



dpi

DIGITAL PAYMENT INDEX HUNGARY

2020

COMPASS IN THE HUNGARIAN
ELECTRONIC PAYMENT MARKET

REPORT

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FOREWORD

DIGITAL PAYMENTS INDEX HUNGARY: A COMPASS FOR THE FUTURE OF PAYMENTS

If anyone had any doubts about the power of digitalization, the changes of the past few months have certainly convinced them. The introduction of contactless cards is still a vivid memory, because with their rapid take-up is one of the reasons why it was so difficult to imagine a simpler way to pay. And in the 12 years since then, industry players have repeatedly refuted this claim: the first Hungarian mobile banking app was launched in 2016, followed by many more including the entry of digital giants.

Not only our cards have moved into our phones. We use our smart phones for many other ways to pay: mobile banking, instant payments, money sending, ordering, authenticating, accepting payments, and the list goes on.

Again, we could just say that there is no simpler solution than managing payments by our mobile. As industry stakeholders we are already working on the next solution, seeing the millions of opportunities in 5G, IoT and open banking.

In Hungary, yet no comprehensive study existed, that gives a 360-degree view of the payment market in a comparable way, provided on a year-on-year basis. At Mastercard, we believe that the most important step in any development is to assess the needs, the opportunities and the potential of the market and try to respond with the best possible solutions and innovations. This requires a thorough mapping of existing infrastructure, consumer habits and mindsets, which takes a lot of time and energy, yet could be put to much better use in the development process of solutions.

Therefore, we decided to launch the Digital Payment Index with the purpose of serving as a compass for the Hungarian market and to help industry players in their daily work.

This index will be updated every year, so that stakeholders can always get an up-to-date picture of infrastructure, usage, customer knowledge and attitudes.

We know that no one wants to spare the researches, needed to create their own financial products, driving decisions or regulations, however it can be helpful to have a solid knowledge base and a holistic view of the market to do this work. We trust that many people will find this in the Digital Payments Index.

Endre Eölyös
Country Manager, Hungary and Slovenia, Mastercard



INTRODUCTION TO THE DIGITAL PAYMENT INDEX

Hungarian consumers have a variety of digital payment alternatives to choose from when shopping online and offline. Electronic means for payments developed significantly and can provide today a simple and secure alternative to cash. In addition, accelerating the digitalization of payments has been top of the agenda for both regulators and the industry. However, the adoption of cashless payment methods remained slow in recent years and the role of cash still prevails in the economy.

The global pandemic that unfolded in 2020 has considerably impacted the lifestyle and attitudes of Hungarian consumers. This change has the potential to catalyze the digitalization of payments in Hungary by stimulating innovation within the industry and driving the adoption of digital payment solutions. At the same time, both the European Union and the Hungarian

authorities (e.g. MNB and NAV) keep their focus on implementing policies that enable and promote the usage of cashless payments among the population and businesses as well. To understand the dynamics of this change and to capture the maturity of the Hungarian payment ecosystem, Mastercard developed a measurement approach, called Digital Payment Index.

The Digital Payment Index ("DPI") is an annually released index, which was designed to serve as a navigator and provide a holistic view of the digitalization of consumer payments in Hungary. Since such measurements have been scarcely available on the market, the index contributes to filling this gap by creating an integrated view across payment rails with the benefit of providing a yearly and comparable calculation. It serves as a reference point for the different stakeholders, supports them in setting the course for development and making policies by quantifying market development on a scale of 100, in three critical dimensions that outline the main structure of the index:



INFRASTRUCTURE

Readiness of the existing infrastructure and its ability to support cashless payments



KNOWLEDGE

Consumers' knowledge and understanding of digital payments, which is required for usage



USAGE

Pattern that shows the adoption of digital and its position against cash

The index aims to support the local payments ecosystem with actionable insights, by leveraging public sources, bespoke primary research and Mastercard's expertise of the market.



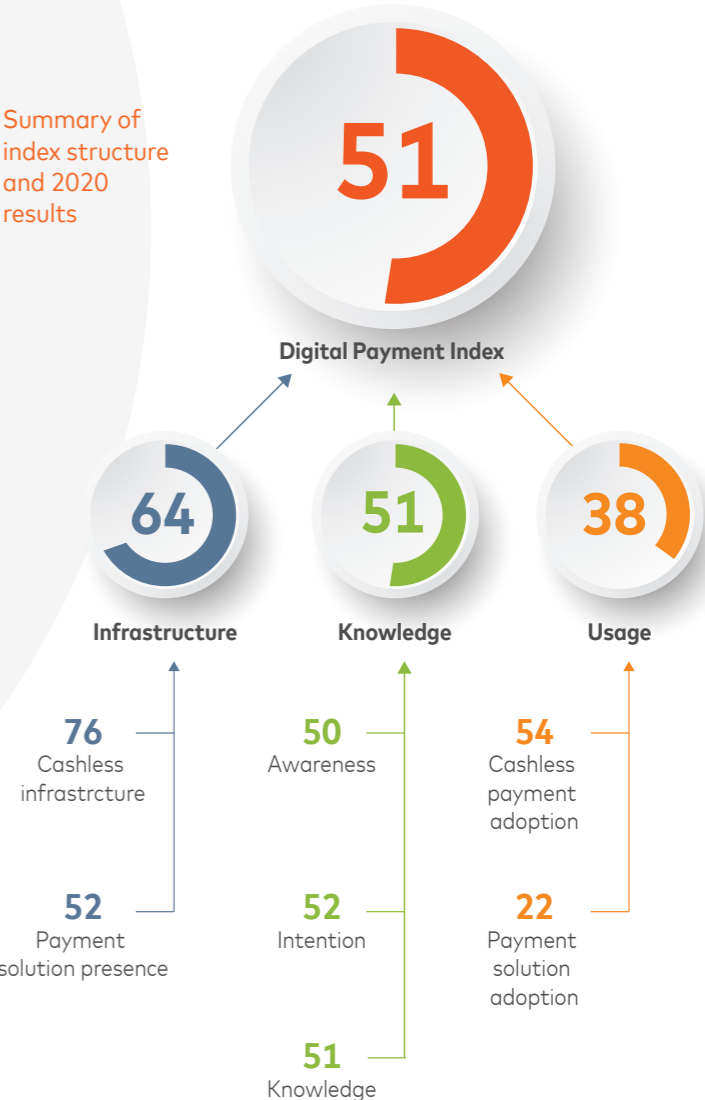
This report gives a summary of the index results, a discussion of its main components and indicators that were considered when quantifying the development of payments in Hungary. This issue interprets the results of the year 2020 which is going to serve as a baseline to understand trends and changes over the upcoming years. The study is structured as the following: first, it starts with the review of index results for 2020, next each individual pillar is discussed in-depth to provide additional context and insights on the key drivers contributing to the assessment. The last section covers key aspects of the index methodology and the sources used.

SUMMARY OF INDEX RESULTS

In 2020 the Digital Payment Index scored 51 on a scale of 100. This result is calculated from the individual scores of each pillar: 64 for Infrastructure, 51 for Knowledge and 38 for Usage. The sub-indices provide an assessment of the development of payments in Hungary.

When read together, Infrastructure indicates there's a strong foundation for digital payments, which can further scale with the digitalization of the population and merchants and due to new payment technologies entering the market. Second, consumers' level of knowledge, which is captured in the Knowledge pillar, implies that attitude towards and skill to use digital payments are yet to grow. This stresses the need to raise awareness and educate the population about the benefits of cashless payments, which are required to increase the adoption of digital payments. As a result, Usage sub-index scored the lowest, which is consistent with the results listed before.

While development of payment infrastructure is likely to remain at the core of regulatory efforts and industry innovation, knowledge and the emerging usage patterns are expected to mature at slower pace given the complex nature of payments. However, unprecedented circumstances created by the global pandemic might accelerate the speed of this development. In addition, active regulatory policy and incentives could also promote the digitalization process.



KEY TAKEAWAYS

INFRASTRUCTURE

Score of 64 indicates that there is a good foundation for the digitalization of consumer payments in Hungary.

