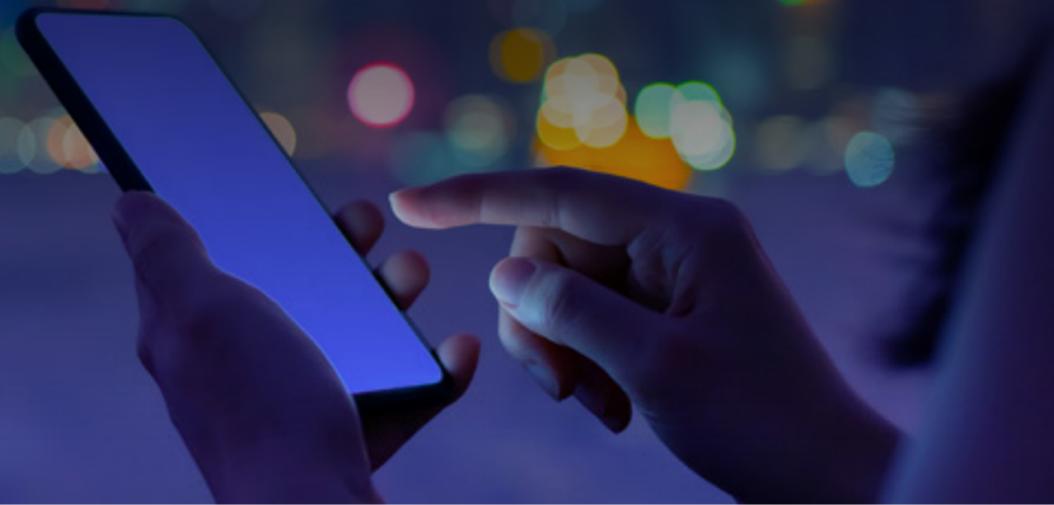


April 2022

# Prime Time for Real-Time



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# Welcome



## Foreword Real-Time Payments Are Reshaping Economies



**“Governments define the rules, but financial institutions can be the real winners.”**

**Odilon Almeida**  
President and CEO - ACI Worldwide

**Our yearly report looking at the growth and impact of real-time payments worldwide is now in its third edition — and more apt than ever.**

Market forces and global events have combined to develop significant momentum around real-time payments, placing the organizations that enable them right at the heart of modern economies. It is undeniably prime time for real-time payments.

The numbers speak for themselves on the scale of the opportunities, both already realized and untapped. 118.3 billion real-time transactions were made globally in 2021, as measured by our partners at GlobalData, and 427.7 billion are expected by 2026 (which would be 25.6% of all global electronic payments). Meanwhile, research from our partners at the Centre for Economics and Business Research (Cebr), and included here for the first time, shows a clear correlation between real-time payments and economic growth. Real-time payments helped generate an additional economic output of \$78.4 billion in 2021 across the 30 countries included in the Cebr study. By 2026, this figure is set to rise to \$173 billion across the same group of countries.

The evidence is clear: real-time payments improve overall market efficiencies and boost economic growth by allowing for the transfer of money between parties within seconds rather than days.

However, the analysis barely hints at the story's significance underlying much of this growth. An important driver of real-time payments adoption in recent years has been a series of unprecedented transformations to the daily lives of consumers and businesses. The transition to digital and real-time living, working and paying was already underway, but 2020 saw the COVID-19 pandemic accelerate adoption to new levels and there is no looking back.

Real-time payments offer consumers and businesses cheaper, faster and more efficient ways to pay. Payments are increasingly becoming embedded into non-financial digital apps and services, with today's customers looking for a hyper-connected, frictionless customer experience.

As our research reveals, modern economies depend on real-time payments to boost economic growth, prosperity and financial inclusion, with governments worldwide as the primary enabler of these systems. Yet, in the coming years, shaping the future of payments will come down to the individual financial institutions that take advantage of the opportunities enabled by these new payment rails.

Financial institutions globally are at different stages in their modernization journey. Some are contemplating, others are planning, but many more are reinventing their mission-critical operating systems to compete in the new real-time, post-digital, cloud-first and data-centric business environment. Inaction is not an option as broad-based disruption of the sector has moved beyond a tipping point.

ACI Worldwide is pleased to present the definitive view of real-time payments globally. In partnership with GlobalData, we have again expanded the scope of countries covered to reflect the increasing footprint of real-time payment schemes. And, for the first time, proprietary research from Cebr provides an unprecedented view of the economic benefits stimulated by real-time payments.

Our goal, as ever, is to provide vital insights for payment leaders looking to assess from where growth is likely to come, the speed with which it will arrive and the payments modernization required to capitalize on it.

At ACI, we take great pride in our work with customers, bringing our global experience, scale and flexibility to bear on their efforts to innovate with mission-critical, real-time payments software. It is a privilege to share our learnings and reflections in this report for the third consecutive year.

## Introduction The World Has Gone Real-Time — Act Now or Be Left Behind



**Jeremy Wilmot**  
Chief Product Officer - ACI Worldwide

**In “just” 24 months — and counting — of the global COVID-19 pandemic, the world has experienced 10 years' worth of evolution in digital real-time experiences. Almost nothing has been left untouched and people in most economies around the world now expect real-time experiences in everything they do.**

Payments are not an exception to this, and though payments themselves are increasingly commoditized, the faster movement of money has been right at the forefront of enabling this digital acceleration. Ultimately, consumer expectations are definitively trending towards new services and experiences layered on top of real-time payments.

### Central mandates are the difference maker

The difference in terms of how far and how fast those new use cases have taken hold is the work done in the previous years and decades by governments, regulators and central banks to stand up national real-time payment schemes. Another important but secondary factor is the environment created by those bodies for Big Tech involvement and the impact this increased competition has on incumbent banks and payment services providers.

Government or central intervention takes many forms. Some regulators are hands-on and set aggressive timelines with real consequences for non-compliance. Others take a consensus-driven, collaborative and gradual approach. But from Brazil to Indonesia, from the U.A.E. to India, governments have turned to real-time payments as a lever for improving economic prosperity and financial inclusion. And, given the success of real-time payments in unlocking meaningful impacts on GDP, they will continue to do so. Data from the Centre for Economic and Business Research compiled exclusively for this report shows that by 2026, an additional \$131 billion in GDP output is expected to be facilitated by real-time payments across the world's top five global real-time markets — India, China, Thailand, Brazil and South Korea.

It is little wonder, then, this year's edition of our annual report into global real-time payment trends provides further evidence that services tend to be most robust, and adoption highest, where clear and strong government or central mandates exist. This is the first of three grand themes that are emerging.

### The next chapter in real-time payments' maturation: digital services

Regardless of how they get there, where real-time payments do take hold, we also see participants across the payments value chain eager to engage with the new scheme. But the real action happens in the middle, between the traditional bank accounts bookending transactions. Here, society's sudden and seismic digitization has stimulated dramatic growth, with an explosion of real-time enabled, digital payment experiences launched by new market entrants or traditional players.

This is the next chapter of real-time payments' maturation, and our second grand theme in the arc of real-time development. As living and working converges onto digital experiences, offering real-time payments is becoming more than enabling new ways of paying. It is about embedding payments within these experiences in order to enhance those journeys, improve their convenience and increase their value.

### The cloud is the great enabler for differentiated payment experiences

Our third and final grand theme is the cloud. By flipping traditional infrastructure procurement on its head and standardizing related operational and

security capabilities, the cloud is inexorably reshaping the payments market. By freeing organizations to focus their expertise and energies on developing added-value payment features and functions on top of these standardizations, it dramatically accelerates time to market on new use cases. The unrivaled abilities of hyperscale cloud providers to manage and scale data security and privacy requirements transform the fight against real-time payments fraud. And those same capabilities advance the industry's maturity when it comes to using data to improve the customer experience.

As greater security increases trust and better data leads to more relevant use cases, the flywheel of real-time payments adoption and innovation will develop a self-sustaining momentum. The pace of change will only accelerate. For a window on what this future looks like, we can look to India where UPI (Unified Payments Interface) processes more than 5.3 billion transactions per month<sup>1</sup> and is already launching its third generation just six years since the first. Wildly successful adoption has seen use cases extend far beyond sending and receiving funds, to loans and credit checking, cardless cash withdrawals and growing regional cross-border interoperability.

### Payments must become cloud first and data centric

As an industry, we are still only scratching the surface of the cloud's potential. But my hope is that readers of this report, which expands significantly on each of the grand themes outlined here, consider its insights through that lens. How is the cloud going to help you to modernize and take advantage of the burgeoning digital real-time opportunity in the next 12 months and beyond?

As other industries have already shown, and as this report confirms, it is increasingly clear that banks and financial institutions with designs on winning with payments in the digital real-time economy need to be cloud first and data centric.

<sup>1</sup> <https://www.npci.org.in/what-we-do/upi/product-statistics>



## About GlobalData

**GlobalData is a leading provider of data, insights and analysis for the world’s largest industries, covering 17 industry verticals including banking and payments. GlobalData’s industry-leading data rests on a foundation of “Gold Standard” data derived from trusted central sources and a team of expert analysts in each sector.**

This report leverages GlobalData’s Instant Payments market sizing data as well as insights on adoption of mobile wallets, use of online payment tools and consumer experiences of fraud from GlobalData’s Financial Services Consumer Survey.

The Instant Payments market sizing data is a custom-built dataset developed specifically for the Prime Time for Real-Time report series, based on a core methodology of secondary research into any publicly available data on the development of real-time payment systems available from the entities that run those systems, or from central banks. These numbers are then cross-checked against GlobalData’s in-house datasets covering overall payments by type, standardized and adjusted where necessary based on analyst input. To the historic and current-year data derived from this methodology, we apply our proprietary forecasting model based on tested correlations of the target variables against multiple macro-economic variables which is then reviewed by our team of expert analysts. Forecasts are provided five years into the future under this model, from the base year (2021 in this report).

GlobalData’s annual Financial Services Consumer Survey is a key source of unique information, complementing GlobalData’s deep market-level and alternative datasets to provide a complete picture of the financial services industry. The most recent survey, the 2021 Financial Services Consumer Survey, was conducted online in Q1-Q2 2021 among 52,742 consumers in 42 markets globally. The survey explores global consumer behaviors, purchasing preferences and attitudes across the most important banking products. Every year, respondents are recruited via an online panel. Quotas are set to ensure samples are nationally representative. The number of respondents to any particular question depends on individuals’ characteristics, their financial product holding and their interest in that area. Our questionnaire has been developed over a decade of iteration and client input, leading to a focused script that covers a wide range of financial services topics. Questions are designed with an emphasis on being closed-ended questions with a natural language used throughout. Our questionnaire aims to strike a balance between providing usable time-series data from questions that remain consistent over time and questions that address emerging themes in financial services.



# Cebr

## About Cebr

**For more than 25 years, the Centre for Economics and Business Research (Cebr) has supplied independent economic forecasting and analysis to hundreds of private firms and public organizations. Our Economic Advisory specializes in economic impact assessments, having advised several government departments, as well as FTSE and multi-national firms, on a range of topics. Cebr’s Forecasting team delivers award-winning forecasts of the U.K. and global economies, helping our clients stay ahead of the game in anticipating future economic developments.**

### Scope, modeling framework and methodology

The study is designed with an objective to estimate the economic impact of adopting real-time payment systems, assessing thirty countries across six global regions.

To perform the economic impact assessment of real-time payments, a comprehensive methodology was designed with a bottom-up approach. The assessment first identifies and estimates the various channels of cost savings from introducing real-time payments in the current payments environment of each economy. Secondly, it quantifies the impact of the total savings across the whole economy in terms of support to national output, and finally, extrapolates the benefits by five years into the future to showcase the increased stream of benefits in 2026.

The study covers thirty countries representing the six major global regions. There are eight countries from Europe, five countries spanning the Americas, two from the African continent and ten countries across the broad Asia-Pacific region. Except for Russia, the analysis has full coverage of the G20 member nations.

For the model estimating the economic impacts of real-time payments in 2021 and 2026, we use transaction volume and transaction value data for each component of the payments mix. Underpinning the study, we leverage data provided for this report from GlobalData on payment volumes and values for each country, disaggregated at the payments instrument level.

To estimate the counterfactual scenario of 0% real-time payments, in all channels of this model we estimate a “new” payments mix that is based on the distribution of electronic (non-instant) payments versus paper-based payments. This allows us to produce an estimate for how the transactions that are currently undertaken through real-time instruments would likely have been made in the absence of this technology. Here, we distribute the volume of real-time transactions proportionate to the current non-instant electronic versus paper payments mix, while applying the average real-time transaction value to those transactions, which ensures that the overall, newly estimated payments system with zero real-time payments has the same number of transactions and the same total transaction value.

To estimate the potential maximum additional benefit that real-time payments present, we construct a counterfactual framework within each country that estimates the efficiency savings and wider benefits associated with hypothetical 100% real-time utilization.

It must be stressed that full real-time adoption is not a realistic or likely scenario for any country in the near-term future, even for those with the most advanced payment systems. In general, while we are seeing a shift away from paper-based instruments based on the information regarding the payments landscape today, full real-time adoption is not realistic for the timeframe assessed within this study. Results should be considered indicative of the potential scale of benefits, rather than any form of prediction or forecast.

The three stages of the overall analysis include:

- i. A bottom-up estimation of the net efficiency savings in 2021 from the adoption of a real-time payments system for businesses and consumers
- ii. The estimation of the macroeconomic impacts as a result of the agent-level efficiency savings
- iii. A forecast of the benefits to 2026 for businesses and consumers and at the aggregate macroeconomic level

### Net efficiency savings for businesses and consumers

The framework for estimating the total cost savings (or benefits) for firms and consumers comprises three channels:

- Channel 1: The adoption of real-time payments technology will lead to a change (typically a reduction) in the unit costs per transaction
- Channel 2: The adoption will suffice in reducing the “payments float”—in other words, the time the funds are locked in the payments system after a payment is issued but before it is settled
- Channel 3: The reduction in the rate of failed transactions as a direct result of real-time payments usage

### Macroeconomic impact framework

Once the net efficiency savings for firms and consumers are estimated based on both 2021 real-time adoption rates and 100% real-time payments adoption, we can integrate these results into the macroeconomic impact framework to estimate the country-wide benefits of real-time payments. The final output of the macroeconomic impact framework is the total economic impact in each country that is supported by real-time payments. We present this as a dollar figure, as a percentage share of GDP and as an equivalent jobs figure.

Translating agent-level benefits to aggregate economy impacts requires prudent handling because some components of the agent-level model should not be incorporated at face value. Critically, we only include efficiency savings that generate additional final economic output.

The channels of the agent-level model that are included in the macroeconomic impact framework are the payment float impacts, the labor costs share of the failed payments impact, and finally, the impact that real-time payments have in formalizing segments of the informal economy.

The International Monetary Fund defines the “shadow economy” to represent “illegal activities and unreported income from the production of legal goods and services, either from monetary or barter transactions, that would be taxable were they reported to the tax authorities.”

To estimate the size of the informal economy in each country, we use timeseries data from the Centre for

Applied Macroeconomic Analysis, which includes measures of informality over the period 1990-2018, from which we are able to forecast to 2021 and 2026.

Research shows that a reduction in the cash share of the economy leads to reduction in the shadow economy. We use the academic evidence as a basis to build a model estimating the cost savings from this channel.

### Forecast of impacts to 2026

The final component of the analysis involves forecasting the economic impacts with a five-year time horizon to 2026.

Regarding the framework for the bottom-up model of benefits for firms and consumers, plus the macroeconomic benefits that are stimulated using real-time payments, the mechanism for 2026 is symmetric to the modeling framework for 2021 as described previously in this section.

There are, however, a few key differences with regards to the datapoints that underpin the 2026 forecast. Critically, the payments mix for each country is reestimated, driving a significant proportion of the results. This data is based on forecasted adoption rates of real-time payments, plus changes in the proportions of electronic (non-instant) transactions and paper-based transactions making up the remainder of the overall payments mix within each country. All payment mix estimates for 2026 are provided by GlobalData.



# Executive Summary: Real-Time Payments Drive Real-Time Economies



Governments worldwide, led by those in emerging nations, are a vital enabler of the current and unstoppable move towards real-time — boosting economic growth and prosperity, offering consumers and businesses cheaper, faster and more efficient ways to pay. Real-time schemes and services tend to be most robust and adoption highest where clear and strong government or central mandates exist. These markets also show the highest economic impact.

Financial institutions that take advantage of the opportunities enabled by real-time payment rails will be at the forefront of payments innovation. Cloud technology will be the key enabler for real-time banking modernization and the catalyst for success.

## 1 Modern economies are real-time

Real-time payments are at the heart of the new global payments landscape, which is evolving rapidly. Real-time transactions and growth forecasts continue to rise globally, with emerging countries leading the way and outpacing developed nations.

## 2 Real-time payments unlock economic growth

By allowing for the transfer of money between businesses and consumers within seconds rather than days, real-time payments improve overall market efficiencies in the economy. Real-time payments improve liquidity in the financial system and therefore act as a catalyst for economic growth. This is especially important for our fast-paced and digital-led gig economies.

## 3 Consumers expect real-time payments

Real-time payments are offering consumers and businesses cheaper, faster and more efficient ways to pay. Payments are increasingly becoming embedded into non-financial digital apps and services, with today's customers looking for a hyper-connected, frictionless customer experience.

## 4 Cloud accelerates banking modernization

Banks are reinventing their mission-critical operating systems to compete in the new real-time, post-digital, cloud-first and data-centric business environment. The financial services industry has moved beyond the tipping point of broad-based disruption and is now witnessing the realization of those changing paradigms.



## Real-time payments help to generate additional economic output.

Formal GDP facilitated by real-time payments across 30 markets in the Cebr Economic Impact Report:



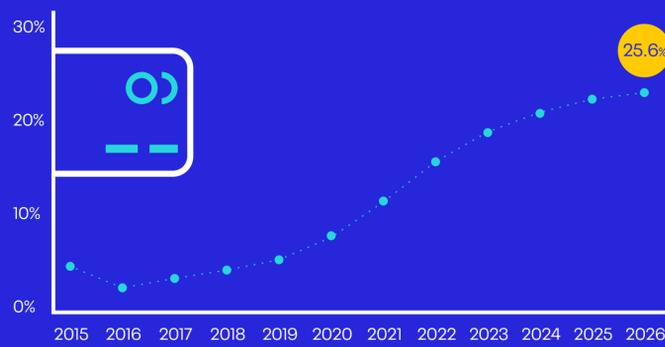
Real-time payments are saving consumers and businesses money.



Formal GDP facilitated by real-time payments across the top five global real-time markets (by transaction volume) — India, China, Thailand, Brazil and South Korea:



By 2026 real-time payments are set to be at the heart of the new global payments landscape, accounting for a quarter of all electronic payments globally.



India led the way for real-time payment transaction volumes in 2021.

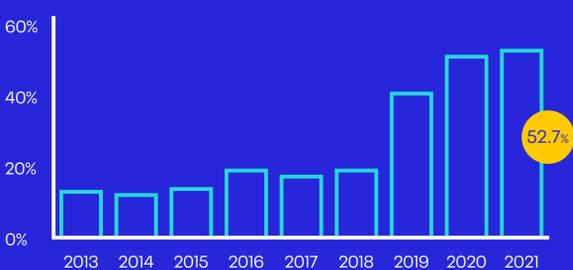


## Top-five fastest-growing real-time markets:

(where IP share of all electronic payments is at least 10%)



Consumers are embracing digital payment methods and, globally, more than half now hold and use a mobile wallet.



However, this is creating new opportunities for fraudsters and digital wallet hacking is on the rise.



To capitalize on the growth opportunities of real-time payments, banks around the world are prioritizing the cloud to modernize, with South and Central America and MEASA leading the way.

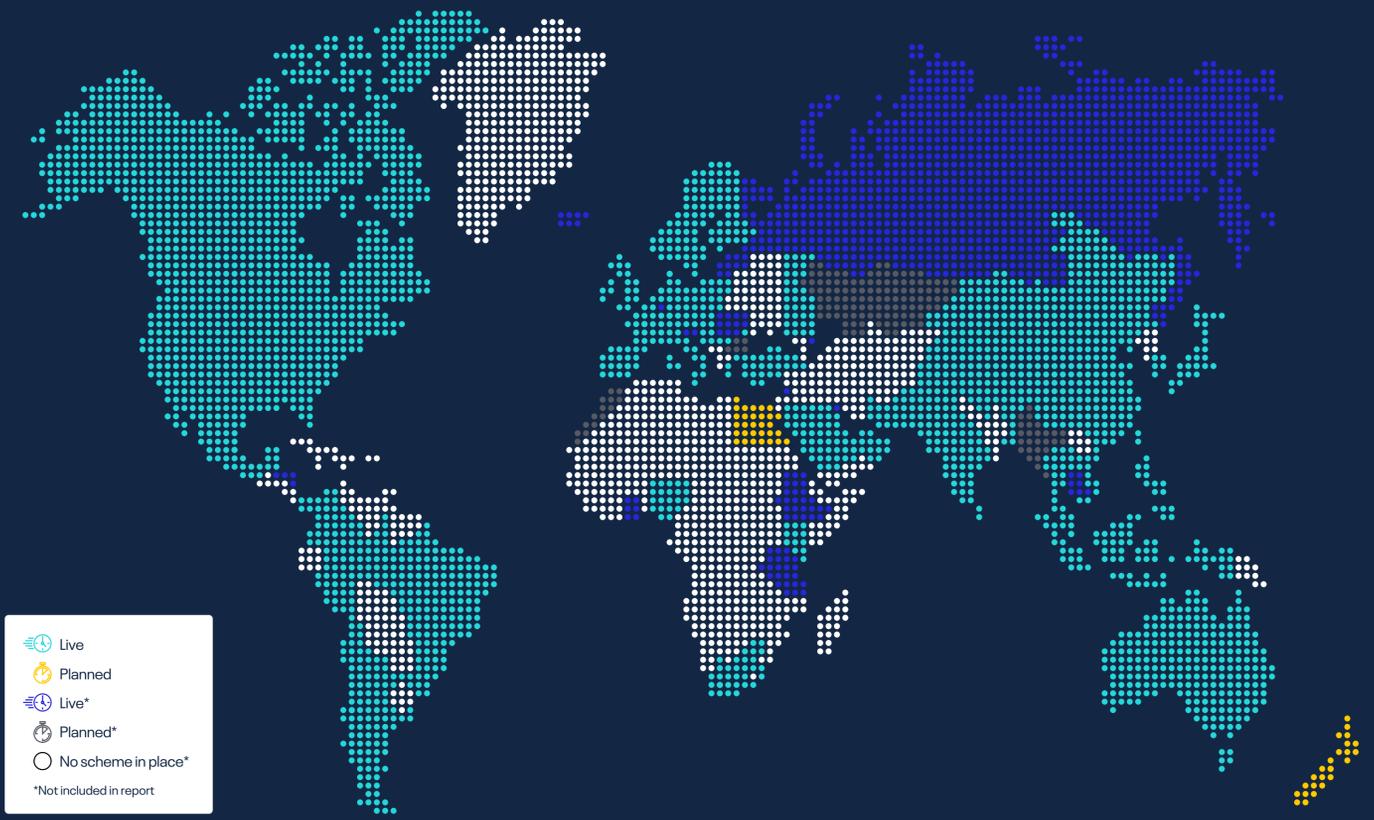


Prime Time for Real-Time 2022 tracks real-time payments volumes and growth forecasts across 53 countries and provides an economic impact study for 30 key global markets. The move towards real-time payments is unstoppable, and financial organizations that enable them are at the heart of modern economies. It is undeniably Prime Time for Real-Time!

Discover more about innovating with real-time payments at [aciworldwide.com](https://aciworldwide.com).



# Global Real-Time Payments Adoption



## North America

Country	Real-Time Payments Method	Status	Year
Canada	Interac e-Transfer	🕒 Live	2002
United States	RTP and Zelle	🕒 Live	2017
	FedNow	🕒 Planned	2023

## Pacific

Country	Real-Time Payments Method	Status	Year
Australia	New Payments Platform (NPP)	🕒 Live	2017
New Zealand	No scheme in place	🕒 Planned	TBD

## Asia

Country	Real-Time Payments Method	Status	Year
Cambodia	Real-Time Fund Transfer (RFT)	🕒 Live*	2019
China	IBPS	🕒 Live	2010
Hong Kong <small>(Special Administrative Region)</small>	Faster Payment System (FPS)	🕒 Live	2018
Indonesia	BI-FAST	🕒 Live	2021
Japan	Zengin System	🕒 Live	1973
Kazakhstan	ISMT	🕒 Planned*	2025
Malaysia	DuitNow	🕒 Live	2018
	Interbank Funds Transfer (IBFT)	🕒 Live	2006
Myanmar	No scheme in place	🕒 Planned*	TBD

Country	Real-Time Payments Method	Status	Year
Philippines	InstaPay	🕒 Live	2018
Singapore	FAST	🕒 Live	2014
	PayNow	🕒 Live	2017
South Korea	CD/ATM	🕒 Live	1988
	Electronic Banking System (EBS)	🕒 Live	2001
Taiwan	Financial XML	🕒 Live	2003
	Interbank ATM funds transfer system	🕒 Live	1987
Thailand	PromptPay	🕒 Live	2016
Vietnam	NAPAS Quick Money Transfer Service	🕒 Live	2016

## Europe

Country	Real-Time Payments Method	Status	Year
Austria	SCT Inst	🕒 Live	2017
Azerbaijan	IPS	🕒 Live*	2020
Belgium	SCT Inst	🕒 Live	2017
Bulgaria	Borica Instant Payments	🕒 Planned*	TBD
Croatia	NKSInst	🕒 Live	2020
Czech Republic	Instant Payment	🕒 Live	2018
Denmark	Straksclearing	🕒 Live	2014
Estonia	SCT Inst	🕒 Live*	2017
Finland	Siirto	🕒 Live	2017
	SCT Inst	🕒 Live	2017
France	SCT Inst	🕒 Live	2017
Germany	SCT Inst	🕒 Live	2017
Greece	IRIS	🕒 Live	2017
Hungary	Azonnali fizetési rendszer (AFR)	🕒 Live	2020
Iceland	CBI	🕒 Live*	2020
Ireland	SCT Inst (only few banks are offering)	🕒 Live	2017
Italy	SCT Inst	🕒 Live	2017
Latvia	EKS Zibmaksajums	🕒 Live*	2017
Lithuania	CENTROlink	🕒 Live*	2017
Luxembourg	BLInet	🕒 Live*	2020

Country	Real-Time Payments Method	Status	Year
Netherlands	SCT Inst	🕒 Live	2017
Norway	Straksbetaling	🕒 Live	2013
	Vipps	🕒 Live	2015
Poland	Express Elixir	🕒 Live	2012
	BlueCash	🕒 Live	2012
Portugal	SCT Inst	🕒 Live	2017
Romania	Plati Instant	🕒 Live*	2005
Russia	FPS	🕒 Live*	2019
Serbia	IPS	🕒 Live*	2018
Slovakia	No scheme in place	🕒 Planned*	2022
Slovenia	Flik	🕒 Live*	2020
Spain	SCT Inst	🕒 Live	2017
	Bizum	🕒 Live	2016
Sweden	BIR	🕒 Live	2012
Switzerland	TWINT	🕒 Live	2016
Turkey	Retail Payment System (RPS)	🕒 Live	2012
	FAST	🕒 Live	2021
United Kingdom	Faster Payments	🕒 Live	2008
Ukraine	No scheme in place		TBD

## Middle East, Africa and South Asia

Country	Real-Time Payments Method	Status	Year
Bahrain	Fawri+	🕒 Live	2015
Egypt	No scheme in place	🕒 Planned	TBD
Ethiopia	EATS	🕒 Live*	2011
Ghana	GhIPSS Instant Pay (GIP)	🕒 Live*	2007
India	IMPS	🕒 Live	2010
	UPI	🕒 Live	2016
Iran	No scheme in place		TBD
Israel	No scheme in place		TBD
Kenya	PesaLink	🕒 Live	2017
Kuwait	NBK Quick Pay	🕒 Live*	2018
Lebanon	Zaky	🕒 Live*	2020

Country	Real-Time Payments Method	Status	Year
Morocco	No scheme in place	🕒 Planned*	TBD
Nigeria	NIP	🕒 Live	2011
Oman	MPCSS	🕒 Live	2017
Pakistan	Raast	🕒 Live	2021
Qatar	QMP	🕒 Live*	2020
Saudi Arabia	sarie	🕒 Live	2021
South Africa	RTC	🕒 Live	2006
Sri Lanka	LankaPay	🕒 Live	2017
Tanzania	Tanzania Instant Payments System (TIPS)	🕒 Live*	2019
U.A.E.	Immediate Payment Instructions (IPI)	🕒 Live	2019

## Latin America

Country	Real-Time Payments Method	Status	Year
Argentina	DEBIN	🕒 Live	2017
	PEI	🕒 Live	2016
Brazil	SITRAF	🕒 Live	2002
	PIX	🕒 Live	2020
Chile	TEF	🕒 Live	2008
Colombia	Transfiya	🕒 Live	2019

Country	Real-Time Payments Method	Status	Year
Honduras	SIP	🕒 Live*	2008
Mexico	SPEI	🕒 Live	2004
Peru	Immediate Interbank Transfers	🕒 Live	2016
Uruguay	No scheme in place		TBD
Venezuela	LBTR	🕒 Planned*	TBD

\*Not included in report

# Thematic Insights



## APMs Ready To Capitalize on Data-Enabled Use Cases

Author: Amelia Ruiz Heras, Solution Consulting Manager – ACI Worldwide

**Even as some alternative payment methods (APMs) experience impressive successes, bigger opportunities are on the horizon, writes Amelia Ruiz Heras, solution consulting manager.**

Recent years have seen a near-continuous emergence of APMs. The results are increased consumer choice and a fast-pace of innovation — and enough experience for a blueprint for success to emerge.

Timing can be a big factor in whether APMs succeed or fail, with new technologies often failing to catch on the first time around. And an APM is a non-starter if it isn't extremely easy for merchants to exploit, with most built around differentiated, friction-free experiences. For that reason, many of the most successful make their home — at least initially — in eCommerce or embedded finance applications where they can easily outperform the card experience and its information entry.

### The APM blueprint for success

But what differentiates the best from the rest is often a focus on winning with a single, core initial use case and a clearly defined audience. Doing so allows them to strike the magic combination of brand awareness and a critical mass of consumers familiar with the experience, which allows them to transfer into other scenarios and use cases. Klarna's excellent leverage of social media and collaborations with major retailers like H&M have driven both of these factors, for example. It has become an instantly recognizable brand with younger people in a short amount of time. This has created a following that other merchants are clamoring to tap into. Bizum in Spain, which leverages the real-time rails, has capitalized on the immense levels of brand awareness attained from being the market's go-to P2P service for transfer to merchant use cases.

### Real-time heralds the next phase in APMs

The initial blueprint seems set then. Create an APM with a contained yet mass appeal use case that allows you to build brand awareness and educate consumers on the experience and convenience.

But the next phase, which the market is only just beginning to enter, is to provide additional, data-driven services on top, such as loyalty schemes and reward programs, typically enabled by real-time schemes based on the ISO 20022 messaging standard. Furthermore, there is a huge opportunity to go beyond rewarding individual customers, mining the data gathered at the point of sale and in embedded finance experiences for insights into consumer behavior. These insights can be monetized via value-added services for merchants. And with more data comes more opportunities to leverage AI, both to discover and respond to trends, and to enhance fraud management and detection.

This model is not unlike internet services that provide a service for free, or at very low cost, to build a critical mass of users that can then be monetized in other ways. But even accounting for the constraints of data privacy regulations, it is questionable right now whether APM providers, banks and merchants are truly making full use of this data.

### The cross-border "super" APM opportunity

Most APMs tend to experience domestic success, since limited standardization forces a country-by-country approach that results in comparatively little penetration in cross-border payments. This is perhaps the next frontier of untapped volume, with modernizations around ISO 20022 — and, in Europe, the European Payments Initiative (EPI) — potentially opening the door to regional "super" APMs that dominate cross-border use cases. It will not be quite as simple as that, of course. Any new payment type will always come up against cultural nuances unique to each market, with some attached to cash, debit or credit cards; and some more used to services like buy now, pay later (BNPL). These factors will often be tough nuts to crack, but successful APMs have proven that convenience is king.



Even before that happens, however, APM providers are likely to find themselves in a unique position. Growing adoption, proliferating real-time schemes and increased messaging standardization will enable them to create end-to-end offerings that add value to the payments ecosystem's many players — helping banks, acquirers and merchants to drive and monetize digital payments.

This will require a way to bring together the relatively narrow interests in the payments value chain held by each stakeholder. It remains to be seen how that will play out, but that role would seem tailor-made for a vendor with the global experience in real-time payments to act as a unified innovation enabler. Overall, however, this serves to illustrate the huge opportunities we see coming down the road for alternative payments players in 2022 and beyond.

It may not be long before the "alternative" label needs revisiting.

**"There is huge opportunity to go beyond rewarding individual customers, mining the data gathered at the point of sale and in embedded finance experiences for insights into consumer behaviors. These insights can be monetized via value-added services for merchants."**



## Payments as a Service Is Key for Real-Time Business Models

Authors: Ciaran Chu, Head of Cloud Transformation – ACI Worldwide and Ray Caradine, Director Product Management – ACI Worldwide

**As refresh cycles come around, prompted by the need to accept new payment types, provide better customer experiences and reduce costs post-pandemic, banks are discovering how processing payments as a service enables a wealth of strategic business outcomes, explains ACI's Ciaran Chu and Ray Caradine.**

Real-time payment schemes around the world can teach us a great deal about the critical success factors that drive adoption. But exactly how quickly volumes will increase remains something of a great unknown.

Afterall, myriad factors influence consumer adoption (business use cases almost always lag behind), including how entrenched cash is, how well incentivized cards are and the availability of mobile connectivity.

That makes scalability and cost predictability key criteria when standing up connections to new schemes, at which point cloud infrastructure inevitably enters the conversation. (The pandemic provided a sharp lesson in this principle when payment volumes hit Black Friday levels for much of 2020 and into 2021.)

However, as many banks are discovering, the ability to scale with demand is actually only a surface level operational benefit of migrating payment processing to the cloud. Processing payments in the cloud — specifically as a managed service — is instead best thought of as a strategic vehicle for changing an organization's cost base and driving revenue growth.

### Cloud processing turns challenges into opportunities

Real-time payments challenge long-standing revenue streams, from the charging of interchange fees to the holding and trading of customer deposits (also severely undermined by low interest rates). The margins are lower and their processing also puts pressure on banks' legacy payment infrastructures, which are more comfortable working in batches and at much lower volumes.

This, plus the broader trend of declining topline growth necessitating cost-base reductions, makes cloud an important part of the business model.

Against this backdrop, migrating payment processing and infrastructure to the cloud — along with all its attendant management and resourcing costs — becomes extremely attractive. (It is a bonus that the likes of Microsoft, Amazon and Google are among the world's best-equipped companies to secure sensitive data.)

However, cutting costs can only sustain margins for so long. Instead, positive and enduring growth comes from redeploying resources from undifferentiated operational work to driving new revenue streams, capitalizing in particular on leveraging the real-time data that accompanies real-time payments. That means utilizing cloud providers' world-leading machine learning capabilities to develop high-value products and services around the insights — or access to the insights — contained within that data. For merchants and businesses, that might mean providing supplier and cash flow insights, or automated accounting functions. For consumers, it might involve enhanced money management features or embedding payment experiences within other aspects of their daily lives.

This also gives banks' personnel valuable opportunities to experience cloud-native development techniques, and the DevOps workflows that accompany them, to support accelerated testing and release cycles. And it allows management to sidestep talent bottlenecks by accessing cloud vendors' ecosystems, leveraging these partners to enrich the payments stream further with complementary services.

### Cloud is not a destination — it is a vehicle

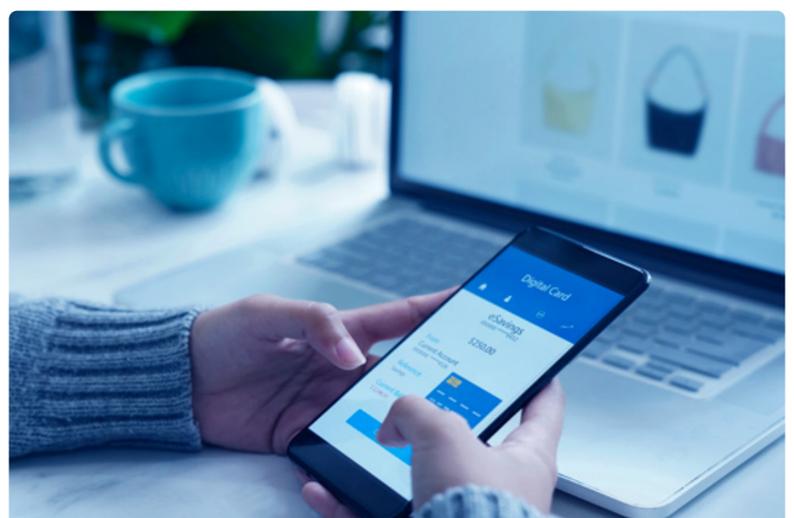
As the examples above illustrate, cloud is not a destination but rather a vehicle for driving payments modernization journeys that deliver improved business outcomes (often enabled as a service).

Another such outcome might be more effective payments risk management. Real-time, machine-learning-driven decisioning is the only way to balance offering a friction-free experience (as far as possible) while checking that payments are genuine, are being sent to the intended destination and meet AML requirements. That makes the previously mentioned access to data vital for payments intelligence in the fight against fraud.

And yet despite growing acceptance of the cloud for payment processing, an interesting feature of recent RFIs is that many banks have one eye on

what happens if they need to bring things back, either on premise, to a co-location environment or even another public cloud. High profile outages at the very biggest internet-era firms do nothing to calm the nerves in this regard, giving rise to interest in multi-cloud strategies (at least as fail overs if not for running integrated workloads).

Resiliency then is another prized business outcome that can be enabled as a service via the cloud, demonstrating that even as the arguments mount up in favor of the cloud, banks look set to remain as considered as they always have been. That may make adoption relatively slow compared to other industries, but the direction of travel looks set: cloud is well on the way to playing a major role in successful real-time business models in the years to come.





# Real-Time Payment Markets To Watch For in 2022

Author: Somya Patnaik, Principal Product Manager – ACI Worldwide

**Mumbai-based Somya Patnaik, ACI Worldwide’s principal product manager, brings us her real-time payment markets to watch in 2022.**

## Asia: Indonesia and Pakistan

Indonesia is due to launch the BI-Fast real-time payments scheme in 2022 as part of the government’s Indonesia Payment System Blueprint 2025 vision to improve digital payments availability and adoption. It is a late entrant to real-time payments in the region, but neighboring and highly mature markets such as Malaysia, Thailand and Singapore offer a glimpse of the exciting developments to come around digital overlays and value-added services. With a population of 270M, Indonesia is predicted to become the world’s fourth largest economy in the next 20 years. That, combined with already-high levels of cross-border activity with Malaysia and Thailand, good mobile wallet adoption and a unified interoperable QR standard all add up to favorable market conditions for the new real-time scheme. [See our Indonesia profile, p.22, for more.](#)

Meanwhile, Pakistan’s efforts to lift financial inclusion and curb illicit financial transactions will be boosted in 2022 when the phased launch of the Raast real-time payments system kicks off. Being backed by the State Bank of Pakistan, the first use cases include government payments, salaries and pensions, alongside payments from national social and welfare programs.

The scheme is inspired by India’s wildly successful UPI service (mobile-first, account proxy identifiers, widespread fintech connectivity), but it faces some big challenges. A high proportion of the population is unbanked, and low penetration of smartphones and internet connectivity means digital payments adoption among consumers is very low. Merchant adoption is almost nil. [See our Pakistan profile, p.64, for more.](#)

## Middle East and Africa: Kingdom of Saudi Arabia, U.A.E. and South Africa

The Kingdom of Saudi Arabia has taken advantage of its region-leading levels of mobile and internet connectivity to make huge strides in real-time payments. Since the launch of its first scheme in 2020, our data shows adoption stands at an estimated 174.59M transactions in 2021. This is 5.9% of overall electronic payments by volume. This impressive achievement is testament to the clarity and execution of the government’s Vision 2030 strategy to modernize and digitize its payments infrastructure. With strict and highly visible targets — such as making 70% of payments digital by 2030 and new use cases coming online — we expect to see immense and accelerated adoption from here on out. [See our Kingdom of Saudi Arabia profile, p.65, for more.](#)

Meanwhile, the Central Bank U.A.E. plans to launch its IPP real-time payments scheme in October 2022 (announced recently) and market conditions could hardly be more favorable. The market’s extremely cosmopolitan demographic has already embraced digital payments, with mobile-based payments common and usually preferred. It also enjoys one of the region’s strongest rates of merchant adoption, with point-of-sale terminals and QR codes displayed at most outlets. To capitalize, banks and other payment players will need to innovate around mobile-based real-time payments serving P2P, C2B and G2C use cases. There is also a clear need for digital overlays or value-added services in the U.A.E. market and the central bank is working to include many of these capabilities from day one. [See our U.A.E. profile, p.68, for more.](#)

Elsewhere, South Africa’s Rapid Payment Program (RPP) is bringing the next generation of capabilities and use cases to the country’s long-established real-time payments system. With mobile use having exploded since the original scheme launched in 2010, the program aims to simplify the platform by adding mobile-based functionality and payment-alias capabilities to the existing underlying rails. With a population already highly familiar with real-time payments, we can expect these new use cases to inject renewed vigor, growth and innovation into the market. [See our South Africa profile, p.66, for more.](#)

## Pacific: New Zealand

COVID-driven adoption of digital payments in New Zealand exposed gaps in its payment experiences that the central bank is now keen to close with a real-time scheme. Public details are scarce this early in the process, but technology won’t be a problem with API-based open banking already a strong feature of New Zealand’s payments ecosystem. Given this, and the relatively small scale of the market, it might be that a point-to-point system based on APIs emerges as the architecture of choice. This would be a far more cost-effective approach than the centrally built, owned and managed schemes commonly seen elsewhere. This potentially novel approach makes New Zealand a market to watch in the coming years. [See our New Zealand profile, p.73, for more.](#)

## North America: U.S.

FedNow in the U.S. is the biggest real-time payments story to come out of North America in recent years, with 2021 seeing the launch of a pilot phase involving more than 200 financial institutions and processors. A real-time, account-to-account (A2A) payments service slated for full launch in 2023, FedNow is the

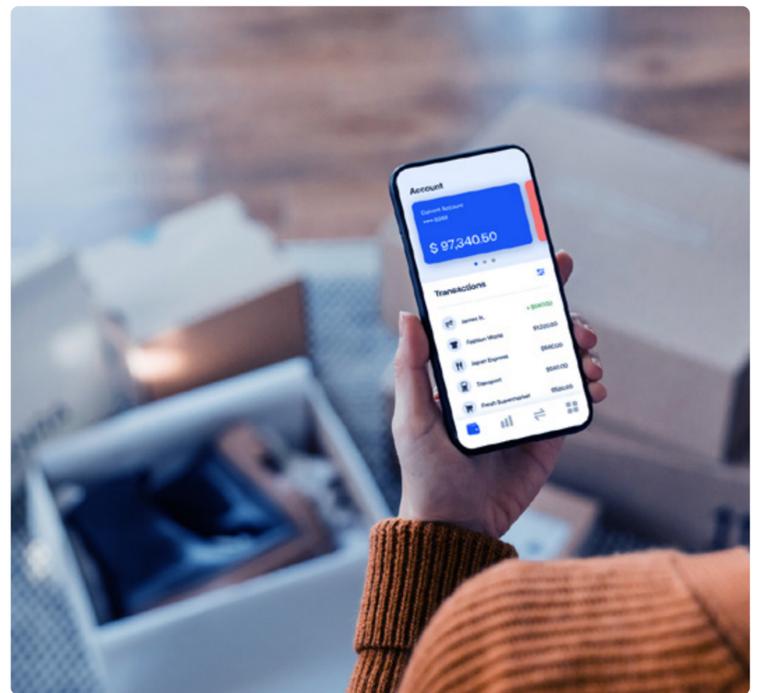
Federal Reserve’s first major new payments system in four decades. By leapfrogging the development journeys seen in other markets around the world, the network is expected to significantly advance real-time payment schemes in the U.S. It will deliver ubiquitous A2A transfers, QR code payments and biller Request for Payment (RFP), but among the challenges it is likely to face is interoperability with the country’s other real-time schemes. [See our U.S. profile, p.16, for more.](#)

## Latin America

Brazil’s PIX system has gotten off to a flying start, passing a billion transactions within months of launching and continuing to go from strength to strength. There are now more than 100 million PIX users, showing regional neighbors what is possible. Latin America is a fairly well-developed real-time payments market, but PIX stands in sharp contrast to the experience of some countries, such as Mexico, where the domestic scheme’s reliance on legacy technology has limited innovation at the front end and around frictionless payments. PIX on the other hand solved for that from day one with an all-purpose, real-time payments tool for almost every scenario in everyday life. And the scheme continues to capitalize on its success with a steady stream of new use cases. [See our Brazil profile, p.78, for more.](#)

The next wave of real-time payments success is set to come from Peru, where the modernization of its Deferred Transfers and Immediate Interbank Transfers system (ITT, launched 2016) has been designed to better meet the needs of the 70% of citizens who have yet to be financially included. Peru has already seen incredible real-time payments transaction growth, with plenty more predicted. [See our Peru profile, p.82, for more.](#)

**“With a population of 270M, Indonesia is predicted to become the world’s fourth largest economy in the next 20 years. That, combined with already-high levels of cross-border activity with Malaysia and Thailand, good mobile wallet adoption and a unified interoperable QR standard all add up to favorable market conditions for the new real-time scheme.”**



# Real-Time Payments Prompt Refreshed Thinking Around Payment Hubs

Dean Wallace, Director of Consumer Payments Modernization - ACI Worldwide

**Dean Wallace, ACI Worldwide’s director of consumer payments modernization, examines the driving forces behind refreshed — and resurgent — interest in a hub approach to payment processing.**

As momentum grows for real-time payments and other digital payments, payment hubs — a decades-old approach to managing payments — are back on the agenda for many banks.

The main arguments in favor of a hub are not new. They include a drive to lower the cost of operating multiple — and growing — payment services, such as in the related back-office functions and any overlapping IT infrastructures. They also include being better able to serve customers by bringing new products and services to market faster, though quickly and cost-effectively adding new payment types to existing infrastructure. That supports longer-term strategies for efficiently dealing with as-yet undefined future payment needs, such as central bank digital currencies (CBDCs), crypto or alternative payments methods (APMs).

But the reasons for the refreshed interest in payment hubs are new. Prompted by the wider push to move critical workloads — including payments — to the cloud, many banks see an opportunity to re-engineer their payments estate, which remains heavily dominated by legacy technology. Many of the aforementioned cost and agility challenges could be decisively squashed if these functions could be migrated to the cloud. Once there, they can be more flexible and more interoperable with other systems.

## Why cloud will define the next generation of payment hubs

This is an important conversation for the industry to have, and a timely one. COVID-19 has thrown a lot of banks’ payment strategies into question, because what’s now known about how quickly behaviors can change or volumes can surge is very different to

planning assumptions made even two years ago. Meanwhile, challengers, Big Tech players and fintechs continue to march on incumbents’ market shares.

In response, banks need a strong approach to modernizing their payment processing. Unlike first generation hubs, the latest generation will not be a single vendor’s software installed in a bank’s data center. The need to continue servicing existing systems for the foreseeable future — perhaps indefinitely, given the risks of removing them — while also cost-effectively incorporating modern payment types precludes this. Only the cloud — or cloud-like technology maintained in house, for those with the biggest technical resources — can solve for these challenges, with the result that payment hubs are no longer “a thing” that you buy anymore. Instead, they’re a collection of best-in-class assets and services brought together to deliver the various elements of a bank’s payments strategy.

## A new partnership strategy for a new generation of hubs

This refreshed approach to assembling and maintaining a payments environment will require a refreshed sourcing strategy. Modern payment hubs will be a hybrid of existing, “safe” capabilities and newer services consumed from the cloud (those existing capabilities might also be shifted to the cloud). Therefore, a modernization strategy doesn’t need to be about replacing what you have. It can instead be about working with your partners to maximize existing investments, by making them part of the cloud-enabled deployment and operating models and bringing them along on ISO 20022 modernizations.

Concerningly, however, conversations with customers and analysts these past 12 months leave the impression that many banks do not yet have a clear and defined payments strategy for the next five years. That risks their ability to differentiate themselves against proliferating and diversifying competition, and their ability to fully capitalize on cloud adoption and related modernization opportunities.

To avoid this, banks need an understanding of where their payments business is going and who it will be competing with, against which they can then measure their current environment.

Things that can work within the modern environment can be leveraged while also reducing the risk of too much change at once. For the rest, they need to ask themselves:

- Is it reliable?
- Is it making full use of best-in-class tech (supported by a best-in-class infrastructure strategy)?
- If they already have a first-generation hub, are they locked into working with that vendor? (The vendor might claim they are, but the reality is that all hubs have touchpoints that other services can leverage.)

Clearly, payments hub modernization is a complex engineering challenge, matching the complex business and operational challenges that come with real-time payments and other new payment types.

But for the banks that can harness best-in-class services from vendors that can actively support them in the cloud, as ACI can, this is an opportunity to maximize revenue, protect margins and launch an entirely new generation of payment business models.

Discover more regional insights into global banks’ approaches to payment hubs in this [whitepaper from ACI Worldwide and Edgar, Dunn & Company: Defining and Building the Next-Generation Payments Hub](#)



## Payment hubs, defined

Forrester defines a payment hub as “a flexible, extensible, scalable payments solution that enables financial institutions to consolidate, manage and execute a variety of payments over the lifecycle of a payment transaction — across multiple channels and a variety of payment schemes and networks — all based on a single defined architectural concept.”

Read the Forrester guide to enterprise payment hubs: <https://go.aciworldwide.com/Forrester-Enterprise-Payment-Processing-Platform-report.html>



# Looking Back: Real-Time Payments Retrospective

Author: Craig Ramsey, Head of Real-Time Payments – ACI Worldwide

**Real-time payments growth continues to accelerate around the world. Craig Ramsey, ACI Worldwide’s head of real-time payments, banking, takes a look at the previous forecasts that have under-shot and had to be revised. He also explores the COVID-19-related trends that have stuck around and a small selection of industry expectations that have not yet materialized as hoped.**

## 1. Brazil and the meteoric rise of PIX

The volume of transactions handled by Brazil’s PIX real-time payments system in 2021, its first year of operation, has massively outperformed the forecast of last year’s report (1.8B) with an incredible 8.7B. Strong adoption (as measured by transaction volumes) was expected, but the scale of overachievement is testament to the impact of launching new schemes as all-purpose payment services. PIX provides consumer access to real-time payments for almost every scenario in everyday life, allowing it to quickly capture P2P and C2B transactions that would otherwise have been cash-only in a very informal economy.

## 2. India: still showing the rest of the world how it’s done

Astronomical real-time payment volumes for India’s UPI interface are not news. What is news is that growth continues to outperform our forecasters’ best efforts. As a result, we’ve increased our five-year estimates for real-time transaction volumes in India, from 27.5% CAGR in our 2021 report (2020-2025), to 33.5% from 2021 to 2026. Several reasons lie behind UPI’s stunning winning streak. First, it is now the center of an embedded financial ecosystem that is much wider than simply banking and finance apps. Second, it is able to use this position to create a flywheel effect for innovation, generating new use cases to compound its utility for consumers. For evidence of this, look no further than the major upgrades taking place through 2021 and into early 2022, which will introduce 13 new features including cross-border QR code payments, QR code ATM withdrawals and support for the country’s digital currency, the e-RUP.

## 3. Request to Pay — ready to breakthrough?

Request to Pay (R2P) has been tipped for a breakthrough into the mainstream for some time. Now, R2P is finally riding the global success of real-time payments, gaining popularity as a modern capability aligned with end consumers’ digital expectations. It is safe, secure and brings about more control and visibility for consumers and businesses. It is also considered to be a relatively lower-cost method compared to other payment collection solutions. And it has become an entry-level requirement for new real-time schemes around the world. With many markets around the world now in possession of the infrastructure and know-how required to make for a seamless R2P user experience, many of our experts are tipping 2022 to finally be the year. The go-live of R2P in the U.K. in 2021 shows that even mature markets are continuing to add value to their real-time payments ecosystem.

## 4. Peru paves the way for modernization

Peru is in the early stages of upgrading its first-generation, real-time scheme in response to faster and larger-than-expected growth in real-time payment volumes. The forecast for 2021 was 24M transactions — this became an incredible actual total of 63.7M transactions. Among the updates to the system are a move to genuine immediate clearing and settlement and 24/7/365 availability. With most of the nation’s banks already signed up to the scheme, and a concerted effort underway to bring down the country’s unbanked population, this is expected to almost immediately unlock yet more additional growth. But, more broadly, Peru’s experience is illustrative of the modernization needs of first-generation, real-time schemes. Many of these have suddenly experienced rapid growth due to changing consumer expectations and a COVID boost to adoption. This in turn has laid bare the need to modernize in line with technological advances since they first launched (such as mobile banking and ISO 20022).



## 5. B2B real-time payments still to take off

Despite several years of expectations that real-time B2B payments would take off and solidify revenue-generating opportunities, usage remains low. Transaction limits are one culprit, with generally low limits still making the expensive RTGS system the only viable option in many cases. Corporate B2B payments are also typically a high-care service with repair, verify and extra security checks, which are valued by corporates, while real-time payments have less touchpoints and can be considered more consumer-focused by banks. And with RTGS services carrying a higher margin, it would be of little surprise if banks were protective of them (though this wouldn’t be sustainable for long, as customer awareness of cheaper and faster services grows). Ultimately, the business case for real-time payments is as much about staying relevant with customer expectations as it is about driving revenue. So rather than corporates having to forego the high-care RTGS experience in exchange for the benefits of real-time payments, they should have the flexibility to choose based on different payment needs.

**“Request to Pay (R2P) has been tipped for a breakthrough into the mainstream for some time. Now, R2P is finally riding the global success of real-time payments, gaining popularity as a modern capability aligned with end consumers’ digital expectations.”**



# ACI’s Scale, Simplicity and Flexibility Transform Payments as a Service

Q&A with Sam Jawad, Executive Vice President, Head of Banks and Intermediaries – ACI Worldwide

**For more than 20 years, ACI has managed and operated payment solutions on behalf of its customers. How has the landscape for managed payment services changed in that time?**

**Sam Jawad:** The enormous global investment in cloud technology of the last decade or so has transformed the way payment services can be provided for every tech player in the world and in every industry. It is now more efficient, cost-effective and faster than ever for financial institutions to integrate and consume third-party, cloud-hosted Payments-as-a-Service solutions and use them to get products out to market quickly. And that applies across the entire payments solution stack, from real-time payments, cards and account-to-account to acquiring and transaction processing.

Modern cloud architectures also mean that today’s Payments-as-a-Service models are not the same as traditional models of outsourcing operations, which left financial institutions dependent on their partner’s roadmap. Vendors with mature offerings and decades of market experience also have rich partner ecosystems, whose solutions can also be enabled and integrated via the cloud to enrich the payments experience. This allows financial institutions to further accelerate cost to return by cutting out significant development time and costs — it is common now for new features and services to be brought to market in 90 to 180 days or less. These ecosystems also enable financial institutions to circumvent skills shortages, which are growing more acute as fintechs and big tech players compete for talent and demographic changes see experienced talent leave the workforce.

**“Success in digital payments depends on getting to market quickly with new and differentiated overlay services that, enabled by richer data, enhance the customer relationship and establish new revenue streams beyond simply processing payments.”**

**How do these factors enable financial institutions to leverage Payments as a Service to enhance their competitive advantage?**

**SJ:** Payments as a Service, and the cloud more generally, allows you to create an ecosystem of partnerships. That allows banks and payment providers to better respond to today’s competitive landscape by strategically focusing on the areas where they differentiate and add value while partnering in the areas where they don’t.

This matters because success in digital payments depends on getting to market quickly with new and differentiated overlay services that, enabled by richer data, enhance the customer relationship and establish new revenue streams beyond simply processing payments. For consumers, that might be services built on top of traditional borrowing and lending products that improve manageability or better integrate with other aspects of their lives (both financial and non-financial). In the corporate world, quicker sending and receiving of funds improves liquidity, but data-enabled services around payments management, tracking, financial insights and automations are more differentiated and higher value.

However, the complexity of today’s spaghetti architectures seriously limits banks’ abilities to compete with neo-banks and other new entrants on these kinds of customer experiences. They are also not well suited to managing the evolution to a real-time world with consumers and corporates expecting instant gratifications. Built on new rails with advanced messaging formats, real-time payments require a new set of working relationships, processes and policies across the board — and this is just the tip of the iceberg.

Cards took decades to evolve from tools for making payments more convenient and transportable to sitting in digital wallets and enabling eCommerce. Real-time, too, will evolve beyond being just a faster alternative to traditional payments to unlock new business models and real-time economies (we already see this in the gig economy). But that change will be even more disruptive, and it will take a fraction of the time. Payments as a Service will be



vital for keeping up, specifically, managed services from vendors with reputations for running mission-critical software.

**What are the differentiated attributes that ACI brings to the table as a Payments-as-a-Service partner, and why are they important?**

**SJ:** ACI and its solutions have the scale, expertise and flexibility to simplify payment environments and provide customers with credible paths to incredible changes that deliver transformation without compromise, right across the payments landscape. These attributes are vital for financial institutions looking to develop end-to-end consumer or corporate payment experiences, beyond individual channels.

Payment processing is a critical and potentially systemically important function. For the as-a-service model to truly allow banks to focus on developing their business and better serving customers, it requires mature solutions combined with decades of experience with payment messaging formats and handling business processing complexity. Our scale in terms of depth and breadth of resilient,

high-performance solutions for any payments channel — and the global experience and skills to support them — is a huge advantage here. Other advantages are a track record of successful implementations stretching back 45+ years, plus the knowledge and experience gained from supporting the payment strategies of 19 of the world’s top 20 banks.

And then, as financial institutions build out new tech stacks combining best-in-class services, our solutions and wider ecosystem mitigate complexity by being simple to work with, to access and connect to. This ensures time to market remains short, even as the scope of their ambitions around digital payments and overlay services grows.

And, finally, the nature of financial services means one-size-fits-all solutions or deployment models are not always appropriate. Financial institutions require the flexibility to modify — or have modified — vendor solutions, or the option to deploy them on premise in their own cloud instances. Only vendors of a certain scale and maturity, such as ACI, can offer the flexibility to tailor managed service solutions based on customers’ needs.



# Increased Collaboration Is Vital as APP Scams Show No Signs of Slowing

Q&A with Cleber Martins, Head of Payments Intelligence and Risk Solutions – ACI Worldwide

**Real-time payments are plagued by authorized push payment (APP) scams, and open banking and decentralized financial services offer further room for the problem to grow. A radical rethink in industry-wide collaboration is required, writes Cleber Martins, ACI's head of payments risk solutions.**

## What are the payment risk management challenges coming down the road in 2022?

**Cleber Martins:** Developed real-time payment markets are suffering an epidemic of social engineering scams and even kidnappings designed to convince — or coerce — individuals to transfer funds to accounts controlled by criminals. These APP scams pre-date real-time payments, but instant clearing, a strong supply of mule accounts and successes tackling other types of fraud have made the “business case” stronger.

Despite expensive consumer education campaigns and some clever use of purposeful friction in the user experience, the value of losses keeps rising. In the U.K., for example, gross losses to APP fraud have overtaken card fraud for the first time.<sup>1</sup> As such, the industry’s strong supply of mule accounts and successes tackling other types of fraud have made the “business case” stronger.

## What options are open to the industry, and to regulators, in terms of a response?

**CM:** For as long as it is only the banks from which fraudulent transactions are initiated that shoulder the liability — there is currently almost no risk at all for receiving fraudulent transactions — then the problem can’t be solved. We will just end up with more friction in the payments experience and further barriers to performing transactions. So, the receiving end must become accountable; they are the ones with visibility of transactions coming in and then very rapidly going out of mule accounts. This is perhaps the biggest unpulled lever in payments fraud prevention and it has not escaped the attention of regulators. If the industry doesn’t find a way to collaborate more effectively and close this gap, then it is not unimaginable that regulators would be driven to intervene.

Indeed, in November 2021, the U.K.’s payment regulators indicated exactly that. They have proposed new rules requiring banks to publish data on their performance in relation to APP scams, on reimbursement levels for victims, and which banks and building societies’ accounts are being used to receive the fraudulent funds.<sup>2</sup>

## What would that enhanced collaboration look like?

**CM:** The only way to turn the tide on APP fraud is if the initiating and receiving ends of transactions can collaborate — without sharing sensitive information about customers with competitors or breaching privacy regulations.

