Using Design Thinking to identify banking digitization opportunities
Snapshot of the Hungarian banking system

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Abstract

In our research, we used Design Thinking and our "One Week Sprint" methodology to identify digital transformation opportunities for the Hungarian banking sector. Our main findings can be grouped to three main areas: (1) the changing role of branches (2) online, mobile and phone-based services and (3) products and services. The compound of customers is quite heterogeneous in age, education or income status for all banks in our research, therefore, the possibility of generalization of problems and possible solutions is limited. A major challenge for banks is that they need to think up to 20-30 customer segments, and offer services with which can serve the needs of other segments – so generic enough to meet more segments' needs. Of course, the strategies of banks may differ in the targeted segments; however, banks with general strategy can be dominated by competitors concentrating on a niche strategy, or a FinTech, for example, with the widespread application of digital solutions.

Keywords: Digital Transformation, Design Thinking, One Week Sprint, Banking

1   Introduction

Although the banking industry is a traditional and conservative industry, it has to follow the required changes of digital transformation. Although the banking industry is heavily dependent on technological solutions, this change is not encoded in the genes of the banks. Moreover, identifying possible digital developments is harder, than the banks think.

The goal of our research was to analyse to identify customer challenges of Hungarian retail banks, to develop and to test digital ideas to address these challenges. For this research, we were collaborating with seven Hungarian banks, and analysed both online

and offline customer challenges. The goal of this paper is to overview the related concept in the literature, and present the results of this research.

2   Related concepts

The goal of this chapter is to analyse the current challenges of digital transformation, presenting the challenges of the banking industry, and analysing how customer centric digital innovations can be delivered.

2.1   The challenge of Digital Transformation

Digital developments were traditionally dedicated to the responsibility of IT Departments. Although the alignment between business and IT goals was a never-ending discussion of both practitioners and researchers (Henderson and Venkatraman, 1993; Renaud et al (2016); Kahre et al, 2017), the leading role of organizational IT was not really questioned, and outsourcing of IT services usually arose mostly in operational issues.

By now, the exclusivity of developing new IT services, and delivering digital innovations has loosened, mainly because of the following reasons:

- As digitization reached business departments, the requirement of IT knowledge, and IT savvy employees became vital of organizational success (Weill and Aral, 2006). Therefore business leaders and employees had to acquire digital skills, so IT departments' knowledge monopoly is under demystification.
- As Software-as-a-Service (SaaS) solutions, especially cloud-based solutions became more and more accepted, business units have the opportunity access IT services without involving their IT departments (Katzan, 2009; Foster, 2011; Sultan, 2013). Moreover, introducing a new IT service into business operations via the SaaS model takes less time than the traditional implementation projects (Waters, 2005; Gerhardter and Ortner, 2013).
- Not only the speed of implementing new services is an issue, but also the quality of new services. As IT solutions, like infrastructure, or access to internet became a commodity for most organizations (Carr, 2003), the transaction cost of choosing or changing SaaS services decreased, therefore organizations can select innovative SaaS solutions with lower costs and lower risks. As Carr (2003) urged, "it's time to rethink IT management".

Therefore, Bharadwaj et al (2013) claim that business units lead the way of digitization, and digital business strategies are separated from traditional IT strategies, as digital strategies address cross-functional business objectives, and changing business processes by utilizing IT resources. Digital strategy is treated as business strategy itself.

2.2   Digitization challenges of the banking sector

Digital technologies have been entering the banking industry for years, and the banking industry and banking operations and highly dependent on the IT services (Fung, 2008). Shaikh and Karjaluoto (2016) originates automated retail banking services into the mid-1960s, because of the requirement of processing the huge number of credit-card related electronic transactions. Since then, digital solutions are not uncommon in the financial

sector: ATMs in the late 1960s and 1970s, telephone banking and POS solutions since 1980s, online banking and even mobile banking since late 1990s. Motivations of digitization was faster and cheaper customer service. Despite of these efforts and digital achievements, banking services still seem to be lagged behind general digital technology trends, and behind the digitization of other sectors, especially commerce (Harvey, 2016).

