



# dpi

DIGITAL PAYMENT  
INDEX HUNGARY 2022

COMPASS IN THE HUNGARIAN  
ELECTRONIC PAYMENT MARKET

REPORT

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# FOREWORD

Although this is the third year that we have prepared our study mapping the digital payments landscape in Hungary, its aim has remained unchanged since its launch: to gain deeper insights and identify the points where better attention can accelerate development and make the digital payments ecosystem more efficient. We have calculated the results of the Digital Payments Index along the pillars of infrastructure, knowledge, and usage, but we have also looked at a number of other metrics and components behind these precisely so that all players in the digital payments market — from financial institutions, payment service providers, businesses, merchants, to government policymakers and regulators — can find the elements that will help them to plan, develop and build more effectively. We continue to believe that it is only through the joint work and efforts of all these parties that the adoption of digital payments can continue to grow.

This is also significant because the current result is already a joint success, namely that the overall score for 2022 on a 100-point scale has risen by 10 points in three years, advancing by 3 points compared to last year alone. The now-published figures are also special in that they reflect the boost that the pandemic, which is now thankfully behind us, brought to digitization. Thanks in part to this, not only the overall score but also the scores of the sub-indices have risen. As in 2021, we have extended the study to other countries in 2022, allowing us to compare and exchange experiences internationally.

However, while we are delighted that the results clearly demonstrate progress, we cannot sit back and relax, as the gap between the infrastructure enabling digital payments and consumers' knowledge of it is clearly widening. While the digitalization explosion has brought a lot of technological innovations to the Hungarian market, users are very slow to acquire the skills and knowledge necessary to use them. If we look at the difference between the infrastructure and usage scores in 2021 and 2022, we see that users are less and less able to keep up, not to mention that there may be even more considerable differences between regions and between different groups of society. This, of course, does not imply that the dynamics of development should be decelerated but that users cannot be left behind. That is why we believe it is crucial that we examine the current results and work with all market players to develop the necessary strategy and mindset.

As before, we at Mastercard will continue to work to support the domestic market in all areas of digital payments and all its players, and to contribute to the further growth of the Digital Payments Index through our innovations.

**Endre Eölyüs**  
Country Manager, Hungary and Slovenia, Mastercard



## INTRODUCTION

Hungarian consumers can choose from a variety of digital payment alternatives when shopping online and offline. Electronic means for payments have developed significantly and provide a simple and secure alternative to cash today. Accelerating the digitalization of payments has been a top priority for both regulators and the industry. The development of more innovative payment solutions is also visible in the market, with room for further improvement. Even though card payments are becoming more and more used on the Hungarian market, cash remains a significant payment method.

In recent years, attitudes toward digitalized payment solutions have changed. The first

priorities for consumers are convenience and safety. This change has the potential to catalyze the improvement of digital payment solutions by stimulating innovation within the industry and driving the adoption of more secure and convenient payment solutions. At the same time, both the European Union and the Hungarian authorities (e.g., MNB) are focused on implementing policies that enable and promote the usage of cashless payments for consumers and businesses. It is also interesting to see if high inflation has any impact on digital payments. To understand the dynamics of this change and to capture the maturity of the Hungarian payment ecosystem, Mastercard developed a measurement approach in 2020, called the Digital Payment Index (DPI).

The DPI is an annually released index, designed to serve as a navigator and to provide a holistic view of the digitalization of consumer payments in Hungary. Given the relative unavailability of such measurements, the Index helps fill the gap by creating an integrated view across payment rails and enabling a yearly and comparable calculation. It serves as a reference point for the different stakeholders, and supports them in making development and policy decisions by quantifying market development on a scale of 100 in three critical dimensions:



### 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

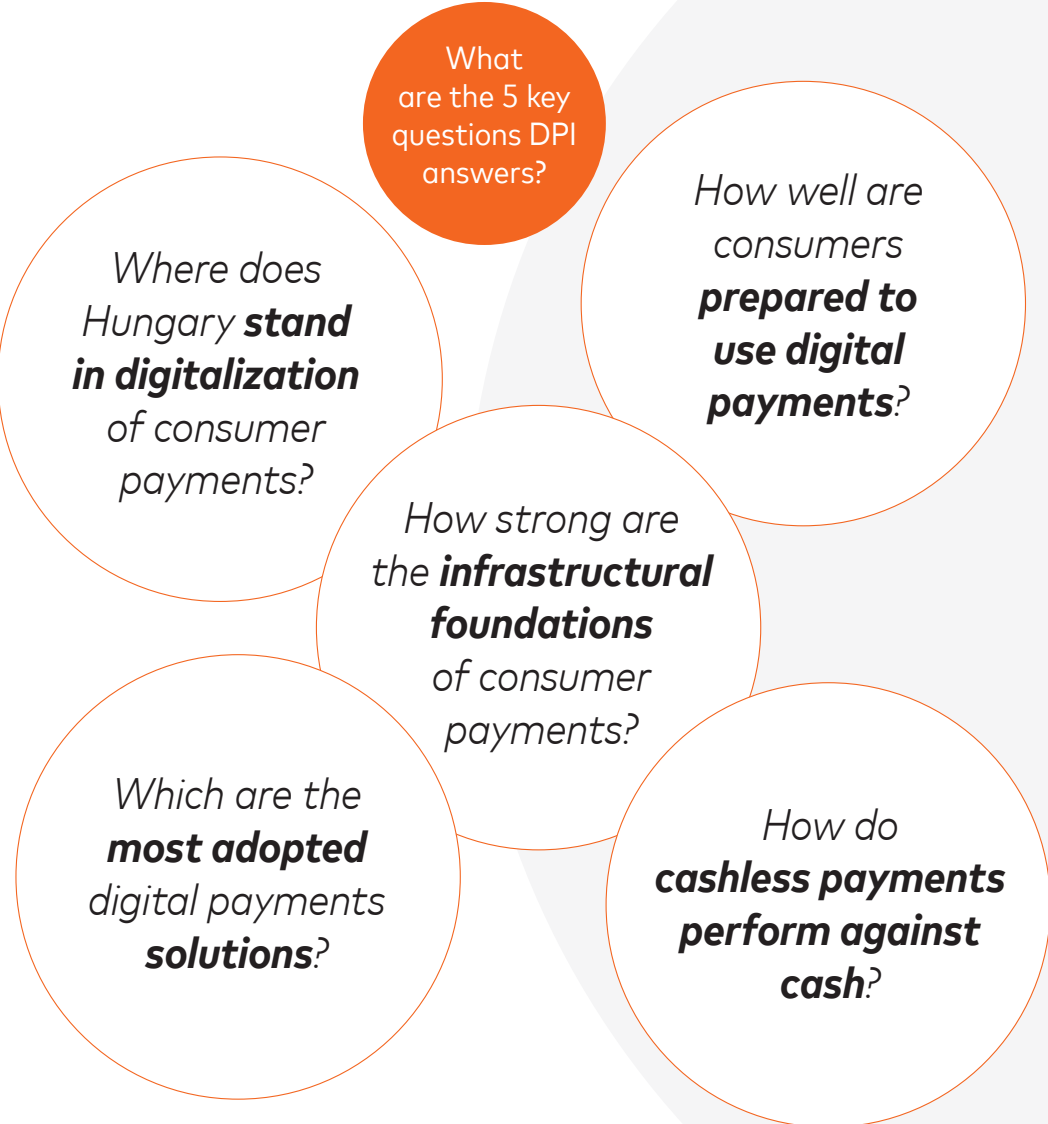


### USAGE

Pattern that shows the adoption of digital payments 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 market expertise.

This report summarizes and interprets the Index results from 2022, taking into account the results from the previous year to identify trends and changes impacting the local market currently and in the future.



THE STUDY IS STRUCTURED AS FOLLOWS:

- Review of Index results for 2022
- Individual pillars are discussed in-depth to provide additional context and insights on the key drivers contributing to the assessment
- A cross-country comparison provides an overview of the results from other countries participating in the DPI 2022: Austria, Croatia and Romania
- Key aspects of the index methodology and the sources used

There is also a section of cybersecurity developments. Although not formally part of the DPI, this topic is highly relevant as digitalization, and the attendant cyber risks, keep evolving in the payments sector.

SUMMARY OF INDEX RESULTS

The Digital Payment Index for Hungary scored 61 on a scale of 100 in 2022 – a 3-point increase from the previous year. The result is calculated from the individual scores for each pillar: 76 for Infrastructure, 55 for Knowledge and 52 for Usage. The sub-indices provide an assessment of the development of the payments market in Hungary. Moreover, they unravel the individual evolution of all pillars that together contributed to the 3-point increase in the score from 2021 to 2022 (Mastercard, 2023c).

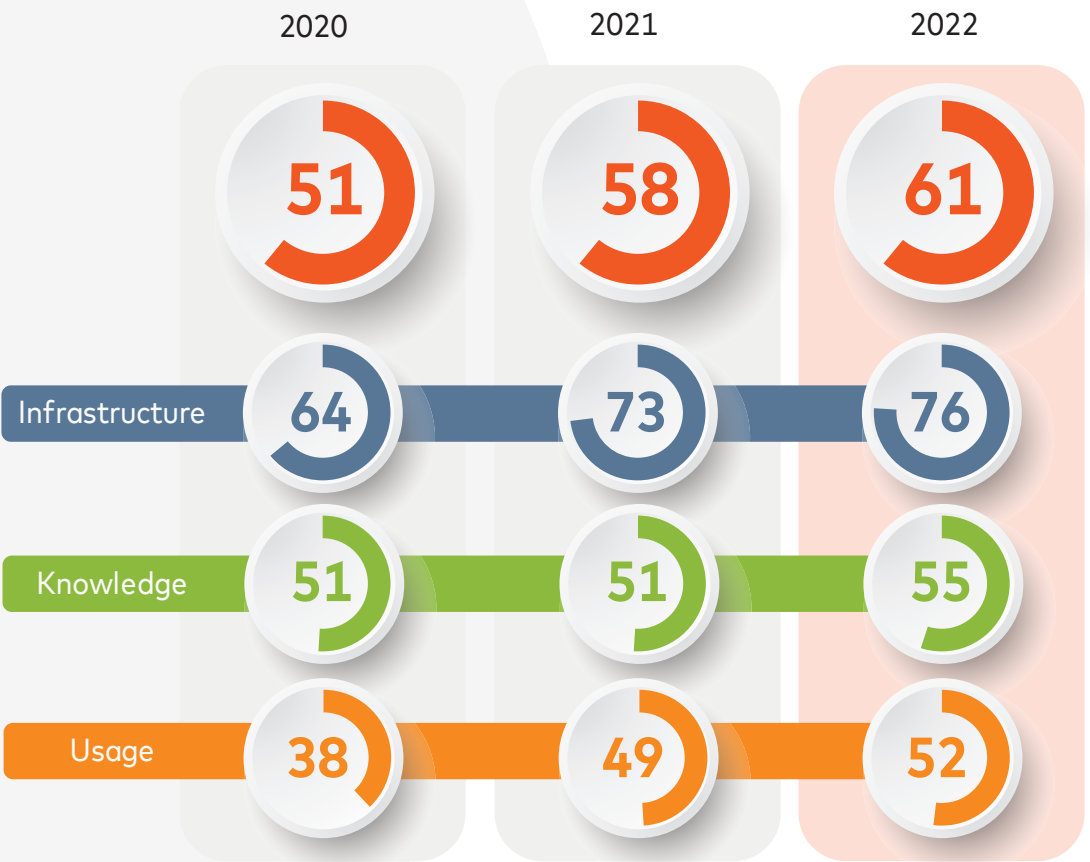


Figure 1: Digital Payment Index results from 2020 to 2022

The DPI score of Hungary has increased by 10 points from the first year it was developed in 2020 as seen in Figure 1., with development visible overall index pillars. This was primarily driven by the expanding acceptance network and increasing enablement of digital payment solutions (enhancing the cashless infrastructure)

along with the significant growth in the adoption of these solutions. Nonetheless, there is a clear gap between the Hungarian infrastructure that provides the foundation for digital payments and consumers' knowledge about them. This gap is important to address because awareness is the first step to increase the adoption of new solutions.



## SUMMARY OF INDEX RESULTS

### Infrastructure:

The Infrastructure score of 76, 3 points higher than the year before, indicates a strong foundation for digital payments in Hungary. As local players adapt to emerging payment solutions, they contribute to market evolution and to the digitalization of both merchants and cardholders, which is also supported by regulatory efforts.

### Knowledge:

The Knowledge pillar score of 55 is 4 points higher than in 2021. This growth is driven by consumers' increased objective knowledge about digital payment methods. However, consumers lack awareness of all available payment methods and the affinity to use them remains low, indicating potential for growth.