Somehow, initiating banks need to gain insights into where payments are going. In order to understand whether the destination is likely to be a mule account, they need to evaluate its reputation based on its activity. Is it a long-standing account that regularly receives similar transactions? Has it been dormant for years or only recently opened? Of course, if receiving banks are to take on more accountability, they also need insights into the initiating account. Why, for example, would that account want to move a hundred thousand dollars into this one? Answering these questions and measuring the outcomes against internal risk scores, in real time, would bring a whole new meaning to knowing your customer (KYC).

## How can new technology enable this enhanced collaboration?

**CM:** Network intelligence technology based on federated machine learning facilitates the real-time exchange of machine-readable fraud signals without exposing the underlying data. That enables machine learning algorithms to combine fraud signals from a diverse range of internal and external sources — a game-changer for collaboration.

This collaboration also gets more powerful over time, with the signals that are exchanged between all mutual stakeholders (including central bodies) also written to transactions in real time. That creates a DNA database of risk for that transaction and every single one like it, which can be leveraged for machine learning-enabled decisioning in the present and improved algorithm training in the future. In this way, the value of collaboration is perpetually enhanced.

## What are the risks to not addressing gaps in collaboration on payments fraud?

**CM:** Without enhanced collaboration, APP scams cannot be brought back under control. The longer it is lacking the more likely regulation becomes, risking increased compliance obligations and costs for banks.

Longer term, the decentralization of finance and advances in open banking are potential vectors for APP scams and related risks to transfer to other aspects of the economy.

For example, open banking solutions that empower customers to carry their good reputation throughout the market will also see criminals building mule account networks to take advantage of this. This would enable them to move even more freely through the financial system, opening credit lines and yet more mule accounts to support their activities.

Further, today’s financial system includes more than just banks. Retailers, telcos, so-called “super apps” and even multinational firms are all leveraging central bank-backed, real-time payments infrastructure to hold and move funds for customers or employees. Today’s APP tactics are easily transferable to these ecosystems and securing them is an emerging challenge. The solution is likely to center on managing risk at the points where funds can leave the ecosystem, either as cash or as goods that are easily converted to cash.

These examples illustrate how the need for collaboration will grow beyond one-to-one or even one-to-many among financial institutions to create communities that cross market and industry boundaries. Unfortunately, they also illustrate how far the issue of APP has to run before we are likely to see it brought under control.



# What the World Says...

**George Evers, Senior Vice President, Real-Time Products – Mastercard, says:**

The pandemic increased adoption of real-time payments wherever these systems were present. It also forced governments that hadn’t yet launched these capabilities to pause or slow their modernization as priorities shifted. However, 2022 will see the pace of modernization return to the highs of pre-2020. Established drivers, such as financial inclusion, remain as relevant as ever, but the role of real-time payments as a stimulus for economic growth will be higher in the minds of governments and regulators. It has been proven out that, combined with the perpetual motion of mobile utilization and the digitization of everything, real-time payment systems offer a foundation for economies to be more dynamic. As such, market participants not already exposed to a real-time system soon will be. Increasing their readiness is now urgent and they should look to the many available examples around the world — and in this report — for inspirational use cases and business models.

**Monica Monaco, Owner and Managing Director – TrustEU Affairs, says:**

The European Commission is aiming to create a competitive and innovative EU payments market as Ms. Mairead McGuinness, commissioner for financial services, financial stability and capital markets union, explained in a speech delivered in Brussels in November 2021. The commissioner explained in regard to the retail payments strategy that this aims to create a competitive, innovative and well-regulated EU payments market with a high level of consumer protection to achieve an effective payments infrastructure and to make international payments cheaper, faster and more transparent, including remittances. Moreover, she explained that as for real-time payments, these must support innovative business models like payment initiation services when combined with new add-on services such as

Request to Pay. Furthermore, real-time payment solutions must increase competition and diversify the payment options offered to consumers, while scaling up the offerings of EU payment initiation service providers and fintechs by enabling them to compete globally. Such aims can, in the commissioner’s view, be reached only via EU-wide rules, and an initiative on real-time payments is consequently scheduled for the first half of 2022.

**Reed Luhtanen, Executive Director – U.S. Faster Payments Council, says:**

My outlook is extremely positive in terms of real-time payments in the United States. With the existing services gaining momentum and another major service planned to launch in 2023, I expect 2022 to be a huge year for real-time payments in the market. Among the other huge positive influences will be the continued enhanced value of joining these networks, combined with the reduction in the costs associated with joining. It is increasingly essential that all participants in the payments ecosystem develop a payments modernization strategy that includes real-time payments as a key component of that strategy. The industry is rapidly evolving, and real-time is quickly going to become table stakes for remaining competitive.

**Peter Hazou, Director, Business Development, Financial Services – Microsoft, says:**

The journey to real-time for payments is an inextricable one and the obvious destination for all payments irrespective of whatever rail they travel on. The real-time world around us is prompting the banking system to modernize its infrastructure and processes to accommodate real-time activities and the data that travels with them. The speed at which the world operates also creates a lot of uncertainty and risks which banks, and the payment systems

they operate, are trying to accommodate. For example, global challenges in supply chains and the uncertainties of counterparty risk are raising the need for real-time agility in both decision-making and the data that underpins it. As a result, real-time payment capabilities are becoming table stakes for banks that are innovating to serve client needs. They are core to product development and data insights and should be central to banks’ modernization roadmaps.

**Leo Lipis, Chief Executive – Lipis Advisors, says:**

My outlook on real-time payments is very positive, with payment volumes expected to grow around the world albeit in different ways. In markets where services are already mature, the focus is on adding use cases. Others are focused on onboarding new banks and driving volume, while others still are introducing real-time payments or modernizing existing market infrastructures to spur growth.

Competition from non-banks and fintechs has brought societal trends towards the perceived need for faster service, and the demand for richer, more personalized services to payments. The new expectations this has created means that real-time payments are here to stay, and their importance will only increase. The challenge is that these payments expose the weaknesses of the legacy systems that often still process them. Players with temporary or stop-gap solutions, and those that have treated real-time payments as a compliance exercise, will struggle to handle increasing volumes. Rising to the challenge instead demands modern, flexible payment architectures.



<sup>1</sup> Source: U.K. Finance  
<sup>2</sup> <https://www.finextra.com/newsarticle/39245/uk-government-to-legislate-for-mandatory-reimbursement-of-app-fraud>



# Developing Nations Continue To Drive Global Real-Time Payment Volumes — and There’s More To Come

Author: Sam Murrant, Lead Analyst - GlobalData, ACI Worldwide

**With an estimated 118 billion global transactions in 2021, and a CAGR of 29%, real-time payments continue to increase their share of electronic payments. By 2026, it is expected that real-time schemes will process 25% of all payments in most of the major economies.**

## Developing nations pave the way

Developing nations continue to lead the way in driving the majority of volume gains, confirming the historical industry trend of the strongest growth coming in economies with minimal existing electronic payments infrastructure, and therefore heavier reliance on cash. But in almost all cases, government initiatives are significant drivers of the transition to real-time payments for a variety of reasons. The enhanced regulation of digital payments reduces the shadow economy and increases the tax take. And a modernized infrastructure boosts financial inclusion where traditional mechanisms, such as cards and formal bank accounts, are lacking. New systems can, if thoughtfully implemented, offer added protection for consumers against fraud. There is undoubtedly a profit motive, too: the more electronic payments there are, the more profit industry participants can generate. There is also evidence — largely anecdotal, but nonetheless persuasive — that electronic payment options encourage people to spend more.

Regionally, 45% of those 118 billion transactions occurred in India, the Middle East, Africa and South Asia, while China accounts for most of Asia Pacific’s 34.6% share. The fastest-growing regions are South and Central America, who are in the early stages of conversion to electronic payments, and with a predicted CAGR of over 50% from 2021 until 2026. In the Middle East, Africa and South Asia, the figure is 33%.

By contrast, growth is forecast to be slower in the mature markets where cards have been established for decades and are now the underlying mechanism for contactless or mobile wallet transactions. As a result, Europe’s CAGR for 2021-26 is 23%, North America’s is 30% and Asia Pacific’s is 15%. In each region, real-time’s market shares are similarly smaller, in single digits. Indeed, as the pace of digital payments growth quickens in developing countries and regions, the disparity between them and the more mature markets is set to become more marked.

## The influence of mobile payments

Among individual countries, India continues to accelerate its real-time payments development, fueled by the full integration of real-time into mobile payments. Real-time payments, already 64% of electronic payments, are expected to grow at a CAGR of 33.5% until 2025 to a share touching 90%.

Amid all this activity, the key trends that will determine the trajectory of real-time payments are becoming clearer. In all markets, mobile will be pivotal, but will take different forms. For developing markets, India provides the template for mobile wallet integration with underlying real-time payment systems. In that market, mobile wallets are already popular, and banks don’t have the same penetration as mobile devices. In Western markets, mobile will still be the leading form factor, although we may see banks’ involvement sitting more behind wallets, as they already do with the Paze model.

## Growth of in-store real-time payments

The big stimulus to real-time adoption will be the progression from largely peer-to-peer (P2P) transactions, first to remote purchasing, and finally to in-store. At present, use cases other than P2P are fairly specific in much of the developed world, with most limited to P2P and consumer-to-business (C2B) for bill payments and similar transfers rather than everyday purchases. But in-store payments promise the next wave of huge volumes needed to keep real-time payments cheaper than cards, which is of paramount importance for the success of individual real-time payment schemes and for the market as a whole.

The transition is already apparent in the Nordic countries, led by MobilePay (Denmark and Finland) and Vipps (Norway). Linked to bank accounts, both are increasingly being used in-store, generally using QR codes. And as the P27 Nordic Payments scheme comes in, the use case



will become irresistible, especially for merchants looking to reduce their outgoings from card fees in these mostly cashless economies.

## Fraud prevention is needed from day one

Finally, any discussion of forecasts for real-time payments must factor in the growth of fraud. Confidence-based frauds, including authorized push payment (APP) fraud that attack the human element in the payments chain, have been rising consistently from 2018 onwards. While most instances occur online, in-store mobile fraud is increasing, and until a regulatory framework is in place, in-store real-time will be a less secure option than cards, which are at present less vulnerable to in-store attacks. This, in turn, may present challenges to the nascent real-time payments value chain, as more (albeit necessary) compliance burdens are placed upon it.

This speaks to the wider challenge with real-time payments fraud, and one of the biggest risks to this payment method’s credibility. To date, markets with strong real-time payments adoption, from Brazil to the U.K., are more notable for their dramatic increases in fraud than their ability to mitigate or prevent it. While some controls are in place, there is nothing approaching the regulatory framework that exists for card transactions, where people understand who’s responsible for what.



# Economic Impact of Real-Time Payments: Opportunities, Current Barriers To Growth and Policy Recommendations

Author: Owen Good, Head of Advisory, and Peter Harber, Economist – Centre for Economics and Business Research

**By allowing for the transfer of money between parties within seconds rather than days, real-time payments improve overall market efficiencies in the economy. Real-time payments have huge potential to accelerate financial inclusion and are especially important in providing flexibility within digitally-led gig economies, as they can directly alleviate cash flow and liquidity issues as highlighted by the COVID-19 pandemic.**

However, barriers to immediate adoption range from ensuring that fraud prevention and security systems are in place and at an adequate standard, to addressing consumer resistance or “inertia” towards innovation and change as the technology is rolled out.

A successful real-time ecosystem will work alongside country-specific characteristics, rather than apply a one-size-fits-all mentality. Our recommendations for key areas to target are governed by the general infrastructure capacity of each country.

Overall, our view of the future of real-time is of prudent enthusiasm; recognizing that there is immense potential; but the most astute path to increasing real-time coverage is by confronting the risks and to take each use case as unique by assessing the key characteristics of each economy.

## Opportunities generated by real-time payments

Over the last two years, the importance of liquidity for businesses and consumers has been highlighted. The COVID-19 pandemic has presented an opportunity to accelerate the adoption of real-time payments due to the increased demand for cash flow. One consequence of the pandemic was restricted liquidity for businesses and individuals. While clearly there were unique external factors causing businesses challenges, exogenous to the efficiency of the payments mix, real-time instruments can more generally play a part in alleviating such issues by providing more efficient payments for businesses. Payments mix data does suggest a faster adoption of the technology since the start of the pandemic.

The gig economy refers to labor markets that are characterized by informal contracting, often on a temporary basis. Examples of jobs that comprise the “just-in-time workforce” include ride-hailing services (such as Uber or Bolt), food delivery services, or even house sitters and dog walkers. Real-time payments are important in the gig economy because workers are paid quickly, allowing them to better plan their finances. There are also benefits for gig employers. Real-time payments allow businesses to be more flexible and reduces the need for overly burdensome cash flow management.

Finally, real-time payments have huge potential to accelerate financial inclusion. Real-time payments technology is not reserved exclusively for countries that are already well served by banks. If introduced effectively and appropriate steps are taken, real-time payments can be a key contributing factor to improving the rates of financial inclusion through the shift away from a status quo, with large shares of the population solely relying on cash-dominated payment mixes.

The results of our analysis have highlighted certain country characteristics that present significant areas of opportunity for real-time to support beneficial economic outcomes.

For example, in countries with a large informal economy as a percentage of formal output, real-time could support in formalizing this activity through reducing cash usage. This has various economic advantages, notably in growing the size of the formal economy and increasing the resulting tax base.

Other characteristics that present significant areas of opportunity for real-time are when high returns to capital (proxied by real interest rates) combine with long clearing times for traditional payment instruments. Real-time instruments allow money to flow through the payments system more efficiently, therefore, countries with such characteristics have the potential to gain significantly by increasing their real-time payments usage.

These characteristics apply beyond the thirty countries that are assessed in this report; hence, this study provides policymakers with evidence of the potential mechanisms and magnitudes of how real-time payments are likely to impact their respective economies.

## Current barriers to growth

In this section, we move away from quantitative analysis and assess real-time payments through a qualitative lens. We discuss considerations from an economic perspective regarding the efficient and effective introduction (or further development) of real-time payment systems.

The literature reveals important factors to consider that can support the increase of real-time payments adoption and subsequently lead to greater economic gains being realized from the technology.

Firstly, a competitive landscape is a key driving force behind technological revolutions, including in the payments system. Priming this landscape involves actions across the banking and financial industries by both non-traditional payment system providers (PSPs) and traditional PSPs alike. Individual stakeholders cannot drive progress in isolation. The presence of suitable digital infrastructure serves as the foundation on which the development and expansion of real-time payments depends. A user-friendly infrastructure with clear and easy-to-digest benefits for consumers are vital for the adoption of the technology on the demand side of the market, however, the role of authorities can also define success in achievement of higher adoption of real-time payments.

Central banks play an important role in accelerating the development of real-time payments, with many of these actions related to the supply side of the market. In many cases, these efforts serve to encourage the implementation of fast payments through open systems when coordination problems among PSPs might otherwise complicate or prevent their implementation.

Successful growth of real-time payments will require all parties to move in the same direction towards the same goal: to increase efficiency savings and productivity gains across the payments mix that ultimately contribute to wider economic benefits.

One barrier to immediate adoption is ensuring that fraud prevention and security systems are in place and at an adequate standard. This is no simple fix and requires significant back-end resourcing to ensure that real-time infrastructures are fit for purpose. This holds especially true in countries with less technologically advanced economies with less advanced incumbent payment systems

where the infrastructure must be built from a less developed baseline. In most economies in 2022, real-time payments are not a completely new phenomenon, and lessons can be learned from the past by using best practices developed by other countries as a guide. However, this does not imply that there are no new unforeseen challenges that will need to be addressed.

Another barrier could be due to the resistance of consumers or businesses to change, even when the presented change is beneficial. Consumer resistance or inertia to innovation or change is a common phenomenon observed across economics. This can be driven by multiple factors including uncertainty, convenience, habituated decision making or loss aversion. Such a phenomenon reinforces the importance of a user-friendly infrastructure with easily digestible benefits for take-up, as there will likely be some natural resistance to move away from the status quo for consumers.

## Policy recommendations

Looking towards the future development of real-time payment systems, our view is of prudent enthusiasm; recognizing that clearly there is immense potential, demonstrated by the fact that for most countries, the unrecognized percentage of potential economic benefits far outweighs the recognized share.

However, the most astute path to taking advantage of the untapped benefits is confronting the risks that are presented by this technological revolution. Across the world, there are a wide range of country-specific requirements for businesses and consumers that indicate the most prudent approach to increasing global real-time coverage is to take each use case as unique.

The benefits of real-time can be maximized by structuring regulatory frameworks that are not only fit for purpose today, but also have the flexibility and adaptability to react to developments in the future that may jeopardize the quality of service of the technology. An example of this might be for a domestic real-time system to adapt to cross-border transactions as the demand for this service grows in the future.

The economic impact can be maximized by improving the wider enabling infrastructure of real-time.

Examples of this include breaking down the barriers to entry with better consumer user experience (UX). Other examples of this enabling infrastructure are improving general levels of financial inclusion, reducing the underbanked share of the population and ensuring strong mobile network coverage to support the impact of real-time payments through mobile banking services.

There is a role for all payment types in the future, however, efficiency is optimized by each being used in their respective areas of comparative advantage. A successful real-time ecosystem will work alongside the country-specific characteristics rather than apply a one-size-fits-all mentality. Our recommendations for key areas to target are as follows:

States with low infrastructure capacity:

- Actions to intensify development of enabling infrastructure
- Increased banking population with policies on financial inclusion

States with medium infrastructure capacity:

- Employing strategies to combat consumer resistance or inertia towards new technology
- Exploring and formulating cross-solution rules and standards and prioritizing changes in the regulatory framework

States with high infrastructure capacity:

- Supporting the development of infrastructure needed to achieve interoperability across solutions
- Ensuring the sustainability and evolution of faster payments through advocacy and education on the faster payments system, investing in research and development on cross-border real-time payments and other emerging technologies, and supporting the development of fraud detection, reporting and information-sharing methods



# North America

Regional Spotlight

Payment Trends To Watch In 2022

Payments Fraud Viewpoint

Canada

United States

## Regional Spotlight

# Differentiation Is Vital as Regional Payments Modernization Accelerates

Author: Glenn Wolff, Senior Vice President, Head of North America - ACI Worldwide

**An already exciting period of payments modernization in North America is accelerating, driven by two strong currents.**

The first is the implementation of the ISO 20022 standard ahead of SWIFT's mandate falling due in November of this year, which impacts both the Canadian and U.S. markets. The second, which impacts the U.S. specifically, is the development of FedNow. The Fed's new real-time payments scheme, set to enter its pilot phase in 2022, will eventually break open the real-time payments market for U.S. financial institutions of any size — [more than 10,000 in total](#).

These are huge opportunities for the region's financial institutions to better serve customers — both consumers and businesses — with more and better payment services. But, for some, the challenges in getting to that point are also almost as significant.

### Compliance is not the story

All financial institutions should be in implementation mode for ISO 20022 by now, but a sizeable minority are not. For some, it has proved more complex than anticipated and many are holding out hope for an extension that seems unlikely. Instead, a better option is to engage and enlist existing partners and double down on their efforts for the first half of 2022. Meanwhile, as we discuss at further length in our U.S. market coverage, FedNow is expected to be pivotal in accelerating growth in real-time payments for the U.S. market in the coming years. But while the current timelines are, of course, longer than those for ISO 20022 adoption, the measured pace of preparations seen from most financial institutions will need to be picked up markedly in 2022.

But the race to compliance is not the real story. To maximize value on both projects, financial institutions must be wary of fixating on the interface aspect of the project. This is not in and of itself a success factor of these projects, let alone enough to support a sustainable long-term business model.

Instead, the region's financial institutions must recognize that they're on the cusp of a new world of possibilities enabled by real-time payments, and act accordingly. ISO 20022's enhanced data will allow banks to better apply AI to, for example, financial advice, fraud prevention and compliance with anti-money laundering (AML) regulations. It would also enable the rollout of higher-value services such as Request for Payment and faster automated reconciliation of invoices. For FedNow, the network is expected to significantly advance real-time payment schemes in the U.S., leapfrogging forward on the development journeys seen in other markets around the world to deliver ubiquitous account-to-account payments and biller Request for Payment.

### Financial institutions driven to act by impending ubiquity

The timing of the market's modernization couldn't be better. The region's digital payment markets have been so fundamentally changed by the COVID pandemic, that it is difficult to overstate the size of the opportunity ahead. Within weeks, historically low acceptance of payment methods, such as contactless payments, was overcome. These habits have stuck around, and a critical mass of merchants and consumers are now able to take digital payments. Any new scheme or capability that is launching into a region that is primed for adoption has the potential for any new services to achieve ubiquity in record time.

The promise of this fast track to ubiquity should drive financial institutions of all sizes to transform to support more digital payment capabilities and experiences. This will be vital to attracting and retaining customers, but it won't be simple. The U.S. market is so regionalized and fractured that, historically, only a handful of very large players have had the required resources and scale to innovate at this level. Canada's more concentrated market doesn't have this problem, but it also doesn't have the same scale, so innovation must be more targeted and more systematic.



### Capitalize with cloud and managed services

In response, financial institutions in both markets are showing refreshed interest in payment hubs — specifically those enabled by cloud technology and managed payment services — as a way to get to market on new digital payments better, faster and cheaper. No one wants to be in the data center business anymore, and successes in recent years with moving critical workloads to the cloud have paved the way for financial institutions to re-engineer their payment estates (many of which are heavily dominated by legacy technology).

In the U.S., assembling or modernizing payment hubs with best-in-class services and infrastructures is a path to overcoming market fragmentation. Whether they're locally or regionally focused, or one of the market's trillion dollar multinationals, handing off the complexities and costs of compliance with multiple systems and standards allows financial institutions to focus on innovation and differentiation.

In Canada, the same approach will enable financial institutions to lower costs in the absence of further scale opportunities in the consumer space. This will also free resources for innovation while providing additional agility to continue developing progressive leading-edge payment use cases to remain globally relevant on the corporate side.

Ultimately, then, for financial institutions in both markets, 2022 must be the year that they think bigger than the compliance and technical challenges around payments modernization. By turning their attention to innovation and differentiation, leveraging the agility of the cloud and managed services to accelerate time to market, they can establish new revenue streams for a new generation of payment services.



## Decisions Made Now Will Define the Future of APP Scams in North America

Author: Marc Trepanier, Principal Fraud Consultant - ACI Worldwide

**Authorized push payment (APP) scams in North America have a long way to go before they hit European levels. But as real-time payment schemes either launch or modernize in their home markets, the region's banks and payment players must gear up for an inevitable explosion.**

Fraudsters in the region are already proving remarkably skilled at figuring out what makes consumers tick and duping them into parting with their money. Employment, romance, investment — there's a scam for everyone.

While there are elements of the market in Canada, and certainly most of the U.S., still in the growth phase of real-time payments adoption, they have an opportunity that was not afforded to Europe. They can use their advance warning of the coming threat to get the right technologies, processes and policies in place to stop things from getting out of hand and cutting into real-time payments' thinner margins.

That means heading off unwelcome regulatory interventions by preempting wrangles over liability, which contribute to a poor customer experience, and make banks look anything but customer-centric. It also means leveraging federated and incremental machine learning to side-step some of the more painful operational processes around using data and deploying machine learning models. And it means doing it all with the team they already have, while being ready with new capabilities from day one of incoming developments such as FedNow in the U.S. and modernization of Interac's e-Transfer service to Interac Instant in Canada.

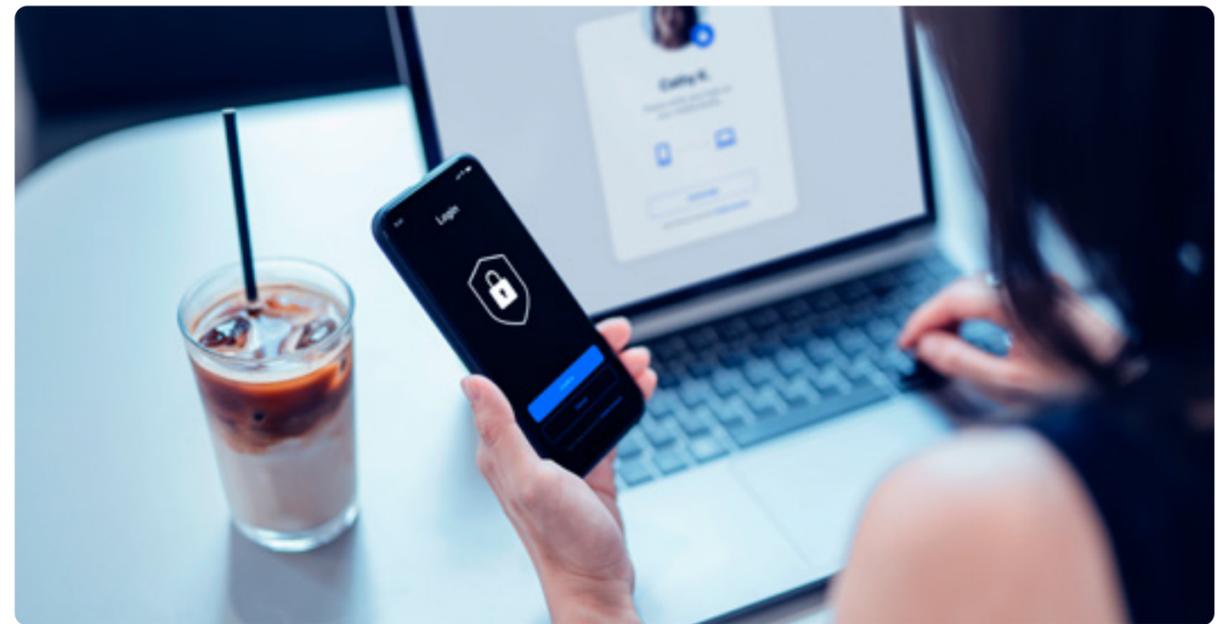
There are several priorities for banks looking to achieve this. First, a 360-degree view of their customers. That requires real-time, enterprise-level oversight of every aspect of their relationship with the bank, so that fraud teams can design intelligent controls based

on their behavior. A traditional channel-based, point solution model — silos, in other words — won't cut it when fraudsters cross departmental boundaries and international borders at will.

Next, large teams manually reviewing those 360-degree views and individual payments is not sustainable. The enterprise view also needs to be overlaid with rules and policies enforced by machine learning and behavioral analytics, and response protocols actioned by robotic process automation.

Banks in the region also have an opportunity to leverage new developments in AI and machine learning to reduce operational overheads and improve model performance. The first development, [network intelligence](#), uses federated machine learning to enable participants in the payment ecosystems to train models on pooled signals for fraud without revealing the underlying data, so they can work together as a community. These communities outperform consortiums due to their level playing field — all contributors are treated equally — and the way they allow participants to be selective with the community features they incorporate into their models. (This is also known as hybrid machine learning.)

The other major machine learning development is fraud scoring as a service, enabled by incremental learning. Centrally hosted models, available as a managed service hosted in the cloud, are transforming fraud detection. These services allow for banks to receive an outcome — optimized and



custom fraud scoring across every channel — rather than procure a solution. While traditional machine learning models need to be retrained as fraud patterns change, centrally hosted models can be constantly exposed to data to use incremental learning to make small adjustments on an ongoing basis. These models can be built in weeks and performance is maintained or improved over time; as a result, far fewer model refreshes are required.

Network intelligence and fraud scoring as a service are the next chapters in the maturity of machine learning for fraud detection. And it is a journey that the North American market gets to make without passing through the older operating models experienced elsewhere around the world.

Ultimately, with smaller margins on real-time payments, the market cannot afford for APP losses to grow to the proportions seen in Europe. And anything that jeopardizes the customer experience and drives consumers off the network is also a serious risk to

revenues and reputations — especially when fintechs are joining the party with great experiences built around real-time payments.

The good news is that having the right processes, policies in tech at the right time — before volumes take off — is an opportunity to get out ahead of this, and to make protecting payments a competitive differentiator in the eyes of customers.

**“North America's banks and payment players can use their advance warning of the coming threat to get the right technologies, processes and policies in place to stop things getting out of hand.”**

# North America Trends in Payments To Watch For in 2022



Author: David Grindal, Vice President, Head of Americas Solution Consulting - ACI Worldwide

**Across North America and Canada, there is progress toward real-time payments, although the last-mile connectivity remains a challenge in the U.S. Banks should migrate strategically to new architectures and explore the opportunity to launch new services.**

## Momentum grows in the U.S. for real-time payments

In the U.S., there is strong momentum toward real-time payments, but still much work to do. The network for TCH real-time payments is well established, but the incoming FedNow service and SWIFT's ISO 20022 mandate are going to prove challenging for banks that are allowing uncertainty around how to approach these modernizations to delay their planning. They may get some level of reprieve, in that SWIFT will continue to support its old message formats beyond the November 2022 deadline — but they must use that time wisely.

## Support for new market entrants

North America may be a world leader in general information technology, but other regions are showing greater innovation in payments.

Open banking has stalled in Canada, and in the U.S., progress is only slightly better. However, there are signs of consolidation between established payment providers and newcomers. Visa's bid for Plaid was blocked by the U.S. Department of Justice, but Visa has moved to acquire European open banking platform Tink for \$2.2 billion.

It is expected that stronger support for open banking across the region will open more opportunities for innovation and therefore additional real-time payment volumes.

## Cross-border real-time payments

The Canadian and U.S. economies are tightly intertwined, so some level of coordination between the U.S. and Canadian payment systems is required. The vast majority of payments are domestic, so there's no need for a single integrated network

spanning the countries. However, discussions are ongoing to create an interlock or a bridge between the U.S. and Canadian systems in order to simplify cross-border business by enabling real-time payments with confirmation and finality.

Cross-border real-time payments will also be significant between North America and countries in other regions. SWIFT Go will connect to local real-time payments systems around the world, and is expected to be adopted in North America. Chase Bank has also demonstrated the results of its own project to connect TCH real-time payments to an individual European bank with settlement and finality.

Although domestic payments will continue to overwhelmingly outnumber international payments, real-time cross-border payments will become fundamental to trade between North America and the rest of the world.

## The challenge of the last mile

The biggest barrier to growth in the U.S.' TCH real-time payments is the last-mile connection to the end user. Banks are linked to the TCH network, and the network is fully operational. However, real-time payments are only slowly becoming available in online banking user interfaces, and in the API interfaces that large corporates use to send and receive their payments.

Now that the TCH network has been proven to be viable and banks are connected to it, banks can refocus their attention and their budgets on improving the last mile.

## Building new services on payments

North American financial institutions should see real-time payments as an opportunity to innovate and outmaneuver the competition. The trick is to



identify the needs of corporate clients and build services that help them to win or retain business. Insurance companies, for example, could win over new customers if they can make a real-time payment when a claim is approved, instead of mailing a check. Trucking firms could request payment as they make the delivery and perhaps offer a discount for immediate payment.

## Enabling real-time fraud detection

One of the reasons that some banks have been hesitant to adopt real-time payments is that faster payments mean faster fraud. However, real-time fraud detection systems are available and proven in many banks worldwide. As banks increasingly enable real-time payments, they need to ensure they build in fraud detection from day one, before higher volumes make retrofitting solutions harder to manage.

## Achieving a strategic migration

We expect to see rapid innovation in the region based on real-time payments. For that reason, it is essential that banks have flexible architectures that enable them to quickly react to what their competitors do.

Many banks are seeing the introduction of various real-time payment schemes as an opportunity to modernize their architecture. While it might be possible to layer new schemes on top of old architecture, that would increase complexity and do nothing for agility. Banks are instead migrating toward more flexible and lower-cost servers, moving towards more open architectures and to cloud technologies (if not to the cloud itself). It's impossible to move everything at once, so banks are instead working iteratively and ensuring that each new project progresses the vision for tomorrow's architecture. After the first few projects, new initiatives are more about replicating and reconfiguring existing orchestration and interfaces than building from scratch. Less time is spent on building and the bank can be much more responsive to its markets and customers.

# Economic Benefits of Real-Time Payments Remain Largely Untapped

Canada recorded 949 million real-time transactions in 2021, which resulted in an estimated cost savings of \$204 million for businesses and consumers. This in turn helped to unlock \$1.14 billion of additional economic output, representing 0.06% of the country's GDP.

With real-time transactions set to rise to \$1.5 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$315 million. That would help to generate an additional \$1.11 billion of economic output, equivalent to 0.05% of the country's forecasted GDP.

That means for the ninth largest global economy, the potential economic benefits of real-time payments remain untapped. According to the Cebr, the theoretical impact of all payments being real-time could add 2.7% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Real-time payments have been available in Canada since the launch of Interac e-Transfer in 2002. The adoption and use of real-time payments steadily gained traction over the last few years, thanks to the wider participation by more than 250 financial institutions as of December 2021, and a continued preference for electronic payments among consumers.

However, real-time payments still accounted for a smaller share of 4.9% in terms of volume in 2021, compared to 77% of the non-instant electronic payments. This is due to the high adoption and usage of payment cards in the country. The increased contactless payments limit amid the COVID-19 outbreak has further pushed their usage for day-to-day, low-value transactions. Meanwhile, Payments Canada is developing a new and advanced real-time payments system known as Real-Time Rail (RTR), which is expected to go live in 2022. The launch of this new system is anticipated to accelerate real-time payments growth over the next few years.

## ACI's Take

While not the most visible on the world stage, Canada has been — and remains — a global leader in real-time payments for more than a decade. Interac e-Transfer, the domestic real-time scheme, is the go-to for P2P payments. Request to Pay is only just breaking through in other markets but has been supported by Interac e-Transfer for years, under the name "Request Money."

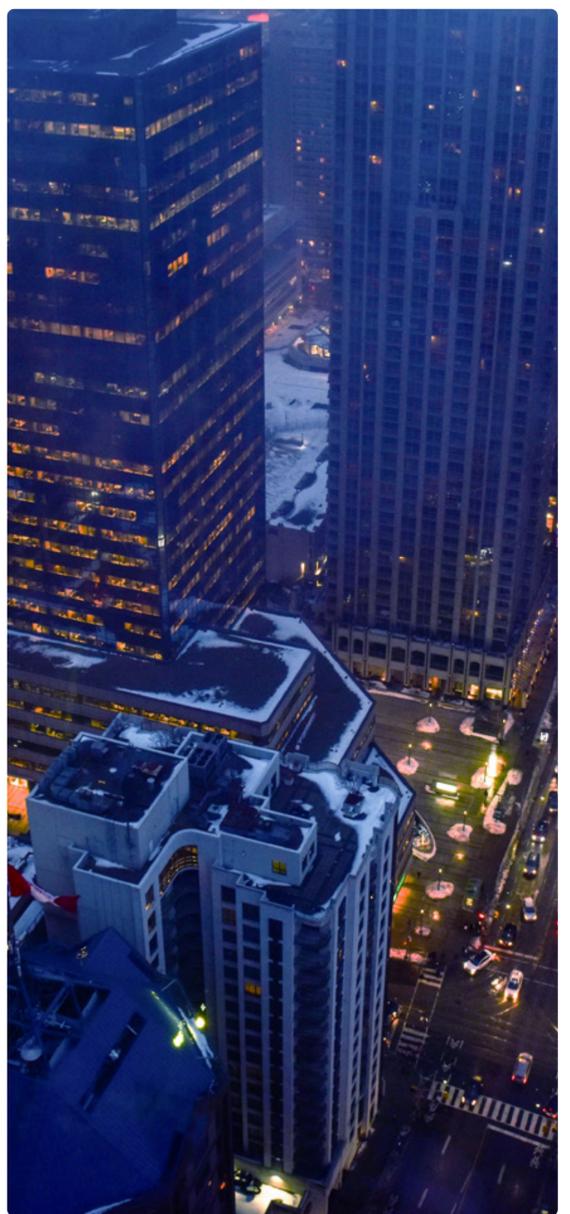
There is significant change coming down the pike, however, and all of it revolves around ISO 20022. Interac is modernizing its e-Transfer service to Interac Instant, based on the new ISO 20022 messaging, in a move intended to prompt significant growth in B2B real-time payments. Payments Canada has also selected Interac to implement its new real-time payments system, the Real-Time Rail (RTR), which will also leverage the ISO 20022 data standard. Both of these developments follow the 2021 release of Canada's new wire system, also based on ISO 20022.

Clearly the priority for the market's payment players is aligning their payment systems around ISO 20022, and to do so in a way that promotes greater efficiency even as payment types proliferate. Many banks implemented payment hubs about ten years ago,

but these first-generation hubs often struggle to meet today's requirements, particularly with regard to maintenance costs. These banks will need to look at modernizing their hubs to ensure they can control their costs, and continue to compete effectively with the latest payment services.

In response, some banks are running mini hubs, spreading payments between hubs according to payment type (high-value wire payments versus lower-value real-time payments) or regions. This can help with resilience, but banks often struggle to work out the best way to carve up their payments across the hubs. There is no right answer. Assuming that workloads are reasonably balanced, the bank should make an initial decision and plan now to iterate as events unfold. Don't allow "perfect" to be the enemy of "good." Any reasonably modern hub solution should allow the bank to adjust workflows as needed.

Finally, we expect to see fintech providers continue their campaign for open access to the payment rails. Openness will be important for innovation and consumer choice, but it's unlikely to accelerate adoption, given the existing success of real-time payments in Canada.



## Trends + Data



Cloud Management Platform



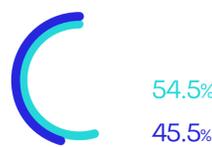
Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



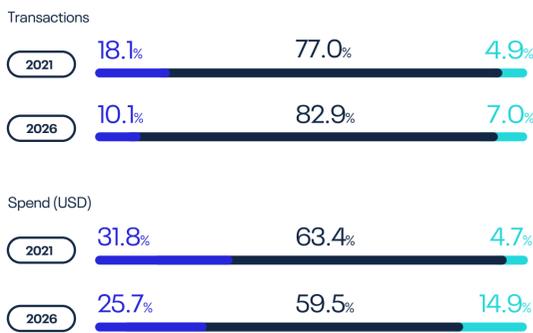
Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f

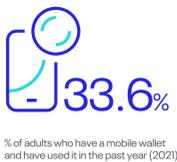


## History

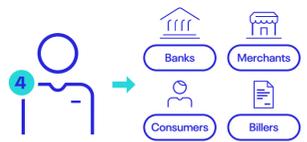


## Key Stats

Mobile Wallet Trends



Real-Time Acceptance



Real-Time Total Participants



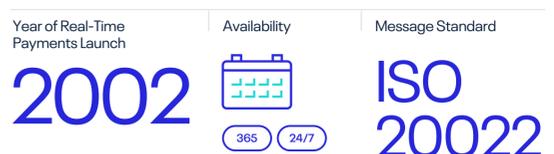
Real-Time Payment Types



Initiation/Authorization Methods



Population Banking Level



## Cebr

Canada is a high-income country ranked as the ninth largest global economy in 2021 (Cebr World Economic League Table, 2022).

Real-time payments accounted for 4.9% of all transactions in 2021, a relatively typical share for an advanced economy. Net benefits of real-time payments for consumers and businesses hit \$204 million in 2021, mainly due to the reduction of failed transactions which contributed to half of these savings (\$102 million). Failed transactions generate an associated annual cost of \$118.5 billion globally, borne by financial institutions, consumers and other businesses across the globe. In Canada specifically, we estimate the total cost of failed transactions to be almost \$2 billion per year.

In 2026, real-time payments are anticipated to account for 7% of the payments mix. The resulting net benefits of real-time payments for businesses and consumers are expected to increase moderately to \$315 million.

At the macroeconomic level, the real-time payments system was estimated to facilitate economy-wide benefits worth around \$1.14 billion in 2021, equivalent to 0.06% of GDP or the output of 10,966 workers. This is forecasted to drop marginally to \$1.11 billion (0.05% of GDP) by 2026.

The cause of this slight decline is due to the reduced impact real-time payments are expected to have in the formalization of shadow economy activity. Cash usage is expected to be low in 2026 across Canada, with electronic (non-real-time) payments accounting for almost 83% of all transactions. Therefore, the degree to which real-time payments are displacing paper-based instruments is limited compared to 2021. As a result, we expect a fall in the absolute value of informal activity that real-time payments are credited for formalizing.

For Businesses and Consumers



GDP Growth





## Economic Benefits of Real-Time Payments Remain Largely Untapped

The adoption of real-time payments is still limited in the U.S., accounting for only 0.9% share of total payments volume in 2021, which is not significant compared to paper-based payments and electronic payments (excluding real-time payments) at 21.4% and 77.7%, respectively.

The U.S. recorded 1.8 billion real-time transactions in 2021, which resulted in an estimated cost savings of \$648 million for businesses and consumers. This in turn helped to unlock \$1.4 billion of additional economic output, representing 0.01% of the country's GDP.

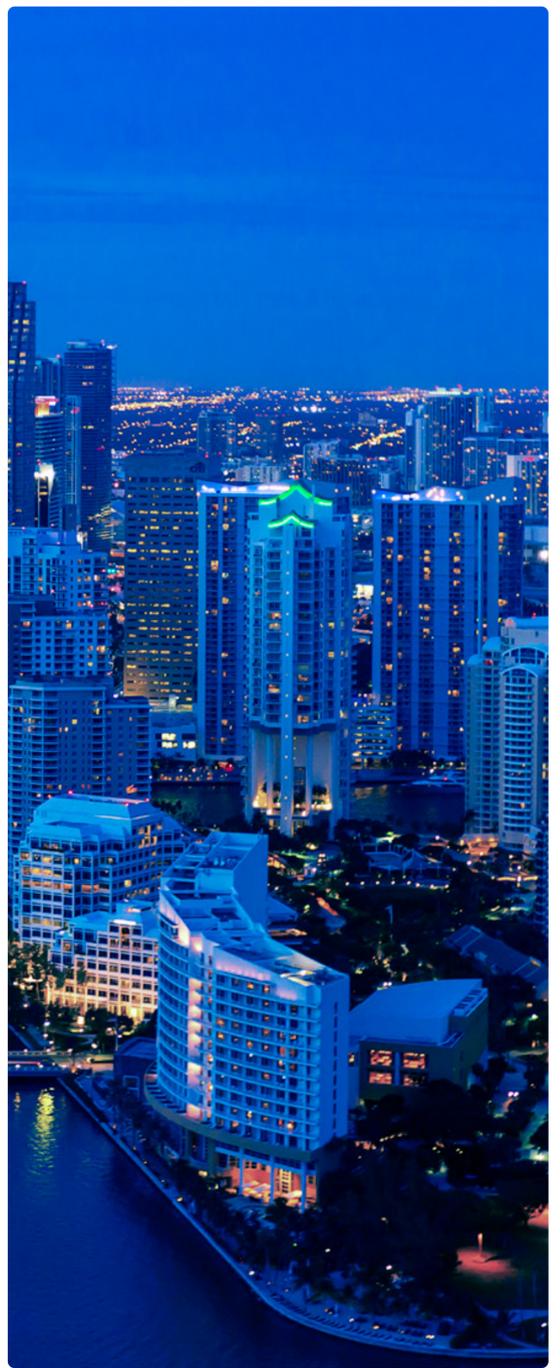
With real-time transactions set to rise to 8.9 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$2 billion. That would help to generate an additional \$5 billion of economic output, equivalent to 0.02% of the country's forecasted GDP.

That means for the largest global economy, the potential economic benefits of real-time payments still remain untapped. According to the Cebr, the theoretical impact of all payments being real-time could add 1.7% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Future projections for real-time payments are expecting strong growth as the volume of real-time payments are projected to grow at a CAGR of 37% from 2021-2026. This growth can be driven by the gradual decline in cash usage in the U.S. and the launch of the Federal Reserve's own real-time payments scheme called FedNow, which is being piloted with ACI Worldwide.

As of now, there are two real-time payment solutions in the U.S.: Zelle and the RTP network from The Clearing House (also connected with ACI Worldwide), but their adoption at a national level is still limited due to the dominance of cards in the market. Both platforms were launched in 2017. But despite the presence of both the RTP network and Zelle, the U.S. is still lagging behind other countries that have already implemented a real-time payments network.

RTP and Zelle are not overarching real-time networks that cover the entire country, which is necessary for providing this service at a national level. Economic impact of RTP is thus expected to be low in the immediate and medium term; much of the RTP functionality is already available to consumers in one form or another, mostly through private companies such as Venmo and Zelle.



### ACI's Take

In straightforward terms, we expect growth in real-time payments for the U.S. market to accelerate in the coming years — and banks, other financial services and payment processors may soon need to pick up the pace on their current measured preparations.

FedNow, the central bank's instant payment service is being piloted through 2022, and will eventually enable P2P, B2B, B2C, C2B and G2C payments (the full launch is slated for 2023). Given the size of the population and the national economy, it could easily grow to become one of the largest payments clearing settlement systems in the world.

To some executives, it might be tempting to see real-time payments as simply a novel way to process payments. Actually, these payments are a critical component of new and disruptive economic functions. The gig economy, for example, is growing at a tremendous rate thanks to digitization and mobile connectivity. But the nature of the work and the services it supports requires payments to be settled on delivery, not at the end of the month. The movement of money in real time is already lagging, and yet many more business models will

also soon depend on real-time payments to enable customers, merchants and financial institutions to work more effectively together.

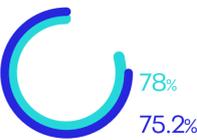
If the market's payment players are not preparing now, they should start soon by getting a handle on what FedNow compliance looks like: the infrastructure required and how the transition will be sequenced. They need to establish critical milestones, priorities and contingency plans. To help with this planning process, banks and financial institutions should drill right down to the level of specifics, so they have a clear idea of the requirements of real-time payments for both their organization and its customers.

When the time comes, any real-time payments infrastructure must be flexible so that payment players can respond to future changes more easily than they can today. Service-oriented architectures, sourced from multiple suppliers, are likely to play a role, so orchestration between them will be critical. These services need to mesh elegantly and be reliable and resilient. With a more complex framework of systems in place, a failure in any one would make executing and processing transactions harder.

### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



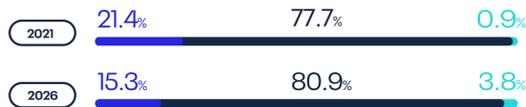
Software as a Service (SaaS)



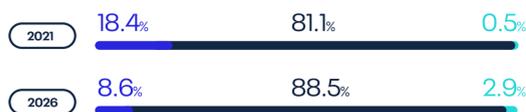
### Shares of Volumes by Payments Instrument

Paper-based payments Electronic payments Real-time payments

Transactions

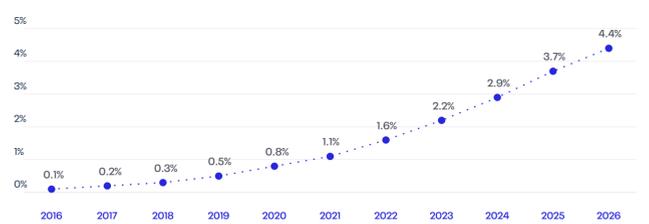


Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2016-26f

% of total electronic payment transactions volume



Real-Time Transactions

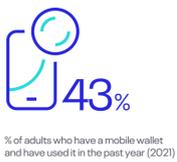


### History

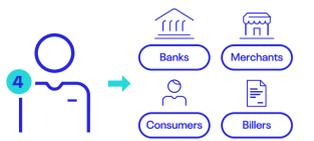


### Key Stats

Mobile Wallet Trends



Real-Time Acceptance



Real-Time Total Participants



Real-Time Payment Types



Initiation/Authorization Methods



Population Banking Level



Year of Real-Time Payments Launch



Availability



Message Standard



### Cebr

The United States is one of the world's wealthiest countries per person, ranking as the world's largest economy in 2021 (Cebr World Economic League Table, 2022). In 2021, the United States accounted for 16% of global GDP after adjusting for purchasing power parity.

However, considering the U.S. is the largest economy in the world, real-time payments usage remains nascent in 2021, accounting for less than 1% of total transaction volumes. As a result, the current overall economic impact is limited, while the untapped potential is significant.

In 2021, net benefits for businesses and consumers reached \$648 million (less than 5% than that of China), supporting \$1.4 billion of total national output (0.01% of formal U.S. GDP). The primary

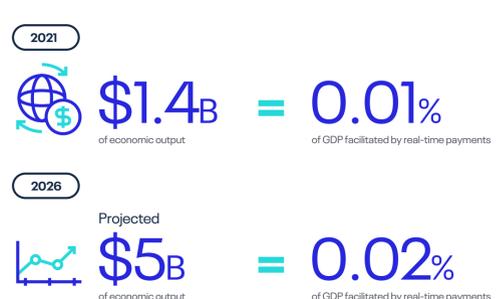
factor generating these benefits was the ability for real-time payments to formalize activity in the shadow economy by reducing cash usage. Given the scale of the U.S. economy, the country's 8% shadow economy share represents an estimated \$1.86 billion in informal output. Despite the relatively small transaction share in the U.S. of real-time payments, they have the ability to formalize a relatively large level of informal economic activity.

Looking forward to 2026, approximately 3.8% of the payments mix is anticipated to be real-time, tripling the anticipated economic benefits for businesses and consumers to almost \$2 billion. The economy-wide impact also rises significantly to \$5 billion, representing a 0.02% share of forecasted formal output, or the equivalent of 31,542 additional jobs.

For Businesses and Consumers



GDP Growth



# Asia

## Regional Spotlight

Payment Trends To Watch In 2022

Payments Fraud Viewpoint

China

Hong Kong

Indonesia

Japan

Malaysia

Philippines

Singapore

South Korea

Taiwan

Thailand

## Regional Spotlight

# Asia's Real-Time Payment Players Under Pressure To Explore the Next Frontiers of Growth

Author: Leslie Choo, Senior Vice President, Managing Director - Asia Pacific - ACI Worldwide

The story of real-time payments in Asia for 2022 is the search for new sources of growth.

In the largest markets of the ASEAN portion of the region — Singapore, Malaysia and Thailand — low-value real-time payments are in advanced maturity. The question there is how to move up the value chain to high-value (and higher margin) payments. In common with their northern neighbors — the region's mega economies: China, Japan and Korea — there is also a growing need to look beyond their borders for the next significant boost to real-time payment volumes. And for both there is the question of infrastructure modernization as the business case grows for payments convergence — low- and high-value real-time, cross-border, even cards — onto a single processing architecture.

However, differences in the origins and evolution of their real-time payment markets will influence their approach and priorities. The ubiquitous low-value real-time payment ecosystems found in the big ASEAN markets evolved out of account-to-account transfers via national switches, enabled by early mobile applications. Today, the underlying networks retain their account-to-account topology (as will the latest, Indonesia's, when it comes online in 2022) and their banks are experts in this model.

Banks in the northern group have much less experience with low-value payments because, to differing degrees and for differing reasons, the connections between banks are historically not as robust. In China, they have seen digital wallet solutions take ownership of holding funds and facilitating payments between consumers and businesses. As a result, banks see little of this activity and little of its revenue. In Japan and Korea, their national real-time payment schemes are an accepted feature of the market. But without strong government mandates driving their development, functionality and revenues have remained stable. As a result, there has been little reason for banks to invest in new use cases and services.

**"Faced with yet another new payment type to onboard and a host of legacy ones to maintain, banks should work to bring low- and high-value real-time payments into a single process."**

### The SWIFT effect

Now both groups see an opportunity — or they should — in SWIFT's mandate for participants to receive and process ISO 20022 messages by November 2022.

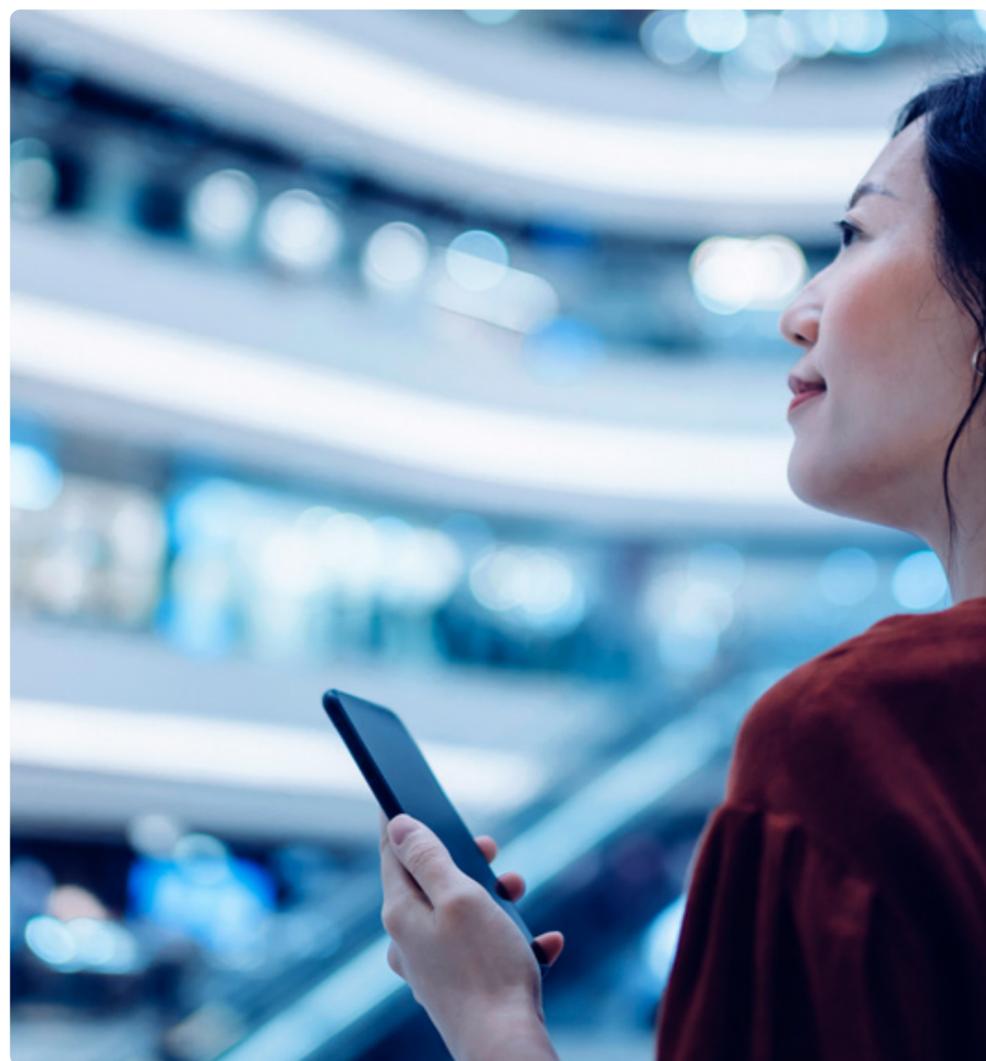
On the ASEAN side, the simpler bank-to-bank connections enabled by ISO 20022 and its improved data granularity will allow them to better serve corporate customers, pushing them up the value chain into high-value real-time payments. For the north Asian group, these same benefits mean there is a chance for banks to kickstart innovation in their domestic real-time schemes, which they will need to do in order to make their investment in complying with SWIFT really pay off. (This modernization will also position them for future real-time use cases and payment innovations — including CBDCs — to ensure they don't miss the boat again.)

But perhaps the biggest opportunity arising from ISO 20022 modernization for both is the potential improvement in cross-border interoperability. Direct connections with their larger, more populous neighbors from the perspective of the ASEAN markets, or a block of markets with a population of more than 600M from the north Asian perspective, are huge untapped sources of growth.

### Bringing cloud tech on prem will be vital

Faced with yet another new payment type to onboard and a host of legacy ones to maintain, banks should work to bring low- and high-value real-time payments into a single process. This will improve ongoing manageability, and ensure their payments modernization has long-term strategic value, is cost-effective and sustainable. It will also make future changes easier to deal with and provide a model for wider convergence of more payment types onto a single architecture, or a payments hub. (For the largest banks, their role as SWIFT intermediaries for smaller banks will already see them use the domestic low-value rails on which to pass funds; this will force the blending of high-value and low-value payment processing.)

To achieve this, banks in all markets are recommended to start with their low-value payments infrastructure, where anything between 30-50% of the total value



of their payment infrastructures might already be tied up. Expanding that to high-value payments is the fast-track to leveraging a single solution for all their ISO 20022-compliant real-time payments.

On the technology side, given real-time transaction volumes are either high, and growing, or liable to suddenly spike — either seasonally or unpredictably as in the case of the COVID pandemic — these hubs should be based on cloud technology. The region's regulatory environment doesn't favor the public cloud model, but applications can be developed or updated using containerized and microservices-based architectures, and kept on premise for now.

This will make for faster, cheaper implementations and reduced management costs now, and will reduce the future costs of doing business until the cloud is a more viable option.

That will make this new generation of payment hubs a collection of best-in-class services, rather than a single monolithic application. That in turn will put the spotlight on working with vendors that offer an ecosystem of technologies that can be combined based on your requirements today, and reconfigured in response to whatever tomorrow brings.



# Collaboration and Enhanced Regulatory Frameworks Vital for Fighting Rising Real-Time Payment Scams

Author: Jackie Barwell, Director (Fraud) Product Management - ACI Worldwide

**Even for the region's established real-time payment markets, the mass shift online prompted by the COVID pandemic was a shock to the system, as spikes in authorized push payment (APP) fraud have followed an expanded user base.**

With the criminals behind APP scams thinking and acting like businesses, they relished the increase in their total addressable market as COVID restrictions sent more people online than ever before. With real-time payments making stolen funds instantly accessible — passing through a series of mule accounts and into the hands of criminals in seconds — their ROI has increased. This has led to increasing levels of sophistication and scale.

The nature of the shifting fraud landscape — a massive and sudden change rather than progress or an evolution — has led to disruption and uncertainty. Markets that have generally focused on the positives of real-time payments, such as large growth and increased financial inclusion, have been forced to pause and confront the darker side of their super convenient and flexible schemes.

Banks are responding with increased fraud budgets, which are being directed to consumer education and bolstering their enterprise view of customer activity. Banks can then focus and apply machine learning models for detecting and mitigating fraud and scams.

This will help, but without greater collaboration between banks and an enhanced regulatory framework to enable it, these measures will only ever be a patch on the problem. Banks will struggle to drive meaningful volumes of fraud off the network.

And without consistent end-to-end approaches from all stakeholders and actors from across justice systems, covering capture, investigation, prosecution and punishment, banks have been largely left to fight at the front line of scams and resolve liability issues between themselves. This hasn't worked

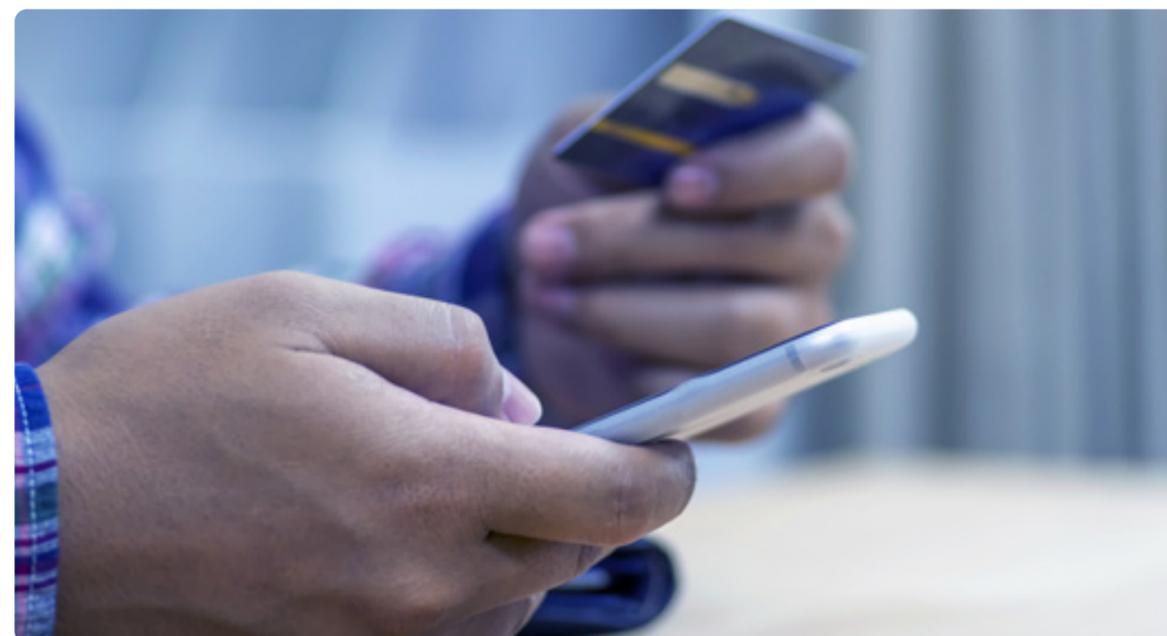
and regulators need to take responsibility, even if belatedly, for levelling up the rules of engagement back in favor of banks.

