Elicitation of Requirements for the Design of Mobile Financial Advisory Services – Instantiation and Validation of the Requirement Data Model with a Multi-Method Approach

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Abstract

The mobile channel is becoming more vital for the private banking customer segment. Recent studies suggest that mobile will even become a key differentiator for private banks in the ever-increasing competitive environment. This study elicits requirements for the design of a mobile financial advisory service (mFAS) by instantiating and validating the Requirement Data Model (RDMod). In order to achieve this goal, we chose a multi-method approach conducting ten expert interviews, four focus groups and a literature review. The findings suggest a list with ten customer and stakeholder, two process, two environment as well as two bank requirements. Furthermore, we contribute to existing theory by instantiating the RDMod with a feature-based evaluation.

1. Introduction

Since the beginning of the economic downturn in 2008, private banking has substantially suffered from a reputational damage, which led to poor customer trust [37]. One of the major customer concerns is the principal-agent issue [14]: This phenomenon involves information and interest asymmetries between the relationship manager (RM) and the customer [34]. The RM might pursue short-lived and individual goals such as increasing his own profits to the detriment of his clients.

By providing proactive and aggregated information on financial products, banks try to address this challenge. For example, a large bank in Switzerland will launch a new service called “E-Private Banking” in 2014, which should provide more transparent advisory services [6]. Moreover, customers become more demanding also with regard to digital service delivery [1]. According to a recent private banking survey by PricewaterhouseCoopers [37] client interactions through the mobile channel will grow from 13% in 2013 to 60% in 2015. KPMG reports similar figures: 60% of the consulted experts from private banks believe that by the year 2022 mobile will become a key differentiator for advising customers [19].

By introducing a mobile FAS (mFAS), such as a native app or a mobile website, private banks meet their client expectations with regard to reachability as well as quality of such services, and address the problem of information asymmetries [19,37]. Moreover, recent studies show that a shared interface on a mobile app may facilitate a more transparent information exchange and thus may address information as well as interest asymmetries [31,38].

The design of such a mFAS, however, is complex: it not only consists of hardware components (tablet or smartphone), but also of software (applications), the service (FAS) and product components (financial investment products). The literature refers to such a solution as “product service system” or “hybrid product” [4,27]. Scholars state that the literature on designing hybrid products, in particular the requirement elicitation process (RE), is still in its infancy [3,4]. Thus, the aim of this research paper is to contribute to the existing body of knowledge by instantiating and validating the Requirement Data Model (RDMod) by Berkovich et al. [4] with a multi-method approach. We elicit and analyze requirements from expert interviews, focus groups as well as a literature review. In order to achieve this goal, we define the following research question: What are the requirements for designing mobile financial advisory services (mFAS)?

We structure this research paper as follows: section 2 covers related work. After introducing the multi-method approach in section 3, we present the findings of the RE process in section 4. Subsequently, we conduct a feature-based evaluation and consolidation of the requirements in section 5. Finally, section 6 covers the conclusion as well as the theoretical and practical contribution of this study.
2. Related work

2.1. Mobile financial advisory services (mFAS)

The delivery of mobile services is a critical demand for banks as customers become more demanding and have new expectations [28]. Recent studies addressed tablet-supported FAS [31,32]. We build on this existing body of knowledge and gather specific requirements for a mFAS, which also allows for location-independent client interactions.

Nussbaumer et al. [31] and Möwes, Puschmann and Alt [28] emphasize the importance of focusing on specific customer segments, e.g. retail, corporate or private banking customers, when it comes to designing such new services. Within this paper, we target the high-net-worth (HNW) customer segment with an investment sum of more than $1 Mio.

A mFAS that serves this HNW customer segment is a novel artifact and there is a lack of a consolidated list of requirements for the design of such a solution. Within this study, we address this gap and elicit requirements for a mFAS.

2.2. Requirement Data Model (RDMod)

The design of a mFAS for the HNW customer segment includes various components, such as the application and software, but also the hardware components (e.g. tablets or smartphones) as well as financial investment products. The literature refers to such a bundle of hardware, software and service components as "hybrid products" or "product service systems" [15,27].