### Usage:

The Usage pillar increased by 3 points from 2021 to 2022, reaching 52, but still lags behind consumers' knowledge of digital payments. Several factors positively impact Usage, including development of the digital payment infrastructure, regulatory efforts and the proliferation of card payments. However, cash usage remains substantial in the country. There is significant potential to realize benefits as users' knowledge of payments and adoption rates rise.

Looking ahead, the Infrastructure pillar is expected to continue developing, due to regulatory requirements and consumers' demand focusing on convenience and safety (Fintechzone.hu, 2022b; Fintechzone.hu, 2022c). The development of the Knowledge pillar depends on the local regulators' efforts and the extent of awareness campaigns. Even though Hungarian consumers have become more knowledgeable about digital payment methods, they remain slow to adopt more innovative solutions. Lastly, Usage might increase as the new digital payment methods become more available and established in the coming years, but a major uptake is only likely if coupled with consumer education efforts.

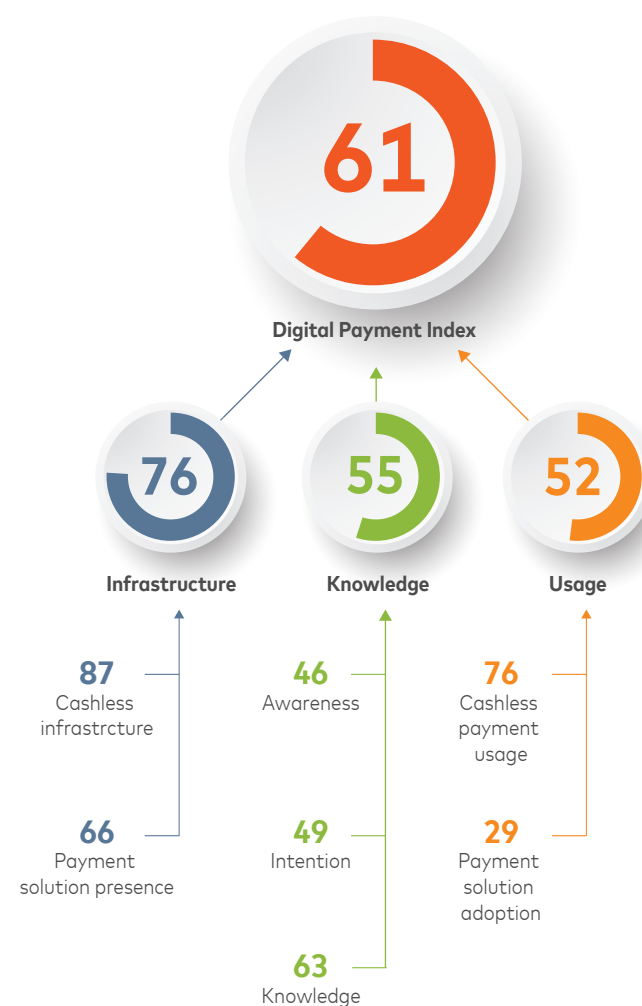


Figure 2:  
Summary of index structure and 2022 results



## KEY TAKEAWAYS

# INFRASTRUCTURE

The Infrastructure score of 76 – a 3-point increase over last year's result – indicates that the cashless infrastructure is well developed in Hungary.

The greater accessibility of digital payment solutions built on these rails drove the growth of the Infrastructure pillar in 2022. While there is further room for improvement, this performance advanced the digital landscape of Hungary by enabling consumers to use more digital solutions.

### CASHLESS INFRASTRUCTURE

This component, which measures the spread of core cashless payment rails, scored 87, a very slight increase over the already high level achieved in 2021<sup>1</sup>.

This sub-index is based primarily on two factors. The first is a highly developed account-to-account infrastructure, operated by the local Automated Clearing House (ACH), GIRO Zrt, which slightly improved throughout the past year (MNB, 2023; KSH, 2023; Mastercard, 2023c). The second factor is the card-based payment network in which Hungarian adults held 9.2 million consumer cards (MNB, 2023; KSH, 2023; Mastercard, 2023c).

Both account and card ratio surpassed full penetration among the adult population in 2022, with more than one card and account per adult on average. However, this still lags behind the EU average of 2.6 cards per adult (MNB, 2023; Mastercard, 2023c).

Regarding the acquiring side, the spread of new innovative acceptance solutions, such as mPOS, gave consumers more options to pay digitally, which can be scaled further with the spread of softPOS (different methods of turning a smart device into a POS terminal) solutions (Fintechzone.hu, 2022a). The share of the potential market with POS terminals significantly increased since 2020, but still nearly 50% of it was not terminalized in 2022, leaving room for improvement, especially among smaller merchants (NGOs, self-employed professionals, beauty salons) (MNB, 2023; Eurostat, 2023; Mastercard, 2023c). The number of merchants providing cashless payments via terminals could expand in the future as innovative acceptance technologies (portable devices, softPOS) become more widely adopted. Through the development of acceptance methods, merchants can meet the changing needs of consumers better and comply with the regulations on providing a cashless payment solution.

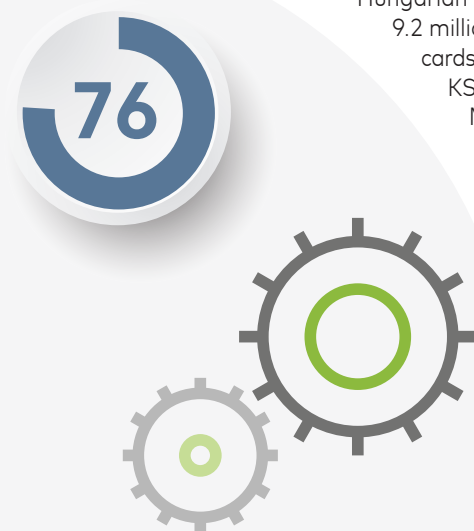
### DIGITAL PAYMENT SOLUTION PRESENCE:

The second component, the availability of payment solutions built on account-to-account and card-based rails, scored 66 in 2022, compared with 60 in 2021. The significant increase in the presence of digital payment solutions was the key driver for the growth of the Infrastructure pillar in 2022. There remains potential for development considering the maturity of the cashless infrastructure. However, this is not surprising given that the solutions in scope cover not only well-established and regulated index indicators (e.g., instant transfer or contactless card penetration), but also innovative methods (e.g., installment payment, merchant tokenization) that are in the early adoption phase among local banks.

Nevertheless, the availability of various digital payment solutions on the market has improved since 2021, following the wider implementation of innovative payment methods. A significant growth driver was the enablement of stored credentials by more local banks. Most of the market now supports stored credentials, which not only meets consumers' need for increased convenience but also addresses the increasing number of online transactions (Financial institutions' official websites, 2023; Mastercard, 2023c). More issuers also started offering payment request solutions, anticipating regulatory intentions to further develop the instant payment network with the coming AFR 2.0 regulation (Fintechzone.hu, 2022b). This highlights the crucial role of a strong infrastructure as the cornerstone of the implementation of innovative payment solutions. Peer-to-peer payment<sup>2</sup> is also considered a marketwide, issuer-agnostic solution that is available to any consumer regardless of their banking relationships, therefore supported by international players on the Hungarian market (Service providers' websites, 2023; Mastercard, 2023c).

Installment options, both offline and online, became more accessible in 2022, giving more freedom and liquidity for consumers but still only less than half of the examined market players provide the solution (Financial institutions' official websites, 2023; Mastercard, 2023c). Even though Buy Now Pay Later (BNPL) options were available on the market by third party providers, local banks were yet to offer their own solutions, leaving space to further improve its availability to consumers.

The availability of contactless technology remained high; acceptance was above 95% and 93% of Hungarian-issued cards were contactless (MNB, 2023; Mastercard, 2023c). The market is now almost fully saturated, leaving very little room for further improvement. Going forward, contactless and online payment solutions might scale in the local market and more innovative solutions can be more widely adopted by local players with a pre-existing solid infrastructure.



<sup>1</sup> In 2021, the published score of the component changed due to the revision of previously published data

<sup>2</sup> Card-to-card solution has been re-evaluated and renamed peer-to-peer for the 2022 DPI





## KEY TAKEAWAYS

# KNOWLEDGE

This chapter is based on the results of extensive market research on the digital payment habits of Hungarian adults.

The Knowledge index pillar achieved a score of 55, growing by 4 points from 2021 to 2022 (Mastercard, 2023a). This significant increase can be attributed to the increase in consumers' objective knowledge regarding digital payment and related processes.

However, the affinity for new payment solutions is still low, making it the most crucial obstacle to improving this score. The awareness (46) and intention (49) components scored similarly in 2022 compared with 2021. However, the objective knowledge component, measured through a quiz, increased significantly from last year's score of 54 to 63 in 2022.

## AWARENESS

The overall score of the awareness component was 46, similar to 2021 data. Since the first DPI in 2020, a decent level of awareness regarding payment alternatives has been observed among Hungarian consumers, but this knowledge often does not translate to interest in using new solutions. In 2022, consumers' ability to link specific payment solutions with their providers did not increase. This stagnation could be driven by newly-added brands that make it difficult for consumers to discern one solution from another in an increasingly crowded marketplace (Mastercard, 2023a).

## INTENTION

Cash is still the most common form of payment in Hungary, with consumers finding it both the most secure and convenient way to pay. Nonetheless, card payments and bank transfers were used very often, scoring high for convenience and security. Installments were the least-used payment methods, with low ratings for security and convenience.

Approximately two-thirds of respondents did not indicate interest in obtaining information about new digital payment methods. This finding suggests that it will be challenging to increase knowledge and usage of digital payments in the coming years as local consumers remain reluctant to alter their payment habits (Mastercard, 2023a).



## KEY TAKEAWAYS

# KNOWLEDGE

## KNOWLEDGE

The component driving the greatest change compared to last year was the objective knowledge of local consumers with a score of 63, a 9-point increase from 2021. As expected, adults with more education and higher economic status performed better, while lower education can be associated with relatively low knowledge on digital payment methods. Respondents aged 30-49 were also identified to be more likely to score high on the quiz, while younger segments performed slightly worse. Looking at specific topics, payment card-related questions represented the deepest knowledge among respondents, as these options have been available on the market for a long time. Knowledge regarding QR code payments, wallet payments and various fraudulent activities also rose from 2021, contributing to the overall

increase of the component. On the other hand, installment payments – not a widespread option in Hungary yet – had among the lowest number of correct responses (Mastercard, 2023a).

As regulators in Hungary push for advancing digital payments, it is expected that local consumers will gradually extend their knowledge and experiences to different payment methods. General understanding regarding digital payments among respondents grew significantly in 2022, establishing the foundation for sparking more curiosity and increasing usage. If local players put more effort into the financial education of consumers, knowledge and confidence about payment methods might increase, as well as interest in new payment solutions.

## KEY TAKEAWAYS

# USAGE

The Usage pillar reached 52 points in 2022, increasing 3 points since 2021. This reflects a slight evolution in the market but suggests significant growth potential to further scale the usage of digital payment solutions.

Scaling is a challenge because of the strong position that cash still holds among the Hungarian population. There is a significant difference between the pillar's two components: cashless payment adoption scored 76 while the adoption rate of digital payment solutions remained relatively low at 29, with no significant change compared to 2021.

## CASHLESS PAYMENT ADOPTION

The cashless payment adoption component grew slightly from 2021 reaching a score of 76 in 2022, indicating a well-developed and growing foundation in the local market to use cashless payment solutions. As was the case in 2021, Hungarian cardholders used their payment cards – in terms of volume – more for digital payments than for cash withdrawals, which is an important foundation of digital payments (Mastercard, 2023a).

A key enabler for digital payments is receiving income to bank accounts. Around three out of four Hungarians receive their full income digitally. Those who spend it through digital means has increased by 4 percentage points to 23% in 2022, showing that a nearly a quarter of the population does not necessarily intend to use cash payments (Mastercard, 2023a).



## KEY TAKEAWAYS

# USAGE

## ADOPTION OF PAYMENT SOLUTIONS

This component scored 29 out of 100. While this is a slight improvement over 2021, the usage of newer digital payment solutions is still low. The component provides insights into the adoption of digital payment solutions built on top of the cashless infrastructure described above. It reveals the state of the more innovative payment methods and provides a great overview of the extent of their usage.

Overall, we can see that despite the enablement of innovative payment solutions such as installment payment, QR code payment and payment requests, the adoption of these solutions is not yet widespread and needs improvement.