There are a couple of ways they could do this. Firstly, where it exists, liability almost exclusively rests on the initiating bank. Given the visibility they have of patterns of likely mule behavior, the receiving end needs to become accountable in some way. Only regulators and collaboration can make this happen.

Next, the best regulations promote collaboration by spreading the burden of protecting consumers and businesses. In today's digital age, that means intelligence sharing. To effectively push back on scams, initiating banks need to be able to evaluate the reputation of destination accounts. And, of course, if receiving banks are to take on more accountability, they also need insights into the initiating account.

The industry is so concerned with protecting data privacy that the risks of sharing information of almost any sort have been too high for financial institutions to contemplate any significant collaboration to prevent fraud. This gap in visibility is one of the chief reasons fraudsters are able to operate so widely and brazenly. They know that they won't be followed when they cross the lines between organizations or even between lines of business.

Respect for data privacy is a good thing and the rules should be kept strong. But given the importance of protecting payments to consumer confidence and the health of the economy, regulators should have their smartest minds working on ways to protect both privacy and payments.



**“Given the importance of protecting payments to consumer confidence and the health of the economy, regulators should have their smartest minds working on ways to protect both privacy and payments.”**

While banks have to wait for regulators to act, the federated machine learning technology found in [network intelligence](#) applications enables the real-time exchange of machine-readable fraud signals without exposing the underlying data. That allows banks to train machine learning algorithms on fraud signals drawn from a diverse range of internal and external sources in full compliance with data privacy regulations. This is particularly relevant when cross-border payments are expected to be increasingly important to the region's growth prospects, since models will need to reflect the nuances of payment behaviors in other markets.

Acting now is vital. Reputational pressure arising from these scams will continue to grow, especially when customers are not being reimbursed in full.

Banks and acquirers that push all of their losses onto customers will eventually be deserted by consumers and merchants, and regulators will always intervene if they think consumer and business interests are not being adequately protected. Ultimately, whether it is a long time coming or relatively quick, that is how this story ends.

By preparing now to demonstrate that they're using every tool available to tackle this problem proactively, the region's payment players stand the best possible chance of coming out on the right side of any regulatory interventions.

# Asian Trends in Payments To Watch For in 2022



Author: Chee Cheng Ong, Vice President, Mission Sales Leader and Solution Consulting - ACI Worldwide

**The Asia region is reacting to the same COVID-related challenges around accelerated digitization as seen around the world. But factors such as cutting-edge, cross-border CBDC experiments and accelerated ISO 20022 adoption contribute to a unique vibrancy and dynamism in payments.**

## COVID-19 leads to sharp rise in contactless payments

As in other markets around the world, the COVID-19 pandemic has accelerated digital payments adoption in Asia. Notably, there has been a sharp rise in contactless payments, particularly those leveraging the real-time rails. In response, businesses have had to increase the pace of their own efforts to digitize operations in order to keep pace with this growth, as well as related trends toward cashless payments in general and changing consumer preferences towards eCommerce. Even when the biggest impacts of COVID-19 subside, new digital habits will likely stick around, meaning we can expect to see Asian consumers' already-strong digital lifestyles to be powered further by innovative payment experiences.

## Payment strategies converge

The shift to ISO 20022 is accelerating across the region, bringing with it a drive towards interoperability that will eventually — and finally — break down the walls between cards and real-time payment ecosystems. This will also pave the way for

next-generation payment systems. Run on the latest microservices-based architectures, these systems will also hasten the convergence of high- and low-value payments onto a single payments framework (or payments hub).

## More inclusive payment methods to drive further eCommerce growth

As noted, eCommerce growth has been dramatically accelerated in Asia, as consumers form new shopping habits due to the COVID-19 pandemic. And this rise will be perpetuated further by consumer preferences towards, and retail rollouts of, more inclusive payment options.

## International scheme integrations to transform cross-border payments

Cross-border payments have been identified by many financial institutions as the next frontier for driving significant real-time payment volumes, and as a result, interest is high in regional payment scheme integrations. The central banks in Southeast Asia



are continuing to explore multilateral interoperability between their domestic schemes, in keeping with regional efforts to establish further linkages within ASEAN and with countries outside the region. Central bank digital currencies (CBDCs) are also a feature of proposed cross-border payment transformations, with Project Dunbar's testing of CBDC-based payments between Malaysia, Singapore, Australia and South Africa a leading example.

In addition, Malaysia and Singapore are also participating in Project Nexus' experiments around real-time cross-border between those markets and the euro area. In Malaysia's case, this complements the country's existing efforts around linking RPP/DuitNow with other real-time payment systems in the ASEAN region.

## Concerns over financial crime and fraud grow

Financial crime and fraud are recurring problems for the regions' regulators, central infrastructures and financial institutions. And with the growth of real-time payments, the spotlight is on enhancing real-time fraud screening and mitigation policies, processes and capabilities. Forward-thinking organizations are exploring machine learning and predictive analytics applications in this context, with many convinced that only exponential increases in adoption of these technologies can ensure that payments remain safe and hassle-free for consumers.

## Real-Time Payments Forecasted to Help Generate \$18.7 Billion of Additional GDP by 2026

In 2021, China recorded the largest macroeconomic benefit out of the 30 countries covered in the Cebr economic impact study.

In 2021, 18.5 billion real-time transactions were made in China. The widespread adoption of real-time payments resulted in an estimated cost savings of \$15.4 billion for Chinese businesses and consumers. This helped to unlock \$18.7 billion of additional economic output, which represents 0.11% of the country's GDP.

With real-time payment transaction numbers expected to rise to 31.3 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$27.4 billion. That would help to generate an additional \$27.5 billion of economic output, equivalent to 0.13% of the country's forecasted GDP.

In 2010, China launched its real-time payments system called the Internet Banking Payment System (IBPS) to strengthen its banking infrastructures and boost non-cash payments. In 2021, it was ranked as the second country in the world in terms of the transaction volume of real-time payments. In 2021, real-time payments represented a 5.7% share of total payments volume with a 9.5% share of total payments spend — showing that even as the second-ranked real-time payments market worldwide, it still has a lot of growth potential. While its payments volume share was the smallest compared to electronic payments (excluding real-time payments) at 72.1% and paper-based payments at 22.2%, its payments spend was the second largest at 9.5%, putting it ahead of paper-based payment transactions. 2026 projections are expecting real-time payments to lose market share in transaction volume, dropping to 4.7%, but to experience a strong increase in its share of payments value, as it is projected to reach 14.6%.

With the high level of mobile wallet adoption in China, there is a lot of room for real-time payments to grow. This growth could be further driven by the introduction of the central bank digital currency: the e-Yuan. However, this all depends on how integrated the existing financial system is to be with the e-Yuan. It remains to be seen what the impacts of this development for the market will be, and China is a critical case study for the future of real-time payments as a result.



### ACI's Take

The Chinese real-time market is in an interesting transition phase, as the government seeks to take greater control of developments, which have until now been shaped by the mobile wallet providers (chiefly Alipay and WeChat Pay). Ironically, both owe their market dominance to an earlier reluctance of Chinese banks to respond to government's efforts to establish a national real-time payments infrastructure. Alipay and WeChat Pay moved into the resulting gap in the market, and features such as QR-code payments have established mobile wallets as the most popular payment method.

A further sign of centralization is the government mandate that any real-time payments infrastructure and technology must be home-developed — a response to trade tensions between the U.S. and China and to the restrictions placed by the former on Chinese technology providers such as Huawei.

This strategy means there are currently limited opportunities for banks and financial institutions to innovate in the low-value payments space. However, in a country as accustomed to digital payments as China, and as fast-moving technologically, it is inevitable that DCEP's wider adoption will generate new use cases that in turn drive higher volumes. When this happens, banks, processors, acquirers and PSPs must have the systems in place to innovate and differentiate in response to consumer and business needs. ISO 20022 modernizations, which have been mandated by SWIFT for all its participants, are the best entry point for standing up these systems. This would also be a route to maximizing return on investment for complying with the new mandate.

The platform for the government's efforts is Digital Currency Electronic Payment (DCEP), the digital payment and processing network operated by the Central Bank of China. DCEP started trials in April 2020 and is now being gradually rolled out in major cities, such as Beijing and Shanghai, as the central bank advances its plans to replace physical cash with a digital currency, the digital yuan. As a sign of how serious the government is, newspapers have carried reports that the payment licenses for Alipay and WeChat Pay might be withdrawn.

### Trends + Data



Cloud Management Platform



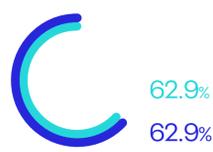
Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



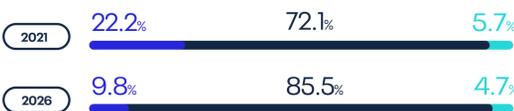
Software as a Service (SaaS)



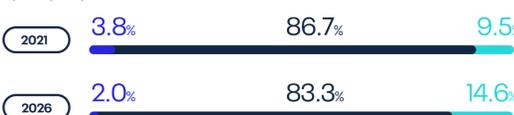
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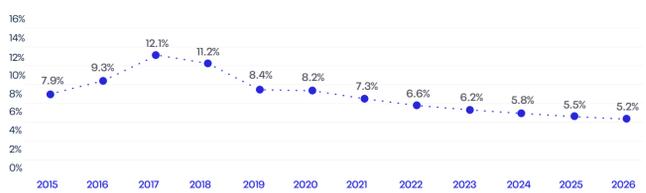


Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f

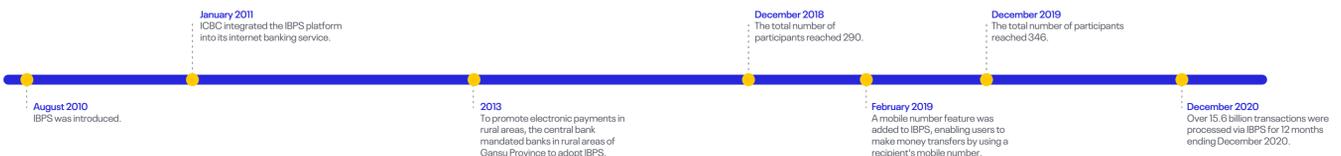
% of total electronic payment transactions volume



### Real-Time Transactions

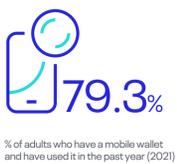


### History



### Key Stats

#### Mobile Wallet Trends



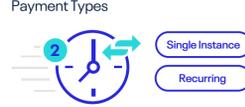
#### Real-Time Acceptance



#### Real-Time Total Participants



#### Real-Time Payment Types



#### Initiation/Authorization Methods



#### Fraud



#### Population Banking Level



#### Year of Real-Time Payments Launch



#### Availability



#### Message Standard



### Cebr

China is classified as an upper-middle-income country and ranked the second largest global economy in 2021 (Cebr World Economic League Table, 2022).

Net benefits for consumers and businesses of real-time payments in 2021 hit \$15.4 billion, with real-time accounting for 5.7% of all transactions. The largest component of net savings was a reduction in the payments float, which subsequently unlocked working capital for businesses.

Based on current adoption levels in China, real-time payments unlocked a total transaction value of \$170.1 billion per day in 2021 through the reduced float time. This working capital facilitated an estimated \$12.4 billion of business output in the same year.

The macroeconomic benefits of current real-time adoption rates in 2021 were estimated to be \$18.7 billion of formal economic output. This is equivalent to 0.11% of Chinese GDP, or the output of 853,695 workers annually.

By 2026, consumer- and business-level benefits will rise to \$27.4 billion again with the payments float reduction making the largest contribution. This will be despite real-time payments' share of all transactions dropping to 4.7% in relative terms. Based on 2026 adoption estimates, the forecasted macroeconomic benefits in 2026 are estimated to be \$27.5 billion of economic output (0.13% of forecasted GDP).

#### For Businesses and Consumers



#### GDP Growth





## Economic Benefits of Real-Time Payments Remain Largely Untapped

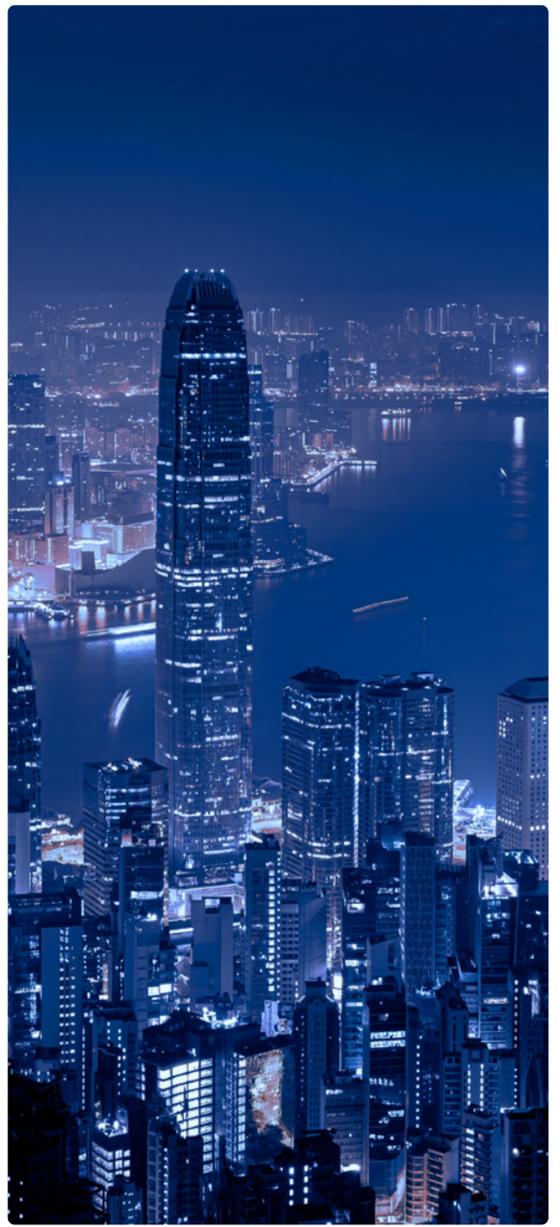
Hong Kong recorded 262 million real-time transactions in 2021, which resulted in an estimated cost savings of \$107 million for businesses and consumers. This in turn helped to unlock \$338 million of economic output, representing 0.09% of the country's GDP.

With real-time transactions set to rise to 1 billion in 2026, net savings for businesses and consumers are forecasted to climb to \$260 million. That would help to generate \$932 million of additional economic output, equivalent to 0.22% of the country's forecasted GDP.

That means for one of the richest countries in the world (with a per capita GDP of \$62,839), the economic benefits of real-time payments remain largely untapped. According to the Cebr, the theoretical impact of all payments being real-time could add 2.4% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Hong Kong launched its real-time payments Faster Payment System (FPS) scheme in September 2018. Unlike several other real-time payment systems globally, FPS connects both banks and payment service providers, allowing interoperable transfers between bank accounts and mobile wallets. The increasing preference for mobile payment solutions, coupled with the adoption of a nationwide common QR standard, supported real-time payments growth in the country. The growing acceptance of electronic payments amid the COVID-19 pandemic has also increasingly supported the adoption and use of real-time payments.

While the share of real-time payments accounted for 7.3% of the total payments volume in 2021, it accounted for a 16.8% share in terms of value. This signifies that real-time payments in Hong Kong are mainly used for low-volume, high-value transfers. However, with consumers increasingly shifting from cash to mobile-based payments for their day-to-day purchases, the gap will significantly reduce with real-time payments volume set to record a 31.9% CAGR from 2021-2026 compared to 12.9% in terms of value.



### ACI's Take

Three years after it was launched in 2018, Hong Kong's Faster Payment System (FPS) is making inroads on its objectives of driving growth in real-time payments.

The high usage of mobile wallets, integrated with FPS and enabling QR-code payments, is a significant driver of adoption. However, the vast majority of low-value payments — the key driver of higher real-time payment volumes — remains the preserve of the Octopus stored-value card and credit cards. The prevailing mindset among Hong Kong consumers appears to be "buy now, pay later," so real-time low-value payments have limited appeal. Consequently, banks have only invested tactically in real-time payments to date, typically taking the low-cost route, via open API and outsourced toolkits.

Hence the major opportunity for real-time payments growth at present is in the higher-value B2B space. Much of the wholesale banking infrastructure is more than 30 years old and ripe for replacement with processing capabilities organized along the lines of a payments hub approach. However, banks

should resist the temptation to again take a tactical approach to standing up these capabilities. APIs and service-based architectures remain important enablers, but they should make this the first phase of a more expansive roadmap for converging payment types onto a single process. This will ensure their payments modernization has long-term strategic value, is cost-effective and sustainable.

Future changes will also be easier to manage and cheaper to action. This will be important if, as expected, FPS steadily gains more traction in the low-value space and new use cases lift consumer expectations. Banks will then be grateful for a more sophisticated, flexible, real-time infrastructure. They should also be preparing for the impact of the Greater Bay Area project, the long-term goal of the Chinese government to economically integrate the Hong Kong and Macao Special Administrative areas with nine mainland cities in Guangdong Province. High on the list of the project's policy recommendations is connecting the various payment and transfer structures.

### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



● Current priority ● Planned

Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

Transactions

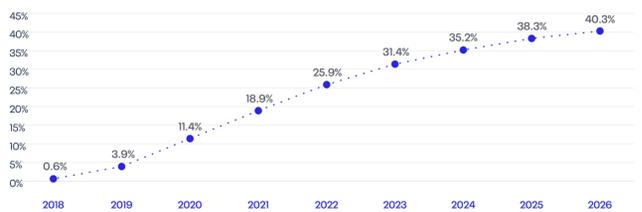


Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2018-26f

● % of total electronic payment transactions volume



Real-Time Transactions



### History



### Key Stats

Mobile Wallet Trends



Real-Time Acceptance

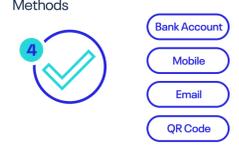


Real-Time Total Participants

Real-Time Payment Types



Initiation/Authorization Methods



Fraud

Payments Fraud Rate



Top 3 Payment Fraud Types

% of fraud victims



Trend



Population Banking Level



Year of Real-Time Payments Launch



Availability



Message Standard



### Cebr

Hong Kong SAR had a GDP per capita of \$62,839\* in 2021, making it one of the richest regions in the world, and the 40th largest global economy in 2021 (Cebr World Economic League Table, 2022).

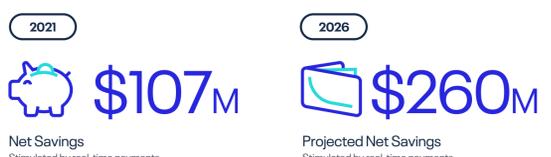
With its current share of adoption, Hong Kong consumers and businesses gained an estimated net efficiency savings of \$107 million; predominantly driven by a reduction in the payments float. Real-time payments unlocked a total transaction value of \$1.1 billion per day in 2021 through reduced float time. This working capital facilitated an estimated \$81 million of output in the same year.

The share of real-time payments in 2021 was recorded at 7.3%, which is estimated to more than triple to 22.8% by 2026. The strong predicted real-time uptake will result in consumer- and business-level benefits reaching \$260 million in 2026.

The macroeconomic benefits of using real-time payments were an estimated \$338 million of economic output (0.09% of GDP) in 2021; equivalent to the output of 3,355 workers. In relative terms, this is in line with the benefits associated with real-time payments across China in 2021 (0.11% of Chinese GDP).

As the share of real-time across the payments mix grows, it is forecasted to facilitate 0.22% of formal Hong Kong SAR GDP in 2026. The scale of this impact is substantial and is equivalent to \$932 million of output, annually. In relative terms, this significantly outpaces the forecasted benefits associated with real-time across China in 2026 (0.13% of Chinese GDP).

For Businesses and Consumers



GDP Growth



\* PPP adjusted

## Real-Time Payments Provide Huge Opportunity for Economic Growth

Indonesia became the most recent entrant into the real-time payments space with the launch of BI-FAST real-time payments system in December 2021. The system went live with 21 banks, starting with individual credit transfer services. Other functionalities, such as bulk credit, direct debit, and request for payment services, are set to be phased in.

Therefore, for 2021, no net savings and no economic impact have been recorded.

With real-time transactions set to rise to 1.6 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$222 million. That would help to generate an additional \$747 million of economic output, equivalent to 0.05% of the country's forecasted GDP.

According to the Cebr, the theoretical impact of all payments being real-time could add 2.7% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Although cash has traditionally been the preferred payments instrument in Indonesia, electronic payments have been steadily gaining ground from the past few years, supported by government initiatives, increasing banked population and improvements in payments infrastructure. The COVID-19 pandemic also further accelerated the shift towards digital payments in the nation. All of these factors provide favorable conditions for the success of real-time payments in the country.

### ACI's Take

The outlook for real-time payments in Indonesia is excellent, thanks in large part to the government's clearly-stated ambitions to create an end-to-end integrated digital economy. This was enshrined in 2019's Indonesia Payment System Blueprint (BSPI) 2025, which established five payment system "visions." These included open banking, a retail payments system and a high-value (wholesale) payments system. Overall, BSPI 2025 is being realized through 23 key deliverables, implemented in stages from 2019 to 2025.

A crucial component of BSPI is Bank Indonesia's BI-Fast real-time payments system. Its preliminary launch was in December 2021 and market conditions are well set up for real-time payments to thrive as it nears full launch in 2022. Those conditions include Indonesia's large population, its high proportion of paper-based payments (the country is one of the world's heaviest users of cash) and low payment card ownership. There are also significant levels of cross-border trade with neighbors Malaysia, Thailand and Singapore. Being a latecomer to real-time payments, Indonesia has the advantages of adopting best practices and lessons learned from around the world. As such, they are taking the opportunity to implement a proven central infrastructure hub and participant connector/gateway solutions leveraging ISO 20022 to harmonize the country's real-time payments ecosystem.

As well as setting firm deadlines and putting in place strong regulatory mandates, the government and Bank Indonesia are following the ideal strategy of prioritizing low-value real-time payments to build volume and critical mass. For banks, cloud-based, scalable "software-as-a-service" payment solutions are the preferred tools for this stage of real-time implementation, with payment hubs following to handle high-value payments.

The shift to real-time payments in Indonesia is inevitable, and the central bank is expected to dedicate a lot of energy to accelerate the development of the central infrastructure hub and adoption of the relevant connectors/gateways by financial institutions. With the speed of growth in volume terms likely to be extremely high, fraud monitoring and mitigation policies and technologies must be ready to go from day one. Experiences in other markets demonstrate the importance of payments intelligence to safeguard the central addressing database and consumers' payment transactions.

More broadly, banks and other financial institutions must hasten their payments modernization journeys to be able to successfully meet any rapid rise in volumes and also to establish the foundations of a modern payments hub architecture. This will make future changes easier to deal with. This would also provide a pathway for processing low and high value payments on a single system — a huge operational advantage — and the future convergence of additional payment types.



### Trends + Data

#### Cloud



#### Shares of Volumes by Payments Instrument



#### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2022-26f



### History



### Key Stats



### Cebr

Indonesia is classified as a lower-middle-income country and ranked the 16th largest global economy in 2021 (Cebr World Economic League Table, 2022).

With regards to real-time payments, Indonesia's BI-FAST system launched in December 2021. As a result, there is no real-time payments economic impact for 2021. However, the hypothetical maximum attainable benefit to Indonesian consumers and businesses from full adoption of real-time payments is estimated at \$16.6 billion in 2021, while the hypothetical macroeconomic gains stand at an additional \$32 billion of economic output (2.95% of GDP) over the same period.

By 2026, the forecasted share of the payments mix for real-time payments is 3%, while most transactions are predicted to remain paper-based instruments (81%). Based upon this forecast, consumers and businesses stand to gain a net value of \$222 million in 2026.

The realized macroeconomic benefits of real-time are anticipated to reach \$747 million in 2026, equivalent to the output of 70,412 workers or 0.05% of formal GDP.

As real-time instruments are introduced into the payments mix, there is an expected net-cost increase for the payments system in 2026 of \$112 million. As the new technology is brought in, the high per-transaction costs relative to paper-based alternatives mean that real-time payments will not yet create net efficiency gains. However, once real-time instruments mature and become established in the payments mix, real-time transactions per capita will rise and Indonesia will start to benefit from net-cost savings across the payments system.

#### For Businesses and Consumers



## Economic Benefits of Real-Time Payments Remain Largely Untapped

Japan's Zengin is the oldest real-time payments infrastructure in the world, having been launched in 1973.

Japan recorded 1.7 billion real-time transactions in 2021, which resulted in an estimated cost savings of \$3.3 billion for businesses and consumers. This in turn helped to unlock \$4.3 billion of economic output, representing 0.09% of the country's GDP.

With real-time transactions set to rise to 1.8 billion in 2026, net savings for businesses and consumers are forecasted to reach \$3.2 billion. That would help to generate an additional \$4.2 billion of economic output, equivalent to 0.08% of the country's forecasted GDP.

That means for the third largest global economy, the economic benefits of real-time payments remain largely untapped. According to the Cebr, the theoretical impact of all payments being real-time could add 1.9% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Japan is an interesting case, as despite being the oldest real-time payments scheme, it still has not overtaken other payment tools in total payments volume. In terms of payments volume, Japanese consumers still favor paper-based payments, which held a 68.9% share of total payments volume in 2021. By 2026, paper-based payments will see its payments volume market share decrease to 59.8%, but this decrease will benefit electronic payments (excluding real-time payments) while real-time payments will remain the same as it was in 2021, at 3%. But in terms of total payments spend, real-time payments (which all bank transfers are in Japan) is the dominant payments tool at an 89.6% share of total payments spend; this is predicted to slightly increase to 90.8% by 2026. Only financial institutions are allowed to provide real-time payments, which prevents fintech companies from joining the system. As a result, the real-time payments system may lack in terms of innovative development, in turn holding back the potential of the system to grow and reach more consumers and fulfil more use cases.

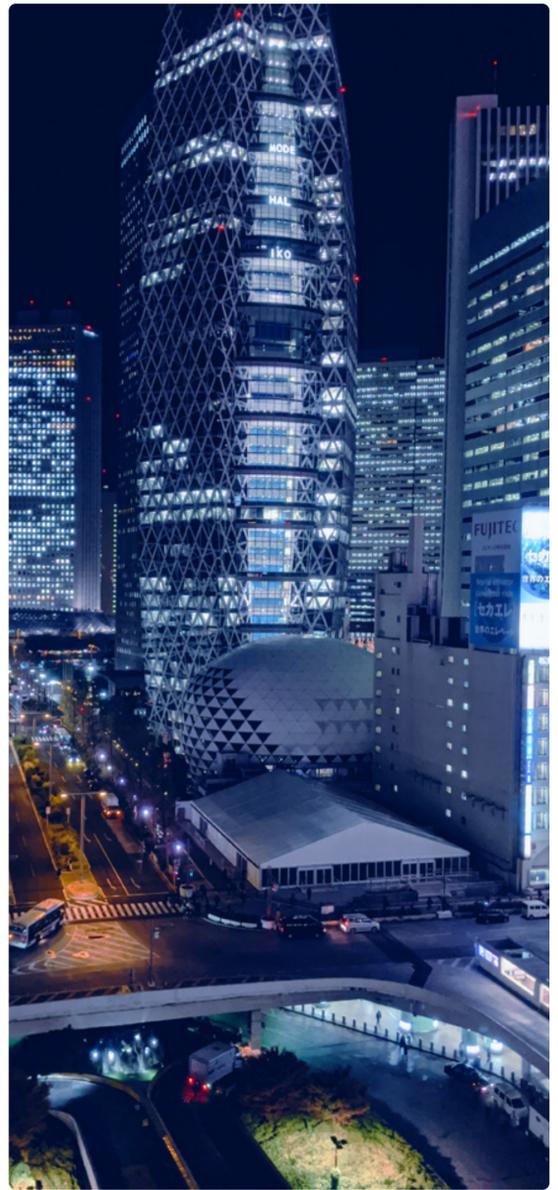
### ACI's Take

One way to describe the progress of real-time payments modernization in Japan is "on hold." At a national level, Japan has had real-time payments in place for more than 20 years, but only for high-value payments. Because the country's strong cultural attachment to cash persists, banks and institutions see no business case for low-value payments, and the large existing domestic market for high-value transactions provides little incentive to modernize. So, while the legacy infrastructure that's in place is not ISO 20022-compliant, the market has not seen any real need for such compliance — until, that is, SWIFT mandated its adoption by November 2022.

the initial catalyst will be growing corporate demand for enhanced cross-border interoperability that would bring costs down. Again, as in China, this will necessitate leveraging more advanced payment architectures based on cloud best practices, which could in theory also be applied to low-value payments, triggering new use cases and boosting volumes significantly. Indeed, to make these modernizations pay in the long run, these innovations may be essential.

Banks, acquirers, merchants and PSPs would therefore be rewarded for accelerating modernizations in pursuit of enhanced abilities to bring to market added-value real-time payment use cases. To do so, they will need technology partners with proven experience in real-time payments around the world, and with the cross-border experience to connect Japanese payments infrastructure to regional neighboring systems such as PayNet (Malaysia) and BI-Fast (Indonesia).

Japan will surely only be able to resist the trend for wider real-time payments availability for so long, however. Perhaps in recognition of this, the Payment Clearing Network, which operates the Zengin clearing system, has established a number of task forces on real-time settlement. As is happening in China,



### Trends + Data

#### Cloud



### Shares of Volumes by Payments Instrument



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



### Real-Time Transactions

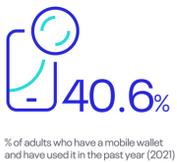


### History



### Key Stats

#### Mobile Wallet Trends

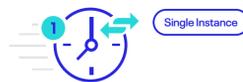


#### Real-Time Acceptance



#### Real-Time Total Participants

#### Real-Time Payment Types



#### Initiation/Authorization Methods



#### Population Banking Level



#### Year of Real-Time Payments Launch



#### Availability



#### Message Standard



### Cebr

Japan is a high-income country and the world's third largest economy in 2021 (Cebr World Economic League Table, 2022).

Japan is one of the few advanced economies that remains predominantly cash-based (68.9% of all transactions), with just 3% of all transactions in 2021 made through real-time instruments. However, despite its low share of instant payments, Japan still stands to benefit greatly in economic terms from real-time technology.

In 2021, the total benefit to consumers and businesses was estimated to be \$3.3 billion, the fourth largest share from Cebr's 30-country economic impact assessment. This is primarily a result of the payments float mechanism: Japan's payments mix has a high paper-based share combined with high-value, real-time transactions meaning that real-time payments unlock a total transaction value of \$108.6 billion per day through the reduced float. The resulting working capital facilitates an estimated \$3.1 billion of business output in the same year.

In 2021, Japan realized total macroeconomic benefits worth \$4.3 billion or 0.09% of GDP, equivalent to the output of 56,538 workers.

The share of real-time payments is forecasted to remain at 3% to 2026. As a result, the economic impacts at the consumer and business level and the economy-wide level are predicted to remain broadly constant in real terms. In 2026, the benefit for consumers and businesses is forecast to be \$3.2 billion, facilitating \$4.2 billion of the total national output (0.08% of formal GDP); equivalent to the output of 52,195 workers.

#### For Businesses and Consumers



#### GDP Growth



## Real-Time Payments Forecasted to Help Generate 0.2% of GDP by 2026

In 2021, the country recorded 1.1 billion real-time transactions, which resulted in an estimated cost savings of \$484 million for businesses and consumers. This in turn helped to unlock \$394 million of additional economic output, which represents 0.1% of the country's GDP.

With real-time payment transaction numbers expected to rise to 3.6 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$637 million. That would help to generate an additional \$989 million of economic output, equivalent to 0.2% of the country's forecasted GDP.

Real-time payments in Malaysia have been available for many years through the Interbank Funds Transfer system. However, due to the limitations in the system, a new real-time payments system dubbed DuitNow was introduced by the national payments network and central infrastructure provider PayNet, in collaboration with ACI Worldwide, in December 2018. Unlike the previous system, which only supported transfers using account numbers, the new system also enables transfers using a recipient's mobile phone number or identification numbers.

In addition to fund transfers, the system also supports online payments, QR code-based in-store payments, and future-dated and recurring payments. Despite these developments, real-time payments account for just a 4.8% share of the total payments transaction volume in 2021 due to the traditional preference for paper-based payment instruments, which accounted for a 77.4% share.

However, the real-time payments volume will gradually increase at a CAGR of 26.9% from 2021-2026, supported by increasing consumer awareness, growing preference for mobile payments and multiple use cases of DuitNow. The COVID-19 pandemic also accelerated the shift towards electronic payments, which will further drive the adoption and use of real-time payments in the nation.



### ACI's Take

Malaysia is remarkable for the speed with which it has implemented nationwide real-time payments, and its rapid adoption by banks. Key to the achievement has been the concerted effort of government and the central bank to mandate that the whole banking community comply with ISO 20022 on a unified connector/gateway; this has served to harmonize the nation's payments structure.

a single platform/hub. By leveraging the ISO 20022-compliant transaction infrastructure already in place, the transition to a single process for both low and high-value payments will be fast and cost-effective. The chosen infrastructure for banks is currently on-premise payment hubs because of relatively low cloud maturity and the current lack of regulations governing cloud-based solutions.

Malaysia has followed an innovative route to real-time payments, stimulating high volumes of low-value payment transactions from the beginning. Identifying overall financial inclusion as a key driver, banks incentivized take-up with offers such as no fees for consumers on transfer of RM5000 and below. The second phase saw the incorporation of Request to Pay and real-time debit, to add further use cases alongside existing QR code payments, and improved interoperability between banks and different mobile wallet solutions.

The pace of development shows no signs of slowing. As noted last year, coming down the track are services such as consent management platforms for debits, KYC digital ID compatibility and cross-border payment with ASEAN real-time payment schemes such as Thailand's PromptPay. These prove that real-time payments support continuous innovation, and to remain competitive it is essential that participants invest in modernized, ISO 20022-compliant payment solutions capable of handling the convergence of consumer and corporate transactions. The central bank is also exploring the viability of central bank digital currencies, particularly as a way to reduce the cost of cross-border payments (a use case it has trialed with its counterparts in Singapore, Australia and South Africa).

The next phase will be the move into high-value payments for domestic and cross-border payments, where margins are higher for financial institutions. To avoid adding cost, however, the focus should be on consolidating low-value and high-value payments on

### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



### Shares of Volumes by Payments Instrument

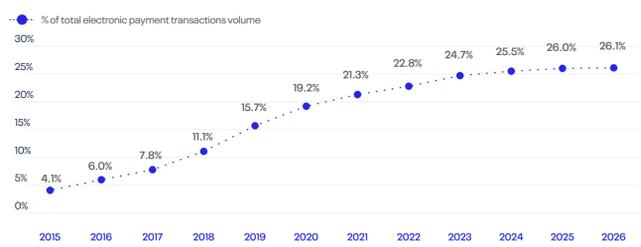
Paper-based payments Electronic payments Real-time payments



### Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



### Real-Time Transactions

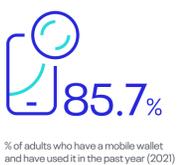


### History

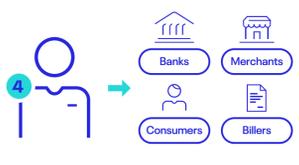


### Key Stats

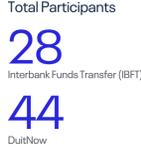
#### Mobile Wallet Trends



#### Real-Time Acceptance



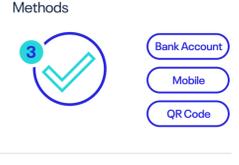
#### Real-Time Total Participants



#### Real-Time Payment Types



#### Initiation/Authorization Methods



### Fraud

Payments Fraud Rate: **22.2%**

Population who reported being a victim of fraud in the last 4 years

#### Top 3 Payment Fraud Types

% of fraud victims	Trend
22.5%	↓
14.0%	↓
11.7%	↑

Other: 11.7% (My card was lost or stolen)

#### Population Banking Level



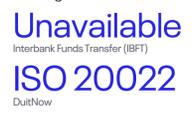
#### Year of Real-Time Payments Launch



#### Availability



#### Message Standard



### Cebr

Malaysia is an upper-middle-income country, at approximately the same level of prosperity as Greece or Turkey. In absolute terms, Malaysia ranked the 39th largest global economy in 2021 (Cebr World Economic League Table, 2022).

At the macroeconomic level, economy-wide efficiency gains are estimated to facilitate \$394 million of economic output (0.11% of formal GDP). This equates to the output of 16,505 jobs.

Looking forward to 2026, net efficiency savings for consumers and businesses are estimated to increase to \$637 million. The forecasted macroeconomic impact of real-time is estimated to be \$989 million of economic output (0.20% of formal GDP), equivalent to the output of 34,071 workers annually.

In recent years, adoption of real-time payments in Malaysia has been rapid in terms of transaction volumes, rising from a 3.3% share in 2020 to 4.8% in 2021, with forecasts suggesting further rises to 12.9% in 2026.

Led by the reduction in net payment system costs, total efficiency savings for consumers and businesses, through the use of real-time payments, generated benefits worth \$484 million in 2021. On a per-transaction basis, real-time payments in Malaysia had a 41% lower average payments cost, compared to non-instant payments, representing a \$422 million cost savings.

#### For Businesses and Consumers



#### GDP Growth



## Real-Time Payments Provide Huge Opportunity for Economic Growth

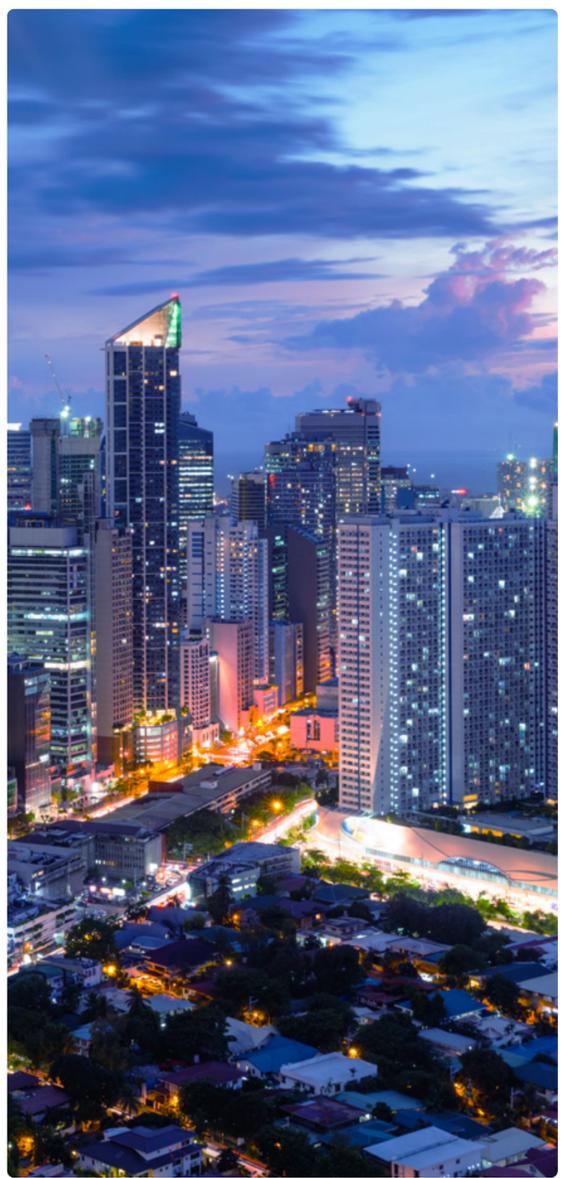
The Philippines introduced its real-time payments scheme, InstaPay (an interbank funds transfer service launched by Bangko Sentral ng Pilipinas), in 2018.

The country recorded 480 million real-time transactions in 2021, which resulted in an estimated cost savings of \$17 million for businesses and consumers. This in turn helped to unlock \$60 million of additional economic output, representing 0.02% of the country's GDP.

With real-time transactions forecast to rise to 1.9 billion in 2026, the Philippines' real-time payments system will begin to enjoy significant economies of scale that were out of reach in 2021. As a result, net savings for consumers and businesses are forecasted to climb substantially to \$2.2 billion in 2026, helping to generate an additional \$322 million of economic output, equivalent to 0.06% of the country's GDP.

However, the untapped economic potential of real-time payments in the Philippines still remains large. According to the Cebr, the theoretical impact of all payments being real-time could add 6.5% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

The Philippines' economy is still heavily connected to, and reliant on, paper-based transactions. In 2021, paper-based transactions represented a 98.7% share of payments volume, while for the same period real-time payments only represented 0.5% of payments volume. Real-time payments are expected to reach 2% by 2026. With the Philippines' geography separating the population within its archipelago, the availability of a real-time transfer system will likely have a significant impact on the economy, facilitating P2P and especially B2B transactions as they move away from paper-based payments, which are much less well-suited to facilitate commerce between islands. Currently InstaPay only works within the Philippines, but it is looking to collaborate with the Monetary Authority of Singapore to link InstaPay with Singapore's PayNow. This collaboration should facilitate real-time, cross-border payments between both countries at a cheaper rate than established remittance providers.



### ACI's Take

We have noted in previous reports that a degree of self-sufficiency characterizes the real-time payments scene in the Philippines. Transactions grew strongly after the launch in 2018 of the InstaPay electronic funds transfer system, and the conditions for growth exist — a population of 110 million, a high share of paper-based payments and accelerating adoption of digital wallets. However, the country's position at the lower end of ASEAN GDP has not attracted investment from international players. As a result, domestic players dominate the payments ecosystem.

infrastructure. This has resulted in inconsistencies in how some banks connect to the real-time rails, a situation not helped by the inharmonious way mandates are often rolled out. Overall, this tends to deter new entrants and make it harder to integrate the country's payments system with others in the region.

On the positive side, the progress made by neighboring countries clearly shows the way beyond low-value, through Request to Pay, to high-value transactions and cross-border harmonization. In due course, we expect the Philippines to become more active in regional payments modernizations, but in the short to medium term, there is a need for national mandates on standardizing connectivity and unifying payments messaging. These would enable domestic players to leverage the scale to increase efficiency and lower cost.

The volume of low-value payments is continuing to grow, boosted by the COVID-19 pandemic, with banks encouraging expanded domestic use cases and a growing number of domestic fintechs. But the innovations that will fuel further rapid growth are hindered by the toolkit approach taken by the banks, almost all of whom have built their own real-time

### Trends + Data



#### Cloud Management Platform



#### Infrastructure as a Service (IaaS)



#### Hybrid Cloud



#### Managed Cloud Service



#### Platform as a Service (PaaS)



#### Private Cloud



#### Software as a Service (SaaS)



### Shares of Volumes by Payments Instrument

Paper-based payments Electronic payments Real-time payments

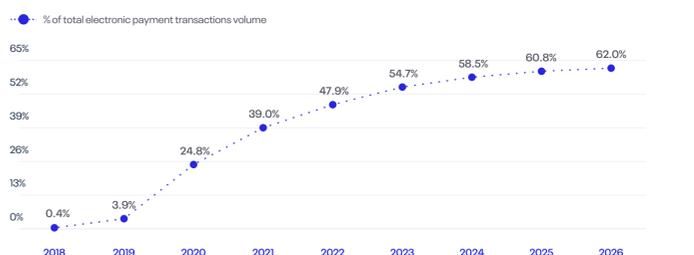
#### Transactions



#### Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2018-26f



#### Real-Time Transactions

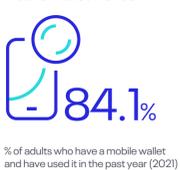


### History



### Key Stats

#### Mobile Wallet Trends



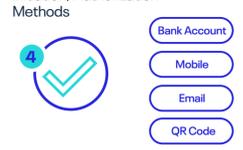
#### Real-Time Acceptance



#### Real-Time Payment Types



#### Initiation/Authorization Methods



#### Population Banking Level



#### Year of Real-Time Payments Launch



#### Availability



#### Message Standard



### Cebr

As of 2021, the Philippines is classified as a lower-middle-income country and the 37th largest global economy (Cebr World Economic League Table, 2022).

The 2021 payments mix of the Philippines was heavily dominated by cash, with 98.7% of all transactions made via paper-based payment methods. Despite its current low share of transaction volumes (0.5%), real-time payments are expected to grow to 2% in 2026.

As a result, the realized impacts are relatively low in comparison to other countries, although the unrealized potential benefits are significant. 2021 consumer- and business-level efficiency gains estimated to facilitate \$60 million of economic output (0.02% of formal GDP).

Within this, however, there was a small negative net cost of \$3.2 million as a result of higher real-time transaction costs due to indications that real-time payments are less efficient than paper-based payment methods. The high initial costs and low take up means that costs per transaction have yet to drop below paper-based transactions.

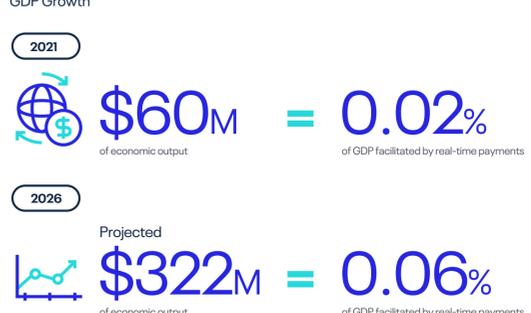
As real-time payments grow, the country will begin to enjoy economies of scale and see a sizeable reduction in net payment system costs. By 2026, we estimate that realized benefits for consumers and businesses will total \$2.2 billion, almost exclusively driven by net payment system cost savings. On a per transaction basis, Philippine real-time payments will have a 51.9% lower average payments cost, compared with non-real-time payments.

By 2026, the forecasted economy-wide impact of real-time payments is estimated to reach \$322 million of economic output, equivalent to the output of 28,838 workers. Therefore, if the Philippines can successfully integrate real-time transactions into its payments mix, it will be able to enjoy significant future economic benefits.

#### For Businesses and Consumers



#### GDP Growth



## Real-Time Payments Provide Huge Opportunity for Economic Growth

Singapore recorded 256 million real-time transactions in 2021 which resulted in an estimated cost savings of \$105 million for businesses and consumers. This in turn helped to unlock \$375 million of additional economic output, representing 0.10% of the country's GDP.

With real-time transactions set to rise to 603 million in 2026, net savings for consumers and businesses are forecasted to climb to \$231 million. That would help to generate an additional \$616 million of economic output, equivalent to 0.14% of the country's forecasted GDP.

According to the Cebr, the theoretical impact of all payments being real-time could add 2.1% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Singapore has two well developed real-time payment systems. The first is FAST, which was launched in 2014. FAST is an interbank funds transfer service that enables customers of participating banks to transfer funds from one bank to another. Its second is PayNow, which was launched in 2017. PayNow is a P2P instant funds transfer service built on existing FAST infrastructure. Electronic payments (excluding real-time payment transactions) are the main payments tool in Singapore, representing a 40.1% share of total payments spend, while real-time payments had 23.3% of the market share in 2021. But real-time payments are expected to overtake electronic payments (excluding real-time payment transactions) by 2026, as they will reach 54.8% market share of total payments spend, while electronic payments will fall to 27.8%. The Monetary Authority of Singapore is actively working on expanding the reach of PayNow by linking its platform to other real-time payment platforms in the region. In 2021, it linked PayNow to Thailand's PromptPay, which enabled cross-border transactions between both countries. Further platform linkage is expected for 2022 as it is planning to make similar connections with India's UPI and Malaysia's DuitNow. Due to the developing inter-regional linkages between real-time payment systems — which Singapore is heavily involved in — there is high growth potential both for the domestic and cross-border market in the near term.

### ACI's Take

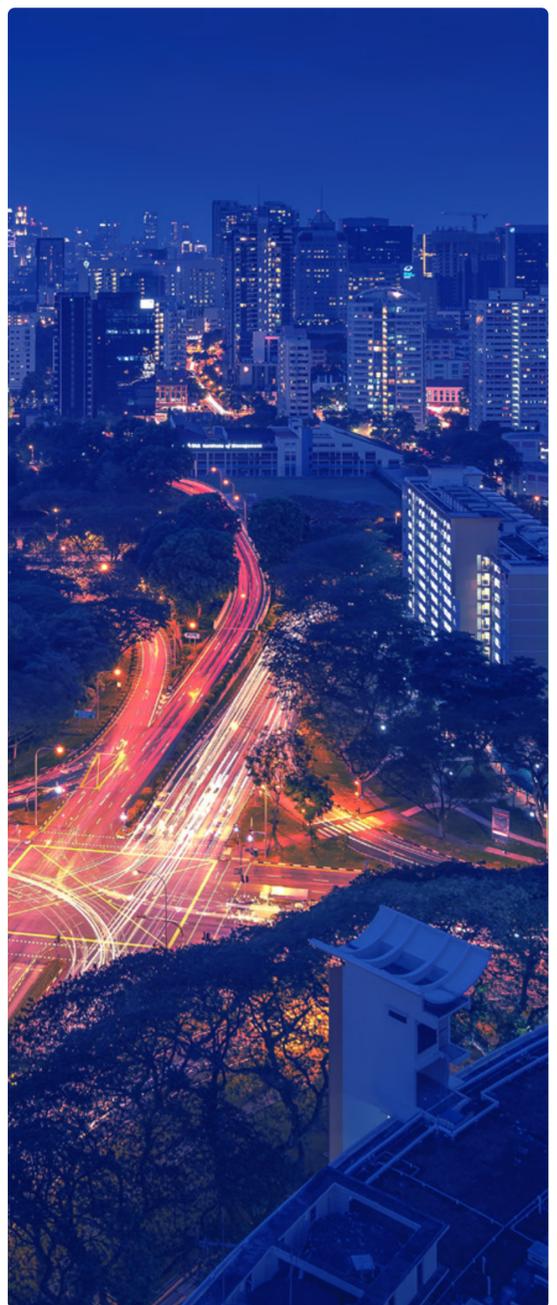
Despite a high reliance on debit, credit and charge cards, Singapore has taken to real-time payments with enthusiasm, leveraging the PayNow system for low-value consumer payments of all kinds. The Monetary Authority of Singapore is committed to cross-border expansion of PayNow and has concluded reciprocal interconnections between PayNow and the real-time payment systems in Thailand. Further connections are planned with Malaysia and India in 2022.

With a population of just 5.7 million, connections to international markets via a stable high-value cross-border payments infrastructure is essential to Singapore's economy and to the long-term growth prospects for real-time payments. To that end, the market's banks are around two years into a wide-ranging modernization of these systems, with most now focused on transforming disparate legacy systems to converge low-value and high-value payments onto a single, ISO 20022-compliant platform.

Unlike the infrastructure they're replacing, which tends to be a single vendor's software installed in a bank's data center, this new generation of payment hubs will be a collection of best-in-class services

aligned to a wider payments strategy. Their role will be a demanding one, simultaneously expected to cost-effectively service both legacy systems and modern payment types and standards. As such, solving for these challenges in the present and ensuring they are less of an issue in the future will require cloud-native, services-based architectures, deployed either in the private or public cloud as regulations dictate. And that will demand partners well-versed in supporting an ecosystem of technologies that can be combined and reconfigured in response to regularly changing requirements.

Looking further ahead, Singapore is one of the region's most active drivers of Central Bank Digital Currency (CBDC) trials. One example is its participation in the Project Dunbar trials of CBDC cross-border payments between Australia, Malaysia and South Africa. Although these developments have a long time horizon before they enter into common use, financial institutions' payments modernization strategies must reflect the fact that retail and wholesale CBDC payments are a likely feature of the future of payments.



### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

Transactions



Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



### Real-Time Transactions

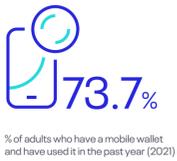


### History

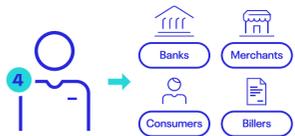


### Key Stats

#### Mobile Wallet Trends



#### Real-Time Acceptance



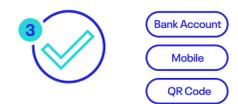
#### Real-Time Total Participants

29

#### Real-Time Payment Types



#### Initiation/Authorization Methods



#### Population Banking Level



#### Year of Real-Time Payments Launch

2014

#### Availability



#### Message Standard

ISO 20022

### Cebr

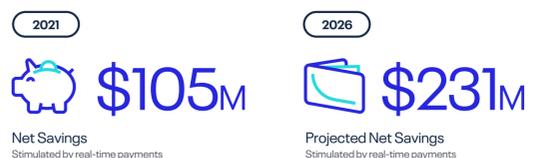
Singapore features among the world's most competitive economies. It is one of the four Asian Tiger economies and has seen consistently high levels of economic growth over the last four decades. It is a high-income country and ranked the 38th largest global economy in 2021 (Cebr World Economic League Table, 2022).

Of the \$105 million in consumer- and business-level benefits in 2021, real-time payments generated the largest agent-level economic impact through a reduction in the payments float, which unlocks working capital for businesses. Based on current real-time adoption rates in Singapore, real-time payments unlocked a total transaction value of \$866.9 million per day in 2021 through reduced float time. This working capital subsequently facilitated an estimated \$74.9 million of business output.

In 2021, economy-wide efficiency gains were estimated to facilitate \$375 million of economic output (0.1% of formal GDP). The country has a reasonably well-established real-time payments infrastructure with the first of two schemes launching in 2014.

Based on current real-time adoption forecasts, real-time payments will account for 15.5% of all transactions in 2026. Total annual realized consumer and business benefits are estimated to more than double to \$231 million. Economy-wide output supported by real-time payments is estimated to rise to \$616 million in 2026 (0.14% of forecasted formal GDP), equivalent to the output of 5,122 workers.

#### For Businesses and Consumers



#### GDP Growth



## Real-Time Payments Forecasted to Help Generate 0.32% of GDP by 2026

South Korea has a well-developed real-time payments infrastructure, which was introduced in 1988.

In 2021, the country recorded 7.3 billion real-time transactions, which resulted in an estimated cost savings of \$2 billion for businesses and consumers. This in turn helped to unlock \$8 billion of additional economic output, which represents 0.44% of the country's GDP.

With real-time payment transaction numbers expected to rise to 11.3 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$3.1 billion. That would help to generate an additional \$6.7 billion of economic output, equivalent to 0.32% of the country's GDP. (The expected reduction in economic output generated compared to 2021 reflects a natural decline in the informal sector of the economy, resulting in reduced relative scope for real-time payments to make an impact.)

In 2021, South Korea was the third ranked country for total volume of real-time payments with 6 billion payments volume processed, after China and India. In 2021, real-time payments represented an 18% share of total payments volume, and its share of payments spend was at 80.9%. Real-time payments are thus mainly being used for more expensive transactions than daily expenditures, but with paper-based transactions expected to decline by half, going from 16.2% to 8% between 2021 and 2026, real-time payments are expected to benefit from this change. The transition away from paper-based instruments will also likely bolster spending in general, as has been seen worldwide as share of cash decline.

### ACI's Take

The South Korean market is highly proprietary. While real-time payments have been in place for many years, they are domestic in focus, based on legacy infrastructure and therefore non-ISO 20022-compliant. Korea Financial Telecoms & Clearing (KTFC) runs the low-value system and Bank of Korea the high-value system.

Open banking was launched in 2019 and, coupled with the government's proactive approach to accelerating digital payments adoption, has created a competitive environment for low-value transactions. Banks, fintechs and card companies, along with the major social media businesses, have transformed into PSPs offering a diverse range of services to customers and consumers. Because the latter can, and do, switch easily between PSPs, it is important for legacy players to understand consumers' needs in creating new services and products.

The COVID-19 pandemic boosted both domestic digital payments and demand for cross-border access to other countries' payment systems. This means that the next phase in South Korea's payments

modernization journey — cross-border expansion of C2B, B2B and B2C payments — will require an ISO 20022 gateway for South Korea to integrate with the counter countries. Acceleration in cross-border payments should also follow conclusion of the Regional Comprehensive Economic Partnership free trade agreement between ASEAN, Pacific and North Asian countries.

The challenge that payment technology providers face in gaining a foothold in the next phase is posed by the substantial in-house IT arms that South Korean banks and fintechs possess. This gives them confidence that they can develop their own platforms, and makes it imperative that providers make a persuasive argument to justify the cost of what they bring to the modernization table. They can do this by positioning themselves as not only technology providers but also as business enablers committed to facilitating growth in the ASEAN community as a whole. Vendors that are members of the Asian Payment Network, for example, have a broad overview of regional and global trends with which domestic players cannot compete.



### Trends + Data



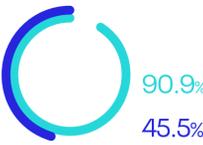
Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



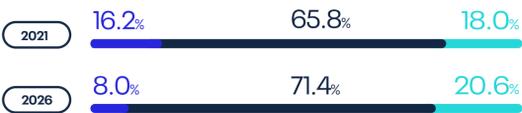
Software as a Service (SaaS)



### Shares of Volumes by Payments Instrument

Paper-based payments Electronic payments Real-time payments

Transactions

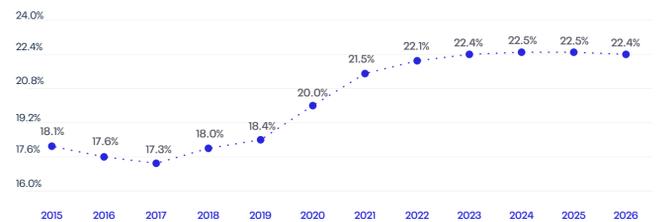


Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f

% of total electronic payment transactions volume



### Real-Time Transactions

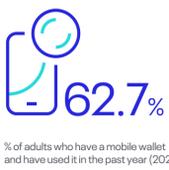


### History

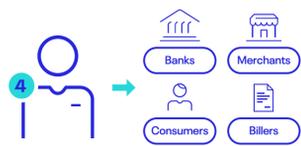


### Key Stats

#### Mobile Wallet Trends



#### Real-Time Acceptance



#### Real-Time Total Participants

All Domestic Banks  
CD/ATM  
61  
Electronic Banking System (EBS)

#### Real-Time Payment Types



#### Initiation/Authorization Methods



### Fraud

Payments Fraud Rate: 6.3%  
Population who reported being a victim of fraud in the last 4 years

### Top 3 Payment Fraud Types

Type	% of fraud victims	Trend
Confidence trick	24.2%	↓
Identity theft	18.2%	↑
Bank account hacked	12.1%	↑

#### Population Banking Level



#### Year of Real-Time Payments Launch

1988 CD/ATM  
2001 Electronic Banking System (EBS)

#### Availability

365 24/7

#### Message Standard

Proprietary

### Cebr

South Korea is a high-income economy. Alongside Singapore, Taiwan and Hong Kong (Special Administrative Region), it is one of the four Asian Tiger economies, characterized by significant economic growth between the 1960s and 1990s. Today, it ranks as the 10th largest global economy (Cebr World Economic League Table, 2022).

South Korea is one of three countries in the analysis which has lower macroeconomic impact forecasts for 2026. This is driven by a number of factors: The fact that between 2021 and 2026 the share of real-time payments is forecasted to grow relatively minimally at the same time as the share of paper-based payments is decreasing substantially by 2026, and the fact that the relative size of the informal economy is decreasing organically between 2021 and 2026. Combined, the result is that the potential for real-time payments to impact the informal economy in 2026 compared to 2021 is more limited, and as a result the overall impact of real-time payments is reduced. In 2021, net benefits for consumers and businesses of real-time payments hit \$2 billion. The largest component of this was net savings through a reduction in the payments float, which unlocks working capital for businesses. Based on 2021 real-time adoption levels, instant payments unlocked a total daily transaction value of \$104.1 billion, through reduced float time. This working capital facilitated an estimated \$1.2 billion of business output in the same year.

The macroeconomic benefits in 2021 under current real-time payment adoption rates were estimated at \$8 billion of economic output, or 0.44% of formal GDP. This is equivalent to the annual output supported by 120,199 workers. In absolute terms, this economic impact is the third largest across our sample, trailing only China and India.

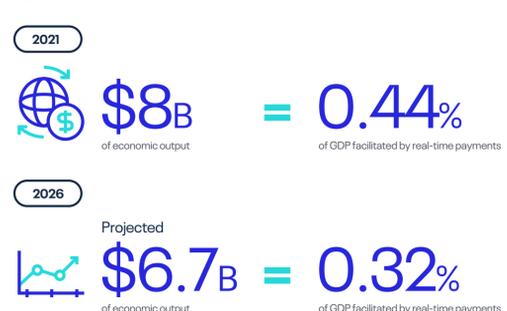
The large benefits in 2021 may be a result of real-time payments in South Korea dating back to the late 1980s. Real-time payments in 2021 are typically high value, accounting for 80.9% of total spend from just 18% of total transaction volumes.

