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Dr hab. Michał Polasik, prof. NCU

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Nicolaus Copernicus University in Toruń, Poland

The Power of Standardization in the Payment Market: Mechanisms and Case Studies



2024 ANNUAL CONFERENCE

7-8 October 2024 – Helsinki

Plan of presentation

- Global trends in the digital payments market
- A network effect - theory and impact on the payment market
- The role of standardization and interoperability in payment innovations
- Strategies of the European Commission and the ECB in retail payments
- European mobile payments market
- Case studies - Success by coopetition and standardization in the payments market
- Current issues of providing accessibility for payment terminals



1. Global trends in the development of digital payments

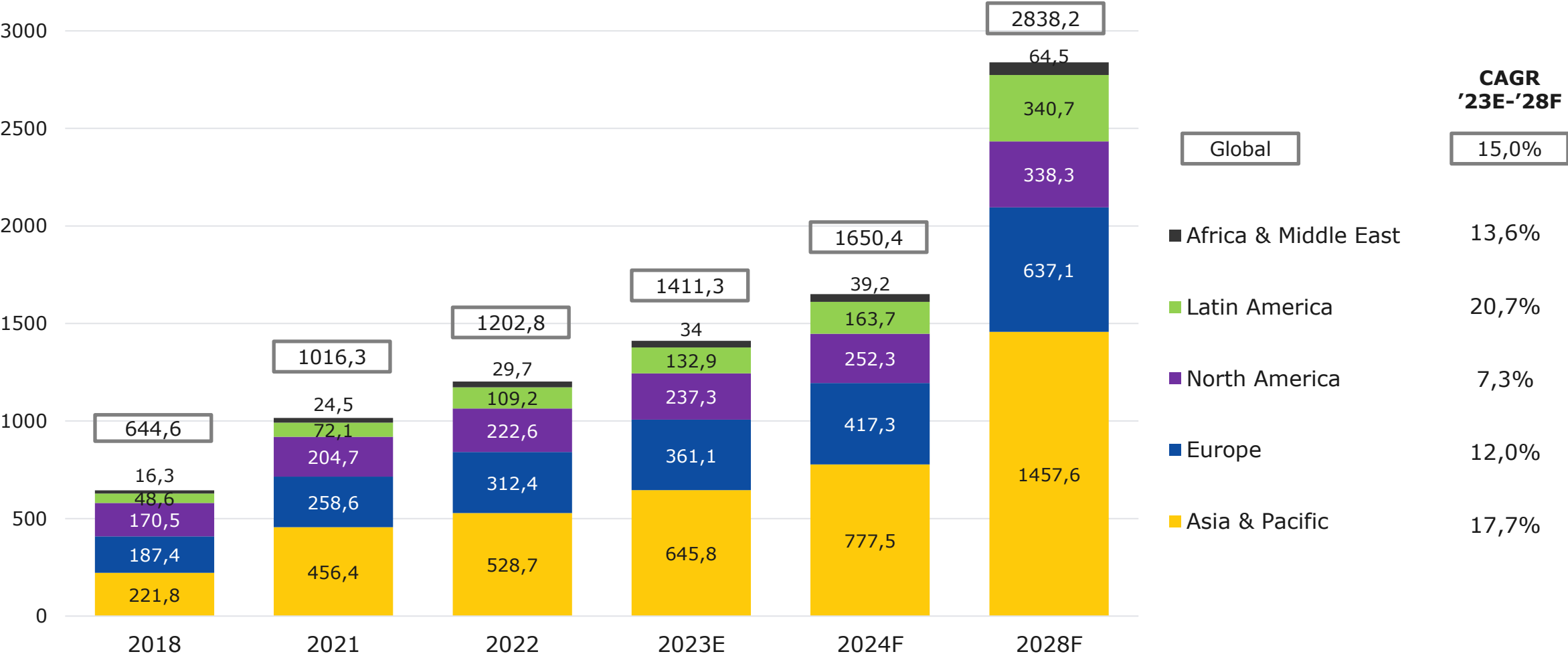


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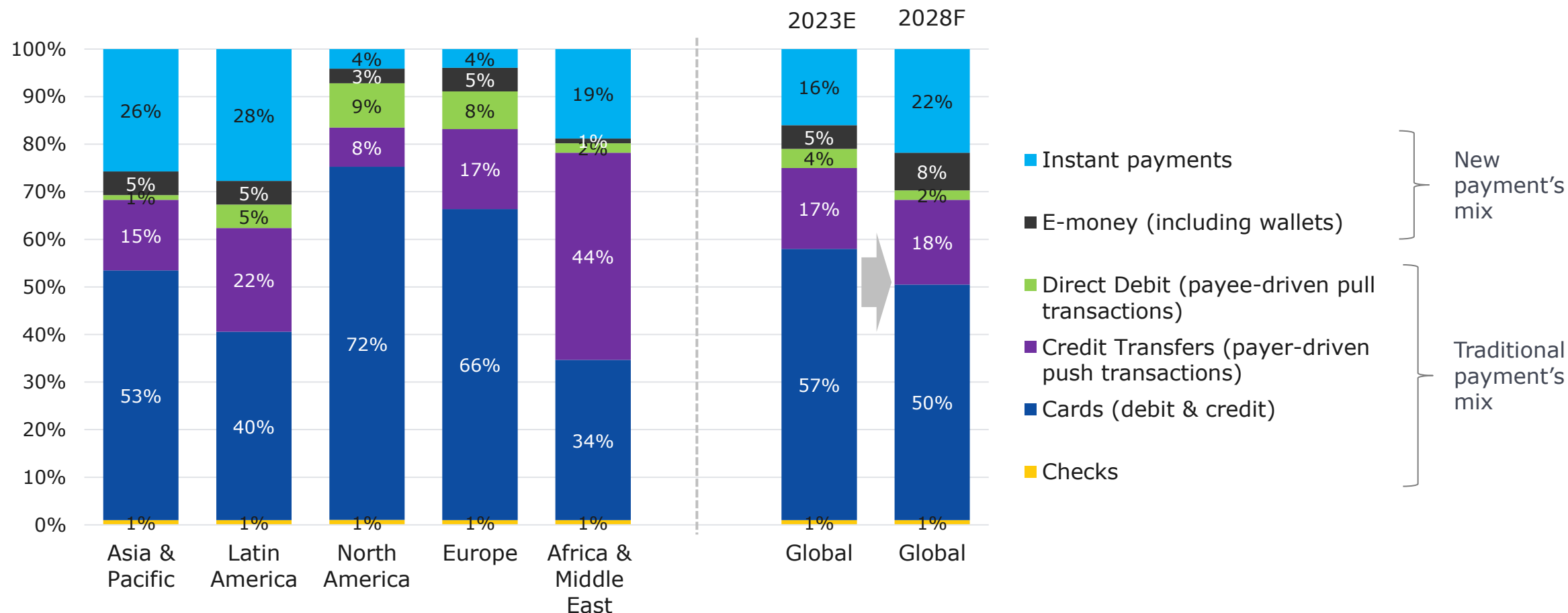
Worldwide non-cash transactions

(enterprise and retail, volume in billions, 2018-2028F)



The payment rails mix: New payments vs traditional payments

(% of transaction volume, 2023)



The Mobile Money* in Africa in 2023

Live services	Registered accounts	Active (30-day) accounts	Transaction volume	Transaction value (\$)
169	856 m +19%	237 m +13%	62 bn +28%	919 bn +12%

West Africa

Live services	68	
Registered accounts	356 m	+23%
Active accounts**	84 m	+19%
Transaction volume	19 bn	+40%
Transaction value (\$)	347 bn	+40%

Central Africa

Live services	20	
Registered accounts	83 m	+19%
Active accounts	28 m	+18%
Transaction volume	5 bn	+25%
Transaction value (\$)	72 bn	+19%

Southern Africa

Live services	15	
Registered accounts	23 m	+19%
Active accounts	5 m	+7%
Transaction volume	592 m	+10%
Transaction value (\$)	6 bn	+2%

Nort Africa

Live services	13	
Registered accounts	20 m	+17%
Active accounts	2 m	+54%
Transaction volume	150 m	+44%
Transaction value (\$)	7 bn	+48%

East Africa

Live services	53	
Registered accounts	372 m	+16%
Active accounts	118 m	+7%
Transaction volume	38 bn	+23%
Transaction value (\$)	488 bn	-2%

**Africa
Pay&ID
Expo**

Source: The State Of The Industry Report On Mobile Money, GSMA, 2024, <https://www.gsma.com/sotir/>

*Mobile Money enables to deposit and withdraw cash, make payments, and remittances based on the value stored in an electronic wallet on a mobile phone; offered by EMIs, FinTechs, MNOs, or banks; **Active accounts in the last 30 days.

The Mobile Money* in Africa in 2023

West Africa

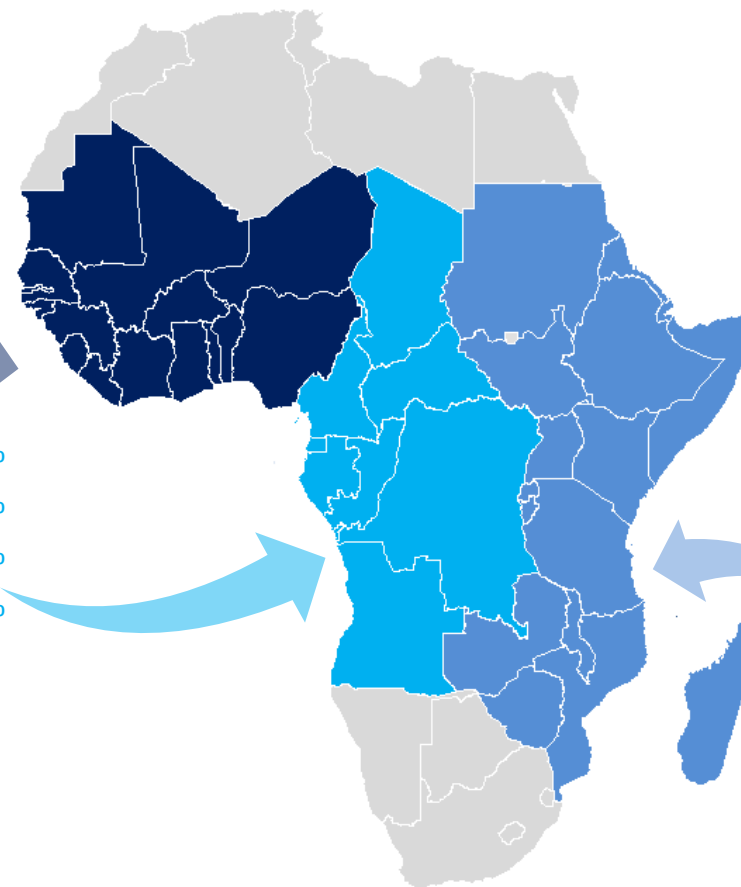
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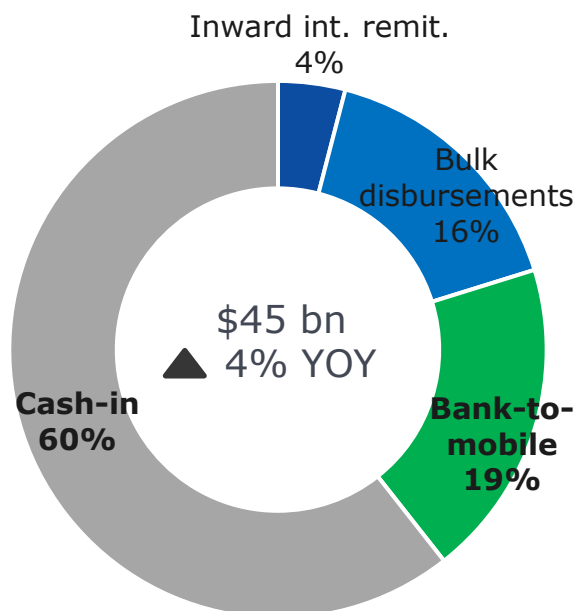
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Source: The State Of The Industry Report On Mobile Money, GSMA, 2024, <https://www.gsma.com/sotir/>

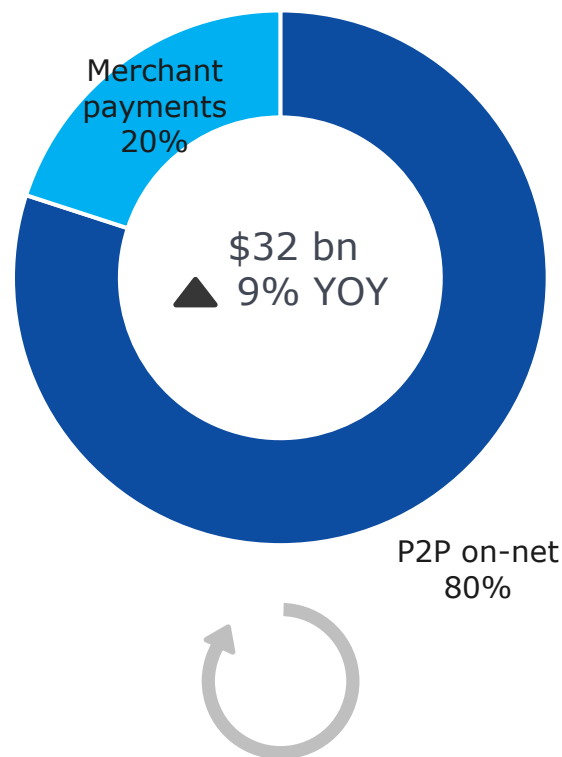
*Mobile Money enables to deposit and withdraw cash, make payments, and remittances based on the value stored in an electronic wallet on a mobile phone; offered by EMIs, FinTechs, MNOs, or banks; **Active accounts in the last 30 days.