The situation is more challenging for the banks, as their customers take their financial services from different service providers (e.g. account, mortgage, commercial credit, credit card, etc.). Easy to access internet-based services make this situation even worse: using SaaS services on the internet provides low transaction costs for trialling, selecting or changing alternate service providers. Moreover, Y-Generation and technology-savvy customers demand and appreciate digital services, and these segments are ready to change for a better digital customer experience (Lipton el al, 2016).

Beside the changing customer behaviour, banks have to face new challenges (Harvey, 2016):

- As new entrants, FinTech companies offer digital financial services in several niches. FinTech companies act as startups, frame a very specific customer challenge, and offer very specific solutions (e.g. money transfer, microloan, crowdfunding, payment, etc.). One FinTech service probably will not endanger banks, or the banking sector, but together they target small but very profitable slices of the banks' value chains. Surprisingly banks didn't start to address this challenge, yet (Bunea et al, 2016), although this hybrid financial model seems to stick in the market, and questions the role of banks in the following years (Akkizidis and Stagars, 2016).
- Technology companies also enter to the market of financial services, as financial services became an integrated segment of their value offerings: Alibaba, Google, Apple, Samsung, etc. provide more and more financial services, which are technologically advanced, and moreover, they can target their existing user base.
- Since the financial crisis started in 2008, government and industrial regulations became stricter, and require banks to apply and report these requirements (Goodhart, 2008). These compliance issues require additional investments in technological solutions (reporting, data analysis, fraud protection, anti-terrorism analysis), and makes their service offerings less flexible, and sometimes less user friendly.

2.3 Customer centric digital innovations

As customer behaviour is changing, it is not enough simply to offer new digital services, or just to copy the existing services of the competition. Even before the age of digitization, customer experience questions were highly important, and loyalty of banking customers was related to perceived value, service quality, service attributes, satisfaction, image and trust (Beerli, 2004; Lewis and Soureli, 2006). Digital services are expected easy to use, comfortable, natural, but moreover, the solutions should service the need of the customers.

FinTech companies, and digital innovators not simply digitalize or automate existing processes, but adequately understand customer challenges or new requirements, in which customer experience has a vital role (Harvey, 2016; Kenesei and Seprődi, 2017).

The need of a better-grounded design of products and services started by Herbert Simon (1969, 1996), as defining the role of design as "the transformation of existing conditions into preferred ones" (Simon, 1996:4). Further researches added additional layers to the discourse, applying different epistemology and core concepts (Johansson-Sköldberg et al, 2013):

- Rationalism: The science of artificial
- Pragmatism: Reflection in action
- Postmodernism: Wicked problems
- Practice perspective: Designerly ways of knowing
- Hermenutics: Creating meaning

Nonetheless of the evolvement of the design process, further thinking still refers back to Simon's framework and practical approaches try to integrate all discussed concepts (Huppatz, 2015). The art of design, the systematic way of designing products and serviced is labelled as "Design Thinking" (West and Di Nardo, 2016), and applies the following characteristics:

- Targets solving non-structured problems
- Applies a customer centric approach, analysing customer challenges through observation
- Emphasizes the importance of customer value creation and customer experience
- Emphasizes the importance of collecting and processing information from various sources
- Enhances creativity of participants
- Helps to bring together various actors: users, designers, developers, etc.

Because of the nature of a general design thinking approach, it is able to be a basis of digital innovations (Izukura et al, 2015; Hosono et al, 2016).