The requirement elicitation (RE) process is vital for the successful design and implementation of such a hybrid product [8,22,41] and needs to involve all relevant stakeholders [21]. However, the existing literature in the domain of product, software or service engineering falls short in covering RE for hybrid products [3]. Thus, in order to address this gap, Berkovich et al. [4] provide a structured model, the Requirement Data Model (RDMod). This RDMod covers five layers, which guide the practitioners and scholars in gathering requirements for hybrid products.

(1) Goal level: Two distinctive views pose the starting point for the RE process. First, the hybrid product, in our case the mFAS, should solve real-world customer problems. Second, such a new solution should also add value to the service provider, in our case the bank.

(2) System level: Requirements on the system level are generic, solution-neutral and represent expectations of the stakeholders and how the hybrid product is utilized in the respective environment [4]. Differentiating between the four different stakeholders on the system level supports a more structured RE process:

- **Customer:** This stakeholder includes requirements from the customer and customer-related stakeholder such as the RM.
- **Business process:** The development of a hybrid product should also consider existing business and customer processes such as the FAS.
- **Environment:** Requirements with regard to the environment include the market, society, organization, laws or technological standards. We need to consider these factors in the RE process as well.
- **Service provider:** Similar to the requirements from the customer and other stakeholders, the service provider also expresses specific requirements. In our case, this is the view of the bank. Such requirements might arise from different departments within the organization, e.g. finance, accounting or marketing.

(3) Feature, (4) function and (5) component level: Having collected generic stakeholder requirements on the system level, the requirements engineer can continue with concretizing requirements in a system design. In order to do so, the requirements are further specified in product-, result-, process- and resource-oriented requirements.

However, the scope of this study is to elicit general requirements from various stakeholders on the system level. Hence, we apply and validate the second layer, the system level of the RDMod.

3. Method

3.1. Requirement elicitation (RE) process

We chose a multi-method approach for eliciting and analyzing requirements. According to scholars and practitioners this is critical for a successful RE [23,41]. Furthermore, such a multi-method approach qualifies for real-world and complex situations [26] and allows us to prioritize the requirements [30].

3.1.1. Expert interviews. Interviews are among the most popular techniques for RE [3,39,41] and also in IS research for gathering rich and qualitative data [29]. We chose a semi-structured approach in order to adapt to each stakeholder individually. In total, we conducted ten interviews. We interviewed the
following stakeholders: project sponsor (INT01), senior consultant (INT02), social media manager (INT03), investment advisor (INT05), relationship managers (INT04, INT08, INT09) HNW customer (INT06), independent investment advisor (INT07), and a decision maker (INT10). This selection of stakeholders from different banks in Switzerland including a HNW customer is a comprehensive and representative sample for gathering preliminary requirements.

First, we asked questions with regard to the individual role of each interviewee and his or her personal goals (What is your role within the company? What kind of goals do you have in your job?). Second, we continued with questions related to the FAS (What are your personal requirements for a mFAS? What are the requirements of other stakeholders within your company, e.g. customers, business processes, environment or the bank?). Third, we led an open discussion (What do you think makes a mFAS successful? What have we not talked about yet that you think might be important for designing such a service?).

The duration of the interviews was between 45 and 75 minutes. We transcribed each of the interviews and put the data into a database. Two of the authors applied in vivo codes individually and consolidated the findings in a workshop according to standards for qualitative data analysis [25]. We used ATLAS.ti software for the coding process.

3.1.2. Focus groups (FG). Parallel to conducting interviews, we also organized focus groups (FG). Farinha and Silva [11] argue that FG utilize synergies among the participants and solve some of the communication challenges with regard to RE.

Moreover, in order to facilitate the discussions, we built preliminary mock-ups and wireframes. Such a prototyping approach is widely acknowledged for the RE process and is especially useful in FG [41] and should also stimulate the discussion [11]. Overall, we conducted four FG. Each group consisted of homogeneous stakeholders with regard to their job role, which distinguishes the approach from other group sessions or workshops [20].