This index pillar is largely driven by the core cashless infrastructure component (scored 76) which is primarily based on a highly developed account-to-account (with 0.9 penetration among adult population, (MNB, 2021a; KSH, 2021a)) and card-based payment networks (cards held by households to adult population was 1.3 in 2020, (MNB, 2021a; KSH, 2021a)), reaching effectively most of the adult population. In terms of mobile payments which build heavily on the card infrastructure, there is space for growth: share of cards added to mobile wallets reached 14% among the adult population (MNB, 2021a; KSH, 2021a) and is expected to increase as the various providers are penetrating the market.

On the acquiring side, the terminalization rate of businesses with B2C serving potential is at 42% (MNB, 2021a; KSH, 2021b). This is expected to drive the growth of the infrastructure pillar in the upcoming years by steadily increasing due to regulatory requirements, and innovation initiatives which increase the presence of advanced terminal technologies, such as SoftPOS¹ or mPOS.

The second major component of the Infrastructure index pillar is the presence of payment solutions which are built on the account-to-account and card rails. Besides some established indicators (e.g. contactless infrastructure), it also covers various innovative ones, which are relatively new and yet to be established on the market (e.g. the use of secondary account identifiers, QR code-based payments, tokenization, installments, etc.), thus this component overall scored lower than the first component of the sub-index. As an example, while contactless has scaled to close to full coverage in the country (physical cards with 99% and terminals 98% penetration rate (MNB, 2021b)), secondary account identifier (SAIs) enabled accounts only reached 0.59% of total (MNB, 2021b). However, the global pandemic confirmed the pivotal role that a solid infrastructure can play, creating momentum for contactless and online technologies, so going forward these solutions are expected to continue to scale.

¹ Enables merchants to turn their Android mobile devices into a terminal to accept contactless NFC payments, introduced to the market in 2020 within Mastercard's infrastructure development program, "Doppio"



KEY TAKEAWAYS

KNOWLEDGE

This chapter is based on the results of a unique research, the Digital Payment Index survey (Mastercard and Scale Research, 2021).

The final score of 51 indicates that there is a need for familiarizing customers better with the available digital payment alternatives.

This pillar's main components scored very similarly: awareness, intention, and objectively measured knowledge on how to use the different payment alternatives achieved scores of 50, 52, 51 respectively. However, if we break down the awareness component further, it seems that the self-reported general familiarity with payment methods and basic security measures score higher (58-62) while the component's results are weakened by the awareness of specific payment providers' brands and solutions.

Overall, cash is still considered as the most secure and the second most convenient payment method (behind card payment at POS terminals), even within the most digitally savvy segment. It is followed by the more traditional electronic payment alternatives (e.g. account-to-account transfer, online payment by providing card details), while more innovative solutions, such as payment with wearables, rank in the lower quarter. This perception hinders the average customers' affinity to try out and establish solid knowledge on new payment methods, beyond the fact that generally only 39% of consumers claim to be interested in new information on payment solutions.

In line with the general expectations, the more recent a solution is on the market, the lower customers' actual knowledge on them when measured via a representative, objective test. As an example, 75% provided correct answers for questions related to payment with card at physical POS terminals, while in case of payments with mobile wallet and instant payments only 57% and 45% respectively.

Besides the different payment methods, the survey also examined the security measures and authentication method related general knowledge and perceptions. While the overall awareness is quite strong (on average 90% heard about the mentioned examples and above 70% claim to know well the most common ones, such as text message about transactions, purchasing limits, etc.), customers are less confident about the more advanced or less frequently used features (e.g. zero liability and chargeback, limiting card usage abroad, etc.): the average who marked these as well-known is only 42%. Users should be familiarized more with these good practices to increase trust in using them.

Going forward, as the presence of the relatively new payment solutions (such as QR code payments, installments, etc.) strengthens on the market, it is expected that customers' understanding of these is also going to improve.

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KEY TAKEAWAYS

USAGE

With an overall score of 38, this pillar is ranking the lowest among the 3 covered by DPI, suggesting that there is a significant potential to increase the usage of digital payments among consumers.

This result is mostly due to the strong position that cash held in Hungary: while the rate of cash withdrawals to card payments by volume decreased to 1 over the past years (MNB, 2021b), it still indicates large appetite for cash.

In terms of the adoption of core cashless payment alternatives, one main driver is the share of regular income received on account (71% of consumers based on the Bankindex Consumer Survey representative research conducted (Scale Research, 2020)), being fundamental to driving out cash from the economy and increase account-to-account usage. Another supporting indicator is the high share (0.9) of active cards to total adult population (MNB, 2021b; KSH, 2021a). The usage of mobile wallets' contribution is much lower to the overall score but expected to strengthen in the upcoming years: in 2020 the share of wallets in contactless transactions already experienced an uptake, having increased to 8% (Mastercard, 2020).

When looking at the adoption of payment solutions built on the core rails, similarly to the trend under the Infrastructure pillar, there are some more established alternatives which are used frequently: for example the use of contactless technology reached 94% share of POS transactions, and already 62% of cards used

online have also been stored online, allowing for a more frictionless online purchasing experience. (Mastercard, 2020). However, recently introduced payment options are still waiting for a real uptake: for instance, the share of instant transfers initiated with SAIs among all instant transfers only reached 0.03% by the end of the year (MNB, 2021b), or remote commerce leveraging tokenization technology, which could further improve the security of online transactions with the use of tokens, reached only 0.5% penetration in online transactions (Mastercard, 2020).

Going forward, the role of cash is likely to decline due to an increased demand for cashless alternatives and a growing supply of convenient and secure payment solutions becoming available to consumers. Growth of Usage is also expected to be driven by online solutions that have seen increased demand due to the pandemic.

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BANKING

INFRASTRUCTURE

1.1 DEFINITION AND OBJECTIVES

The Infrastructure sub-index, which is the first pillar of the Digital Payment Index, provides an assessment of the current state of the electronic payments system including both payments methods and acceptance solutions.

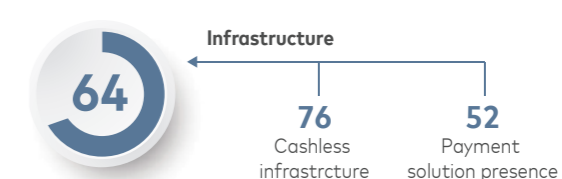
First, it introduces both mainstream and innovative products, technologies available on the market, second it also explores the development of these solutions. For instance, plastic cards, payment accounts and traditional POS terminals are considered among mainstream payment enablers, while innovative solutions include tokenized cards that are digitalized in mobile wallets, peer-to-peer payments, account-based real-time payments, or software-based POS terminals. The Infrastructure sub-index also covers payment solutions that are yet to land on the market, but which have considerable potential to promote digital payments upon their introduction. Throughout this overview, Mastercard leveraged public statistics and reports (e.g. MNB, KSH), as well as its own data and insights.

The primary objective of this sub-index is to demonstrate the infrastructural and technological basis that enable digital payments in the country. This section can provide insights into the below set of questions:

- Which cashless payment enablers are present in Hungary?
- How developed are these payment rails within the country?
- Which payment solutions are (not) present on the market?

This pillar is composed of 2 main components, 1) cashless infrastructure and 2) payment solution presence. The former captures the breadth of core cashless payment rails, covering both account-to-account and card-based payments, while the latter introduces the various solutions that are built on top of this infrastructure.

1.2 SUB-INDEX RESULTS



The infrastructure sub-index scored 64 in 2020, which indicates there is a solid and growing foundation for digital consumer payments in Hungary. The cashless infrastructure is primarily based on a highly developed account-to-account infrastructure (operated by the local ACH, GIRO Zrt.) and on card-based payments, which scored 76 when combined.

Payment solutions available on the market are mostly built on and leverage these core payment technology rails. In 2020 the Hungarian infrastructure's landscape has seen a wave of innovation driven by regulation, as well as by increased demand from consumers due to the global pandemic. New solutions emerged on top of the account-to-account system (e.g. secondary account identifiers, request-to-pay), while the availability of card-based solutions continued its growth. Since new solutions (namely QR-code payments, use of secondary identifiers, token-based solutions) are yet to get a foothold in the market, the second component of the infrastructure sub-index scored 52, which indicates the mix of new solutions are yet to scale.