The inflows and outflows of Mobile Money, December 2023

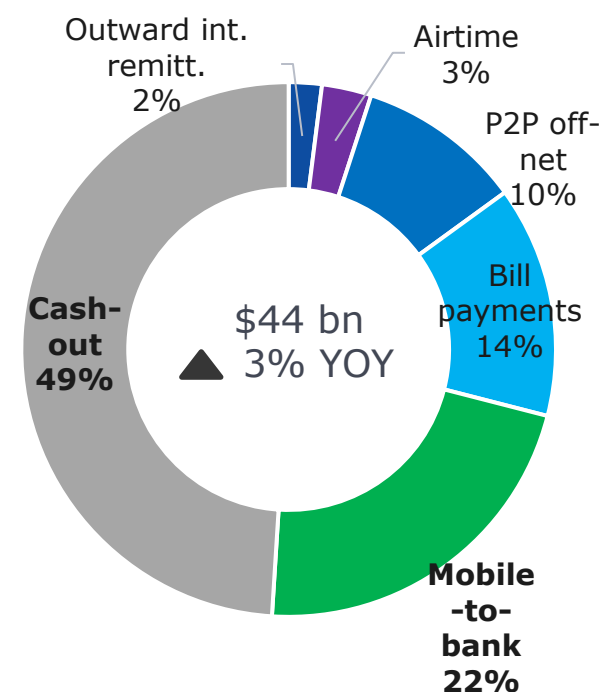
Incoming transactions



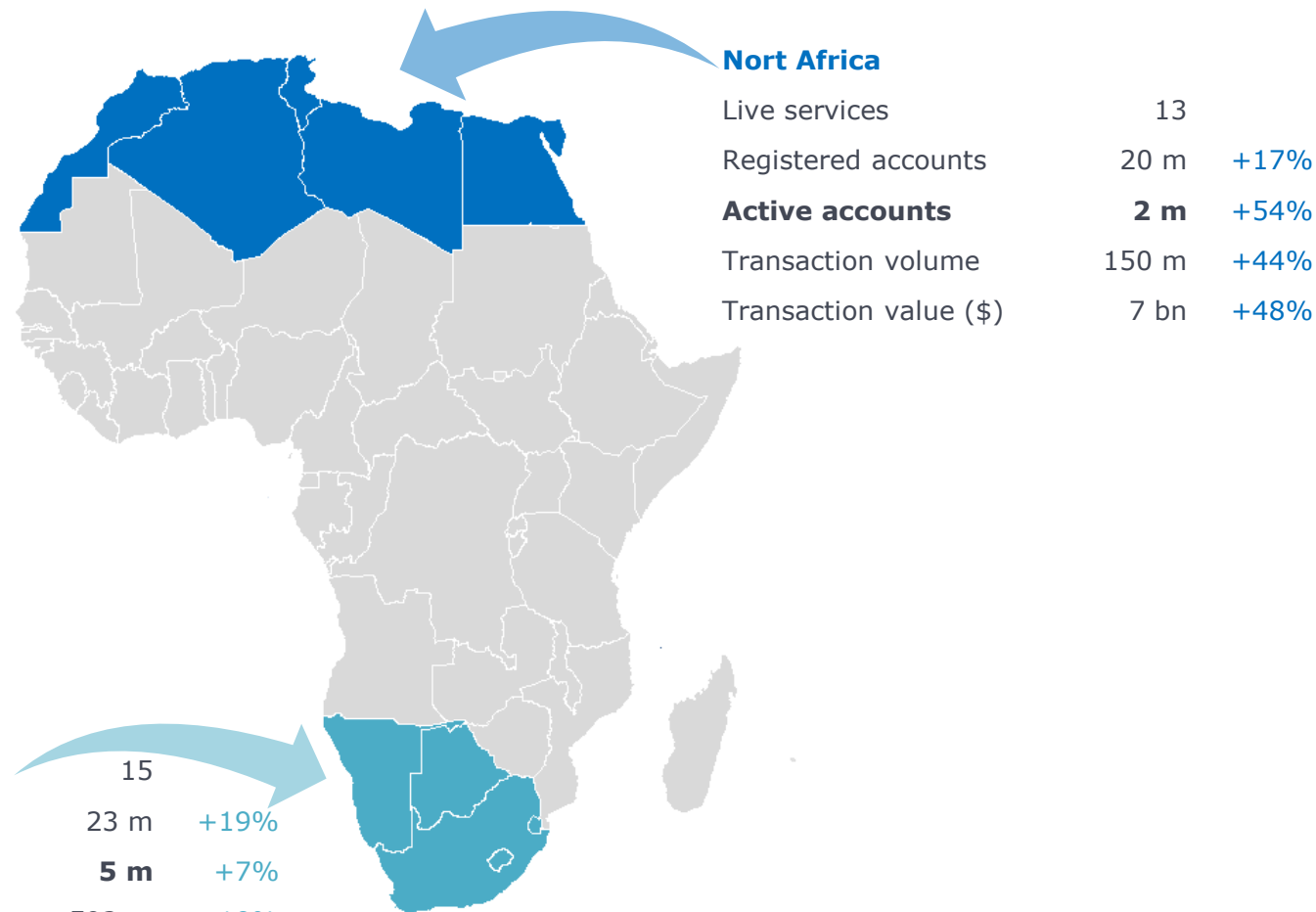
Circulating value



Outgoing transactions



The Mobile Money* in Africa in 2023



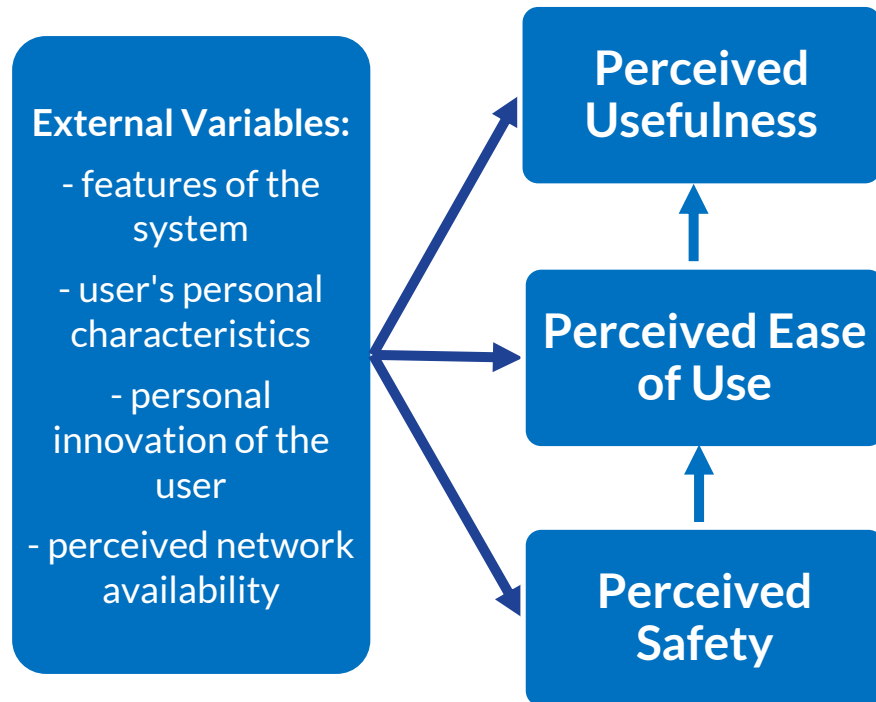
2. Success factors of cashless payments growth



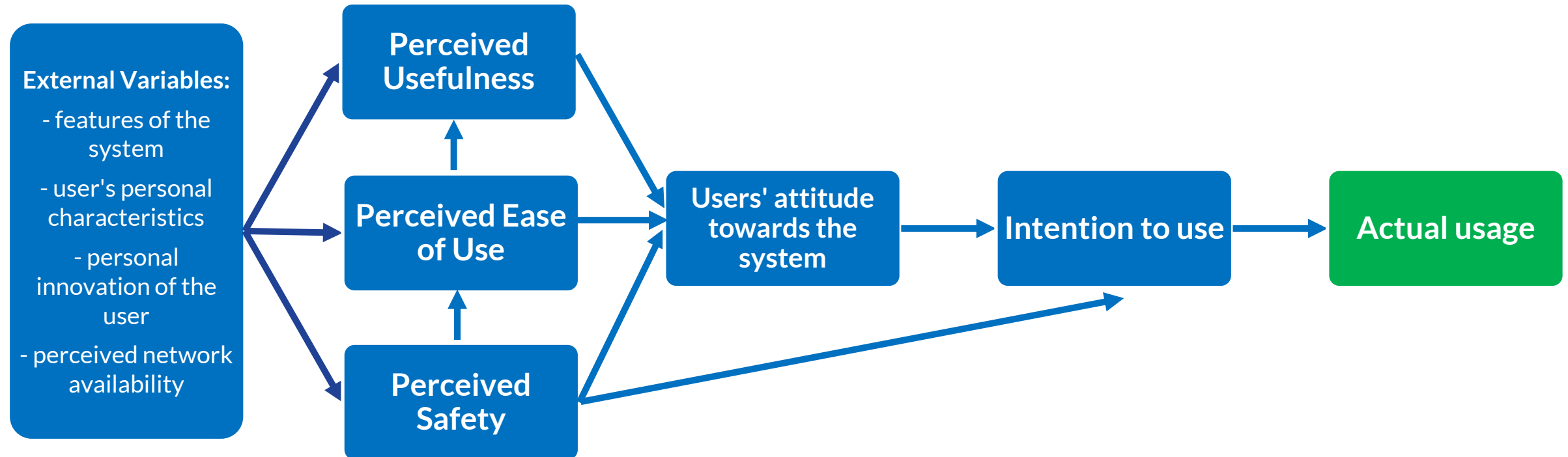
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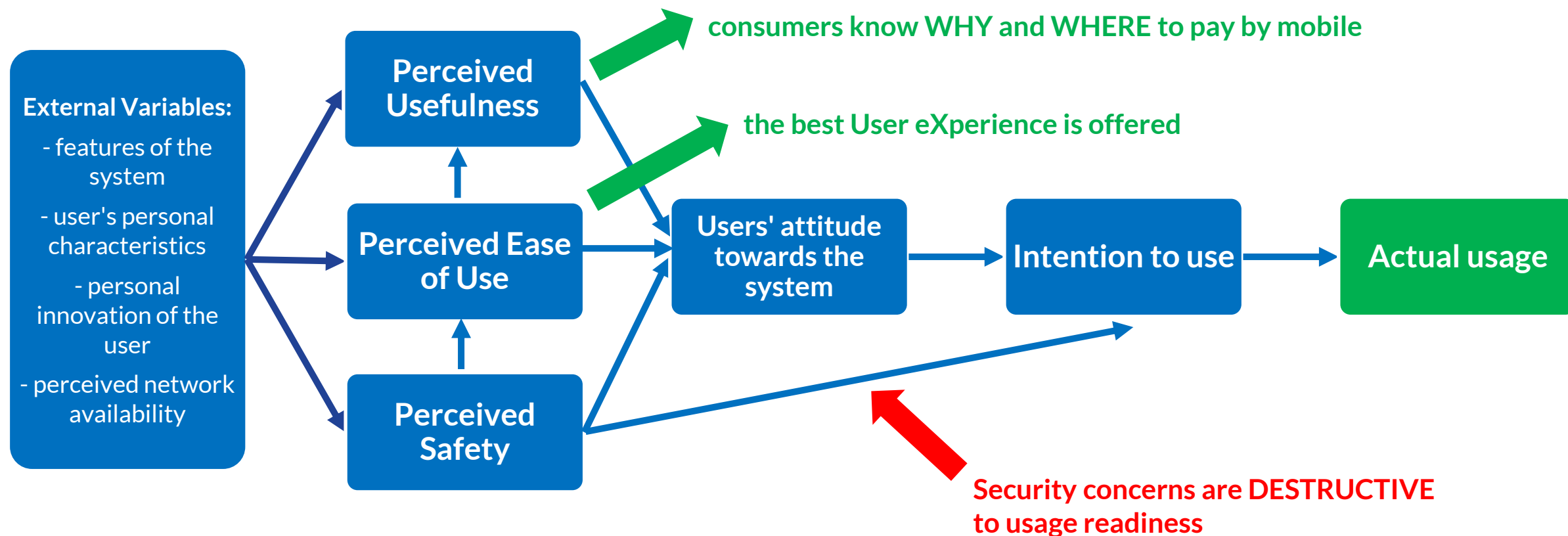
The acceptance of technology by individual clients based on the model TAM



