3-5-2015

Is an App Better than an Email? Developing Trust in a Mobile Financial Advisory Service - Design and Evaluation of a Prototype

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Abstract. Private banks see great potential in digital technologies for engaging with clients. Both practitioners and researchers believe that digital technologies, such as mobile applications, increase transparency in the advisory process and consequently raise trust, satisfaction and customer loyalty. This study proposes 5 design requirements (DR) for developing trust in a mobile financial advisory service. A first prototype was designed following the proposed DR. In addition, we conduct an experimental evaluation with 34 participants and compare the prototype with email communication. The findings provide mixed results on how a mobile application, designed according to the proposed DR, could increase trust and intention to use. With regard to overall satisfaction, the app was favored over email communication.

Keywords: mobile service, mobile banking, trust, experimental evaluation

1 Introduction

Since the economic downturn in 2008, private banks have suffered serious reputational damage [1]. One of the key issues with respect to financial advisory services (FAS) is the information and interest asymmetry [2]. Some relationship managers (RM) do not have their clients' best interest at heart and attempt to maximize their own short-term profits. Accordingly, private banks see a considerable potential in new technologies [1], [3], which might help to restore customer trust [4-5]. For example, a large Swiss bank introduced a new digital private banking service in 2014 [6]. Not only practitioners, but also researchers see the benefits of digital technology with respect to developing trust. Nussbaumer et al. [7] showed a successful introduction of a surface tablet for FAS, which increased cost transparency, overall satisfaction as well as the willingness to pay for such services. Furthermore, establishing trust in customer relationships is vital for the future use of the application and technology [8]. While previous studies on trust and the use of FAS have either focused on online or mobile banking for retail clients [8–10] or FAS supported with media tablets in physical proximity [5], [9], this study aims at introducing location-independent FAS specifically for the private banking segment. Moreover, the FAS should run on the mobile device of the

12th International Conference on Wirtschaftsinformatik,
March 4-6 2015, Osnabrück, Germany

Ruf, C. T.; Wittmann, M.; Back, A. (2015): Is an App Better than an Email? Developing Trust in a Mobile Financial Advisory Service - Design and Evaluation of a Prototype, in: Thomas. O.; Teuteberg, F. (Hrsg.): Proceedings der 12. Internationalen Tagung Wirtschaftsinformatik (WI 2015), Osnabrück, S. 225-239

customer and provide easy access to the personal RM. In order to validate the potential of such a mobile FAS (mFAS), we compare email with a mobile application (app) in an experimental setup. Such apps might include both native or web apps that run in the browser of the customer [12]. Due to limited resources for this project, we were not able to develop a native app for each platform of our study participants (iOS, Android and Windows Phone). Hence, we chose a web app for our evaluation in this study. Furthermore, our first prototype was intended to develop trust, increase intention to use as well as overall satisfaction. We propose the following research question: *Does a mobile app, designed according to the proposed requirements, lead to higher trust in a mFAS and consequently increase satisfaction and intention to use, compared to email communication?*

First, we describe the related work in Section 2. Subsequently, we present the design requirements (DR) as well as our first prototype in Section 3. Section 4 contains the research model, and the setup of our experimental evaluation involving 34 participants. Finally, we present the results of the study in Section 5 followed by a discussion and conclusion in Sections 6 and 7 respectively.

2 Related Work

In this section, we define the term mobile financial advisory services (mFAS) and elaborate on the determinants and effects of building trust for such a mFAS.

2.1 Mobile Financial Advisory Services (mFAS)

The characteristics of a FAS differ between customer segments [11], [13]. Hence, in this study, we focus on the FAS for the high net worth individual (HNWI) customer segment specifically, with investable assets exceeding CHF 1 Million. The FAS for this customer segment involves various steps [14], which include the following: Setting goals with the client, gathering relevant information, analyzing information, constructing a financial plan, implementing strategies in the plan, monitoring the implementation and reviewing the plan. We focus specifically on the last two steps of the FAS. This process typically involves for relationship manager (RM) to sending out updates and investment ideas according to the targeted performance, the personal risk profile, as well as to the client preferences, either by email or by phone. With the recent technological advances, there are clearly alternatives to email or phone communication. A mobile app allows the customer to access his personal financial information on the smartphone. We thus define the information exchange between the RM and the customer regarding the implementation and monitoring of the investment strategy on a mobile phone, a mobile FAS (mFAS). Such a mFAS can either me mediated with email or a mobile app. Furthermore, we focus on well-established relationships between the customer and the personal RM.