Based on 2026 real-time adoption estimates, consumer- and business-level benefits are forecasted to rise to \$3.1 billion. By 2026, it is estimated that 0.32% of economic output, \$6.7 billion, will be underpinned by efficiency savings as a result of real-time payments, equivalent to the productive capacity of 90,088 workers.

#### For Businesses and Consumers



#### GDP Growth



Taiwan was one of the earliest countries to adopt real-time payments. Currently, there are two real-time payment schemes operating in the country under Financial Information Service Company (FISC) — a multipurpose funds transfer system that processes a range of electronic fund transfers through several sub-systems. While the Interbank ATM funds transfer system allows customers to conduct various transactions, including fund transfers and payments in real-time at ATMs and via online banking channels, Financial XML facilitates interbank fund transfers between businesses in real time. Despite the availability of real-time payments since 1987, they still accounted for just 7% of the total payments transaction volume in 2021. This can be attributed to limited use cases of current real-time payments and increasing popularity of payment cards and mobile wallets. Future prospects for real-time payments look timid, with real-time volume share expected to reach 11.7% in 2026 as the use cases for real-time payments in the country are still not focused around low-volume, everyday expenditures.



## ACI's Take

There is great scope for real-time payments to break through in Taiwan, where cash and credit card usage are widespread, and mobile wallet uptake is high. Although the government wants to expand digital payments, low-value payments are still generally cash-based, one reason being merchants' general resistance to any sort of transaction fee. What low-value payments support that does exist does not comply with ISO 20022 and so does not enable cross-border payments.

Similarly in Japan and China, as consumers and businesses demand cheaper and faster cross-border payments, driving real-time capabilities and ISO-compliance will become more pressing. Indeed, the market relies on SWIFT for cross-border payments today, so banks will be required to be able to send and receive ISO 20022 messages by November 2025.

This change throws into relief the dated XML messaging format underpinning Taiwan's B2B interbank real-time infrastructure. Banks should take the opportunity of onboarding yet another new payment type to bring low- and high-value real-time payments into a single process. With legacy payment types and messaging formats still needing to be supported, however, it will not be a simple case of just replacing today's infrastructure. Instead, they will need to create a hybrid environment consisting of existing, "safe" capabilities and newer solutions consumed as a service from the cloud (or supported in a similar way on premise).

However, there are a handful of positive developments in the market including the fact that a number of digital-only banks have launched, with more to come. These banks are likely to invest in creating unique digital payment use cases of which they can take ownership in order to draw market share away from the incumbents (though some of the established banks have been quick to follow suit with digital-only sub-brands). The experiences of markets elsewhere in the region show that, as these players develop services and use cases that respond more directly to consumers' needs, real-time payments will eventually come to be seen as a more convenient payments option than cards.

## Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



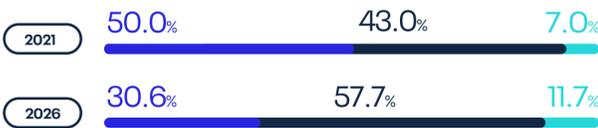
Software as a Service (SaaS)



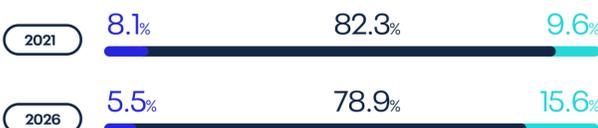
## Shares of Volumes by Payments Instrument

Paper-based payments Electronic payments Real-time payments

Transactions

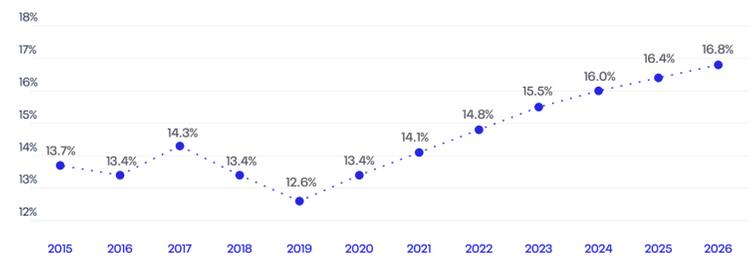


Spend (USD)



## Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f

% of total electronic payment transactions volume



## Real-Time Transactions



## History

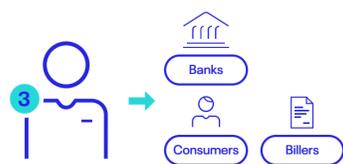


## Key Stats

Mobile Wallet Trends



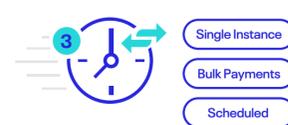
Real-Time Acceptance



Real-Time Total Participants



Real-Time Payment Types



Initiation/Authorization Methods



### Fraud

Payments Fraud Rate

**7.2%**

Population who reported being a victim of fraud in the last 4 years

Top 3 Payment Fraud Types

% of fraud victims	Trend
<b>22.2%</b> Card details stolen/skimmed in person	↑
<b>16.7%</b> Bank account hacked	↑
<b>16.7%</b> Other	↓

Population Banking Level



Year of Real-Time Payments Launch



Availability



Message Standard

Proprietary

# Real-Time Payments Forecasted to Help Generate 2.08% of GDP by 2026

Thailand is a real-time payments success story and has a more mature real-time payments infrastructure compared to Western countries like the U.S. and the U.K. Of all countries covered in the Cebr economic impact study, by 2026 Thailand has the second largest forecasted GDP facilitated by real-time payments in percentage terms (2.08%).

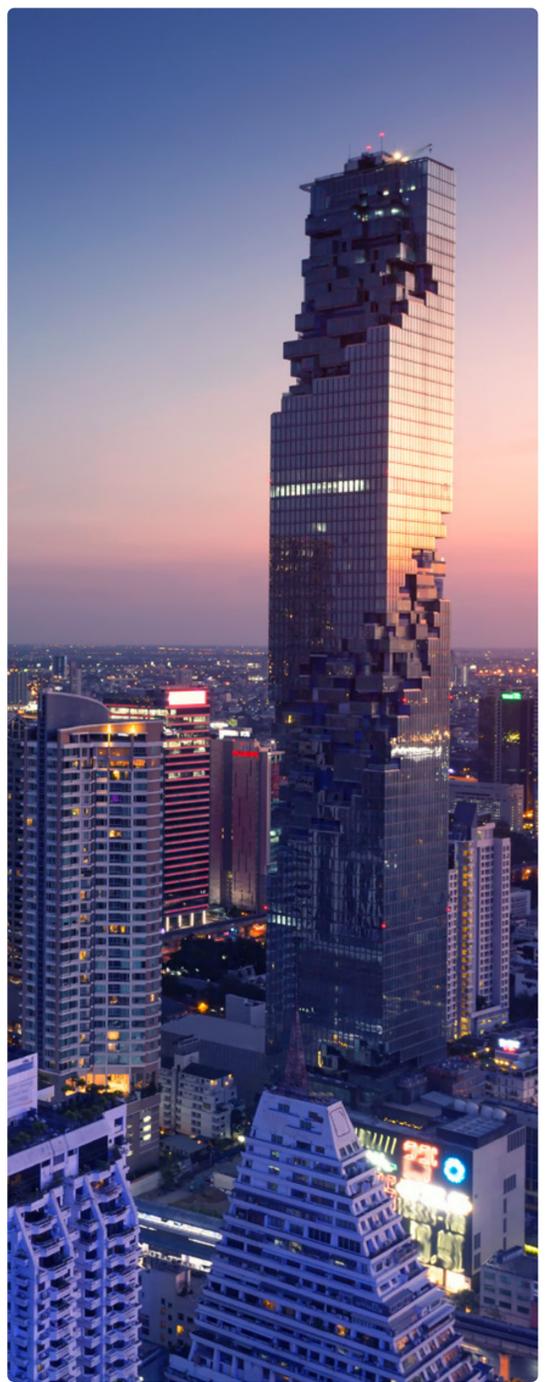
In 2021, Thailand recorded 9.7 billion real-time transactions, the fourth leading country in the world. The widespread adoption of real-time payments resulted in an estimated cost savings of \$1.3 billion for businesses and consumers in 2021, which helped to unlock \$6 billion of additional economic output. That in turn represents 1.12% of the country's GDP.

With real-time payment transaction numbers expected to rise to 25.7 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$3.9 billion. That would help to generate an additional \$13.4 billion of economic output, equivalent to 2.08% of the country's forecasted GDP.

In 2018, Thailand launched its own real-time payments platform called PromptPay to promote financial inclusion in the country. In 2021, 24.7% of total payments volume were transacted through its real-time payments network, making it the second most popular payments tool in Thailand after paper-based payments, which represented a 58.3% share of total payments volume. The real-time payments network's share of volume is projected to grow at a CAGR of 21.5% between 2021 and 2026, and by 2026 it is expected to reach 47.2%, making it the main payments tool in terms of transaction volume. The adoption of PromptPay was pushed by the large presence of mobile phones within the country. Thailand, along with other ASEAN countries, is actively working on creating a regional real-time payments network by connecting their real-time payment platforms.

This strategy will create interoperability among those connected platforms, which should enable them to provide real-time, cross-border transactions. This is likely to shift international transfers from the traditional remittance providers in Thailand. Thailand's PromptPay was officially linked with Singapore's PayNow and Malaysia's DuitNow in 2021. As of December 2020, 56.2 million PromptPay IDs were registered, which represents 80.5% of the country's population.

These linkages — and the developing trade linkages within the ASEAN region they are designed to facilitate — will make this region a hub for electronic payments in the near term. This region is clearly one to watch in terms of real-time payments-driven economic development.



### ACI's Take

A key ASEAN economy, Thailand's well-executed strategy for real-time payments implementation has delivered the fastest expansion of low-value payment capabilities in ASEAN. Real-time payments are widely available and consumers can choose from a variety of ways to initiate and pay for transactions. Features such as Request-to Pay and QR codes are already in place, and the population has enthusiastically adopted digital overlay services. PromptPay, for example, uses a database of aliases — emails, phone numbers and ID numbers — for P2P, P2C and C2B payments.

National ITMX, co-owned by the largest banks and governed by the Central Bank of Thailand (BOT), has the responsibility for developing the digital payments structure. It has successfully completed the modernization of legacy bulk payments infrastructure onto next-generation ISO 20022 B2B bulk payments infrastructure.

However, remaining traditional infrastructure still poses challenges to the market in terms of the ability to handle the growing volumes of both low-value and B2B transactions. While some leading banks are exploring on-premise ISO 20022-compliant systems that leverage cloud-like development best practices, others are behind the curve. By way of incentive to double down on their efforts, other markets have shown the importance of modernizing systems using proven, modular solutions that enable financial institutions to "turn on" capabilities as required, as they transition from low-value to high-value payments (and even beyond, to Central Bank Digital Currencies). Just 1,600km to the south, the Malaysian success of RPP is an excellent template for Thailand to follow in its migration from legacy platforms to ISO 20022 infrastructure.

### Trends + Data



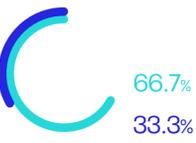
Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



### Shares of Volumes by Payments Instrument

- Paper-based payments
- Electronic payments
- Real-time payments

Transactions



Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2017-26f



Real-Time Transactions

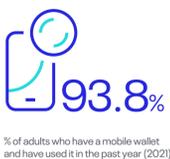


### History



### Key Stats

#### Mobile Wallet Trends



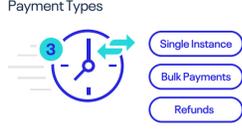
#### Real-Time Acceptance



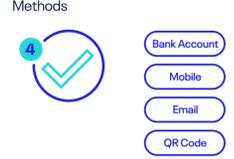
#### Real-Time Total Participants



#### Real-Time Payment Types



#### Initiation/Authorization Methods



### Fraud

Payments Fraud Rate: **28.6%**

Population who reported being a victim of fraud in the last 4 years

#### Top 3 Payment Fraud Types

Type	% of fraud victims	Trend
My card was lost or stolen	25.9%	↑
Confidence trick	15.4%	↓
Card details stolen/skimmed in person	13.3%	↑

#### Population Banking Level



#### Year of Real-Time Payments Launch



#### Availability



#### Message Standard



### Cebr

As of 2021, Thailand is an upper-middle-income country, having seen strong growth rates over the last few decades. Indeed, its economic growth has pulled millions out of poverty, resulting in it being hailed a development success story. As of 2021, it is the 26th largest global economy (Cebr World Economic League Table, 2022).

The macroeconomic benefit of real-time payments is predominantly driven by the formalization of informal economic activity. Real-time payments have the potential to directly address this through transparency and displacement of paper-based transactions, contributing to long-term economic growth in Thailand.

In volume terms, 24.7% of transactions were executed through its real-time payments infrastructure in 2021, the third largest percentage of Cebr's 30-country economic impact assessment, trailing only Bahrain and India. In 2021, the total economy-wide impact generated by real-time payments stood at \$6 billion, or the equivalent output of 430,960 workers. This equates to 1.12% of formal GDP, the largest realized share within our 2021 analysis. This macroeconomic benefit is supported by consumer and business benefits to the sum of \$1.3 billion.

Based on forecasted real-time adoption volumes, Cebr estimates that by 2026, Thailand is set to benefit from an additional \$13 billion of output that would have otherwise occurred outside of the formal institutional and bureaucratic frameworks. Ultimately, the forecasted macroeconomic benefits in 2026 are estimated to be \$13.4 billion of formal economic output (2.08% of formal GDP) facilitated by real-time payments, equivalent to the output of 789,359 workers. In 2026, total consumer and business benefits are estimated to be worth \$3.9 billion.

#### For Businesses and Consumers



#### GDP Growth





## Cebr

As of 2021, Vietnam had the 41st largest economy in the world with an estimated PPP adjusted GDP per capita of \$11,608 (Cebr World Economic League Table, 2022).

Vietnam's economic growth story has been nothing short of a miracle, with the Doi Moi reform period in the mid 1980s, coupled with favorable global trends, enabling the nation to achieve rapid economic growth, and propelling the country from a poor country to a lower-middle-class country.

Vietnam does currently have a central real-time payments infrastructure that was launched by NAPAS, the National Payment Corporation of Vietnam, in 2020. This system provides a 24/7, near-real-time interbank funds transfer service across Vietnam.

However, data availability on the usage of this is very limited, and we are only able to estimate the payments mix for 2021, while solely disaggregating between paper-based payments and electronic payments (including those which are real-time). As real-time payments were unable to be stripped out, the economic impacts are exclusively presented for the maximum attainable benefits in 2021.

The country has a population fast approaching 100 million and more than 4.6 billion transactions in 2021 (78.9% of which are already electronic).

Consequently, the potential unrealized benefits are the key areas for Vietnamese policymakers to look to take advantage of by increasing real-time payments take-up rates.

We estimate that there is a theoretical maximum of \$1.2 billion in business- and consumer-level benefits that Vietnam can unlock in 2021, supporting 2.2% of formal GDP (\$8,311 of economic output, which is equivalent to the support of 1.2 million jobs).

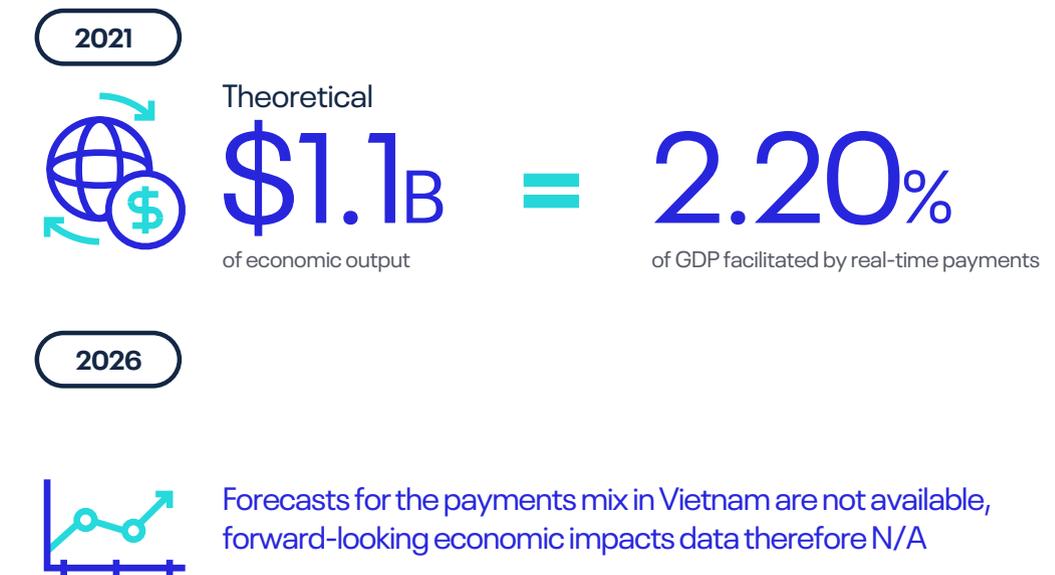
This is predominantly driven by the potential of real-time payments to reduce the size of the informal economy and formalize significant portions of economic activity. In Vietnam, we estimate that \$7.9 billion of currently informal output could be shifted to the licit economy under 100% real-time payments usage.

We do not have forecasts for the payments mix in Vietnam in 2026; therefore, we are unable to present these forward-looking economic impacts, as with other countries, within the scope of our research. However, as seen by the potential impacts of full real-time utilization in 2021, there is significant potential for the benefits of real-time payments to facilitate further economic prosperity in the country.

## For Businesses and Consumers



## GDP Growth



# Europe

## Regional Spotlight

### Payment Trends To Watch In 2022

### Payments Fraud Viewpoint

Austria

Belgium

Croatia

Czech Republic

Denmark

Finland

France

Germany

Greece

Hungary

Ireland

Italy

Netherlands

Norway

Poland

Portugal

Spain

Sweden

Switzerland

Turkey

United Kingdom

## Regional Spotlight

# Critical Mass of Adoption Heralds a New Era in Real-Time Payments

Author: Nick Craig, Senior Vice President, Head of Europe - ACI Worldwide

**Europe is entering a new era of critical mass in real-time payments. After decades of adoption, strong growth continues and there remains ample room for this to continue, given the still-high use of cash in the region.**

The implications of this for the region's financial institutions mean that these services can no longer be approached tentatively: the performance and availability of real-time payments now has a significant impact on customer experience, and therefore, revenue.

In short, resiliency, efficiency and agility are the order of the day. Financial institutions must solidify the business case for real-time payments while refreshing their modernization strategies and driving persistent fraud out of the system. Higher volumes must be processed more dependably and securely, at a lower cost. Added-value services must also be made easier to integrate and cheaper to manage.

### Real-time payments' value lies in experiences, not immediacy

No wonder, then, that questions around how to build reliable systems with appropriate backups and redundancies are high in the minds of banks and payment players. They are also braced for imminent regulatory interventions in response to escalating problems with authorized push payment (APP) scams, as insiders report that losses for individual financial institutions are running into the millions of pounds a day. [\(See our Payments Fraud Viewpoint on page 32.\)](#)

However, even these concerns are superseded by a lack of clarity around the business case for real-time payments. Financial institutions in the region were quick to get into real-time payments to stay relevant and competitive in the face of changing customer expectations. But they have been slower to recognize that the highest revenue potential for real-time payments lies not in immediacy, but in the experiences it enables. From value-added services such as Request to Pay (R2P) and eInvoicing, the immediate transfer of funds presents myriad opportunities to add greater value to payments.

France's eInvoice mandate shows the region's direction of travel, but the prevalence of on-premise solutions means it is difficult for

almost any of the region's banks to quickly create value-added services. This infrastructure was conceived of, deployed and then managed from the standpoint of supporting a payment type, not the experiences that would be overlaid on top.

The result is that the region has only begun to scratch the surface of its world-leading open banking framework, and we must look abroad for examples of more mature thinking beyond the speed of real-time payments. Malaysia and India, for example, have shown how critical mass can be turned into a thriving ecosystem of embedded finance applications. And Asia's real-time-based, mobile-first ecosystems should be an inspiration to European financial institutions and regulators.

### Scheme refreshes add to cost pressures on financial institutions

Much of this is taking place against the backdrop of real-time scheme refreshes, the most significant of which is the U.K.'s New Payments Architecture (NPA). This will provide simpler access for increased participation, boost ongoing stability and resiliency, and increase innovation through greater competition. It will also enhance security and adaptability. These changes are welcome, but they create additional considerations for banks when it comes to the cost of supporting them, and there are questions around the role of banks' aging on-premises infrastructure.

So, with the cost of change already high, and more change coming, partners must be found that have global experience of standing up successful real-time payment businesses and a broad ecosystem of solutions and services. Existing infrastructure doesn't automatically need replacing, but it must be kept relevant and combined with hosted solutions and managed services. The resulting hybrid architecture of best-in-class services and infrastructures will enable financial institutions to design a payments strategy around outcomes and experiences — not the speeds and feeds of processing — and with the requisite agility to make future change simpler to respond to.



### Ongoing uncertainty places further premiums on resiliency, agility and efficiency

Near-term, this enhanced agility will enable the accelerated consolidation of payment types into the real-time payments infrastructure to improve efficiency. It will also help with responding to future regulatory interventions around escalating APP scams. (This is an emerging issue, but we should expect new requirements focusing on screening both the send and the receiving sides of transactions.)

But, longer term, there are signs that this agility could be called into action in some even more disruptive ways. If we play out today's market developments five or ten years ahead, there seems little reason to assume that the payment rails of today will be the payment rails of the future.

As open banking matures and related innovations allow for direct connections to the payment rails, is it a case of when and not if real-time payments bypass traditional payment mechanisms and players? Indeed, towards the end of 2021, Amazon's announcement that it would stop accepting U.K.-issued Visa credit cards in a dispute over fees could be read as a big bet by a major player on a world beyond traditional payment infrastructures.

However the future shakes out, this new era of payments will have some big losers and some very unexpected winners. And so, with high uncertainty over how the market will evolve and who the competition will be, agility at scale and backed by resiliency will remain prized capabilities for many years to come.



# European Institutions Must Work Together To Defeat Real-Time Payments Fraud

Author: Jay Floyd, Senior Principal Fraud Consultant - ACI Worldwide

**As plastic fraud becomes harder to do, criminals are shifting their focus to authorized push payment (APP) scams that leverage real-time payment schemes. Financial institutions must modernize their technology and their thinking if they are to stem the tide.**

European financial institutions are in some ways becoming victims of their own success in driving down card fraud. Certainly, there remain risks, especially around contactless transactions if a criminal steals a wallet full of cards. But liability shifts around magnetic stripes, and the introduction of the 3D Secure 2.2 protocol and other SCA technologies to accommodate PSD2, have made systematic plastic fraud harder to perpetrate.

In response, however, these criminals are increasingly targeting real-time payment schemes with APP scams. Indeed, in the U.K., H1 2021 was the first time non-plastic fraud losses exceeded card fraud losses.<sup>1</sup>

These scams can be hard for financial institutions to stop since the genuine customer is the one that is pushing the payments. And they come in all shapes and sizes, from CEO fraud (impersonating senior executives and targeting employees) to dating and invoice fraud.

The incentives to respond are multiplying all the time. The commercial impact is huge — especially given real-time payments' thinner margins. And with duped customers and companies sometimes losing huge sums of money, and the media mobilizing in support of vulnerable groups, banks' reputations (and share prices) are at risk, too. Institutions need to ensure they are investing in the right processes, technology and

people to tackle APP fraud. The confirmation of payee initiative in the U.K. is an example of one approach banks can use to warn customers of possible fraud. Financial institutions should be much more rigorous in their KYC processes that include regular KYC checks to prevent accounts (known as mule accounts) from being opened, or existing accounts from being taken over by fraudsters to which they send money and then disperse that money into numerous other accounts or simply withdraw cash.

But, ultimately, successfully tackling today's fraud requires two things to change: regulators must adopt a more proactive attitude and financial institutions must get better at cooperating (including data sharing). With regards to the former, banks are getting hit hard by these scams. It's disappointing that the industry hasn't been able to mitigate these issues between themselves, but the absence of timely and robust assertive guidance and initiatives from regulators has, to date, almost certainly not helped. Yes, banks need to work better together to stop fraud, rather than simply diverting it towards institutions with weaker controls. But it's time for regulators across the board to lay down some concrete expectations that the industry can work with.

As far as cooperation and data sharing goes, banks are still using a lot of legacy technology with data held in silos. Implementing modern enterprise fraud



solutions would enable data aggregation across divisions for a more complete picture of the customer and the transaction. If a customer is buying a coffee in Geneva with a contactless card, but accessing their online banking from Berlin 20 minutes later, at least one of those transactions is illegitimate. Most consumers would be surprised to learn their bank is unable to detect legitimate versus illegitimate transactions, given the multi-channel experiences they enjoy elsewhere.

Each bank can only see what's going out and coming into their own accounts, so perhaps there's a greater role here to play for central infrastructures, as the nexus for greater collaboration is enabled by network intelligence technology. Based on federated machine learning, [network intelligence](#) facilitates the real-time

exchange of machine-readable fraud signals without exposing the underlying data. This enables machine learning algorithms to learn from more data and so makes them more effective.

Ultimately, as we're seeing today, fraud is too big for any one institution to tackle alone. To defeat it will require much more cooperation across Europe, and a new culture of shared intelligence.

<sup>1</sup> <https://www.ukfinance.org.uk/system/files/Half-year-fraud-update-2021-FINAL.pdf>

# European Trends in Payments To Watch For in 2022



Author: Amelia Ruiz Heras, Director of Solution Consulting - ACI Worldwide

**With increasing convergence across payment methods and technologies, some wider trends in eCommerce and banking will have an impact on real-time payments.**

## Pandemic habits are here to stay

The COVID-19 pandemic has had an enormous impact on the way that people shop and pay. In many cases, the new practices are more convenient for customers, and so are unlikely to be reversed. For example, to minimize the risk of the virus spreading on cash, contactless payments have become the first choice of both retailers and customers. Online shopping, especially for groceries, saw huge growth during lockdowns and retains its popularity now.

## Mobile becomes more than banking

COVID also forced banks to find new ways to stay close to customers, inspiring many banks to level up their mobile offerings beyond banking functions to offer additional services such as end-of-life financial planning. Having seen that many customers prefer these channels, banks will continue to invest in them. For instance, the mobile phone is becoming the new branch.

## Physical and digital payment habits converge

With the accelerated adoption of contactless and mobile banking, more and more payments are cashless. This will usher in further growth in real-time payment volumes by blending physical and digital payment habits to create more consistent experiences between offline and online channels.

For example, some stores are pioneering cashless payments to make their in-store customer experience more convenient and closer to their online one. Retailers are also experimenting with allowing customers to scan items into a digital trolley and leave the store without having to go through a queue and checkout process.

## Real-time credit

Obtaining credit used to be a slow process, but now companies such as Klarna are popularizing the concept of buy now, pay later (BNPL). Although it's possible retailers will introduce BNPL in their stores, for now its popularity among younger audiences helps

to drive a preference for digital channels and specific retailers. These use cases also help eCommerce retailers replicate some of the better in-store experiences by, for example, enabling customers to order several items of clothing to try on and return before they have to part with any money.

Credit from retailers has traditionally been available for big-ticket items, such as televisions. Now, consumers can get credit simply for a pack of toothbrushes.

While inappropriate credit can lead people into debt, real-time schemes such as Klarna decide at the digital checkout whether you should be offered credit based on your track record.

This unlocks spending power that was not available previously, which will help to fuel real-time payments growth in the future and drive economic prosperity.

## Central bank digital currencies (CBDCs)

There is increasing interest from central banks in introducing digital currencies. The European Central Bank (ECB) has started an investigation into the design and distribution of the digital euro, which will run through 2022 and much of 2023. This follows experimentation work that identified no major technical obstacles. Sweden has been working on the e-krona since 2017, and the Bank of England will launch a consultation on digital currency in 2022.

For digital currencies, the natural way to make payments will be using real-time rails, and mobile banking apps are likely to play a vital role.

## Adoption of ISO 20022 and real-time payments

Across Europe, there are a number of initiatives based on ISO 20022 for real-time payments. In the U.K., there is the New Payments Architecture (NPA), P27 in the Nordic region and the EU is pushing on with the European Payments Initiative (EPI). This is in addition to the ISO 20022 initiatives for high-value and cross-border payments from the European Central Bank, Euro Banking Association, SWIFT and other global systems.



Using ISO 20022 will improve cross-border and regional connectivity and enable additional data frames that can be used to build new services.

## Request to Pay

While Request to Pay (R2P) is already established and widely used in countries such as India, it is still in its infancy in Europe. Nevertheless, it is an important use case for driving real-time payments adoption in the C2B payments world. R2P will enable payment players to add value to their corporate customers by making it cheaper and easier for them to collect payments, and contribute to a more seamless customer experience.

## Technology considerations

Faced with so much change in the payments industry, many financial institutions are finding that their technology cannot keep up. Legacy architectures are not flexible and will struggle to accommodate new initiatives, such as EPI or strong customer authentication (SCA). The deadline for SCA was extended at the behest of many financial institutions that were challenged by the original timeline. These kinds of blockers on innovation are increasingly unsustainable in a digital-first world. Banks need to respond by shifting to cloud-based managed services and adopting more of a service-based paradigm.

**“Schemes such as Klarna unlock spending power that was not available previously, which will help to fuel real-time payments growth in the future and drive economic prosperity.”**

<sup>1</sup> <https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210714~d99198ea23.en.html>

Austria was among the first countries to adopt the pan-European SCT Inst scheme in November 2017. Although adoption remained slow initially, Austria observed increased participation from banks and payment service providers over the years, to 425 participants by December 2021, the second-highest number trailing only behind Germany.

However, real-time payments still account for just a 2.6% share of total payments transaction volume in 2021, compared to a 58.5% share held by other electronic payments. This is a result of increased preference for payment cards, particularly contactless, with their usage gaining further traction amid the COVID-19 pandemic. Nevertheless, real-time payments will continue their uptrend, increasing at a CAGR of 33.3% in terms of volume from 2021-2026.

## ACI's Take

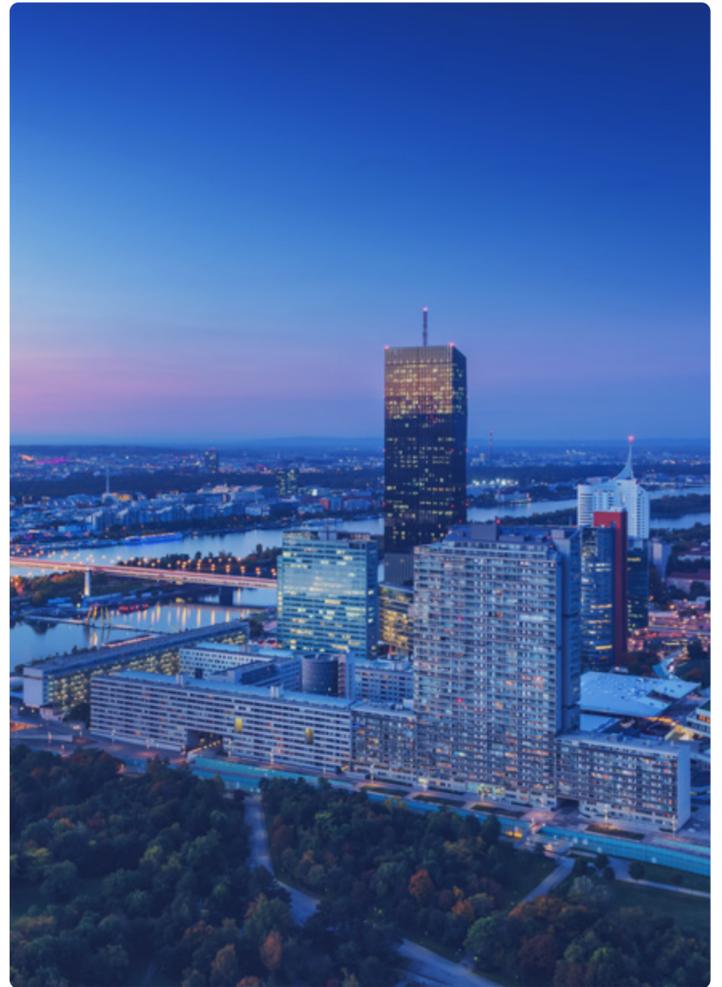
Quick to sign up for SCT Inst, more than 90% of Austria's payment service providers have now adopted the scheme. Recently, however, the market's impetus towards real-time payments has slowed somewhat. Despite their continued promotion by the larger Austrian banks, most online and in-store transactions are via card, PayPal, Klarna and the like.

However, younger Austrians have proved receptive to mobile wallets and similar digital experiences, with real-time P2P payment use cases such as bill-splitting growing in popularity. With the right real-time payment services it should be possible to also claim significant market share in the merchant and retail spaces, both online and brick-and-mortar. With Austria importing many more consumer goods than it produces, the benefits for retailers would include better cash flow to support more agile and responsive inventory strategies. From the consumer's point of view, prompt refunds would be attractive when you consider that around 30% of goods purchased online are returned.<sup>1</sup>

In the final analysis, it will be consumers who drive real-time payments growth. As services in every walk of life become more real time, it will be up to banks and acquirers to enable merchants to ensure payments are no different.

In our last report, we observed that due to the relatively small size of the market, Austrian banks were likely to collaborate on real-time payments in order to contain costs. While this creates demand at the outset, it can deter the unique innovations that drive wider real-time payments adoption. Differentiation, then, is the main challenge (or opportunity) facing Austria's banks and acquirers.

As they explore how to achieve this, banks should engage best-in-class partners that have experience with successful real-time payment business models from around the world. With the right partner on board, they can accelerate time to market on added-value solutions that meet the needs of merchants and their customers.



## Trends + Data

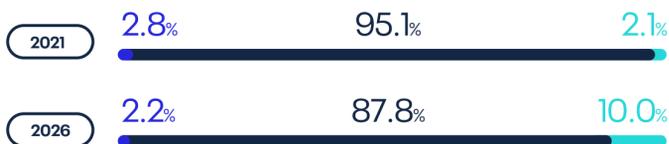
### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

#### Transactions

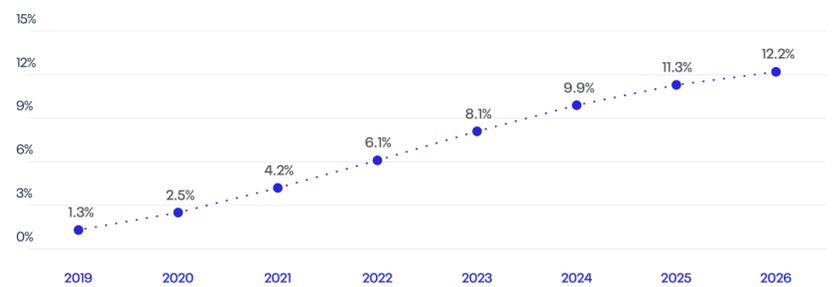


#### Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2019-26f

● % of total electronic payment transactions volume



### Real-Time Transactions

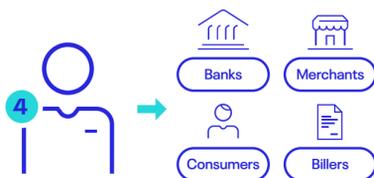


## History



## Key Stats

### Real-Time Acceptance



### Real-Time Total Participants

425

### Real-Time Payment Types



### Initiation/Authorization Methods



### Population Banking Level



83

Index to global average



### Year of Real-Time Payments Launch

2017

### Availability



### Message Standard

ISO 20022

<sup>1</sup> <https://www.invespcro.com/blog/e-commerce-product-return-rate-statistics/>

Belgium enabled real-time payments in the country with the March 2019 adoption of the pan-European real-time payments scheme SCT Inst, which was developed by the European Payments Council (EPC). The usage of real-time payments is still at a nascent stage, accounting for 1.6% of total payments volume in 2021. However, these payments are catching on fast in Belgium and are expected to grow at a CAGR of 66.2% from 2021-2026 in terms of volume.

## ACI's Take

Belgian banks have signed up to participate in the development and launch of the European Payments Initiative (EPI), which will see the convergence of card payments and real-time payments onto a new scheme with an accompanying digital wallet.

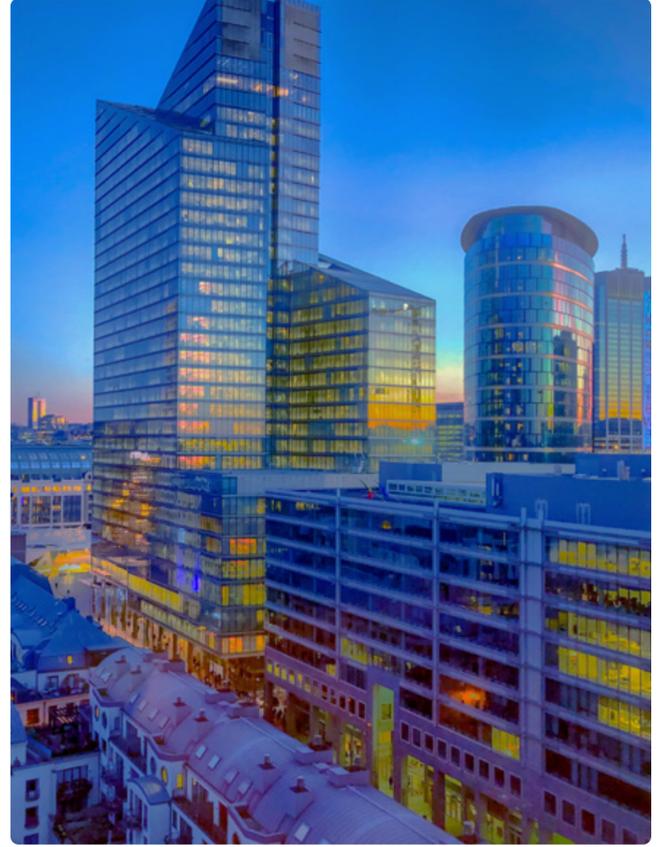
This will not only be a challenge, given the disruptive and wide-ranging nature of the proposed project, but also a major opportunity. EPI's business-led drivers are likely to be a highly powerful starting point for widespread modernizations, more so than any technology-led need to refresh could ever be. Not only will it allow banks to get out from under high transaction fees paid to non-European payment networks, but it will also enable them to enjoy more ownership of innovation to, overall, offer better and more relevant services to customers at a lower cost. It will also likely allow them to leverage much of the infrastructure that they currently use to service both cross-border and domestic real-time payment use cases, and so maximizing those investments.

Some new functionality will be required, of course, and it will mean becoming familiar with new rules and new mandate maintenance requirements. They should take the opportunity to deliver this aspect

of the project with a tech strategy that prioritizes having the flexibility to respond to changes while minimizing disruption. That means adopting solutions that will evolve with changing mandates and can take out any unpredictability around the costs of compliance once related services are in market and banks are outside of project mode.

Among the unintended and under-explored consequences of the widespread real-time payments adoption that EPI hopes to create is the impact on core banking systems. Instantaneous balance updates are possible, and in many cases, not difficult. The challenge will be the sheer volume of channels that require this information. Customers will expect a real-time balance across mobile, internet, ATMs, in branch and digital wallets, and any embedded finance use cases they make use of.

Finally, EPI's convergence of cards and real-time payments will likely involve a long, step-by-step modernization of card infrastructures. As that modernization develops, banks will become more motivated by the benefits of modernization to migrate other payment applications and services onto these new infrastructures.



## Trends + Data



### Cloud Management Platform



### Infrastructure as a Service (IaaS)



### Hybrid Cloud



### Managed Cloud Service



### Platform as a Service (PaaS)



### Private Cloud



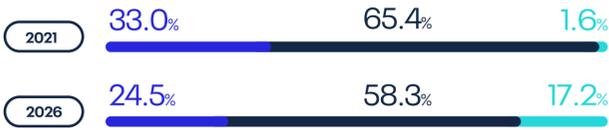
### Software as a Service (SaaS)



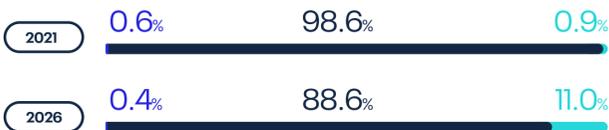
## Shares of Volumes by Payments Instrument

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### Transactions

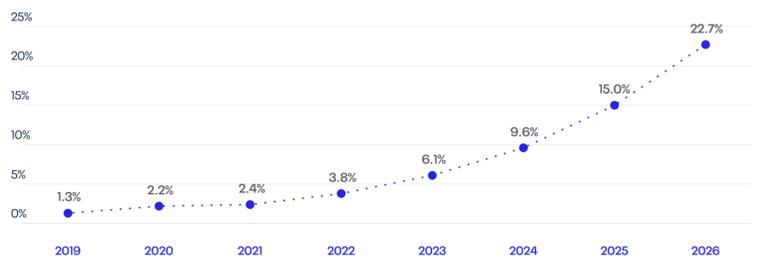


### Spend (USD)



## Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2019-26f

● % of total electronic payment transactions volume



## Real-Time Transactions



## History



## Key Stats

### Mobile Wallet Trends



### Real-Time Acceptance



### Real-Time Total Participants

### Real-Time Payment Types



### Initiation/Authorization Methods



## Fraud

### Payments Fraud Rate



### Top 3 Payment Fraud Types



## Population Banking Level



### Year of Real-Time Payments Launch



### Availability



### Message Standard



Croatia is among the recent entrants to the real-time payments space with the launch of NKSInst in October 2020. Continuous developments, such as the launch of a proxy look-up service in March 2021 and increased participation from banks, will support the growth of real-time payments over the next few years. Between 2021 and 2026, real-time payment transactions are anticipated to grow at a CAGR of 83.7%, by which time they are expected to amount to 16% of all electronic payments. The accelerated shift towards electronic payments amid the COVID-19 pandemic will also contribute to the growth.



## ACI's Take

Croatia's population of just four million makes it difficult to achieve the critical mass needed to justify further investments in real-time payment services. Nevertheless, the building blocks are in place for wider adoption than we see today. There is a relatively large banking sector, connected to TIPS, and a national real-time payments scheme in place, NKSInst, which is authorized (though not mandated) by the Croatian National Bank and based on SCT Inst. This allows for instant local currency transfers when both parties hold accounts at any of the participating banks.

Because of the lack of critical mass noted earlier, financial institutions tend to build and maintain their own payments infrastructure, often making tactical investments in multiple add-ons with a careful eye on cost containment. As a result, what has developed to date is a real-time payments ecosystem of bits and pieces. Proxy look-up is in place, but digital wallets — popular elsewhere in Europe, and a relatively low-cost investment — are not being taken up by any of the players.

The situation is best described, then, as one in which all the players are satisfied with the state of things as they are. Major short-term developments in the domestic market are therefore unlikely, but change could occur in the area of cross-border payments. Because NKSInst is based on SCT Inst, it would only take a marginal investment to access other clearing and settlement mechanisms in Europe based on SCT Inst. In due course, all banks will be connected to the NKSInst, at which point a comprehensive offering that serviced both domestic and cross-border needs would be a significant opportunity for banks to expand and deepen customer relationships. To better monetize those relationships, however, banks will need to put aside the tactical approach in favor of more strategic infrastructure roadmaps. Key criteria will be the ability to efficiently service today's payment needs while quickly, and cost-effectively onboarding new payment types in the future.

## Trends + Data

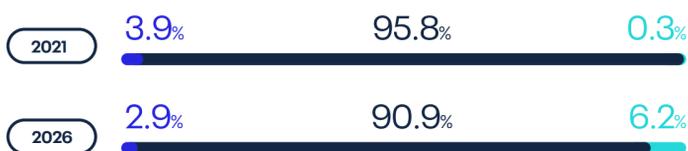
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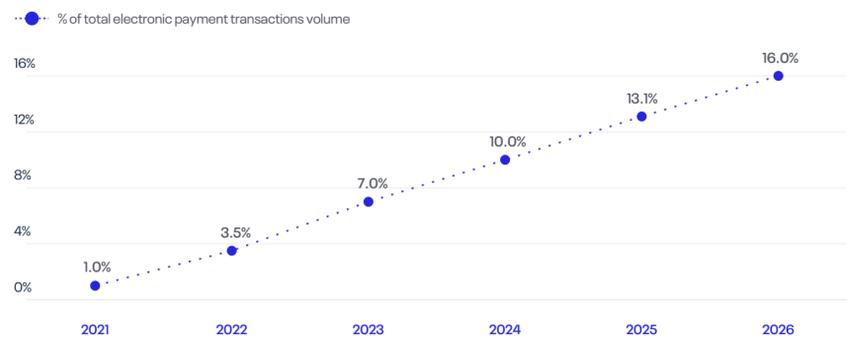
#### Transactions



#### Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2021-26f



### Real-Time Transactions

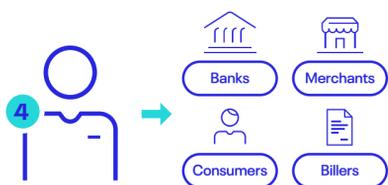


## History



## Key Stats

### Real-Time Acceptance



### Real-Time Total Participants

3

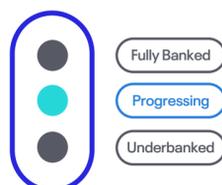
### Real-Time Payment Types



### Initiation/Authorization Methods



### Population Banking Level



### Year of Real-Time Payments Launch

2020

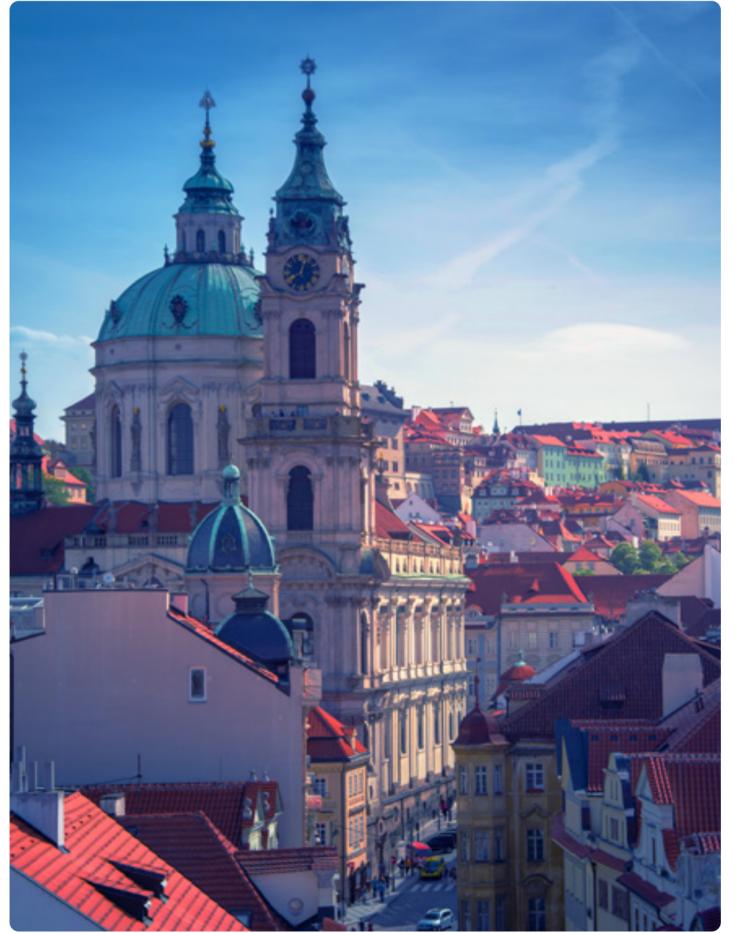
### Availability



### Message Standard

ISO 20022

Czech Republic enabled real-time payments in the country with the launch of a domestic real-time payments service in November 2018, which is operated via Czech Express Real-Time Interbank Gross Settlement. Despite limited participation and use cases, real-time payments gradually gained traction in the country and now account for a 3.5% share of the total volume of payment transactions in 2021. The high levels of cash usage and moderate reliance on payment cards provides further growth prospects for real-time payments, helping it to increase both in terms of volume and value at respective CAGRs of 29% and 34.4% from 2021-2026.



## ACI's Take

Payments executed through the CERTIS real-time scheme are required to be executed in just a few seconds, with performance monitored via time data that participants must collect and report to the Czech National Bank (CNB). CNB's analysis of these reports shows that the processing time from the moment a payment is sent by the payer's bank, until it is received by the payee's bank, is less than 0.5 seconds for half of the payments executed. It is less than 1.5 seconds for 99% of the payments executed.<sup>1</sup>

payments mix, but they have not penetrated much beyond their initial launch uses cases. Serious merchant offerings are lacking, as are corporate services around high-value and batch-based payments.

Some of this can be put down to the CERTIS scheme's relative immaturity. But much more of the hesitancy to commit arises from banks' and other payment players' lack of conviction around the business case for real-time payments.

Twelve of the country's largest banks are participants in the CERTIS real-time scheme, there is effectively no minimum payment (payments of CZK 0.01 can be made) and the maximum payment is relatively high at CZK 400,000. The scheme also operates 24/7/365. Performance and coverage, then, are not issues the market must contend with.

There is an element of chicken and egg at play here: some market demand has been proven, but in the absence of more use cases, volumes are not astronomical. To break the status quo and mitigate any perceived risks around investing in new capabilities, banks should turn to vendors with managed payment services offerings and mature cloud capabilities. This would enable them to accelerate time to market on new services, absorb the cost as an operational expense and bake-in the flexibility to either scale up (or down) with demand and pivot to target new opportunities.

What is lacking, however, is a concerted push to drive added-value use cases above and beyond the fast transfer of funds between accounts. Real-time payments are an established part of the market's

## Trends + Data

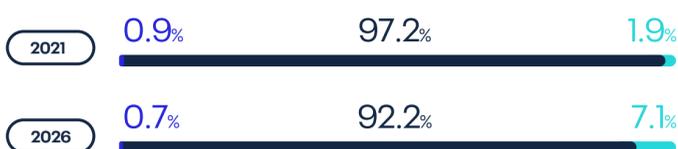
### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

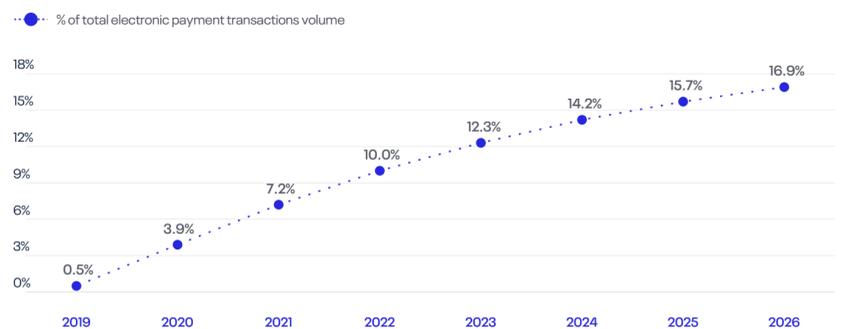
#### Transactions



#### Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2019-26f



### Real-Time Transactions

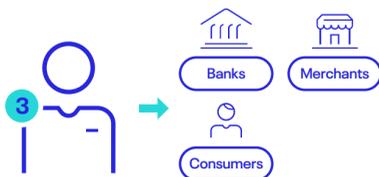


## History



## Key Stats

### Real-Time Acceptance



### Real-Time Total Participants

13

### Real-Time Payment Types



### Initiation/Authorization Methods

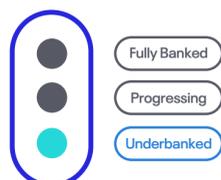


### Population Banking Level



60

Index to global average



### Year of Real-Time Payments Launch

2018

### Availability



### Message Standard

Proprietary

<sup>1</sup> <https://www.cnb.cz/en/payments/certis/instant-payments-description/>

## Real-Time Payments Forecasted to Help Generate 0.23% of GDP by 2026

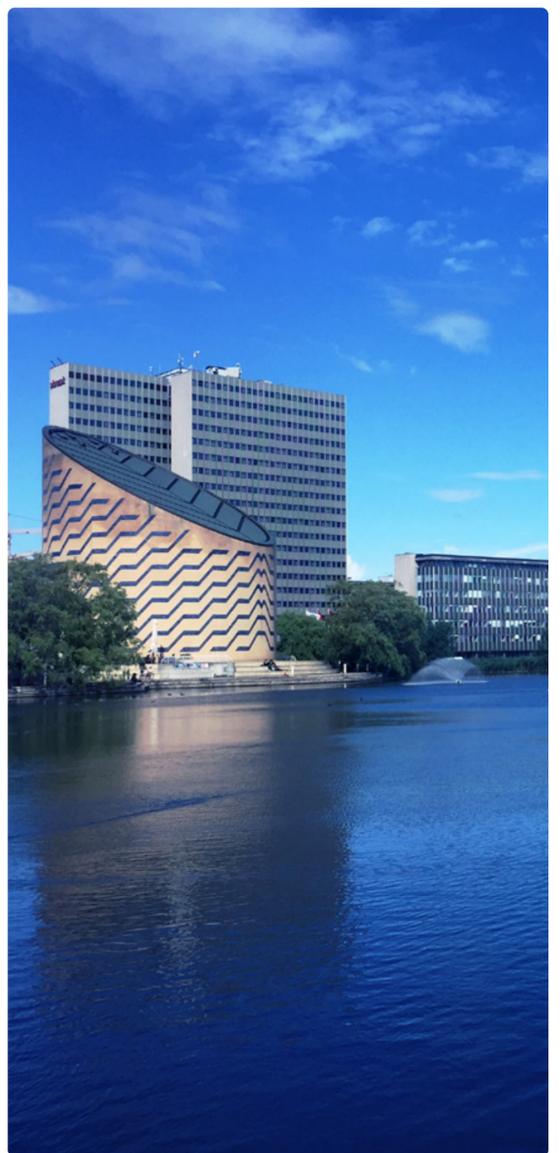
Denmark, like its Nordic peers, is on a faster track to “cashlessness” than other developed markets, due to its high levels of financial inclusion and internet access.

In 2021, the country recorded 433 million real-time transactions, which resulted in an estimated cost savings of \$71 million for businesses and consumers. This in turn helped to unlock \$552 million of additional economic output, which represents 0.14% of the country’s GDP.

With real-time payment transaction numbers expected to rise to 883 million in 2026, net savings for consumers and businesses are forecasted to climb to \$151 million. This would help to generate an additional \$1 billion of economic output, equivalent to 0.23% of the country’s forecasted GDP.

Denmark’s real-time payments infrastructure, called Straksclearing, is owned by the Danish Bankers Association and was launched in 2014. To provide real-time payments, banks need to join Straksclearing and the central bank’s payments system, Kronos. In addition to banks, mobile payment providers such as MobilePay also provide real-time payments. In 2021, real-time payments represented a 9.9% share of payments by number of transactions, but it is predicted to gain significant growth by 2026 in both share of number of transactions and share of spending.

As a result, real-time payments can expand to fill the space left behind by cash and facilitate a more fully electronic economy.



### ACI's Take

Danes' shopping habits have seesawed between eCommerce and card payments in 2021, depending on the curfews implemented in response to COVID-19. While Q1 was dominated by eCommerce transactions, Q2 and Q3 saw card transactions quickly rebound to pre-pandemic levels. In the background, contactless payments continue to rise and fraud with them. However, deployments by card issuers of increased monitoring and AI technology have had an observable impact.

In terms of the regional picture, a good level of harmony between the payment rulebooks of the NPC and those found in the European Union hasn't stopped strong lobbying for more streamlined transactions between local currencies and the euro. While the regulating bodies work to find some common ground, the region's financial institutions are innovating around least-cost routing. The result is a high level of sophisticated thinking at banks around taking advantage of different payment rails to deliver a better quality of service, all at a lower cost to their corporate customers.

Denmark is also in the process of refreshing the domestic real-time settlement rails (RTGS). This is aligned with similar projects underway in neighboring Nordic markets, with four RTGS refreshes all moving through a single supplier. One of the primary goals is to synchronize their modernization on the ISO 20022 standard, so each is working towards similar timelines. Arguably, this potentially introduces risks and challenges for the participants and trade bodies to navigate.

Developments such as this and the ongoing P27 cross-border initiative will ensure that Danish banks and payment players benefit from greater interoperability between domestic, regional and international schemes. But each market must balance the need to deliver choices to drive innovation, increase competition and lower costs today, while keeping an eye on the future costs of maintaining and operating compliance with multiple schemes. The ideal state is a common and uniform set of gateway services that can provide multi-scheme access, which would substantially extend the reach of current interoperability capabilities and make future changes much easier to onboard.

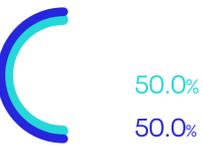
### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



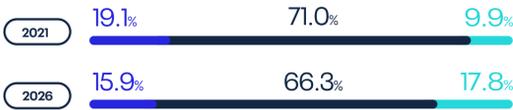
Software as a Service (SaaS)



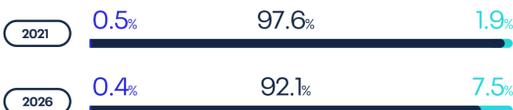
### Shares of Volumes by Payments Instrument

Paper-based payments Electronic payments Real-time payments

Transactions



Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



### Real-Time Transactions

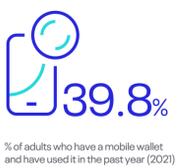


### History



### Key Stats

#### Mobile Wallet Trends



#### Real-Time Acceptance



#### Real-Time Total Participants



#### Real-Time Payment Types



#### Initiation/Authorization Methods



### Fraud

Payments Fraud Rate: 19.0%

Population who reported being a victim of fraud in the last 4 years

#### Top 3 Payment Fraud Types

% of fraud victims	Trend
17.1% (Card details stolen online)	↓
16.4% (Confidence trick)	↑
12.2% (Other)	↓

#### Population Banking Level



#### Year of Real-Time Payments Launch



#### Availability



#### Message Standard



### Cebr

Denmark ranked as the 35th largest global economy in 2021 and is classified as a high-income country. (Cebr, World Economic League Table, 2022).

The current share of real-time payments (9.9% of all transactions in Denmark) led to an estimated efficiency savings of \$71 million for consumers and businesses, driven in large part by a reduction in the costs associated with failed transactions. Failed transactions generated an associated cost of \$118.5 billion annually, borne by financial institutions, consumers and other businesses across the globe. In Denmark specifically, we estimate the total cost of failed transactions to be \$342 million per year. However, real-time payments saved the

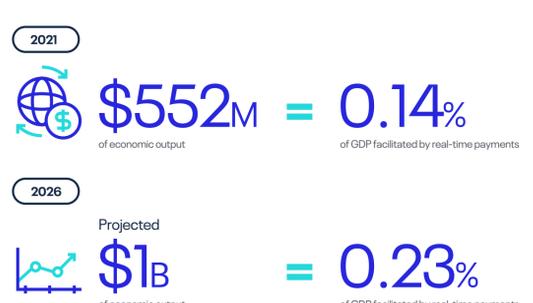
above-mentioned stakeholders from an additional \$37 million of payment failure costs in 2021. With regards to the realized aggregate economic benefits in 2021, real-time transactions contributed to 0.14% of GDP (\$552 million), or the output of 4,013 workers annually.

For 2026 we estimate that the efficiency savings for consumers and businesses will grow to \$151 million, contributing to the realized macroeconomic benefits of real-time almost doubling to \$1 billion or 0.23% of formal GDP. This is in line with the forecasted CAGR of real-time transactions of 15.3% over the five-year period, with real-time payments estimated to represent 17.8% of the payments mix volume by 2026.

#### For Businesses and Consumers



#### GDP Growth



1 [https://www.nationalbanken.dk/en/statistics/find\\_statistics/Documents/Payments/Payments%2020210503.pdf](https://www.nationalbanken.dk/en/statistics/find_statistics/Documents/Payments/Payments%2020210503.pdf)



Finland has two real-time payments schemes in place. The first, Siirto, is a domestic real-time payments system launched in March 2017. The second is the pan-European SCT Inst, which was adopted in June 2018. Growth in real-time payments has been slower than anticipated due to limited adoption, with Siirto having two participants and SCT Inst with seven as of December 2021.

However, the growth is expected to accelerate over 2021-2026 both in terms of volume and value, registering respective CAGRs of 47.5% and 66.7%. Finland is also part of the P27 Nordic Payments Platform, which aims to provide cross-border real-time payments for individuals in the Nordic region. The platform is set to launch in 2022, which will boost the growth of real-time payments in the country.