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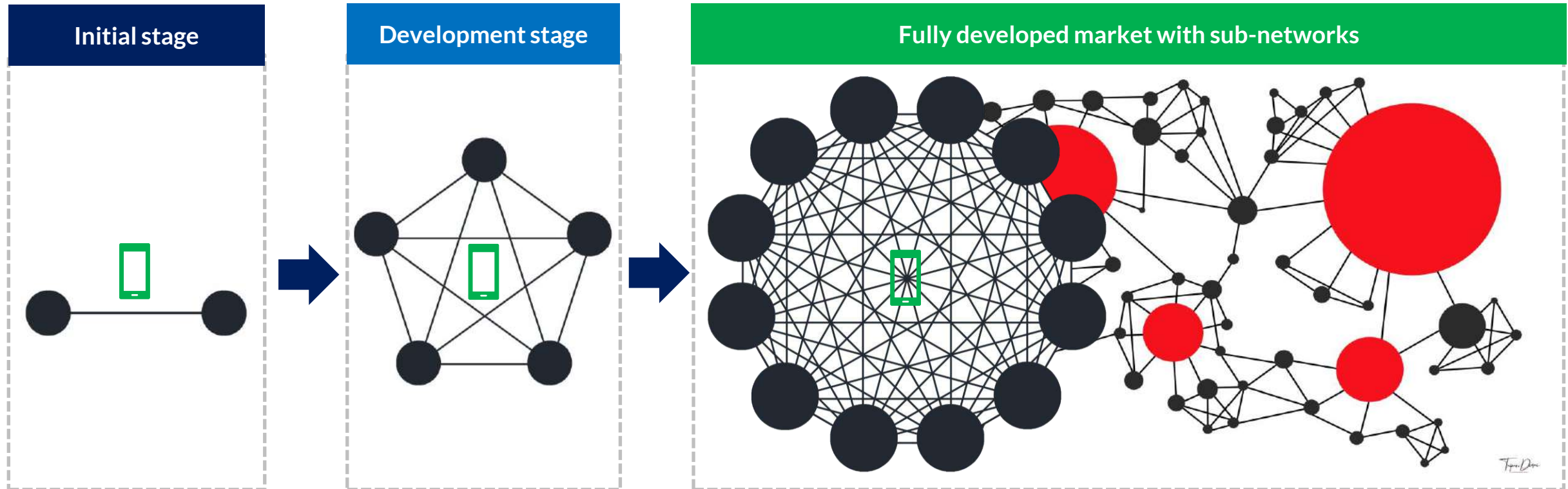


2.1. Perceived Usefulness



The economics of network effects is the key to success in the payment services market

Confirmed in numerous outstanding works by economists, including Jean Tirole (TSE, Nobel Prize) and Leo Van Hove (VUB) and others.

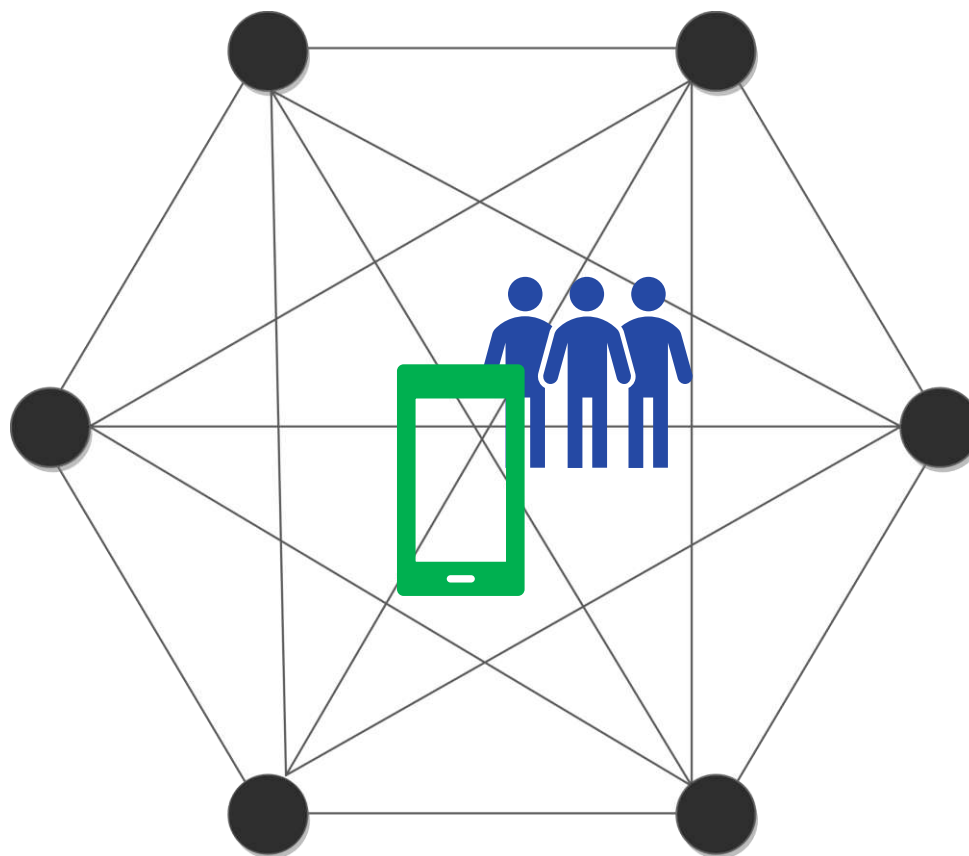


Metcalf's Law - The value of networks increases proportionally to the square of the number of users:

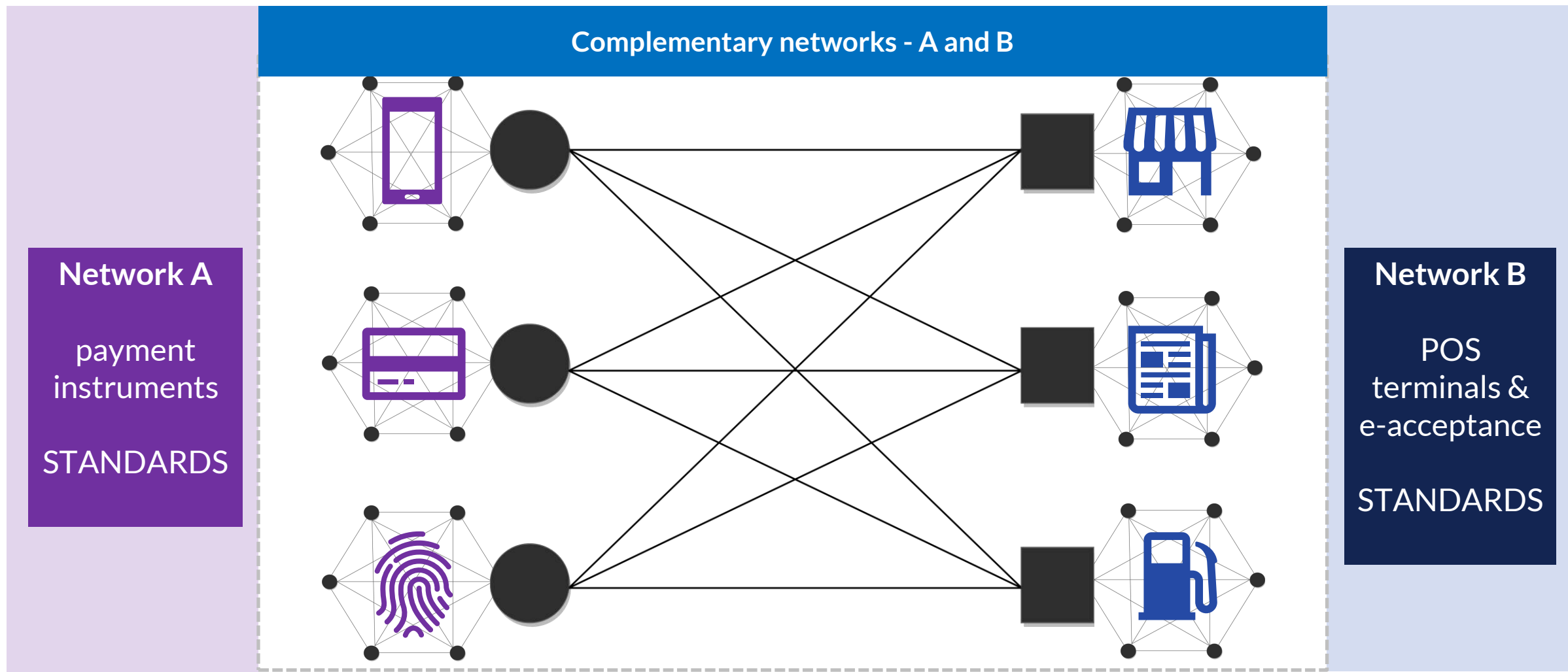
$$\text{Value} = (\text{number of users})^2$$

Peer-to-peer networks

Telephones, communicators, social networks & bank accounts, P2P payments



Indirect network effect - two complementary networks A and B



2.2. Perceived Ease of Use



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Small store with seller service



Supermarket

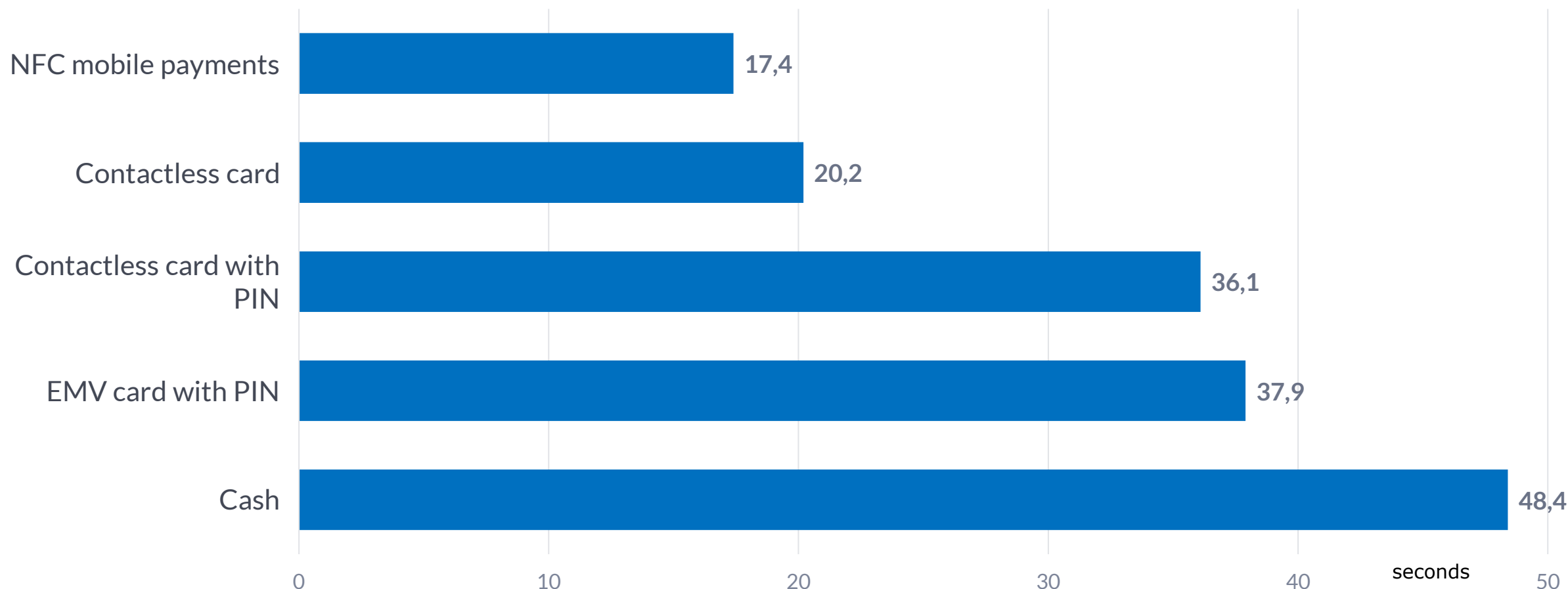


Restaurant (low-service entity)