Inspired by the overview of different design thinking approaches by Gioia (2011:39) and based on the collection of Dam and Siang (2017) of the Interaction Design Foundation, and processing additional widespread models, a general design thinking process includes the following steps (Figure 1):

- Define: defining the scope, problem and challenges, understanding constrains
- Explore: explore the target area, context and stakeholders
- Interpret: process the explored insights and define the problem to be solved
- Ideate: collect, then evaluate multiple solutions
- Prototype: develop initial prototypes to illustrate the solution
- Iterate: test the prototypes, even is multiple cycles to enhance the idea and to select the most suitable solution
- Implement: develop the product or service
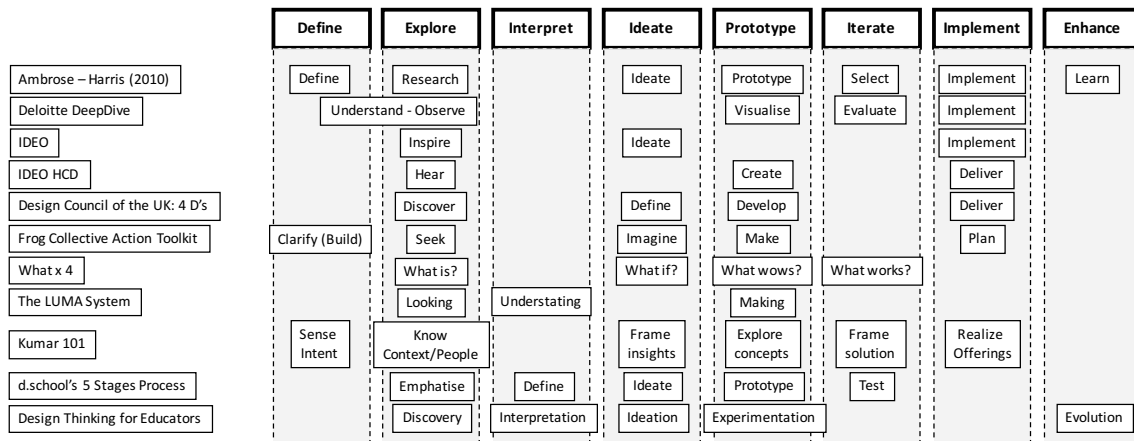- Enhance: keep up with the product, provide supper, analyse data and plan further developments (restart the cycle)

	Define	Explore	Interpret	Ideate	Prototype	Iterate	Implement	Enhance
Ambrose – Harris (2010)	Define	Research		Ideate	Prototype	Select	Implement	Learn
Deloitte DeepDive		Understand - Observe			Visualise	Evaluate	Implement	
IDEO		Inspire		Ideate			Implement	
IDEO HCD		Hear			Create		Deliver	
Design Council of the UK: 4 D's		Discover		Define	Develop		Deliver	
Frog Collective Action Toolkit	Clarify (Build)	Seek		Imagine	Make		Plan	
What x 4		What is?		What if?	What wows?	What works?		
The LUMA System		Looking	Understating		Making			
Kumar 101	Sense Intent	Know Context/People		Frame insights	Explore concepts	Frame solution	Realize Offerings	
d.school's 5 Stages Process		Emphatise	Define	Ideate	Prototype	Test		
Design Thinking for Educators		Discovery	Interpretation	Ideation	Experimentation			Evolution

Figure 1: Different models to do design thinking[1]

3   Methodology: "One Week Sprint"

The goal of our research was to explore and identify customer challenges in retail banking. To achieve this goal, 7 Hungarian banks joined to the project, of which total balance sheet altogether represents 68% of the Hungarian banking industry.

s nature of the research, exploring digital banking possibilities, the research was considered explorative. We wanted deeper insight than the traditional surveys and case studies, therefore we decided to select design thinking approach among the qualitative research methods. The Design Thinking approach can provide a deeper understanding of customer-centric challenges than traditional surveys or case studies through deeper involvement of observation. The Design Thinking approach also help to identify and evaluate as many challenges, as possible, and ideate as many solutions, as possible.