Two key components – the transfer digitalization rate (the share of digitally initiated bank transfers) and the adoption of contactless payments – remain very strong in the Hungarian market, around 90% (MNB, 2023; Mastercard, 2023c). Both indicate a high demand for convenient digital payments for well-established solutions.

On the other hand, payment request showed a significant drop in usage since 2021, while other innovative options such as the use of mobile wallets or wearables remain low, despite the growth tendencies they exhibited in 2022 (Financial institutions' official websites, 2023; Mastercard, 2023c). Installment payments (both online and offline) did not show any significant growth in adoption in 2022, indicating that increasing awareness of certain payment solutions does not necessarily boost usage (Mastercard, 2023a).

Credential on file continues to be a highly used solution for online payments with three out of four cardholders storing their card details on merchant sites. More customers are also using merchant tokenization, which provides increased security through encryption, although it is still rarely used. Low adoption rates can be attributed to the very few acquirers enabling the solution for their merchants. This suggests that increasing support for this solution along with providing more access to it on the Hungarian market is highly important to make online payments safer and more secure.



## INFRASTRUCTURE

### 1.1 DEFINITIONS AND OBJECTIVE

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

The primary objective of this pillar is to demonstrate the infrastructural and technological basis that enables digital payments in the country. This section can provide insights into such questions as:

First, the Infrastructure pillar introduces products and technologies available in the market — both well-established and innovative. Second, it explores the development of these solutions. For instance, payment cards, payment accounts and traditional POS terminals are considered to be 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 pillar also covers payment solutions that are yet to land on the market but could have considerable potential to promote digital payments upon their introduction. Throughout this overview, Mastercard leveraged public statistics and reports (e.g., MNB, Eurostat), as well as its own data and insights.

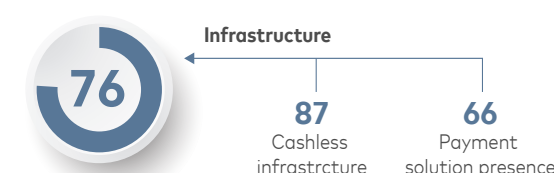
- Which cashless payment enablers are present in Hungary?
- How developed are these payment rails within the country?
- How available are payment solutions in the market?

This pillar is composed of two main components: cashless infrastructure and 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.



# INFRASTRUCTURE

## 1.2 SUB-INDEX RESULTS



In 2022, the Infrastructure pillar scored 76, compared to 73 in 2021, providing a strong foundation for digital payments.

This indicates that the potential for digital consumer payments slightly increased in Hungary. The cashless infrastructure is primarily based on two factors: a well-developed account-to-account infrastructure and card-based payments. In both cases, each adult has more than one account and card on average. In addition, merchants who are able to accept card payments with a terminal are also part of this pillar. Overall, cashless infrastructure reached the high score of 86 in Hungary, while payment solutions presence result was 66.

Most of the accessible payment solutions in the market leverage these fundamental payment rails. The Hungarian landscape, as in previous years, experienced progress and innovation from the regulatory side, also involving the local

players in the discussion (Portfolio.hu, 2022a). The market also responded to consumers' needs for convenience and security when it comes to preference in payment methods (Fintechzone, 2022c).

Some of the most significant growth drivers were payment request enablement and stored credential availability, both of which were newly introduced by a few local players. Close to 60% of market players continued to provide their customers access to account-to-account QR code-based payments (Financial institutions' official websites, 2023, Mastercard, 2023c). Moreover, installment enablement and wearable presence scored higher than last year. The payment solution presence component scored 66, showing a 6-point growth compared to 2021, contributing to the overall growth of the Infrastructure pillar. It indicates that issuers and acquirers have a strong foundation to leverage, providing various options for digital payments. In the future, there is a potential for non-card based digital payment solution to scale further as well.





# INFRASTRUCTURE

## CASHLESS INFRASTRUCTURE INSIGHTS

Account penetration and card penetration slightly increased from 2021 to 2022, providing the foundation for digital payments. On average, there are more than one account and card per adult in Hungary, meaning that almost all of the adult population has access to financial products.

Overall, this finding indicates that the market has a strong foundation, thus, local customers could choose from various options, benefiting from the available infrastructure.

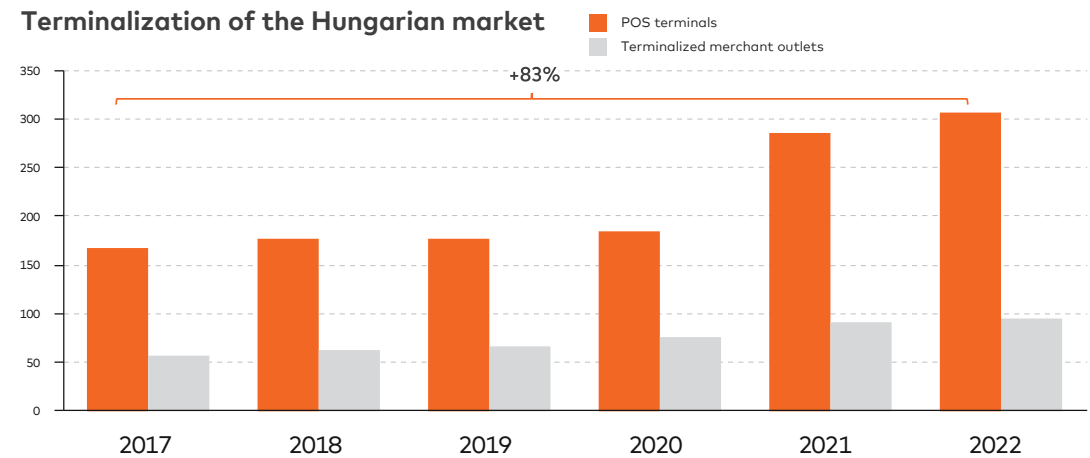


Figure 3. The number of POS terminals and terminalized merchants 2017-2022

The number of terminalized merchants has shown an upward trend recently in the Hungarian market, raising the acceptance infrastructure and allowing the proliferation of digital payment methods.

Related to this metric, terminalization rate<sup>3</sup>, which also takes the number of merchants in relevant sectors into consideration, has remained close

to 50% (Eurostat, 2023; Mastercard, 2023c). It indicates that there is room for improvement as approximately half of the potential enterprises cannot accept card payments. Sectors that are still underterminalized are among others NGOs and foundations, self-employed professionals or beauty shops. For smaller merchants who are currently excluded from the digital payment space, innovative solutions, such as turning a mobile device into a terminal (e.g., SoftPOS, mPOS) could be a useful methods (Portfolio, 2021).

<sup>3</sup> Terminalization rate is measured by the number of merchants with POS terminals, including online merchants acquired by cross-border acquirers divided by the potential market.

# INFRASTRUCTURE

## SHARE OF LOCAL PLAYERS THAT MADE PAYMENT SOLUTIONS AVAILABLE

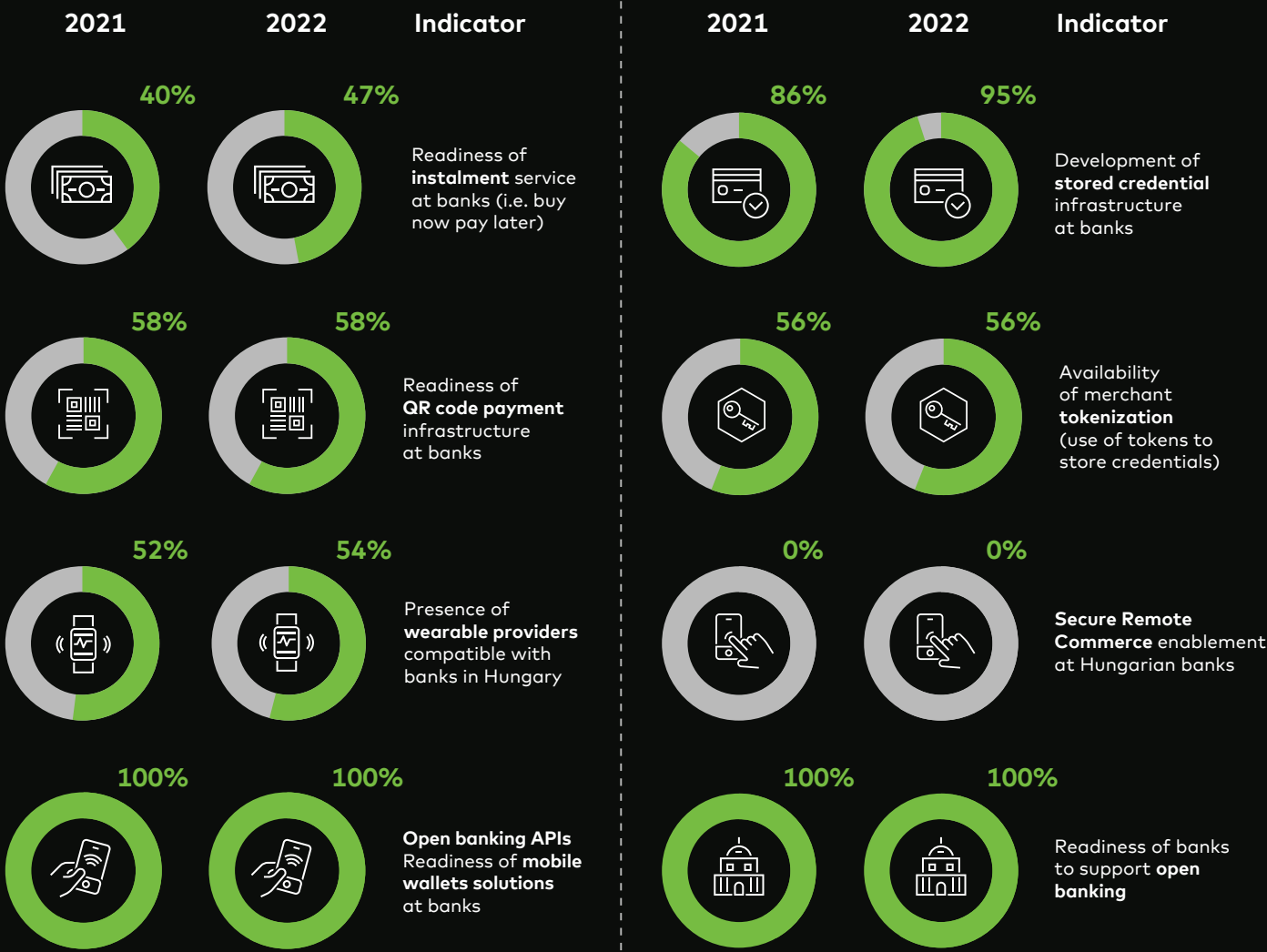


Figure 4: Summary of payment solution presence 2021-2022

## INFRASTRUCTURE

This section covers the payment solutions that emerge on top of the infrastructure for digital payment methods discussed above. Figure 4. summarizes the development of the payment solutions discussed in this section within the Hungarian banking sector. Readiness of those solutions, which require the availability of infrastructure from the consumers' and merchants' sides as well, was assessed. As an example, access to merchant tokenization requires the cardholders' issuing banks as well as the capacity of merchants and their acquiring banks to support the given service.

The trend regarding the number of digital credit transfers continued a positive note since the introduction of instant payment, with transfer numbers rising by almost 10 percentage points compared to 2021 (Mastercard, 2023c). Instant payment enables bank transfers to happen in less than five seconds without surcharge under 10 million HUF, ensuring close to real-time transfers. Providing this payment method was mandatory for all Hungarian banks (MNB, 2020).

Digital transfers account for the strong majority of account to account transactions, the number of paper-based transactions halved in the last five years. However, 12% of all bank transfers still remained paper-based in 2022 indicating that there is still a portion of the population who do not use digital payment channels (Mastercard, 2023a).

In recent years, solutions based on instant transfer, such as payment request and payment with QR code became available. On the issuing side, almost all of the examined banks in Hungary offer these solutions.

Payment request enablement increased from 2021 and was provided by almost 90% of local issuers (Financial institutions' official websites, 2023; Mastercard, 2023c). Payment requests can be received by banks or by third party providers such as Billingo in Hungary. After receiving a request, users can pay in their mobile banking application (Fintechzone.hu, 2021). Payment with QR code was available through OTP Bank's Simple app. As merchants must generate a QR code on the terminal for customers to scan, their acquiring banks have to provide the technology for them to do so. Even though not all acquirers were able to provide the solution for the merchants, most customers had access to QR code payments in the e-commerce space and for initiating bank transfers digitally (Financial institutions' official websites, 2023; Mastercard, 2023c). With the technicality of QR code generation, due to change with the new standard to be introduced by the Hungarian Central Bank in 2024 (AFR 2.0), local players offering the solution might consider sunsetting current methods to adhere to the new standard (Fintechzone.hu, 2022b).