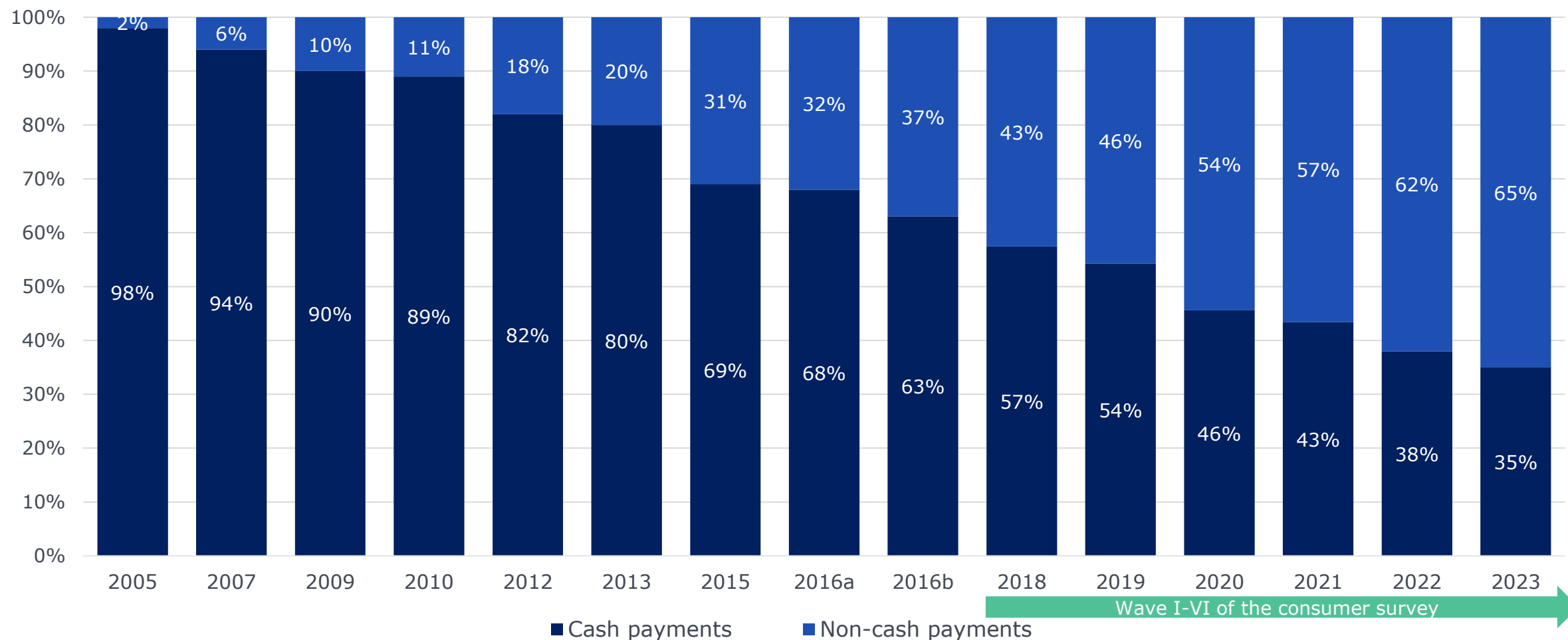


Average transaction time with selected payment methods at POS

Seconds; The time of "payment process with instrument preparation"; Poland



Share of cash and non-cash payments in the number of payments of retail payments in Poland



2.3. Perceived Safety



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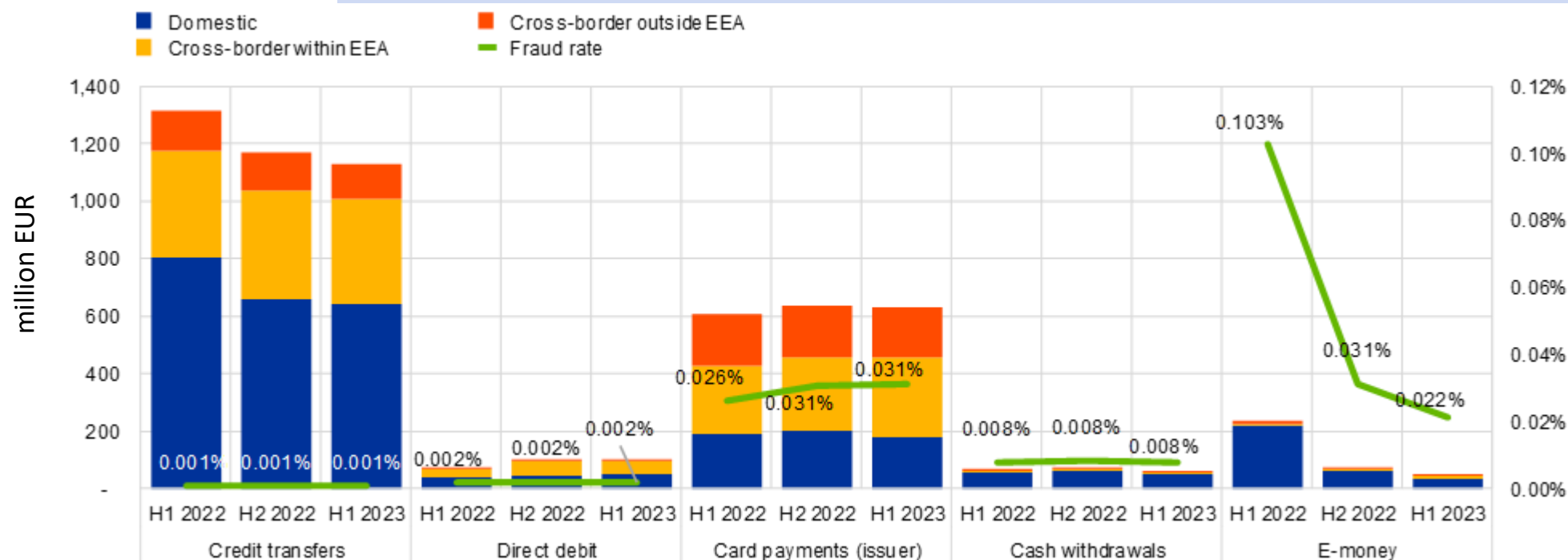


European regulations increased the safety of payments

- The European Central Bank (ECB) and the European Banking Authority (EBA) joint report confirms the effectiveness of strong customer authentication (SCA) requirements, in particular for protecting against card fraud.
- Card fraud risk is lower for transactions within the European Economic Area, owing to the mandatory application of strong customer authentication.

Unfortunately, the cost of transaction failures (inc. lost purchases) was very high!*
→ Ease of Use VS Safety dilemma.

Levels of fraud



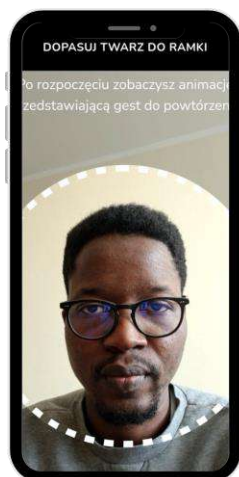
Role of biometrics in easy-to-go mobile onboarding process

1

Full online onboarding

- Mobile App
- Web App
- Video with the consultant
- E-id NFC Reading
- Dedicated scanners

2




Areas of expertise needed

- Fraud prevention
- Biometric verification
- Documents verification
- Sanctions & PEP Checks
- KYC Compliance

Verification scope:

- Verification of document authenticity
- Biometric comparison of Document Holder Image and Person performing process
- Liveness detection to prevent spoofs (performance attacks with masks, prints, screens and deepfakes detection)

3





Verification result:  Verification result


MENDY LOUIS
Senegal, Passport, SEN-AD-

Verification files













Reverse side

Uploaded Self-portrait

Liveness challenge: Look left:  Liveness challenge: Look right:  Liveness challenge: Look down:  Liveness challenge: Pose: 

Face similarity:  100 %

Data comparison

Date of birth in Personal Number on MRZ matches date of birth on MRZ 	Date of birth in Personal Number on MRZ matches date of birth on front side 	Date of birth in Personal Number on reverse side matches date of birth on MRZ 	Date of birth in Personal Number on reverse side matches date of birth on front side 
Date of birth on MRZ matches date of birth in Personal Number on MRZ 	Date of birth on MRZ matches date of birth encoded in PESEL on MRZ 	Comparison of surname on front side with surname on MRZ 	Nationality on front side matches nationality on MRZ 
Identification number on reverse side matches identification number on MRZ 	Date of expiry on front side matches date of expiry on MRZ 	Date of issue on reverse side less than date of expiry on MRZ 	Sex on front side matches sex on MRZ 

3. European strategies and challenges



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The strategic goals of the European Union for retail payments



European Commission retail payments strategy for the EU

Vision:

*Citizens and businesses in Europe benefit from a **broad and diverse range of high-quality payment solutions** (...)*

***Competitive home-grown and pan-European payment solutions** are available,*

*The EU makes a significant contribution to **improving cross-border payments**, (...).*

Four key pillars: instant payments, competitive markets, interoperable systems and infrastructures, international payments



The Eurosystem's retail payments strategy

Aim:

to promote European retail payment solutions that are safe and efficient for society as a whole and to meet the rising **challenges to European sovereignty** in the payments market

Main elements of the strategy: a pan-European solution for payments at the POI, the full deployment of instant payments, the improvement of cross-border payments, support for innovation and digitalization, further goals related to cash and environment.