2.2 Developing Trust in a Mobile Financial Advisory Service (mFAS)

Due to the uncertainty in banking relationships, in particular due to information and interest asymmetries, the customer takes great risks entrusting a bank with his personal wealth. Such risk-taking actions as well as cooperative behavior in client relationships, require trust [15]. Accordingly, a prominent definition of trust is the following [16]: "Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another." Moreover, the digital nature of the relationship of a mFAS, makes it even more important to develop trust [17]. Establishing customer trust, however, is not means in itself and leads rather to various consequences and advantages. For example, trust might lead to a reduction in transaction costs, to a faster adaption of technology or to an increase in customer loyalty. In the banking field, the literature acknowledges that trust is a prerequisite for customers to execute transactions through digital channels [8].

Regarding the mFAS, it affects various elements of trust. First, we focus on well-established and existing customer relationships in the private banking segment. Developing trust, based on the personal assessment of previous behavior in established relationships, is also referred to as (1) *knowledge-based trust* [18]. Second, with the previously mentioned challenges of information and especially interest asymmetries, the customer demands transparency and needs assurance that the potential benefits exceed the potential risks of the relationship with the bank and the RM. This form of trust is referred to as (2) *calculative-based trust* [19-20]. Third, due to the highly sensitive nature of personal finances and money in general, security and assurances on a digital platform, such as a mobile app, are truly essential. Researchers describe this issue as (3) *institution-based trust* [17].

Regarding online or mobile banking, the existing literature does not jointly address these three distinctive views of trust. Yousafzi et al. [8] propose an e-trust model, which incorporates institution-based trust. They specifically address security and privacy as antecedents for trust. Luo et al. [10] examine the influence of structural assurance on perceived risk, customer trust, as well as the intended use of mobile banking services. Another article from Kim et al. [21] explains various antecedents for trust and usage intention. However, besides structural assurance, they also do not cover the other views or aspects of trust, neither calculative-based nor knowledge-based. Moreover, Kang et al. [9] shed light on the construct of trust transference from offline to online to mobile channels. However, the authors do not address any of the specific three views of trust within their model. Similar to the previously mentioned studies, Awasthi and Sangle [22] also focus on the construct of institution-based trust, and do not cover the other views of trust. In summary, our literature review reveals that a joint trust model covering all three different views of trust, which we deem relevant in our study, has not been introduced in the domain of online or mobile banking. Hence, this study applies the trust model from Gefen et al. [23], which is highly acknowledged in the information system literature, and incorporates the three views of trust: (1) knowledge-based, (2) calculative-based as well as (3) institution-based. By applying elements of the trust model [23] in our experimental evaluation of the mFAS, we contribute to the existing body of literature and gain new insights into how

this model might be adapted in the mobile banking discipline in general. The following section sheds light on the DR for a prototype in mFAS, which we derive from the three views of trust.

3 Designing for Trust in a Mobile Financial Advisory Service – Presenting the Design Requirements and Prototype

In order to design the prototype of the mobile app, we define and present 5 DR, which can be expected to develop trust in a mFAS and consequently lead to increased intentions to use as well as enhanced overall satisfaction. Following the introduction of the DR1-5 in Section 3.1-3.3, we demonstrate the prototype in Section 3.4. Within this section, Figure 1 summarizes how the prototype was designed according to the proposed DR. Furthermore, Figure 1 also depicts features and functions of the mobile app.

3.1 Knowledge-Based Trust

Regarding knowledge-based trust, the literature states that clients need to be familiar with the entire customer process [23], creating an appropriate context for developing trust [24]. Furthermore, knowledge-based trust requires time and a well-established long-term relationship [25]. This conforms to the context of a private banking relationship enabled through a mFAS. Hence, familiarity as a DR for the mFAS should increase customer trust.
DR1: The content and form of the product recommendations are familiar to traditional email communication or phone calls.