For the basis of the applied methodology the 5 steps approach of IDEO and Riverdale was selected (Design Thinking for Educators, 2012). Because we have limited time (5 working days) and limited resources (7 project teams, one for each participating bank, 34 project members and 2 coaches) we had to adapt the methodology to fit into these frames. To achieve our goal, we used the following additional sources to construct our research methodology:

- The book of Knapp et al (2016) presents the methodology that Google uses for rapid prototyping of their ideas. Although we applied different phases and steps,

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[1] Sources of the models: Ambrose - Harris (2010): Ambrose, G. - Harris, P (2010) Design Th!nking, AVA Publishing, Lausanne | Deloitte DeepDive: Originally IDEO, Deloitte acquired in 2006, https://www2.deloitte.com/us/en/pages/consumer-business/articles/deep-dive-consumer-product-innovation.html | IDEO: Brown, Tim – Wyatt, Jocelyn (2010) Design Thinking for Social Innovation, in: Stanford Social Innovation Review, 2010 Winter, pp. 31-35 | IDEO HCD: https://www.ideo.com/post/design-kit | Design Council of the UK: 4 D's: http://www.designcouncil.org.uk/ | Frog Collective Action Toolkit: https://www.frogdesign.com/work/frog-collective-action-toolkit/ | What x 4: Jeanne Liedtka and Tim Ogilvie's book, Designing for Growth, | The LUMA System: https://www.luma-institute.com/ | Kumar 101: Kumar, V. (2013) 101 Design Methods, Wiley, Hoboken, New Jersey | d.school's 5 Stage Process: https://dschool.stanford.edu/ | Design Thinking for Educators: https://designthinkingforeducators.com/, IDEO and Riverdale

this book helped a lot how to organize the week. This approach, the agile project blocks also inspired the name of our methodology.

- Although we heavily relied on the "Design Thinking for Educators" methodology, we used parts of additional design thinking approaches: Brown (2009); Ambrose and Harris (2010); Stickdorn (2012) Mootee (2013); Kumar (2013); Cosovan and Horváth (2016).
- To enhance creativity, we used additional creative techniques during workshops, based on the works of Sibbet (2010); Gray et al (2010); Michalko (2010 and 2011); Zichermann and Cunningham (2012) and Vogel (2014).

Based on these resources, we created the "One Week Sprint" format that consists of the following steps and content (Table 1).

Number	Phase	Purpose	Description and guides
0	*Preparation*	*Get an overview and common understanding of the general challenges of the banking industry*	*Collecting good and bad practices from a general banking industry, sharing personal stories.* *Summarise results and creating an initial problem map.* *Set the goal of the week*
1	Discovery	Discovery builds a solid foundation for your ideas	Prepare for fieldwork: Build a question guide. Fieldwork: Learn from experts / users, identify extreme users
2	Interpretation	Interpretation transforms your experiences / stories into meaningful insights.	Document experiences: share stories, document problems on post-it notes. Structure problems, find headlines, turn headlines into statements. Don't jump to conclusion, yet: explore all the problems first, before you go further! Get input from the outside: Explain the themes to someone who is not part of your team. Make Insights Actionable! – How might we… Define the needs, through the eyes of the customer/user. Add visual reminders (Process charts, Diagrams, Matrixes, Relationship maps). Select the need/problem you want to solve!
3	Ideation	Ideation means generating lots of ideas.	Brainstorm ideas. Analyze ideas (Prioritization Grid, Selection criteria). Evolve your promising ideas. Consider even radical ideas, look for the WOW factor! Select a solution to work with
4	Experimentation	Experimentation brings your ideas to life	Present your idea visually (paper/ppt prototype, storyboard, diagram, sample process, "create-an-ad"). Present your business model (one-page business canvas for products). Get feedback, test as much as possible, capture feedback learnings

Number	Phase	Purpose	Description and guides
			Iterate your prototype, create a new prototypes, repeat several times
5	Evolution	Evolution is the development of your concept over time	What will be your MVP?
			Track learnings & document progress
			Plan Next Steps: how will you develop your idea/product further? Create a timeline!
			Pitch Your Concept! Include risks, costs, benefits, value, etc.