## ACI's Take

Mobile commerce adoption in Finland remains the lowest in the Nordic region (33% of total Finnish eCommerce), allowing huge space for growth in this area if neighboring markets are a guide to what's possible. And in physical stores, the population is happy to rely on traditional near-field contactless (NFC) payments via card, with mobile phone payments only representing 10% of the grand total.<sup>2</sup>

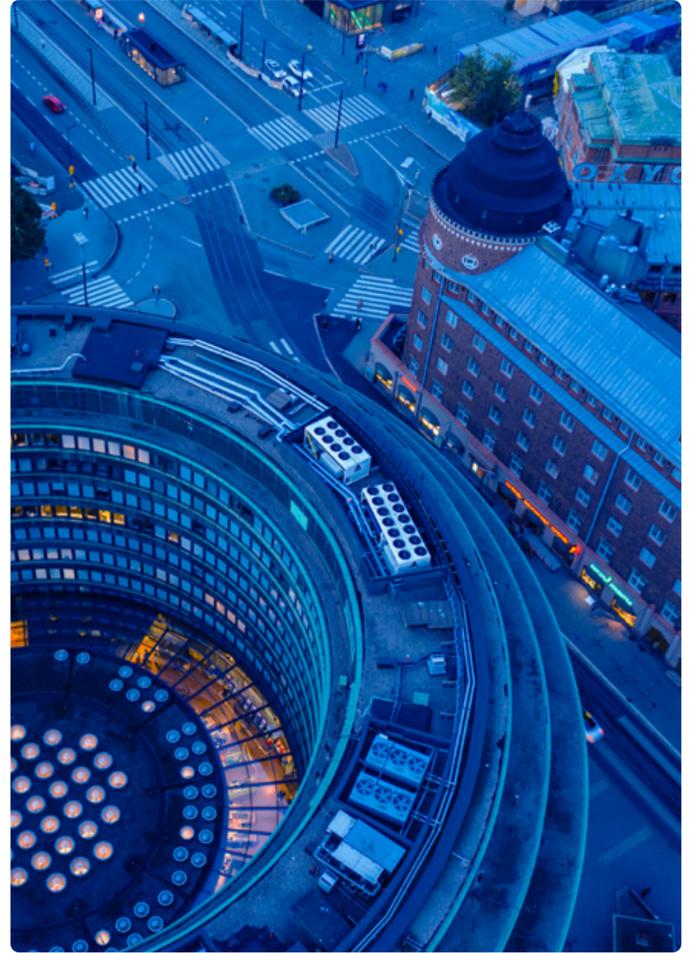
In common with most of its regional neighbors, the Bank of Finland is also keeping a close eye on developments around central bank digital currencies (CBDCs). In an analysis bulletin on the topic, it concluded that CBDCs require "...extensive analysis and also value choices. The Bank of Finland is participating in this work in the Eurosystem, but no decisions have been made on the introduction of a digital euro."

Despite the regular celebrations of interconnectedness in the region, fraud prevention and management has historically been fragmented due to locally owned approaches. But stronger collaboration between

the markets' various financial intelligence units, built around centrally hosted data, is transforming risk management and AML monetary disclosure reporting.

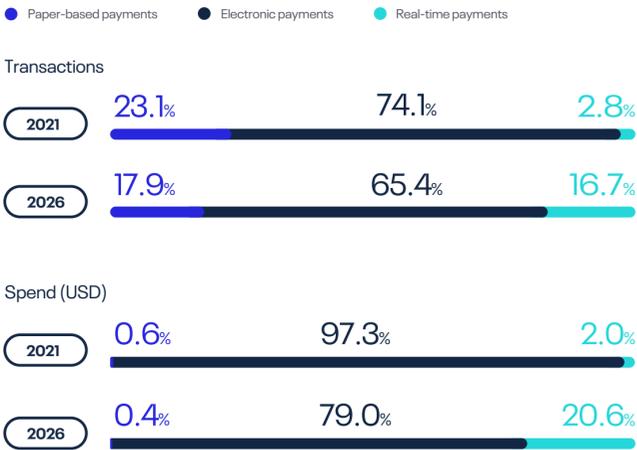
Developments such as this and the ongoing P27 cross-border initiative can only benefit Finnish banks and payment players, as they enjoy greater interoperability between domestic, regional and international schemes. But its banks must ensure that their requirements are accurately reflected in joint projects, if they are to truly benefit from greater choice and lower costs.

While the ideal state for banks to aim for is relatively simple — a common and uniform set of gateway services that can provide multi-scheme access — there will be important decisions to make each step of the way around what resides in the cloud, either on hosted infrastructure or as managed services, and what remains on premise.

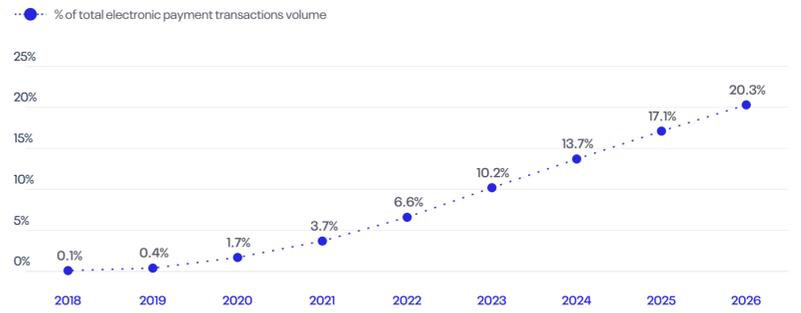


## Trends + Data

### Shares of Volumes by Payments Instrument



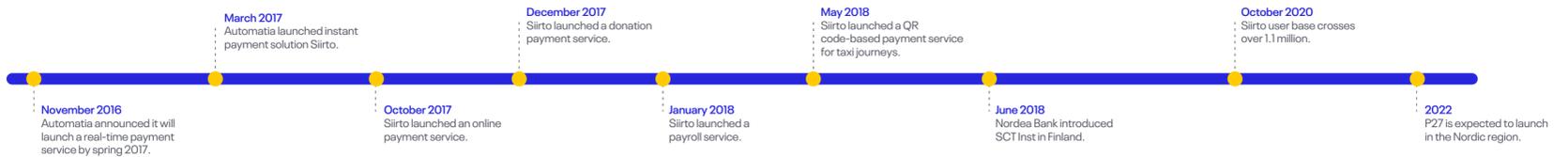
### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2018-26f



### Real-Time Transactions

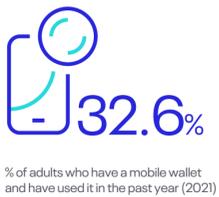


## History

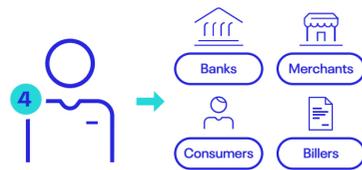


## Key Stats

### Mobile Wallet Trends



### Real-Time Acceptance



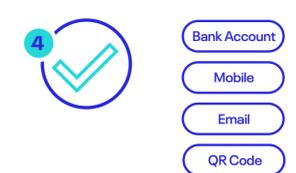
### Real-Time Total Participants



### Real-Time Payment Types



### Initiation/Authorization Methods



### Fraud

Payments Fraud Rate: **9.6%**  
Population who reported being a victim of fraud in the last 4 years

Top 3 Payment Fraud Types (% of fraud victims):

- Confidence trick: **19.6%** (Trend: ↓)
- Other: **17.7%** (Trend: ↑)
- My card was lost or stolen: **15.7%** (Trend: ↑)

### Population Banking Level



### Year of Real-Time Payments Launch



### Availability



### Message Standard



1 <https://www.jpmorgan.com/merchant-services/insights/reports/finland#:~:text=Finnish%20consumers%20are%20gradually%20embracing,payments%2C%20or%20E2%82%AC1.02%20billion.&text=PayPa%2CAE%20dominates%20among%20digital,e%2Dcommerce%20payments%20in%20Finla>  
2 <https://qvik.com/news/mobile-payments-in-finland-these-services-are-available-right-now/>

## Economic Benefits of Real-Time Payments Remain Largely Untapped

France recorded 108 million real-time transactions in 2021, which resulted in an estimated cost savings of \$27 million for businesses and consumers. This in turn helped to unlock \$105 million of economic output, representing less than 0.01% of the country's GDP.

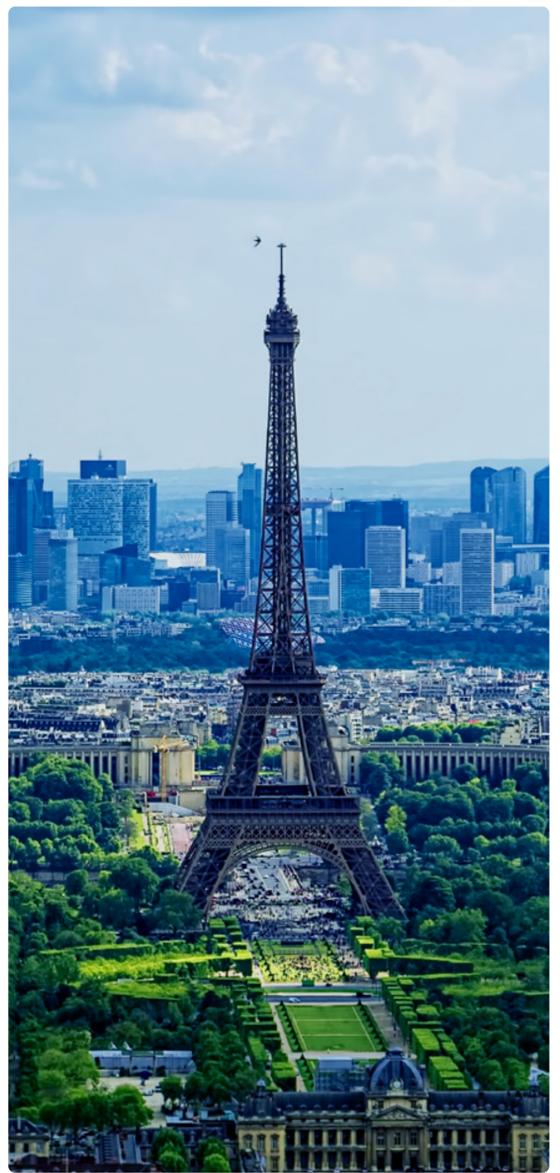
With real-time transactions set to rise to 1.2 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$315 million. This would help to generate an additional \$872 million of economic output, equivalent to 0.03% of the country's forecasted GDP.

That means for the sixth largest global economy, the economic benefits of real-time payments remain largely untapped. According to the Cebr, the theoretical impact of all payments being real-time could add 2.8% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

France does not have its own domestic real-time payments network. Instead, it adopted SCT Inst in 2018 to implement real-time payments into its network. SCT Inst is a pan-European instant credit transfer scheme launched by the European Payment Council (EPC). It was developed by the EPC with the aim to create a real-time payments network within the eurozone. This linkage has the potential to facilitate international remittance and trade within the EU, which may help bolster economic activity within the bloc.

It should be noted, though, that payments within the eurozone were already quite easy compared with other international transfers. Most major banks in France, such as Credit Lyonnais and Société Générale, support SCT, and as of November 2021, it accounted for 130 participants. Despite being accepted by most institutions, it is still a small payments tool, accounting for 0.3% of total payments transaction volume in 2021.

Projections are for real-time payments to gain more market share by 2026 and reach 2.9% share of transaction volume. This growth can be attributed to a small decrease in paper-based payments, whose share is expected to decline from 31.9% to 22.8% by 2026.



### ACI's Take

There is high interest among real-time payment players in R2P as an opportunity to kickstart the development of higher-value services that can drive further adoption. Naturally at this early stage, there are questions around how to integrate it with existing lines of business, but it ties in well with a mandated transition for businesses issuing paper bills to offer digital versions and e-invoicing. So, overall, the rulebook issued by the European Central Bank (EPC) has been well received and the motivation is there to pick it up and run with it.

Partners that have experience in rolling out similar overlay services around the world will be vital to solving any questions around how to manage the initial R2P solution. Malaysia and India are notable examples of successful rollouts, but closer to home, Hungary's largest banks have adopted the domestic R2P solutions with impressive results.

The market's interest in R2P coincides with a general need to refresh payments infrastructure to take costs out of operations and improve flexibility. As such, it offers an opportunity to think differently and ensure future use cases and changes are easier to implement.

For example, banks should consider whether procuring an R2P capability as a managed service would be an appropriate test case for the concept more generally. This would reduce costs by shifting payment processing to an operating expense, while also ensuring associated technology costs only grow in line with revenues.

With their infrastructure and compliance requirements taken care of by a managed services partner, banks would also be able to get to market faster on differentiating features and services. This will be vital, since the EPC's Request to Pay rulebook provides ample scope for innovation around the service to drive differentiation and add value.

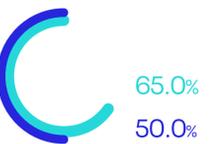
### Trends + Data



Cloud Management Platform



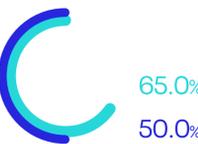
Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



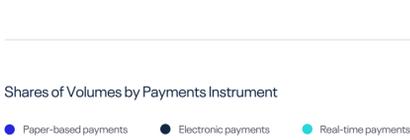
Private Cloud



Software as a Service (SaaS)



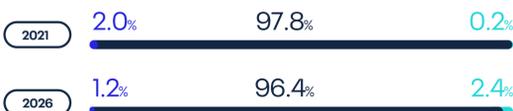
### Shares of Volumes by Payments Instrument



### Transactions



### Spend (USD)



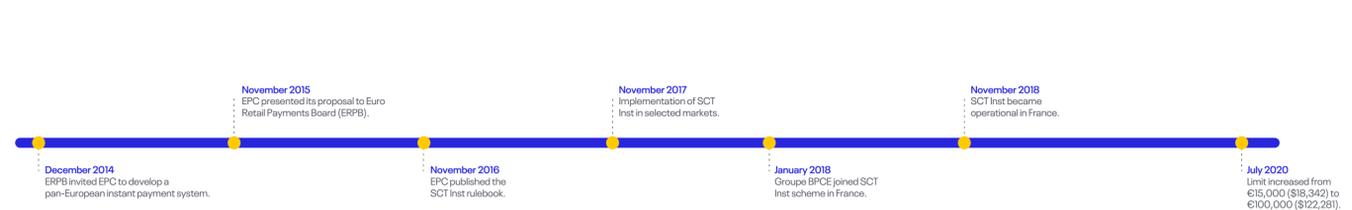
### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2019-26f



### Real-Time Transactions

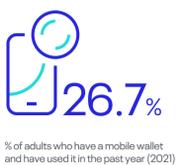


### History

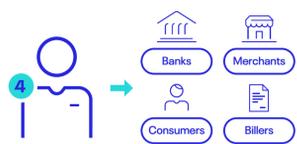


### Key Stats

#### Mobile Wallet Trends



#### Real-Time Acceptance



#### Real-Time Total Participants

130

#### Real-Time Payment Types



#### Initiation/Authorization Methods



#### Population Banking Level



#### Year of Real-Time Payments Launch

2018

#### Availability



#### Message Standard

ISO 20022

### Cebr

France is classified as a high-income country and ranked as the sixth largest global economy in 2021 (Cebr World Economic League Table, 2022).

However, considering that France is one of the largest economies in the world, real-time payments usage remains low as of 2021, accounting for just 0.3% of total transaction volumes. As a result, the current overall economic impact is relatively limited, while the untapped potential is significant.

In 2021, net benefits for consumers and businesses stimulated by real-time payments reached \$27 million (less than that of the Netherlands), facilitating \$97 million of the total national economic output (<0.01% of formal GDP).

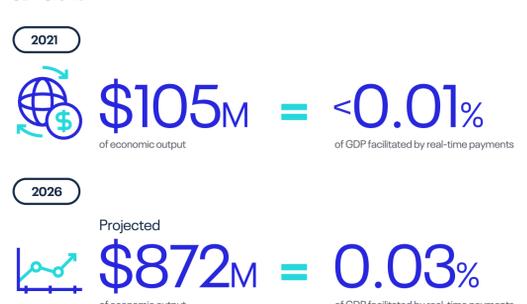
The primary factor generating these benefits was the ability for real-time payments to formalize activity in the shadow economy by reducing cash usage. Given the scale of the French economy, the country's 14% shadow economy share represented an estimated \$407 million of informal output in 2021. Despite the relatively small transaction share of real-time payments in France, they have the ability to formalize a relatively large level of informal economic activity (\$94 million annually).

Looking forward to 2026, approximately 2.9% of the payments mix (by volume) is anticipated to be real-time. While still modest, this increases the anticipated economic benefits for consumers and businesses more than ten-fold to \$315 million. The economy-wide impact also rises significantly to \$872 million, representing a 0.03% share of forecasted formal French GDP, or the equivalent output facilitated by 7,725 additional jobs in 2026.

#### For Businesses and Consumers



#### GDP Growth



## Economic Benefits of Real-Time Payments Remain Largely Untapped

Germany recorded 1.2 billion real-time transactions in 2021, which resulted in an estimated cost savings of \$313 million for businesses and consumers. This in turn helped to unlock \$1.4 billion of economic output, representing 0.03% of the country's GDP.

With real-time transactions set to rise to 3.4 billion in 2026, net savings for businesses and consumers are forecasted to climb to \$1.1 billion. That would help to generate an additional \$3.3 billion of economic output, equivalent to 0.07% of the country's forecasted GDP.

That means for the largest economy in the European Union, the economic benefits of real-time payments remain largely untapped. According to the Cebr, the theoretical impact of all payments being real-time could add 3% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Germany adopted the pan-European real-time payments scheme SCT Inst in 2017, which was developed by the European Payments Council (EPC). By integrating it, Germany gained access to a real-time payments scheme that provides euro transfers not only among participating financial institutions in Germany, but also with any European countries part of the eurozone. This integration makes transfers easier between the EU markets, helping boost economic activity. Based on total payments spend, real-time payments had the second highest market share with 1.6% in 2021, and it is expected to grow to 6.8% by 2026. Electronic payments (excluding real-time payments) are the dominant payments tool in Germany.

Despite being available at 1,215 institutions in Germany and being provided by most major banks, real-time payments have a long way to go before they can claim to hold a significant share of the overall volume of electronic payments (excluding real-time payments). Future projections for real-time payments are positive as real-time volumes are expected to record a CAGR of 24.1% from 2021-2026, and payments spend will grow at a much stronger CAGR of 38% over the same period. The higher growth in value of transactions on real-time systems indicate that there is still progress to be made towards RTP's adoption as an everyday means of transaction. Germany is, however, one of the markets where bank transfers (and invoice-based payments, often settled with bank transfers) are strongest within the EU. This, combined with its traditionally cash-dependent consumer base, may make the market more likely to shift to real-time payments for purchases when compared with its peers that are more card-dependent.

### ACI's Take

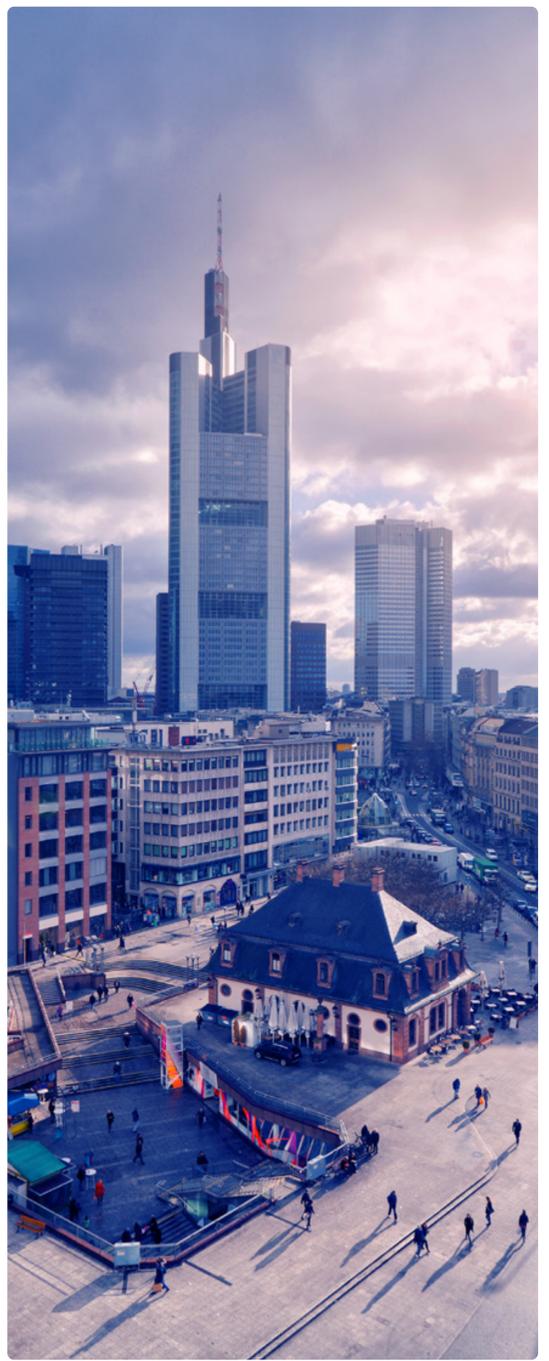
Germany's progress towards real-time payments continues along a steady, incremental path. Businesses and consumers remain open to new payment options, and banks are responding — particularly on the corporate side. Here, the initial transaction limit of €15,000, which made real-time payments unviable for businesses, was raised to €100,000. This is still low for larger corporates, but is an encouraging step towards more persuasive, and higher margin, use cases. Another welcome development would be the ability to make bulk payments in real time.

In a further important development, German banks participating in SCT Inst and with TARGET2 accounts will respond in 2022 to a mandated migration to TIPS accounts. This could supersede the currently dominant RTI scheme, which although SCT Inst-compliant, lacks the reach necessary for universal real-time payments.

With TIPS set to become multi-currency in 2022 when Sweden plugs into the scheme, Germany will expand its real-time payments connectivity beyond its eurozone-centric heartlands. Other non-euro

countries are likely to follow, giving TIPS — and therefore German banks — a truly European reach beyond the euro. Throughout 2022, the European Payments Initiative (EPI) will also continue to develop, with German banks among the largest shareholders. Although some of the details around EPI are still unclear, it will stimulate new use cases and is an important factor to monitor.

German banks and institutions are well-positioned to exploit these opportunities, thanks to the substantial modernization of legacy systems and payments infrastructure already undertaken from 2017 onwards. They know they have to invest in TIPS connectivity, and this refresh cycle is a further opportunity to future-proof their infrastructure. For example, prioritizing API-driven architectures will enable them to easily onboard future use cases, including the aforementioned multi-currency transactions. They know too that growth in adoption for real-time will also put pressure on their ability to identify and mitigate fraud, and to manage customers' identities across multiple channels. This will intensify pressure to advance data and analytics maturity, and accelerate time to production on machine learning applications.



### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



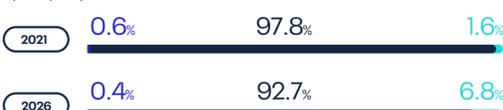
### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

Transactions

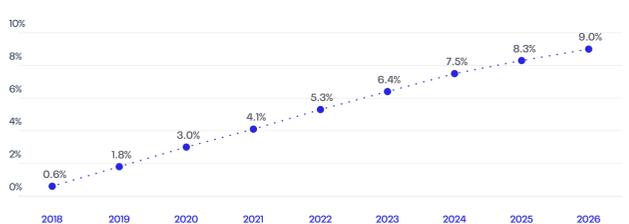


Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2018-26f

● % of total electronic payment transactions volume



Real-Time Transactions

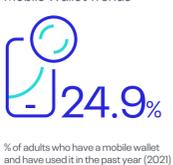


### History



### Key Stats

Mobile Wallet Trends



Real-Time Acceptance



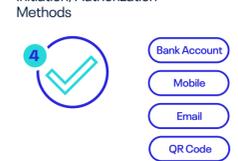
Real-Time Total Participants

1,215

Real-Time Payment Types



Initiation/Authorization Methods



Population Banking Level



Year of Real-Time Payments Launch

2017

Availability



Message Standard

ISO 20022

### Cebr

Germany — the European Union's largest economy — is a high-income country and ranked as the fourth largest global economy in 2021 (Cebr World Economic League Table, 2022).

With its current share of real-time payments adoption, German consumers and businesses benefited from estimated net efficiency savings of \$313 million in 2021, which is predominantly driven by a reduction in the payments float. Real-time payments unlocked a total transaction value of \$4.8 billion per day in 2021 through a reduced float time. This working capital facilitated an estimated \$114 million of business output in the same year.

As of 2021, the macroeconomic benefits of real-time payments in Germany were an estimated \$1.4 billion or 0.03% of formal GDP; equivalent to the output of 14,525 workers. In absolute terms, this is the third largest macroeconomic benefit (behind the U.K. and Turkey) across the European countries within the economic impact study.

In 2021, the share of volume for real-time payments was recorded at 2.7%, but this is estimated to more than double to 6.9% by 2026. This robust growth in uptake will result in consumer- and business-level benefits reaching \$1.1 billion in 2026. This is forecasted to facilitate 0.07% of formal GDP in 2026, or \$3.3 billion of output, equivalent to the output of 31,074 workers.

For Businesses and Consumers



GDP Growth



Greece launched the real-time IRIS Online Payment system in May 2017, which enabled real-time payments through internet banking systems using account numbers or IBANs. Later in June 2017, it launched IRIS Mobile Payment, allowing real-time payments through mobile banking channels using a recipient's email address, mobile phone number, company VAT number or QR code.

The growth in real-time payments has been slow in Greece due to limited participation from banks. However, with paper-based transaction volume amounting to a 73.2% share in 2021, Greece presents a huge potential for real-time payments growth. Real-time payments volume is expected to increase at a CAGR of 33.8% from 2021-2026.

## ACI's Take

Real-time payments face an uphill battle in Greece, a market where cash remains a major payments instrument, despite government interventions intended to — among other things — increase tax revenues. Banks also charge a premium for real-time payments, which is a sure way to suppress transaction volumes, and a further indicator of the static situation is the absence of any meaningful discussion of Request to Pay, a hot topic elsewhere in Europe.

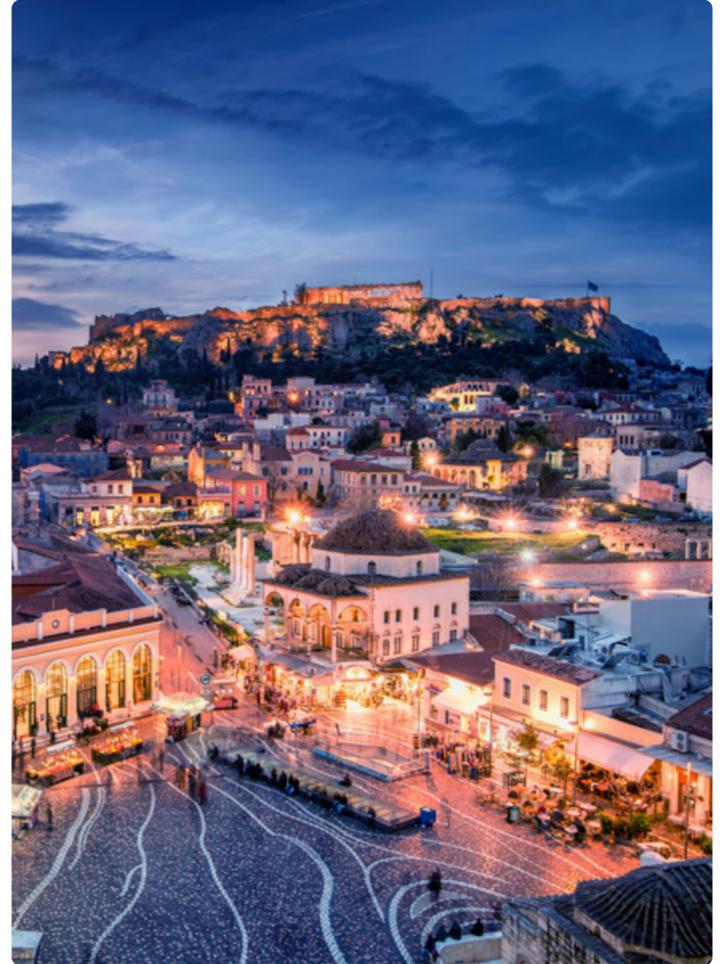
In our last report, we noted that Greek financial institutions should consider themselves on notice to accelerate payments modernization journeys ahead of an inevitable tipping point in favor of digital and real-time payments. The argument was that as real-time payments became the norm in account-to-account transactions, anything less in spheres such as retail or bill pay would feel antiquated.

However, that tipping point feels no closer right now and more persuasive use cases are needed to make a breakthrough. Vasilis Panagiotidis, the Hellenic Bank Association's head of payment systems, has identified the actions needed to accelerate implementation,

including sustainable economics for payment services, investment in security and technical infrastructures, innovative user-friendly payment solutions, and rapid execution and attractive pricing.<sup>1</sup>

There is an element of chicken and egg at play in the Greek real-time market then. While consumer demand remains suppressed by high charges and entrenched cash habits, it's harder to make the business case for providing real-time payments. But experience in similar markets around the world show that, once exposed to the convenience and versatility of real-time payments, consumers are willing to leave old habits behind.

And there have been hints over this year of the opportunity open to those payment players willing to innovate in this area. The COVID-19 pandemic increased real-time payment volumes by nearly 50% more than originally forecasted for 2021. Widespread interoperability exists between banks and fintechs, use of the Viva digital wallet is growing and Apple Pay is present. All these suggest an openness to digital payments and related services.



## Trends + Data

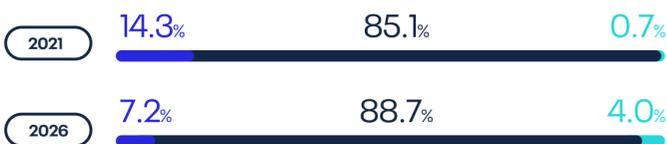
### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

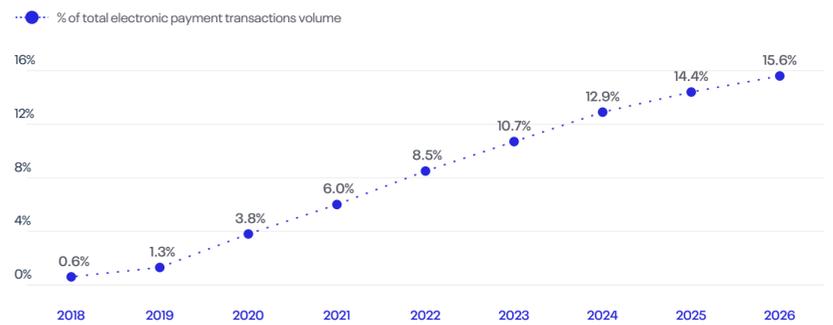
#### Transactions



#### Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2018-26f



### Real-Time Transactions

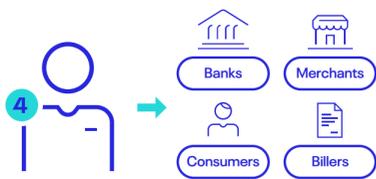


## History



## Key Stats

### Real-Time Acceptance



### Real-Time Total Participants

5

### Real-Time Payment Types



### Initiation/Authorization Methods



### Population Banking Level



### Year of Real-Time Payments Launch

2017

### Availability



### Message Standard

Proprietary

<sup>1</sup> <https://www.europeanpaymentscouncil.eu/news-insights/insight/greeces-steady-progress-towards-cashless-society>

## Economic Benefits of Real-Time Payments Remain Largely Untapped

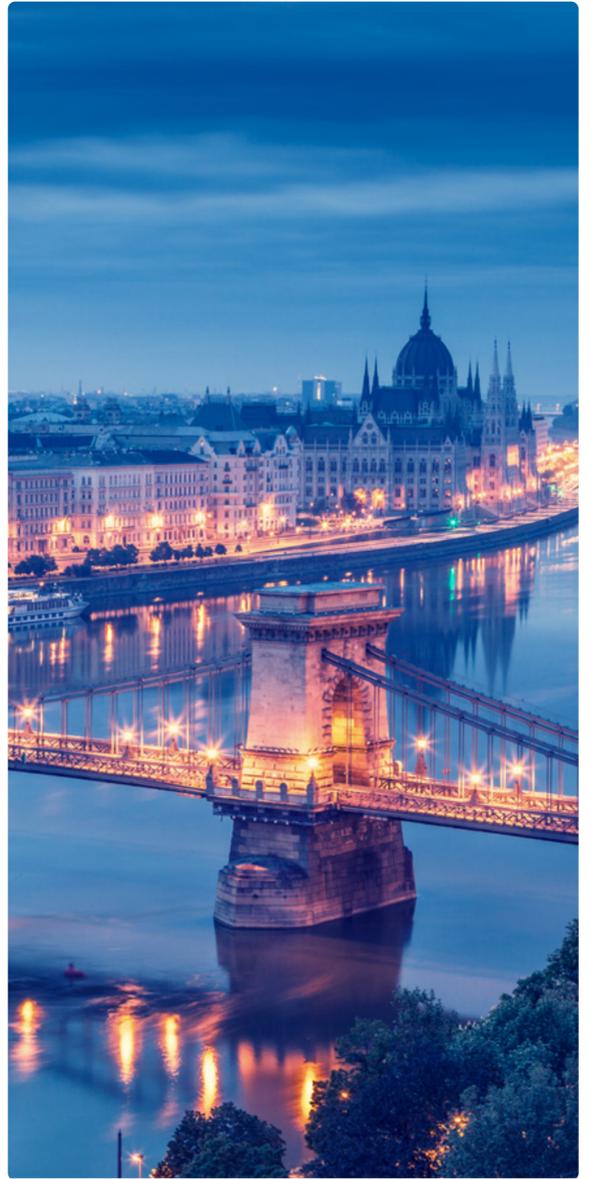
Hungary recorded 166 million real-time transactions in 2021, which resulted in an estimated cost savings of \$39 million for businesses and consumers. This in turn helped to unlock \$153 million of additional economic output, representing 0.08% of the country's GDP.

With real-time transactions set to rise to 471 million in 2026, net savings for consumers and businesses are forecasted to climb to \$131 million. That would help to generate an additional \$415 million of economic output, equivalent to 0.19% of the country's forecasted GDP.

Hungary is one of the countries for which real-time payments provide the biggest economic growth opportunities. According to the Cebr, the theoretical impact of all payments being real-time could add 4.4% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments.

Azonnali fizetési rendszer (AFR) is Hungary's domestic real-time credit transfer scheme launched in March 2020 in compliance with SCT Inst standards. Despite being less than two years old, the share of real-time payments of the total payments transaction volume stood at 4.2% in 2021. This can be attributed to AFR supporting different kinds of payments, including individual P2P, bulk, and recurring payments, and proving the convenience of making payments using mobile phone numbers, email addresses or tax identification numbers.

The central bank requires all Hungarian banks to offer real-time payments via AFR, which also supported this growth. The rally in both real-time payments volume and value will continue at the expense of cash, registering respective CAGRs of 23.1% and 35.7% from 2021-2026. The increased preference for electronic payments amid COVID-19 will also support this trend.



### ACI's Take

A proactive government continues to drive growth in the Hungarian real-time payments market. Participation in the HCT Inst scheme (branded as AFR and based on SCT Inst) has been mandated since 2020 and payments under the value of HUF 10m must execute within five seconds. At the start of 2021, a further mandate compelled all brick-and-mortar stores to accept electronic payments.

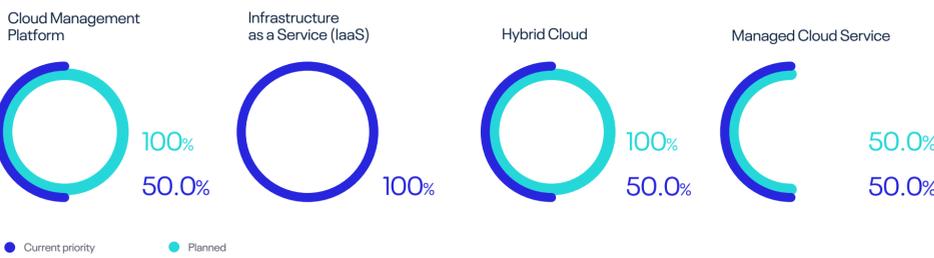
We anticipate that a big enabler of increased adoption will be the consolidation of the currently fragmented API landscape, in which there is no common standard shared by the banks. One solution looking to plug this gap is Mastercard's Open Banking Connect — of which most banks are part — which provides third parties with a universal connection to financial institutions' open banking functionality.

Still, while adoption is healthy, a critical mass is yet to be achieved, meaning real-time payments are not yet generating significant revenues for most players. However, it is encouraging that banks remain willing to invest in new use cases. Confident that the demand is there to be tapped, they are putting the infrastructure in place to capitalize on increased demand. Take OTP Bank, for example. The largest card payments provider with a 50% footprint, OTP has launched a real-time payments solution featuring a digital wallet that enables customers to pay merchants who also have OTP accounts.

In the near term, then, this dramatic lowering of the barriers to entry should prompt a renewed influx of fintechs bringing new services to market. Banks should ready themselves for increased competition as a result. Across the board, payment modernization roadmaps need to move beyond the previously noted minimum-level mandates to added-value services. Among the options available is Request to Pay, which is supported by AFR today, but only three banks currently support receiving these payments (OTP, Erste Bank and Raiffeisen). And there remains ample scope for increased innovation in the user experience around proxy look-ups through phone numbers and email addresses, among other identifiers.

### Trends + Data

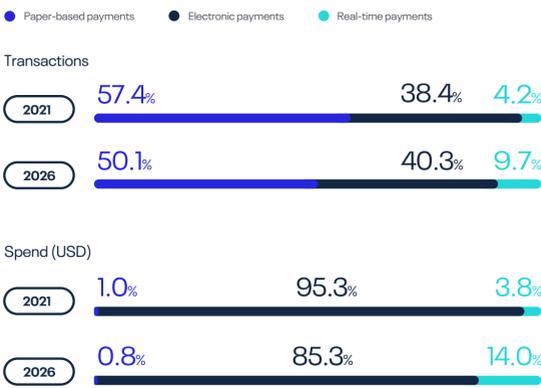
#### Cloud



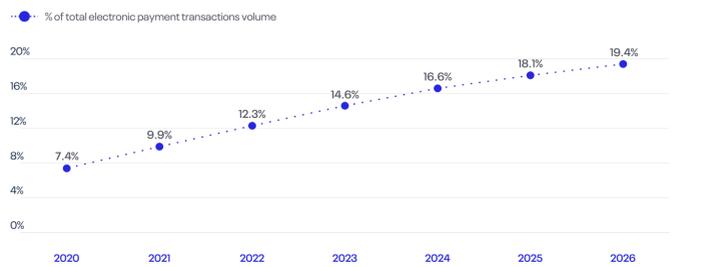
#### Platform as a Service (PaaS)



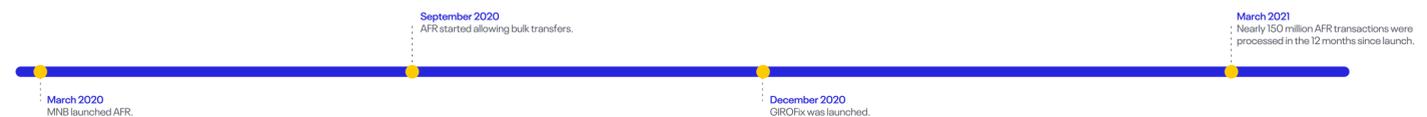
#### Shares of Volumes by Payments Instrument



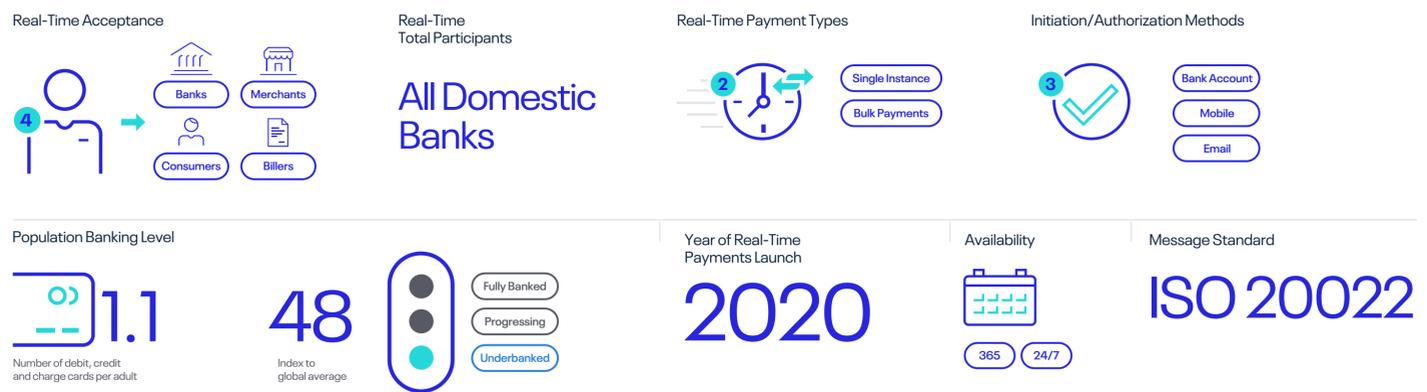
#### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2020-26f



### History



### Key Stats



### Cebr

Hungary, a high-income country, ranked as the 56th largest global economy in 2021 (Cebr World Economic League Table, 2022).

With its current share of real-time adoption, Hungarian consumers and businesses gained estimated net efficiency savings of \$39 million in 2021, which was predominantly driven by a reduction in the costs associated with failed transactions. In Hungary, we estimate the total cost of failed transactions to be \$329 million in 2021. However, through reducing the probability of failure, real-time payments saved stakeholders from an additional \$14.4 million of payment failure costs.

In 2021, economy-wide efficiency gains were estimated to facilitate \$153 million of economic output (0.08% of formal Hungarian GDP). The country has a relatively young real-time infrastructure with the first scheme launching in 2020, but by 2026, the share of volumes for real-time payments is estimated to more than double to 9.7%.

This robust real-time uptake will result in business and consumer level benefits reaching \$131 million in 2026. This is forecasted to facilitate 0.19% of formal GDP in 2026. Compared to other European countries in relative terms, the scale of this impact is above average and is equivalent to \$415 million of economic output annually.

#### For Businesses and Consumers



#### GDP Growth



Real-time payments have not been launched at a country level in Ireland, although a handful of banks offer this service via SCT Inst. Electronic payments are widely used in the country, with their share accounting for 63% of the total payments transaction volume in 2021. The large banked population and high awareness of electronic payments will act as key contributing factors if a real-time payments scheme is launched at the country level.

## ACI's Take

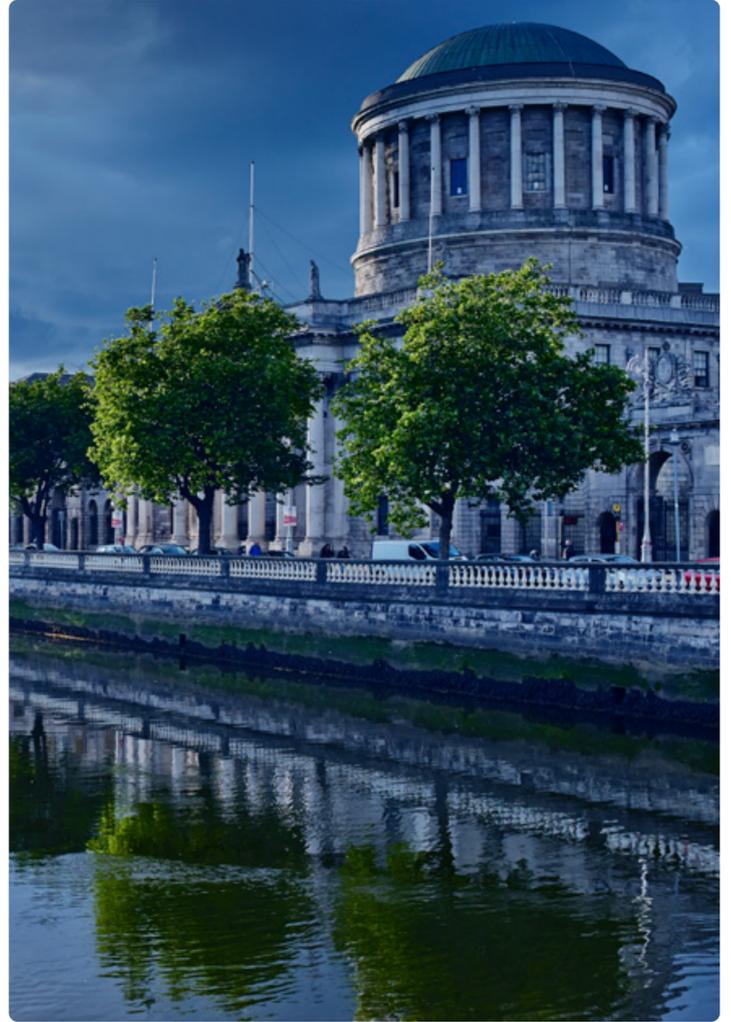
In response to growing market demand for real-time payments, several of Ireland's main banks have agreed to collaborate on a new mobile app, Synch Payments, focused on retail. The project's tech strategy is inspired by similar developments in Italy, with SIA Jiffy chosen to develop and run the scheme.

At the time of writing, in December 2021, the Competition and Consumer Protection Commission had announced that it was investigating the competitiveness of the project. However that pans out, it seems unlikely that Synch Payments will evolve into the broader domestic real-time payments scheme that banks need to drive additional consumer and business use cases. Instead, since Ireland is a eurozone country with a relatively small population, the logical option from a cost and convenience point of view would be to rely on the ECB's TIPS or EBA's RT1 rails. The alternative for Ireland may be to adopt the same strategy as Belgium and work with a local domestic clearing and settlement mechanism (CSM) like STET, which also has cross-border reach and interoperability.

That means the biggest impetus for modernization is likely to come from elsewhere, such as delivering better customer experiences and taking costs out of cross-border payments, with SCT Inst payments superseding SEPA debit, direct debit and SEPA credit transfers as we have seen already in the Netherlands.

Ireland has a significant migrant population abroad, and innovations that bring down the cost of transferring funds into and out of Ireland — particularly to and from the U.K., U.S. and Australia — would be most welcome. So, the ability to make real-time cross-border payments settled in local currencies could be a key driver for payments modernization.

The recommendation is that Irish banks make strategic infrastructure decisions the focus of upcoming refresh cycles, particularly when it comes to which processes to outsource and which to retain in house to take out or reduce costs. The market's ceiling for real-time payment volumes is lower than its larger European neighbors, so managed payment services would help to keep operating costs and the cost of compliance under control, while also accelerating time to market on new revenue streams. It would also make the onboarding of future payment types relatively painless and make Ireland an attractive fintech and regtech hub for introducing new overlay service providers. (This may in turn help with the Ireland Development Agency's [a government department] ambitions for encouraging inward investments into Ireland.)

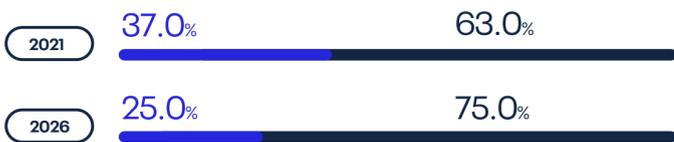


## Trends + Data

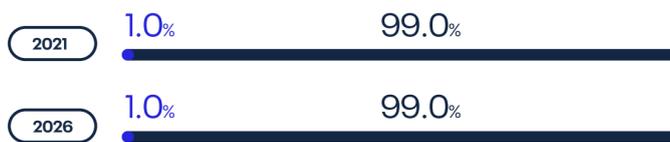
### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments

#### Transactions



#### Spend (USD)



## History

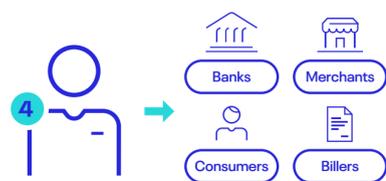


## Key Stats

### Mobile Wallet Trends



### Real-Time Acceptance



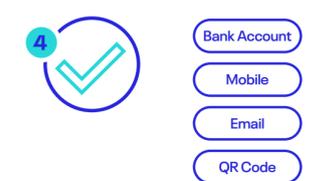
### Real-Time Total Participants

4

### Real-Time Payment Types



### Initiation/Authorization Methods



### Fraud

Payments Fraud Rate: **15.8%**

Population who reported being a victim of fraud in the last 4 years

Top 3 Payment Fraud Types

Type	% of fraud victims	Trend
Card details stolen online	25.3%	↑
Card details stolen/skimmed in person	16.7%	↓
Bank account hacked	16.7%	↑

### Population Banking Level



### Year of Real-Time Payments Launch

Expected

### Availability



### Message Standard

Expected

# ISO 20022

# Economic Benefits of Real-Time Payments Remain Largely Untapped

Italy is among the few nations that adopted the pan-European SCT Inst scheme in the early stage in November 2017. Despite the head start and wider participation from banks and payment service providers (280 participants as of December 2021), the growth in adoption and usage of real-time payments has been slow due to a high preference for cash.

Italy recorded 248 million real-time transactions in 2021, which resulted in an estimated cost savings of \$51 million for businesses and consumers. This in turn helped to unlock \$418 million of additional economic output, representing 0.02% of the country's GDP.

With real-time transactions set to rise to 737 million in 2026, net savings for consumers and businesses are forecasted to climb to \$168 million. That would help to generate an additional \$1.2 billion of economic output, equivalent to 0.05% of the country's forecasted GDP.

Italy is one of the countries for which real-time payments provide the biggest economic growth opportunities. According to the Cebr, the theoretical impact of all payments being real-time could add 4.9% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

While real-time payments account for just a 0.9% share of total payments transaction volume in 2021, paper-based transactions occupied an almost three-quarter share. However, with the COVID-19 pandemic now accelerating the shift towards digital payments, real-time payments volume is set to grow at a CAGR of 24.3% from 2021-2026.

### ACI's Take

At the time of writing, Italy's first digital overlay service to make use of the SCTInst real-time scheme is in development: Request to Pay on the Secure Real-Time Platform (SRTP), with all its accompanying and applicable use cases. This initiative by national regulators and financial institutions is the first step in a renewed focus on expanding real-time payment use cases. The idea is to inject some energy into what is a stable but slow-growing market, by better embedding real-time payments into everyday aspects of consumer life.

Indeed, longer term there are talks of extending real-time payments into eCommerce. There, current penetration is virtually nil, but COVID-19-related shifts in consumer behavior mean overall activity volumes are higher than ever.

Expanding use cases therefore contributes to a continued positive outlook for real-time payment opportunities in the market, further fueling the business case for action by the market's payment players. Historical preferences for paper-based payments, a high maximum real-time transaction limit (up to €100,000), a continuously improving domestic scheme — these are strong foundations for high real-time payment volumes.

Maturing regional interoperability throughout Europe, converging on the TIPS system, is another factor expected to influence growth of real-time payments. (Though it must be noted that Italian banks, which have already invested heavily in the Bancomat Pay scheme, remain in wait-and-see mode when it comes to the European Payments Initiative (EPI)).

The feeling is that real-time payments adoption will not remain sluggish for long, especially as more innovative use cases come online. As they do, success will depend on more than handling high volumes. Payments modernization strategies should continue to prioritize competitive differentiation around ancillary services, such as fraud monitoring, digital identity management, and billing and liquidity management. But they should also reflect the fact that rationalizing infrastructure and removing duplication will be vital to cost-effectively onboarding and processing new payment types, schemes and use cases. Accelerating the convergence of payments architecture into a hub environment will also accelerate the path to profitability for real-time payments.



### Trends + Data



#### Cloud Management Platform



#### Infrastructure as a Service (IaaS)



#### Hybrid Cloud



#### Managed Cloud Service



#### Platform as a Service (PaaS)



#### Private Cloud



#### Software as a Service (SaaS)



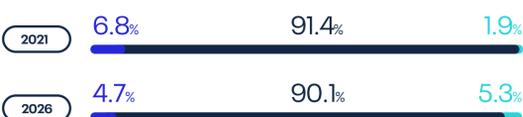
### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

#### Transactions



#### Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2018-26f



### Real-Time Transactions



### History



### Key Stats

#### Mobile Wallet Trends



#### Real-Time Acceptance



#### Real-Time Payment Types



#### Initiation/Authorization Methods



#### Population Banking Level



#### Year of Real-Time Payments Launch



#### Availability



#### Message Standard



### Cebr

In 2021, Italy ranked as the world's eighth largest economy (Cebr World Economic League Table, 2022).

In contrast to its European peers, Italy has a primarily paper-based payments mix. Almost three quarters of all transactions in the economy are paper based, leaving real-time payments with a marginal share of 0.9% as of 2021. Italian consumers and businesses therefore enjoyed relatively modest benefits from real-time payments, totaling only \$51 million in efficiency savings.

These benefits contribute to the real-time payments system facilitating \$418 million in macroeconomic gains in 2021 (0.02% of formal GDP); equivalent to the output of 4,535 workers. This macroeconomic

impact is predominantly driven by the formalization of shadow economy activity. Cebr estimates that, in Italy, real-time payments were responsible for the formalization of \$359 million of economic activity that would have otherwise occurred outside of the formal institutional and bureaucratic frameworks.

By 2026, the share of real-time payments is expected to increase to 2.9%, with paper-based transactions remaining dominant. The benefits at the business and consumer level are expected to increase to \$168 million, while the macroeconomic benefits of real-time payments are estimated to rise to \$1.2 billion of formal economic output; equivalent to that of 12,694 workers, or 0.05% of formal GDP in 2026.

#### For Businesses and Consumers



#### GDP Growth





## Real-Time Payments Forecasted to Help Generate 0.23% of GDP by 2026

In 2021, the country recorded 1.2 billion real-time transactions, which resulted in an estimated cost savings of \$338 million for businesses and consumers. This helped to unlock \$1.2 billion of additional economic output, which represents 0.12% of the country's GDP.

With real-time payment transaction numbers expected to rise to 3.4 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$1.6 billion. That would help to generate an additional \$2.6 billion of economic output, equivalent to 0.23% of the country's forecasted GDP.

The Netherlands introduced its real-time payments infrastructure when banks adopted SCT Inst in 2019. SCT Inst is a pan-European real-time payments scheme that was developed by the European Payments Commission (EPC). It provides instant payment transfers within any countries that are part of the eurozone. Real-time payments had a rapid adoption in the Netherlands. By 2021, the real-time payments market share of total payments volume reached 10%, rapidly catching up to paper-based transactions, which were at a 13.9% share of total payments volume. Future projections for real-time payments are expecting strong growth as a payments tool and becoming the second most used payments tool in terms of total payments volume and total payments spend. Real-time payments volume is expected to have a five-year CAGR of 22% for the period of 2021-2026, and real-time payments spend is expected to have a five-year CAGR of 52% for the same period.

### ACI's Take

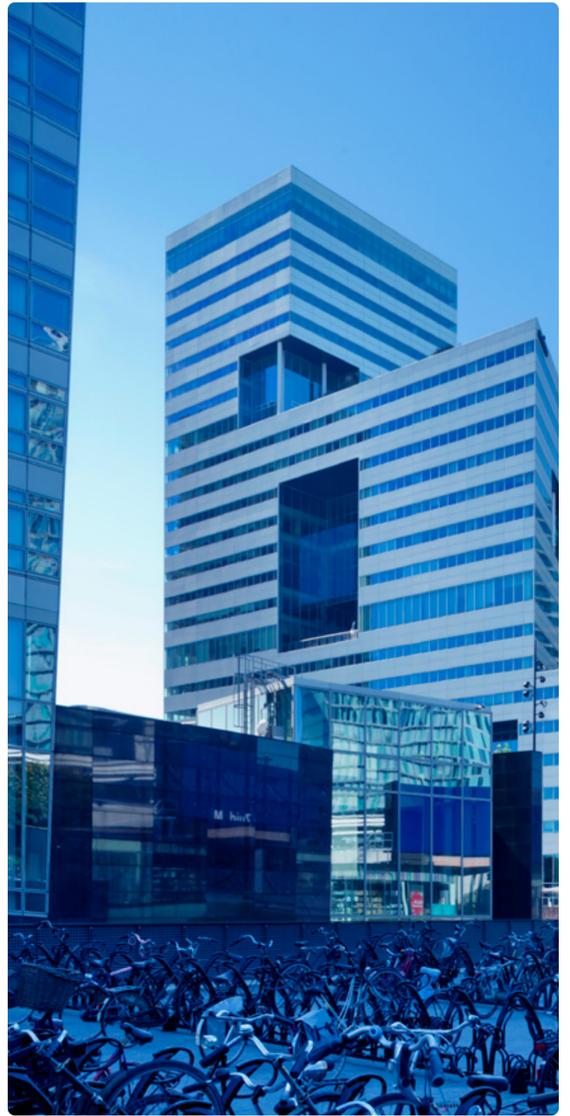
The Netherlands is a nation that strongly favors debit payments over credit. That means immediate debit schemes play well to consumers generally, which has helped real-time payments to become well established in the market. Nowhere is this better illustrated than in the eCommerce space, where the iDEAL payments scheme was used for 70% of payments in the first half of 2021 and was used by 96% of online shoppers. But, more broadly, real-time payments for P2P transactions have been in widespread use for two years already and the corporate market is also showing strong growth, although additional use cases are required to make further inroads.

Chief among those use cases would be real-time batch payments. This would immediately make real-time payments more relevant to businesses and provide a high-value revenue stream for banks that would also — potentially — set them on the longer-term path to retiring significant legacy architectures.

One of the drawbacks of being an early mover is that the Netherlands has less to gain by modernizing its payments infrastructure (whereas markets that are only just standing up real-time payments also have

the opportunity to launch with a broader range of use cases from day one). In the Netherlands today, real-time payments are settled in their place in the payments ecosystem, meaning there is little appetite to implement new services like Request to Pay. That is a reasonable decision given current market conditions, but banks should be mindful of the risks around imported innovations from international competitors or the emergence of new market entrants. (PSD2 not only makes the latter more likely, but it also gives rise to opportunities for banks to build their own premium services.)

Finally, financial institutions in the Netherlands are pioneers of payment processing in the cloud. The market's leading banks are sold on the vision of winding down much of their own data center commitments to increase efficiency and scalability, and transition much of their IT cost base to an operational expense. To that end, we see these organizations making concrete steps to migrate payment processing to the cloud by the end of 2022. This will be the first step on a wider transformation journey towards adopting payment processing as a service.



### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)

44.4%

33.3%

Private Cloud

66.7%

44.4%

Software as a Service (SaaS)

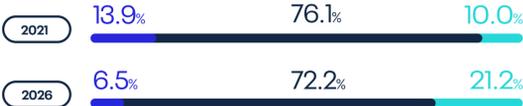
55.6%

66.7%

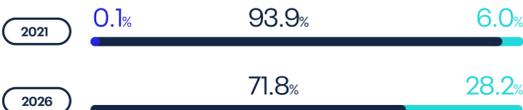
### Shares of Volumes by Payments Instrument

Paper-based payments Electronic payments Real-time payments

Transactions



Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2019-26f



Real-Time Transactions

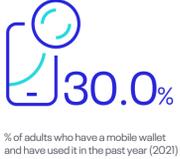


### History



### Key Stats

Mobile Wallet Trends



Real-Time Acceptance

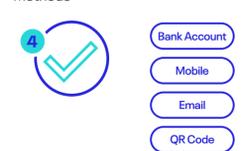


Real-Time Total Participants

Real-Time Payment Types



Initiation/Authorization Methods



Population Banking Level



Year of Real-Time Payments Launch



Availability



Message Standard



### Cebr

The Netherlands is a high-income country that, as of 2021, ranked as the 18th largest global economy (Cebr World Economic League Table, 2022).

In 2021, 10% of all transactions in the country were real-time, a figure in line with the U.K. but outpacing Eurozone counterparts France and Germany.

As a result of its strong real-time adoption, consumers and businesses in the Netherlands benefited from efficiency savings of \$338 million in 2021, with real-time payments ultimately supporting 0.12% of the formal economy (\$1.2 billion) in the same year, equivalent to the output supported by 11,412 jobs.

By 2026, the share of transactions by volume is forecasted to grow to 21.2% — at a CAGR of 22.6% — driving the impact of real-time payments for consumers and businesses up to \$1.6 billion. This result is underpinned by the significant benefits generated by the reduction in the size of the payments float, which is estimated to unlock a total transaction value of \$2.9 billion per day in 2026. This working capital is expected to facilitate an estimated \$1.1 billion of business output in 2026.

At the macroeconomic level, economy-wide efficiency gains are estimated to facilitate \$2.6 billion of economic output or 0.23% of formal GDP in 2026, equivalent to the output supported by 21,835 jobs.