FG1 and FG2 consisted of project managers, sponsors and project members. This team currently gathers requirements for designing a mobile platform that should facilitate the communication between RM and customers. Within FG1, there were four people present, for FG2 a total of eight people. FG3 involved investment advisors who support the RM in FAS. For this session, three investment advisors were present. Finally, within FG4 we gathered requirements from six RM.

3.1.3. Literature review. We applied the framework of vom Brocke et al. [7] for the literature review in this study. As we are interested in requirements for mFAS, we conceptualized the topic and derived various search strings. We combined “requirement*” with the following other keywords: “financial plan”, “financial service”, “financial advisor”, “financial advice”, “mobile banking” and “online banking”. We were interested in identifying as many papers as possible. Hence, we considered both the “basket of 8” [8] as well as other peer-reviewed papers from the following databases: SpringerLink, IEEE Xplore Digital Library, EBSCOhost and AIS Electronig Library (AISel). We only included papers published since 2000 in this review. By looking at the title and abstract, we selected 67 of 2966 papers that appeared in the search. Having read the 67 articles including a backward search, we identified 14 papers, which we used for the RE.

3.2. Feature-based evaluation

Within this paper, we instantiate the RE process applying the RDMod from Berkovich et al. [4]. In order to validate the elicited requirements, we conduct a feature-based evaluation and content analysis [24]. In order to do so, three authors analyzed the elicited requirements and consolidated the findings in a workshop. We applied the quality criteria provided by the IEEE recommended practice for software requirements specification [16]: Thus, the elicited requirements should be correct, unambiguous, complete, consistent, ranked for importance, valid and current, verifiable, modifiable as well as traceable.

4. Results and discussion

We structure the results from the empirical data collection and the literature review in customer and stakeholder, process, environment and bank requirements according to the RDMod [4].

4.1. Customer and stakeholder requirements

Ease of use: This requirement was widely acknowledged by the experts in the interviews, by the FG participants as well as by scholars [10,17]. A representative statement from FG3 was the following: “We need to do it like Apple: if my grandmother cannot use it, neither can the RM nor our customers...” Moreover, the login procedure on the mobile device is critical when it comes to

1 Basket of eight: http://aisnet.org/?SeniorScholarBasket
usability (FG4): “...a single sign-on is essential...” Finally, INT08 emphasized the importance of simplicity: "...the RM and the customer are not IT experts; it just needs to work...”

**Access to experts:** Customers demand a single point of contact for the day-to-day interactions. However, the RM should have easy access to a wide network of financial experts who support him with the decision-making process. Thus, the RM has the function of an information hub (FG3): “I think it would be better if the customer is able to interact with other experts through the RM. Otherwise, the experts receive too many contact requests...” The high reachability of the RM poses a customer requirement too (INT07): “For the RM such a platform is great: he is only a click from the customer away...” However, in order to provide the customer with knowledge and insights from professional financial investment advisors, it will be critical to get these experts to participate in the platform (FG4): “The most important thing for us is that we get our experts to participate in the platform...”

**Proactive information:** As a next requirement we identified timely and proactive information [28,36]. The HNW client is interested in upcoming events on specific financial topics. Furthermore, he or she appreciates to receive reminders by push notifications or pop-ups (INT06): “I would like to receive reminders before an event starts. Pop-ups are a nice way to do that.” With regard to financial information, the RM and experts need to be able to anticipate future trends and topics (FG4): “...the experts need to anticipate... the information needs to be relevant for specific customer segments. The experts should also proactively create threads on the platform...” INT10 confirmed this with the following statement: “...we need to be able to send out updates to our customers... our research has just reevaluated the stock and we recommend you to proceed as following...”