Table 1: The "One Week Sprint" methodology

During the research, each team was dedicated to a selected bank. Coordination of the teams and methodological assistance were provided by two leading researchers, in the role of design thinking coaches. The research team invested more the 1000 working hours during the 5 days to explore and analyse customer challenges, and provide viable ideas for the banks. In the discovery phase the main goal was to identify as many challenges as possible, while in the interpretation phase the teams prioritised these challenged and reduced them into a few for further work. In the ideation phase the teams brainstormed a huge number of ideas, but during experimentation only a few viable were selected and tested, and the successfully tested and iterated ideas got only the final phase. In the last phase the surviving few ideas were developed further: costs, benefits, risks were analysed, and a project timeline was added (Figure 2).

Following this methodology Project teams delivered their research findings at the end of the 5th day, concentrating on the main problems and main solutions. After the One Week Sprint, all the identified challenges, and possible solutions were collected and analysed further by the coaches. This paper presents these aggregated results.
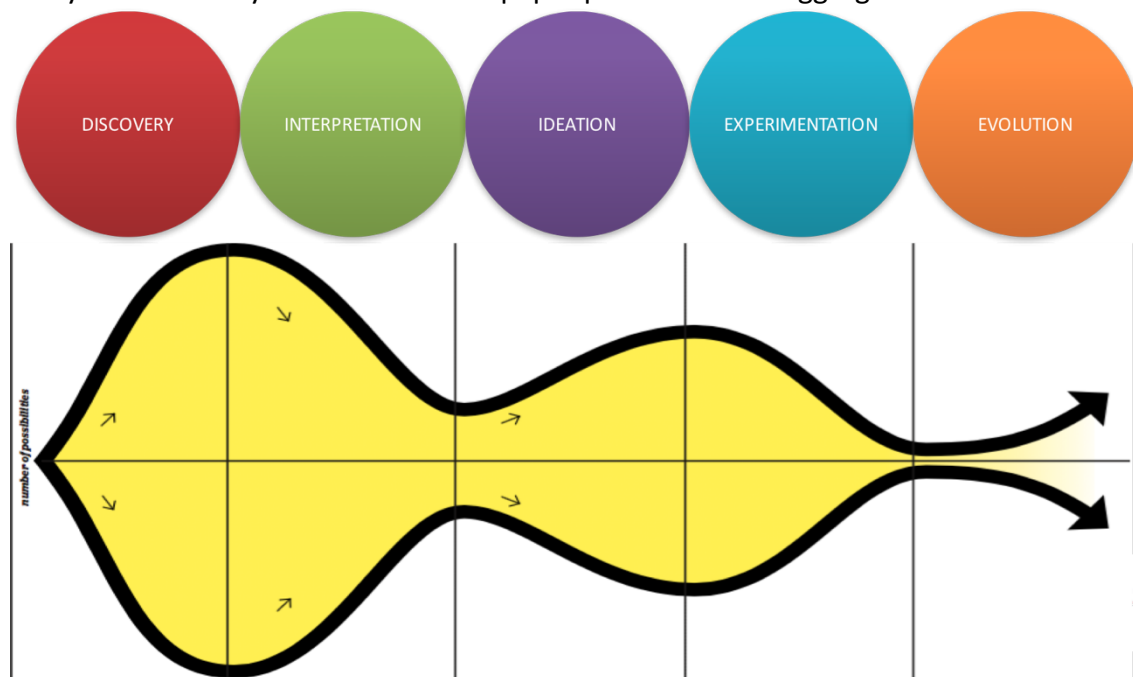

Figure 2: Overview of the "One Week Sprint"

4   Research findings

Our main findings can be grouped to three main areas:
- The changing role of branches
- Online, mobile and phone-based services
- Products and services

In each problem area, we present the identified customer challenges, based on our observation, then we present the possible solutions identified by the project teams. Although each project team was dedicated to a specific bank, customer challenges and problems overlapped of the different banks.

