The digital financial solutions pathway for generations

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Abstract: Digital financial solutions have been in focus since before Covid, whether we look at financial service providers or consumers. Covid has accelerated digitalisation, which has many positive benefits, but we need to understand and research what each generation wants, how they like to bank and what services they need. We need to ask a number of questions about what is worth digitising and at what cost, but we also need generational research, because not all age groups may need to digitise all services. The mainstream focus for financial service providers is central digitisation, but then the financial culture will need to be developed so that we don't go into new rounds of digitisation unnecessarily. Financial literacy education must start with the youngest generations, at pre-school, primary and secondary school levels. The path of development must therefore be planned and the current infrastructure must be consciously built to make future digitalisation truly effective.

Keywords: fintech, generations, digitalization, financial culture, finfluencer

1 Introduction

After the 1990s, as the Internet and other modern technologies developed and spread, an increasing number of applications emerged and revolutionized not only private but also business life. The introduction of Fintech technology not only gives a certain level of comfort for businesspeople, but the increasing demands of consumers / clients nowadays also make it necessary to use these applications. Even in the poorest sections of the world, practically everyone is attempting to catch up and take use of these opportunities in almost every aspect of life.

Similarly, in Hungary, viable businesses and organizations are those that have already adopted more advanced technologies and are able to meet their consumers' expanding demands. Significant developments have occurred in payment instruments in recent years, and the introduction and integration of the immediate

payment system into existing payment procedures in March 2020 will further contribute to this. Unquestionably, one of the most significant events of 2020 will be the emergence of the COVID, a pandemic that has profoundly altered the lives of people in every aspect.

2 Way to instant payment system

In recent years, the evolution of information technology (robotization and artificial intelligence, the expansion of cloud services, the adoption of IoT devices, Fintech, proptech, etc.) has presented new difficulties and opportunities to most industries. These technological advancements fundamentally alter the operational procedures of several businesses, and thus, they have incredibly significant economic effects. The financial sector is not an exception to this rule. The emergence of Fintech firms, shifting client needs, and the growing emphasis on customer experience have also brought about substantial changes in this industry, which are continually restructuring our financial and banking practices and expectations (Csiszárik-Kocsir, 2021; 2022). In place of "traditional" bank card solutions, new types of bank cards that are integrated into mobile applications have evolved, as have payment options without bank cards, via new applications, or employing rapid payment methods. Users no longer rely solely on their bank for trust. The use of available Fintech applications is expanding rapidly, and large banks are losing ground. Fintech applications are now formidable rivals to the mobile banking applications of large domestic banks (Fintech Zone, 2020). Applications like Revolut, TransferWise, Curve, and the services of ApplePay and GooglePay have been common in Hungary as well. Revolut and TransferWise were much less popular among Android users in 2018 and did not even make the TOP20. In contrast, among Apple lovers, Revolut was already ranked 18th and TransferWise ranked 20th. In 2019, Revolut was already in the top three in Hungary for both sorts of users (Fintech Zone, 2019).

The instant payment system, which was introduced in March of 2020, and PSD2 provide additional potential for Fintech businesses to build new services, and it should not be neglected that the Hungarian market and regulatory framework also provide a stimulating atmosphere for them. PSD2 will make it possible for third-party service providers to enter the banking environment. The new law enables new multi-channel access for users, thereby enhancing the customer experience through flexible and innovative solutions. It provides them with unrestricted access to payment service providers, who can legally offer digital payment services even if they are not classed as financial institutions. And this will allow Fintech to continue operating in the digital banking sector without any issues in the future (NeoPay, 2020).

2.1 Consequences and prospects of Instant payment regulation

The immediate payment system, which enables transactions under 10 million HUF to be completed within 5 seconds, will become operational in 2020, and it will be accessible 24 hours a day, 365 days a year (Bakonyi, 2020). Numerous nations have adopted QR code mobile payments as a result of the immediate payment system. The QR code has gained popularity in nations where the regulator has produced an open standard with market participants or where banks and service providers with a big client base have developed a standardized solution. In Hungary, the MNB anticipates the introduction of digital payment solutions that are interoperable with the immediate payment infrastructure and that rivals can use at no additional cost.