**Information quality:** According to FG3, the content, which the RM and experts provide on the platform, needs to be valuable and timely: “...content is absolutely critical...” The decision maker explicitly confirmed this statement (INT10): “...the most relevant and timely information needs to be available at my fingertips...” INT01 even states that the information quality becomes a differentiator for banks: "We cannot differentiate us from other banks with functionalities but with more valuable information..." Due to many information portals and sources on the internet, customers are well-informed [2] and expect the bank to aggregate and consolidate information, which is relevant for them (INT08): “I observe that customers are much better informed than 10 years ago...” INT10 mentions the need for aggregated information: “There are a thousand websites that provide information on the Twitter IPO. Our job is to aggregate and present this information so that it is relevant for the customer.” Scholars also agree and emphasize the importance of individual and personalized information that such a platform should provide [9,17,28]. Finally, FG4 discussed the necessity of dashboards on the start screen, which should contain this relevant information: “Information, which appears on the start screen, needs to be relevant and actionable for the customer...”

**Customer insights:** One of the vital requirements for the RM is to learn as much as possible from the client’s interactions (FG4): “It would be very valuable for me to get notified what events my customers attend...” In addition, INT10 mentioned the following: “...when the RM logs into the system he needs to get notified about everything the clients have been up to...” Furthermore, INT03 provided the following statement: “We get more and more information and we understand our customers better when they express their opinions and views. Community intelligence is very important to us.” These customer insights allow for more personalized FAS [12,17]. However, it is equally important that the customer is aware of the fact that his customer behavior is tracked and analyzed [9]. Thus, banks should inform their clients what kind of information they collect.

**Support for organizational tasks:** The mFAS should support the RM with various organizational tasks. Especially when it comes to legal and compliance issues, it takes a lot of time out of the RM’s day (INT08): “As a RM I need to write protocols after each meeting. If the platform supports me in doing that, that would be great...” Other organizational requirements from the RM’s perspective are file sharing, exchanging documents, managing tasks and setting reminders (FG3): “...it is very important to us that we are able to communicate, exchange documents, data, slides as well as videos...” INT08 mentioned task management and reminders: “A real added value of such a platform would be the task management and setting reminders... if the customer sends us a message, we need to react as quickly as possible...”

**Situational use and platform independence:** Another requirement is the platform independence (INT01): “We will develop a mobile version first and will provide a HTML5 version, which supports all prominent operating systems and devices.” The literature also acknowledges the openness of a system as a requirement [18,28,36]. Moreover, when it
comes to situational use, a requirement is to support cross-border client relationships (FG3): “…if I want to explain something to a client from South Africa, such a platform might be very handy…” INT09 also stated the usefulness of such a mFAS for geographically dispersed teams: “For long-distance customer relationships such a platform might be very useful…” With regard to client expectations, INT04 stated that customers tend to expect their banks to offer services anywhere: “…at least for my generation around 40 or 35, they do not want to go to the banks…” According to the literature, location-independent services are also a vital requirement [28]. Moreover, scholars confirm that the usefulness of a mobile solution is highly dependent on the context of its use [5].

Social presence: With respect to social presence, meaning rich personal communication [13], the empirical analysis showed two distinctive requirements: social presence for interactions between the RM and the customer as well as for peer-to-peer communication [17,35]. For social interactions with the RM, the findings of this study are ambiguous. While the HNW client (INT06) stated he would appreciate talking to his RM through a live video chat, other experts in the FG3 were more skeptical: “There is no need for one-on-one videoconferencing… neither the RM nor the customer are keen on being video recorded…” Other experts also mentioned that it is not the media, which makes an interaction personal, but the content (INT02): “It is not the media, which makes the interaction personal or sociable, it is the information itself.” Moreover, tools like screen sharing or co-browsing might be the value-added features rather than just transmitting a video of the person (INT04): “I think in terms of interactions not only that sort of face-to-face contact, but more using the tools available, that would be the value added.” FG1 discussed the newsfeed, which should facilitate a more transparent interaction with the RM: “Social features are important for such a platform, especially the communication feed, which contains the information exchange between the customer and RM.” With respect to social presence in peer-to-peer interactions, the findings are also unspecific (INT01): “I know other banks do it, but we do not want that customers interact with other customers. That is not within the scope of our project.” On the other hand, FG2 concluded that customers might find it beneficial to connect with other peers that they already know: “…peer-to-peer connections are only important for people that know each other and from well-established existing relationships.” Expert INT07 and the literature [12] remark that peer benchmarks are an important requirement: “…what is the performance of a typical customer and of my peers? That would increase customer trust…” Such benchmarks gain relevance when the RM needs to legitimate a difficult year and declining returns in the customer’s portfolio. Another interesting peer-to-peer feature came up in the interview with INT03: “Videoconferencing is also very interesting for events … If we could have something like Google Hangouts that supports groups, we could discuss topics and questions with an expert … that would create real added-value to the community.” FG1 and FG2 confirmed the importance of such webinars or online events.