4.1   The changing role of branches

Customers articulated their most problems related to branches in Discovery phase (Figure 3.). As we investigated the area of branches in Interpretation phase, it appeared that no one loves to go to bank branches, especially not the younger generation. The access of a branch may be a challenge, since it may be too far, or the opening hours may not fit the customer needs; since they typically are open during working hours - when customers are working too. But once a customer reaches the bank branch, there is typically long waiting and administration time, and in the one hand customers do not always get what they wanted (clerks' quality); in the other hand they are confronted with pushed offers of new products, services clerks try to sell them, which also increases the waiting and administration time.

The traditional functionality of bank branches was to serve as the central point of customer relations. However, for customers visiting the branch may be "only" a drag, or worse, it can mean frustration for them. From the banks side, the reducing number of customer visits should motivate branches to take advantage of these rare opportunities, improve customer relationships and trying to sell new products and services using their personal presence.

From the customers' side, the branch visits are considered as a task with no significant added value, so they would like to do it as fast as possible. And they consider all the things that prevent this (waiting, administration time, listening to offers) as annoyance.

Figure 3: Challenges related to branches

To manage these problems, nowadays it is considered natural to direct all possible administrative tasks to appropriate online channels (phone, mobile, web). The question

remains: what to do with the bank branch where customers do not want to appear in person; and how to convince customers to choose the closest relationship: personal appearance?

The question is complicated because of the heterogeneous composition of the banks' customers, and there is no solution that would be appropriate for everyone. There are customers, who prefers personal presence in their sensitive banking affairs - and the customer experience should be ensured for them as well.

Suggestions made up during Ideation phase and tested in Experimentation phase:

- **Enrich waiting time:** Waiting is typically a lost time, both for customers and for banks. It is worth to make this time more meaningful, and provide an opportunity for interaction with the bank through personal assistants or electronic solutions.
- **Know the customers' intentions in advance:** It can speed up administration if customers can arrive to scheduled time, if they can indicate what do they want to achieve, or what challenges await assistance from the bank in their actual phase of life.
- **Speed up administration with online started processes:** Although not all cases can be fully solved online, it can reduce administrative time in branches if processes can be initialized online, checked in the background; this way only the identification and signings have to be done in the branches.
- **Change, or extend the function of branches:** as the traditionally non-financial service providers enter the market of banking services, so should not the banks be afraid to build up a new kind of profile towards managing relationships with customers. Is not that a more direct connection if the branch is more like a café, where the clerks sit next to the customers with a tablet? Or, if the branch will become a - increasingly fashionable - community office at the same time? Or inverted: what is required for an agent to visit community offices, appearing elsewhere day-by-day as a mobile branch clerk to arrange matters? After all, the branch is not necessarily the physical space, but the place where the issues can be arranged.

One full project proposal from the Evolution phase was dealing with how to reduce waiting time and to understand the intentions of customers. If the waiting time may be longer than a few minutes, the customers should not draw a line number, instead, a tablet serves as a personalized caller. Through this device, the authentication of the customer and identification of the customer's preferences can be easily done. The customer can get familiar with the bank offers, and even express their interest in banking products. The customer needs can be assessed in the form of tablet games. It is important, that in these cases the bank can identify the real customer needs and offer those products only, that meet the real needs - even in a personal administration - rather than products typically offered to all customers. If the customer needs can be identified in advance, or detect lack of interest, the personal administration will be targeted, so it can be faster.

4.2 Online, mobile and phone-based services

Empowering customers to manage their issues in an online channel seems to be an obvious solution to most of the problems outlined in the previous section. Arranging

issues online reduces the need of personal contact, which may ease the customers' life and lower operating costs for the banks themselves.