Expert study

- 202 sector experts
- 30 countries – all European Union members, UK, Norway, and Switzerland
- Covering all types of payments market stakeholder institutions

Consumer &
Expert surveys

Expert survey only

Consumer study

- 5504 respondents of the CAWI survey
- 22 European countries
- Sample representative for the structure of Internet users



Partners of the study



POLISH BANK ASSOCIATION

Febelfin

Use of the results in the EU

- The results of the PayTechImpact.EU study are used in the implementation of the PSD2 evaluation project

Study on the application and impact of Directive (EU) 2015/2366 on Payment Services (PSD2)

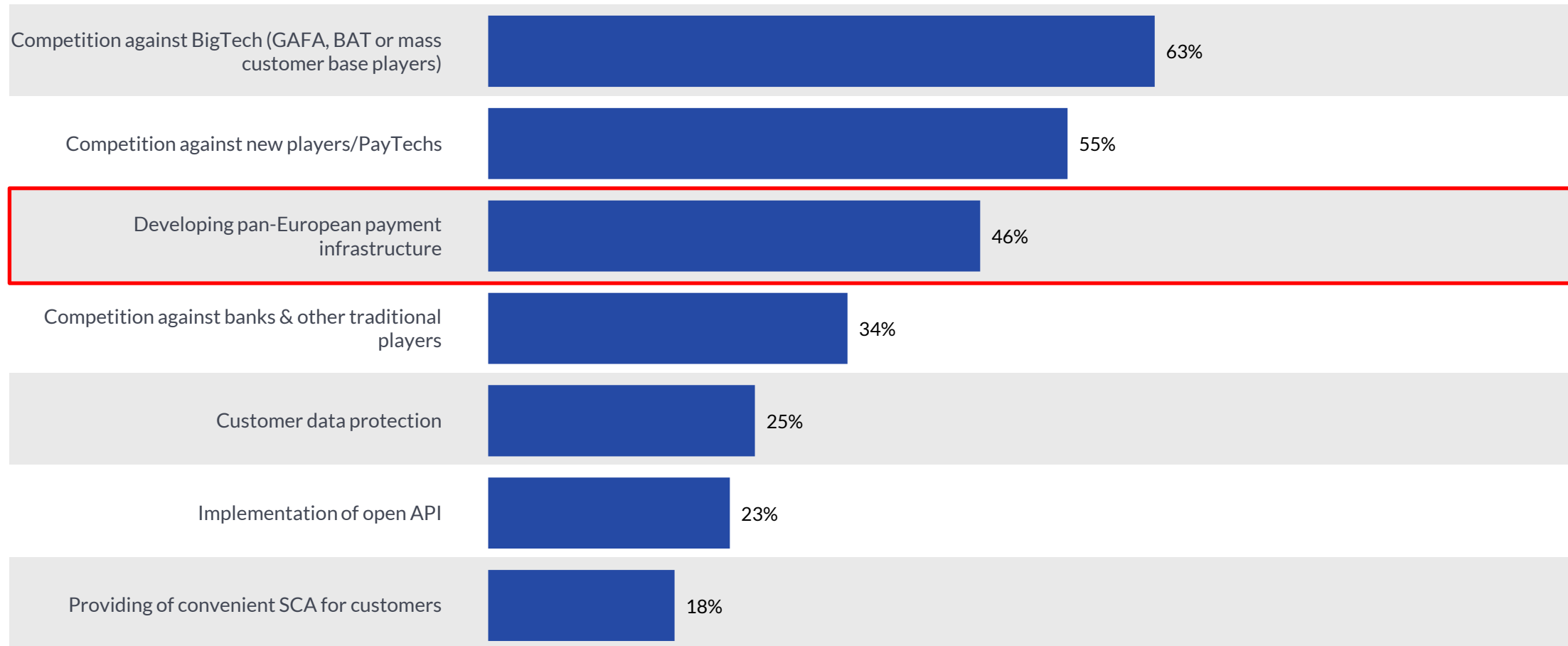
- Under call FISMA/2021/OP/0002 of European Commission – DG FISMA – Retail financial services
- Implemented by the consortium of VVA, CEPS and NCU



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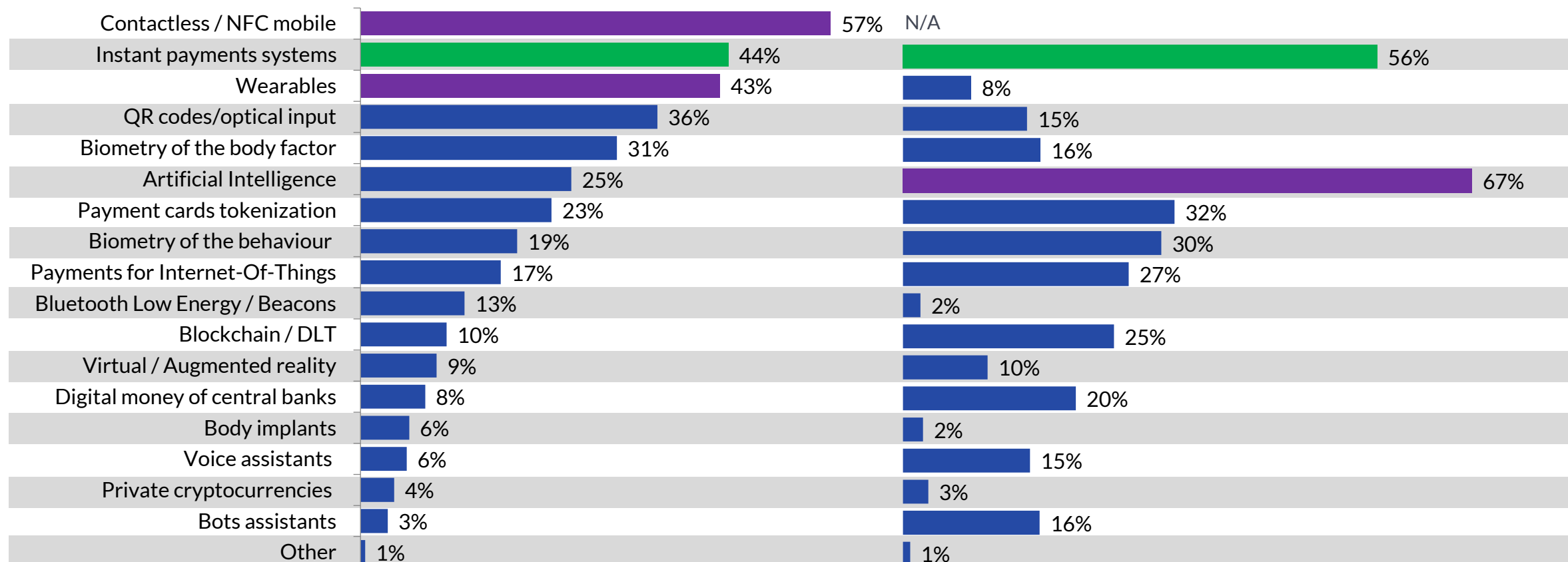
The biggest challenges for traditional business models* in the European payments market, by the end of 2025



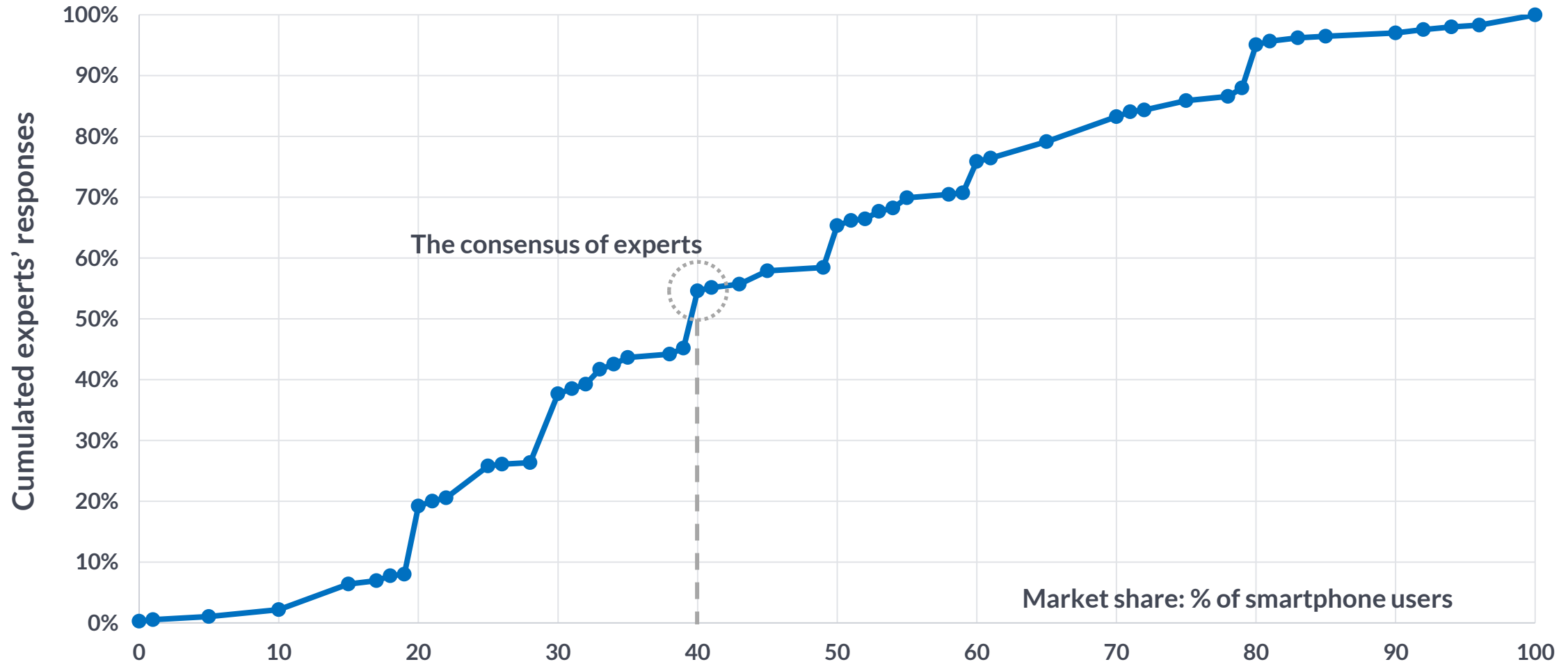
The technologies that will have the biggest impact on the development of payment services in Europe by the end of 2025

Point-Of-Sale

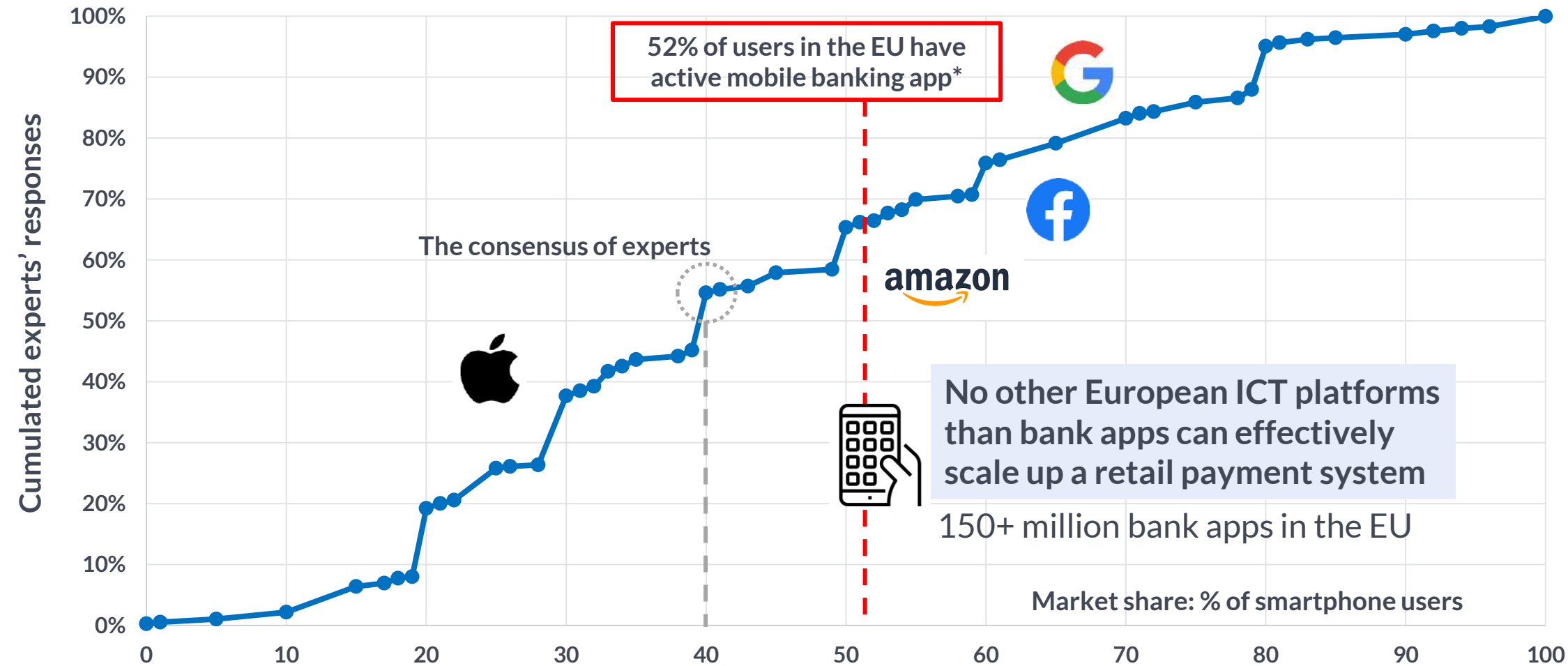
e-Commerce



The needed percentage of users of a given mobile payments scheme to benefit substantially from the adoption of such a standard – to achieve a critical mass