Cashless infrastructure insights

Historically, account-to-account payments and card payments were the principal means for electronic payments in Hungary. In 2020, the ratio of consumer accounts to the adult population (14-69 years) stood at 0.9, which indicates a high penetration of the account-to-account infrastructure. There were over 6.3 million consumer accounts used primarily for payments according to MNB statistics (MNB, 2021a). Similarly, ratio of retail cards to adult population (14-69 years) was 1.3, which suggests population is well-equipped with cards. According to MNB, households held over 9.1 million cards at the end of 2020 (MNB, 2021a).

INFRASTRUCTURE

In recent years, the card-based infrastructure was further enhanced with the emergence of mobile payments in the country. In 2020, over 800 thousand cards were added to mobile wallets (digitalized) (MNB, 2021a), which translated into 14% adoption rate within the adult population (14-60 years) (KSH, 2020a).

Consumers have the option to choose from a variety of mobile wallets: most Hungarian banks offer both ApplePay and their own Android-based mobile wallet solutions, while Simple acts as a market-wide solution that can be used with any local issued card. During 2020, GooglePay was accessible to the users of international fintechs active on the Hungarian market, such as Revolut, Curve, Monese (Portfolio.hu, 2020). At the beginning of 2021 it became accessible at commercial banks as well.

Another critical dimension of the card infrastructure is the development of the card acceptance network.

The terminalization rate of businesses with B2C serving potential was estimated at 42% (MNB, 2021a; KSH, 2020b), which implies there is room for expanding the domestic acceptance network in Hungary. Furthermore, the increased availability of innovative terminal technologies (e.g. SoftPOS, mPOS) contributes to the terminalization of small businesses. For instance, SoftPOS, which was first introduced to the market in 2020, enables merchants to turn their Android mobile devices into a terminal to accept contactless NFC payments. Similarly, merchants can also convert their devices into terminals using mPOS solutions, which leverage mobile hardware or dongles instead of traditional terminal hardware. These solutions provide cheap and convenient card acceptance alternative to merchants. Terminalization is likely to be further amplified by new regulation that requires businesses operating an online cash register to offer their customer electronic means for payment from 2021. In response, Global Payments Europe communicated plans to launch its SoftPOS service in partnership with billing service provider, Billingo in 2021 (Fintechzone.hu, 2020). The growing demand for e-commerce due to the pandemic emphasized the need to build out an online presence for merchants, which is likely be a major driver of future growth of the acceptance network.

INFRASTRUCTURE

PAYMENT SOLUTION PRESENCE INSIGHTS

This section covers the payment solutions that emerge on top of the infrastructures for electronic payments discussed above. Figure 1 gives a summary of the development of the payment solutions discussed in this section within the Hungarian banking sector. Readiness for those solutions, which require the availability of infrastructure from the consumers' and merchants' side as well, was assessed for both sides. For instance, the preconditions to installments are cardholders' access to the service from their issuing banks, as well as the ability of merchants, and their acquiring banks, to support the service in-store or online.

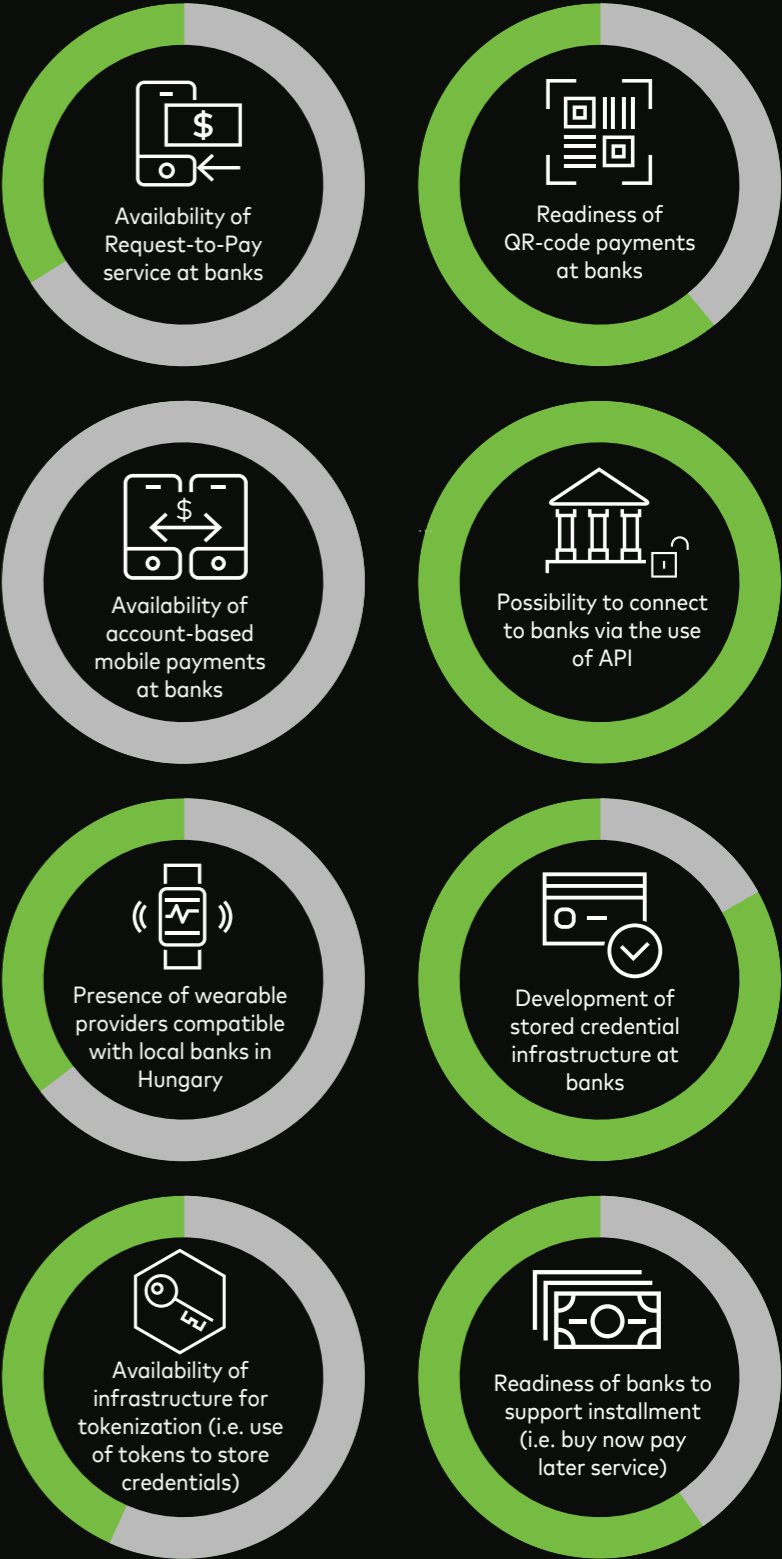


Figure 1: Presence of payment solutions on the market

INFRASTRUCTURE

A fundamental metric for the digitalization of payments is the digital access to accounts. Figure 2 depicts the share of domestic accounts that can be accessed via digital channels (e.g. through internet or with a dedicated software).

This metric already shows a strong position, standing at 75% in 2020, but it also has the potential to grow further, creating the foundation for a greater level of digitalization.

The Hungarian instant payment service launched in March 2020 and it brought two new payment alternatives to consumers: use of secondary account identifiers (SAIs) and request-to-pay service for credit transfers. The former significantly improves convenience of domestic transfers, and the share of accounts that are SAI enabled are expected to gradually increase as more and more use cases gain

foothold on the market. The latter is being gradually introduced; 4 banks already implemented the service at the end of 2020, and 2 more players started offering it at the beginning of 2021 (Fintechzone.hu, 2021).

QR code payment is another method that leverages the account-to-account system, which became increasingly accessible to the market in 2020. End users could already pay using the technology, yet the solution remained only available to merchants of a few early adopter banks, such as OTP and Raiffeisen – the latter builds on OTP's solution, which is also potentially available to any other payment providers who form partnership with the bank². Historically, QR code payments were limited to utility bill payments first via iCsekk, and later via Simple since 2019. In addition, Mastercard announced the launch of Pay by Account, which is another solution built on top of the account-to-account payment system (Mastercard, 2020a). It enables accountbased mobile payments for cardholders, while providing the benefits of card payments (e.g. convenience, wide acceptance, security).

