023	0,443		0,023
	Weekly_use	0,353	0,463	0,251	0,369	0,323	0,248	0,348	0,349	0,317	0,328	0,169	0,337	0,144	0,219	0,037	0,399	0,023	

8.10 Correlation: Continuous usage

		Total_USE	Total_SIF	Total_COP	Total_AIN	Total_APC	Total_SQ	Total_ASQ	Total_AUS	Total_RISK	Total_PEV	Total_FEE	Total_EPE	Total_AAD
Pearson Correlation	Total_USE	1,000	0,177	0,153	0,348	0,339	0,463	0,349	0,439	-0,387	0,554	-0,231	0,370	0,324
	Total_SIF	0,177	1,000	0,488	0,302	0,369	0,239	0,226	0,308	-0,082	0,358	-0,010	0,138	0,335
	Total_COP	0,153	0,488	1,000	0,340	0,446	0,246	0,322	0,308	-0,027	0,246	-0,043	0,221	0,301
	Total_AIN	0,348	0,302	0,340	1,000	0,555	0,680	0,588	0,670	-0,320	0,504	-0,168	0,504	0,564
	Total_APC	0,339	0,369	0,446	0,555	1,000	0,604	0,608	0,639	-0,303	0,448	-0,197	0,333	0,454
	Total_SQ	0,463	0,239	0,246	0,680	0,604	1,000	0,738	0,761	-0,277	0,545	-0,214	0,630	0,535
	Total_ASQ	0,349	0,226	0,322	0,588	0,608	0,738	1,000	0,757	-0,293	0,508	-0,207	0,548	0,582
	Total_AUS	0,439	0,308	0,308	0,670	0,639	0,761	0,757	1,000	-0,285	0,569	-0,287	0,630	0,677
	Total_RISK	-0,387	-0,082	-0,027	-0,320	-0,303	-0,277	-0,293	-0,285	1,000	-0,257	0,350	-0,350	-0,164
	Total_PEV	0,554	0,358	0,246	0,504	0,448	0,545	0,508	0,569	-0,257	1,000	-0,262	0,405	0,432
	Total_FEE	-0,231	-0,010	-0,043	-0,168	-0,197	-0,214	-0,207	-0,287	0,350	-0,262	1,000	-0,268	-0,169
	Total_EPE	0,370	0,138	0,221	0,504	0,333	0,630	0,548	0,630	-0,350	0,405	-0,268	1,000	0,537
	Total_AAD	0,324	0,335	0,301	0,564	0,454	0,535	0,582	0,677	-0,164	0,432	-0,169	0,537	1,000
Sig. (1-tailed)	Total_USE		0,015	0,030	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,002	0,000
	Total_SIF	0,015		0,000	0,000	0,000	0,002	0,003	0,000	0,159	0,000	0,451	0,046	0,000
	Total_COP	0,030	0,000		0,000	0,000	0,001	0,000	0,000	0,373	0,001	0,298	0,003	0,000
	Total_AIN	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,020	0,000	0,000
	Total_APC	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,008	0,000	0,000
	Total_SQ	0,000	0,002	0,001	0,000	0,000		0,000	0,000	0,000	0,000	0,004	0,000	0,000
	Total_ASQ	0,000	0,003	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,005	0,000	0,000
	Total_AUS	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000
	Total_RISK	0,000	0,159	0,373	0,000	0,000	0,000	0,000	0,000		0,001	0,000	0,000	0,022
	Total_PEV	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,001		0,001	0,000	0,000
	Total_FEE	0,002	0,451	0,298	0,020	0,008	0,004	0,005	0,000	0,000	0,001		0,000	0,019
	Total_EPE	0,000	0,046	0,003	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000
	Total_AAD	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,022	0,000	0,019	0,000	

8.11 Correlation – Continuous usage error

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	5,817	1,755		3,315	0,001		
Total_SIF	-0,017	0,035	-0,040	-0,486	0,628	0,600	1,665
Total_COP	0,011	0,037	0,025	0,303	0,763	0,586	1,706
Total_AIN	-0,059	0,050	-0,118	-1,181	0,240	0,418	2,392
Total_APC	0,002	0,051	0,004	0,042	0,966	0,409	2,445
Total_SQ	0,183	0,090	0,256	2,032	0,044	0,261	3,830
Total_ASQ	-0,079	0,054	-0,166	-1,459	0,147	0,320	3,123
Total_AUS	0,059	0,066	0,119	0,896	0,372	0,237	4,218
Total_RISK	-0,115	0,039	-0,237	-2,970	0,004	0,651	1,537
Total_PEV	0,212	0,044	0,416	4,810	0,000	0,555	1,801
Total_FEE	0,000	0,038	0,000	0,004	0,997	0,784	1,275
Total_EPE	4,772E-05	0,032	0,000	0,002	0,999	0,440	2,275
Total_AAD	0,025	0,052	0,047	0,492	0,624	0,457	2,190
Gender	-0,377	0,317	-0,080	-1,190	0,236	0,921	1,086
AGE	0,070	0,096	0,056	0,729	0,467	0,692	1,445
Education	-0,124	0,145	-0,063	-0,852	0,396	0,762	1,312
Duration	0,176	0,100	0,123	1,762	0,080	0,845	1,183
Weekly use	0,159	0,116	0,093	1,370	0,173	0,899	1,113