A QR code is a two-dimensional barcode (point code) that can contain the data of the payer or the payee required to complete a payment (name, address, bank account number, and date), thereby considerably accelerating the payment process by eliminating the need to re-enter the data each time. As a result of the QR code, the possibility of errors is also reduced. The QR code standard in Hungary is based on worldwide standards (the EPC standard), but MNB and GIRO experts have made modifications so that it can be used for in-store purchases, invoice payments, online purchases, and interpersonal payments.

The usability of a QR code is mostly determined by the amount of data that can be encoded within it. Experts took into account a variety of commercial concerns when determining the content of the data so that the quick payment system may be utilized as widely as feasible. The Hungarian QR code allows for a broader variety of data than the data groups transmitted during payment transactions. The QR code additionally specifies the content of the data categories, the data fields, the compatible data formats, and the maximum amount of data that can be entered, making the data suitable for automatic processing (Németh, 2019).

It should also be related to instant payment, a concept of PSD2 that aims to protect customers who engage in online money transactions. PSD2 is the abbreviation for Payment Services Directive 2, whose essence is the formulation and oversight of payment legislation in EU and EEA member states. Within the PSD2 regulatory framework, additional non-bank payment service providers will be permitted to increase competition, but good consumer authentication is a prerequisite for all of them (Green et al., 2020).

As clients and business partners now expect 24 hours accessibility, rapid payments are now the standard. Companies that have fallen behind in technology must catch up and incorporate this opportunity into their business if they wish to survive and pursue growth and development (Eber et al., 2018). In the case of B2B, fast payment enables the enhancement of cash flow, as funds can be received, spent, and invested not only during the week, but also on weekends (Kok, 2019). Also achievable with improved cash flow management is an increase in liquidity provision. The time spent at the cash register is decreased, and management of revenue and expenses is

kept current. Also during non-working days, businesses can plan and budget for their operations. Instantaneous payments can untie funds from the financial system and boost competition (Deloitte, 2019). Safe and quick, so that businesses can improve their customer service (Kok, 2019). According to the MNB (2016), the instant payment system serves three primary functions: extending payment alternatives with simplicity and continual availability, ensuring innovation in the financial industry, and decreasing non-transparent payments. In addition to the aforementioned, the paper states that it will be possible to provide immediate feedback as well as create new payment platforms and extra services.

3 Fintech's evolution and definition

After the internet revolution of the 1990s, the online financial sector, e-finance, evolved, with low-cost financial transactions serving as one of its primary drivers. Electronic and digital finance is a broad concept that encompasses all financial activities and transactions that can be conducted via the Internet, including investment, insurance, stock exchange, and the provision and use of financial services without physical contact. Due to this innovation, the services of digital players other than traditional financial institutions, such as online brokerage services and online money transfer providers, have emerged and have significantly reduced the number of physical and personal contacts, while also providing speed, convenience, and security, among other benefits. Smart gadgets, such as smartphones, have accelerated the development of digital financial activities, and new services specializing in mobile phones have developed (King, 2019). Mobile finance is already present in the realms of mobile banking and mobile payments; these, in conjunction with e-finance, artificial intelligence, social media, and big data analytics, have aided the emergence and growth of Fintech since the 2008 financial crisis (Lee and Shin, 2018; Csiszárik-Kocsir, 2016; Csiszárik et al, 2013, Csiszárik-Kocsir and Medve, 2012). Although Fintech has not yet realized its full potential, billions of dollars are spent annually on Fintech companies around the world, and there is no business sector that will not be affected or have no economic influence from it (Schueffel, 2016).