Penetration of digital accounts in domestic accounts (MNB, 2021a)
%, 2011-2020

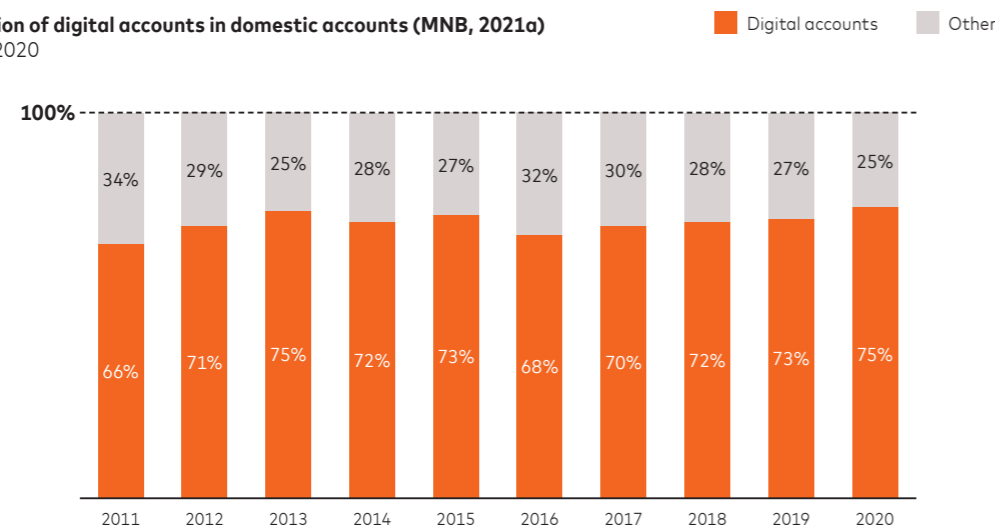


Figure 2: Digitalization level of domestic accounts

Note: Digital accounts refer to accounts accessible through the internet or via dedicated software

² Raiffeisen announced it joined OTP's solution at the beginning of 2021 (Portfolio.hu, 2021)

INFRASTRUCTURE

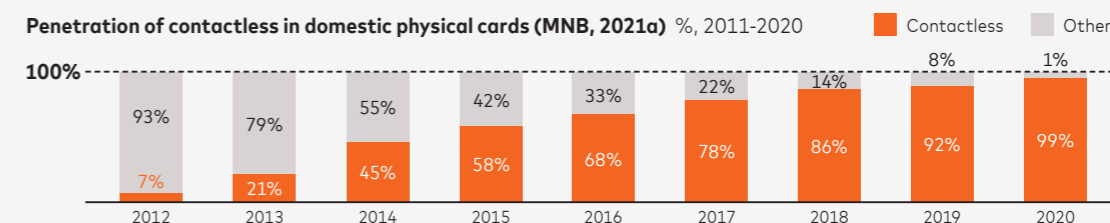
When it comes to card payments, Figure 3 captures the development of contactless in Hungary over the past years: contactless technology reached close to full coverage in the country, both in terms of physical cards³ and terminals, which achieved 99% and 98% penetration rates respectively (MNB, 2021a). Wearable presence on the other hand is yet to grow – only one provider offered wearables that were compatible with local banks at year-end.

In recent years, the opportunity to shop online using saved card details has grown significantly to offer increased convenience to customers. Additionally, spiking demand for e-commerce in the face of the pandemic stressed the importance of increasing security of online payments. The implementation of PSD2 raised the online security standards with the Strong Customer Authentication requirements going live from the beginning of 2021. At the same time, tokenization-based solutions are being introduced to the market, which improves online payment security by allowing merchants to store card details using secure token-technology.

During 2020 the Hungarian payment landscape has seen a set of additional innovations using card rails. For instance, the first debit installment service was launched, which allows its debit cardholders to benefit from buy now pay later service. Another example is Transfergo, which started offering a card-based peer-to-peer solution that enables real-time cross-border transfers among cardholders⁴ (Mastercard, 2020b).

Open Banking APIs became technically accessible in 2020 to comply with PSD2 requirements, which promotes the development of new payment solutions for financial institutions and fintechs. To facilitate connectivity to banks, several players have started offering API aggregator service, e.g. Agregg8.io, SaltEdge, as well as Mastercard. With these both banks and fintechs can easily connect to Hungarian banks to offer Open Banking services. Multiple players moved to explore opportunities in account aggregation (AISP), for instance, billing service providers (e.g. Billingo in partnership with SaltEdge, Számlázz.hu), or fintechs (e.g. Koin, RECASH).

Penetration of contactless in domestic physical cards (MNB, 2021a) %, 2011-2020



Penetration of contactless in domestic physical terminals (MNB, 2021a) %, 2011-2020

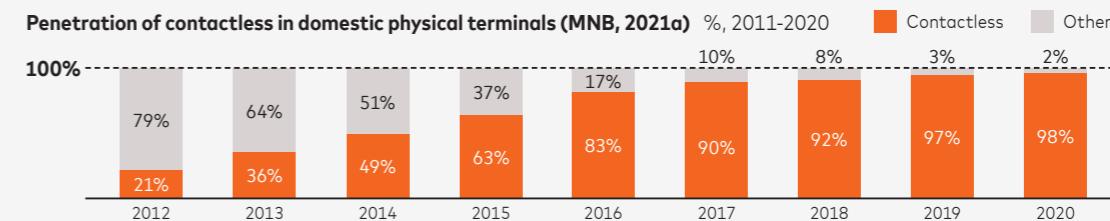


Figure 3: Development of contactless infrastructure in Hungary

Note: Virtual cards and terminals are excluded

³ Calculation excludes virtual cards (i.e. cards that can only be used for transactions performed on the internet)

⁴ Transfergo's peer-to-peer solution leverages Mastercard Send technology (Mastercard, 2020b)

INFRASTRUCTURE

1.3 FUTURE OUTLOOK

Findings of this study suggest that the Hungarian payment infrastructure provides a strong foundation for the digitalization of payments.

Account-to-account and card-based payment networks are effectively reaching most of the adult population, which will drive the adoption of cashless payments and builds a basis for future innovation.

The central bank's proactive policy making has created favorable conditions for scaling up the solutions that became available with the introduction of instant payments in Hungary (e.g. use of SAs, request-to-pay, QR code payments). One emerging use case which is expected to be one of the main drivers for the scaling of account-to-account-based payment alternatives is the emerging focus on

utility payments. Regarding QR code payments, the availability of basic infrastructure creates favorable conditions on the supply side: having the option to easily join and build on a large bank's existing solution, lowers the barrier to entry for solution providers, potentially leading to further growth in their number. Future growth of card-based infrastructure is expected to be primarily driven by the acceleration of merchant terminalization process and the conquest of mobile wallets among cardholders.

The latter is especially relevant as mobile phones are increasingly becoming the primary platform for users' everyday activities, enabling faster spread of solutions building on this channel. Besides, consumers are expecting to have convenience, security and speed ensured at the same time, and for this need mobile banking and payments can respond well.

The global pandemic also confirmed the pivotal role that a solid infrastructure can play, which created momentum for contactless and online technologies. Many solutions already emerged on top of the card infrastructure (e.g. tokenization, installments), which should continue to scale.



KNOWLEDGE

2.1 DEFINITION AND OBJECTIVES

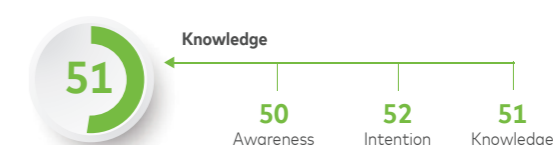
The Knowledge index pillar was built with the objectives of examining consumers' affinity towards digital payments and providing insights to their level of knowledge on the currently available payment methods.

This chapter is based on the results of a unique research, the Digital Payment Index survey (Mastercard and Scale Research, 2021) which was launched to gain timely and relevant insights on these topics, useful for all industry participants. Understanding the existing level of knowledge could help certain stakeholders to educate customers more effectively and to identify how to strengthen their trust towards the different payment solutions and providers. At the same time, attitudes towards digital payments support financial services players in the development and launch of new innovative solutions that resonate well with customer expectations.

This index pillar breaks down consumer knowledge into 3 main components: general awareness of digital payment methods, intention to use them and the practical knowledge on how to use cashless payments.