On top of the account-to-account system, Mastercard offers Pay by Account for account-based mobile payments. This solution allows consumers to select any of their accounts to pay with the security and convenience of mobile payments. However, this solution was not accessible on the Hungarian market yet, nor on any other countries examined in the Digital Payment Index.

The ratio of contactless cards remained extremely high in Hungary, with nearly all payment cards enabled for contactless payments.

## INFRASTRUCTURE

The share of contactless POS terminals was above 95% indicating that consumers were able to use a wide contactless infrastructure that provides a foundation for mobile wallets and other NFC enabled technologies (MNB, 2023; Mastercard, 2023c).

Peer-to-peer payments were widely available in Hungary with international, issuer-agnostic solutions providing P2P payment options like PayPal™ or Wise. Splitting costs and transferring money to friends and family are also possible using the solution of other international players, such as Revolut; however, it is necessary to open an account on their platform and users cannot register cards issued by other institutions (Service providers' websites, 2023; Mastercard, 2023c).

The installment enablement<sup>4</sup> score was close to 50% which examined both online – such as Buy Now Pay Later (BNPL) - options and in-store installment payment availability. As expected last year, BNPL solutions entered the Hungarian market in 2022, with the first player on the consumer market being IzzyPay. Compared to other installment options, the BNPL payment process is much simpler and quicker for consumers. Moreover, merchants experience fewer cart abandonments and more customers. Nevertheless, Hungarian banks did not offer their own BNPL services. Merchants or financial institutions might be able to use available white-label solutions on the market (Financial institutions' official websites, 2023; Mastercard, 2023c). Further improvement is expected on the market. Providing simple and cost-free BNPL solutions for consumers is especially important in tougher economic circumstances. BNPL solutions

are widespread in some other countries: in the UK, for instance, more than 15% of consumers choose BNPL option at online check-out (Portfolio.hu, 2022b).

Open banking is a solution that allows connectivity between financial institutions and account holders, and eases business for new entrants, such as startups, or fintechs. Open banking, for instance, could help banks to offer optimized financial products or services for customers, speed up the loan application process, or reduce administrative tasks.

Providing open banking solutions in Hungary was mandatory for all local players; thus, consumers had access to this regardless of their banks (Fintechzone.hu, 2019).

Regarding the presence of APIs, no significant change occurred since last year, as over 30 APIs and over 40 API aggregators existed in Hungary (Open banking tracker). The development of the system was a bit slower than expected due to the difficulty of complying with the regulations of PSD2, the quality of banking connections, and players' openness. However, banks started to recognize the opportunities inherent in open banking, such as embedded finance and banking as a service (BaaS), that could be established as new solutions and other sources of income (Fintechzone.hu, 2023). Open Banking Connect, Mastercard's open banking solution, allows third parties to connect to European open banking services more easily, with no separate connections to each bank. The Mastercard Engage program has also expanded its open banking solutions, further supporting collaboration in the payments sector.



## INFRASTRUCTURE

Since consumers find convenience and security as the most critical factors for payment solutions, offering credential on file is a good way to address their needs as there is no need to enter card details manually. On the issuing side, all local players have made this solution accessible for customers.

On the acceptance side, credential on file is available from all but one institution, which increased availability by 9 percentage points, reaching 95% in 2022 (Financial institutions' official websites, 2023, Mastercard, 2023c).

When using merchant tokenization, there is no difference for the end customer; however, card details are stored and handled via a different system that uses encryption for greater security. Cardholders can tokenize their cards regardless of their issuer; however, only one acquiring bank provides the solution (Mastercard, 2023c). In case, besides issuers, acquirers also make the tokenization of cards available in the future, the solution could be more widespread in the local market. Consumer convenience was the main driver behind storing card details online. The market

also indicates a growing need for these solutions to be more accessible. The number of online transactions is increasing, and more transactions are being initiated from mobile devices, suggesting that financial players should focus on optimizing mobile solutions first (Fintechzone.hu, 2022c).

As mobile transactions are increasingly used by cardholders, there is no backward change from local banks to support wallet payments. Figure 5. shows the share of institutions offering a certain wallet or wearable solution (Financial institutions' official websites, 2023; Mastercard, 2023c).

Apple Pay® is enabled by all players in the market. Typically, banks that do not yet support Google Pay™ payments have developed their own issuer wallets for consumers.

As more banks support Google Pay™, their own issuer wallet becomes redundant; thus a few banks have already taken their own solutions off the market. Regarding wearables, there is slow progress as more and more issuers support wearable solutions such as XiaomiPay™, FitbitPay™ or GarminPay™. Overall, it is a positive development to see the market adapting to the changing needs of consumers.

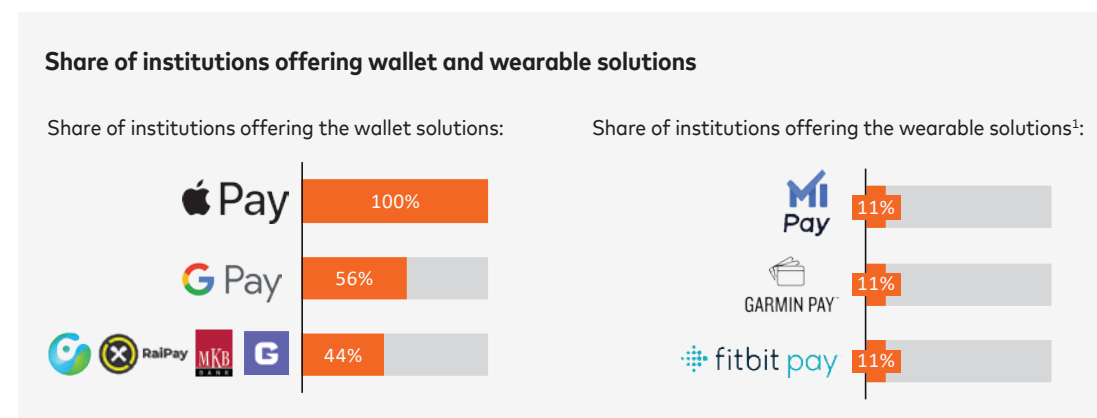


Figure 5. Share of institutions offering wallet and wearable solutions

Source: Mastercard, Expert interviews

Note: 1. Google Pay and Apple Pay are also considered when looking at wearable enablement for the market

## INFRASTRUCTURE

### 1.3 FUTURE OUTLOOK

The results of this research show a firm foundation for the Hungarian payment infrastructure to enable the further scaling of digital payments. The penetration of accounts and cards in the market also indicates future progress, incentivizing local players to further broaden the scale of existing offerings and implement new digital payment solutions.

In the future, it is important to enable more merchants to accept digital payments. Turning more mobile devices into terminals could be relevant and important for smaller sized merchants.

The payments industry also understands this demand, which can lead to the introduction of various innovative acceptance technologies. For example, SoftPOS allows merchants to turn Android® or IOS devices into terminals (e.g., Tap on Phone). Similarly, the mPOS solution leverages mobile hardware or dongles rather than traditional terminal hardware to accept NFC payments.

Wearable payments are also becoming more common on the market (Xiaomi Pay, Fitbit Pay), requiring attention from the local acquirers to drive growth in the future.

Contrary to issuers, local acquirers do not support merchant tokenization yet. The wider enablement of the solution on the acquiring side would allow not just more convenient but also more secure online payments for the consumers.

As the Hungarian Central Bank is highly proactive in the market, new regulations will be introduced. With updated regulations for the instant payment system expected in 2024 (AFR 2.0), banks are already considering how to comply with the new rules. This includes the introduction of a new QR code standard, enhancing security by adding a central authentication process. The aim is to make instant payment-related methods (QR code payment and payment request) mandatory for local issuers and thus available for the whole market. Regulators will improve quality as well. For example, confirmation about successful QR code payments – as well as rejected ones – will be sent to merchants so they know the status of all transactions. Enhancing the level of security, a chargeback system will be introduced, allowing consumers to get their money back if the merchant fails to deliver. (Fintechzone, 2022b; Portfolio.hu, 2022a).

In addition to QR code payments, the Hungarian Central Bank plans to record the standardized data entry methods based on NFC with deep linking. The new system aims to make payment processes quicker and more seamless. Regulators also suggest increasing the limit of instant bank transfers from 10 million HUF in 2022 to 20 million HUF. Regulators also intend to improve the user experience and introduce new safety measures (Portfolio.hu, 2022a). The European Payments Council will also mandate changes in line with the Hungarian Central Bank's regulations (European Payments Council, 2022).

Finally, upcoming regulations combined with new possibilities in open banking can drive market growth as well. In 2023, a PSD3 regulatory proposal is expected, aimed at increasing safety and standardizing APIs across the European countries (Open Banking Expo, 2022). PSD3 plans to utilize learnings from PSD2, while also ensuring access to various payment services and products (Fintechzone.hu, 2023).

# KNOWLEDGE

## 2.1 DEFINITION AND OBJECTIVES

The Knowledge index pillar was built to examine consumers' affinity toward digital payments and provide insights about their knowledge of currently available payment methods.

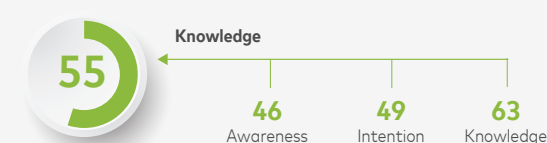
This chapter is based on the results of extensive market research focusing on the digital payment habits of Hungarian adults (Mastercard, 2023a). The generated insights and conclusions are useful for a wide range of industry participants. Understanding the existing level of knowledge can help certain stakeholders educate consumers more effectively and identify how to strengthen their awareness of and trust in different digital payment solutions and providers. At the same time, understanding consumer attitudes toward digital payments can help financial services players develop and launch new innovative solutions that resonate well with consumer expectations.

This pillar divides consumer knowledge into three main components: general awareness of digital payment methods, intention to use them, and objective knowledge on how to use cashless payments.

This pillar examines consumers' understanding of an array of payment methods—such as mobile payments, QR-code payments, and instant payments—and also probes their familiarity with specific providers, their perceptions of the convenience and security of payment alternatives, and their level of trust.

# KNOWLEDGE

## 2.2 SUB-INDEX RESULTS



The Knowledge index pillar scored 55 – a 4-point growth from 2021 – indicating that consumers' understanding of digital payments developed significantly in a year. This brings the level of knowledge about digital solutions slightly closer to the infrastructural readiness in Hungary. However, there is still room for improvement for consumers to learn more about various digital payment solutions and brands with different offerings.

In most dimensions of the Knowledge pillar, the younger, affluent segments with a university education typically demonstrated more confident knowledge and performed above average, while the elderly and consumers with lower education levels possessed weaker knowledge regarding digital payments.

Hungarians, who receive a major share of their income in cash, were also found to know less about digital methods, however, those who shop online more frequently scored significantly higher.

While it can be observed that the general knowledge of respondents regarding digital payments increased significantly by 9 points to 63 in 2022, their awareness of various brands, digital payment solutions and security measures did not change significantly compared to 2021, remaining at 46. The final component of the Knowledge pillar, intention, scored 49, representing almost no change, as the 2021 result was 48.

Awareness of various digital payments methods showed no significant increase compared to 2021, even though additional, lesser-known brands were investigated as the market continuously develops. Awareness of digital payment methods is nearly

twice as high as the awareness of different brands offering these digital services. Brand awareness scored only 24 points, substantially reducing the overall score of the component. Nonetheless, it was not a significant decrease from last year, as brand awareness already had a very low score.

Looking at convenience and security, both KPIs improved from 2021, which corroborates customers' desire for those two attributes in their payment solutions (Fintechzone.hu, 2022c). While the convenience of digital payments reached 50%, the latter KPI reached 48% showing only a slight improvement from last year. Cash is perceived as the most secure and nearly the most convenient payment option (among the examined payment solutions) by all age groups, but especially by the older generations. Nevertheless, contactless payments are considered slightly more convenient by respondents, especially who are aged 30-69.

The most significant increase from 2021 (9 points) was in consumers' general digital payment knowledge, which reached the score of 63. This KPI measures knowledge covering different areas, including security, processes and responsibilities related to digital payments. It suggests that Hungarian consumers are relatively knowledgeable regarding digital payments, as they have more knowledge and experiences than in recent years. Demographic groups with higher levels of education (completed university degree or PhD) scored significantly higher, providing evidence of a positive correlation between the level of education and knowledge on payment products. Another key factor in having a substantially higher score was monthly income; those who earn at least 350,000 HUF (net) monthly scored significantly higher on the test. Therefore, a good target group for financial education might be younger people (aged 18-29) who are not enrolled in higher education and earn relatively low salaries, exactly the most vulnerable segment of the population.