Traceability of decisions and transparency: Another customer requirement suggests traceability and transparency of investment decisions [2,9,31,33]: There should be a protocol of the information exchange between the RM and the customer. Videos, phone calls as well as chat feeds should be accessible by both the customer as well as the RM (INT04): “…you could say, as of 2 o’clock this afternoon you have mentioned you wanted to buy 200 shares and you agreed… yes lets go forward with the deal.” Moreover, the recommendations the customers receive from the RM should relate to the predefined investment strategy according to Felfernig & Kreutl [12]. INT07 mentioned the following: “… does the product fit into the portfolio? Is the recommendation consistent with the defined investment strategy?” INT02 even said that he would provide the customer with the same access to tools and data as the RM: “We should not only provide the RM with advisory tools, but also the customer… maybe the customer does not trust the RM, but he trusts an application.” However, the general tendency of all expert interviews was the following (INT01): “…the customer shouldn’t just click on a few buttons and hit the buy button. That is not our intention.” Thus, the customer should always check with the RM in order to go forward with a particular trade. Furthermore, the mFAS consist of self-service elements, but the personal interaction with the RM is still vital for a long-term and successful relationship [33]. Regarding cost transparency, despite the fact that scholars vote for such a requirement [31,32], INT08 also expressed some concerns: “I am not sure if the customer really benefits from knowing how much the bank earns with each trade… at some point, banks need to make money and if not by commissions then in some other way…”

Mitigation of privacy concerns: Private banking is all about discretion and privacy. Thus, it is vital for the customer that third parties cannot intercept the information exchange between the RM and the
customer (INT10): “As a bank you need to make sure that nobody is able to eavesdrop on the client interactions on such a platform...” Hence, scholars argue that a secure user authentication and login is an essential requirement [18,35]. Yan et al. [40] refer to this requirement as structural assurance, which supports customer trust. Moreover, the customer should always be in control of what personal information he shares [17] and he should be able to easy and quickly change his personal preferences (INT01): “You would probably also not trust an application, which does not ask you to access the GPS sensor of your smartphone...” FG2 concluded the following: “We should allow the customers to change their privacy settings easily... let the customer decide what kind of information is accessible by the RM and the bank...”

4.2. Business processes requirements

Guiding the financial advisory process: According to the RDMmod, we also gathered requirements with regard to existing business processes in FAS. For this artifact, the compliance rules for the existing advisory process pose a first requirement (INT01): “...the financial advisory process consists of several process steps and the RM needs to stick to each one of them... the onboarding process, for example, involves about 10 to 20 different documents that need to be signed and archived...” Not only from a compliance perspective, but also from a usability angle this is a requirement, which should support the RM in advising his clients (INT07): “The financial advisory process should be visible for the RM and the customer on the platform like a ticker...” Scholars also confirm the importance of this link to the formal advisory and business processes [12,17].