Within this pillar, besides assessing the understanding of a wide range of payment methods, such as mobile payments, QR code payments or instant payments, the familiarity with specific providers, the perception of convenience and security of payment alternatives, and consumers' level of trust also play an important role.

2.2 SUB-INDEX RESULTS



The knowledge sub-index scored 51, indicating that there is large room for enhancement of customers' understanding of digital payments. Not surprisingly, in most of the dimensions of this index pillar, typically the younger, affluent segments with university education demonstrated more confident knowledge, performing above average, while the elderly and consumers with lower education level possess weaker skills in this area.

This pillars' main components scored very similarly: awareness, intention, and objectively measured knowledge on how use the different payment alternatives achieved scores of 50, 52, 51 respectively. However, if we break down the awareness component further, it seems that the self-reported general familiarity with payment methods and basic security measures are scoring higher (58-62) while the component's results are weakened by the awareness of specific payment providers' brands and solutions. This suggests that overall high-level awareness of payment alternatives exists, but it may not be enough to understand and even start using many of them.

Looking at the results from the angle of the different payment methods, the general conclusion is that cash is still considered as the most secure and the second most convenient one, even among the most digitally savvy segment. The more innovative methods are not only perceived lower on these dimensions, but the actual knowledge on them is also much less strong than in case of the more traditional electronic payment alternatives. As an example, 75% provided correct answers for questions related to payment with card at physical POS terminals, while in case of mobile wallet and instant payments only 57% and 45% respectively.

KNOWLEDGE

AWARENESS COMPONENT INSIGHTS

This component, reaching an average score of 51, reflects how informed and familiar users are with the payment environment by examining indicators for general awareness of different payment methods, specific providers, and payments related security measures.

The score received for awareness of different payment methods proved to be almost twice as high (scored 58) as the solutions of specific providers' (scored 29). However, in case of both indicators it is a clear tendency that there is a great difference between "being aware" and "knowing well" the different alternatives. In case of almost all payment methods (except for installments) more than 80% of consumers claimed to at least having heard about them, however, on average 51% stated to "know them well". Beyond physical and online card payments and account-to-account transfer, confident awareness about the more innovative payment alternatives – such as instant money transfer with SAI, QR code-based payment, or online payment with mobile wallet – drops significantly. When asked about familiarity with brands and specific solutions of payment providers, customers were less confident.

In terms of brand awareness, mobile wallet providers are the most well-known, while less than 50% were familiar with other mentioned fintech providers. Just like in case of the payment methods, when respondents were asked about whether they claim to "know well" these solutions, the positive answers dropped by 50% in case of all.

General awareness of security measures and authentication methods achieved the highest score among indicators within this pillar (62): on average 90% heard about the mentioned examples and above 70% claim to know well the most common ones (e.g. text message about transactions, PIN, purchasing limits, etc.). At the same time, customers are less confident about the more advanced or less frequently used security features (e.g. zero liability and chargeback, freezing card or limiting usage abroad, biometric authentication): the average who marked these as well-known is only 42%. It suggests that users should be familiarized more with these good practices to demystify some still existing believes about digital payment methods not being secure and having high risk of money theft, thus increase confidence in using them.

KNOWLEDGE

INTENTION COMPONENT INSIGHTS

Customers' intention to use digital payments consists of 3 main indicators: customers' perception of the convenience of different payment methods, of their security, and general openness towards innovation in payments.

Figure 4 represents how consumers rank the different payments solutions based on convenience and security, besides the size of the bubbles illustrates the share of respondents who use them at least monthly.

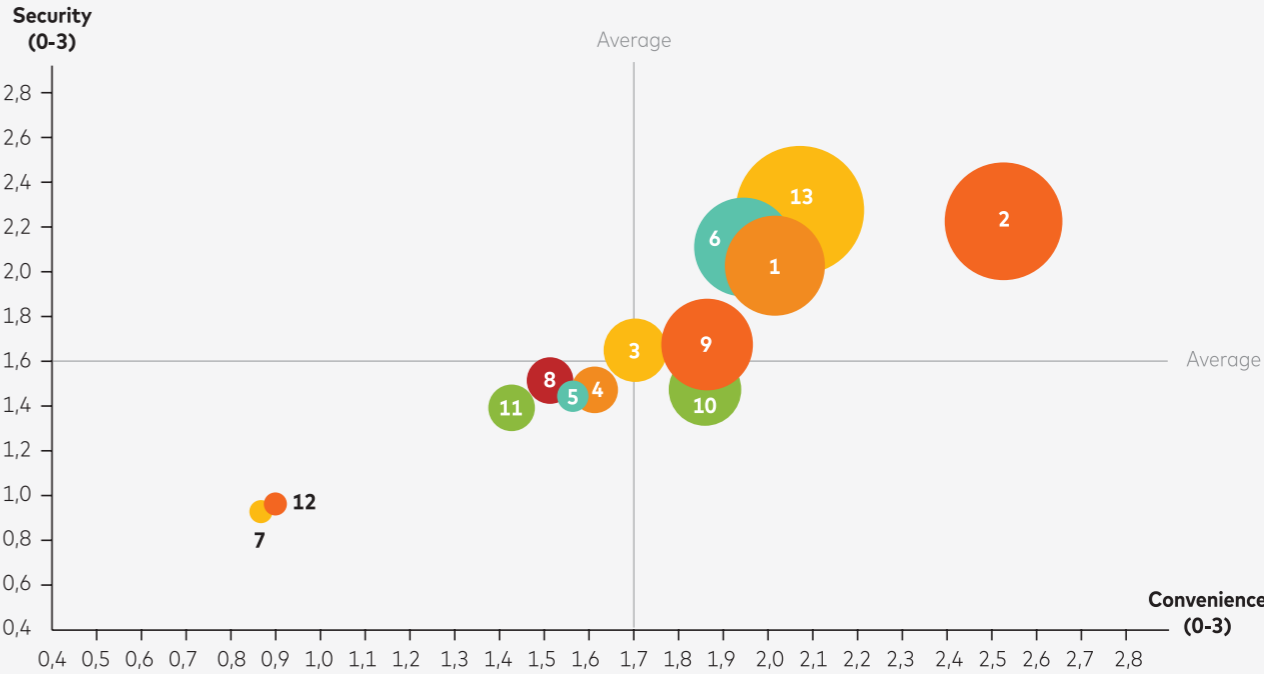


Figure 4: Different payment methods' perceived convenience, security, and usage frequency

- 1 Card payment by inserting into POS terminal
2 Contactless payment at POS terminal
3 Instant transfers initiated with SAIs
4 Mobile wallet, mobile payment at POS terminal
5 Payment with smart watch at POS terminal
6 Account-to-account payments
7 Installment for payment at physical POS
- 8 QR code payment
9 Online payments by adding card details
10 Online payments using saved card details
11 Online payment with mobile wallet
12 Installment for online payment
13 Payment with cash

KNOWLEDGE

Regarding the perception of convenience and security, in case of almost all payment methods there is a strong correlation between the two dimensions: the more convenient a payment method is considered, the more secure it is perceived by customers.

An exception is online payment with stored payment credentials which customers find convenient but less secure compared to the average. Cash proved to be the most secure and the second most convenient form of payment even within the most digital savvy segment, while it seems that the more innovative payment methods are, the lower consumers' trust in them. For example, payments with mobile wallet is considered much lower in both aspects than when the card is involved. This also suggests that most probably, having physical presence counts notably in the perception of security.

Figure 4 also shows that there is a strong correlation between the perception of payment methods and the frequency of usage by consumers. For the longer time payment alternatives are present on the market, the more opportunities consumers have for familiarizing themselves, trying out and adopting new alternatives. It can be assumed that having first-hand experience with using a given payment solution strengthens the perception of convenience and security, while improvement along these dimensions presumably triggers more frequent usage.

Besides having gaps in the perception of convenience and security, another factor which hinders the average customers' affinity to try out new payment methods is the general lack of openness towards

innovation. Only 39% of consumers claim to be interested in new information on payment solutions and only 25% seeks to proactive get to know them.

KNOWLEDGE COMPONENT INSIGHTS

After being generally aware and have the affinity to access information and even try out digital payment alternatives, the next step is to build deeper understanding and the skills to use them.

The knowledge on payment methods strongly correlates with their usage: the better consumers know a particular solution, the more confidently and frequently they might use them, while real understanding can be formed after trying out payment methods in practice.