Overall, it can be concluded that the knowledge and the understanding about the various digital purchase options rose, but significant improvement potential remains. Awareness regarding digital payments lags behind the available infrastructure. Nevertheless, high awareness is the cornerstone of shifting consumers to digital payment channels.



KNOWLEDGE

AWARENESS COMPONENT INSIGHT

Awareness reached a score of 46, reflecting 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. A slightly declining trend could be observed since the first DPI, measuring the market in 2020. However, this is not very surprising, since the payment solutions and specific payment providers are continuously changing and evolving. New brands or solutions are naturally less known by the consumers.

The first KPI measured in this component was consumer's awareness of various digital payment methods, which increased slightly to 55 in 2022. A key driver behind the growth is the increased awareness of installment payment options online or offline. It suggests that consumers have heard more about paying in smaller portions, although a very small share reported to "know it well." Even though payment by installment is available for almost half of the market in Hungary, consumers are still not well aware of this option.

Recognition of other methods such as mobile or e-wallet payment and tapping a smartphone or smartwatch to a terminal also increased slightly. Newer or more specific methods added in 2022 do not have substantially different recognition on average than those asked about in the previous year's survey.

Wallets and wearables posted the biggest increases among used payment methods, indicating that more adults are turning to their smart devices for payments.

Similar to the survey results from DPI 2020 and 2021, more than 75% of consumers claimed to have heard about all payment methods (except for installments and payment request). Only 50% stated to "know them well." This shows strong consistency among consumers, indicating their level of awareness was not changing substantially either in positive or negative way.

The score of digital payments awareness (55) was more than two times higher than the awareness of brands offering payment solutions (24) – similarly to the previous two years.

This suggests that consumers know various payment solutions better than specific providers of those solutions. When it comes to familiarity regarding brands and payment solution providers, customers remained less confident. Nevertheless, a significant difference can be noticed between well-established brands, such as some mobile wallet brands and other payment service providers with longer and stronger presence in Hungary, and wearable providers who are new to the market. Not surprisingly, among all brands, less than 20% of those saying they "at least heard about it" actually used that brand's solutions (Mastercard, 2023a).

Awareness of existing security measures, including authentication methods, achieved the highest score (58) among indicators within the Awareness component in 2022, suggesting that throughout the past year, users' familiarity with certain security aspects remained relatively strong.

Regarding security, 85% of respondents heard about the mentioned examples in the conducted survey and close to 75% claimed to "know well" the most common security measures (e.g., text messages about transactions, PIN, changing password or PIN, etc.). However, consumers are less confident about the more advanced or less frequently used security features (such as freezing card or limiting usage abroad, biometric authentication, limiting payment channels, etc.): less than 44% of adults marked them as well-known security possibilities. This indicates that, as cybersecurity threats grow, more education is needed for consumers about security measures that they could implement to better protect themselves against fraudulent activities.

KNOWLEDGE

INTENTION COMPONENT INSIGHT

Consumers' intention to use digital payments consists of three main KPIs: consumer perceptions of the convenience and the security of different payment methods, and general openness toward innovation in payments.

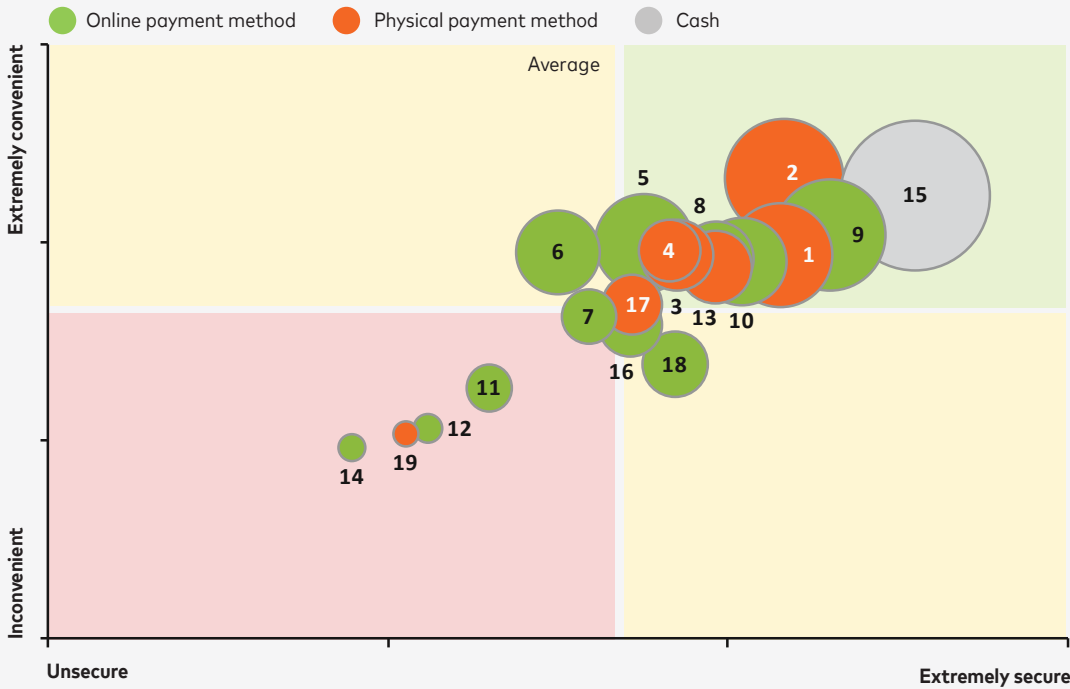


Figure 6: Different payment methods' perceived convenience, security, and usage frequency

Note: size of bubbles represents usage frequency of payment methods: % of respondents who use them at least once a month

- 1 Inserting payment card in a POS terminal  
 2 Tapping a payment card on a POS terminal  
 3 Payment with mobile wallet by tapping a terminal  
 4 Payment with smartwatch or other wearable by tapping a terminal  
 5 Online payment with payment card by entering card details manually  
 6 Online payment with previously saved payment card details  
 7 Payment with virtual card provided for e-commerce  
 8 Online payment with mobile wallet or e-wallet (e.g., PayPal)  
 9 Bank transfer by entering the recipient's bank account number  
 10 Complete payment through direct debit
- 11 Complete payment by accepting a request for money transfer (e.g., Revolut request)  
 12 Choosing an installment option (e.g., Buy Now Pay Later)  
 13 Payment with prepaid voucher cards  
 14 Online or in-store payment with a cryptocurrency (e.g., Bitcoin, Ethereum)  
 15 Payment with cash  
 16 Bank transfer by entering the recipient's secondary identifier (email or phone number)  
 17 Payment by mobile with QR code  
 18 Request to pay / Request open invoice payment at an online store  
 19 Request an installment payment immediately using a terminal (offline)

Figure 6. shows how consumers rank the different payment solutions based on convenience and security, while the size of the bubbles illustrates the share of respondents who use the methods at least monthly, according to the representative primary research conducted within the scope of this report (Mastercard, 2023a).

KNOWLEDGE

Examining 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 consumers.

Payment with cash is still considered to be the most secure and nearly the most convenient method, following contactless card payment.

According to the results, cash also has the largest share of respondents using it the most frequently. It indicates that consumers find almost every digital payment option less secure, presenting an opportunity to promote digital methods more. It can also be observed that card usage, whether tapping or inserting it to POS or digital device terminals was evaluated as both secure and convenient payment solutions, while also having significant weight in terms of usage. Moreover, contactless payments are considered slightly more convenient by respondents aged 30-69, indicating that younger generations are not necessarily aware of the benefits of digital payments.

While most payment methods did not change significantly in terms of security or convenience,

the perceived safety of payment with cryptocurrencies dropped to almost half of last year's result, which could correlate with the steep price decline of decentralized currencies.

Concerning payment frequency, most payment methods remained almost the same. However, growth was observed in developing areas of the Hungarian market. For example, the monthly usage of wearables almost doubled, while online payments with wallets or e-wallets increased by almost 70% from 2021, where 22% of respondents used it already.

One of the main obstacles to engaging consumers with new payment methods is their lack of curiosity and openness toward innovative payment solutions.

In the study, only 34% of respondents were interested in news related to payment solutions, that could mean that almost two-thirds of local consumers intend to stay with their current payment solutions. Less than one-fifth of the adults indicated curiosity regarding new digital payment methods, which presents a large challenge to local players in building awareness through education and promotion.

KNOWLEDGE

OBJECTIVE KNOWLEDGE COMPONENT INSIGHT

Although respondents' knowledge did not improve in many areas, their objective knowledge about digital payments reached 63 points, a 9-point increase from 2021. This is a key result since greater familiarity with the processes, measures, and circumstances surrounding digital payments makes consumers more likely to try out new payment methods.

This component score was measured via an objective test, in contrast to the previous two components that reflect the subjective view of consumers. The distribution of respondents based on the achieved scores is illustrated in Figure 7.

Looking at the scores for separate age groups, respondents aged 30-49 improved the most (+10 points) from last year's quiz.

As they have the most active experiences regarding payments, they are also the most knowledgeable based on the results of this survey.

Similarly, the level of knowledge was segmented based on the respondents' educational and economic backgrounds. As the levels of education and income grew, the share of outperformers increased (mostly people with university degrees, monthly income above 350K HUF), while the share of underperformers dropped.

For those with lower levels of income and education (mostly people with primary school or vocational school backgrounds, monthly income maximum 150K HUF), the share of underperformers increased.

Distribution of respondents based on the achieved test score  
% of total respondents; () change compared to DPI 2021 results

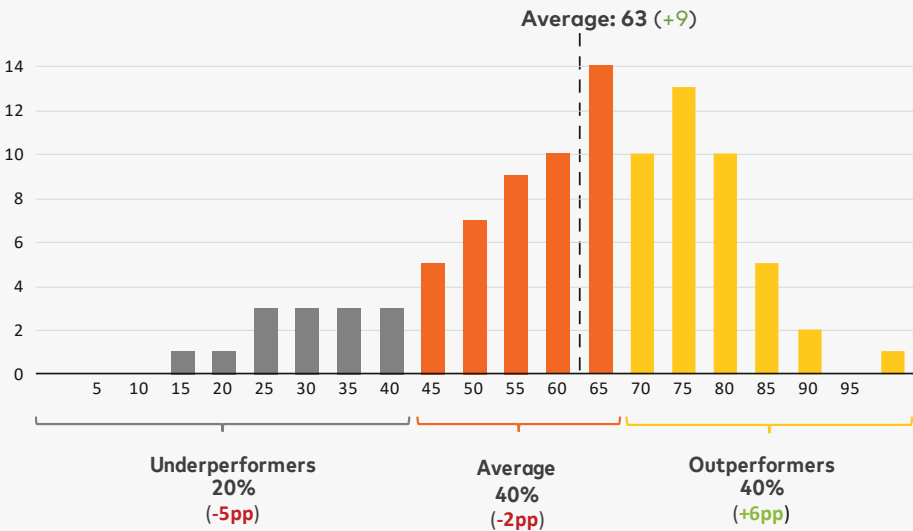


Figure 7: Distribution of respondents according to quiz scores



## KNOWLEDGE

In the quiz, card-related questions received the most correct answers – unsurprising since cards are widespread, have a long market history, and are well understood by the Hungarian consumers. For example, the majority of participants know how to block and adjust the limits of payment cards.

Compared to the questionnaire last year, the knowledge regarding offline and online authentication also rose: approximately three out of four adults know about those security features. This familiarity becomes more important, as consumers get more exposed to different kinds of frauds.

Much fewer respondents who only completed primary school or have relatively low income know about these security features, indicating that education and income are significant factors when it comes to knowledge about digital payment security. Overall, the age group that had substantially more correct answers in most

of the quiz were aged 30-49, while the younger generation scored lower, which suggests that we cannot make assumptions about the financial education of the younger segment.

Knowledge about wallets and the storage of card credentials also grew. However, the biggest increase happened to the awareness of QR code payments as the number of correct answers grew significantly since 2021. Local consumers' knowledge could be also impacted by the news on and the advancement efforts of paying with QR code.

Installment payments is an area that needs more educational and promotional efforts. Respondents' awareness remained low, with approximately three out of four consumers not understanding this type of payment. This result correlates with the previously mentioned awareness of installment payments, which suggests the overall knowledge regarding this solution is low in Hungary.

In summary, there was a significant advance in the objective knowledge of local consumers in 2022, which could positively impact the usage of digital payment solutions in Hungary.