The needed percentage of users of a given mobile payments scheme to benefit substantially from the adoption of such a standard – to achieve a critical mass



4. Mobile payments in the EU



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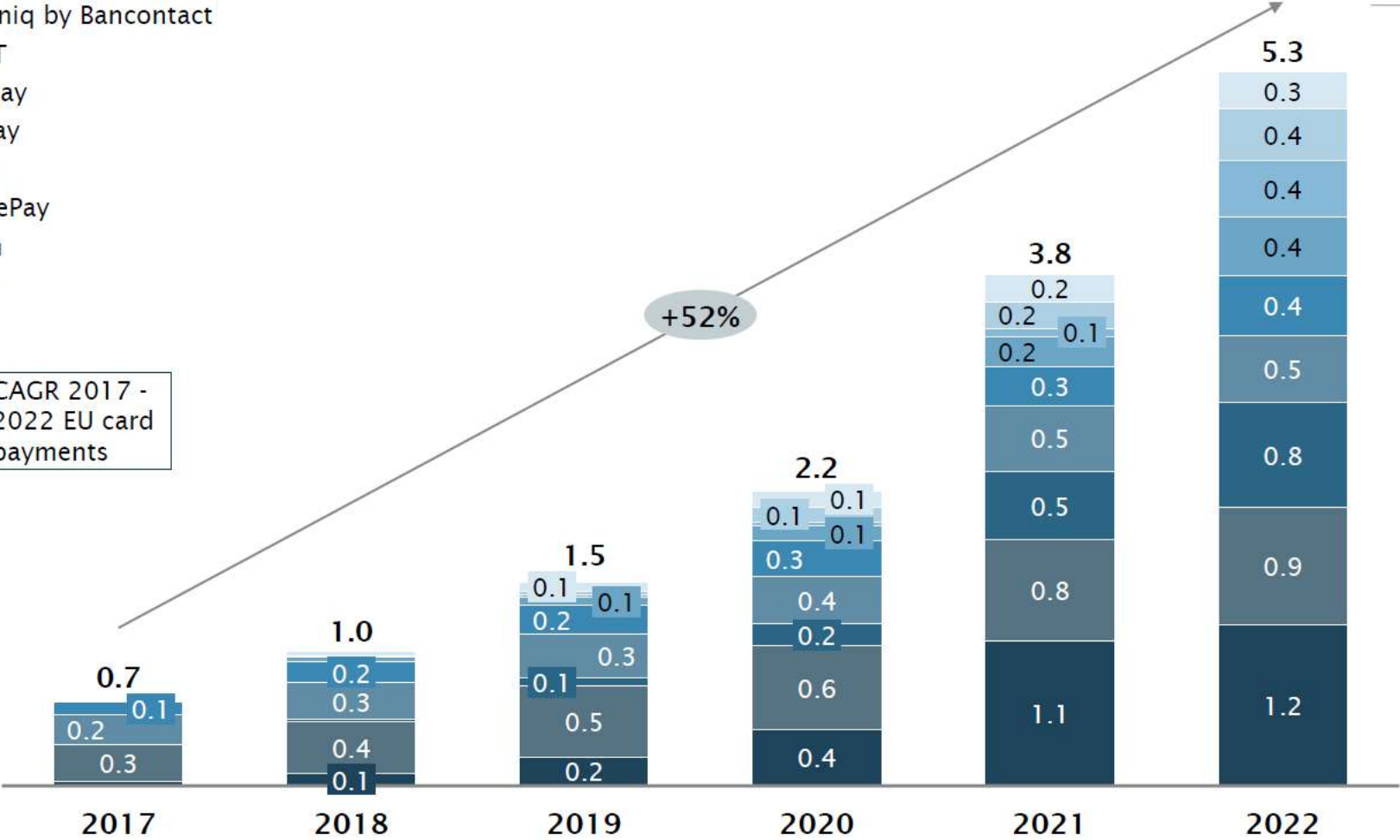
European mobile payment landscape: National leaders with spectacular growth rates



Number of transactions [billions]

- Payconiq by Bancontact
- TWINT
- Satispay
- MB Way
- Vipps
- MobilePay
- Bizum
- Swish
- BLIK

CAGR 2017 - 2022 EU card payments
+9%



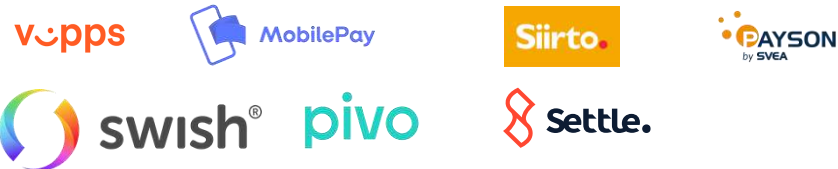
CAGR 2020-2022

48%	payconiq	
89%	TWINT	
302%	satispay	
93%	MB WAY	
30%	vipps	
29%	MobilePay	
118%	bizum	
19%	swish®	
68%	blik	

European mobile payment landscape: A story of enormous fragmentation



Nordics



DACH region



UK & Ireland



Baltics



Eastern Europe



France



Iberia



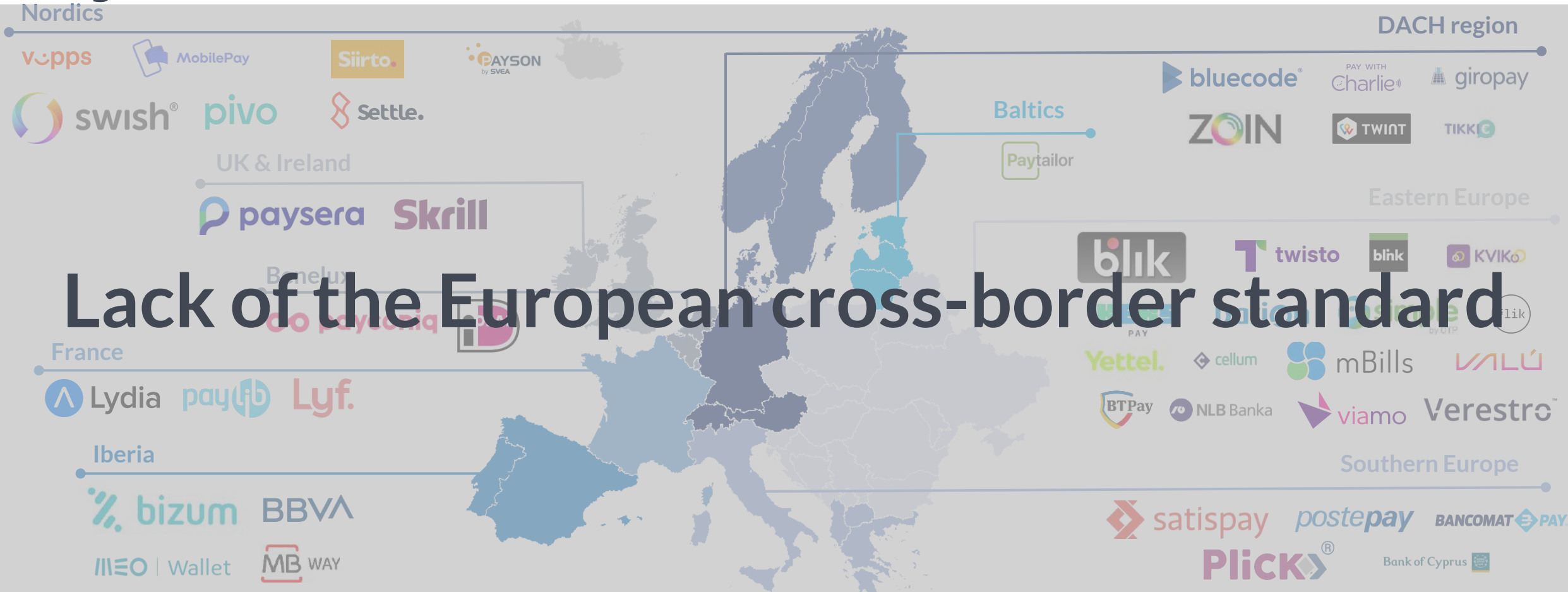
Southern Europe



Major global wallets



European mobile payment landscape: A story of enormous fragmentation



Lack of the European cross-border standard

Major global wallets



4.1. European consolidation initiatives



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European consolidation initiatives in the mobile payments sector



- **A new European mobile payment system**, based on **A2A** SEPA instant credit transfer (SCT Inst) rails, and Wero payment wallet (August 2024).
- **Wero will compete** both, with Google Pay and Apple Pay, and with other European existing solutions, that it plans to replace.
- EPI WERO wallet will be provided by **16 European banks** and financial services providers from **4 countries**: France, Germany, Belgium and the Netherlands.

VS

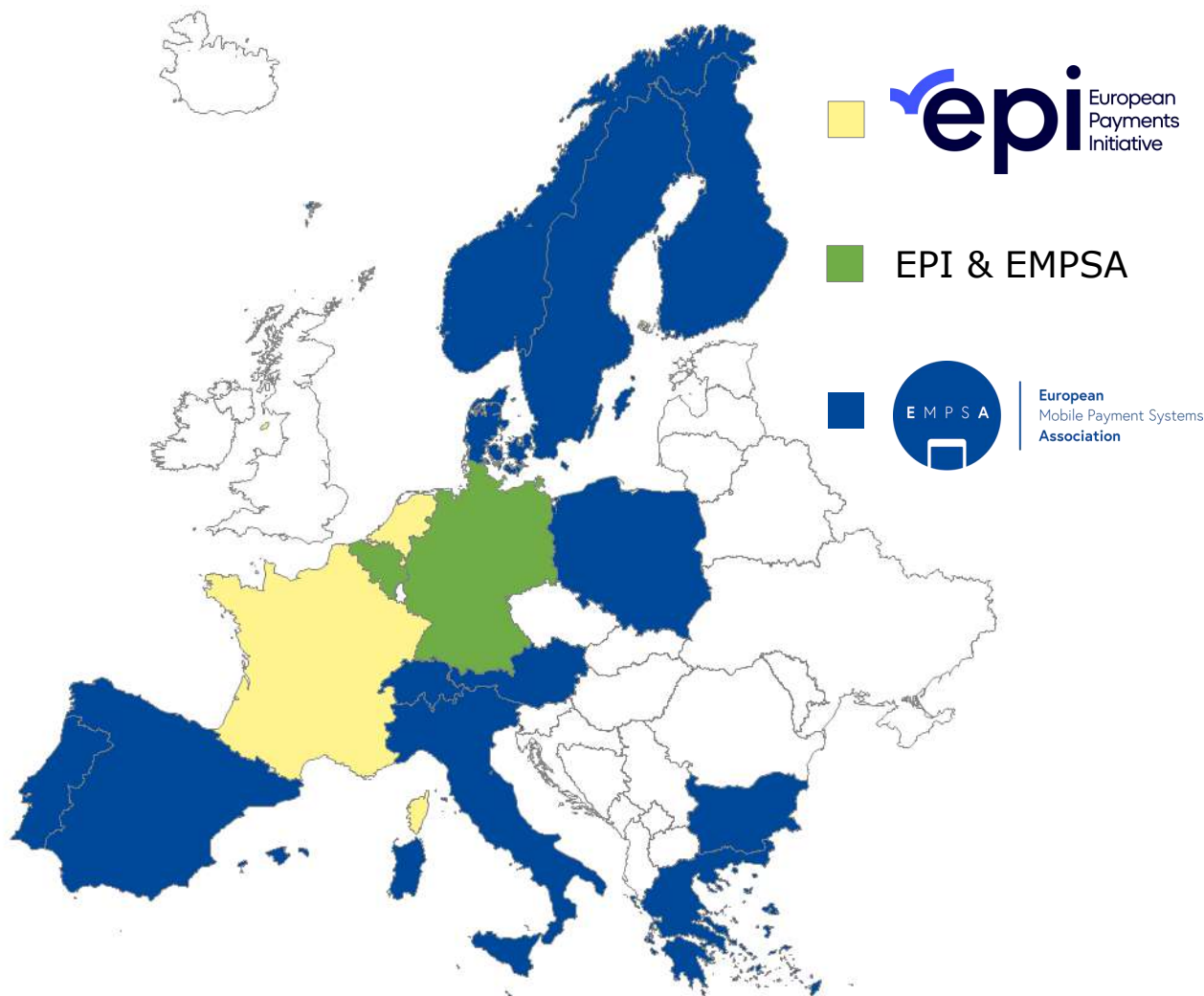


European
Mobile Payment Systems
Association

- **Association of well-established players** aiming to ensure **interoperability** between existing payment solutions in European countries.
- Among the **11 members** operating in **14 countries** are providers of leading and already successful solutions:
 - Bancomat Pay, Bizum, Blik, Bluecode, Borica, Dias, Payconiq, Twint, Sibs, Swish, Vipps