There is no consistent definition for the Fintech phenomenon because it is too comprehensive and complicated; yet, several have attempted to characterize it suitably. Fintech is the abbreviation for Financial Technology, and Fintech startups often concentrate on a particular financial sector or service (Statista, 2020b). Fintech, according to Leong and Sung (2018), is a merger of multiple fields, including Technology, Innovation, and Finance as a transdisciplinary subject. According to Arner et al. (2015), Fintech technology comprises the digital goods and services offered by traditional financial institutions. According to Sekhar (2018), Fintech employs new financial technology, devices, and tools that

incorporate formal, invention, and advancement innovations. According to Philippon's (2018) research, Fintech encompasses digital innovations and technology-based business model innovations in the financial sector.

3.1 Categories in Fintech

Since there is no unified definition of the idea of Fintech even today, Chen et al. (2019) grouped Fintech devices according to their application areas and developed the following categories based on the findings of multiple sources, papers, and studies.

- Cybersecurity: employs encryption and authentication to defend against financial attacks in the form of hardware or software (such as API security solutions, DDoS prevention solutions, Single sign-on (SSO) solutions, and data loss prevention (DLP) solutions);
- Mobile transactions: enable payments using wireless devices such as smartphones and tablets. Required applications include Android Pay, Apple Pay, LG Pay, Samsung Pay, Alipay, and PayPal;
- Using technological algorithms, data analytics enables users to examine financial data, whether transactional or consumer data. These include Cloud solutions, Big Data, and artificial intelligence, among others;
- Blockchain: fundamentally utilized in financial services with distributed ledger technologies like Smart contracts and cryptocurrencies (Ripple Payment, Bitcoin);
- Peer-to-peer (P2P): hub-, node-free networks, systems, and platforms that allow a direct and therefore quick connection to perform the financial transactions of the customers (such as Kickstarter);
- Robo-advising: the provision of financial advice to clients through machine learning and artificial intelligence; Internet of Things (IoT): the collecting and transmission of real-time data via smart devices.

Bada (2019) established distinct categories to classify Fintech applications, with the following classification: InsurTech focuses on insurance solutions, while RegTech focuses on regulatory issues. LendTech is concerned with lending, PayTech with payments, TradeTech with commercial activities, WealthTech with personal finance, and BankTech with retail banking.

According to the 2019 Statista Digital Market Outlook, the Fintech market may be divided into four distinct segments: Digital Payments, Personal Finance, Alternative Lending, and Alternative Financing (Statista, 2019).

Opportunities and effects of innovative Fintech

Possibilities of Fintech include enhancing the customer experience with precise tools, efficiently controlling risks, assisting lending procedures in the near future,

and possibly providing adequate credit alternatives (Sljukic and Gabler, 2018). Taking into account the primary objective of the present study, it is vital to evaluate how Fintech influences the banking industry. According to a BIS analysis (Philippon, 2017), Fintech has the ability to dismantle and disrupt old structures, but it also facilitates the formation of new partnerships by giving rethought products and services.

According to the impact assessment by Parameshwar et al. (2019), the emergence of Fintech startups poses a significant threat to the profits of traditional financial institutions as the number of clients utilizing their services declines. According to Christi and Barberis (2016), the Fintech sector is booming and has beneficial consequences for early adopters, whereas traditional institutions risk negative repercussions if they do not embrace Fintech as well. According to the authors, the global financial sector is in the infancy of digital disruption, but Fintech is the most promising and all-encompassing industry, driven by creative business models and the transformation of financial infrastructures.