For Businesses and Consumers



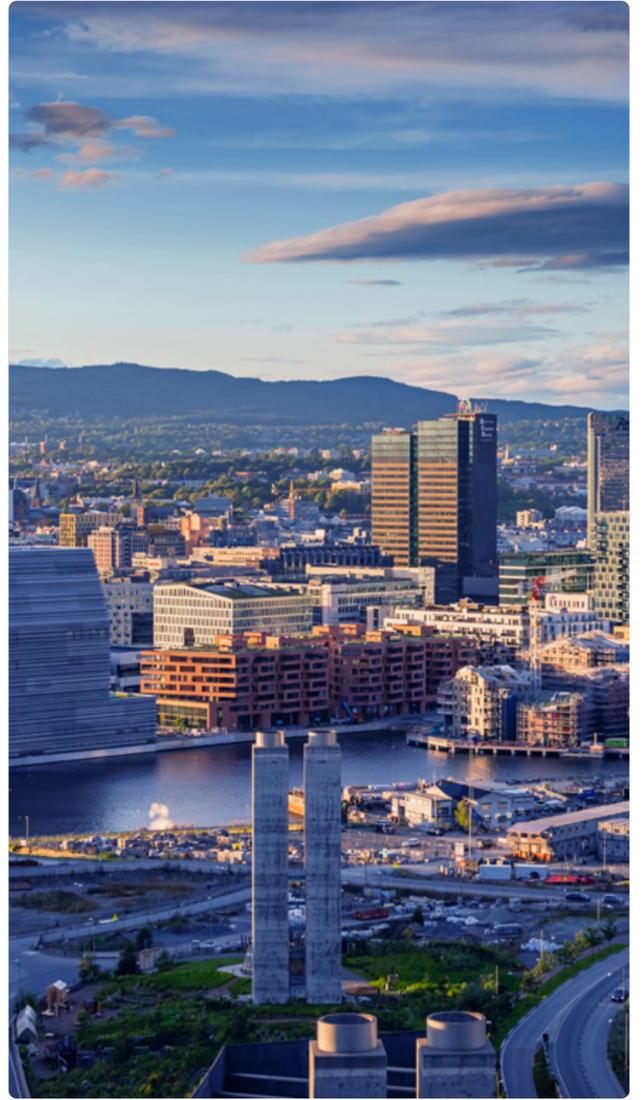
GDP Growth



With the launch of Straksbetalinger in 2013, Norway integrated real-time payments within its national payments infrastructure. Straksbetalinger required significant improvement as it had some shortcomings, particularly around settlement issues that put the payee's bank at risk. To remediate those issues, an updated version was released in 2020 called Straks 2.0. The mobile payments app Vipps was launched in 2015 to enable users to make real-time payments between Vipps users only. To fund their Vipps account, they use their bank account or card payments. Vipps is accepted by more than 100 banks in Norway.

In 2021, real-time payments represented 5.7% of total payments volume, making it the second most popular payments method after electronic payments (excluding real-time payments). The Norwegian market is still dependent on electronic payments (excluding real-time payments). But the future of real-time payments is positive as its total payments volume is projected to reach 16.4% by 2026, greatly benefitting from the drop of paper-based transactions.

With further development coming for Vipps, we can expect to see rapid growth with real-time payments in the future. In 2021, Vipps announced that it will be integrated with Danish MobilePay and Finnish Pivo to create a single wallet solution. If successful, this will create one of the largest mobile wallets in Europe with a user base of 11 million consumers and more than 330,000 merchants across the three countries.



## ACI's Take

Norway is one of Europe's leading lights on the drive to go cashless. Cash transactions are hovering around just 3% and Norwegian citizens have also almost totally embraced cards for payments in the retail sector, with the highest usage of cards per capita in the world. And now the central bank is testing a central bank digital currency (CBDC) solution — the result of four years of research — as a way to boost digital payments adoption, increase payments efficiency with lower transaction fees and reduce fraud thanks to increased oversight via blockchain tech.

That plays into a curious development in the region: despite high-profile and visionary drives to improve cross-border payments, each market is pursuing its own refresh of the domestic real-time settlement rails (RTGS). If P27 delivered on its ambitions, there arguably wouldn't be any need for these projects — how many real-time schemes are actually too much?

Care must be taken that these various modernizations reflect the fact that Norway's banks are navigating a complex interplay between new domestic and cross-border requirements, each in different stages of development. Banks in the market should be aiming for a common and uniform set of gateway services that can provide multi-scheme access. Full convergence is potentially too disruptive in the mid-term, but the former approach would still deliver the required increase in reach for current interoperability capabilities. It would also make onboarding future changes less complex.

Beyond the region's borders, a good level of harmony between the payment rulebooks of the Nordic Payments Council and those found in the European Union has not stopped strong lobbying for more streamlined transactions between local currencies and the euro. Processing these one-leg-out transactions with eurozone countries remains inefficient and expensive. For now, in the absence of a regulatory framework, banks are exploring least-cost routing, combining different rails to provide more competitive services to corporate customers.

## Trends + Data

### Cloud

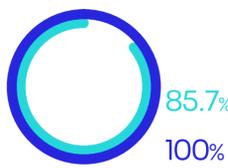
Cloud Management Platform



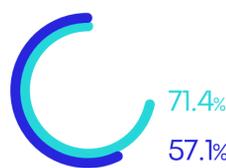
Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



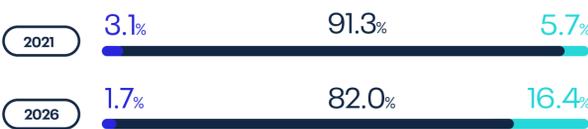
Software as a Service (SaaS)



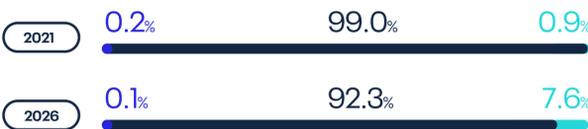
## Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

Transactions

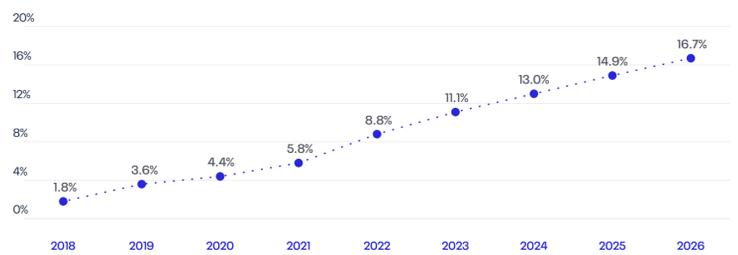


Spend (USD)



## Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2018-26f

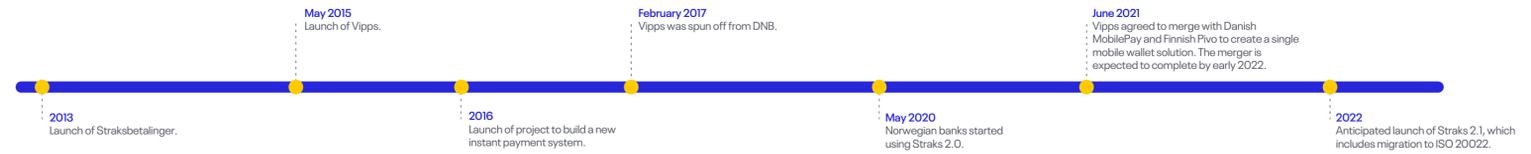
● % of total electronic payment transactions volume



## Real-Time Transactions

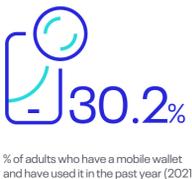


## History



## Key Stats

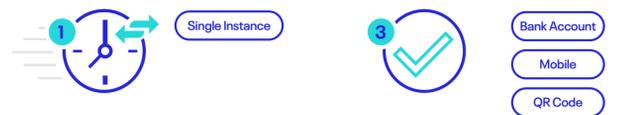
Mobile Wallet Trends



Real-Time Acceptance



Real-Time Payment Types



Population Banking Level



Year of Real-Time Payments Launch



Availability



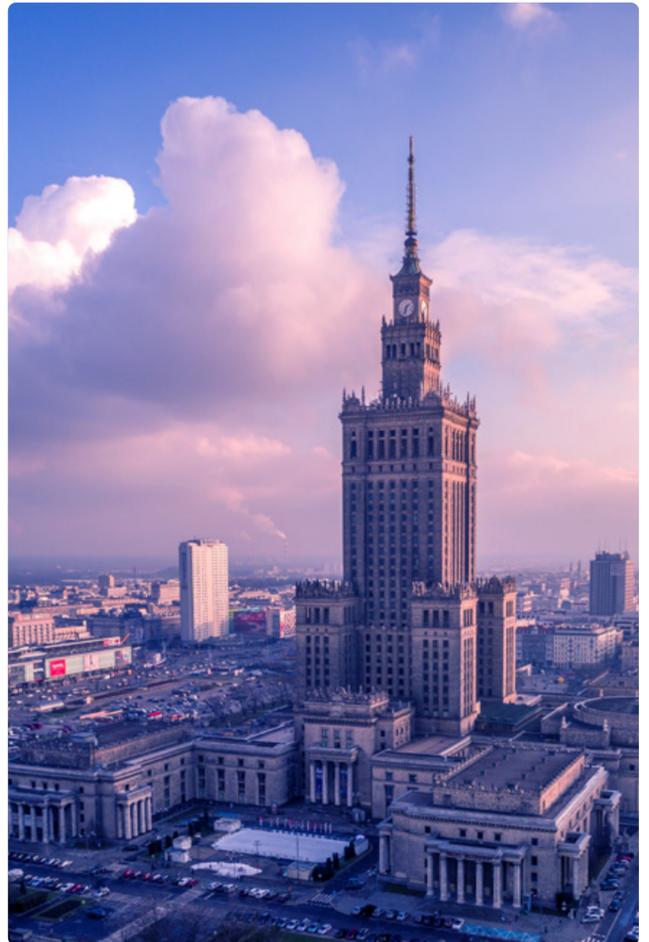
Message Standard

Proprietary

Poland was one of the earliest adopters of real-time payments in Europe and has two systems in place, both launched in 2012. The Express Elixir real-time payments scheme was launched by Krajowa Izba Rozliczeniowa, Poland's payments clearing system.

BlueCash is the second real-time payments platform in Poland, launched by the Blue Media company. Both platforms enable real-time transfers between bank accounts, operate 24/7/365 and are available to both individuals and businesses. The main difference between Express Elixir and BlueCash is that the former allows transfers between accounts of participating banks, whereas with BlueCash, either the sender or the receiver must be a user of the BlueCash platform.

In 2021, real-time payments represented a 0.7% share of total payments volume, making it a very small share of payment tools compared to electronic payments (excluding real-time payments), which were at 51.5% and paper-based transactions, which were at 47.8%. Future projections for real-time payments are pointing towards a general increase in activities. Real-time volume is expected to reach a CAGR of 39.4% from 2021-2026 and value will grow at a similar CAGR of 37.8% over the same period.



## ACI's Take

2022 will mark a decade since Poland became the second European country to introduce real-time payments in the shape of the Express Elixir real-time payments clearing system. Since then, the BLIK mobile wallet has made online and in-store real-time payments, and real-time P2P transfers, a feature of everyday life.

Poland thus has many of the hallmarks of a mature market for real-time payments. It has already achieved a critical, but stable, mass of adoption thanks to its national real-time payments infrastructure and a digitally savvy population.

Nevertheless, there is considerable room for further growth, and new use cases are needed to chip away at cash's still significant market share. BLIK is rising to the challenge here, with new functionality such as ATM withdrawals and payments at the point of sale.

However, the market is approaching a technology crossroads that will impact how banks, PSPs and acquirers can best engage with additional new use cases or develop their own.

It may be that Express Elixir and BLIK continue to innovate independently, adding an element of simplicity through familiarity to payments modernization roadmaps. But given PKO Bank Polski's membership in the European Payments Initiative (EPI), they may respond to this influential bank's almost-inevitable adoption of that scheme's digital wallet. This will have a consequent significant knock-on effect, especially around acquiring transactions from the newcomer. PKO's huge market share means EPI could reach critical mass very fast, so its digital wallet strategy and that of the wider EPI project are hugely important factors to monitor.

## Trends + Data



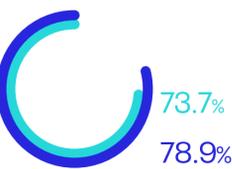
Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)

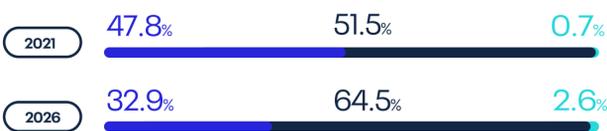


● Current priority ● Planned

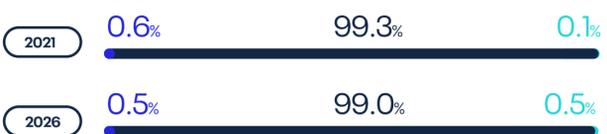
## Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

Transactions

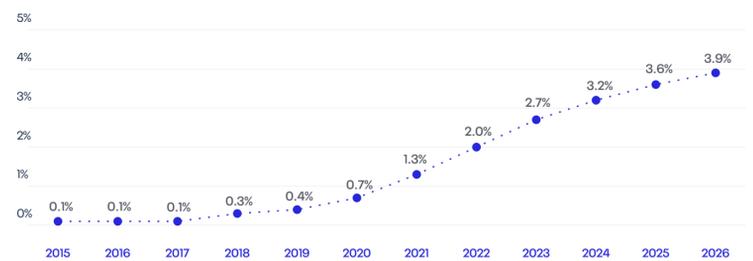


Spend (USD)



## Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f

● % of total electronic payment transactions volume



## Real-Time Transactions



## History

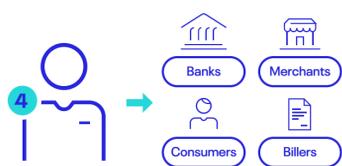


## Key Stats

### Mobile Wallet Trends



### Real-Time Acceptance



### Real-Time Total Participants



### Real-Time Payment Types



### Initiation/Authorization Methods



## Fraud

Payments Fraud Rate



### Top 3 Payment Fraud Types



### Population Banking Level



### Year of Real-Time Payments Launch



### Availability



### Message Standard





Portugal does not have a domestic payments scheme. The Portuguese interbank clearing system SICOI enabled SCT Inst transfers in Portugal in September 2018. Initially available for domestic transactions, Portuguese banks started offering cross-border transfers from October 2020. The real-time payments market in the country is still in its nascent stage, with real-time payments accounting for just a 0.2% share of total payments transaction volume in 2021.

However, with the preference for electronic payments on the rise, the further prospects of real-time payments look promising, with their volume anticipated to record a CAGR of 54.7% from 2021-2026.

ACI's Take

To date, Portugal's strategy for implementing real-time payments has been built around creating a multi-purpose domestic infrastructure, SIBS, on which banks can build and promote their own digital overlay services, and create persuasive use cases. Based on SCT Inst, SIBS Instant Payments was launched in 2018 to facilitate real-time payments between national banks. By 2020, 95% of accounts were available on SIBS.

In 2020, the national Forum para os Sistemas de Pagamentos proposed a two-year strategy to accelerate the adoption of electronic payment solutions. Among the four "key action points" are educating consumers and retailers of the benefits of real-time payments and boosting real-time transactions to a point where they become "the new normal."

Achieving both will be helped by the onboarding of real-time payments for eCommerce by MBWay, the universal digital wallet launched in 2016 as a P2P payments vehicle. This development provides Portugal with the foundation to follow a similar path to driving further growth in real-time payments adoption as that taken by Bizum in neighboring Spain.

MBWay is in a position to replicate Bizum's hugely successful model of leveraging its immense brand recognition and market penetration to systematically identify and service popular use cases. Indeed, it is perfectly possible for this ubiquitous digital wallet to go further and become a "sticky" lifestyle "super app" in the mold of an Alipay or WeChat.

All of this means Portugal's incumbent banks and financial institutions must accelerate the development of their own digital overlay services on top of MBWay to fend off incoming new entrants. They have an advantage in the shape of existing granular knowledge of the way customers already use real-time payments. As such, their modernization roadmaps must do more than account for handling mere operational challenges, such as increased transaction volumes. They must also chart a path to making better use of AI to manage and mine data for insights into customer behavior.

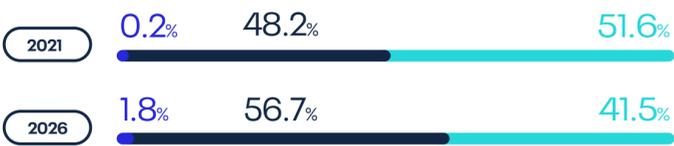


Trends + Data

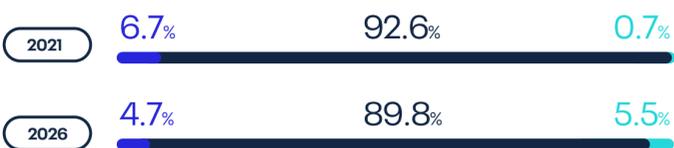
Shares of Volumes by Payments Instrument

Paper-based payments Electronic payments Real-time payments

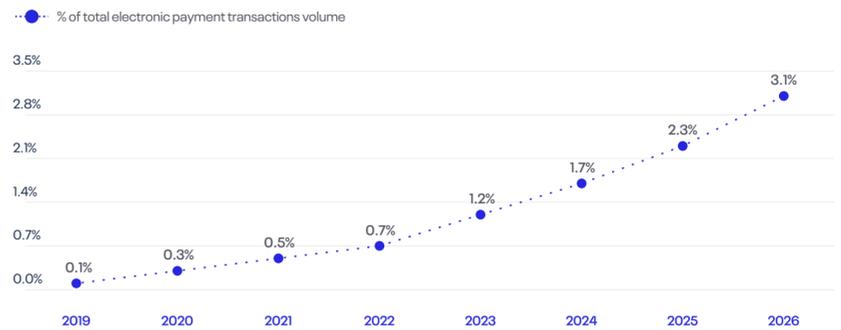
Transactions



Spend (USD)



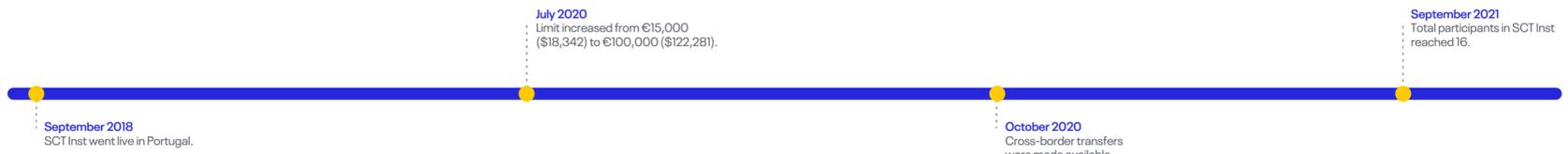
Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2019-26f



Real-Time Transactions

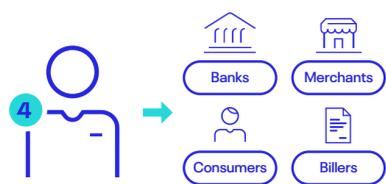


History



Key Stats

Real-Time Acceptance



Real-Time Total Participants

16

Real-Time Payment Types



Initiation/Authorization Methods



Population Banking Level



Year of Real-Time Payments Launch

2018

Availability



Message Standard

ISO 20022

Spain launched its domestic real-time payments system Bizum in October 2016 and later adopted SCT Inst in November 2017. The adoption and use of real-time payments in the country has been on a gradual rise, supported by increasing participation from banks and financial institutions. While Bizum has more than 31 participants, SCT Inst was adopted by more than 90 banks in Spain as of December 2021. The increasing demand for electronic payments amid COVID-19 has also supported the growth.

The trend is likely to continue over the next few years, with real-time payments set to record a CAGR of 36.3% from 2021-2026 in terms of volume. Consequently, the share of real-time payments of the total volume of electronic payments will increase to 14.1% in 2026 from 4.7% in 2021.

## ACI's Take

Spain's appetite for digital payments continues to grow unabated. Indeed, the pace of change from cash-centric to digital-centric has quickened remarkably — mostly thanks to the wildly successful Bizum app. Launched in 2016 and built on SCT Inst, the Bizum mobile wallet has attracted more than 18 million and has regularly added features beyond its original P2P functions.

Things have taken off at a speed that has surprised even the app's most ardent proponents. One driver of adoption is the modern Bizum user interface replicating social networks. Another is a steady stream of use cases taking real-time payments deeper and deeper into consumers' lives. These include support for donations to NGOs, eCommerce payments and refunds, and even real-time settlement of national lottery prizes. Its ease of use is also boosted by widely available QR-code initiation.

Interestingly, three large European Payments Initiative (EPI) shareholders — Santander, BBVA and Caixa Bank — are also Bizum shareholders. This means there is likely to be heavy promotion of that scheme when it arrives in Spain, but it also means other markets should take note: it is quite possible the wallet's development will be shaped by Bizum's success.

Responding to the continued success of real-time payments means greater volumes of transactions for Spain's banks to process, which gives rise to operational and technology challenges. But the proliferation of use cases for real-time payments via Bizum is a challenge with potentially greater implications — and opportunities. These transactions give banks ever more granular, micro-level information about how their customers live (apartment-sharers splitting rental payments using Bizum, for example) that could herald a new phase of customized banking: real-time personalization of services.

Banks must develop payment modernization roadmaps that go beyond the speeds and feeds of payment processing. They must reflect what it takes to succeed as a data-driven business: agile cloud-based systems and advanced data management/mining processes that can support AI use cases. These are the topics that are increasingly coming up in conversations with banks and financial institutions.

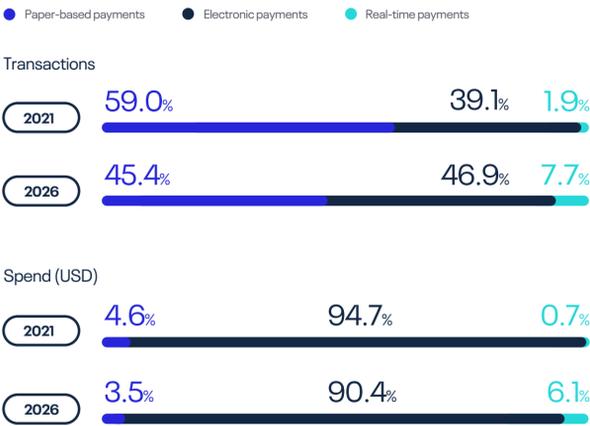


## Trends + Data

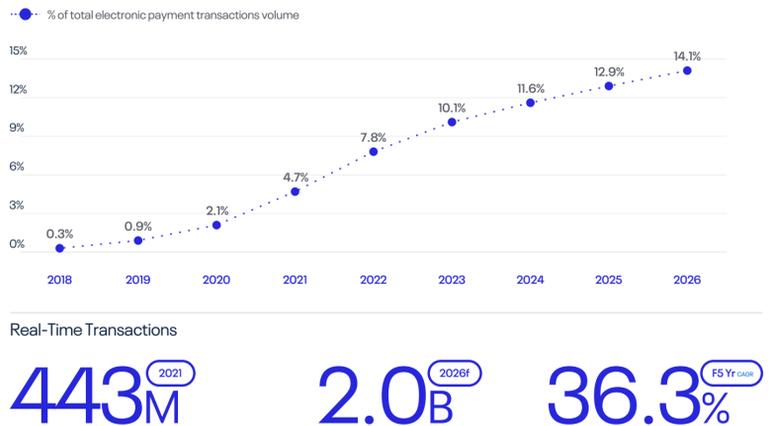
### Cloud



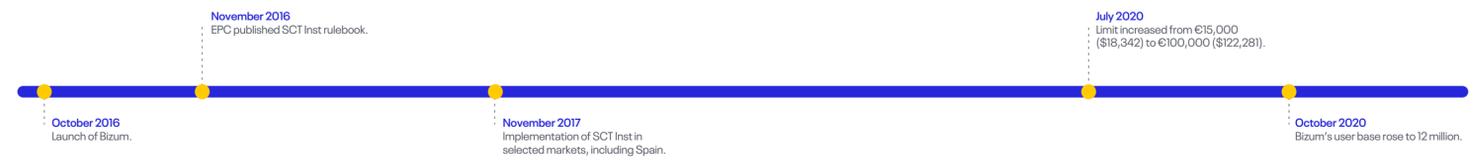
### Shares of Volumes by Payments Instrument



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2018-26f



## History



## Key Stats

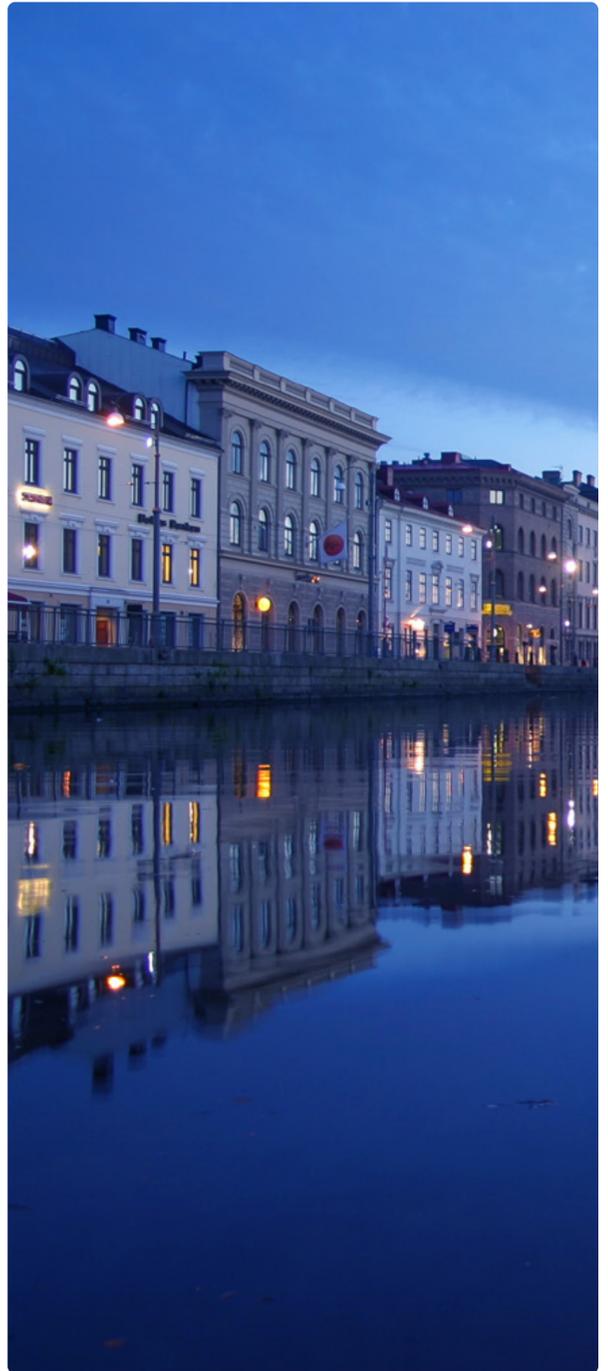


The Swedish payments clearing system, Bankgirot, launched a real-time payments platform in 2012 called BIR that enables users to make real-time transfers between bank accounts. Through the different APIs it provides, BIR allows financial institutions and other businesses to use its infrastructure and build their own services taking advantage of its real-time payments solution. In December of 2012, Swish became the first payments app to be integrated into the scheme through the use of APIs.

Swish enables Swedish consumers to perform P2P and C2B transfers using a mobile phone number associated with their current account. In 2021, real-time payments accounted for an 11.2% share of total payments volume, making it the third-ranked payments tool in terms of payments volume. But when compared to total payments spend, only 1.9% is attributed to real-time payments. Nevertheless, this adoption reveals that real-time payments are being used for everyday expenditures, thanks to the increased accessibility via Swish. In the future, real-time payments volume is expected to grow at a CAGR of 13.3% from 2021-2026, while the value should grow further at a CAGR of 20.3% over the same period.

With paper-based payments expected to gradually decline over time, the paper-based payments market share of total payment volumes is expected to drop from 12.6% to 9.4% by 2026. Sweden is slowly preparing to transition to a cashless economy within the next 10 years. This would be an opportunity for real-time payments to gain more market share and replace paper-based payments.

Meanwhile, a secondary real-time payments scheme is being developed called P27. P27 is a collaborative initiative among leading banks such as Danske Bank, Handelsbanken, Nordea, OP Financial Group, SEB and Swedbank. They are working together to develop a pan-Nordic real-time payments scheme. Due to be launched in 2022, it should improve cross-border transactions in the region.



## ACI's Take

Digital payments adoption in Sweden has been given a boost by the BankID mobile app, which allows anyone with a Swedish "personnummer" (personal identification number) and bank account to access digital public services and online banking. Its simplified experience, built around a six-digit code or fingerprint ID on a smartphone, has spared Swedes from needing to remember card numbers, passwords and obscure security question answers when accessing digital services. The central bank is also among the latest to announce plans to explore a central bank digital currency (CBDC) in the shape of the e-krona.

At the domestic level, Sweden is refreshing the real-time settlement rails (RTGS). The RTGS refreshes are all moving through a single supplier within each of the geos. Each geo is keen to synchronize its modernization on the ISO 20022 standard and is working towards similar timelines.

From the regional point of view, P27's drive to modernize and simplify cross-border payments between the Nordic markets — Denmark, Sweden and Finland — continues to move forward, though not as fast as initially hoped. This may in part be attributed to the pandemic, but the acquisition of Bankgirot and the ensuing formalities around securing its clearing and settlement license has also contributed. But delays are par for the course on projects with such a grand scope. Overall, the project's mandate remains

clear, and the organization is still committed to delivering its promise to enable the region's banks to offer a better customer experience and service for cross-border payments, at a lower cost.

Nevertheless, layer one is being laid down and the focus now is on layer two. This covers the overlay services, which are expected to include bill payments, Request to Pay and confirmation of payee, alongside fraud prevention and security initiatives.

All that said, the real challenge going forward, not just for P27 but more generally for the Nordic Payments Council and wider participant community, is juggling what these future schemes and services look like in each of the region's geos to satisfy individual needs. For most, full consolidation and convergence is potentially a step too far in the mid-term. Instead, they need a common and uniform set of gateway services that can provide multi-scheme access. This would make future changes easier to manage while substantially extending the reach of current schemes and networks.

Behind that connectivity, they must develop a longer-term roadmap to deliver the flexibility to settle in any currency available today — not just domestic ones — and whatever new ones may emerge in the future, such as CBDCs or even cryptocurrency.

## Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



● Current priority ● Planned

Platform as a Service (PaaS)



Private Cloud



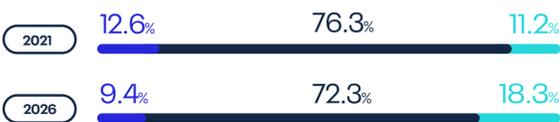
Software as a Service (SaaS)



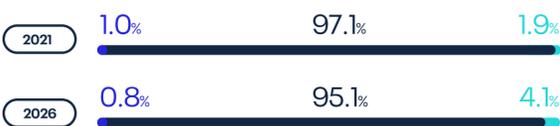
## Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

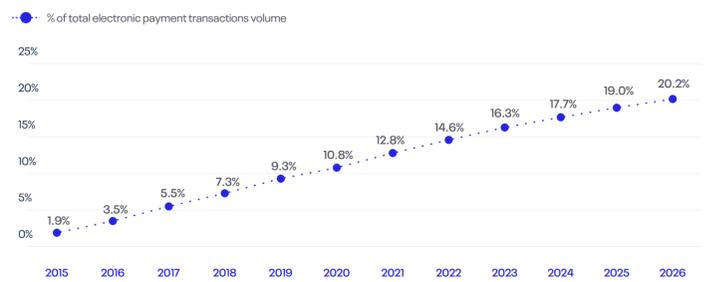
Transactions



Spend (USD)



## Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



Real-Time Transactions



## History

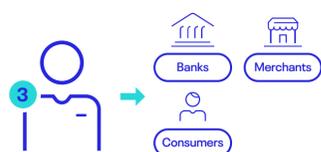


## Key Stats

Mobile Wallet Trends



Real-Time Acceptance



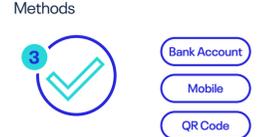
Real-Time Total Participants



Real-Time Payment Types



Initiation/Authorization Methods



## Fraud



Population Banking Level



Year of Real-Time Payments Launch



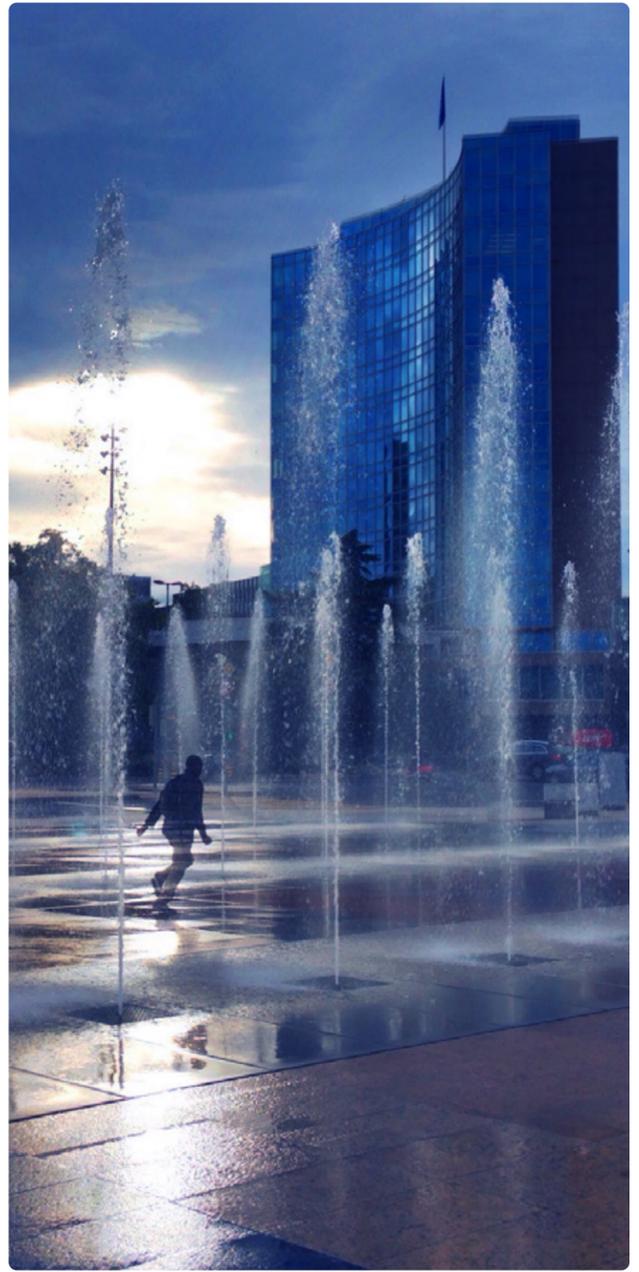
Availability



Message Standard



Switzerland launched its real-time payments infrastructure in 2017 when PostFinance and Paymit collaborated to launch their real-time payments app, TWINT. TWINT directly links to users' bank accounts and enables direct account-to-account transfers instantly. In 2021, real-time payments represented a 3.9% share of total payments volume, a smaller payments tool compared to electronic payments (excluding real-time payments), which owns the largest market share at 49.3% of total payments volume. But future projections for real-time payments share are positive, as it is expected to reach 17.9% of total payments volume by 2026 at a CAGR of 38.7% between 2021 and 2026. TWINT registered 3.5 million users on its platform, which represents about 40.5% of the nation's population — given this figure, TWINT has a lot of room to grow its user base and thus its market share within Switzerland in the near term. Currently, unlike most other European real-time payments schemes, there are limited prospects for international integration, as Switzerland is not in the EU or eurozone.



## ACI's Take

Swiss financial institutions have been mandated to receive real-time payments by August 2024, with SIC5 (the new Swiss instant payments scheme) likely to become available in 2023.

Many institutions were relaxed about the mandate because the central infrastructure owner, SIX Payments, was initially planning to launch a real-time payments solution that would help them satisfy this requirement. But those plans were indefinitely suspended in 2021, as the market reevaluated requirements and institutions now need to put in place their own solutions.

Facing a tight deadline, several financial institutions view this as only a compliance mandate cost and not an opportunity to expand, grow and leverage real-time payment capabilities as a revenue generator. Many will be looking at the easiest way to extend their existing infrastructure to satisfy the incoming mandate. A few banks will turn to their core banking providers, software vendors and trusted technology partners to understand how they can help. As a result, this low-level transformation will be relatively simple for them as a very short-term fix, which has raised some concerns from analysts.

Although several banks believe initial real-time payment volumes will be low, this is potentially short-sighted. As we have seen in many other countries that have adopted real-time payments, this is not often the case. The recommendation of several analysts is for banks to think longer term, beyond the initial compliance requirements now. As we have seen in other countries, one mandate is often followed by others (for example, around real-time fraud detection and sending of real-time payments), which often reflects substantial increases

in real-time payments. Banks should therefore assess their supplier base, questioning the extent to which current partners have the resources, technology, available proven software or skills to keep up with continuous change and an increasing scope of requirements (especially with digital overlay enhancements). SaaS and PaaS models are highly attractive options for Swiss banks, as they provide the services that not only meet the upcoming 2024 requirements but also provide financial institutions the capabilities to scale at speed and with minimal investment.

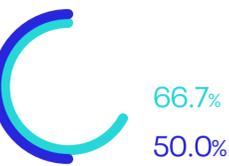
Some of the larger Swiss banks are already taking a more strategic approach, investing in deploying their own custom payment platforms with robust, API-driven payment orchestration capabilities that will — eventually — save time and money meeting future mandates and customer requirements (both corporate and retail). For them, cost-effective compliance will be a source of a competitive advantage in the future. Of course, only the very biggest players can contemplate building and maintaining their own platforms, so the rest are encouraged to add similar requirements to the aforementioned assessment of current suppliers.

Finally, experience in other markets shows that real-time payments' early movers tend to retain their competitiveness, if not jump ahead. Some will stick to the limited scope of the mandate, so the stage is set for the bolder and more forward-thinking members of Switzerland's agile and innovative financial services community to go further. By developing a roadmap to support end-to-end real-time payments and related, data-enabled overlay services (for consumers and businesses), they can capitalize on a huge emerging opportunity.

## Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



● Current priority ● Planned

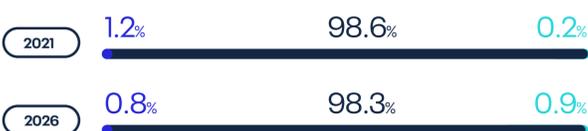
## Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

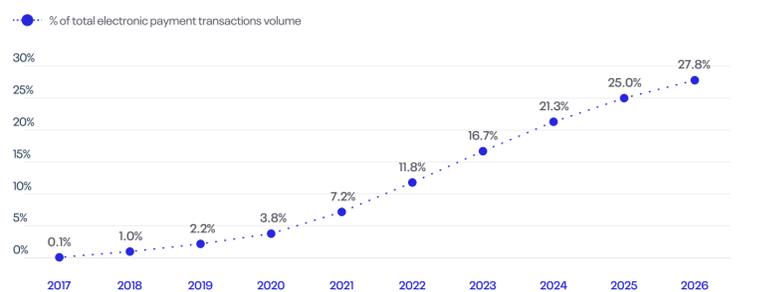
Transactions



Spend (USD)



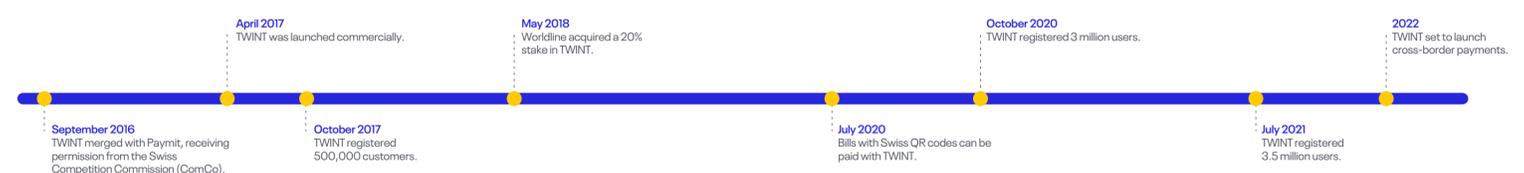
## Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2017-26f



Real-Time Transactions

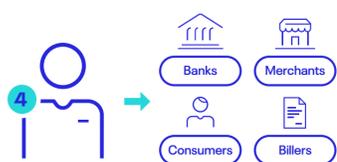


## History



## Key Stats

Real-Time Acceptance



Real-Time Total Participants

75

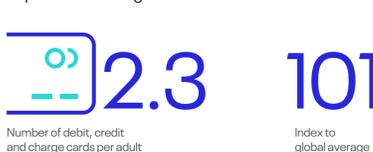
Real-Time Payment Types



Initiation/Authorization Methods



Population Banking Level



Year of Real-Time Payments Launch

2016

Availability



Message Standard

ISO 20022

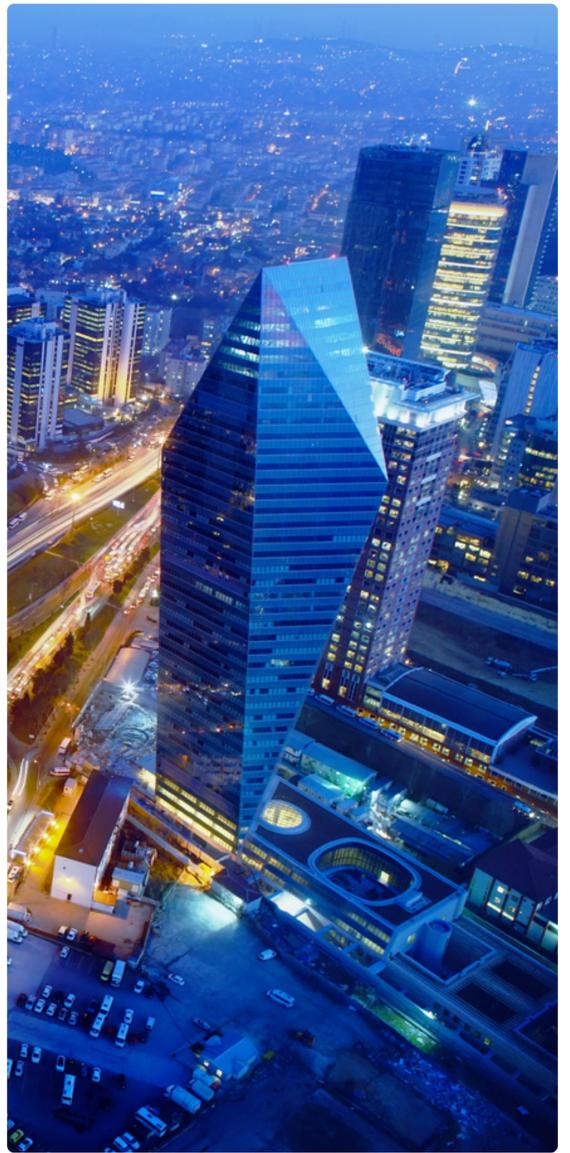
## Real-Time Payments Forecasted to Help Generate 0.36% of GDP by 2026

The Central Bank of the Republic of Turkey introduced real-time payments in the country in 2012, with the launch of the Retail Payment System (RPS).

In 2021, the country recorded 1.4 billion real-time transactions, which resulted in an estimated cost savings of \$1.3 billion for businesses and consumers. This helped to unlock \$2.1 billion of additional economic output, which represents 0.26% of the country's GDP.

With real-time payment transaction numbers expected to rise to 3.9 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$2.3 billion. That would help to generate an additional \$3.7 billion of economic output, equivalent to 0.36% of the country's forecasted GDP.

The RPS system supports individual P2P, C2B and B2B transfers, and also bulk transfers such as salary payments. However, transfers through RPS were limited to only during business hours. This prompted the central bank to launch a new real-time payments system called Instant and Continuous Transfer of Funds (FAST) in January 2021, making real-time payments available 24/7. The new system supports payments using mobile phone numbers, ID numbers or email addresses, and payments using QR codes are also set to be introduced. As the new FAST system is set to facilitate QR code-based, day-to-day payments, real-time payments volume is set to record a 21.9% CAGR from 2021-2026.



### ACI's Take

Turkey's hoped-for accession to the European Union — and the degree of upfront regulatory alignment that is required — is a major driver of current real-time payments development in the country, alongside its mission to achieve a cashless market by 2023.

It has a strong foundation for both of these aims in the shape of the FAST real-time payments system. Designed from inception to be multi-functional, supporting a wide range of use cases — in-store, P2P, bill-paying and so on — FAST also features standardized QR codes and an Easy Addressing System. And the Turkish government refuses to lift its foot from the gas. From mandating all payment and electronic money institutions to join the Association of Payment and Electronic Money Institutions of Turkey, to the Turkish Central Bank's banning of crypto currency (directly or indirectly) as an instrument of payment, it continues to take a proactive role in shaping the real-time payments infrastructure.

As a potential EU member, Turkey receives pre-accession assistance under the new Instrument for Pre-accession Assistance (IPA III) scheme, which supports countries in adopting and implementing key economic reforms to comply with EU values and progressively align to EU rules, standards and policies. So far, as open banking is concerned, anything that happens in Europe will be mirrored in

Turkey, which has already announced compliance with PSD2 and will comply with whatever enhancements the European Commission mandates when it reviews the Directive. This brings an element of simplicity and predictability to payment modernization roadmaps.

One complicating factor, however, is the potential for future tension as the Turkish government seeks to maintain control of the technological direction of travel. PSD2 provides a current example: while the Directive mandates certain third-party access to bank-held consumer data, under Turkish law it is not clear if a bank is obliged to do this. Banks and institutions should also monitor the government's progress in resisting the expansion of Big Tech players. This is evident in its approach to social media — with several government departments publicly stating a preference for Turbo's BiP messaging service versus Facebook's WhatsApp, for example — which has implications for the incorporation of real-time payments into mobile apps.

Yet overall, the government's involvement bodes well for payments transformation, not least because imposition of systems from the top down is more possible than in other territories. Given that high cash use (still over 60%) provides ample room to grow, with continued regulatory involvement — and patience — Turkey could grow into one of Europe's largest real-time markets by volume.

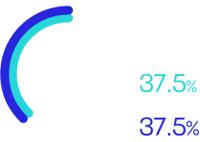
### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



### Shares of Volumes by Payments Instrument

Paper-based payments Electronic payments Real-time payments

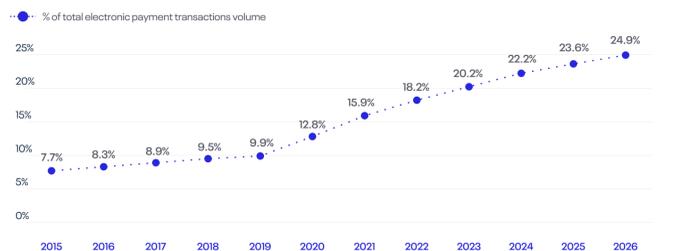
Transactions



Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



### Real-Time Transactions

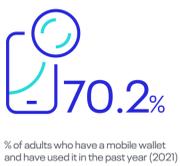


### History

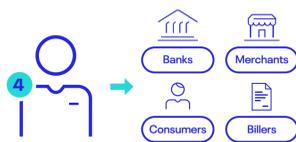


### Key Stats

#### Mobile Wallet Trends



#### Real-Time Acceptance



#### Real-Time Total Participants



#### Real-Time Payment Types



#### Initiation/Authorization Methods



#### Population Banking Level



#### Year of Real-Time Payments Launch



#### Availability



#### Message Standard

Proprietary

### Cebr

Turkey is classified as an upper-middle-income country and ranked as the 21st largest economy in 2021 (Cebr World Economic League Table, 2022).

As the majority of transactions by value take place as real-time (91.6% of the total value of all transactions in the country), the economic impact is sizeable. Consumer and business benefits totaled approximately \$1.3 billion in 2021. The largest component of this (\$1 billion, or 78.5% of the total) was due to net savings from the reduction in the size of the payments float.

At the macroeconomic level, the benefits of real-time payments as of 2021 amounted to \$2.1 billion or 0.26% of Turkish GDP. The most significant contribution is again the additional economic activity supported through a reduction in the size of the payments float, allowing this unlocked capital to support higher levels of economic output.

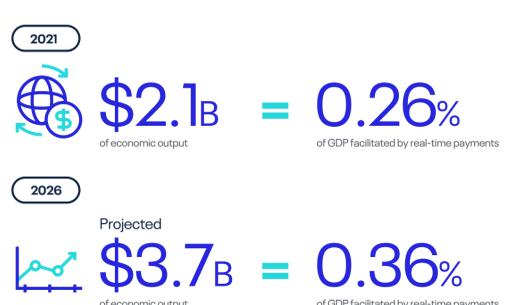
By 2026, it is estimated that the share of transactions by value will remain at the same level while the share of transactions by volume will grow to 14% at a strong CAGR of 21.9%. This results in the consumer and business level benefits rising to \$2.3 billion. The specific benefit associated with the reduction in the size of the payments float is estimated to increase to \$1.4 billion.

This increase in the consumer- and business-level benefits are also expected to contribute an increase in Turkish GDP facilitated by real-time payments, which is estimated to increase to \$3.7 billion in 2026. This is equivalent to 0.36% of formal Turkish GDP, or the output supported by 118,870 jobs.

#### For Businesses and Consumers



#### GDP Growth



## Economic Benefits of Real-Time Payments Remain Largely Untapped

Real-time payments have been possible in the U.K. since 2008 under the Faster Payments scheme, though the market's development has been markedly slower than those in the developing world, despite the significant head start.

The U.K. recorded 3.4 billion real-time transactions in 2021 which resulted in an estimated cost savings of \$950 million for businesses and consumers. This in turn helped to unlock \$3.2 billion of additional economic output, representing 0.10% of the country's GDP.

With real-time transactions set to rise to 5.8 billion in 2026, net savings for consumers and businesses are forecast to climb to \$1.8 billion. That would help to generate an additional \$3.8 billion of economic output, equivalent to 0.11% of the country's forecasted GDP.

That means the potential economic benefits of real-time payments still remain untapped. According to the Cebr, the theoretical impact of all payments being real-time could add 2.7% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Payments in the U.K. are still very much tied to traditional tools — especially cards — despite it being easy and cheap for consumers to access real-time payments. Future prospects for real-time payments look rosy, with real-time volume expected to record a CAGR of 11.1% from 2021-2026 — but its payments spend will grow at a much stronger CAGR of 24% over the same period, showing that the near-term use case for real-time payments in the U.K. is still focused around low-volume, high-value transfers and not everyday expenditures. In terms of economic impact, real-time payments will remain limited until this use case transfers to everyday spending — which the pandemic and shift to more remote transaction channels may lead to in the medium term.



### ACI's Take

Over the next five years, there will be sweeping change to the U.K.'s payment infrastructures in the shape of modernizations to support data-rich, real-time payment transactions. Starting November 2022, SWIFT is moving to ISO 20022. This is driving change in CHAPS and the Real-Time Gross Settlement (RTGS) system, direct participants of which will from April 2023 need to support ISO 20022 payments alongside the legacy SWIFT MT message type. At the same time, Pay.UK is modernizing the Faster Payments Service as part of its New Payments Architecture (NPA) program, which also involves procuring a new ISO 20022-ready central infrastructure.

That's a lot for U.K. scheme participants to absorb over the next five years, especially given the stubborn prevalence of legacy payment systems. Any that haven't started planning to ensure a smooth transition are well behind the competitive curve.

Forward-thinking financial institutions will see this level of change as an opportunity for wider refreshes that leave them better positioned to respond to further changes and new payment mandates in the future. While many will hesitate to migrate their payments infrastructure to the cloud today, deploying cloud-ready infrastructure is recommended — this would leverage development best practices and

ensure a smooth migration if and when the time comes. One aspect to consider in this regard is regulators' concerns about over-reliance on the cloud in the context of the risk to operational resilience. To address this, we expect this may lead to participants adopting an approach of splitting scheme traffic across dual gateways, one operating in the cloud, hosted by the bank or a third party, with a second gateway operating in an on-premise deployment.

In broader strategic terms, consolidation of consumer and corporate payments is coming, and the vision is to achieve a payments-agnostic processing framework. It shouldn't matter where the payment is initiated; which channel is used (digital or otherwise); where it needs to go for authentication and authorization; whether it's a high-value, low-value, global or country scheme; or whether it needs to go to a card network. There is enough overlap in technology and operation support functions that a single, consolidated framework could support most, if not all, payments in a way that is simpler and more efficient to manage. With fraud challenges transcending channels, and efforts to mitigate it being obstructed by internal silos, we should also expect to see increased consolidation of fraud detection systems too, for example across card payments and digital payments.

### Trends + Data



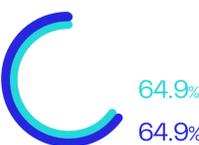
Cloud Management Platform



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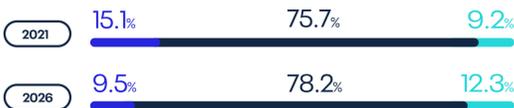
Software as a Service (SaaS)



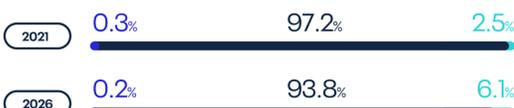
### Shares of Volumes by Payments Instrument

Paper-based payments Electronic payments Real-time payments

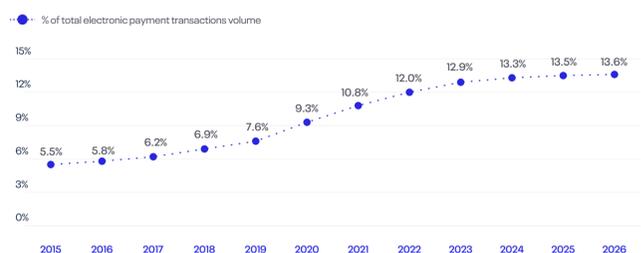
Transactions



Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



### Real-Time Transactions

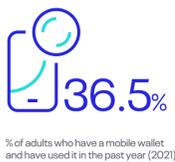


### History



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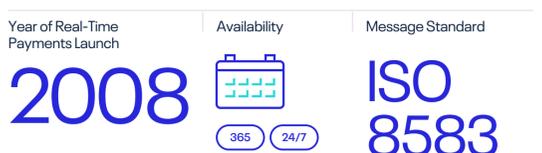
#### Real-Time Payment Types



#### Initiation/Authorization Methods



#### Population Banking Level



### Cebr

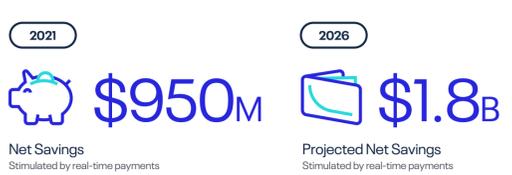
The United Kingdom is an advanced economy that, as of 2021, is the world's fifth largest economy (Cebr World Economic League Table, 2022).

Supported by a relatively strong real-time payments mix share (9.2% of all transactions), in 2021, net benefits for consumers and businesses of real-time payments hit \$950 million. The largest component of this was net savings through the transaction costs within the payments system. On a per-transaction basis, real-time payments in the U.K. currently have a 14.1% lower average payments cost compared to the weighted average mix of all non-real-time payments. Under current adoption rates of real-time payments, this represents an estimated cost savings of \$347.5 million for consumers and businesses across the country in 2021.

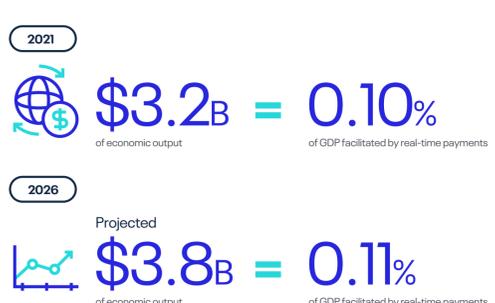
The macroeconomic benefits in 2021 of real-time adoption were estimated to be \$3.2 billion of additional economic output. This is equivalent to 0.10% of total U.K. GDP, or the output of 34,732 jobs.

By 2026, the business- and consumer-level benefits of real-time payments are expected to rise to \$1.8 billion, with the main driving force being the reduction in the size of the payments float. Based on 2026 real-time payments adoption estimates (growth to 12.3% of all payments), these payments are predicted to unlock a total transaction value of \$40.8 billion per day, with this working capital facilitating an estimated \$861 million of business output in the same year. Ultimately, the forecasted macroeconomic benefits in 2026 are estimated to be \$3.8 billion of additional economic output or 0.11% of formal U.K. GDP.

#### For Businesses and Consumers



#### GDP Growth



# Middle East, Africa and South Asia



## Regional Spotlight

Payment Trends To Watch In 2022

Payments Fraud Viewpoint

Bahrain

Egypt

India

Kenya

Nigeria

Oman

Pakistan

Saudi Arabia

South Africa

Sri Lanka

U.A.E.

## Regional Spotlight

# Accelerate Modernization to Capitalize on Transformational Real-Time Payments Growth

Author: Santhosh Rao, Senior Vice President, Head of MEASA - ACI Worldwide

**The Middle East, Africa and South Asia (MEASA) region remains broadly a developing market from a real-time payments point of view (with India the clear exception).**

But advances in technology, especially cloud, and evolving customer expectations are pushing the region ever closer to a period of transformational growth. In preparation, the region's payment players should be dialing up their readiness with payment modernizations geared towards real-time payments.

To illustrate the breadth and depth of the opportunity, look no further than the 30 or so countries across Africa and the Middle East that do not yet have real-time payments. This can be viewed not as a lack of dynamism but as huge untapped potential — especially given the level of innovation in most of these countries around digital wallets, mobile payments, microfinance and fintechs. Two markets, the U.A.E. and Saudi Arabia, are further ahead than most but still early in their real-time journeys. They have seen what has worked around the world and are bringing those learnings to their own highly digital-friendly markets. And even in India, where growth in terms of volumes has been strong for years and still seems to have no ceiling, there is much more room to innovate.

Wherever they are in their real-time payment journeys, financial institutions across the region have an opportunity that was not available to more mature markets. They can observe their experiences to preempt the fastest routes to achieving critical mass, such as supporting more use cases and initiation methods from day one. And they can look for examples of the regulatory environments that best promote innovation.

### Differentiate to maximize real-time opportunities

There is, however, no single approach that will work for every player when it comes to maximizing these opportunities. Financial institutions must work with globally experienced partners to understand what has worked around the world and why, and connect that to their objectives, those of their customers, relevant cultural factors and the regulatory landscape.

Financial institutions must also recognize that building a business out of real-time payments is a phased journey in which connecting to schemes is only the first step. Experience around the world shows that once real-time services are available, customer expectations quickly evolve — and they do so in a non-linear way, highlighting the importance of agility. Demand can quickly develop from domestically focused requirements around instant transfer of funds and digital overlay services, like Request to Pay, to cheaper and faster cross-border payments and greater preference for fintechs.

This, and the lower margins and higher volumes associated with real-time payments, means financial institutions must look beyond compliance every step of the way. That means asking, "How can I best leverage real-time and overlay services to differentiate and create value for customers?" Not simply, "How do I become real-time ready?"

### Modernize with end users in mind

Modernizing in preparation for real-time payments growth could be as targeted as driving greater payments consolidation. Most financial institutions have multiple, channel-focused point solutions. By converging these onto a single platform, they would be more efficient today and better able to respond to change tomorrow.

Others are taking a more holistic approach, however, looking at their payments strategy not from an operational standpoint but from the viewpoint of end-user requirements. Payments consolidation would still be a factor, but in the wider context of enabling outcomes, such as cashless commerce, embedded finance, financial inclusion or improving customer banking experiences.



At the highest level, planning assumptions should reflect that consumers and businesses want simpler, cheaper and quicker ways to transfer and receive funds, inside and outside of their own countries. As these needs are met with new services and acceptance grows, openness towards subsequent innovations will increase to accelerate future adoption. In other words, the pace of change is only going to get faster so financial institutions must ask themselves a straightforward question: how ready are they for a 24/7 digital economy driven by real-time payments?

Given the synergies throughout the region — culturally, developmentally and in terms of migrant population flows — cross-border payments in particular should be expected to be an important revenue stream for real-time payments. Experiments by African banks around low-cost payments routing outside of traditional methods demonstrate that demand is there already for cheaper international payments. Real-time payments offer a more efficient and scalable way to satisfy this demand.