European consolidation initiatives in the mobile payments sector



weRO



4.2. How BLIK built the coopetition network in Poland: Case study



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BLIK mobile payment scheme: owners & members



Owners



Bank Polski



Santander



mBank

Millennium
bank

(2014/2015)



mastercard

(joined in 2019)

Other members



Bank Pekao



Bank Pocztowy



Banki Spółdzielcze

Nest!
BANK

citi handlowy®



Grupa BPS
Banki Spółdzielcze i Bank BPS



BNP PARIBAS



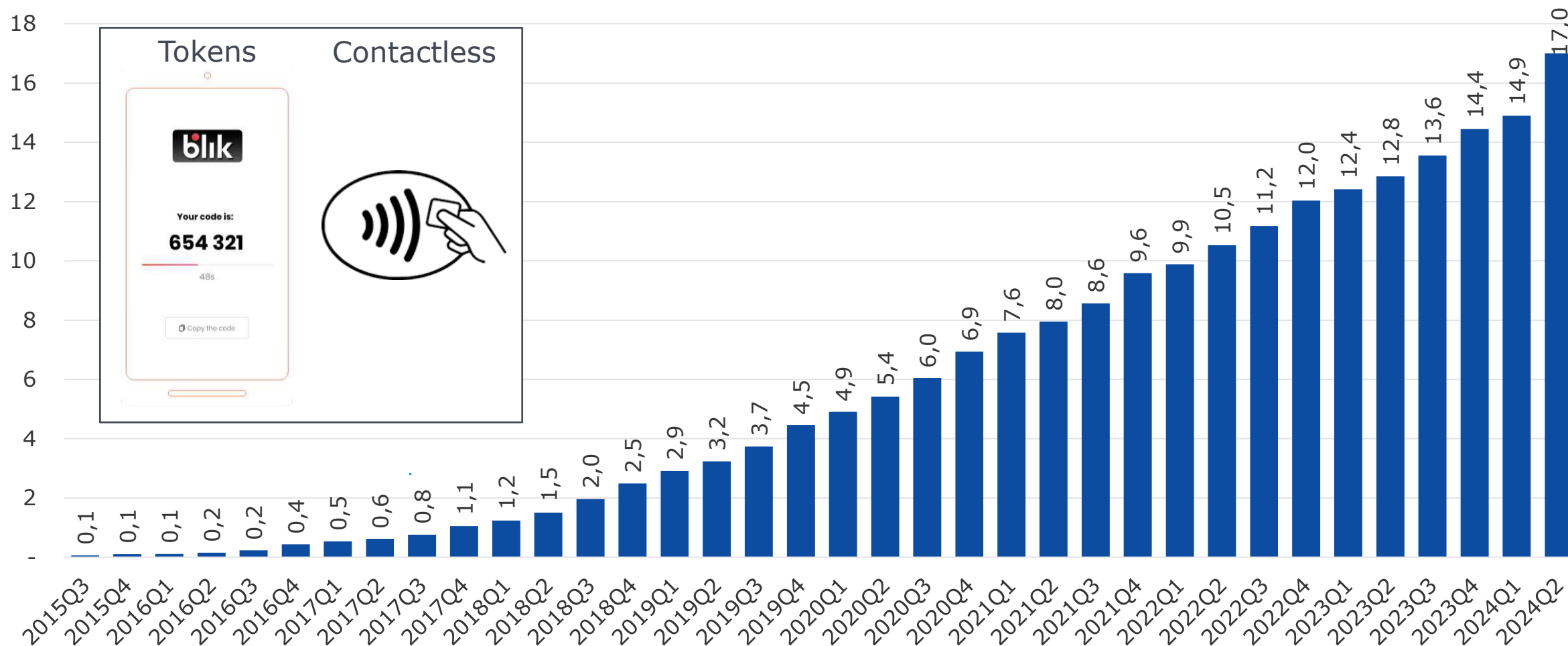
Krakowski Bank Spółdzielczy



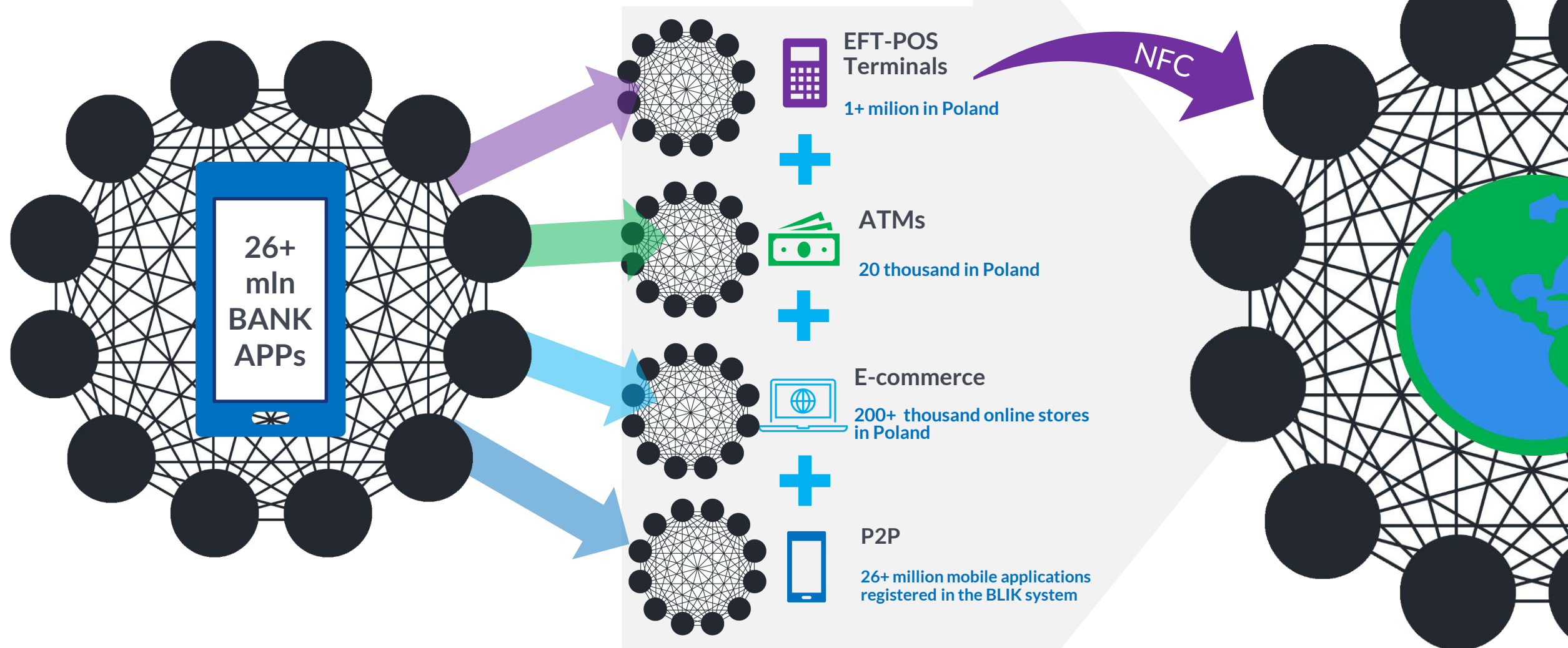
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Source: BLIK, <https://blik.com/>