## KNOWLEDGE

### 2.3 FUTURE OUTLOOK

Efforts of regulators to further improve the usage of digital payments could also affect consumers' knowledge. A key goal of the coming improvements to the Hungarian Instant Credit transfer scheme, AFR 2.0, is to make certain payment processes more seamless, easy, and safe for customers. This could also affect consumers' knowledge regarding payment requests and QR code payments and improve their payment experiences.

Regarding payments by installments, the solution is not yet widespread in the Hungarian market. Even though Buy Now Pay Later option has become available in the market, no local banks provide their own solutions. Given the current more difficult economic situation (Portfolio.hu, 2022c), this interest-free installment option could be a great help for the consumers.

Education is necessary to make Hungarian consumers more knowledgeable about the availability, benefits, and security measures of digital payment solutions, especially by the local financial institutions and regulators.

In addition, digital payment methods could be promoted as a safer alternative to cash options to further support digitalization in the country.

Although consumers' knowledge has the potential to grow further, measures should be taken to raise awareness of digital payment methods and their providers.

# 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: which solutions consumers prefer and why, and the drivers of cashless usage.

The Usage pillar covers the adoption of various digital payment solutions in the local market, as well as the performance of cashless payments compared with cash, thereby identifying which digital solutions are most efficient at driving cash out of the Hungarian economy.

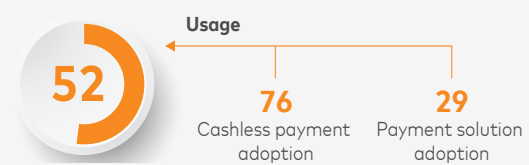
To complement publicly available sources, which provide a high-level view of digital payment methods, Mastercard calculated the sub-index values by using its own data and primary research. The key objective of this pillar is to evaluate the performance of digital payments compared to cash and identify the main drivers contributing to this development. The results presented in this section can help answer such questions as:

- Overall, how does cashless perform relative to cash?
- Which digital payment rails are the most widely used in Hungary?
- What is the adoption of the payment solutions currently in the market?

Similar to the Infrastructure pillar, Usage has two main components: cashless payment usage and payment solution adoption. The former captures overall performance of digital payments relative to cash, while the latter measures the actual adoption of payment solutions already available in the country.

# USAGE

## 3.2 SUB-INDEX RESULTS



The Usage pillar reached a score of 52 out of 100 in 2022, which is slightly higher than the result of 49 in 2021. This indicates that while consumers in Hungary are increasingly turning to digital payment methods, there is a significant potential to further increase their usage.

Cash payment is still widely used on the market due to its perceived convenience and security, propelling the further promotion of digital payment alternatives.

The Usage pillar is based on two components: cashless payment usage and payment solution adoption. The first component achieved the value of 76 out of 100, which shows that Hungarian consumers are relatively prepared for the adoption of cashless payments and many consumers already chose to pay through digital means. Compared to the 2021 data, the value slightly improved, which suggests that trust and affinity for the use of digital payment solutions instead of cash increased among the Hungarian consumers.

The second component shows how well Hungarian consumers adapted to certain digital payment solutions and to what extent they use these solutions. In 2022, the value of this pillar was 29, which shows a slight progress compared to the 2021 data. It suggests that the full potential of the infrastructural opportunities offered on the Hungarian market is not yet realized by the local consumers.



## USAGE

### CASHLESS PAYMENT USAGE INSIGHTS

The cashless payment usage component assesses the usage of the cashless infrastructure, already introduced within the infrastructure sub-index.

The increase in the cashless payment usage is supported by the fact that 74% of survey respondents received their monthly recurring income fully to their bank accounts, which is 2 percentage points higher than last year's value (Mastercard, 2023a).

It also suggests there is room for improvement as a significant share of adults did not get at least a part of their income in a digital format.

Additionally, segments who have fewer years of education (completed primary school) and receive a relatively low income (below net 150k HUF monthly) received most of their income in cash.

On the other hand, 23% of those who receive income digitally do not withdraw any and choose to spend the funds digitally as well; this is a 4 percentage point increase since 2021.

These shifts in consumer behavior are important in promoting digital payment usage, but there is still substantial potential to further increase the propensity to spend digitally. While there is still 8% of Hungarians who withdraw their total income in cash, that number is decreasing.

Overall, digital income penetration is increasing, and more Hungarians actively chose to spend their income using digital payment methods. Population segments who scored lower on the objective knowledge test were the most likely to withdraw most of their income in cash, suggesting that financial education could help spur the adoption of cashless payments by making people feel more secure and comfortable with digital options.

## USAGE

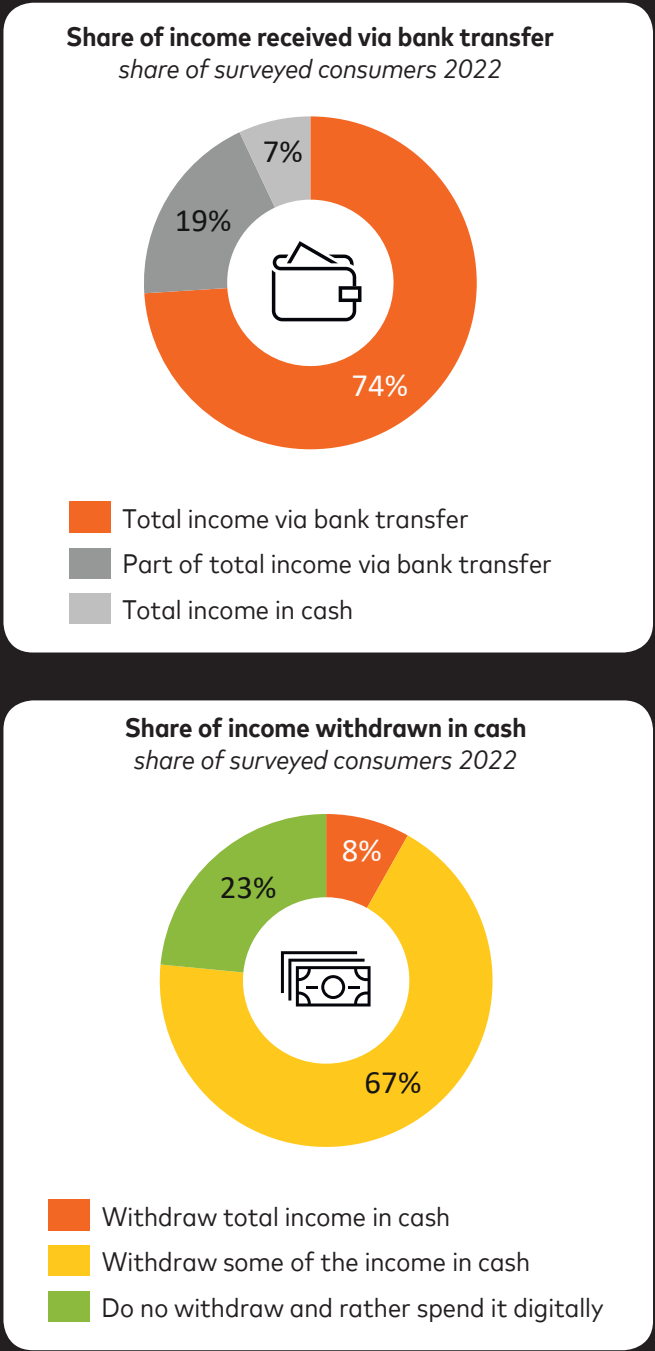


Figure 8. Share of respondents who receive their income via bank transfer, and those who withdraw it in cash

USAGE

Moreover, lower educated respondents, residents of villages and respondents with lower digital affinity were identified to withdraw most of their income.

The number of card transactions at POS terminals was on the rise in 2022, with a 23% increase from 2021. The volume of transactions at terminals grew more sharply. It increased by 32% compared to the year before. This difference indicates that the average ticket size of card transactions increased, which could be also resulted by the increased inflation rate in Hungary in 2022 (MNB, 2023; Mastercard, 2023c).

Moving on to examine the split between cash and card usage, the Hungarian Central Bank reported that card payment volume has been gradually increasing for years now, especially since 2020 when regulation entered into force on the mandatory acceptance of digital payments at most retailers. The share of electronic payments increased significantly, by 5 percentage points, since 2021 but it was still only a third of total spend (in shops and at vending machines) indicating that cash payments was still the most widely used payment method in stores in 2022 (MNB, 2023; Mastercard, 2023c). Nevertheless, the strategic plans of both the Hungarian Central Bank and Mastercard include turning this share in the next 5-7 years to reach a point where the majority of purchases in Hungary is completed through digital means.

Over the past years, card payment volume shows a significant increase, while the growth in the volume of cash withdrawals shows a slowing trend, visible in Figure 9. The ratio of card payments to total card volume increased

from 38% in 2017 to 57% in 2022, reaching a 19 percentage points increase in five years (MNB, 2023; Mastercard, 2023c). This ratio has shown a positive trend over the past years, with card usage increasing continuously and taking over the volume of cash withdrawals in 2021 for the first time. This indicates that consumers already spend more via digital means than cash they had withdrawn from their accounts. While the lower share of withdrawals corroborates the decreasing share of cash payments in stores reported by the Hungarian Central Bank.

The difference between the significant share of cash payments in stores and the lower share of withdrawals could be associated to the significant share of Hungarians who still received part of their income in cash. Thus, focusing on digitalizing incomes can be a potential action in boosting the share of digital payments.

Overall, it can be concluded that despite the slight increase in the cashless payment adoption component, the infrastructure available for consumers in the market is not as exploited as it could be. Even though Hungarian consumers increasingly used card payments, the role of cash still plays an important role. Nevertheless, the use of digital payment methods is likely to scale further over the coming years due to digitalization and the increasing need for convenience and safety by the local consumers.

USAGE

Volume of domestic card payments and withdrawals  
 billion HUF, 2012-2021

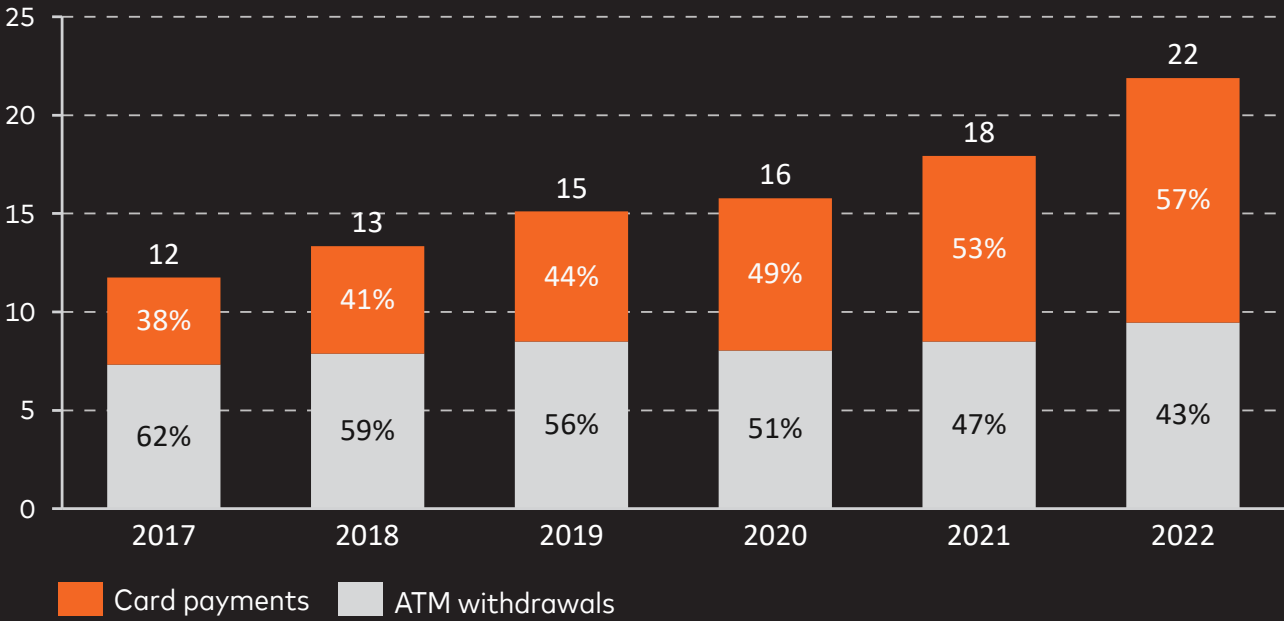


Figure 9: Prevalence of payments and withdrawals in card volumes



## USAGE

### PAYMENT SOLUTION ADOPTION INSIGHTS

The next component of the Usage pillar provides insights into the adoption of digital payment solutions built on top of the cashless infrastructure. It shows the state of the more innovative payment methods, and the extent of their usage.