At the same time, managing issues outside the branch (via telephone, mobile, online) leads to challenges (Figure 4), that would have been easy to handle in the branch itself, such as inadequate supply of information, lack of consultation and the functional limitations of the different platforms.

Regarding the non-branch channels, the most frequently expressed counter-argument is the issue of security: whether the data of the customer will be stolen, what can ensure the customer that they are communicating with the bank itself, what can guarantee the customers that their order will be really executed. These are the challenges we've found in Discovery phase with some of the possible reasons from Interpretation phase.
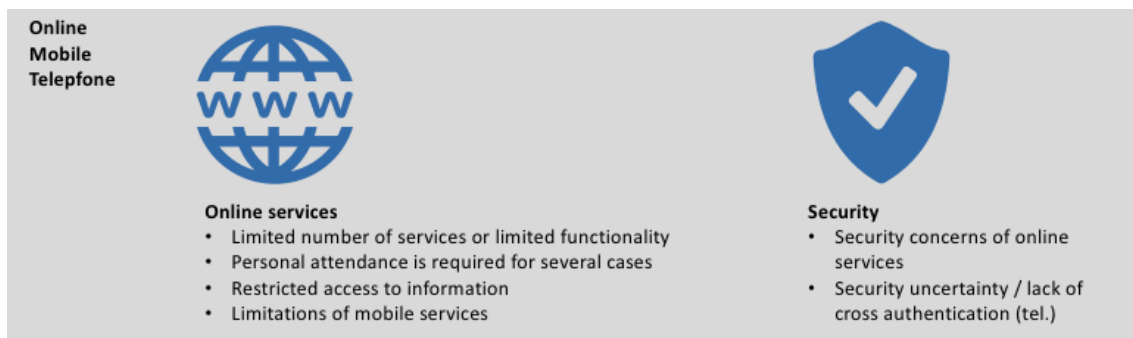

Figure 4: Challenges related to electronic channels

Suggestions made up during Ideation phase and tested in Experimentation phase:

- **Let multichannel administration be possible:** It is almost inevitable for a bank to be present in a professional manner on all platforms (telephone, online and mobile applications). In our research we have seen examples where the mobile platform was only like a minor advertising space, without meaningful services.
- **Let the cases be traceable online:** It supports customers' need for transparency, if the ongoing issues (transactions, orders, transfers) - regardless to the channel they were initiated - can be monitored online, grouped by issue areas or chronologically.
- **Provide adequate, professional support to online channels:** In the back office of online and mobile applications there are no clerks - because of these channels nature. But if the customer gets stuck, or has questions, it would help them a lot if there is an opportunity to redirect to a more personal channel: online chat, video call, call centre. In addition, because the customer has been authenticated online, no other authentication should be performed again during the transition to the new channel. This solution can reduce the number of lost cases.
- **The customer should be a partner in security issues:** Even though the issue of bank security belongs to the banks, a significant proportion of fraud attempts are targeting customers' credulity. To prevent this, banks should improve customers' security awareness and manage their business transparently.

In Evolution phase, teams were making project plans to solutions which were targeting existing mobile applications without meaningful functionality, or to a augmented reality

branch, where customers can manage their issues in the well-known environment of their own branch, with professional clerks as avatars, using internet-based telephony.

4.3 Products and services

Regarding to administration in branches, the interviewed and examined customers highlighted in Discovery phase the lack of transparency in the bureaucracy of banking, and that there is a lot of paperwork with all issues (Figure 5). The loan and investment administration turned out to be the most effected with the problem, that the rules and the processes laid down by banks are too complex, complicated and incomprehensive for customers. Customers typically get information from these rules and processes from clerks during the administration - and sometimes different clerks give different information to them for the same issue. That is a common customer complaint that the rules seem to be articulated in a way that the customer may not understand or do not want to understand them.

Banks must meet several legal requirements and a significant part of these apply on the cooperation with customers, so the banks have no other option than to enforce the rules applicable to customers. This make the rules and the banking operations for customers - but often also for the clerks - difficult to understand, and what is even worse, following the legislative changes the rules and processes are frequently changing as well.