3.2 Calculative-Based Trust

With regard to calculative-based trust, customers need assurance that the bank and the RM do have his best interests at heart and are not pursuing their own short-term goals. In the context of e-commerce, the literature describes this as follows [23]: The customer trusts an e-commerce shop more if he realizes that the vendor would not benefit from dishonest practices. Previous studies have analyzed the construct of calculative-based trust and derived transparency as a requirement [26] for a mobile service targeting private banking customers. As shown in Figure 1, all recommendations and decisions are archived within the app and accessible to the customer at any time. As a result of providing a transparent contact history between the RM and the client, we are not able to ensure the long-term success of the investment strategy. However, we argue that this is still a first step in providing a more transparent information exchange between the two parties. Moreover, the literature also acknowledges such "proof sources" are a way of developing calculative-based trust [16]. Regarding this view of trust, we propose the following DR.
DR2: The customer needs to have access to the contact history at any time and verify that the recommendations of his RM were indeed successful.

3.3 Institution-Based Trust

Regarding institution-based trust, Gefen et al. [23] refer to safety nets and signals, which provide the customer with a secure environment for executing various transactions and for engaging with the digital platform. McKnight et al. [25] propose two elements, which develop trust with respect to institution-based characteristics, namely structural assurance and situational normality.

Situational normality refers to the look and feel of the e-commerce platform or the website [23]. The interactions and the design of the website should remind the customer of other familiar services. Accordingly, such a normal environment develops customer trust [25]. This argumentation is in line with other studies which suggest that trust is a result of fulfilled expectations in general [27]. Regarding the mFAS, we design the app according to existing standards in app development. The menu on the left is a feature which the customer already knows from various well-established apps. The buttons for sign-off, as well as for opening the menu, are also in line with common standards. Finally, the customer is able to respond quickly to the product recommendations from his RM. Hence, we propose the following DR with respect to situational normality:

DR3: The representation of the prototype should remind the customer of similar apps that facilitate communication and interaction.

Structural assurance also refers to the view of institution-based trust. Such assurances usually materialize on a website with certificates or a customer service line [23]. For the mFAS, we implemented a specific "call me back" button. Hence, the customer is able to request his personal RM to call him anytime.

DR4: The customer should have access to a service line and be able to engage quickly with a company representative if a problem arises.

Recent reports advise banks to implement an additional security layer in their mobile apps, e.g. two-factor authentications such as a mobile TAN, fingerprints or other biometrical data [28]. Despite such an additional login, the app is still able to send the client a notification if a message is received. The actual content of the message and all the details, however, are only accessible after authentication. Threema, a secure messaging app from Switzerland, follows such an approach [29]. For feasibility reasons, we did not implement a two-factor authentication login, but still wanted to provide the app with an additional security layer, in order to support structural assurance. Consequently, we propose the following DR:

DR5: The customer needs to login the app with a separate user name and corresponding password.

3.4 Prototype

Figure 1 summarizes the proposed DR and illustrates the prototype of the mobile app. We briefly describe some features of the mobile app. In order to gain access to the information within the app, the customer needs to sign in with a user name and password. Within the app, the user has direct and easy access to the contact information of his personal RM. Furthermore, the customer sees the latest recommendations and

messages from his RM in the inbox. With a push notification, the customer can choose whether the incoming messages are delivered. Moreover, the customer can easily request additional information regarding a specific product recommendation, execute the trade or ignore a trade. The contact history and all past responses are archived in the response folder.