### The region can lead the world in Payments-as-a-Service adoption

The ideal infrastructure outcome for financial institutions is to be able to stand up a real-time payments and overlays business in their home market, and capitalize on the cross-border opportunity with the same solutions (or same set of solutions).

Unencumbered by the types of legacy technology more mature markets are contending with, financial institutions in the region are better positioned to achieve this with Payments-as-a-Service solutions. This approach would enable them to consolidate payments onto a single, flexible and open platform consisting of best-in-class services. Freed from the concerns of infrastructure implementation, availability, security and scalability, financial institutions could then focus exclusively on innovation and differentiation. This is the surest path to claiming the greatest possible share of the region's incoming transformational real-time payments growth.



## Region's Banks Can Learn From Others' Mistakes Over APP Scams — But They Must Act Soon

Author: Damon Madden, Principal Fraud Consultant - ACI Worldwide

**With the region's mass market real-time payment schemes still developing, banks have an opportunity to get out ahead of authorized push payment (APP) fraud before it does the kind of damage to revenues and reputations being seen in more mature markets.**

Around the world, the biggest story in real-time payments fraud is the growth of APP scams.

In more mature markets, these scams have reached epidemic levels and are expected to comfortably outgrow card-related fraud as the biggest driver of fraud losses. The issue does exist in the MEASA region, but it is yet to seriously trouble financial institutions, while the mass market real-time schemes remain in the early stages of maturity or still in development. While that remains the case, banks are urged to use this time wisely — these scams have impacted every mature real-time payments market and they are on their way here.

The risks of not getting out ahead of the challenge are high. Compared to card losses, the average value of each incident tends to be high, with victims often losing their life savings. And APP fraud is a difficult thing to spot and stop since it is the genuine customer initiating the payment. The sooner you start trying, the sooner you can begin the cycle of continuous improvement required to stay ahead of the criminals.

In terms of how to respond, MEASA banks have the benefit of observing and learning from the experiences of markets elsewhere. These clearly show that when building out or deploying your real-time payments infrastructure, you must make sure you

can monitor both outbound and inbound payments. This is essential to identifying and shutting down mule accounts in order to limit criminals' abilities to scale their scams (victims are plentiful, but mule accounts are comparatively much harder to come by).

It's also clear that liability for losses can't be an afterthought. It needs to be thought through at the point of building these real-time infrastructures. That is ideally done from a regulatory standpoint, but if not, then banks with the best visibility over incoming and outgoing transactions will also be better able to demonstrate they are doing what they can to protect customers. They will also be better able to respond to future — and almost inevitable — government mandates. Ultimately, whether it is a scam or not, it is still fraud committed using banking services and products. Governments are bound to intervene in one way or another and they are more likely to side with the citizens.

Far better, then, to preempt these issues with a two-pronged approach combining technology and culture. On the tech side, enterprise-level risk management solutions that are either hosted in the cloud or provided as managed services would allow banks to get new capabilities to market faster should the regulatory environment or threat landscape suddenly change.

Culturally, being in the early stages of ecosystem development means there is also the opportunity to embed in the region a community-led approach to fighting fraud. A single institution or even a small group will struggle to drive criminals off the payments network entirely — insights drawn from across a scheme's participants are needed to provide that level of protection. Previously, data privacy concerns have made this impossible, but now [network intelligence](#) applications that leverage federated machine learning have transformed opportunities for banks and central infrastructures to collaborate in this way. This facilitates the real-time exchange and pooling of machine-readable fraud signals, without exposing the underlying data. That's a game-changer since machine learning algorithms can then be trained on a diverse range of internal and external sources to, for example, identify potential mule accounts.

Network intelligence also offers the ability to benchmark how much a bank is being targeted, either at a group level or for particular signals and types of fraud. This can guide the development of new controls in the payments initiation process, such as a step up for additional authentication or slowing down the payments experience to give customers more time to consider their actions.

Ultimately, in 2022, the region has an opportunity that other mature real-time markets around the world either never had or missed. They can preempt APP scams, a major source of real-time payments fraud, and any fall out in terms of liability — before they wreak havoc on their revenues and reputations.



# MEASA Trends in Payments To Watch For in 2022



Author: Shadi Abboud, Director of Solution Consulting, MEASA - ACI Worldwide

## Still in the grip of the pandemic, the momentum towards real-time payments is unrelenting in this dynamic payments region.

Across the region, governments and central banks are getting serious about accelerating progress, galvanized by the critical role real-time payments have played in getting their populations through the pandemic. With millions of unbanked consumers locked down and isolated in remote areas, unable to access cash, real-time settlement of very low-value micropayments has — literally in many cases — been a lifesaver.

Developing resilient, cross-border payments infrastructure continues to drive growth and innovation. Real-time exploration and competition are especially intense in Africa, the birthplace of mobile payments. In West Africa, for example, more than 100 banks are collaborating to create a real-time payments infrastructure capable of linking all countries in the region. Such advances are being helped by investments from sources such as the Bill & Melinda Gates Foundation, evidence of the central role real-time payments will play in economic levelling-up. The tedious process of the remittance business across the Southern African Development Community (SADC) countries also needs addressing. Here, cash is literally carried by land in buses and cars, so a lot of thought is being put into how to leverage real-time payments to solve for this (perhaps using a common currency as a base). If successful, this will be a revolutionary change in the region that many would follow beyond the SADC area.

For obvious reasons, central banks and governments may be convinced that real-time rails are the future due to the country-level benefits around financial inclusion and reaching citizens in remote areas. But how banks and financial institutions are responding can be divided into two behaviors. There are those that are ready to start the payments journey, as we see in South Africa where many banks are eager to participate in the first pilots sending real-time payments due to go live around mid-2022. And there are those keeping an eye on developments but postponing investment until absolutely necessary.

## Several challenges await both groups

Three challenges face the former group. First, as we saw in India when WhatsApp pay was enabled as a channel for real-time payments, there is the infrastructure challenge posed to core banking systems by the flood of transactions that result from customers conducting multiple transactions every day. When payments are mandated to physically impact the account within 15 seconds (or even less), it will no longer be a solution to shield the core from overload by running five batches a day. Payment systems must therefore be sufficiently robust and integrated to support instant liquidity.

The second challenge is the overall readiness of their payment hubs, which may contain silos or disparate systems accumulated over decades. There are huge benefits to be had from running payment processing through a single, centralized hub, but many hub vendors cannot yet provide a complete integrated ecosystem. This complicates banks' due diligence when considering the capabilities of various hub solutions and modules.

Third, they need to reevaluate business models based on generating the highest revenues from corporate banking. While retail generates revenue too, there is the additional overhead of maintaining the customer base. A change of mindset, similar to that successfully adopted in moving away from card-based payments, is needed to ensure banks reap the benefits of large-scale real-time payments.

The second category of banks — those waiting on the sidelines as long as possible — should be aware of the risks this entails. They may be able to continue harvesting revenues from the acquiring side, through interchange fees and POS device rental for example, but with their competitors investing in real-time, they are likely to see a huge shift in their user base as customers leave for the fastest, cheapest, real-time payments solution. Where real-time payments are mostly focused on the banking sector for now, it will take very little time for the same rails to extend towards merchants and retailers.

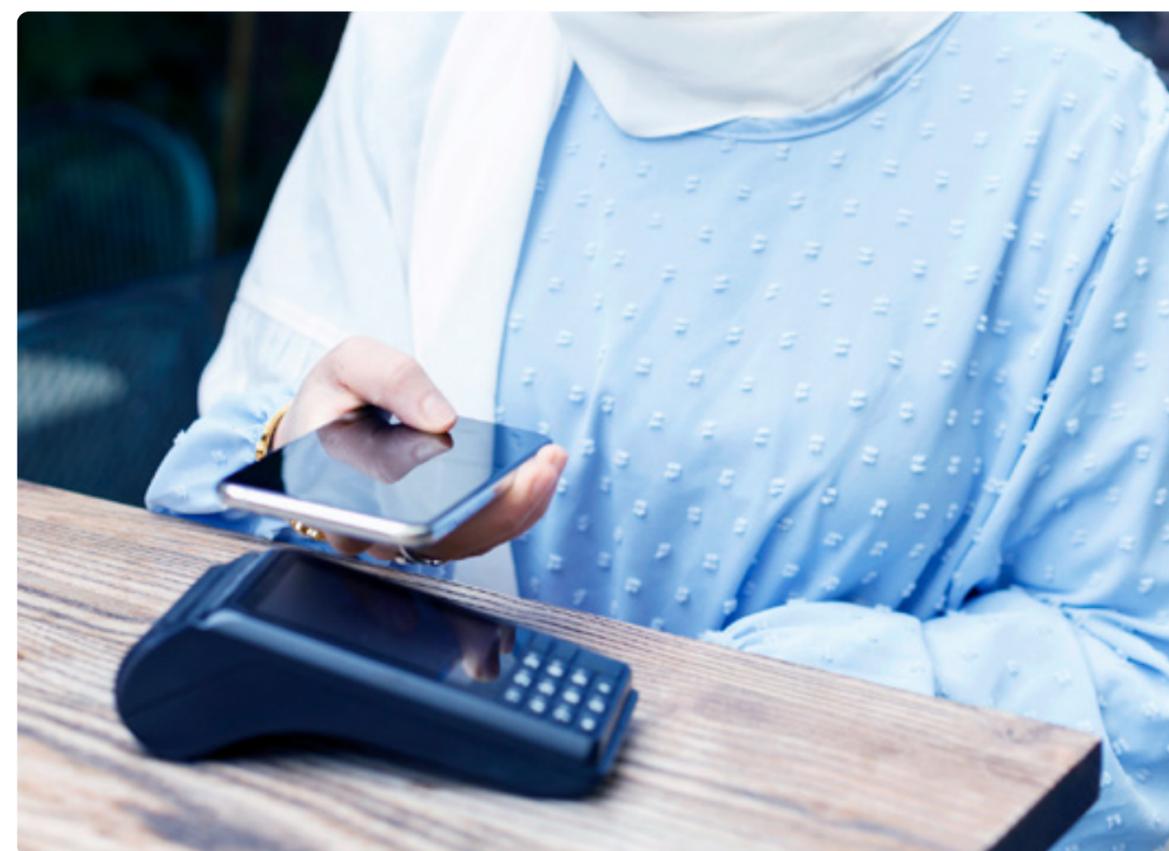
They should also carefully monitor the approach central banks take to mandating real-time payments. Mandates may be introduced gradually at the outset, but there will come a time when the pressure ramps up and the mandate window begins to close rapidly. If they wait until then, they are in danger of missing the real-time boat altogether or being forced to implement rush projects that may not be fully thought through.

## Central banks must take center stage to drive adoption

This also highlights the role that central banks have to play in successful real-time payments adoption. If they don't play a proactive role, then banks often feel they have little choice but to hold back on investment, which risks leaving them on the outside of changing consumer and business expectations around payments. There are exceptions, of course; for example, the 14 countries of the SADC have a common understanding and agreement and so can define innovations among themselves, without central bank involvement.

Connecting to real-time schemes is only the beginning, of course, and banks should also plan their technology strategies to capitalize fully on the experiences the infrastructure enables. As in other regions, it will be through the addition of innovative, appealing overlay services — domestic and cross-border — that banks can differentiate themselves from the competition.

**“A change of mindset, similar to that successfully adopted in moving away from card-based payments, is needed to ensure banks reap the benefits of large-scale real-time payments.”**



# Real-Time Payments Forecasted to Help Generate 0.68% of GDP by 2026

The Bahrain real-time payments market is a success story — at **34.2%**, the country recorded the largest real-time share by volume, according to GlobalData.

In 2021, 142 million real-time transactions were made in Bahrain, and the strong uptake of real-time payments resulted in an estimated cost savings of \$39 million for businesses and consumers. This in turn helped to unlock \$246 million of additional economic output, which represents 0.63% of the country's GDP.

With real-time payments expected to rise to 1.1 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$208 million in 2026. This would help to generate an additional \$310 million of economic output, equivalent to 0.68% of the country's forecasted GDP.

Bahrain's real-time payments system Fawri+ has been in place since 2015 and has seen a rapid ramp-up in terms of adoption and usage, growing from less than 1% of all electronic transactions by volume in 2017 to more than 50% of electronic payments volume in 2021. Real-time payments are expected to record an impressive CAGR of 50.7% from 2021 to 2026 and dominate the overall payments market in that time, despite the historically cash-dependent nature of the market. The integration of Fawri+ with the mobile wallet BenefitPay, as well as non-bank payment providers in the market, have all served to accelerate the adoption of the service among the relatively underbanked population.

2020 was a big year for the growth of Fawri+, with real-time payments' share of electronic payments overall jumping from less than one in ten transactions in 2019 to more than one in three transactions by the end of 2020. This is due to consumers moving away from cash as a result of the pandemic and on to Fawri+ either through their bank or wallet providers. Bahrain is thus another success story in the MEASA region of rapid adoption of real-time payments through opening the system to third-party wallets, combined with the galvanizing effect of the pandemic in 2020.



## ACI's Take

Bahrain was the first member of the Gulf Cooperation Council (GCC) to implement a real-time payments scheme — Fawri+. However, its current usage is limited to P2P payments and the messaging infrastructure is built using APIs.

Nevertheless, adoption is impressively high. Real-time payment volumes in 2021 reached 142 million transactions, an impressive amount for a population of just 1.7M. At around 84 transactions per person, that is on a par with the U.K.'s Faster Payments scheme.

There is a growing desire to modernize the system to push adoption to the next level.

Experience from around the world shows that the guiding star for such a journey is to increase use cases. Converting strong P2P penetration into ubiquitous adoption requires increasing payment choices so that they fit more seamlessly into consumers' everyday lives. Further growth requires serving businesses better with options such as Request to Pay (R2P), which will enable companies to enhance the convenience of paying bills while streamlining operations with better reconciliation. Another factor would be to move to ISO 20022, improving the capture of data and potential interoperability with other payment schemes in the future.

The prospects and timing for the market to transition to a second-generation real-time payments scheme are ripe. It has a well-connected consumer base that is familiar with real-time payments, plenty of examples of success from which to draw inspiration, and strong and established central leadership.

At this stage, it is up for debate as to how far and fast the implementation of potential new use cases would need to be. For example, the market already has a QR code standard in place, which could be extended immediately to open merchant use cases. Another example would be to implement a centralized addressing service that is required to support R2P and potentially direct debits with mandate management. Increased fintech interest in building experiences around these capabilities would follow, which will attract major global names to the market.

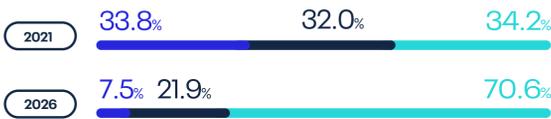
Given where we are today, it is not inconceivable that the coming years will see Bahrain become the GCC's leader in payments innovation and a reference point for success that others try to emulate.

## Trends + Data

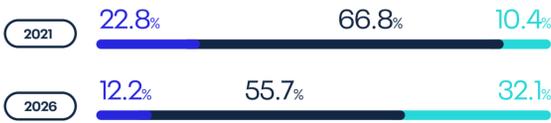
### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

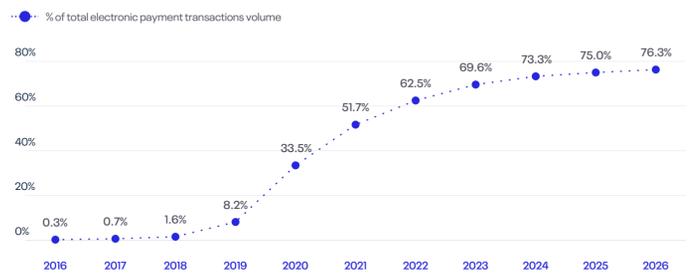
#### Transactions



#### Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2016-26f



### Real-Time Transactions

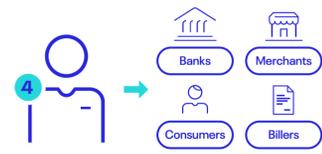


## History



## Key Stats

### Real-Time Acceptance



### Real-Time Total Participants

26

### Real-Time Payment Types



### Initiation/Authorization Methods



### Population Banking Level



### Year of Real-Time Payments Launch

2015

### Availability



### Message Standard

Unavailable

## Cebr

Situated in the Persian Gulf, The Kingdom of Bahrain is a high-income island nation and ranked as the 93rd largest global economy in 2021 (Cebr World Economic League Table, 2021).

Bahrain demonstrates a unique payments system network where real-time payments account for the largest share of transactions by volume (34.2%), followed by paper-based payments (33.8%) and non-instant electronic payments (32%) in 2021.

This means that compared to other countries, a relatively significant share of benefits for consumers and businesses are already realized. The adoption of real-time payments resulted in benefits of \$39 million for Bahraini consumers and businesses in 2021, which was predominantly driven by net payment system cost savings. On a per-transaction

basis, real-time payments in Bahrain had a 32.9% lower average payments cost, compared to non-real-time payments. Based on 2021 adoption rates, this represents a cost savings of \$43.1 million for consumers and businesses across the country.

At the macroeconomic level, GDP facilitated by real-time payments amounted to \$246 million of economic output in 2021. This is equivalent to the output of 6,250 workers annually, and represents a 0.63% share of formal GDP.

The forecast for a significant real-time payments uptake in the country is expected to result in realized consumer- and business-level benefits of \$208 million in 2026. This is expected to stimulate \$310 million in economy-wide benefits (0.68% of formal GDP); equivalent to the output of 7,732 workers annually.

### For Businesses and Consumers



### GDP Growth



Egypt does not have a real-time payments system in place. However, in April 2021, the central bank announced plans to introduce a real-time payments module in the future. Egypt remains a cash-driven society, with consumers preferring to use cash for day-to-day transactions. With the government working to improve financial inclusion and infrastructure, the use of electronic payments is expected to increase over the next few years.

To boost non-cash transactions, the Central Bank of Egypt (CBE) is restricting cash and check payments, focusing on mobile payment accounts and introducing new laws to promote electronic payments. Amid the COVID-19 pandemic, the payments market is undergoing a major change and Egyptian consumers are increasingly opting for secure payments such as contactless — a step towards cashless payments.

## ACI's Take

The Egyptian Banks Company (EBC) has begun introducing the Immediate Payments Network, a new real-time payments scheme modeled on India's UPI and sponsored by the central bank. (At the time of writing, the scheme was in a pilot phase with a handful of banks.)

The original rollout plan was aggressive, seeking to capitalize on momentum at the time to get to market quickly with widespread participation from the country's banks. And then the pandemic intervened.

With COVID-19 also having followed a period of recession, further issues around scheme sponsorship left the market reluctant to invest in new projects. Driving participation will therefore be challenging in a market where key stakeholders are now more risk averse than they otherwise would be regarding experimental, innovative schemes.

Furthermore, Egypt is not expected to follow ISO 20022. This presents future challenges regarding both local and cross-border interoperability, although there is a counterpoint to criticism regarding this decision: many adults are unbanked and there is also no existing national ID. This all adds up to the feeling that the UPI model is a better bet.

The hope from industry-watchers on the ground is that all banks will be mandated to participate in the scheme, and that they will be expected to allow for fintech and non-traditional PSP connectivity. This in turn would accelerate the innovations needed for real-time payments to make an immediate impression on a cash-reliant society; only value-added consumer use cases will displace cash and drive rapid adoption. The question is whether such a scenario will shake enough banks out of their "wait and see" mode, given how satisfied many appear with revenue they currently receive from card payments. But they should be in no doubt that real-time payments are coming, and they represent a big opportunity for organizations prepared to be proactive in pursuit of growth. Those that don't get on board — even today's market leaders — risk coming out on the wrong side of changing consumer expectations.



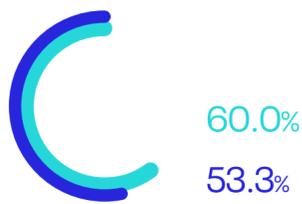
## Trends + Data



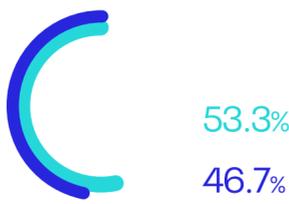
Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



● Current priority ● Planned

## Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments

### Transactions



### Spend (USD)



## Key Stats

### Population Banking Level



# Real-Time Payments Forecasted to Facilitate 1.12% of GDP by 2026

The Indian real-time payments market is well developed compared to other markets such as the U.S., the U.K., Canada, and Australia.

In 2021, the country recorded 48.6 billion real-time transactions, more than any other in the world. The widespread adoption of real-time payments resulted in an estimated cost savings of \$12.6 billion for Indian businesses and consumers in 2021. This in turn helped to unlock \$16.4 billion of economic output, which represents 0.56% of the country's GDP.

With consumers increasingly shifting from cash to mobile-based real-time payments, skipping payment cards, the share of real-time payments of the total payments volume will rise to more than 70% in 2026. That would push our forecasts for net savings for businesses and consumers to rise to \$92.4 billion, helping to generate an additional \$45.9 billion of economic output (equivalent to 1.12% of the country's forecasted GDP).

Real-time payments were available in India since the launch of Immediate Payment Service (IMPS) in November 2010. However, the Unified Payments Interface (UPI) (a real-time payments system launched in April 2016 based on IMPS) is the one that disrupted the payments space in the country, enabling real-time payments using QR codes, mobile numbers, and virtual IDs. The wider adoption of UPI-based mobile payment apps, growing acceptance of QR code payments among merchants and increasing preference for digital payments amid the COVID-19 pandemic helped real-time payments account for a 31.3% share of total payments transaction volume in 2021.

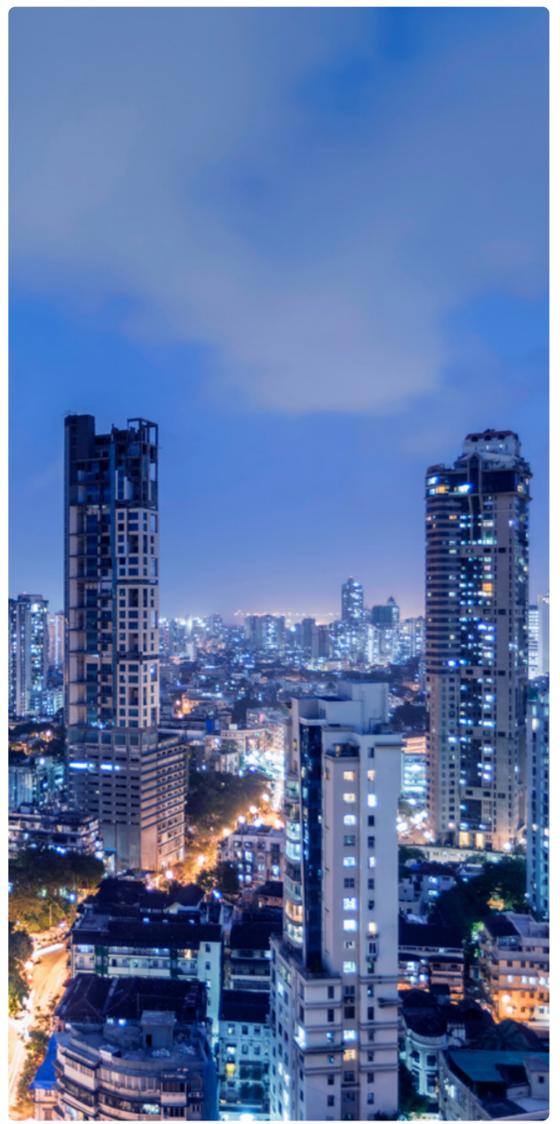
### ACI's Take

Astronomical real-time payment volumes for India's UPI interface are not news. What is news is that growth continues to outperform our forecasters' best efforts. As a result, we've reviewed the actual volumes for 2021, which showed a 22% increase on our forecast. Overall, post-COVID-19 changes to consumer behavior, which has seen UPI's demographic appeal widen further to include older people, mean transaction volumes still have plenty of room to grow.

Looking ahead to 2022, a mandate capping the market share of large fintechs at 30% becomes applicable early in the year. PhonePe, which is owned by Walmart, and Google Pay are reported to process 46% and around 36% respectively of UPI transactions. Meeting the new mandates will represent a major market adjustment as that excess volume gets re-distributed to other market participants.

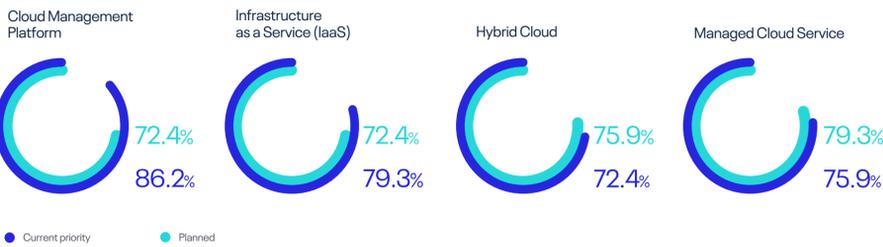
In terms of forward planning for banks and other payment players, the volume explosion will continue to be a major challenge. Scalable payment architectures will remain an area of high priority as a result. Fraud prevention and mitigation is also likely to be a defining feature of the market in 2022 and beyond. During the pandemic, banks had to revisit their fraud strategy as instances of scams targeting UPI users increased significantly. If they haven't already, banks and financial institutions must explore ways to mitigate these threats through a combination of the latest fraud monitoring systems deployed at the enterprise level and educating their customers.

Several reasons lie behind UPI's stunning winning streak. First, it is now the center of an embedded finance ecosystem that is much wider than simply banking and finance apps. Second, it is able to use this position to create a flywheel effect for innovation, generating new use cases to compound its utility for consumers. For evidence of this, look no further than the major upgrades taking place through 2021 and into early 2022, which include new features such as cross-border QR code payments, cardless cash withdrawal, the contactless digital payments solution, and the e-RUPI. (Improved cross-border interoperability includes the rolling out of UPI to Singapore and U.A.E., with more markets planned — this is a huge opportunity for banks to enable new cross-border use cases for customers.)

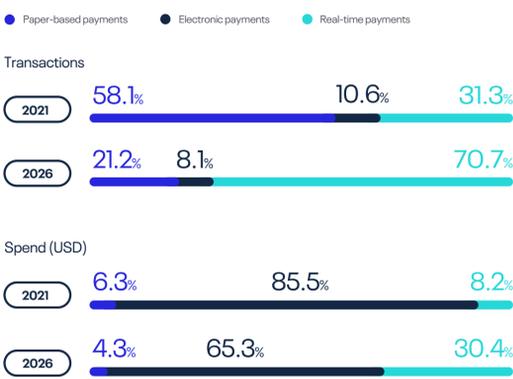


### Trends + Data

#### Cloud



### Shares of Volumes by Payments Instrument



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



### Real-Time Transactions



### History



### Key Stats



### Cebr

India, the second-most populous country in the world, is classified as a lower-middle-income country and in 2021 ranked as the seventh largest global economy (Cebr World Economic League Table, 2022).

In 2021, India recorded the largest absolute number of real-time transactions in the world at over 48 billion, representing 31.3% of all transactions in the country. Indian businesses and consumers benefited from an estimated \$12.6 billion from the adoption of real-time payments in 2021, which is predominantly driven by net savings in the payment system costs.

Total business- and consumer-level benefits contribute to an economy-wide impact of \$16.4 billion of economic output that was facilitated by real-time payments (0.56% of formal GDP); equivalent to the output of approximately 2.5 million workers.

The share of all transactions occurring via real-time instruments is expected to increase significantly to 70.7% by 2026. The strong predicted uptake results in realized business- and consumer-level benefits reaching \$92.4 billion in 2026. This is forecasted to facilitate 1.12% of formal GDP, an impact of \$45.9 billion in 2026. The scale of this impact is extensive and is equivalent to the output of 5.3 million workers annually.

### For Businesses and Consumers



### GDP Growth



1. Within UPI, the two biggest players are PhonePe and Google Pay with a market share of 46.3% and 36.4%, respectively\* <https://timesofindia.indiatimes.com/business/india-business/upi-emerges-king-of-digital-payments-phonepe-google-pay-biggest-players/articleshow/88136978.cms>

Kenya launched its real-time payments system PesaLink in 2017. It enables Kenyan consumers to instantly transfer funds between bank accounts and handles multiple currencies such as Kenyan Shillings, euro, U.S. dollar and British pound. Kenya's economy is very dependent on paper-based transactions still; in 2021 paper-based transactions represented an 87.2% share of payments volume while real-time payments were only at 0.047%. Electronic payments (excluding real-time payments) were at a 12.8% share of payments volume.

The limited access to electronic payments (excluding real-time payments) is an opportunity for real-time payments to divert market share from paper-based transactions. A cashless transformation of the Kenyan economy is already underway, mostly driven by the mobile money platform M-PESA. With this mobile-based system occupying space traditionally dominated by banks in other markets, real-time payments will need to integrate into this system to achieve the most penetration possible at the consumer (and business) level.

Projections are very positive for the share of real-time payments total payments spend, as it is projected to go from 7.7% in 2021 to 46.6% in 2026 at a CAGR of 47.7% between 2021 and 2026.



## ACI's Take

Digital payments acceptance in Kenya has soared in recent years through new products that arrived from industry collaborations. The market is dominated by M-Pesa, which has a customer pool close to 40% of Kenya's 53M population. There is a sense the market has perfected the transfer of funds and the experience that surrounds it — but also, there is a risk the country will stall on a stop-gap, card-oriented approach rooted in ISO 8583.

The business case continues to grow for banks to engage with the domestic real-time scheme's ISO 20022 modernization. This would unlock innovation and options for alternative payment methods, such as non-card-based and non-account-based, including the use of email addresses and national IDs. Once the infrastructure is available, banks must leverage this opportunity to do more than just add front-end protocols for conversion, but instead re-evaluate their existing environment readiness for native support of future payments.

Much of the value in ISO 20022 resides in the richer data accompanying payments, which can drive a range of benefits for corporations and consumers alike. For example, customer information can be leveraged to drive business intelligence that constantly improves their experiences and helps them optimize liquidity, streamline processes and reduce costs. It will also provide banks with more of the data they need to perform advanced fraud screening, including ensuring an end customer is valid, thereby protecting the system from endemic fraud threats.

Of course, access to customers has been complicated by the emergence of MNO-owned payment services. But if banks remind themselves of the spirit of collaboration that initially enabled such a rapid, exciting pace of change to take hold, they will see an opportunity to rethink their relationships with MNOs and fintechs. Working with, rather than against these firms is their best bet for extending footprints in order to achieve a critical mass of volume needed to monetize real-time payments. Everyone must work together to accelerate progress to forward-thinking, innovative payment products that better service their customer base.

## Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



● Current priority ● Planned

Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



## Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

Transactions

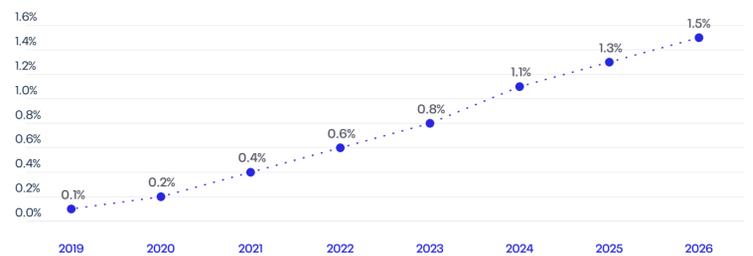


Spend (USD)



## Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2019-26f

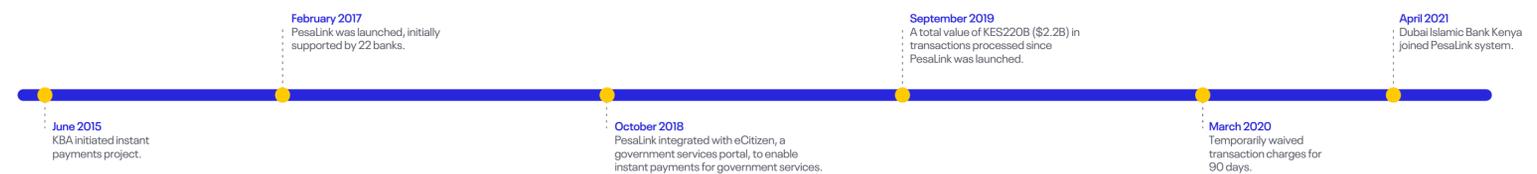
● % of total electronic payment transactions volume



## Real-Time Transactions

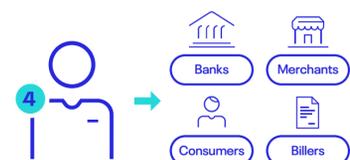


## History



## Key Stats

### Real-Time Acceptance



### Real-Time Total Participants

30

### Real-Time Payment Types



### Initiation/Authorization Methods



### Population Banking Level



### Year of Real-Time Payments Launch

2017

### Availability



### Message Standard

ISO 8583

# Real-Time Payments Forecasted to Help Generate 1.01% of GDP by 2026

Nigeria recorded 3.7 billion real-time transactions in 2021, which resulted in an estimated cost savings of \$296 million for businesses and consumers. This helped to unlock \$3.2 billion of additional economic output, representing 0.67% of the country's GDP.

With real-time transactions set to rise to 8.8 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$2.3 billion. That would help to generate an additional \$6 billion of economic output, equivalent to 1.01% of the country's forecasted GDP.

Nigeria is one of the countries for which real-time payments provide the biggest economic growth opportunities. According to the Cebr, the theoretical impact of all payments being real-time could add 8.5% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

NIBSS Instant Payments (NIP) is the real-time payments system in Nigeria, which was launched by Nigeria Inter-Bank Settlement System (NIBSS) in July 2011. The system is supported by all commercial banks, micro-finance banks and mobile money operators, and can be used via different modalities including internet and mobile banking, bank branches, kiosks, mobile USD, POS terminals and ATMs, which helped NIP to achieve high adoption and usage rates. The COVID-19 pandemic also encouraged Nigerian consumers to shift from cash to electronic payment methods, which further supported real-time payments growth. Furthermore, the NIBSS launched NQR, an interoperable national QR code standard in March 2021 to facilitate instant P2B and P2P payments by scanning QR codes. This will further catapult real-time payments use, helping it to record an 18.6% CAGR from 2021-2026 in terms of volume.

## ACI's Take

Traditionally a cash-based economy, Nigeria increasingly has a population that expects higher speeds, greater simplicity and modern thinking from financial service providers. Cash remains king, but this shift is testament to the success of government regulators in fostering rapid growth in digital openness, particularly payments. There is now an ongoing drive within Nigeria to extend this momentum to cross-border use cases.

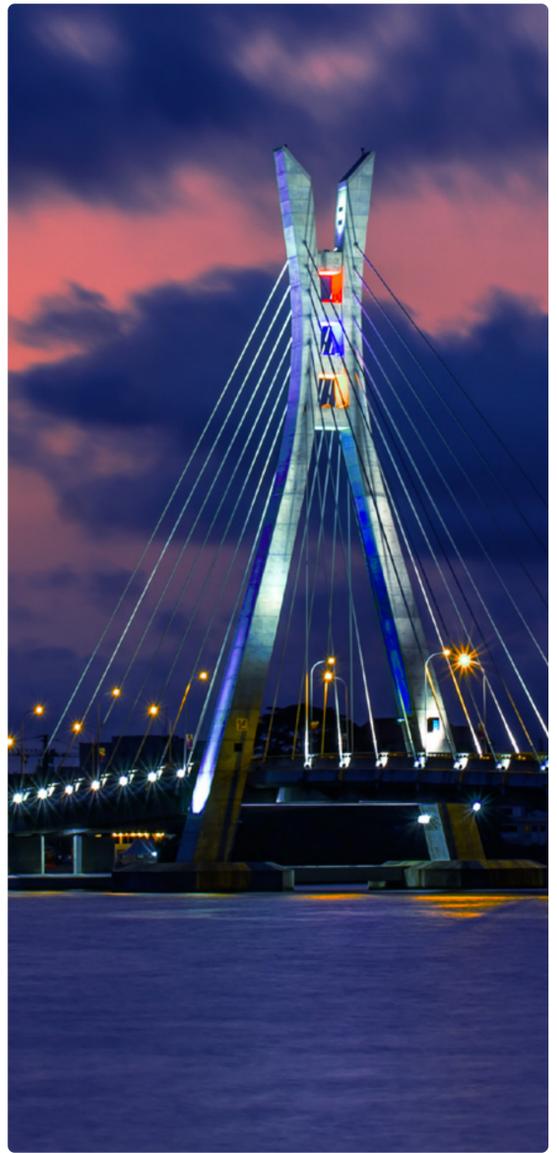
If it can be put into practice, this desire to ensure domestic payment systems aren't isolated, either regionally or globally, will benefit corporations and individuals alike. It will simplify and reduce the cost of international business, while removing nasty exchange rate-related surprises on returning home or for remittance payments.

So, in thinking about a strategy for 2022 and beyond, banks in the region need to position themselves to respond to changing — and changeable — consumer payments behavior and greater cross-border interoperability. The ideal state is an API-driven payments function that allows them to both connect

to new schemes easily and innovate quickly using the real-time rails. This would set the country's financial institutions on the path toward greater openness in banking and align them with the markets increasingly outward-facing and regional — even internationalist — viewpoint. (The risk however is that many will instead consider this a burden and fall behind as a result.)

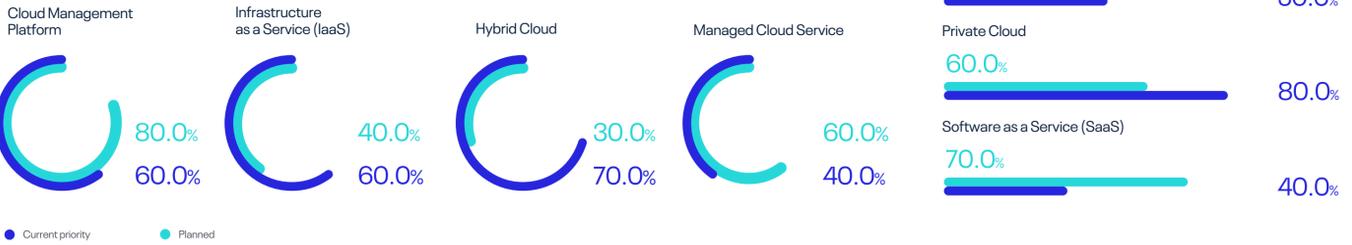
Banks should therefore look at the market as entering a new phase of high opportunity and assess whether the technology they currently use is fit for purpose. Rather than think about an account-based system, a card-based system and an EFT platform, they should move to service-based architecture with a central platform where services are consumed, irrespective of the channel from which a request is initiated.

All this is about long-term thinking. Since regulations will mandate at least some of this journey, it is on banks to seize the moment and build beyond today's short-term requirements. This will help them construct a business strategy that is future-proof and more fully aligned with what modern Nigeria needs.

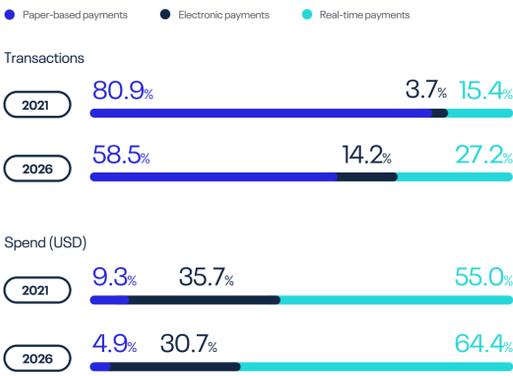


## Trends + Data

### Cloud



### Shares of Volumes by Payments Instrument



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



### Real-Time Transactions\*



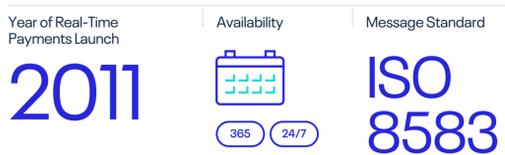
## History



## Key Stats



### Population Banking Level



## Cebr

Nigeria is an emerging market, the world's 29th largest economy and the biggest on the African continent (Cebr World Economic League Table, 2022).

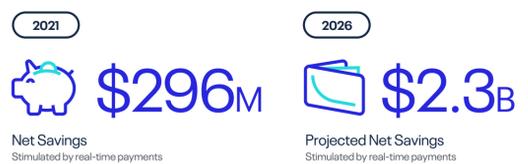
Due to its mature real-time payments market but paper-dominated payments mix, Nigeria's economy already benefits from substantial net savings facilitated by real-time payments, while also having a significant potential for further growth. In 2021, the use of real-time payments resulted in \$296 million in efficiency savings for consumers and businesses. These gains contributed to real-time payments, facilitating 0.67% of Nigerian GDP or \$3.2 billion of financial output in the same year.

In terms of overall macroeconomic gains, the largest contributing factor in 2021 was the shadow economy formalization through real-time payments. In Nigeria, the size of the shadow

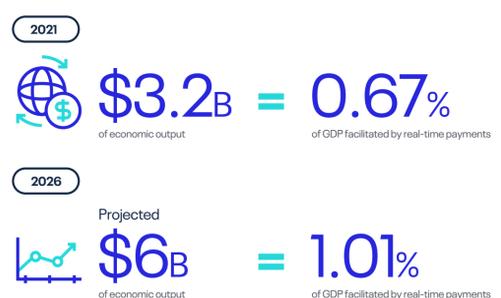
economy was estimated to be 47% of formal GDP in 2021, equivalent to approximately \$228 billion of informal economic output. In the absence of real-time payments, Nigeria's shadow economy would have been 1.4% larger. Hence, real-time payments were responsible for formalizing \$3.1 billion of economic output in that year.

Business and consumer benefits are expected to reach \$2.3 billion by 2026, as paper-based payments continue to be displaced by real-time payments volume (which is forecasted to grow to 27.2% of the payments mix). The economy wide impacts are also expected to grow, with 1.01% of Nigerian GDP supported by real-time in 2026, equivalent to \$6 billion of economic output, or that supported by 668,734 workers.

### For Businesses and Consumers



### GDP Growth



Oman launched its mobile-based real-time payments system called **Mobile Payments Clearing & Settlement System (MPCSS, also known as MPClear)** in July 2017. Although all the banks and payment service providers support the system, its exclusivity to mobile phones and low transaction limit are hindering the growth of real-time payments.

The high preference towards paper-based payments among Omanis has also limited real-time payments growth. As a result, real-time payments accounted for just a 1.1% share of the total payments transaction volume in 2021. However, the government's push towards electronic payments, increasing awareness and improving payments infrastructure will support real-time payments volume to grow at 41% CAGR from 2021-2026.

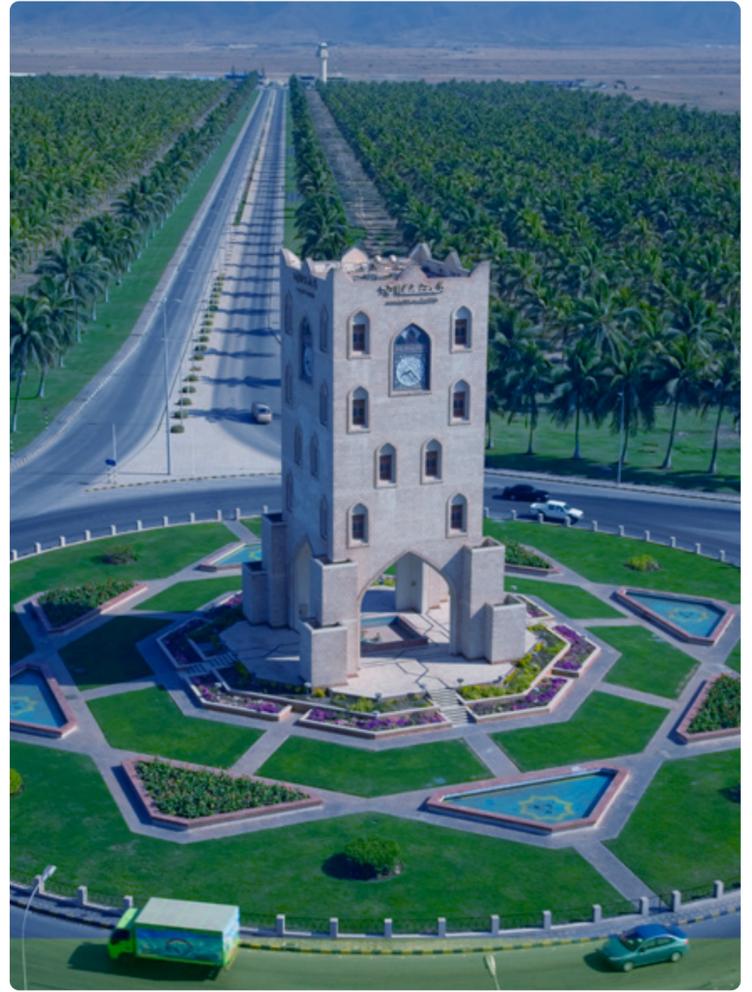
### ACI's Take

Recent years have seen a flurry of activity in Oman's digital payments space, with new platforms, solutions and networks that aim to integrate payments more deeply with people's lives. Consumers and businesses alike have responded well to services that help them retain control over finances while reducing friction, not least in a world where the pandemic boosted demand for contactless payment.

Although real-time payments are not there yet, the CBO's introduction of MpClear continues to provide opportunities for modernization. The mobile payments clearing scheme was the first of its kind in the GCC region. It enables interoperability and unified switching and clearing services among mobile wallets and banking services operated by various banks in the Sultanate. Although there was initially relatively little innovation during early adoption, MpClear is now being used for low-value P2P transfers that also enables POS acquiring.

The latter is achieved through the dynamic generation of a QR code on the POS, scanned using the Bank Muscat mobile app. Payment is then pushed to the merchant account as a P2P. Although a good step toward real-time transformation, this is a low-volume, wallet-to-wallet system with a low payments limit. It is unclear at this time whether the CBO will implement full real-time rails, unlike others in the region, with the organization appearing happy with what it has today in MpClear.

Such a stance impacts the wider industry since everything in Oman's financial system revolves around what the central bank does. If the CBO is reluctant to boost transformation, opportunities for innovation are limited. But there are still some openings for fintechs, such as enabling WhatsApp Pay. What is needed now is for the great potential in Oman to be realized, through banks gaining access to flexible, modern, agile systems that support and accelerate modernization and keep pace with the rapidly evolving demands of Oman's increasingly sophisticated banking population.



### Trends + Data

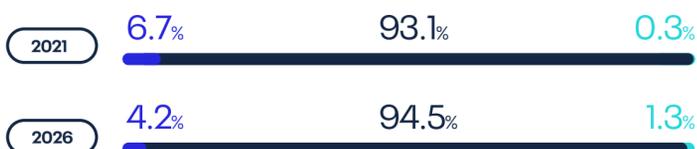
#### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

#### Transactions



#### Spend (USD)



#### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2017-26f



#### Real-Time Transactions

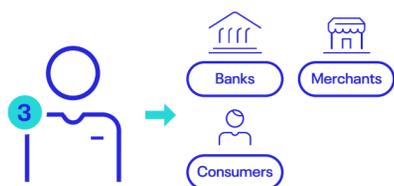


### History



### Key Stats

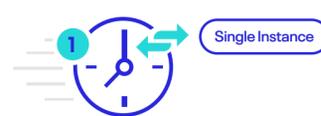
#### Real-Time Acceptance



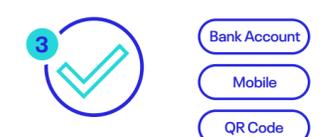
#### Real-Time Total Participants

All Domestic Banks and PSPs

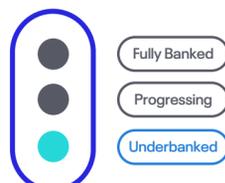
#### Real-Time Payment Types



#### Initiation/Authorization Methods



#### Population Banking Level



#### Year of Real-Time Payments Launch

2017

#### Availability



#### Message Standard

ISO 20022

## Economic Benefits of Real-Time Payments Are yet Untapped

Due to the high initial costs of introducing a real-time scheme and the low real-time take up, the costs of real-time transactions in Pakistan have yet to drop below those of paper-based transactions, which dominate the market with a 99.5% share of all payments. Therefore, in terms of benefits for consumers and businesses, the higher cost of real-time payments per transaction led to a small negative economic impact in 2021 and is expected to remain negative in 2026 (-\$0.1 million and -\$161 million, respectively).

However, with adoption of real-time transactions predicted to grow over time, Pakistan will begin to unlock significant benefits as the cost per transaction falls.

Pakistan is one of the countries for which real-time payments provide the biggest economic growth opportunities. According to the Cebr, the theoretical impact of all payments being real-time could add 6.1% to formal GDP by 2026. However, these are theoretically modeled benefits that the market is some way off realizing relative to other markets in our study (real-time payments are still expected to be less than 1% of payments overall by 2026). This also does not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Pakistan recently entered the real-time payments race with the launch of Raast in January 2021. The system is being rolled out in phases and currently supports only bulk transfers such as salaries and dividend payments, as well as government welfare disbursements. As a result, real-time payments occupy a small share of the total payments transaction volume in 2021. However, with the system being extended to P2P and C2B payments by the end of 2022, growth in real-time payments will observe a significant rise over the next few years. Real-time payments are anticipated to register respective CAGRs of 160.7% and 154.1% in terms of volume and value between 2021-2026

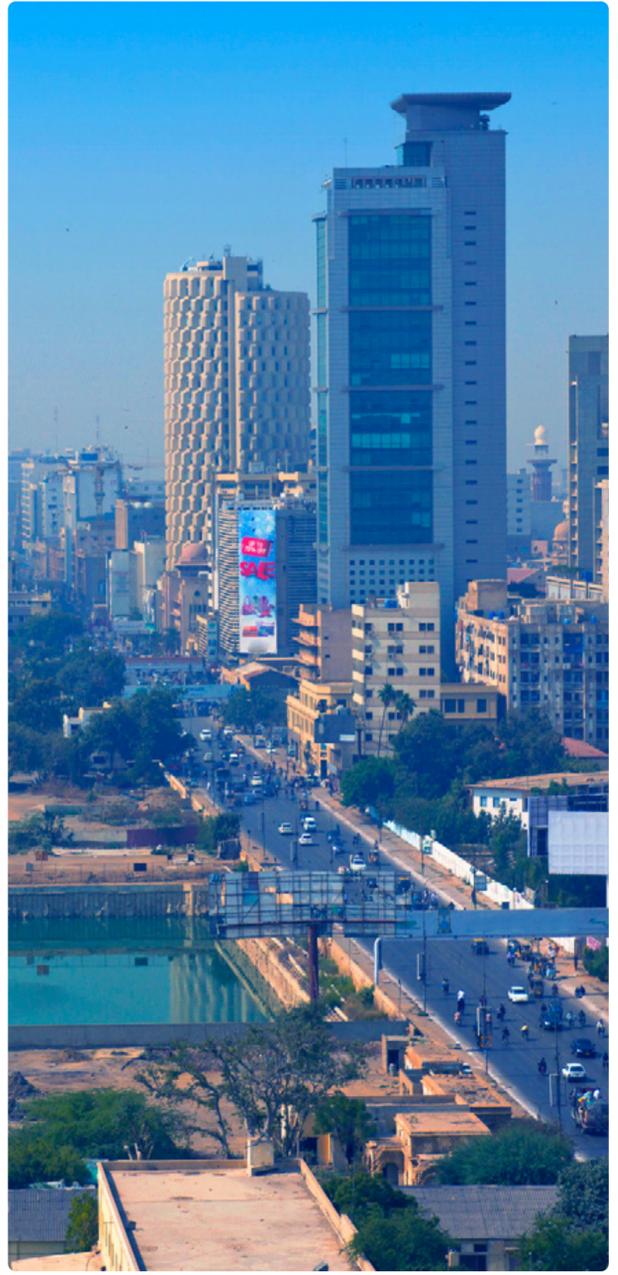
### ACI's Take

The Raast real-time payments system is due to begin its phased launch in 2022, providing a significant boost to the nation's fight against illicit financial transactions and its efforts to lift financial inclusion. The scheme is backed by the State Bank of Pakistan, so among the first use cases will be government payments, salaries and pensions, alongside payments from national social and welfare programs. These use cases touch large portions of the population, so this is a clever way to mandate a good level of adoption from day one and to drive early exposure to the system.

Although inspired by India's wildly-successful UPI service (mobile-first, account proxy identifiers, widespread fintech connectivity), Raast faces some major challenges of its own. A high proportion of the population is unbanked, and low penetration of smart phones and internet connectivity means digital payments adoption among consumers is very low. Very high fees also mean merchant adoption is almost nil.

This adds up to a low base from which to start, meaning significant and widespread adoption may be several years in the making. However, given time, the market is well-equipped to overcome these challenges. The regulator is in a position to expand the mandated use cases as the scheme's rollout enters subsequent phases by, for example, compelling banks to participate (there is no word yet on whether this is in the works). Other more fundamental challenges will not be so easily addressed, such as difficulties around bringing connectivity to the market's significant rural population.

While the market is in early stages of development, its payments players' first objective should be to ensure reliability and resiliency. It is recommended that they undertake reviews of their current payment infrastructures now to assess its ability to handle increased volumes and velocities of payments. Only then can they begin developing modernization roadmaps for onboarding the added-value overlay services that underpin the successful real-time business models seen in other markets.



### Trends + Data

#### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

#### Transactions



#### Spend (USD)



#### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2021-26f



#### Real-Time Transactions



### History



### Key Stats

#### Real-Time Acceptance



#### Real-Time Total Participants

30

#### Real-Time Payment Types



#### Initiation/Authorization Methods



#### Year of Real-Time Payments Launch

2021

#### Availability



#### Message Standard

ISO 20022

### Cebr

Classified as a lower-middle-income country, in 2021 Pakistan ranked as the 46th largest global economy (Cebr World Economic League Table, 2022).

The low level of real-time payments take up (only 0.0003% of all transactions were real-time in 2021) resulted in negligible realized benefits in 2021. By 2026, the number of transactions by volume is forecasted to reach approximately 13 million, however, this is only estimated to account for a 0.04% share of all transactions in the country.

Due to the high initial costs of introducing a real-time scheme and the low real-time take up, the costs of real-time transactions have yet to drop below those of paper-based transactions which are dominant (99.5% share). In terms of benefits for consumers and businesses, the higher real-time cost per transaction led to a small negative impact of -\$0.10 million in 2021.

With the share of real-time transactions predicted to grow over time, Pakistan will start to unlock significant (but untapped) benefits, as the cost per transaction will fall. However, based on estimated adoption rates, this is not expected to happen by 2026. As real-time transaction volumes are still relatively low, payment systems' cost of processing real-time payments will still be higher than the alternative. Before economies of scale can be realized, the expected impact for consumers and businesses is negative and will reach -\$161 million by 2026.

However, at the macroeconomic level, real-time payments will have a positive impact when it comes to formalizing shadow economy transactions through reducing cash usage. The formalization of previously informal sector activity represents an addition to formal GDP. Given the low level of real-time payments usage in 2021, this impact is relatively minor, but it did act to stimulate a slight net positive support to Pakistani GDP (\$0.0024 million).

By 2026, the economic output support by real-time payments is forecasted to increase significantly, albeit from a low starting point, to \$4 million, equivalent to the output supported by 717 jobs.

\*The current negative net impact of real-time for firms and consumers is driven by greater payment system costs in Pakistan. This is due to the small share of real-time volumes (<1% of total transaction volumes) and very high share of paper-based payments (>95% of total transaction volumes) in 2021. As the new technology is brought in, high costs and low initial take up mean that costs per transaction are yet to drop below the more traditional paper-based transaction methods. Net cost savings will grow over time, once real-time transaction volumes increase and the technology matures.

#### For Businesses and Consumers



#### GDP Growth



## Real-Time Payments Provide Huge Opportunity for Economic Growth

Saudi Arabia recorded 175 million real-time transactions in 2021, which resulted in an estimated cost savings of \$23 million for businesses and consumers. This in turn helped to unlock \$166 million of additional economic output, representing 0.02% of the country's GDP.

With real-time transactions set to rise to 473 million in 2026, net savings for consumers and businesses are forecasted to climb to \$109 million. That would help to generate an additional \$267 million of economic output, equivalent to 0.03% of the country's forecasted GDP.

The untapped economic benefits of real-time payments in Saudi Arabia are large. According to the Cebr, the theoretical impact of all payments being real-time could add 2.8% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Saudi Arabia is one of the newest entrants to the real-time payments space. Sarie is the country's real-time payments system launched by the Saudi Central Bank in April 2021. The system is supported by all the banks operating in the nation and enables instant fund transfers between domestic bank accounts through internet banking or mobile banking apps, using the recipient's IBAN, mobile phone number, email address, national ID or residency number. Still at a nascent stage, future prospects for real-time payments in the country look promising, with real-time volume expected to record a CAGR of 22.1% from 2021- 2026. The government's initiatives to push electronic payments in the country and the accelerated shift towards non-cash payment methods amid the COVID-19 pandemic will support this growth.



### ACI's Take

In light of Saudi Arabia's Vision 2030 for laying out goals for long-term economic success, there has been a strong government push to promote and accelerate the adoption of digital payments. Driven by strong — and welcome — central leadership, this permeates all parts of the market. Digital payments acceptance has been chiefly driven by the Saudi Arabian Monetary Authority (SAMA), the kingdom's central bank, carefully orchestrating and launching the real-time ecosystem in 2021, with mandates for every merchant in the Kingdom to have a digital channel for payments, regardless of size. Thanks to these moves, KSA is well placed to handle an increase in digital payments, as its real-time payments growth has a five-year CAGR of 22.1%. This represents progress in the right direction on the Kingdom's ambitions to grow into a real-time payments leader and to do so at a faster pace than other leading global real-time markets.

Longer term, this five-year growth figure also puts KSA's national infrastructure and regulatory environment on a strong footing for real-time payments adoption and innovation. "Sarie," its new real-time payments system, which was taken by most banks as a mandate from the SAMA, aims to enable banks and consumers to drive usage of digital real-time payments, paving the way for business growth beyond the energy market.

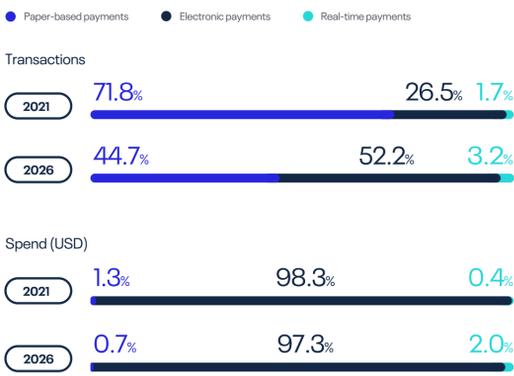
Geidea, the largest fintech company in Saudi Arabia by market share, was the first non-bank institution to be granted an acquiring license by SAMA, and it is highly likely to use the real-time rails. Additionally, KSA's biggest retail bank, Al Rajhi Bank, launched fintech company Neo Leap, which is keen to rapidly expand within and beyond KSA in the card and real-time market. Network International, a well-established major third-party fintech processor within U.A.E., has ventured into the KSA market, further recognition of the strong opportunities for growth on offer.

With two-thirds of its population under the age of 35, there is opportunity and demand for modernization. The framework and infrastructure are there, and the market has seen exponential growth over the last two years. Financial institutions have been agile and have kept pace with mandates — which they continue to do, including the mandate for open banking adoption by Q4 of 2022. This year, we will see the country step closer towards an economic transformation — financial institutions need the right partners with experience of developing real-time business models around strong, relevant use cases. With these partners, they will unlock ways of both coping with the increased volumes and driving continued innovation.