This sub-index scored 51 and it was measured via an objective test, as opposed to the 2 components so far discussed in this chapter, which rather reflect subjective view of consumers. The distribution of respondents based on the achieved scores is illustrated on Figure 5, which shows that extreme low and high values are very rare. The share of segments formed based on the level of knowledge largely differ based on people's demographic and economic background: as the level of education and income grows, the share of Outperformers also increases (mostly covering people with university degree, income above 350 thousand HUF), while the share of Underperformers drops (pensioners and/or people with primary or vocational education, with a maximum average income of 150 thousand HUF).

KNOWLEDGE

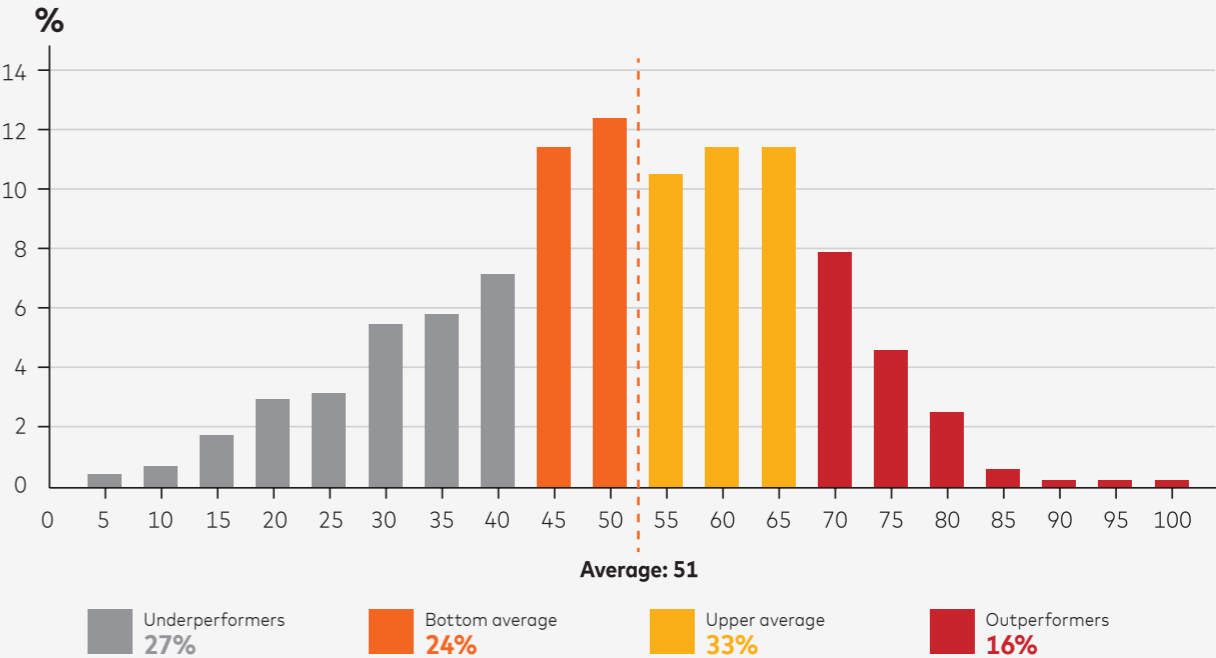


Figure 5: Distribution of respondents based on the score achieved on the objective test about digital payment methods (%)

In case of the different payment methods, generally the innovativeness influences the level of knowledge. Since being on the market for several years and being one of the most widespread payment alternatives, questions related to payment methods with physical card presence reached the best results: on average 75% of respondents provided correct answers. In case of mobile wallets and mobile payments related topics the practical knowledge on how to use them is much lower: for example, only 49% knows that wallets can be used for online and offline purchases as well.

Even though certain payment methods are available on the market for 1-2 years now and are frequently featured in the press and by issuers, consumers are still not familiar with the details, suggesting that knowledge accumulation happens at a relatively slow pace. For example, in case of instant money transfer, which was introduced in Hungary in March

2020, only 40% of consumers are familiar with the secondary account identifiers and the expected timeframe for completing instant transfers. Another example is strong customer authentication (SCA) related requirements: in this case only 27% of respondents provided correct answers for the acceptable ways of authentication.

Finally it comes with no surprise that the methods just gaining traction on the market are the least well-known, however, the knowledge related to these is expected to increase in the upcoming years as more and more providers are going to offer solutions in the space. One example is installment which is currently offered by a few banks on the market and only 25% of consumers were familiar with what it exactly means. Another one is open banking related solutions where only 32% were aware of the general benefits offered.

KNOWLEDGE

2.3 FUTURE OUTLOOK

Going forward, as the presence of the relatively new payment solutions (such as QR code payments, installments, etc.) strengthens on the market, it is expected that customers' understanding of these is also going to improve.

In order to support the development of the knowledge on, and eventually trigger further usage of the various digital payment methods, it is inevitable to have continuous focus on customer education about their benefits and ways to use them, and on further strengthening the trust by emphasizing security measures. Now it is especially a good time to capitalize on the general openness towards digital, i.e. on the accelerated adoption of new channels and innovative solutions, triggered by COVID.



USAGE

3.1 DEFINITION AND OBJECTIVES

In addition to providing an overview of payment infrastructure and consumer knowledge, the Digital Payment Index aims to capture the usage patterns of digital payments in Hungary, e.g. which solutions are preferred by consumers and why, what are the drivers of cashless usage.

Therefore, the Usage pillar covers the adoption of various payment solutions, as well as the performance of cashless payments compared to cash, thereby identifying which digital solutions are most efficient at driving out cash of the Hungarian economy. To complement publicly available sources, which provide a high-level view of digital payment methods, Mastercard calculated the sub-index values by using its own data and primary research materials.

The key objective of this pillar is to evaluate the performance of digital payments compared to cash and identify the main drivers contributing to this

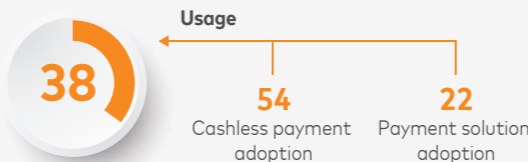
development. The results presented in this section can give answers to the below questions:

- Overall, how does cashless perform against cash?
- Which digital payment rails are the most used in Hungary?
- What is the adoption of the payment solutions present on the market?

This sub-index is composed of 2 main components, 1) cashless payment usage and 2) payment solution adoption. The former captures overall performance of digital payments relative to cash, while the latter measures the actual adoption of payment solutions available in the country.

USAGE

3.2 SUB-INDEX RESULTS



The usage sub-index reached 38 points in 2020, which suggests there is a significant potential to increase the usage of digital payment among consumers. This result is due to the strong position that cash held in Hungary.

For instance, the column chart in Figure 6 depicts the volume of cash withdrawals and card payments (in billion HUF), which shows a significant increase in card payment volume over the past years (MNB, 2021b). At the bottom of Figure 6, the ratio of cash withdrawals to card payments is also displayed to highlight the steady decrease of withdrawals compared to card payments. Despite the declining trend suggested by this metric, the appetite for withdrawals remains high with the ratio only equaling 1 in 2020, therefore the role of cash is still considerable within the population. This dominance is challenged by a rising demand for cashless alternatives in the face of the global pandemic, which could drive future growth compared to cash. Therefore, cashless payment usage component scored 54.