Powerful backend systems and bulletproof technology: Providing customers with valuable insights and proactive information also results in requirements with regard to the IT infrastructure (INT01): “The platform needs to be connected to powerful data warehousing applications. We need to be able to mine customer data in order to provide timely and proactive information.” If banks consider implementing video chats, screen sharing, and content rich collaboration in general, the necessary IT resources need to be reserved as well (INT09): “...video calls and screen sharing require for us to reserve IT resources... we also might invest in new devices for our RM, tablets for example...” Finally, INT10 mentioned that the bank is not allowed to make any mistakes when it comes to technological implementation of such a mFAS: “...we cannot make any mistakes when it comes to technological aspects, the platform needs to be absolutely bulletproof...” Scholars confirm this requirement of technological stability as well as of the powerful backend system [12,17,40].

4.3. Environment requirements

E-Learning concept: When looking at requirements from the environment, we identified the need for educating RM on legal and regulatory aspects (INT08): “...an e-learning concept for the RM is absolutely vital... RMs need to attend courses on a regularly basis. If the platform supports that process, that would be a real value-added feature for the bank to save costs and time for the RM because it is convenient to do that online.” The data collected from FG as well as the literature review did not address this requirement.

Bandwidth and performance of devices: When talking about video chats and screen sharing applications, not only the internal IT infrastructure, but also the bandwidth of the client needs to be powerful enough (INT09): “...if my client lays on the beach in Guatemala, the internet connection might become a problem...” Thus, the bank needs to make sure that the client can only use rich media communication elements if the device and the bandwidth are sufficient. Moreover, the bank needs to make sure that the data transfer is efficient and optimizes the data packages, which are sent to and received by the customer [9,36]. Otherwise, it will result in poor user experience and satisfaction.

4.4. Bank requirements

Compliance and red flags: The compliance topic is also an important requirement from the bank’s perspective. Unauthorized cross-border interactions with clients may result in severe repercussions and lawsuits. Thus, INT08 made the following statement: “...if the RM wants to close a deal with his client, he gets a notification; I have to do this and that in order to be compliant...” In order to manage this complexity, the bank needs to provide the RM with appropriate tools (INT05): “...the business gets more complex every day and the RM needs to receive appropriate tools and support...” For finalizing trades and deals, the RM ought to have a formal confirmation. Hence, the bank should take measures in order for the RM to be able to close deals on the platform (INT04): “...you need to get a confirmation that your client really wants to do that and that you can go forward with the trade.”
Table 1. Requirements for the design of a mobile financial advisory service

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<td>Social presence</td>
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1: I=expert interviews, F=focus groups, L=literature review.

Integration of customer relationship management (CRM), communication and research: An important subject that came up during the expert interviews was the functionalities of the mobile platform. By integrating too many features, the mFAS might become too complex and lack usability. Thus, INT05 clearly voted for separating the transactional system from the mFAS: “...transactions should not be executed on such a platform, but the advisory process and lead generation should.” INT01 stated that such a platform ought to consist of three key elements: the CRM system, the communication and collaboration platform as well as the research information: “We have valuable research information, a CRM system, and if we add mobile to the picture it gets too complex. We need to integrate these systems on a single platform for our customers and for the RM.” Both FG1 and FG2 confirm these notions and vote for merging the CRM system with such a platform: “The CRM system is not linked to the communication platform, which is a huge challenge with respect to data quality...” (FG1) “Today, we use different media, e-banking portal, email phone calls and so forth... somehow we need to integrate these communication streams on a single platform.” (FG2)

Table 1 summarizes the results from the interviews, FG as well as the literature review.

5. Consolidation of requirements and feature-based evaluation

Within this section, we discuss and validate the requirements with a feature-based evaluation according to the requirement specification criteria [16]. Three authors have independently analyzed the requirements. Subsequently, we discussed the various criteria in a workshop.

Correct: We validated the proposed requirements presented in table 1 with at least two different independent data sources (expert interviews, FG or literature review) with only two exceptions: The requirements “e-learning concepts” as well as “compliance and red flags” were only mentioned in the interviews. Besides this limitation, we argue that the elicited requirements are correct.

Unambiguous: The results section of this paper presented the findings and grounded each of the requirements with a direct quotation to the data source. The detailed elaboration of each of the requirements in section 4 guarantees that the stakeholders understand the elicited requirements universally.