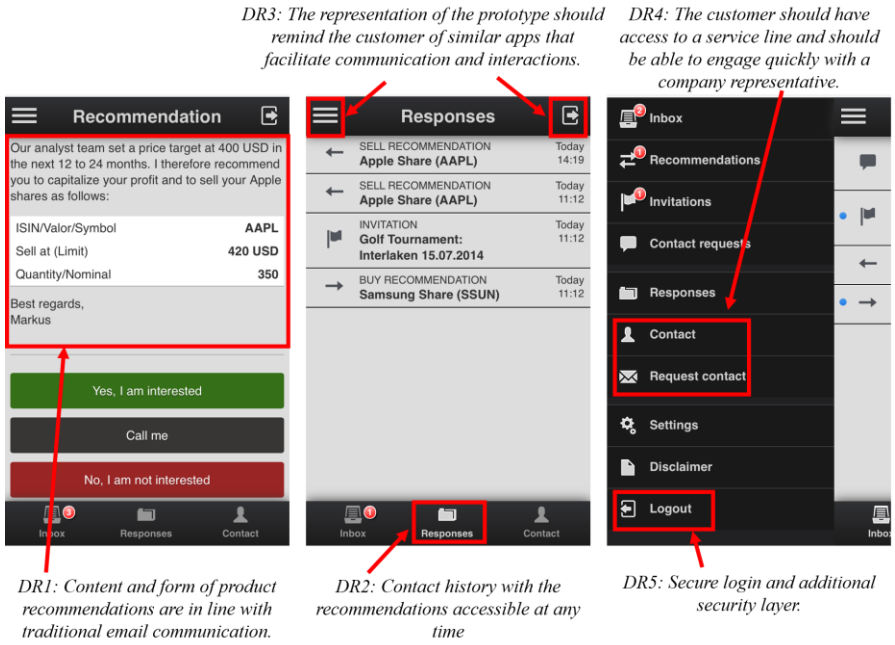

Fig. 1. Prototype for developing trust in financial advisory services (FAS)

4 Research Model and Experimental Evaluation

The evaluation of our prototype by means of an experiment constitutes a valid approach in the literature [30-31]. Such an experimental evaluation is particularly helpful for examining whether the DR have been successfully implemented in a physical artifact [32]. By doing so, we evaluate the usefulness regarding the utility and quality of the design artifact accordingly. Furthermore, we chose a controlled experiment, which supports us in validating specific DR [32] .

4.1 Participants and Sampling

We used a convenience sample for selecting experiment participants [7]. However, a convenience sample might be unrepresentative, which questions the external validity of the study. However, we argue that trust concerns different customer segments through all age groups and hence, does not affect the external validity of our study.

Our group consisted of 34 master students, whom we recruited from two universities in Switzerland. The average age of the student was 25, and ranged from 21 to 30 years. The students did not receive any form of remuneration for participating in the experiment. Most had limited knowledge regarding financial investments. However, most had previous experience with online or mobile banking platforms. We chose to recruit students as study participants, because we could not identify enough private banking customers who were willing to participate in such an experiment. In order to validate DR1 and DR2, we designed the recommendations according to the knowledge base of the students. We had access to a professional RM who helped us with the design of these recommendations. Furthermore, studies show that an increasing number of HNWI customers expect their banks to offer mobile banking solutions [33]. Hence, we would expect this customer segment, similar to the student sample, to have previous knowledge with online or mobile banking solutions.

Following the power analysis, we argue that the sample size of 34 participants is sufficient for this experimental evaluation [34]. According to the G*Power 3 calculation [35], following recommendations of previous studies [7], [11], we need a sample size exceeding 30 participants (effect size dz of 0.58, error probability α of 0.05 and test power $(1 - \beta)$ of 0.95).

4.2 Procedure of the Experiment

Regarding the procedure of our experiment, we randomly assigned each participant to two groups. The first group received the email treatment first, followed with the app treatment. The second group received the two treatments in reverse order. Overall, Group 1 and Group 2 evaluated both the app, as well as the email treatment. Hence, the sample size for each treatment was 34 participants. Each participant received a briefing as summarized in Table 1.

Table 1. Participant briefing

Guidelines	
Your bank	You are a customer with VentionFinance Wealth Management Limited
Your RM	Markus Becker is your personal RM
Your wealth	You have investable assets of approximately CHF 2 million
Your plans	Markus Becker knows that you are looking for real estate in Zurich
Your profile	You favor stocks, particularly technology stocks, and are risk-friendly
Your interests	You are an ambitious golf player

In the experiment, we compare the level of trust and of intended use between two different treatments. The first received three different recommendations consisting of a sell recommendation, a buy recommendation and an invitation to a golf tournament over a time span of 3 days. We sent this information to the participants by email. The second treatment received the same content, but, in this case, we distributed the information through the mobile app. Thus, we confirm that both the email as well as the app treatment fulfills DR1.