4 The sector of fintech in Hungary

4.1 The MNB Fintech Approach

The Hungarian National Bank (MNB) is making every effort to digitize the financial sector, capitalizing on Fintech's prospects. In addition, it employs a variety of regulatory mechanisms. The 2019-completed MNB Fintech plan intends to promote digitalization in the financial industry through 24 activities that are in accordance with and compatible with the Digital Welfare Program's principles (MNB, 2019b). The MNB's FinTech strategy focuses on four significant areas and presents its strategic objectives within the scope of the plan. These regions are as follows:

Supporting customer-accessible financial services that also offer security, simplicity, low cost, convenience, and personalization, hence increasing the usage of these digital services. Creating an efficient and stable financial system through the use of new and cutting-edge technologies, resulting in lower costs, more effective risk management, and enhanced service quality. Facilitating the growth of the Fintech environment in Hungary by supporting the implementation of laws that helps Fintech acquire traction in the country can also attract talent. Effective Fintech technology can also contribute to the economic growth of the nation. Establishing the nation's financial culture through leveraging digital advantages. In addition to expanding and increasing the usage of new and modern services, the objective is to comply with corporate ethics regulations and give further training and education in the domains of technology and finance (MNB, 2019a).

Although Fintech has the potential to be a major success in Hungary, it is still in its infancy, and mobile and payment services have become pervasive. There are roughly 110 active Fintech companies offering their services in Hungary, and this number is projected to rise since there is a need for their products in the home market. According to the results of surveys done in the demand market, there is a need not only for easier and faster money management, but also for the simplification of lending and savings. However, Hungary has a long way to go before its financial industry reaches a greater degree of digitalization due to the slow pace of transition. Approximately 80% of banks utilize fintech applications for cash flow, but their extensive usage in insurance, capital markets, and asset management is not anticipated until the far future (MNB, 2019a).

4.2 Hungary's fintech players and applications

Taking into account the prices of Fintech transactions in Hungary, the overall value in 2020 is approximately $3.9 million. Based on estimations, the transaction values of the entire Fintech sector between 2017 and 2024. (The evaluation is modified to account for the projected impact of the current COVID-19 epidemic.)

Presently and in the near future, the presence of digital payments in Hungary obviously dominates the Fintech market. By 2024, it is anticipated that the value of these transactions will nearly treble, while the other divisions will grow relatively little. According to Statista (2020b), the current 4.86 million users of digital payments will increase to 5.63 million by 2024, representing slightly more than half of the Hungarian population.

The majority of Hungarian banks are eager to implement Fintech solutions, and they are also expanding their use of e-banking and mobile applications. However, there are Fintech businesses that operate independently of banks on the Fintech digital payment market, and their presence stimulates competition in payment services (Bakonyi, 2020). 90% of the 110 Fintech companies presently operating in Hungary primarily offer financial services to B2B clients (Baráth, 2020). The following are the most significant digital payment service companies.

TransferWise is a solution for international payments. The primary benefit is that the conversion expenses are reduced and fixed for a period, so users do not have to worry about swings in exchange rates. Its business strategy is predicated on the fact that, although it strives to facilitate international financial transactions, currencies continue to circulate inside a country and in tandem with money transfers from other nations, hence reducing exchange rate volatility (TransferWise, 2020).

Barion is utilized by over 6000 companies for online payment processing. It provides minimal transaction costs, simple and quick integration, and e-commerce platform plug-ins. It is a safe, cost-free money transfer option that is accessible 24/7, i.e., at any time (Barion, 2020).

Revolut: Revolut is a Fintech startup that issues prepaid cards. By utilizing it, users can avoid hidden costs in money management, high transaction fees with poor conversion rates, keeping expensive foreign currency accounts, obtaining separate bank cards, and lengthy and complex account openings. It claims a solution for the following: exceptionally favorable exchange rate conversion, free and instant money sending and receiving within the system, free and instant foreign currency account management, instant and quick online registration from any location, and free credit card (Szendrei, 2020).

By establishing a Simple card regardless of where the user does banking. The app also supports mobile payments by touch and is compatible with both Android and iOS. Not only does it permit online payment, but it also offers services for purchasing highway stickers, movie tickets, books, cabs, etc (Simple, 2020).