Because of the above mentioned, the customers - regardless of the intention of the banks – can feel that they are at the mercy of these institutions. From the bank's side, ensuring customer experience is becoming more challenging and this can lead to churn of customers. This is one of the most important findings from Interpretation phase.

Products and services

Bureaucratic processes
* Complex and confusing regulations
* Confusing banking processes
* One sided decisions by the bank
* (hard to change bank)
* Paper-based processes
* Complex and huge documentation

Customer requirements
* Unique requirements cannot be served
* Limited service offerings
* No tailor-made solutions

Figure 5: Challenges related to products and services

The extent banking services can be customized or personalized, which is also part of the customer experience. Many customers have indicated that there are only a few options of banking services available, and they cannot find those services that meet their own, sometimes not so unique needs. Therefore, if they can find appropriate services in another bank, they consider the possibility of switching banks.

Suggestions made up during Ideation phase and tested in Experimentation phase:

* **Simplify banking procedures, increase transparency:** the intricately worded rules do not favour the creation of a trust. It should be clear, what are the responsibilities and tasks of the customers, and what are the responsibilities and

tasks of the banks. Use visualization elements, process models and flow charts for better understanding. Use the processes, process models as the base of policies and rules, with clearly defined responsibilities. Simpler and more transparent processes increase the efficiency of processes (faster throughput, less errors), and customer satisfaction.

- **Personalized and proactive services based on the analysis of banking data:** Based on the customer transaction data, banks have extreme amount of information about customers' life: income, spending, spending habits. Based on these, banks can offer opportunities to customers proactively.
- **Banking portfolio expansion with non-banking products and services:** As the traditionally non-financial service providers enter the market of banking services, so should the banks open up to non-financial products: travel, commodities and insurance products. The challenge, however, is that the sales effort of these new products should not bother customers in any of the sales channels.

From Evolution phase, a project plan visioning an online bank, where personalized advertisements can be seen (not only in the field of banking) based on the data gathered from the chronologic and personal data from the customer is important to mention.

5 Conclusion

Although most bank realized the importance of digitization, customer centric approaches are quite new in the Hungarian banking sector. Development is not only a technological question (just copying existing solutions from more developed regions, e.g. USA, Western Europe, of SE Asia), but also a methodological one. In our research we demonstrated a useful, rapid, very focused approach of explore customer challenges, but for a successful project we required a good, and prepared team members. The two coaches were able to provide adequate methodological support.

The findings of the project were discussed with the participated banks, given them better insights of customer-centric approaches, through defining the demand. But additional challenges also pressurise banks to develop their systems: eIDAS compliance, PSD2 challenge, GDPR regulation. It is a limitation of this research, that its focusing only on customer (individual customer) related challenges, that mainly visible in front office services. But for Hungarian banks, they have the opportunity to apply matured solutions and technologies: what is still innovative on the Hungarian market, that is already tried out on other market, and we can know the success and failure stories. Therefore, it is important to benchmark the international market, even before deciding on implementation. Moreover, findings in this research are only a start for further researches, but it was considered a good way to set the basis for further investigations. It is a strategic choice of the incumbent banks, how to manage their relationship to FinTech companies. They can be considered as competitors, as possible partners to work with, but we have also seen a Hungarian bank, that itself developed a Fintech Incubator program. Fintech companies are considered either partners or competitors, but they definitely increase the competition in the sector, and support the digitization efforts.

Generally, the applied research identified several customer challenges and offered also several possible digital solutions. Although the project teams couldn't finish complete, detailed, ready-to-ship products, they made rapid progress, generated and designed a huge number of ideas, and they tested if they are headed in the right direction.

In future researches we would like to expand the size of the research: the used one-week-spring approach should be expanded with additional surveys to validate the findings, and to generalize the results.

6 Acknowledgement

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