However, regarding DR2, only the app offers the potential to provide the contact history of all recommendations we sent out to the clients. In the case of the email treatment, it is the responsibility of the participant to archive the emails appropriately. Hence, we argue that email does not automatically meet DR2, in contrast to the app. The same applies to DR3; while the representation of the app corresponds to similar services, email communication does not necessarily provide such a similar representation. For example, when giving feedback on product recommendations, in the case of the app, the participant is able to respond by a simple push on a button, while in the case of the email communication, the user needs to reply manually and enter a personal message. From a technological point of view, such features could also be integrated into an email with HTML code. However, the RM might find it too time-consuming to incorporate such customizing efforts on a daily basis into customer interactions. Hence, we did not include such features in our email treatment. In our experimental evaluation, we conclude that the DR4 is only addressed with respect to the app communication. Finally, we also argue that the email treatment does not meet DR5. While the standard email app on a smartphone is directly accessible, our mobile app requires an additional security layer. In order for the customer to access the recommendations from the RM, he needs to enter a specific user name and corresponding password. Regarding DR5, we conclude that only the app meets this DR.

Table 2. Design requirements (DR) for the email and app treatments

Design requirements	*Email*	*App*
DR1: Familiar context and form of recommendations	x	x
DR2: Contact history of recommendations	-	x
DR3: Representation of the prototype similar to other apps	-	x
DR4: Easy and quick access to the RM	(x)	x
DR5: Login procedure and additional security	-	x

x = DR is fulfilled, (x) = partially fulfilled, - =DR is not fulfilled

In summary, the app treatment meets the proposed DR1-5. However, the email treatment only fulfills DR1 and DR4 partially. Based on these differences in meeting the DR for each treatment, we develop the hypothesis for our experimental evaluation.

First, the trust model of Gefen et al. [23] shows that knowledge-based familiarity (DR1), calculative-based transparency (DR2), institution-based normality (DR3), as well as institution-based structural assurance (DR4-5) have positive effects on perceived customer trust. Accordingly, we propose the following hypothesis: *H1: Customers perceive the FAS as more trustworthy when the RM communicates with the customer on a mobile app meeting DR1-5, rather than by email.*

Second, researchers also widely acknowledge the influence of trust on intention to use [8], [10], [21], [23],. Following this argumentation, we propose the next hypothesis: *H2: Customers who use the mobile app meeting DR1-5 display greater intentions to use than customers who use email.*

Finally, in order to validate the usefulness of our artifact, we propose a third hypothesis. We believe that the customer will be more satisfied with FAS on a mobile

app which meets DR1-5, than with email communication. This leads us to our final hypothesis: *H3: Customers display greater overall satisfaction with the mobile app meeting DR1-5 than with email.*

Table 3. Measurement model according to Gefen et al. [23]

		*Email Treatment**		*App Treatment**	
Code	*Item*	*M***	*SD****	*M*	*SD*
USE1	I would use email/the app to interact with my bank.	3.706	1.115	3.794	1.095
USE2	I am very likely to provide my bank with the information it needs through email/the app.	3.412	1.048	3.765	1.156
TRUST1	Based on my experience with email/the app, I think the bank is honest.	2.735	0.931	2.971	1.114
TRUST2	Based on my experience with email/the app I think the bank cares about its customers.	3.647	0.884	3.265	1.082
TRUST3	Based on my experience with email/the app, I think the bank is not opportunistic.	2.676	0.767	2.941	0.919
TRUST4	Based on my experience with email/the app, I think the bank provides a good service.	3.176	1.058	3.765	1.103
TRUST5	Based on my experience with email/the app, I think the bank is reliable.	3.294	0.719	3.294	0.905
TRUST6	Based on my experience with email/the app, I think the bank is trustworthy.	2.853	0.784	3.235	0.955
TRUST7	Based on my experience with email/the app, I think the bank knows its customer`s needs.	3.000	1.044	3.471	1.080
OS	Overall, I was satisfied with email/the app.	3.471	0.992	3.882	0.946

*Likert scale from 1= strongly disagree, 2=disagree, 3= neither agree nor disagree, 4= agree, 5, strongly agree, ** M=mean, *** SD=standard deviation

4.3 Measurement Model

For the experimental evaluation, we used the existing measurement model of Gefen et al. [23] regarding the constructs of "trust" and "intention to use". Table 3 contains the item codes for these two constructs, the item questions, as well as the mean and standard deviation of each item. We also included the single item construct of overall satisfaction, which is not part of the model. However, we also wish to compare each of the treatments with regard to this variable. Additionally, we used a 5-point likert scale ranging from 1 "strongly disagree", 2 "disagree", 3 "neither agree nor disagree",

4 “agree”, to 5 “strongly agree” in order to measure the items. Regarding items TRUST1-TRUST7, we adapted the formulation of the survey questions to the context of our experimental evaluation: We replaced “past experience” with “experience with email” and “experience with the app” respectively.