PayPal offers a comprehensive business solution; users can accept payments on their own website and through their own accounts. It has multi-channel conversion, quick payout, enhanced protection, worldwide coverage, simple integration, expandable, and configurable characteristics (PayPal, 2020).

Wyze.me: Wyze.me, a Hungarian Fintech startup. Wyze.me is the first bank-independent, completely automated personal financial application in Hungary. It allows customers to simply and securely synchronize their online bank accounts, providing a comprehensive view of their money. Wyze.me automatically categorizes revenues and expenses, saving the user time (Wyze.me, 2020).

4.3 Opportunities and effects of Instant payment legislation

The rapid payment system, which enables transactions under HUF 10 million to be completed within 5 seconds, will be available 24 hours a day, every day of the year, beginning in 2020. (Bakonyi, 2020). In many countries, the fast payment system has led to the development of QR code mobile payment. In countries where the regulator has developed an open standard with market participants or where banks and service providers with a significant client base have adopted a common solution, the QR code has gained popularity. In Hungary, the MNB anticipates the introduction of digital payment solutions that are compatible with the immediate payment infrastructure and that rivals can use at no additional cost.

A QR code is a two-dimensional barcode (point code) that can contain the data of the payer or the payee required to make a payment (name, address, bank account number, and date), thereby considerably accelerating the payment process by eliminating the need to re-enter the information each time. Due to the QR code, the likelihood of making an error is also reduced. The Hungarian QR code standard is based on worldwide standards (EPC standard), but MNB and GIRO experts have developed modifications so that it can be used for in-store purchases, invoice payments, online purchases, and interpersonal payments.

The usage potential of a QR code is mostly determined by the amount of data it can hold. Experts took into account a variety of business concerns when selecting the content of the data in order to facilitate the broadest possible use of the instant payment system. The Hungarian QR code enables the handling of a greater variety of data than the data groups transmitted during financial transactions. Additionally, the QR code specifies the content of the data categories, the data fields, the relevant data formats, and the maximum amount of data that may be entered, making the data suitable for automatic processing (Németh, 2019).

It should also be related to instant payment, a PSD2 concept designed to protect clients who engage in online financial transactions. PSD2 is the abbreviation for Payment Services Directive 2, the purpose of which is to create and oversee payment legislation in EU and EEA member states. Within the PSD2 regulatory framework, new non-bank payment service providers will be permitted to enhance competition, but they will all be required to implement robust consumer authentication (Green et al., 2020).

As clients and business partners now expect 24/7 accessibility, fast payments have become the norm. Companies that lag behind in technology must catch up and integrate this potential into their business if they wish to remain viable and pursue growth and development if they want to survive (Eber et al., 2018). Instant payment enables the improvement of cash flow for B2B transactions, since money can be paid, spent, and invested not just on weekdays but also on weekends (Kok, 2019). Through improved cash flow management, it is also possible to increase liquidity provision. The time spent at the cash register is decreased, and revenue and expense management are kept current. Additionally, businesses can plan and budget on non-working days. Instantaneous payments can release funds trapped in the financial system and increase competition (Deloitte, 2019). Secure and quick, so that businesses can better serve their customers (Kok, 2019). According to the MNB (2016), the instant payment system serves three primary purposes: extending payment alternatives with simplicity and continual availability, ensuring financial market innovation, and minimizing non-transparent payments. In addition to the aforementioned, the paper indicates that it will be possible to provide quick feedback and develop new services and payment platforms.