Active BLIK users in millions

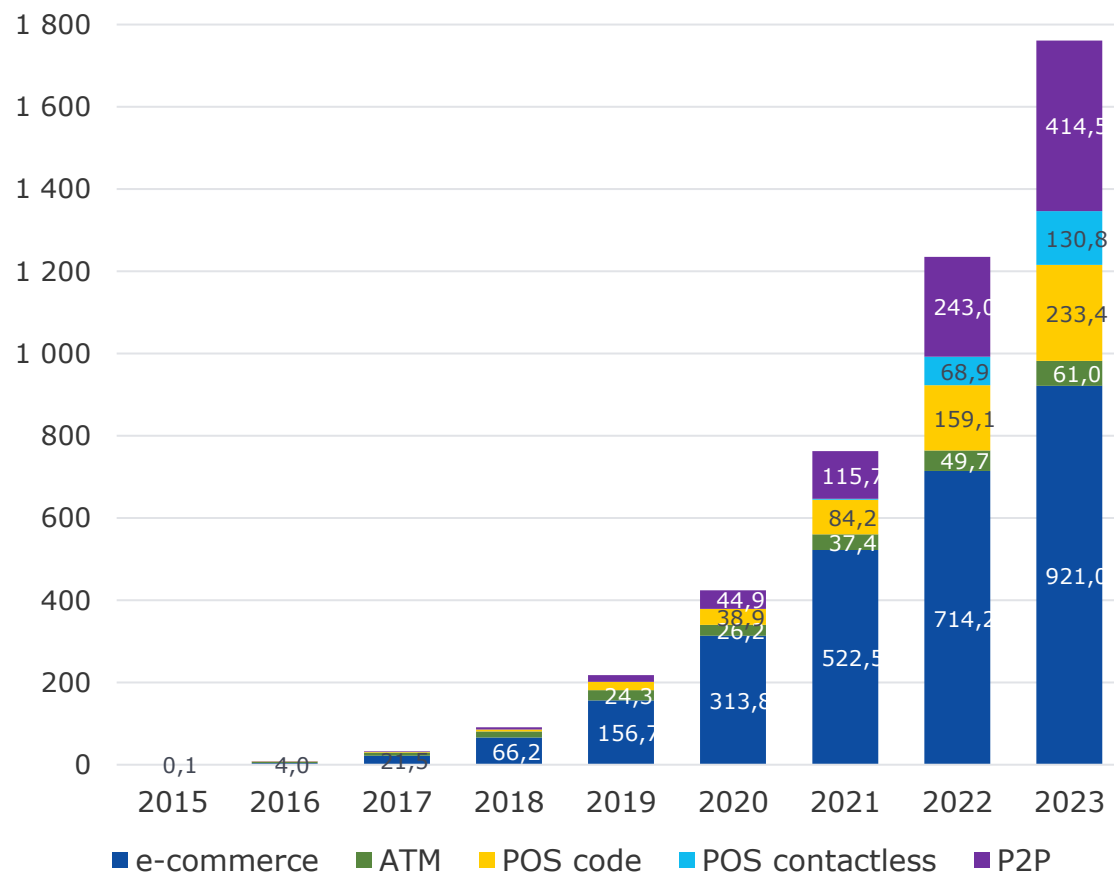


BLIK – Scaling up by connecting payment networks: Consumer value grows

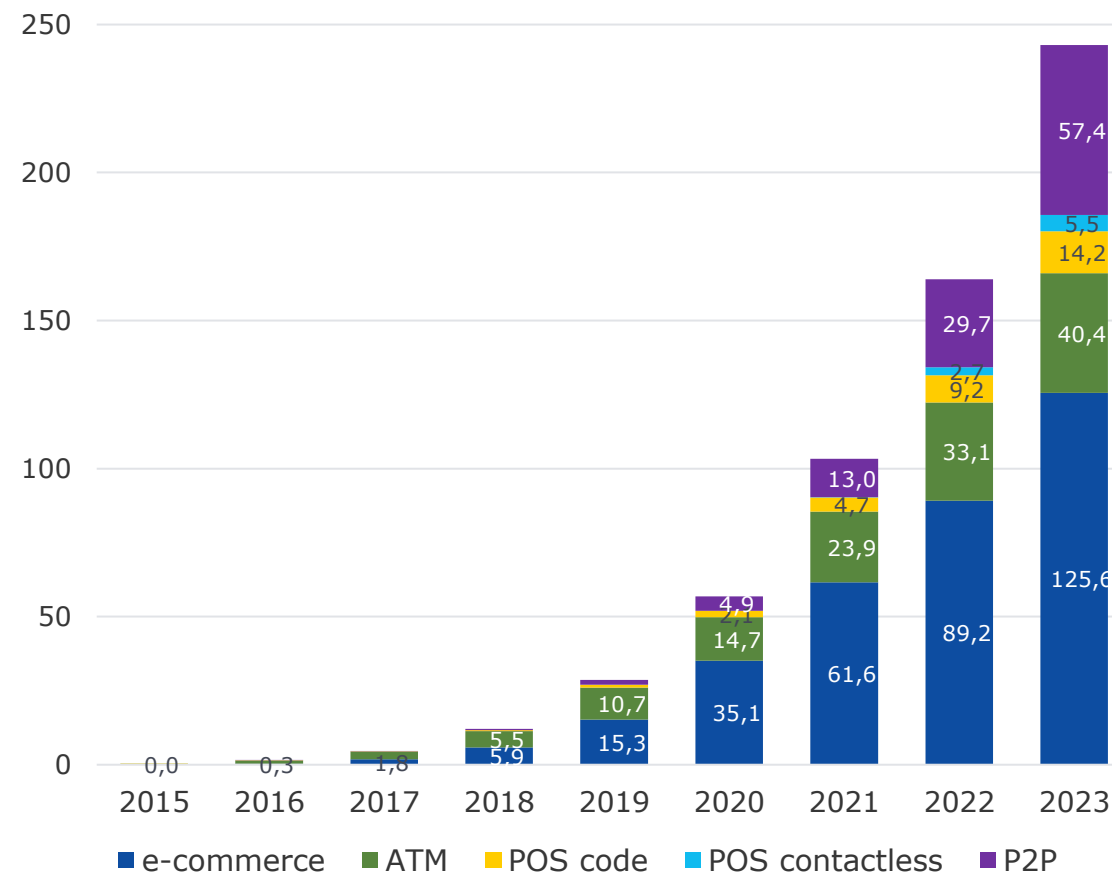


Development dynamics of the BLIK system

Number of transactions (million)



Value of transactions (billion PLN)



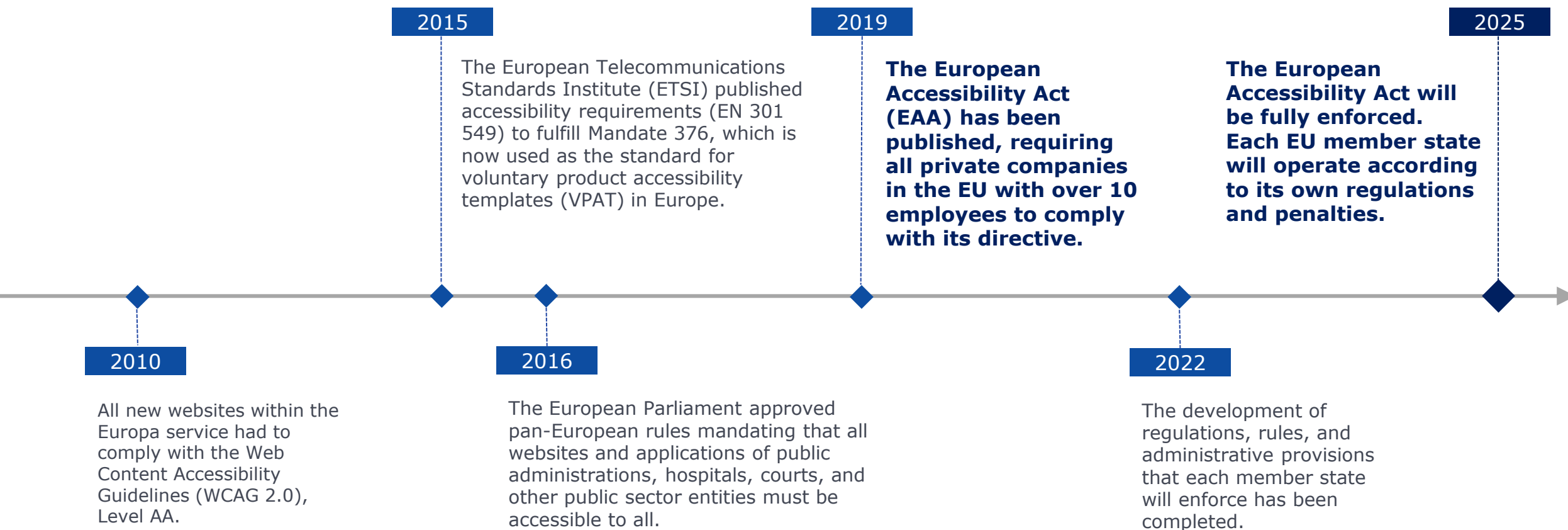
5. It's time for payment accessibility for all!



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EU Accessibility Regulations: The evolution



What are specific needs?

People with physical disabilities



motor limitations resulting from damage to limbs (including temporary injuries), the nervous system (central or peripheral), or muscle groups.

This group includes both individuals who are missing limbs, those using wheelchairs, and those with weakened motor functions (reduced movement precision, slower movements, or decreased muscle strength).

but also



temporarily disabled individuals after an injury, those carrying heavy luggage, and pregnant women

People with sensory disabilities



individuals with sensory organ impairments. In our case, it particularly refers to individuals with visual impairments. This includes both completely blind individuals and those with mild visual impairments (or difficulties in color recognition).

but also



individuals whose limitations result from age

People with intellectual disabilities and limited cognitive abilities



individuals with lower intellectual abilities (an IQ below two standard deviations from the mean).

but also



those with specific cognitive disorders affecting their understanding of messages (neurodivergent individuals), and people speaking another language

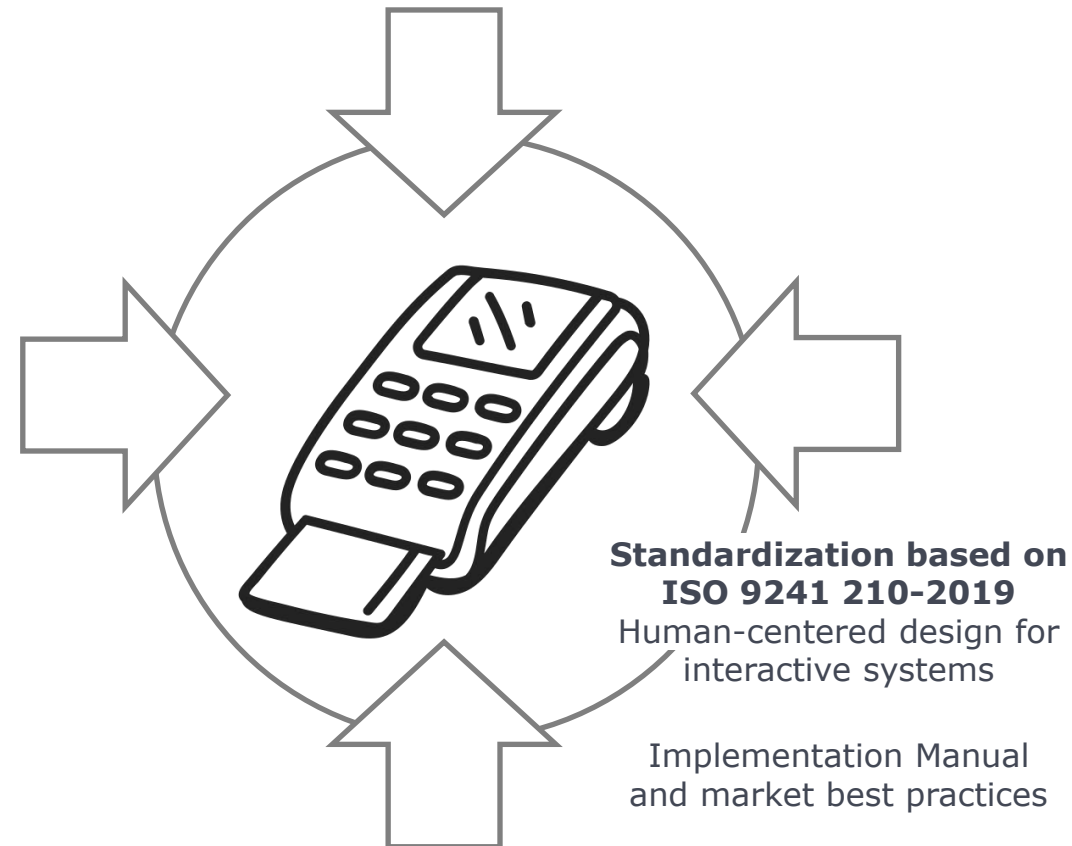


**~~with selected individuals in mind~~
with everyone in mind**



Accessibility Implementation Manual

for the payment industry



We propose to set up cooperation between the NCU and the nexo standards members to elaborate and publish the Accessibility Implementation Manual for the EFT-POS terminal infrastructure.



The NCU's potential for cooperation with the nexo standards' members



EDIH European Digital Innovation Hubs Network

FinTech Copernicus Hub in EDIHs European network

The centre has prepared, with partners, the FinTech Copernicus Hub project, which has received a "seal of excellence" from the European Commission and was included in the European Digital Innovation Hubs (EDIH) network with access to its resources.

<https://european-digital-innovation-hubs.ec.europa.eu/edi-h-catalogue/fisch>

The planned FTCH innovation ecosystem will serve the following:

- Digital transformation of enterprises and public organisations,
- Improving competence,
- FinTech startups development,
- testing of innovations by financial institutions.

NCU Center for Digital Economy and Finance

Research team

The team for the FinTech and Start-ups	The team for financial market regulations and digital currencies	The team for the cashless payments	The team for the digital economy inclusion
dr Anna Piotrowska Lider zespołu	dr Krzysztof Korus Lider zespołu	dr Agnieszka Hutarska Lider zespołu	dr hab. Beata Borowska-Beszta, prof. UMK Lider zespołu
Janusz Dłemko	dr Robert Hutarski	Andrzej Meler	dr Agnieszka Karpitka
Mikołaj Borowski-Beszta	dr Grzegorz Keller	Marta Jakubowska	Mateusz Smieszek
			Anna Borowska-Beszta

Director of the Center
dr hab. Michał Polasik, prof. UMK

PayTechImpact.EU

Coverage of the studies*

Expert study

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- 30 countries - all European Union members, UK, Norway, and Switzerland
- Covering all types of payments market stakeholder institutions

Consumer & Expert surveys
Experts survey only

Consumer study

- 5504 respondents of the CAWI survey
- 22 European countries
- Sample representative for the structure of internet users

Partners of the study:

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- Under call FISMA/2021/OP/0002 of European Commission - DG FISMA - Retail financial services
- Implemented by the consortium of VVA, CEPS and NCU

Future Digital Retail Lab - NCU

- The lab provides a complete research infrastructure for a self-service shop-laboratory to test key elements of process automation, user experience and the impact of social change brought about by COVID-19.
- Laboratory equipment consists of, among other things: a set of cameras and sensors, equipment for eyetracking (Tobii Pro Glasses) and EEG "emotion" measurements (Enobio 8), recognition and as well as algorithm software DeepL.

Tobii Pro Glasses 3

Enobio 8

Meta Quest Pro



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7. Conclusions



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Conclusions

- Effective standards and interoperability development are vital for payments market growth.
- **European sovereignty** in payments is a strategic goal of both the EC and EBC.
 - A **pan-European cross-border** solutions based on **instant payments** are expected to be fully deployed to the market.
 - **SEPA transfers** from **Account to Account** (A2A) are preferred, and acceptance at the **Point-Of-Sale** will be required.



Key requirements to the success of payment systems:

- Maximizing usefulness for consumers and merchants:
 - **The network size** – Multi-schemes integrations on the terminals can support interoperability and the reach of particular standards.
 - nexo standards brings value in standardization and supporting implementations.
- Ensuring ease of use and security:
 - Systematic research and significant investment in **user experience** and **payment speed**.
 - An efficient technical standard of payment interface is needed, and its effectiveness requires continuous improvements.
 - nexo standards helps to achieve efficiency.
 - Modern biometric technologies join both security and convenience.

- The payment industry needs an **Accessibility Implementation Manual** for the EFT-POS terminal infrastructure to:
 - Assist merchants in complying with the EU Accessibility Act requirements.
 - Increase sales by serving to consumers with specific accessibility needs.
 - Lower the costs associated with accessibility implementation.
 - Serve as a credible social responsibility initiative within the ESG framework.



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