We utilized the partial least square (PLS) approach, a variance-based method in order to pursue a confirmatory factor analysis (CFA), because we had previous experience with such an approach. Regarding the PLS approach, we used the software SmartPLS 2.0 [36]. The literature provides guidance regarding the appropriate sample size for a CFA. Due to technical limitations, we could only register 34 participants for the mobile app. However, this relatively small sample meets the criteria expressed by researchers. The literature acknowledges that even small samples yields reliable results regarding a CFA [37]. In order to test our hypothesis, we applied one-sided t-tests. We chose IBM SPSS Statistics 21 for this approach.

5 Results

This section presents the results from the experimental evaluation. First, we conducted a CFA and consequently dropped some of the items that had insufficient loadings. Items TRUST1-3 and TRUST5 had indicator ladings below the threshold of 0.7. As we incorporate various reflective item measurements, we also checked our cross loadings. For each of the remaining items, the cross loadings were smaller than the indicator loadings. We also analyzed the average variance extracted (AVE), the composite reliability and the indicator loadings, which we present in Table 4 for the email and in Table 5 for the app treatment. For both treatments, we confirm that our values are well above the recommended thresholds. Our AVE for trust is 0.653 for the email and 0.682 for the app treatment (>0.5). The same applies to the intention to use construct; 0.807 for email and 0.692 for the app. With respect to composite reliability, our values for trust are 0.849 for the email and 0.865 for the app treatment (>0.6). The composite reliability for the intention to use construct also exceeds the threshold, with 0.893 for the email and 0.817 for the app treatment. Moreover, all our indicator loadings are above 0.7, with the smallest loading of 0.777 for item USE2. The t-stat of our outer loadings are significant with p-values lower than 0.01 for all remaining items. Finally, regarding the Cronbach’s Alpha value, we report significant values (>0.6) for all constructs with one exception; intention to use for the app treatment falls slightly below this threshold. Because the difference is minimal and only affects one variable of one treatment, we still ran our analysis with the data set at hand.

Table 4. Factor loadings of the constructs for the *email treatment*

Construct	*AVE*	*Cron-bach's α*	*Comp. Rel.*	*Items*	*Outer Loadings*	*Outer Loadings (t-stat)*
Trust	0.653	0.741	0.849	TRUST4	0.825**	8.150
				TRUST6	0.782**	5.846
				TRUST7	0.814**	6.549
Intention to use	0.807	0.769	0.893	USE1	0.937**	14.277
				USE2	0.858**	6.070

**significant p-value <0.01

Table 5. Factor loadings of the constructs for the *app treatment*

Construct	*AVE*	*Cron-bach's α*	*Comp. Rel.*	*Items*	*Outer Loadings*	*Outer Loadings (t-stat)*
Trust	0.682	0.766	0.865	TRUST4	0.858**	13.459
				TRUST6	0.761**	6.993
				TRUST7	0.854**	18.218
Intention to use	0.692	0.563	0.817	USE1	0.883**	18.768
				USE2	0.777**	8.281

**significant p-value <0.01

Subsequently to the CFA, with a one-sided t-test, we compared the constructs of trust, intention to use and overall satisfaction between the two treatments. By doing so, we validated the proposed hypotheses 1-3. Table 6 shows the results of the one-sided t-test. With regard to H1, we observe a difference between the email and app treatment. The participants perceive communication with the bank and the FAS with the mobile app as trustworthier than with email. The t-stat of 2.543 results in a p-value smaller than one percent.

Table 6. Results from a one-sided t-test

Construct	*Email Treatment*	*App Treatme*	*t-stat*
Trust	M=2.996, SD=0.768	M=3.488, SD=0.865	2.543**
Intention to use	M=3.560, SD=0.976	M=3.780, SD=0.937	0.917
Overall satisfaction	M=3.471, SD=0.992	M=3.882, SD=0.946	1.721*

*significant p-value <0.05, ** significant p-value <0.01

Furthermore, we also confirm H3. The participants expressed greater overall satisfaction with the mobile app than with email. The t-stat of 1.721 results in a significant p-value of less than five percent. Regarding H2, intention to use, the results are not significantly different. Hence, in this study, we do not confirm that future intention to use differs between the mobile app and email. The t-stat of 0.917 illustrates a p-value, which is larger than 15 percent.