Consistent: We provided a detailed analysis of each requirement in the previous section and verified that the requirements are consistent. However, within some of the requirements we collected contradicting findings, which scholars and practitioners need to discuss in further detail. With respect to social presence and communities, for example, we discovered the following evidence: While some of the experts are keen on implementing features, which allow customers to build communities and interact with other customers, other experts declined this requirement and expressed their concerns. Another inconsistency arose with regard to video chat and videoconferencing: The HNW client regarded videoconferencing as a value-adding feature. However, other experts did not agree with this and expressed their reservations.

We also observed some ambiguity when it comes to cost transparency: While the literature widely confirmed cost transparency as a requirement for FAS, one interviewee was skeptical. Thus, besides these limitations, the elicited requirements are regarded as consistent.

Modifiable: With this criterion, we evaluate whether each of the requirements can be implemented by practitioners and thus can be further
specified along the requirements engineering framework. With the introduction of the system design and first prototypes, practitioners are able to validate the presented requirements in table 1. Thus, we can confirm that the requirements are indeed modifiable.

**Traceable:** As we only elicited requirements on the system level of the RDMod, we cannot validate the requirements with respect to traceability. Going forward with requirements specification, practitioners need to address this criterion by linking each requirement to the system level.

**Complete:** We gathered data from multiple data sources: expert interviews, FG as well as the literature review. Thus, we elicited requirements for the mFAS that should be complete and exhaustive. However, by extending the data sources or by eliciting requirements from other companies, we might have gathered more insights. Thus, we cannot confirm that the presented requirements are entirely complete.

**Ranked for importance:** A practitioner may prioritize a requirement that is grounded in multiple data sources. For example, “proactive information” and “information quality” are each derived from expert interviews, the FG as well as the literature review. Other requirements, however, were only confirmed by two independent sources. Furthermore, the categories allow the requirements engineer to rank the requirements for each stakeholder group individually. Thus, we confirm that the requirements presented in table 1 are indeed ranked for importance.

**Valid and current:** We conducted the data collection process between January and May 2014 and addressed practitioners who have extensive industry experience in the private banking business. Hence, we also confirm that the requirements are valid and current.

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<th>Table 2. Validation of the elicited requirements</th>
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</table>

\(x=\) confirmed, \((x)=\) partially confirmed, \(-=\) not confirmed

Table 2 summarizes the feature-based evaluation. We were not able to confirm the traceability of the presented requirements due to the limited scope of this study. Furthermore, we discovered some inconsistencies with respect to the requirements. We also only partially confirmed the completeness and correctness of the requirements. Besides these limitations, we meet the criteria from the IEEE recommendation of practice and thus argue that we have successfully instantiated the system level of the RDMod in this article.

### 6. Conclusions

The goal of this study was to elicit requirements for a hybrid product, in particular a mFAS targeted for private banking customers. We chose a multi-method approach conducting expert interviews, FG as well as a literature review for instantiating the RDMod. We contribute to the existing literature by successfully validating the elicited requirements according to the IEEE recommendations for requirement specification. Hence, we confirm that the RDMod was indeed useful to elicit requirements for the mFAS on the system level.

Not only scholars, but also practitioners can draw some useful conclusions from these findings: In total, we elicited and consolidated ten customer and stakeholder, two process, two environmental and two bank requirements. This list of requirements should guide practitioners in designing mFAS.

With regard to these findings, our investigation has some limitations. Besides having instantiated and validated the RDMod on the system level with a feature-based evaluation, the model should be further evaluated along the requirements engineering process with empirical findings from interviews or surveys. Moreover, despite the fact of having gathered data from multiple sources and stakeholders, we should further extend and prioritize the proposed requirement list. This should address the correctness, completeness and consistency criteria, which we were able to only partially confirm in this study. Regarding the requirements engineering criteria, we also encountered inconsistencies with respect to social presence and cost transparency. In particular, future research projects should further evaluate whether videoconferencing in one-on-one interactions with the RM poses a requirement. The same applies for communities, peer-to-peer customer interactions and cost transparency.
7. References