5 Research

Our survey asked about the payment habits of the post-COVID young generation, with 287 respondents. 89.89% of the respondents were in the 18-30 age group, which confirms that university students are currently the most likely to have responded to the questionnaire. In response to the question "Which payment method do you use most in shops?" mobile payments came first in 52.26% of the responses,

credit card in second place in 38.37%, and cash in third place in 9.4%. The same question was asked, "Which payment method do you use most in online shops?", here we asked about alternative payment options, but here again, credit card purchases won with 64.11%, the second was Paypal, Apple Pay, and Google Pay, with 22.29% of people making purchases this way. The third one was cash on delivery, the other answers are negligible, but what should be highlighted is that there were 3 answers when it came to transferring, so we are talking about 1%. This tells us quite a lot that instant transfer has not yet entered the payment repertoire. Looking deeper into this question, we asked questions such as "Have you heard of the Hungarian Instant Payment System (AFR)?", the answer was 60.27% yes, which is quite encouraging, despite the fact that it is not used for purchases in online shops, the no answers, in this case, being 39.72%. But we also asked separately highlighting how much young people are aware of AFR 2.0, "Have you heard of AFR 2.0?", here 12.54% of the responses show that they have heard of it, and the remaining 87.45%, unfortunately, do not know what it is.

We didn't let go of the AFR question, especially the AFR 2.0 no and in the question "Based on what you have described before, would you try AFR 2.0 for in-store payments if it were available?" we pushed the envelope further, here we can see the openness of the young people, 70.38% said yes, they would try it, but still a fairly high 29.61% no response. Just a couple of percent higher on the previous question, but for online shopping, 71.77% would try AFR 2.0 online and 28.22% would not.

There is a close connection between the facts and the predictions, in the previous questions we asked about the payment method used for in-store and online purchases, but we also asked about what they would prefer to use. Here the gap is starting to open, they are more willing to try new things.

shops	facts	predictions
credit card	38,33	31,71
cash	9,41	5,92
mobile payment	52,26	51,22
AFR with QR	0,00	6,97
AFR with NFC	0,00	4,18

5. Figure

shops purchases facts and predictions

source: own resources

As you can see in the previous figure, the facts have changed significantly, as we asked people what they would like to use, credit card payments have dropped, after all, hardly anyone carries a credit card, and cash has dropped. Mobile payments have dropped, although not significantly. AFR was one of the focal points in our research, which as you can see, together account for over 11%. So one in ten young people understand why the uptake of this technology is important.

online purchase	facts	predictions
credit card	64,11	39,02
mobile payment	22,30	24,04
money transfer classic one	1,05	2,79
AFR with QR	0,00	19,16
payment request	0,00	4,18
cash on delivery	11,85	10,10

6. Figure

online purchases facts and predictions

source: own resources

The second figure shows the facts and predictions of online shopping, with an even more significant decline in card purchases, who want to swipe their card online. Classic referrals have increased, interesting that they might be confused with AFR? This would be worth exploring further. However, the QR code version of AFR has increased more significantly here than in-store purchases, by nearly 20%, meaning one in five young people would try it. The payment request is also significant, if we combine this with AFR we get almost 25%, i.e. one in four young people would try the instant payment option.

Conclusions

In this research, we wanted to look at the attitudes of the youngest, but already university-age, generation towards financial solutions. With a particular focus on the AFR technology, which in Hungary at the time of writing has been the subject of a very encouraging and forward-looking proposal from the government. According to the proposal, AFR payments with QR codes and AFR orders initiated with a payment request will be free of charge and free of any consumer fees or charges. This is an attempt by the government to promote the widespread uptake of AFR, which is certainly encouraging, especially as the above research shows that the younger generation is interested in using AFR, but lacked the technology to do so. It is worth revisiting the results of the research, 11-12% would be willing to use AFR for in-store purchases, and the same for online purchases combined, 24-25%.

This encouraging statistic and the government's new policy direction show a really promising future for AFR 2.0. For example, all banks will be required to read QR codes and accept payment requests. A new QR code standard will also be created, which will have a central authentication and security element. Standardized data input based on NFC and deep-link will also be laid down in the regulation, and a confirmation of the transfer will be mandatory, as up to now only a message informing of the failure of the transfer. The biggest change, however, will be the

increase from HUF 10 million to HUF 30 million, and the fact that all banks will be obliged to include QR code reading capabilities in their applications.

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