6 Discussion

In the previous section, we reported positive results regarding H1, which indicates that participants trust the mFAS more when communicating through the mobile app than with email. However, we dropped some of the items in the CFA. When examining Table 3, the item TRUST2, which we dropped in the CFA, provides new evidence. That is, participants report that they think their bank cares more about them when the RM sends emails rather than communicating with the app. Hence, despite promising findings regarding our t-test analysis, we need to relativize our findings regarding H1. It is not entirely clear, whether the app performs better than email, when it comes to developing trust in the mFAS.

With regard to intention to use, the mobile app did not lead to significantly better results than email communication in our t-test. Despite the thoroughly researched relationship between trust and intention to use for e-commerce or mobile and online banking services [8], [10], [21], [23], we could not confirm this in our study. Only with regard to OS do the results show that the participants were more satisfied with the app than with email.

So why do our results indicate mixed results for H1 and H2? We believe that this might be due to the following reason. Email communication is still the most dominant form of exchanging formal documents and information with an organization, such as a bank. Despite overall higher satisfaction with the app, participants still prefer the existing status quo. Kang et al. [9] point out similar limitations in their research and were not able to predict intention to use, based on overall satisfaction. We further believe that this change from email to app communication requires comprehensive transformation. In order for banks to change this customer behavior, specific incentive structures for customers are required.

Furthermore, we did not measure perceived ease of use and usefulness in our study. Besides trust, Gefen et al. [23] also used these two constructs as predictors for intention to use. Hence, email communication might still be an easy way for interaction with a RM, especially when compared to a mobile app, which needs to be installed beforehand.

7 Conclusions, Limitations and Future Research

The aim of this study was to design and evaluate a prototype of a mobile app, intended to develop trust in mFAS. In particular, this mobile app should ideally lead to

greater trustworthiness, satisfaction and intention to use than email communication. In order to achieve this, we derived DRs from the trust literature, designed the prototype accordingly and conducted an experimental evaluation with 34 participants. Our experimental evaluation of the prototype suggests that participants perceive greater overall satisfaction with the mobile app designed according to the proposed DR. With respect to trust and intention to use, the results and findings provide a more mixed picture. In the previous section, we discussed that this might require changing customer behavior. Moreover, customers tend to favor the status quo, so that the adoption process requires time.

Practitioners should note that an app does not necessarily lead to better results than well-established email communication. As mentioned in the previous section, practitioners should be especially careful with regard to the installation and registration of such a mobile app. We believe that a cumbersome registration process led to a lower intention to use comparing the app with email.

This study also has some limitations. For technical reasons and restrictions from the mobile app, we were not able to extend our sample size. Hence, despite meeting the recommendations of the power analysis [34], [38] and a random allocation of participants to each treatment, a large sample size would further increase the external validity of our findings. Consequently, we might also be able to improve the quality criteria in our CFA, for example, to improve the Cronbach's Alpha value for one of the constructs.

Regarding the experiment participants, we chose students as proxies for private banking customers. Despite the fact that such students are younger and do not possess much wealth, we believe that the participant group should be able to assess a mobile app regarding the usefulness of our artifact. Moreover, our proposed DR are quite generic. For example, we suggest that structural assurance should be supported with a secure login procedure. However, we did not discuss any details as to what this login should look like and what kind of technology should be used (password, voice authentication or fingerprint scanner, to name just a few). In order to further validate the findings in a practical setting, we recommend that practitioners and researchers further specify the requirements with various iterations in their future research endeavors. Furthermore, it might also be interesting to evaluate our findings for a different customer segment, e.g. for retail banking clients. Finally, we only incorporated customer perceptions in this study. However, other studies [26] suggest that the perspective of the RM plays a significant role. If the client RM is not "on board", he will most likely not recommend his clients to use such a new service. Hence, future research should also take into account the perspective of the RM.

Acknowledgements

We would like to thank Dr. Manuel Thomet from *additiv* for providing us with the prototype in the experimental evaluation. Furthermore, our thanks also go to Torben Küpper for his help with the data analysis as well as to Brian Bloch for his comprehensive editing of the English.

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