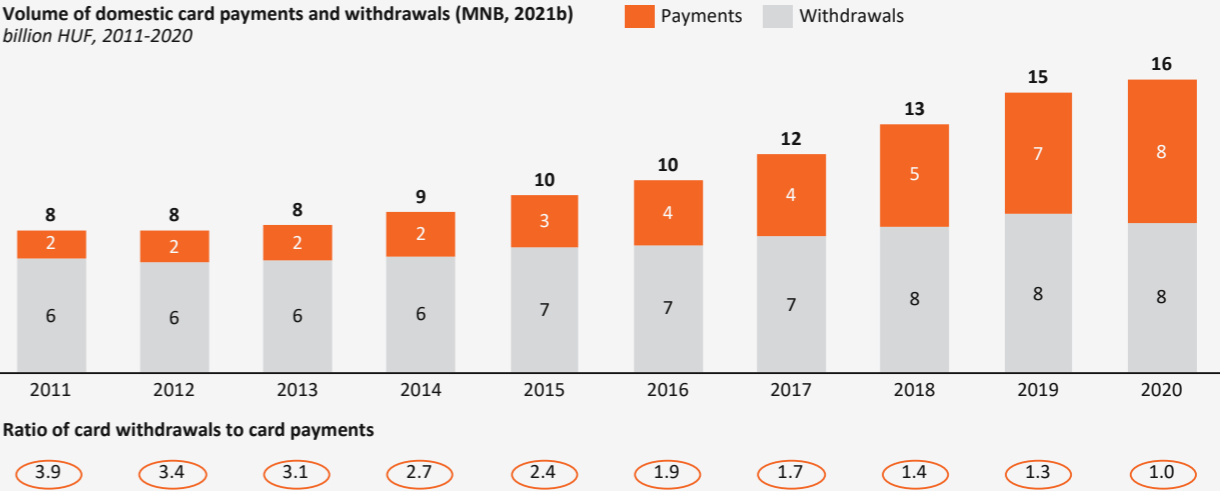


Figure 6: Prevalence of payment and withdrawals in card volumes

In addition, although the infrastructure for innovative solutions is already present on the market, their adoption by consumers is yet to develop.

As a result, the adoption of payment solutions, as the second component, scored 22 points within the sub-index.

USAGE

CASHLESS PAYMENT USAGE INSIGHTS

The subsequent part describes the usage of the digital rails introduced within the Infrastructure sub-index. One of the main drivers of this component is the share of consumers who receive regular income on their account, since it is a precondition to enhancing account-to-account adoption and thereby, decreasing the volume of cash within the economy. According to the Bankindex study⁵, already 71% of consumers fall into this category. At the same time, the ratio of active cards to total adult population (14-69 years) reflects an even stronger performance, reaching 0.9 in 2020 (MNB, 2021b; KSH, 2021a), which suggests that almost every adult cardholder carried out at least one transaction with their cards during the year.

Besides examining fundamental metrics about the use of core digital payment alternatives, it is also important to understand the role of cash. For this, cash withdrawals to card payments by volume is a meaningful indicator, where the lower the value, the weaker the role of cash is. By the end of 2020, this metric declined to 1 (MNB, 2021b), meaning that the volume of cash withdrawn almost equaled to the volume spent by cards at merchants.

While this implies that consumers still heavily demand cash, this metric is likely to further decline due to the general digitalization and the increased demand for electronic payments triggered by the global pandemic.

The emergence of card-based mobile payments is not only experienced from the infrastructure's perspective, but it is also reflected in the usage of mobile wallets. During 2020 the share of mobile wallet transactions reached 6% in card transactions, while share of wallets grew to 8% in contactless transactions (Mastercard, 2020). A yearly conducted representative Mastercard research also explains that 1 person out of 4 has at least tried out a mobile wallet by the end of 2020 (Mastercard and Free Association, 2020).

According to the same survey, the key motivator behind using mobile payments is mainly the convenience, driving usage twice as much as the perception of safety or coolness of the solution. In the upcoming years, as mobile wallet providers' solutions are becoming more accessible on the market and the acceptance network also widens, this trend is expected to continue.

PAYMENT SOLUTION ADOPTION INSIGHTS

The next component of the Usage sub-index provides insights into the adoption of digital payment solutions built on top of the cashless infrastructure discussed earlier. The share of digital channels⁶ in HUF credit transfers increased to 86% by transactions (MNB, 2021b), which indicates that digital channels are already widely adopted among consumers in Hungary. On the other hand, usage of more innovative solutions that leverage the account-to-account rails (e.g. SAls, request-to-pay) is yet to scale among users. For instance, the share of instant transfers initiated with SAls in all instant transfers only reached 0.03% by the end of the year (MNB, 2021b).

According to primary research conducted within the scope of this study, 20% of respondents have already paid with QR code-based solutions (Mastercard and Scale Research, 2021). So far, these predominantly have been used for utility bill payments, but universal applications have recently been developed as well, which could further boost their adoption. Figure 7 depicts results from another survey, which sheds light on the reasons for not choosing QR code payments when paying online (Mastercard and Free Association, 2021). Interestingly, besides the relative preference to cards, availability of the payment method at websites and lack of knowledge to use the solution were reported as the principal reasons for not using QR code payments.

⁵ Research conducted by Scale Research each year (Scale Research, 2020)
⁶ Non-digital channels include transfer based on paper, telephone or data storage device and other channels

USAGE



Figure 7: Reasons for not using QR code payment online

USAGE

Another dimension of analysis was the usage of card-based digital payment solutions. Adoption of contactless technology continued to grow to reach 94% share of POS transactions and 6% share of ATM transactions (Mastercard, 2020). This trend has been driven by an increased demand due to the pandemic, and the corresponding raise of cardholder verification limit (CVM), i.e. amount below which PIN verification is not required, from 5 to 15 thousand HUF. Based on recent consumer research, 36% of respondents claimed to have increased their use of contactless at POS terminals since the pandemic started (Mastercard and Free Association, 2020). Additionally, 9% of respondents within the primary research conducted for this study also reported to have used their smartwatches for payments (Mastercard and Scale, 2021), despite the low penetration of wearables providers on the market elaborated on earlier.

With regards to online shopping, 62% of cards that have been used online have also been stored online, which enables faster checkout and more convenience for cardholders when purchasing on the internet (Mastercard, 2020). Security concerns remain the main barrier to saving card details for online purchases: according to a research 65% of respondents considered storing card details unsafe or reported being afraid of saving these data (Mastercard and Free Association, 2020).

Newly introduced online solutions could address these concerns, such as remote commerce, which improves the security of online transactions by replacing card credentials with the use of safe tokens. As an example, the penetration of merchant tokens reached 0.5% penetration in online transactions during this period (Mastercard, 2020).

Lastly, primary research results of this study also show that 11% of the respondents within the representative sample reported to have already used installments either online or offline (Mastercard and Scale Research, 2021).

3.3 FUTURE OUTLOOK

Although cash is still dominant in the Hungarian payment landscape, its role is likely to decline due to an increased demand for cashless alternatives and an increased supply of convenient and secure payment solutions becoming available to consumers.

Innovative account-to-account solutions are yet to develop strong use cases for consumers in order to unlock broader uptake. Early adopter banks might play an important part in bringing these to market. On the other hand, mobile wallets will continue to play an important role in accelerating the usage of card-based, yet virtual or digital form of card payments. Mobile solutions that can act as a one-stop shop for banking are becoming the principal channel of interaction with consumers, which can amplify the adoption of mobile payments.

At the same time, growth should also be driven by online solutions that have seen increased demand due to the pandemic. Here focus is expected to shift to increasing security of payments, while providing seamless UX to cardholders. Token-based solutions are likely to gain significant share from this market segment (e.g. merchant tokenization). Lastly, compliance with PSD2 created the foundation for the introduction and adoption of Open Banking services that have the potential to extend the current payment landscape.

USAGE

Both mobile and online payments will catalyze the adoption of digital payments, while use cases for newly introduced solutions are yet to emerge among users.

While the share of mobile wallets in card transactions grew in 2020, survey shows the need to address relative convenience and security concerns for future uptake.