The transfer digitalization rate (the share of local currency credit transfers that were initiated via digital channels) was close to 90% in 2022, a slight rise from 2021. Digital channels have been highly adopted by Hungarian consumers, and the rate is likely to remain around that level (MNB, 2023; Mastercard, 2023c).

Payment request adoption dropped significantly in 2022 to 12%, from 18% in 2021. This could explain, at least partly, why local regulators are further developing the payment request solution and encouraging its usage. However, the usage of payment with QR codes – which is built on top of instant payments, similarly to payment request – slightly increased in 2022 (Mastercard, 2023a). This indicates that local consumers want to use these solutions and may welcome the efforts of the Hungarian Central Bank to strengthen and streamline these methods (Portfolio.hu, 2022a). Nevertheless, both account-to-account rail solutions (QR code and payment request) are in the early adoption phase, which might pick up once the new regulations come into effect in 2024.

Contactless POS adoption reached almost full market coverage in 2022, with a slight increase from 2021 (MNB, 2023; Mastercard, 2023c). This reflects a strong infrastructure that leads to higher usage, as almost all Hungarian adults paid by card at least once in 2022. Growth could continue, giving consumers the option to pay in any digital form they choose.

Despite the emergence of some new players on the market, wearable adoption remained almost the same as last year, at approximately 1% (MNB, 2023; Mastercard, 2023c). As a relatively new solution, paying with wearables was not a common method in Hungary, however, this result leaves a significant potential to be boosted in the

future. Having said that, the adoption of wallets rose since 2021 by more than 50% in terms

of wallet tokenized transactions, and the number of cards registered in mobile wallets increased by 450 thousand (MNB, 2023; Mastercard, 2023c). While both the value and number of wallet transactions doubled in 2022, the newly registered cards only constituted to a 37% increase, which indicates both that more consumers developed trust to use this payment method and that those who were already familiar with it used it more often. Overall, the adoption rate was still relatively low, but it can gradually increase in the future.

Underscoring the demand for convenience and security when it comes to digital payments, almost three out of four local cardholders stored their card details online, a significant increase from 2021 (Mastercard, 2023a).

Consumers also used merchant tokenization more often, increasing the score by more than 50% from 2021. However, merchant tokenization adoption is still only around 10% (Mastercard, 2023c). Raising support of this solution is important in making online payments safer and more secure, given that card details are encrypted and stored centrally, rather than at various online merchants (as is the case with credential on file). Customers' demand for convenience is there, demonstrated by the growing e-commerce volume and the proliferation of stored credential transactions. As consumers gain trust in innovative solutions, usage can grow – a trend that could continue given necessary infrastructural support from acquirers.

Installment adoption did not show significant change, which is not surprising considering the slow evolution of the BNPL infrastructure. Around 7% of the surveyed population used either an online or offline installment solution in 2022, same as the year before (Mastercard, 2023a). In order to achieve a higher adoption rate, raising customers' awareness and trust in these solutions will be highly important.

## USAGE

### 3.3 FUTURE OUTLOOK

Although cash usage is still widely used in the Hungarian payment landscape, its role might further decline in the coming years with possibly increased demand for cashless alternatives and potentially a greater availability of secure payment solutions.

The support of the Hungarian Central Bank in following through with the plan to turn the ratio in order to reach a 60% digital share of transactions in the next 5-7 years will be important. The first step is already visible in the spending patterns, where the share of card payments was higher than the volume of ATM withdrawals for the first time in 2021. More innovative account-to-account solu-

tions, such as account-based mobile payments or secure remote payment (Click to Pay; Secure Remote Commerce<sup>5</sup>) option, have yet to develop use cases for consumers to unlock broader uptake. However, mobile wallets could continue to play an important role in accelerating the use of virtual or digital card payments. With smartphones becoming a principal payment channel for consumers, the adoption of mobile wallets can be amplified by solutions that act as a one-stop-shop for banking.

Digital payment usage could also be driven further by consumers' needs for more security and convenience. At the same time, the efforts of local regulators intend to help further improve the necessary infrastructure and incentivize usage among consumers (Fintechzone.hu, 2022b).

<sup>5</sup> Click to Pay, Mastercard's solution is yet to be used in the Hungarian market

## METHODOLOGY

The Digital Payment Index is a metric built to capture the development of a country's digital payments. Digital payments in this report refer to any electronic means for payment that provide consumers with an alternative to cash purchases.

Following a successful launch in Hungary in 2021, this year the Index was replicated in three additional countries (Austria, Croatia, and Romania).

To ensure cross-country comparability the methodology of certain KPIs was updated from last year. These changes ensure a model that can be leveraged for further countries in the coming years.

The study focuses on local consumer payments and is limited to the analysis of transactions with local payment methods (i.e., traffic with accounts and cards), including domestic and cross-border. Since cross-border providers are increasingly relevant across Europe, those active in the local market are also included when discussing the readiness of the infrastructure to provide 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 2022 with bespoke primary research findings from the beginning of 2022. The Index is structured with

three levels: 1) indicator, 2) component, and 3) sub-index. An indicator, the most granular element of the model, is a measure that captures a specific angle of payments performance.

All indicators were indexed on a scale of 100 and then aggregated into components to condense information from individual KPIs. Components were weighted to form three sub-indices, which were considered important to the same extent, hence were weighted equally in the overall index calculation. The consistency of the Index results was checked across the countries to ensure reliability.

Over 40 indicators were included in the index of each country.

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 that capture distinctly different aspects of payments were prioritized to ensure relevance of individual indicators selected. Survey data was used as a substitute proxy when 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., the introduction of new payment solutions).

## METHODOLOGY

### 4.1 DATA COMPONENTS

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

#### ■ Public sources:

Official payment system statistics that are published on a regular basis by the local central banks were inputs for infrastructure and usage indicators, while data from the local statistical agencies 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 data points and add complementary insights to key findings. In addition to the primary research conducted on each market, insights from prior local research by Mastercard were also used.

### 4.2 SCOPE OF PRIMARY RESEARCH

The Knowledge sub-index is based on inputs from primary research commissioned by Mastercard and conducted by local research agencies. The methodology followed the same approach across the countries: It had a hybrid research design, which combined online (CAWI) and personally assisted (CAPI) data collection methods. Fieldwork was conducted in June 2023.

The survey was designed collaboratively with research agencies to form a 20–25-minute 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. In each country 1,000 consumers aged between 18–69 years were surveyed in the sample. Results were representative and weighted by gender, location type, and region.



## CROSS-COUNTRY COMPARISON

This section of the report provides a high-level overview and comparison of how the countries in scope performed in the overall and sub-index values of the DPI. The goal is to offer an additional perspective to help countries identify where they stand in comparison to others, and to enhance discussions among different stakeholders across these countries. In DPI analysis conducted in 2023 the geographic scope was narrowed to four countries: Austria, Croatia, Hungary and Romania.

### 5.1 OVERALL INDEX VALUES

All four countries increased their overall index values for 2022, scoring from 56 to 64 points on a scale of 100. The average was 61 points. Infrastructure sub-index scores continued to grow and remained the highest among all sub-indices, providing a strong basis for digital payments in all countries. Both Knowledge and Usage sub-indices were consistently lower than the Infrastructure value. The slight increase in the Knowledge scores

reflects the initiatives in many countries to educate consumers about digital payment solutions. Usage values differed significantly across the region (Std. Dev. = 4.7)<sup>6</sup>. Adoption rates depend on several factors, including consumer awareness of digital payment options and the maturity of the products available in the market, both of which vary significantly from country to country.

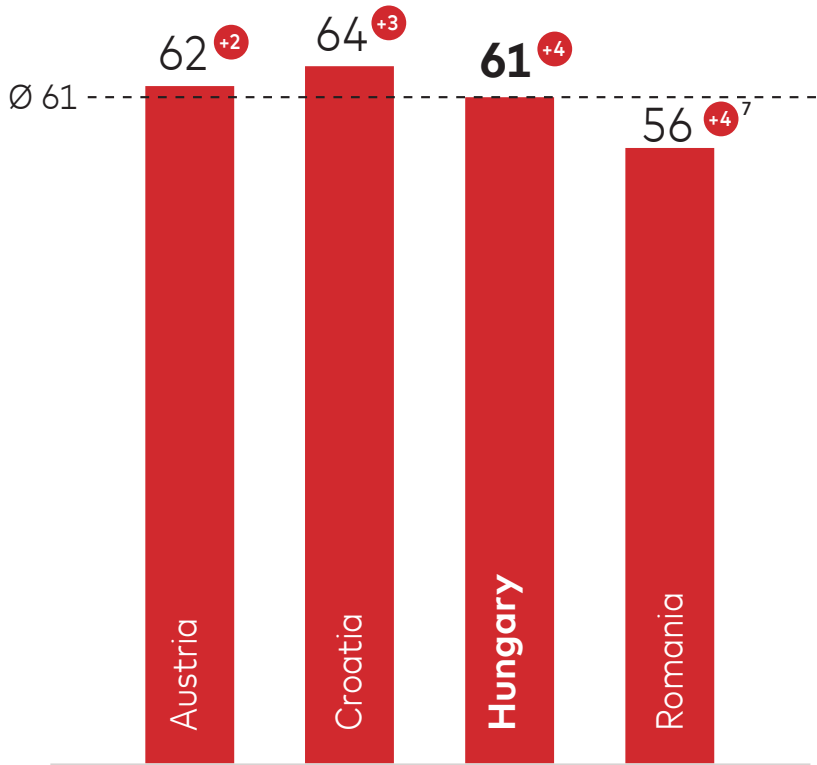


Figure 10: Combined index values of DPI report published in 2023 and the change compared to the report published in 2022, both analyzing the preceding year

<sup>6</sup> Standard deviation in statistics is a measure of the amount of variation among a set of values. A low standard deviation implies that the set of values tend to be close to the mean of the set, while a higher standard deviation indicates that the values are spread over a wider range.

<sup>7</sup> The values used for 2021 are calculated with revised data, based on the latest information available.

### 5.2 INFRASTRUCTURE SUB-INDEX

The Infrastructure sub-index scores continued to grow, ranging from 70 to 80 points with an average of 76 (Std. Dev. = 3.9). The infrastructure value was the highest in Austria, followed by Croatia, Hungary and Romania.

Among the research highlights:

- The cashless infrastructure, which measures account and card penetrations, achieved the maximum score of 100 in each country, indicating that there are at least one card and one account per 1 individual in overall population.
- Terminalization ratio varied strongly across countries with an average score of 46 out of 100. The ratio of domestic merchants with POS terminals to potential markets is especially high in Austria, which posted an above-average

value of 64 points; conversely, both Croatia (41 points) and Romania (32 points) are looking at significant growth potential.

• Payment solution enablement is mostly driven by the regulatory environment (e.g., PSD2 directive) and by local infrastructure characteristics. As an example of the latter, Croatia had among the highest overall and infrastructure scores driven by the strong presence of multiple payment solutions; however, wearables enablement is still in the early stage with a score significantly lower than other payment solutions on the market. Contactless technology is commonplace across the region with high contactless card penetration and POS terminal scores; however, there is still relevant growth potential in the enablement level of newer solutions across countries.

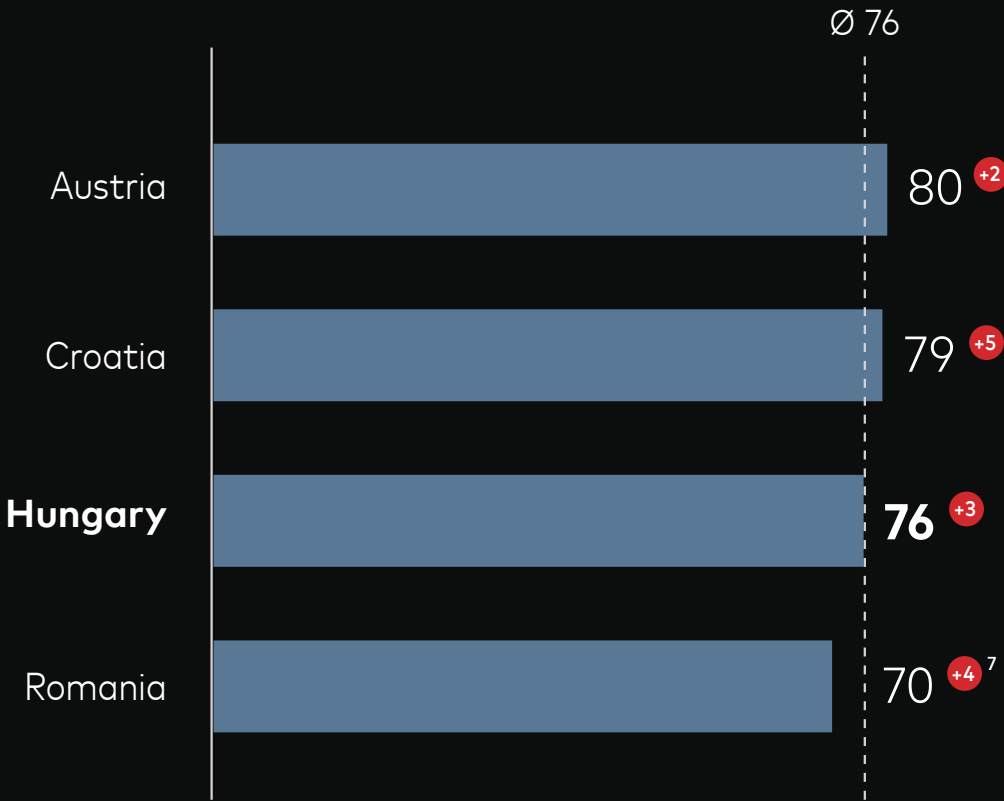


Figure 11: Infrastructure sub-index values of DPI 2023

5.3 KNOWLEDGE SUB-INDEX

The Knowledge sub-index scores show a similar pattern across all countries, ranging from 55 to 56 points with an average of 55 and the lowest variance among the sub-indices (Std. Dev. = 0.4). The growth trend of the Knowledge sub-index indicates an improvement in the digital payment literacy of users in the region.

Among the research highlights:

- Similar to last year's results, users were more aware of payment methods and security measures than of specific brands.

- Perceptions of the convenience and security of digital payment methods correlated among users: the higher they rated the convenience of a method, the more secure they thought it was.
- Regarding consumers' objective knowledge about digital payments, users in general demonstrated a good understanding of more established payment solutions (e.g., card usage). The efforts of countries to educate consumers produced a slight increase in awareness of both innovative payment solutions (e.g., QR code payment) and new security-related issues (e.g., security features of a payment card).

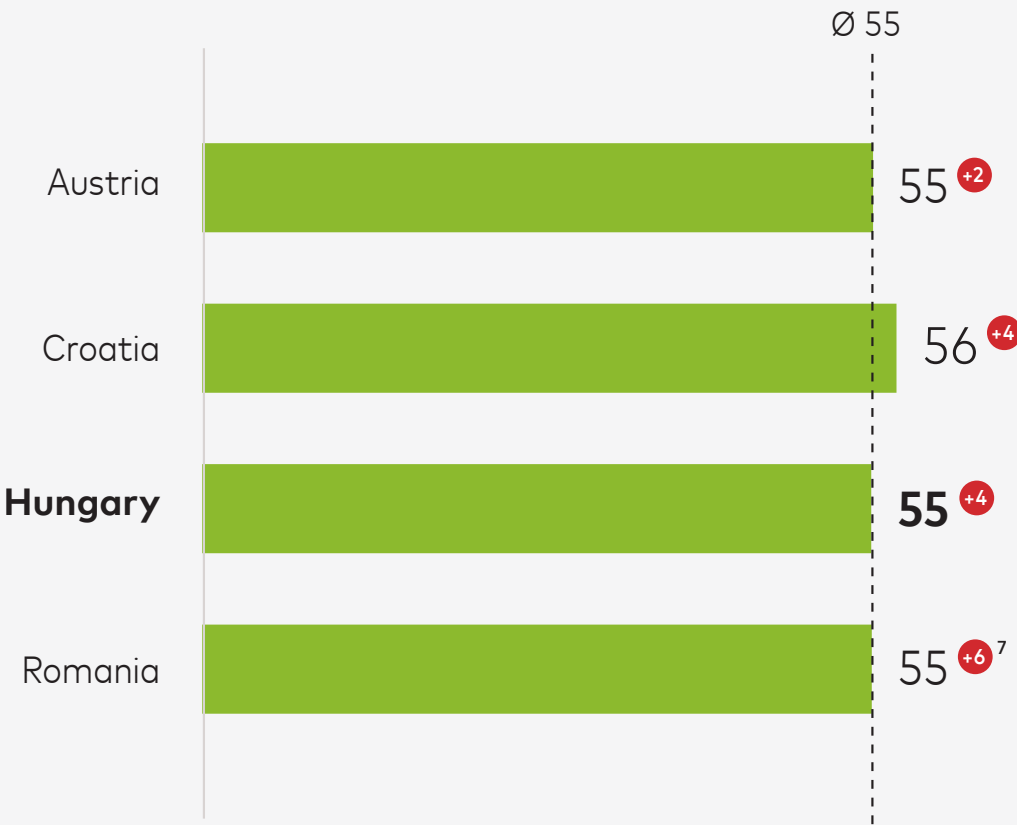


Figure 12: Knowledge sub-index values of DPI 2023

5.4 USAGE SUB-INDEX

There was a strong variance (Std. Dev. = 4.7) in the Usage sub-index values across countries, ranging from 44 to 57 points with an average score of 51. Croatia had a slightly higher level of adoption of digital payment solutions in the region with above-average values. Usage scores in Romania remained below average; however, results show that adoption rates are trending upward in the country.

Among the research highlights:

- Active card penetration scores indicate that card payments are being widely adopted across the countries in scope. There was a relevant improvement in the share of consumers who rather spend their income digitally, especially in Croatia and Hungary.

- The average score of POS to physical card volume ratio (47 point out of a 100) suggests that cash still has a significant presence across countries, especially in Romania, where cashless payment usage scores are below average.
- The Usage sub-index also measures payment solution adoption, where scores are largely driven by the enablement level of underlying infrastructures across countries. The level of knowledge and awareness are also key drivers of the adoption of digital payment solutions. As countries put more emphasis on consumer education, cash usage is expected to further decrease in favor of digital payments. Considering the increase in both the Knowledge and Usage pillars, raising awareness and educating consumers should be in continuous focus to further enhance the adoption level of digital payment solutions in the future.

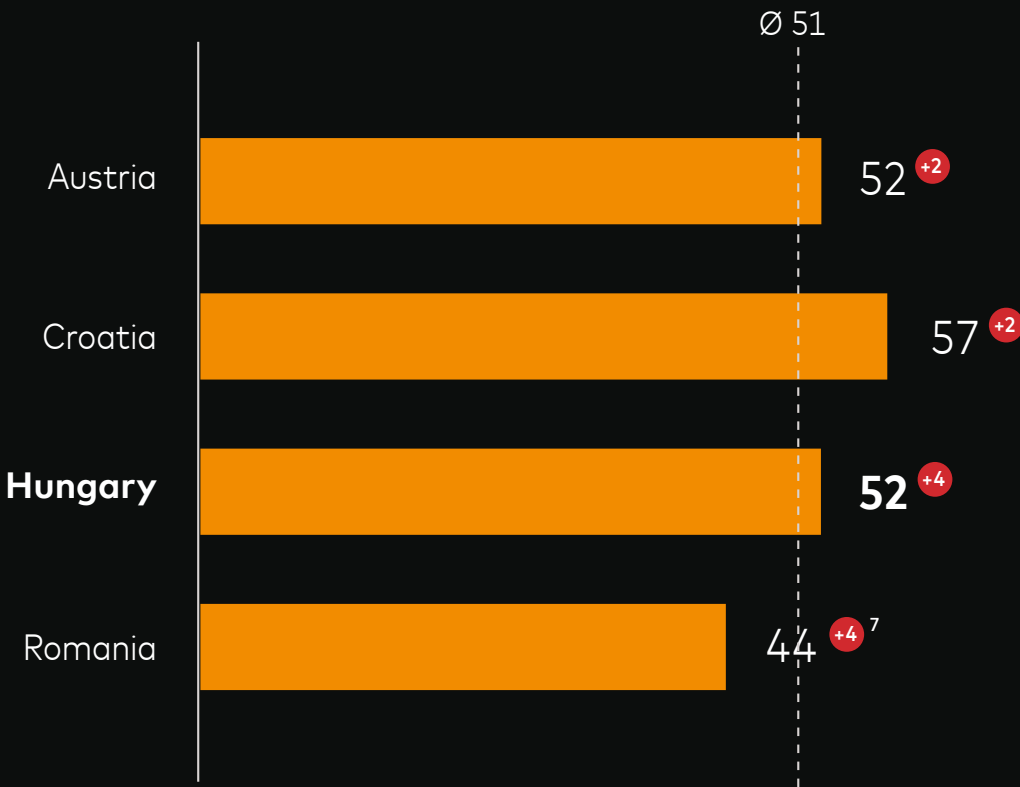


Figure 13: Usage sub-index values of DPI 2023



## CYBERSECURITY INSIGHTS

Improving cybersecurity is crucial, both in terms of educating consumers and protecting organizations from becoming victims of cybercrime. There are regulatory initiatives for organizations, such as the Digital Operational Resilience Act (DORA), which is the EU's proposed operational resilience framework for the financial (DORA, 2022). However, there are fewer initiatives protecting consumers from cybercrime.

Hungary is considered to have moderate cyber risk due to its citizens spending less time online and having a lower average wage (compared to the European Union averages), which are two important factors for assessing the cyber risk of a given population. Moreover, payment statistics confirm that payment fraud is significantly lower in Hungary compared to the SEPA area, which is three times higher in terms of fraud basis points (Mastercard, 2023b).

However, that does not mean Hungarian consumers and cardholders are safe from cyberattacks. The ratio of card payment fraud has been on the rise in recent years, with an especially high ratio for the second half of 2022. This spike in fraud values can be attributed to the emergence of new types of fraud, namely, social engineering. In this crime, fraudsters use email to manipulate and exploit people with spam, scams and phishing. This is a new type of fraud, beyond stealing payment and card credentials affecting the population (Mastercard, 2023b). This evolving fraud type has many forms: criminals often use marketplaces, advertisements, and SMS to reach their targets and there have been multiple cases of scammers operating "call centers", where they initiate phone calls pretending to be representatives of banks – the goal in all cases is to manipulate the victims to hand over payment

data and user credentials willingly. (Mastercard, 2023b).

Our survey found that phishing was the most common suspicious activity experienced by respondents (17%), followed by malware and ransomware (7%), card skimming (6%) and identity theft (4%). Overall, 35% of respondents have experienced fraudulent activity that they were aware of, indicating that Hungarians are indeed targeted by cyberattacks and need support from their banks through vigilance, preventative measures and financial education.

Credit transfer-related crime has also increased dramatically since 2020, reaching almost 6 billion HUF in value (0.13bps) by the second half of 2022. When compared to card fraud, transfer fraud is lower in terms of basis points (the share to total transfer volume) but higher in terms of value. Most of these were SCA transactions. Although SCA provides increased security against unauthorized fraud, cardholders remain susceptible to various forms of social engineering in which fraudsters can trick them into authenticating fraudulent transactions (Mastercard, 2023b).

While our survey found that two out of three Hungarians are aware of the process to follow after an unauthorized, fraudulent transaction (block card, contact bank and initiate chargeback), only 40% are well-versed in how to file a complaint. Of this group, 9% have already filed a complaint to their bank. However, the most important takeaway is that most Hungarians have only heard of the process to report fraud but don't know it well. Educating cardholders on what to do in case of a fraudulent transaction will help boost trust in card payments.

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## DEFINITIONS

### ■ Credential on File

Solution that enables consumers to store their card credentials online with merchants for future use (e.g., recurring transactions).

### ■ Digital payment

Any electronic means for payment that provides an alternative to cash for purchases.

### ■ Installment

By selecting pay with installment (i.e., buy-now/pay-later option) at a POS terminal or during online checkout, cardholders get the flexibility to divide the cost of a purchase into smaller amounts and pay for the goods incrementally 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).

### ■ Terminalization rate

Share of domestic merchants equipped with POS terminals (including online merchants acquired by cross-border acquirers) vs. potential market.

### ■ OEM wallets

Mobile wallets that are provided by Original Equipment Manufacturers (e.g., Apple Pay, Google Pay) and are native to the device.

### ■ PSD2

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

### ■ Request-to-pay

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

### ■ Secondary account identifier

An identifier that is uniquely linked to a consumer's payment account and 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 for 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 an enhanced, multi-factor customer authentication process.

### ■ Tokenization

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

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DIGITAL PAYMENT  
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COMPASS IN THE HUNGARIAN  
ELECTRONIC PAYMENT MARKET

REPORT