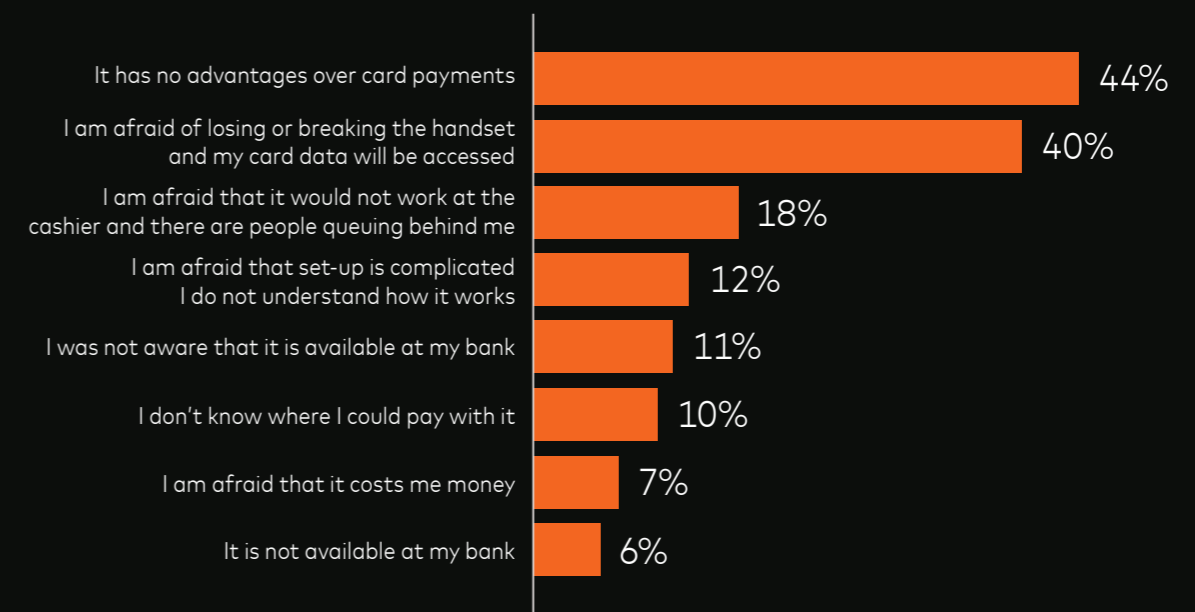


Figure 8: Main barriers of using mobile wallets for payment

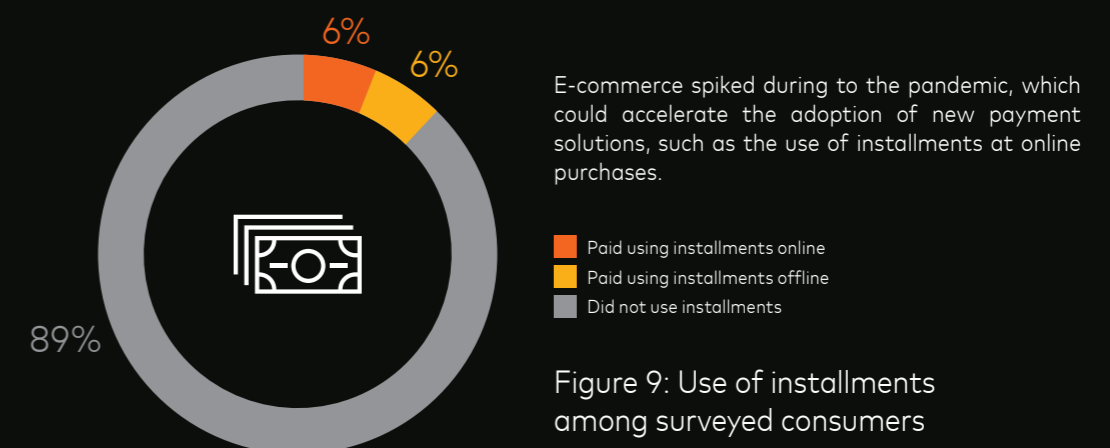


Figure 9: Use of installments among surveyed consumers

METHODOLOGY

The Digital Payment Index is a metric built to capture the development of digital payments in Hungary.

Digital payments in this report refer to any electronic means for payment that provide customers with an alternative to cash purchases.

This study focuses on Hungarian consumer payments and hence, is limited to the analysis of transactions with local payment methods (i.e. traffic with Hungarian accounts and cards), both domestic and cross-border. Furthermore, since cross-border providers are increasingly relevant across Europe, those active on the Hungarian market are also included when discussing the readiness of the infrastructure to allow for a more complete picture.

The index aims to provide a holistic, annual view of payments with both quantitative and qualitative insights. Therefore, it combines statistical data from public sources and Mastercard covering 2020 with bespoke primary research findings from the beginning of 2021. The index is structured at three levels: 1) indicator, 2) component, and 3) sub-index. An indicator is a specific measure, which captures a specific angle of payments performance.

All indicators were indexed on a scale of 100 and next, they were aggregated into components to condense information from individual KPIs. Components were weighted to form the 3 sub-indexes, which were considered important to the same extent, hence were weighted equally for the overall index calculation. Model sensitivity was tested to assess the overall reliability of the index model.

In total, 45 indicators were included in the index.

An important phase of the index development process was the choice of indicators. KPIs were shortlisted based on the availability and quality of data, as well as the sustainability of the data source. Metrics were reviewed with industry experts and those measures were prioritized, which capture distinctly different aspects of payments to ensure relevance of individual indicators selected. Survey data was used as a substitute proxy where statistical data was poor or unavailable.

Finally, the index was designed and structured in a way to be able to flexibly handle market evolution that may occur in the future (e.g. introduction of new payment solutions).

DATA COMPONENTS

To construct this report three types of data sources have been leveraged:

Public sources:

Official payment system statistics that are published quarterly by the Hungarian central bank (MNB) were inputs for infrastructure and usage indicators, while data from the Hungarian statistical office (KSH) provided population and enterprise statistics for index calculations.

Mastercard data:

Aggregated statistics were used to construct ratios for payment solutions that are not reported by public sources (and where reliable data was available), while inputs from expert interviews were included to enrich the study with qualitative insights.

Primary research:

Survey results were used to proxy poor or unavailable datapoints and add complementary insights to key findings – Scale Research provided selected findings from Bankindex Consumer Survey and conducted bespoke primary research for this report, while results from prior research by Mastercard and Free Association were also used.

SCOPE OF PRIMARY RESEARCH

The Knowledge pillar is based on inputs from a primary research commissioned by Mastercard and conducted by Scale Research. It had a hybrid research design, which combined online (CAWI) and personally assisted (CAPI) data collection methods. Fieldwork was conducted during March 2021.

The survey was designed collaboratively with Scale Research to form a 20-25 minutes questionnaire, which combined a series of self-assessment questions related to consumers' awareness of and attitudes to digital payments and a section of objective test questions related to the use of digital payments. 1,000 consumers aged between 18 to 69 years were surveyed in the sample. Results were representative and weighted by gender, location type and region.

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DEFINITIONS

■ Credential on File

Solution with the help of which customers can store their card credentials at the merchants for future use (e.g. recurring transactions).

■ Digital payment

Any electronic means for payment, which provides an alternative to cash at purchases.

■ Installment

By selecting paying with installment (i.e. buy-now-pay-later option) at a POS terminal or during online checkout, cardholders get the flexibility to break down the cost of purchase into smaller pieces and pay for the goods in chunks over a pre-defined period of time.

■ mPOS

Solution that leverages dongles or mobile hardware to turn Android devices into POS terminals.

■ NFC payments

Contactless payments that use near-field communication technology for the exchange of data between devices (e.g. smartphone and terminal).

■ PSD2

"Payment Services Directive 2" is an EU legislation, with two main objectives: improve online payment security through Strong Customer Authentication (SCA), and enable third-party access to customers' certain banking information in order to provide new payment and account services.

■ Request-to-pay

A standardized payment message, which enables the payee to initiate an account-to-account payment request to the payer.

■ Secondary account identifier

An identifier, which is uniquely linked to a customer's payment account and that can be used to facilitate account-to-account payments (e.g. e-mail address, phone number, tax number).

■ SoftPOS

Solution that enables acceptance of NFC payments on Android devices using only software (i.e. without terminal hardware).

■ Strong Customer Authentication (SCA)

Requirement towards payment service providers, introduced by the EU's PSD2 regulation. This regulatory measure is intended to further enhance the security of electronic payments and limit fraud by applying enhanced, multi-factor customer authentication process.

■ Tokenization

Replacement of meaningful payment data with secure tokens that cannot otherwise be used for payments.

ABOUT MASTERCARD

Mastercard is a global technology company in the payments industry. Our mission is to connect and power an inclusive, digital economy that benefits everyone, everywhere by making transactions safe, simple, smart and accessible. Using secure data and networks, partnerships and passion, our innovations and solutions help individuals, financial institutions, governments and businesses realise their greatest potential. Our decency quotient, or DQ, drives our culture and everything we do inside and outside of our company. With connections across more than 210 countries and territories, we are building a sustainable world that unlocks priceless possibilities for all.

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DIGITAL PAYMENT INDEX HUNGARY

2020

COMPASS IN THE HUNGARIAN
ELECTRONIC PAYMENT MARKET

REPORT