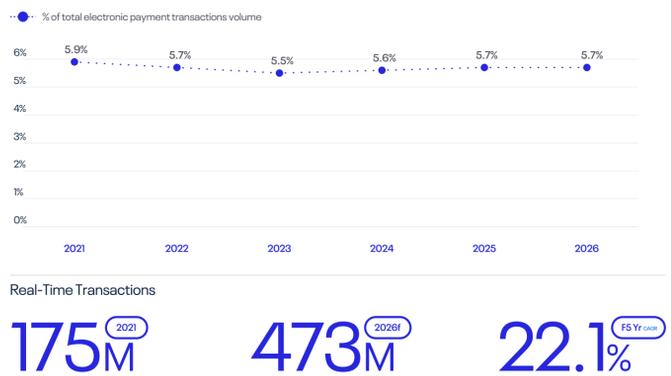
### Trends + Data



### Shares of Volumes by Payments Instrument



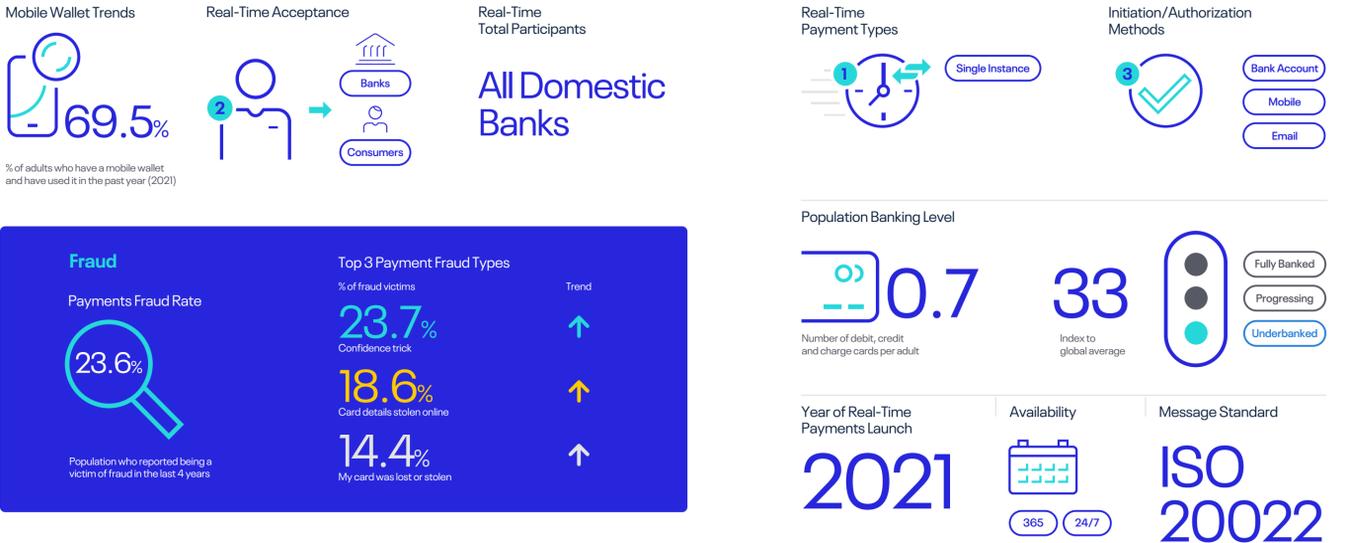
### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2021-26f



### History



### Key Stats



### Cebr

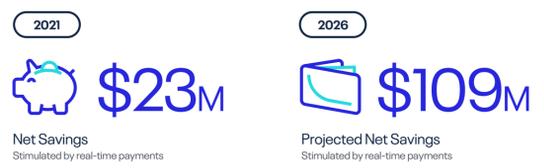
The Saudi Arabian economy is the second largest in the Middle East and is classed as high income. At the aggregate level, the Saudi Arabian economy is the world's 19th largest (Cebr World Economic League Table, 2022).

In 2021, net benefits for businesses and consumers of real-time payments hit \$23 million. The largest component of this was net savings through the reduction in the payments float. Based on current adoption rates, real-time payments in Saudi Arabia unlocked a total transaction value of \$290 million per day in 2021 through a reduced float time. This working capital facilitated an estimated \$9.3 million of business output in the same year.

Almost 72% of all transactions in 2021 were paper based across the country, with real-time payments accounting for only 1.7% of payments. Even by 2026, the real-time share is only anticipated to grow to 3.2%, despite a strong CAGR of 22.1%. This relatively small share of transactions does, however, support a significant increase in the business- and consumer-level benefits forecasted. By 2026, we estimate this will increase to \$109 million.

The macroeconomic benefits of real-time in 2021 were estimated to be \$166 million of economic output in Saudi Arabia, rising to \$267 million by 2026. These represent 0.02% and 0.03% of current and forecasted Saudi Arabian GDP respectively, supporting the equivalent of 2,939 and 4,728 jobs.

### For Businesses and Consumers



### GDP Growth





## Economic Benefits of Real-Time Payments Remain Largely Untapped

South Africa is among the early adopters of real-time payments, with the country launching its interbank real-time payments system Real-Time Clearing (RTC) in 2006.

The country recorded 123 million real-time transactions in 2021, which resulted in an estimated cost savings of \$54 million for businesses and consumers. This in turn helped to unlock \$96 million of additional economic output, representing 0.02% of the country's GDP.

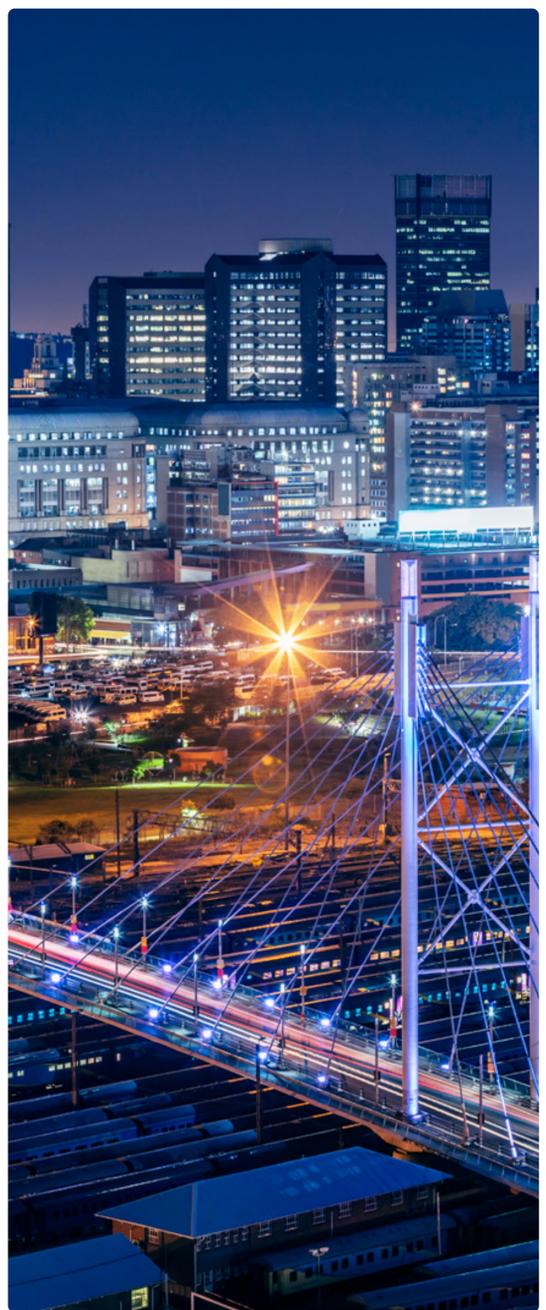
With real-time transactions set to rise to 499 million in 2026, net savings for consumers and businesses are forecasted to climb to \$191 million. That would help to generate an additional \$314 million of economic output, equivalent to 0.07% of the country's forecasted GDP.

South Africa is one of the countries for which real-time payments provide the biggest economic growth opportunities. According to the Cebr, the theoretical impact of all payments being real-time could add 4.5% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Despite being available for more than 15 years, real-time payments have not gained significant prominence due to several factors including limited customer awareness, limited participation and high fees charged by banks on RTC transfers. Consequently, real-time payments still accounted for just 0.8% of total payments by transaction volume in 2021.

Due to the limitations of the existing system, BankServAfrica, the Payments Association of South Africa, the Banking Association of South Africa and other industry players are now collaboratively developing the Rapid Payments Programme (RPP), an interbank real-time payments system. This new mobile-friendly real-time payments system will support payments using proxies such as mobile phone numbers and email addresses. It will also offer request-to-pay services.

The system is being built on the ISO 20022 messaging standard and is expected to go live in 2022 starting with 11 major banks, before being rolled out to other banks and fintech companies. The existing system will be gradually migrated to the new system. The launch of RPP is anticipated to provide a much-needed push for real-time payments market growth in South Africa.



### ACI's Take

The story in South Africa is a familiar one to those who know the region well: one of a country that's had an impressive measure of early success with payments modernization, but risks falling behind in not fully taking advantage of opportunities afforded by more recent developments in real-time payments.

In response, South Africa's Rapid Payment Program (RPP) is bringing the next generation of capabilities and use cases to the country's long established real-time payments system. The rapid payments program aims to simplify payments by adding mobile-based payments (like Request to Pay) and payment alias capabilities in addition to existing payment rails.

This will overcome the usability issues around a system rooted in account-based processing, such as a reliance on card and account numbers, and enable digital payments to consume greater volumes of cash usage (which is currently high in South Africa).

As real-time payment capabilities broaden, and volumes increase, there is an opportunity for the market to embrace a new round of rapid iteration and innovation. Through accelerating planning around ISO 20022, banks can improve user

experiences and increase their reach, drawing people and institutions away from ingrained payment behaviors that don't really benefit anyone and enable theft and fraud to persist. But to do so, banks will have to get over a reluctance to tend toward the bare minimum for compliance.

This stems from widespread but flawed thinking that real-time payment schemes are a business disruptor with few business benefits. Instead, they should be considered an opportunity to rationalize payment environments and build out services driven by a new, canonical, data-rich processing model not tied to any particular high- or low-value payment protocols.

Through this data, business intelligence will be boosted immeasurably, unlocking the chance to differentiate services from the competition, and to align with user demands and expectations. Those organizations adopting a "wait and see" approach could rapidly find a large portion of the market taken away from them by agile competitors. At that point, they'll have lost the acquiring business, the potential to win more customers and the means to better service existing ones.

### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



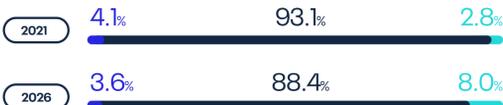
### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

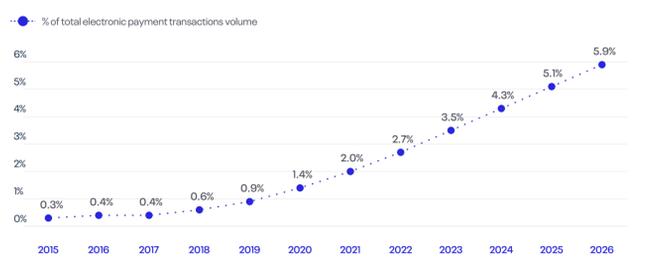
Transactions



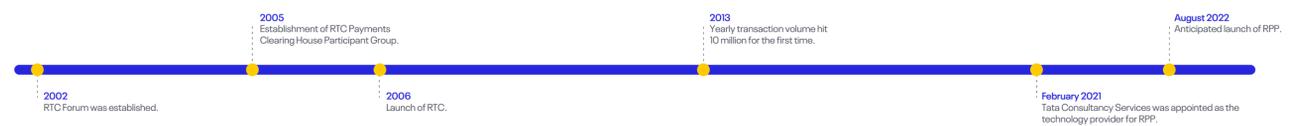
Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f

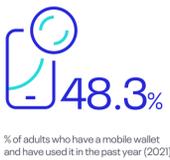


### History



### Key Stats

Mobile Wallet Trends



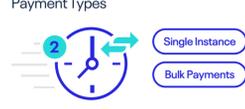
Real-Time Acceptance



Real-Time Total Participants

12

Real-Time Payment Types



Initiation/Authorization Methods



Population Banking Level



Year of Real-Time Payments Launch



Message Standard



### Cebr

South Africa is the second largest economy in Africa after Nigeria and generally considered to be the most industrialized country on the continent. Classified as an upper-middle-income country, in 2021 South Africa ranked as the 33rd largest economy in the world (Cebr World Economic League Table, 2022).

Current business- and consumer-level benefits are relatively low, at \$54 million in 2021. South Africa's first real-time payments infrastructure, Real-Time Clearing (RTC), was launched in 2006; however, adoption rates have been low. Fifteen years later and real-time payments share of overall transaction volumes stands at only 0.8%. At the economy level, in 2021 real-time payments stimulated \$96 million in economic output, equivalent to 0.02% of GDP.

Today, cash dominates the payments mix by volume (59.6%) and is still expected to be king in South Africa by 2026, although the share of paper-based instruments out of total transaction volumes is anticipated to drop to 52.2% in five years' time as real-time volumes grow from 0.8% to a share of 2.8%.

Driven by this growth in real-time transactions over the intermediary period, by 2026 the consumer- and business-level benefits are forecasted to grow to \$191 million. This growth will increase the economy-wide benefits to \$314 million (0.07% of GDP), which is equivalent to the economic output generated by 11,399 jobs.

For Businesses and Consumers



GDP Growth



The Common Electronic Fund Transfer Switch (CEFTS) is the real-time payments system in Sri Lanka, launched in August 2015. Although the adoption and usage of real-time payments was initially low, the market gained significant traction in recent years with the extension of CEFTS to support interbank QR code payments and increasing popularity of mobile wallet solutions amid the COVID-19 pandemic.

With mobile wallets rapidly displacing low-value cash transactions, real-time payments volume is anticipated to increase at a CAGR of 36% from 2021 to 2026. Consequently, their share of the total payments transaction volume is set to rise to 12.3% in 2026 from 3% in 2021.

**ACI's Take**

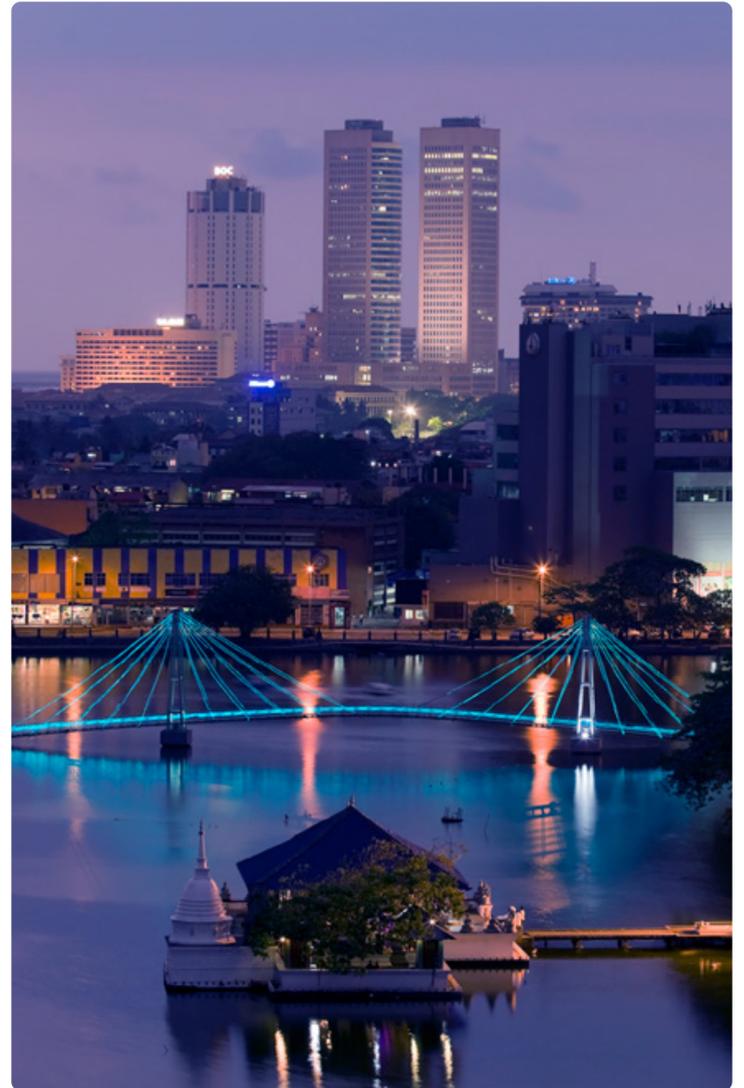
The LankaPay real-time payments scheme has been live since 2017 and is an important feature of the government's drive to increase financial inclusion with fast, convenient and secure mobile-based payments.

The COVID-19 pandemic has seen adoption of the scheme increase significantly, a trend also observed elsewhere in the world. This has prompted regulators to launch a range of initiatives to capitalize on this new momentum by ensuring they maintain an ecosystem that remains affordable for a growing base of participants drawn from all parts of society.

In many ways, this boost to adoption and resulting initiatives is simply making better use of some foundational market factors that have been in place for years. The population has good access to debit and credit cards, although they primarily use them for withdrawing cash and rarely at payment points. They are also keen users of mobile banking to pay utility bills. And digital wallets like DirectPay have enjoyed recent growth that will continue into 2022. On the merchant side of things, point-of-sale architecture for accepting real-time payments is already widely deployed. (However, one of the affordability challenges to tackle is that transaction costs are as high as 3% of the transaction amount.)

The market also has a standardized national QR code format, Lanka QR, which is an advantage for its future growth ambitions, and they are following the lead of many of their regional neighbors (particularly India) by innovating with new use cases around that functionality. Interestingly, and in contrast to neighboring India, Sri Lanka remains a very traditional payments ecosystem with little non-bank participation.

In 2022, the increasing prominence of millennials in the market will see digital payments make big strides towards becoming the norm. As such, the market's payment players are advised to revisit their payments modernization roadmaps based on the "new normal" born out of the pandemic and this demographic shift. There should be greater appreciation now for the importance of strategies that preempt disruption by emphasizing agility and flexibility. Going forward, those attributes will be vital for capitalizing on continued real-time payments growth. The underlying rails are the same for everyone; success comes from getting to market quickly with differentiated added-value services.



**Trends + Data**

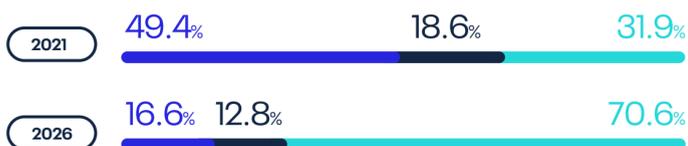
**Shares of Volumes by Payments Instrument**

● Paper-based payments ● Electronic payments ● Real-time payments

**Transactions**



**Spend (USD)**



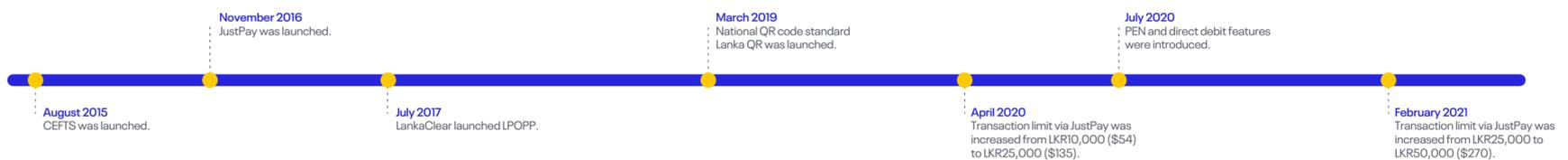
**Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2016-26f**



**Real-Time Transactions**

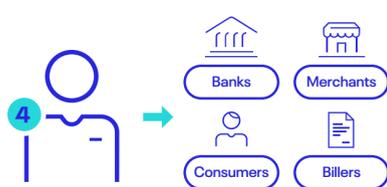


**History**



**Key Stats**

**Real-Time Acceptance**



**Real-Time Total Participants**

43

**Real-Time Payment Types**



**Initiation/Authorization Methods**



**Year of Real-Time Payments Launch**

2015

**Availability**



**Message Standard**

ISO 8583

The U.A.E. introduced its real-time payments system Immediate Payment Instructions (IPI) in mid-2019, focusing mostly on domestic volume and with no notable additions made since launch. Despite being supported by more than 70 institutions, its usage has not gained significant traction due to limited use cases and traditional preferences towards paper-based payment instruments. Consequently, real-time payments accounted for just a 0.8% share of total payments transaction volume in 2021.

However, the central bank is now in the process of launching a new and more comprehensive real-time payments scheme called Instant Payments Platform, which enables interoperable fund transfers between bank accounts and eWallets. The new system will also enable transfers using mobile phone numbers, email addresses and any other unique identifier. The launch of this new system will provide a much-needed boost to the country's real-time payments market.



ACI's Take

A sizable proportion of U.A.E.'s payments activity is cash-based, but the market continues to shift toward modern, digital payment methods. Aiming to further accelerate the trend, 2021 saw the U.A.E. Central Bank implement its NPSS (National Payment Systems Strategy), designed to make payment systems universally interoperable and foster the transition to a cashless society built around real-time payments.

Although the pandemic slowed things down, NPSS has further encouraged new fintechs to enter what was already a diverse and fast-paced market. Mashreq Bank's digital wing, Mashreq Neo, is working to ensure tourists that arrive from India can pay merchants via their domestic UPI service, bypassing Visa, Mastercard and a host of major acquirers. Elsewhere, Emirates NBD's Liv is targeting digital-natives with use cases utilizing WhatsApp Pay.

Although currently primarily working in the card business, these fintechs are aware of the great interest in and power of real-time payments. There's a keenness to be early adopters in a payments market that shows huge potential for growth. Banks and payment players within this environment must respond accordingly. They need to be ready for an incoming real-time payments scheme likely based on ISO 20022. They must also be ready to expose payment-related businesses and services via APIs in order to fully participate in — and capitalize on — market-led innovations.

However, the previously noted announcement from Mashreq that it will soon start UPI acquiring will have alarmed the market's acquirers. That is a huge amount of volume to lose and there is little time for them to respond. Our recommendation would be to stay focused: continue to modernize payment infrastructures to be ISO 20022-ready. The suggested API-first strategy would enable them — when the opportunity arises later — to bring to market real-time payment use cases that are also UPI-enabled.

Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



● Current priority ● Planned

Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



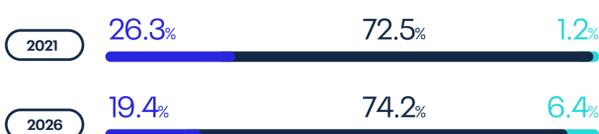
Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

Transactions

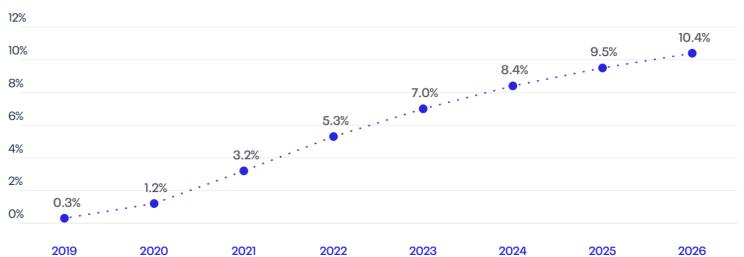


Spend (USD)



Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2019-26f

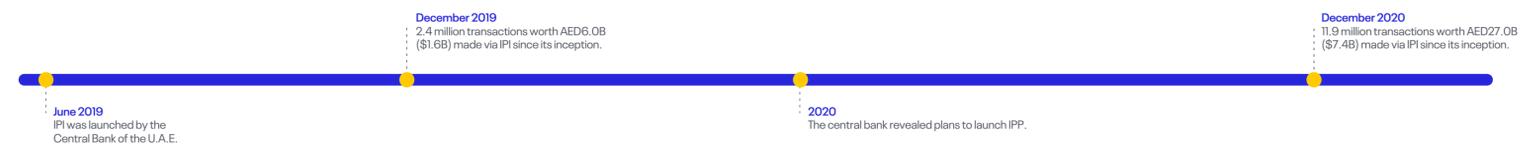
● % of total electronic payment transactions volume



Real-Time Transactions

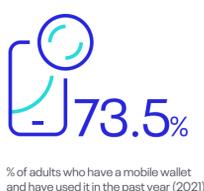


History

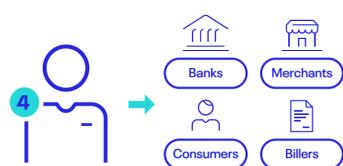


Key Stats

Mobile Wallet Trends



Real-Time Acceptance



Real-Time Total Participants

70

Real-Time Payment Types



Initiation/Authorization Methods



Fraud

Payments Fraud Rate



Top 3 Payment Fraud Types



Year of Real-Time Payments Launch

2019

Availability



Message Standard

ISO 20022

## Regional Spotlight

# Renewed Urgency Shapes Region's Real-Time Payments Outlook

Author: Leslie Choo, Senior Vice President, Managing Director – Asia Pacific - ACI Worldwide

**For different reasons, adoption of real-time payments in Australia and New Zealand is proving slower than would be expected from two westernized economies with digital-savvy populations. But there are reasons to believe a tipping point is on the horizon.**

Despite the COVID-19 pandemic accelerating adoption of digital payments, many Australian financial institutions appear content with a payments market that provides a steady income from interchange fees; they may also be reluctant to invest in the upgrades to legacy infrastructure necessary to support the real-time experiences that are the norm in other countries.

Cards and digital wallets are still the most used payment mechanisms for C2B transactions, and the underlying cash economy remains resilient. As yet, real-time payments have not been incorporated into digital and wallet-based payment, so the payments initiation mechanism has not been modernized. Genuine growth in real-time payments will only happen when its cost advantages are sufficient enough that either merchants or banks decide to take advantage of it. At present, the banks' investment in cards have created a "sticky" payment method that people are familiar with.

### Australia's tipping point

The tipping point for payments modernization in the region may arrive in the shape of the imminent merger slated for 2022 of BPay, the domestic bill payments solution, Eftpos, which facilitates general retail transactions, and the New Payments Platform (NPP), the domestic real-time payments scheme used for fast high-volume transactions. This should create synergies and opportunities, providing a platform for the inevitable expansion of real-time to high-value payments and additional business use cases. While there is always the caveat that the banks accept the loss of income from interchange fees, the regulator's approval of the consolidation is a sign that the Australian government is lending its weight to moving transactions to real-time rails.

As in other countries, a further boost is being provided by the arrival on the market of new fintechs providing new payment schemes and channels offering real-time experiences that are changing expectations and perceptions of both consumers and merchants. A notable example of how these new players are innovating is Azupay's one-time, alias-based, real-time retail solution, which cleverly overcomes a current shortcoming in NPP. These newcomers are forcing the banks to look at how they can replicate modern real-time experiences, which in turn is highlighting the inability of their back ends to support modernization, and in some cases necessitating a layer of middleware between front and back end. There is also considerable interest in payment hubs, which offer a way to simplify the implementation of new standards, such as ISO 20022. Hubs will allow common risk profiles and methodologies, reporting and controls across all payment types, and lower investment costs by removing duplicate infrastructure.

Meanwhile, open banking is beginning to catch on more widely. There is a clear awareness of its potential, despite a slow start due to a current lack of government-mandated adoption. Much of the uptake so far has been oriented to lending rather than payments, and we are some way short of the levels of user engagement seen in Europe. This is largely due to consumers not fully grasping the implications of giving consent, and to a shortage of persuasive use cases.



**“Making up ground in a world where infrastructure and services are constantly developing will mean banks, processors, issuers and fintechs must explore all the options being offered.”**

### New impetus in New Zealand

New Zealand is some way behind its regional neighbor due to a legacy of a stop-start approach to real-time in recent years. However, there is now a genuine commitment on behalf of Payments New Zealand to make up ground and move towards the country's first real-time system. This is largely a result of the COVID-19 pandemic, which demonstrated the advantages of real-time payments while at the same time, exposed a wider audience to the shortcomings of the existing infrastructure already apparent to digitally native consumers.

The size of the New Zealand market has traditionally placed a premium on creatively adapting technology to deliver performance without massive expenditure. In the past, banks have been willing to collaborate closely to find solutions, and the same spirit is apparent in building real-time infrastructure, with a focus on a decentralized approach using Open APIs to connect banks point to point.

Overall, in both Australia and New Zealand, the global pandemic has injected a new urgency into the journey towards ubiquitous real-time payments, reinforced by observing the payments modernization progress in similarly developed economies. Making up ground in a world where infrastructure and services are constantly developing will mean banks, processors, issuers and fintechs must explore all the options being offered. The ideal end state is a balance of manageable and easy-to-maintain existing infrastructure combined with new solutions capable of delivering performance and value at scale.



# Region's Banks Must Act Soon to Learn From Others' Mistakes Over APP Scams

Author: Jackie Barwell, Director (Fraud) Product Management - ACI Worldwide

**The COVID pandemic has provided fertile ground for scams to grow, with more inexperienced people online and transacting digitally than ever before. The region's banks must demonstrate to regulators through closer collaboration that they're escalating their response in line with the threat.**

The "market" for APP fraud grew significantly when the COVID pandemic forced many people to adopt what were, to them, new digital lifestyle and payment habits. Many of the newcomers embraced their convenience with gusto, creating a tempting target for fraudsters that were already highly adept at exploiting people's personalities and vulnerabilities to convince them to transfer funds under false pretenses.

Relative to financial institutions in many other markets, the Pacific has a reputation for being hot on educating consumers about fraud risks, and it is also a mature user of machine learning to detect and mitigate fraud. Regulators have historically done a thorough job of holding financial institutions to account whenever particularly vulnerable people fall victim to scams. As such, they are at pains to demonstrate that they use every tool they reasonably can to protect all consumers.

However, liability and questions of how much to reimburse victims are as much a challenge here as they are elsewhere in the world. Customers are rarely reimbursed in full and debate rages about the ethics here considering that, ultimately, whether it is a scam or not, it is still fraud committed using banking services and products. There's little doubt where governments sit on the issue; when forced to intervene in one way or another they are more likely to side with the citizens. Anti-money laundering is also high on the agenda, with high-profile data breaches like the Pandora Papers revealing local links to dubious wealth-concealing practices.

These are big challenges and the continued growth of scams shows that education and tech alone can only get you so far. To make serious inroads into the problem, there is a growing realization that both ends of transactions need to be able to collaborate, in order to identify suspicious behavior, stop it from getting out of control and to (somehow) share liability. There is currently almost no risk at all for receiving fraudulent transactions; all the risk is assumed by the initiating bank. Perpetrators of these scams relish their scalability, and this imbalance in liability and lack of visibility between the two ends is largely responsible for making this so.

If initiating banks had insights into destination accounts, they would be better able to understand the likelihood that it is a mule account. Is it an account that has recently seen a spike in incoming transactions? Is it long-held or only just opened? Of course, receiving banks couldn't be expected to take on more liability without access to similar insights about what is and isn't usual behavior for initiating accounts.

Privacy regulations have tended to make this level of collaboration impossible, but federated machine learning technology, like that found in [network intelligence](#) applications, enables the real-time exchange of machine-readable fraud signals without exposing the underlying data. That allows banks to train machine learning algorithms on fraud signals drawn from a diverse range of internal and external sources in full compliance with data privacy regulations.



Whether they are sharing them via network intelligence or not, to ensure their signals are as effective as possible, financial institutions need enterprise-level oversight of their relationship with customers, creating 360-degree profiles of their behavior. That would enable fraud teams to design truly intelligent controls. (After all, criminals don't suffer from the same silo challenges that financial institutions do.)

A similar shift is required with payment systems. Moving them onto a standard model would allow banks to assess them all in a uniform and scalable way, streamlining monitoring for fraud and anti-money laundering.

**"Federated machine learning technology, like that found in network intelligence applications, enables the real-time exchange of machine-readable fraud signals without exposing the underlying data."**

Without enhanced collaboration of the sort enabled by network intelligence, APP scams cannot be brought back under control. And the longer consumers and business suffer losses thanks to a lack of cooperation, even when technology makes it possible, the more likely further regulatory interventions become. This risks increased compliance obligations and costs for the region's banks. In that context, the business case for acting is as concrete as the ethical one.

# Pacific Trends in Payments To Watch For in 2022



Author: Wayne Vercoe, Senior Principal Solution Consultant - ACI Worldwide

**The Pacific region is affected by global trends such as payments convergence and the rise of digital wallets but also has challenges peculiar to a region dominated by two economic leaders.**

## Australia's journey offers a heads up for New Zealand

The Pacific region is dominated by the two large economies of Australia and New Zealand, although there are stark differences between them. Being the larger country with a bigger economy, Australia tends to lead in new initiatives. It's invested about AUD2.5 billion in its real-time payments infrastructure.

By contrast, New Zealand is still in the early stages of researching its infrastructure options for real-time payments, but it knows it cannot afford to spend nearly as much. Instead, its central bodies and regulators are likely to take a light-touch approach and allow the market to define key features of any future schemes. They will still look towards Australia for inspiration and for early warnings or a heads up on developments to come. As such, Australia's experiences will do much to prove the effectiveness of real-time payments in the region, and provide examples of how to popularize them in New Zealand and other countries in the region.

## Greater payments convergence

The Reserve Bank of Australia has been driving the amalgamation of Eftpos, BPay and NPP Australia as a first step towards simplifying the number of clearing systems. Currently, different systems are used for card payments, bill payments from bank accounts and real-time credit transfer. The New Payments Platform (NPP) is launching pull payments (Request to Pay and direct debits) as soon as mid-2022 and with that final piece in place, the Australian regulator will be able to accelerate the convergence of payment streams.

The expectation is that further consolidation will drive down costs for banks and improve working capital and cashflow for businesses. Lowering the cost of card payments in particular will reduce the cost of business in Australia, meaning retailers will see some of the strongest benefit.

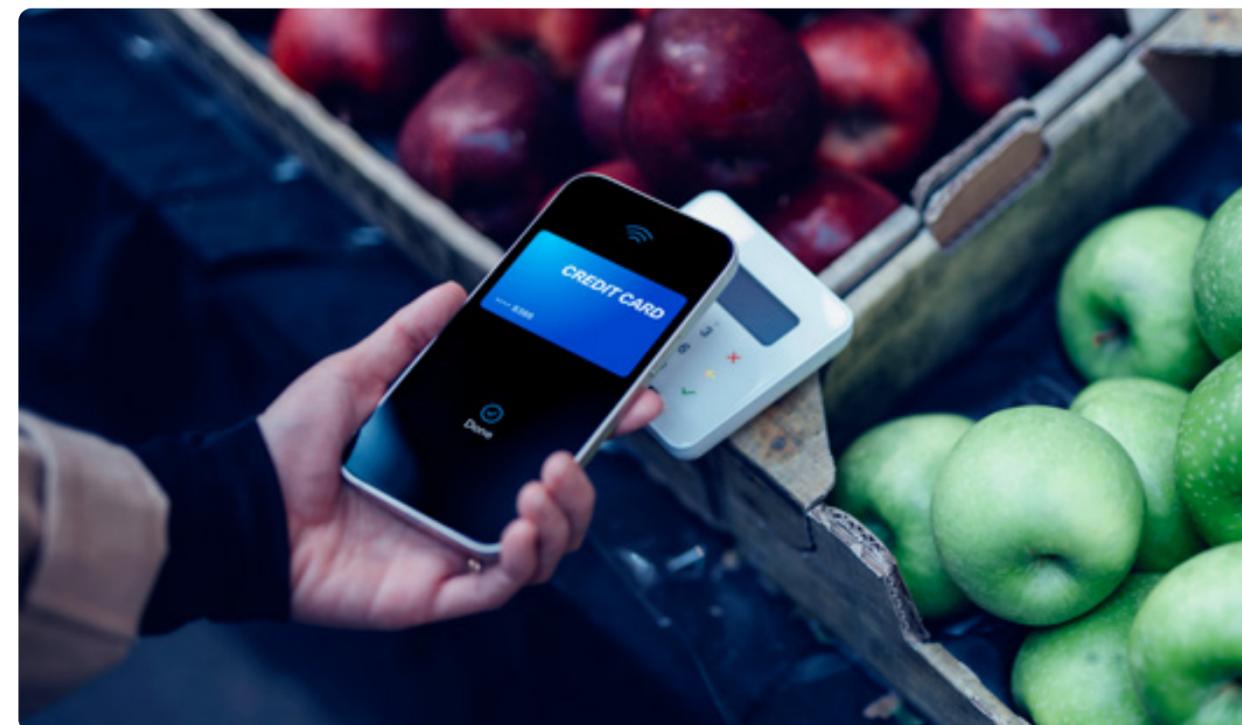
We expect other countries in the region to study Australia's progress with great interest and build convergence into their own infrastructure plans.

## Apple and Google enter the region

As in other geographies, big technology companies are an increasingly large part of the consumer payments ecosystem. Banks have tended to be resistant to Apple Pay, which was first to enter the region, but the brand's strong following has still seen it grow to the extent that they've had to reconsider.

Meanwhile, Eftpos in Australia has announced eQR, a QR-code-based payments system that bypasses the card scheme rails and targets wallets such as Apple Pay and Google Pay. eQR gives banks an opportunity to support retail payments at a lower cost and the chance to expand their user base for mobile payments. With the transaction handled by the big tech provider, they are effectively outsourcing the transaction to Apple or Google.

Elsewhere, the growing popularity of digital wallets has rapidly increased the use of contactless payments in New Zealand. Combined with the pandemic, these solutions have helped to break down resistance from banks and customers.



## Growth in the cloud

As a result of the coronavirus pandemic, many financial institutions have found that they cannot adequately resource their IT environments. This has led to a rapid surge in cloud adoption. In a short time, cloud has gone from being a possible future option to being an immediate strategic priority. Managed services have also seen huge growth over the last year as, overall, financial institutions have been working closely with regulators to reassure them about the safety of the cloud.

This shift to the cloud will be permanent. Even after the pandemic has subsided, the benefits will remain attractive. As in other industries, we're already seeing financial institutions build on their early cloud investments as they gain confidence, slowly migrating more mission-critical applications in the cloud.

## Correspondent banking services interrupted

A lot of the large banks in the region that offer correspondent banking services for cross-border currency trade have started to reduce the number of correspondent relationships they hold for those services. They have concluded that anti-money laundering (AML) provisions make it increasingly unfeasible to continue. This will have a huge impact on smaller nations in the region. Australia and New Zealand need to find a way to continue supporting their regional neighbors, while respecting AML norms.

## Economic Benefits of Real-Time Payments Remain Largely Untapped

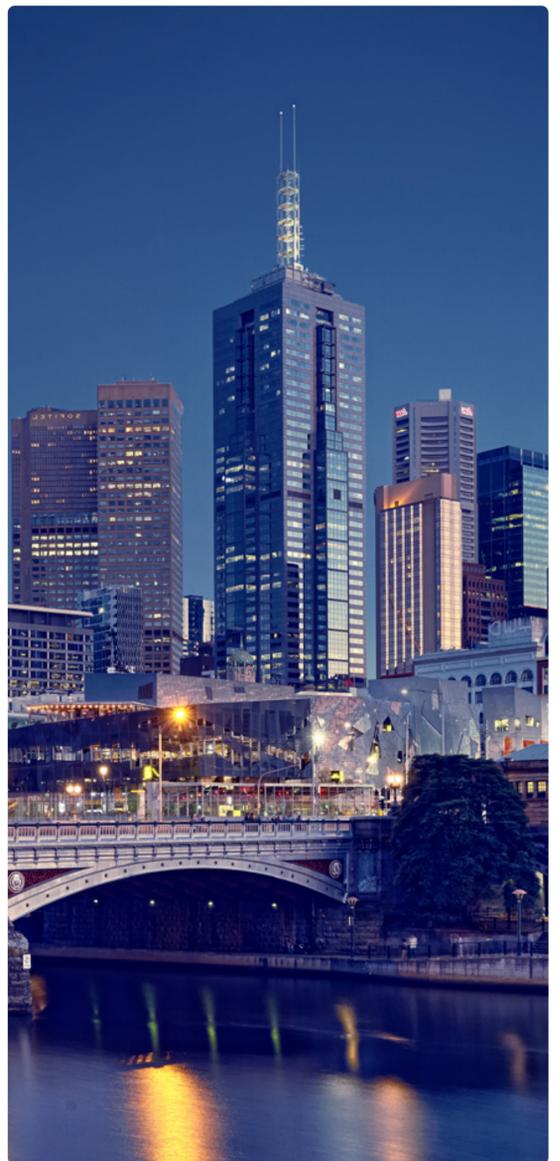
Australia recorded 970 million real-time transactions in 2021, which resulted in an estimated cost savings of \$205 million for businesses and consumers. That in turn helped to unlock \$932 million of additional economic output, representing 0.06% of the country's GDP.

With real-time transactions set to rise to 2.4 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$628 million, helping to generate an additional \$1.4 billion of economic output, equivalent to 0.07% of the country's forecasted GDP.

That means for the 13th largest global economy, the potential economic benefits of real-time payments remain largely untapped. According to the Cebr, the theoretical impact of all payments being real-time could add 2.4% to formal GDP by 2026. However, these are theoretically modeled benefits, which do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Real-time payments were enabled in Australia in 2018 with the launch of the New Payments Platform (NPP) by the Reserve Bank of Australia and its Payments System Board. The system was made available to more than 75 million account holders, with more than 100 banks, credit unions, building societies and fintech companies supporting the system as of December 2021. Despite this wider coverage, real-time payments accounted for just 5.2% of the total payments transaction volume in 2021.

The high preference for payment cards and limited use cases for NPP remained key constraints hindering the overall growth of real-time payments in the country. However, with NPP now expanding its use cases with the launch of new overlay services such as the PayTo service, real-time volume is expected to gradually increase, recording a CAGR of 19.9% from 2021-2026.



### ACI's Take

There is much inertia on the part of Australia's financial institutions when it comes to maximizing real-time payments. It may be that they are protective of traditional revenue streams, such as the interchange fees on cards, but many of them are overlooking the growth opportunity in providing value-added services on top of real-time payments.

However, others have not been so slow. PayTo, the new Request-to-Pay service coming from New Payments Platform (NPP) Australia in 2022, enables bank accounts to be linked to in-app payments, real-time account validation and real-time confirmation of payment. And fintech Azupay provides a real-time payments alias system that can be used for payments and confirmation of payments in retail settings, without exposing bank details to customers or staff. (This is a neat workaround the current gaps in the NPP system's merchant offering.)

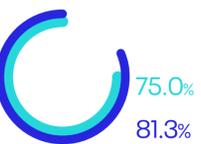
Inspired by what they've seen from these kinds of use cases, merchants and customers are beginning to challenge financial institutions to blend a smooth, real-time experience across every payment type. The merger of Eftpos, BPay and NPP Australia could help to accelerate the rollout of real-time payments across different payment channels in Australia. It will bring together Eftpos' domestic card payments scheme, with BPAY's bank-account-based bill payments and NPP's real-time credit transfer scheme.

But for most banks and payment providers, legacy infrastructure cannot support modern payment experiences (another reason for the inertia we mentioned) and, at the very least, a middleware layer is likely to be needed as a tactical solution. At the strategic level, however, there is growing interest in how a payments hub environment could simplify the adoption of new standards, such as ISO 20022, and the onboarding of new schemes and use cases. This kind of approach would also cut costs by removing duplicate infrastructure and support services, while also allowing common risk profiles, reporting and controls to be shared across different payment channels.

### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



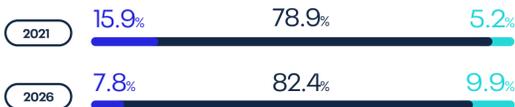
Software as a Service (SaaS)



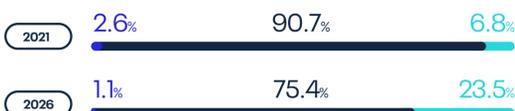
### Shares of Volumes by Payments Instrument

Paper-based payments Electronic payments Real-time payments

Transactions



Spend (USD)



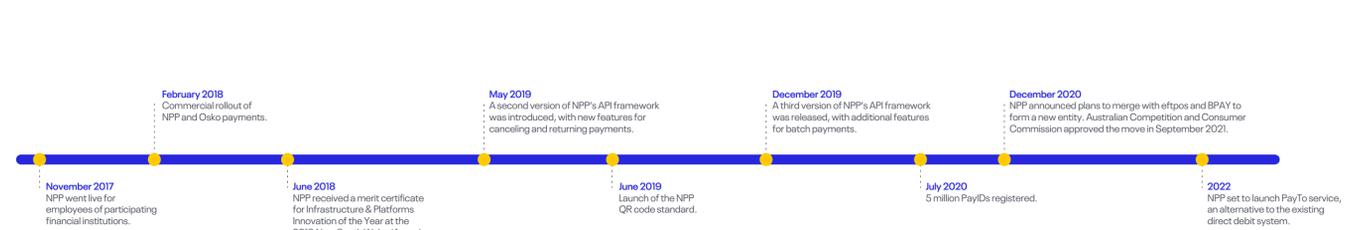
### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2018-26f



Real-Time Transactions

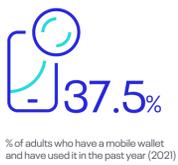


### History

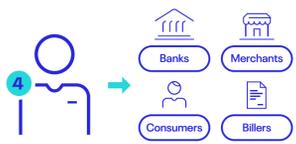


### Key Stats

Mobile Wallet Trends



Real-Time Acceptance



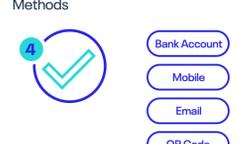
Real-Time Total Participants

105

Real-Time Payment Types



Initiation/Authorization Methods



Population Banking Level



Year of Real-Time Payments Launch

2018

Availability



Message Standard

ISO 20022

### Cebr

Australia is classified as a high-income country and is the 13th largest global economy (Cebr World Economic League Table, 2022).

The 2021 share of real-time payments (5.2% of all transactions) led to a total estimated efficiency savings of \$205 million for consumers and businesses, driven principally by a reduction in the payments float.

Based on real-time adoption rates, real-time payments in Australia unlocked a total daily transaction value of \$2.9 billion through reduced float time. This working capital facilitates an estimated \$106 million of business output.

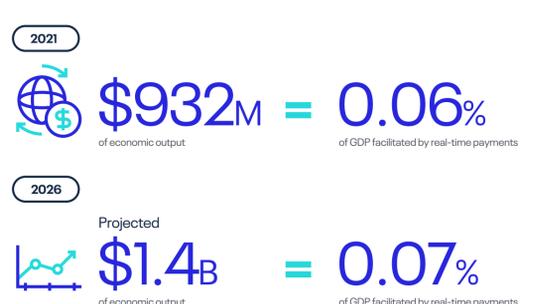
With regards to the realized aggregate economic benefits in 2021, real-time transactions facilitated an economic output equivalent to 0.06% of formal GDP (\$932 million), or the output of 7,512 workers annually.

Forecasts for 2026 estimate that real-time payments will represent 9.9% of the payments mix volume. In the same year, total estimated efficiency savings for consumers and businesses will reach \$628 million. This contributes to the realized macroeconomic benefits of real-time payments increasing to \$1.4 billion or 0.07% of formal GDP.

For Businesses and Consumers



GDP Growth



New Zealand does not have any real-time payments system in place, and no such system has yet been announced. To help fill this gap, in October 2021, the Dosh digital wallet was launched in the country, which allows users to make instant fund transfers and payments to merchants using mobile phone numbers or by scanning QR codes.

The solution is supported by major New Zealand banks including BNZ, ASB, Westpac, ANZ and Kiwibank. The country's payments space is dominated by electronic payments, which occupy 59% of the total payments transaction volume in 2021.

## ACI's Take

COVID-19-driven adoption of digital payments in New Zealand served to underscore known gaps in its payment experiences that the industry is keen to close. In response, Payments New Zealand, the standards body set up by the main banks, is coordinating the exploration of infrastructure options for the market's first real-time payments scheme.

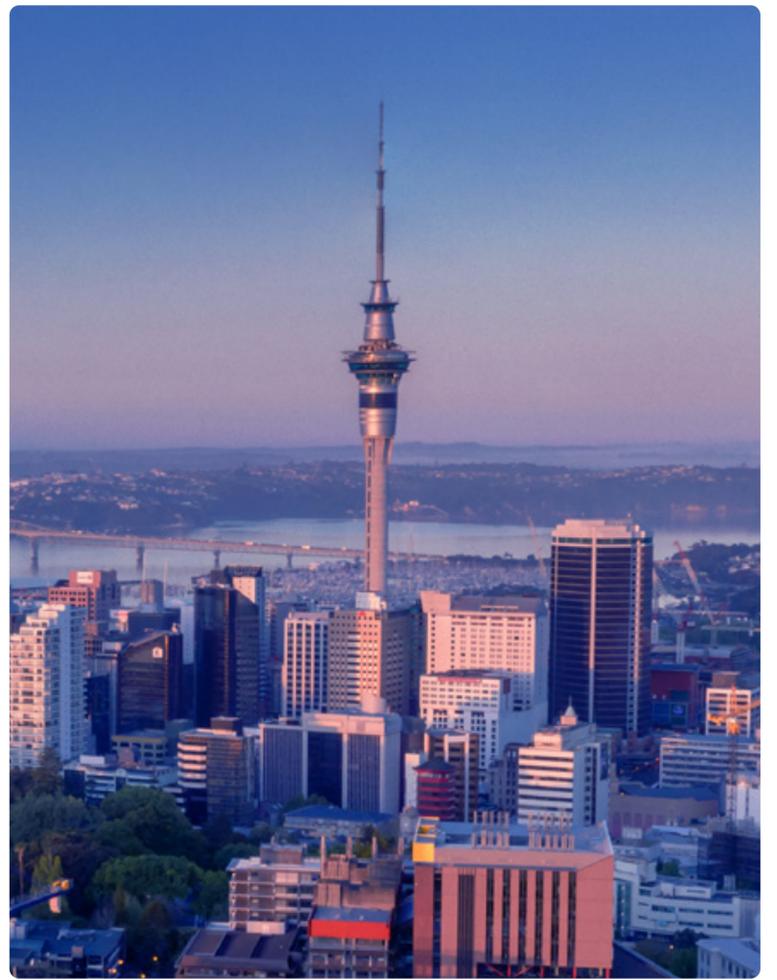
Pressure was building pre-pandemic in any case, with younger, digitally native customers running out of patience with payment experiences that fell far short of those found in other digital services. As a westernized economy, there was growing realization that New Zealand couldn't afford to be left behind as other countries accelerated real-time payments adoption.

However, with a population of just over five million people, New Zealand cannot invest the same kind of money that other countries have when standing up real-time infrastructure. The market will instead need to draw on its reputation for inventive problem solving and the historically high levels of industry cooperation which, much like the Netherlands, define aspects

of New Zealand's banking culture. There is a clear understanding about what's competitive and what isn't. The banks worked together to create a centralized Eftpos network in the late 80s, and we expect to see a similar approach in real-time payments.

Now, some banks are asking whether APIs could be used to connect banks in a point-to-point real-time payments system. This would avoid the need for an expensive central infrastructure that the banks all connect to. It would be a highly unusual approach, but with the industry's history of cooperation, it could be an effective solution that works within the constraint of limited resources.

With limited progress since last year, but an improved outlook on future developments, the recommendation remains for financial institutions to begin strategizing and testing around what real-time services might look like for them. By moving first and making a fast start, they will maximize their chances of claiming the largest share of the market for the longer term.



## Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



● Current priority ● Planned

## Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments

### Transactions



### Spend (USD)



## Key Stats

### Mobile Wallet Trends



% of adults who have a mobile wallet and have used it in the past year (2021)

### Fraud

#### Payments Fraud Rate



Population who reported being a victim of fraud in the last 4 years

#### Top 3 Payment Fraud Types

% of fraud victims

24.8%  
Card details stolen online

14.8%  
Confidence trick

14.1%  
Card details stolen/skimmed in person

Trend



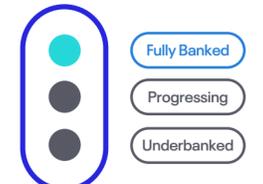
### Population Banking Level



Number of debit, credit and charge cards per adult

151

Index to global average



# Latin America

Regional Spotlight

Payment Trends To Watch in 2022

Payments Fraud Viewpoint

Argentina

Brazil

Chile

Colombia

Mexico

Peru

## Regional Spotlight

# Today's Big Players Must Act on Modernization To Secure Their Future

Author: Leonardo Escobar, Senior Vice President, Head of LATAM - ACI Worldwide

For a window into the near future of real-time payments, Latin America's payment players can look to some of the global markets that are further along on their development journey.

Broadly speaking, the region is potentially a couple of years behind a market like Asia, which provides several opportunities. These include observing the not-so-secret success factors behind achieving a critical mass of adoption and understanding the targeted modernizations that could be made today to get out ahead of future demand. It is also an opportunity to preempt some of the incoming disruption to incumbents' business models and market positions.

But, as with any opportunity, they must be taken if any advantage is to be gained. Because global developments also tell us that, in the age of digital disruption, the big players of today are not necessarily those of tomorrow.

### The not-so-secret success factors behind sky-high adoption

On the path to critical mass for real-time payment volumes, we see a huge divergence between the adoption of India's real-time payment services and Latin American schemes launched around the same time. This can't be conclusively attributed to any single factor, but one major difference is clear: India's UPI has built a general-purpose payments platform on top of the real-time rails in a way that Latin American markets have not.

If this example and that of similar schemes, such as Malaysia's DuitNow, are a roadmap for driving adoption, then the fastest path to critical mass is via peer-to-peer and merchant payments. Those use cases are, in turn, best enabled by mobile-friendly initiation methods, specifically simple payment aliases and QR codes. As such, better leverage of these use cases is vital to achieving similarly high rates of adoption in the region (and Brazil's PIX has begun to prove this out).

### Today's world moves too fast for "wait and see"

Historically — and understandably — financial institutions have waited for clear government direction before making significant investments.

However, there are risks of taking a similar "wait-and-see" approach wherever this direction on real-time payments is not yet clear or is not mandated. The world moves faster now and new market entrants are arriving all the time.

As such, there is little need to go slow on ISO 20022, which will, regardless of each market's specific nuances, be the industry standard messaging format thanks to the data enrichment possibilities it opens up. In fact, delays simply risk inviting a scenario where financial institutions are forced to make these changes in parallel with a range of additional, more complex changes at a later date when competition and therefore urgency is higher.

Another challenge financial institutions in the region can preempt is an aversion in informal markets and among small business to inviting increased visibility into their financial affairs. Lower payment handling fees alone will not offset increased taxation, so serious thought must be put into higher-value use cases that will, over time, break down these barriers. Convenience is king, so to cut through, financial institutions should explore ways to provide admin-busting insights or automations around stock and inventory, sales performance, reconciliations and reporting. (Of course, mandated merchant adoption is also a possibility to force through change.)

### The time is now for refining long-term payment business models

The region is actually relatively well prepared for the launch of new real-time payment schemes or increased volumes. Many players are getting ready for growth by exposing services and APIs and exploring the role of the public cloud.

However, there is more work to do when it comes to the business models and use cases that will drive revenue from real-time payments.

Incumbents must identify the role they expect to play in the new, real-time and open economy. That requires understanding what their business might look like five years from now, when real-time payments are widely launched and gaining critical mass. And it



requires understanding of who they will be competing with and how they will differentiate beyond payments enablement. Will they be a technology-based facilitator? Will they corner specific niches and use cases? Or will they try to gain scale and process as many transactions as possible?

As open banking paves the way for more fintech involvement, incumbents will also need a clear strategy for engaging with them. And as these questions get solved, new ones will be hot on their heels around solving for cross-border real-time payments, given the region's countries are very interconnected with shared languages and cultures. They must also contend with the emergence of super-apps in the region, which are channeling consumers away from incumbents and commoditizing payment processing within their overall ecosystem.

### Today, global and scale experience counts for more

The need to act on payments modernization — even in the face of uncertainty — means finding partners with experience in answering these questions in other markets around the world and scaling the solutions. To enable differentiation, these partners must also be able to offer solution control and governance because roadmap independence will be vital to responding quickly to new demands with new functionality.

Right now, the region's incumbents enjoy strong relationships with banks, merchants and regulators, and they have the biggest customer bases. That adds up to a window of opportunity to modernize in preparation for real-time payments in order to protect the market share they have today and develop new competitive advantages for tomorrow.

But not only will that window not be open forever — it is already closing.



# More Friction Is Not the Answer to Real-Time Payments' Fraud Troubles

Authors: Eduardo de Andrade, Principal Fraud Consultant - ACI Worldwide

**The Latin America region is now home to a number of refreshed, relaunched and brand new real-time payment schemes, which has given rise to an evolution in familiar scams and frauds — and familiar compromises made in tackling them.**

One of the issues with many of the Latin America region's older payment schemes was the delays created by fraud screening measures. If they weren't real-time, or close to it, these schemes were at least designed to be faster than other methods, but imprecise targeting of fraud checks tended to ruin the user experience and contributed to limited adoption.

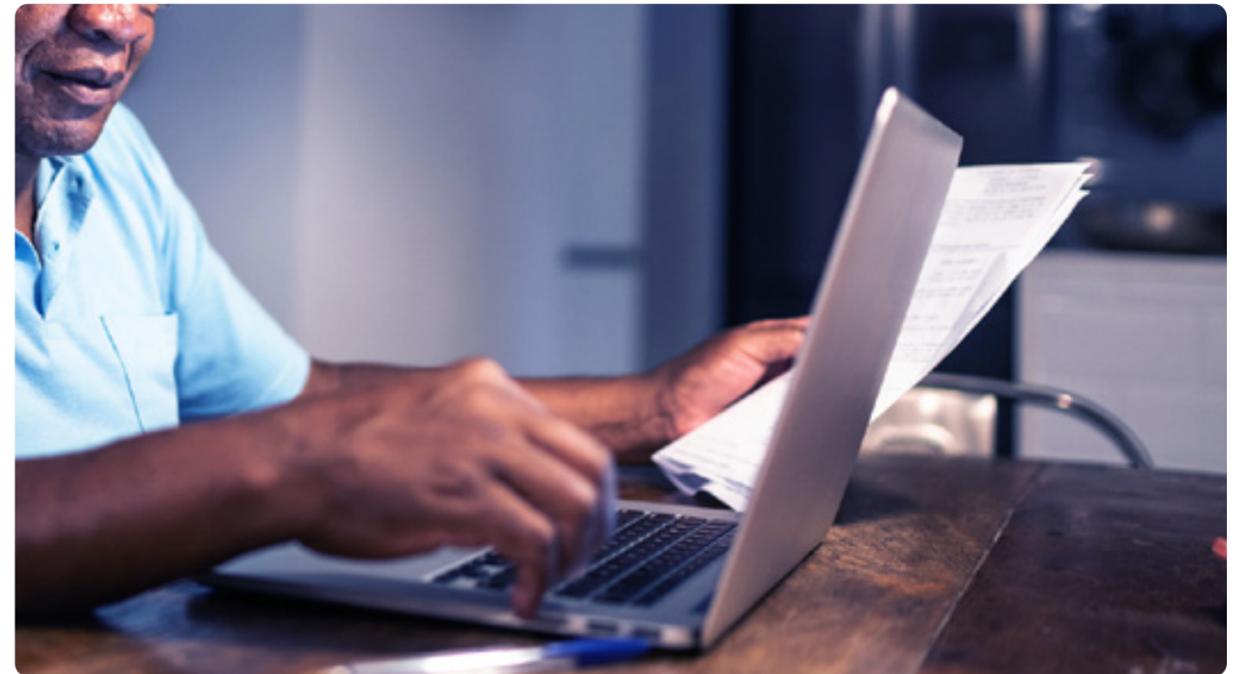
Similar risks are emerging in Latin America where interventions by regulators and banks are doing more to cause delays and undermine the experience of real-time payments than they are to combat fraud. In Brazil, for example, a rise in kidnappings forcing people to transfer money via the PIX system to fraudsters has been met by transfer limits that can only be changed periodically, and limits on activity at night. Some consumers have even taken to carrying cheap burner phones with temporary PIX accounts on them to ensure they don't have access to all their money in case they are a victim. Elsewhere in the region, account takeovers are a persistent problem and are still not being met with enough intelligent screening at the right speed. Both these issues have been challenges in the region for many years, but it is the higher volume that is becoming tough to manage.

Experience in the region, and backed up elsewhere around the world, is making it increasingly clear that tackling real-time payment scams requires visibility into account reputation at both the initiating and receiving ends of transactions. This visibility could be used to create detailed and wide-ranging databases of account behavior on which reputation scores can be based, monitored and optimized.

Unfortunately, several interlinked factors make this technically, practically and legally difficult to achieve today. Technically, banks' systems only see one side of the transaction. Practically, receiving fraudulent transactions today generally carries zero risk so there is no incentive for that side to work with the initiators. And, legally, regulations around data privacy would in any case rule out collaboration of that nature.

The near-term solution is to find a way to allow the initiating and receiving ends of transactions to collaborate, without sharing sensitive information about customers with competitors or breaching privacy regulations. Federated machine learning technology, like that found in [network intelligence](#) applications, enables the exchange in real time of fraud signals that are machine-readable, but do not expose the underlying data. Banks can use these signals to train machine learning algorithms on fraud signals drawn from a diverse range of internal and external sources in full compliance with data privacy regulations. To be truly effective, these signals must also be the result of enterprise-level oversight of financial institutions' relationships with customers, creating 360-degree profiles of their behavior. Criminals are not beholden to silos after all, so moving beyond channel-based strategies and point solutions would help to level the playing field and enable fraud teams to design more intelligent controls.

Longer-term, regulatory interventions are needed to promote collaboration by spreading the burden of protecting consumers and businesses. This means clarifying liability and expectations around customer reimbursement.



**“Experience in the region, and backed up elsewhere around the world, is making it increasingly clear that tackling real-time payment scams requires visibility into account reputation at both the initiating and receiving ends of transactions.”**

In addition, regulators have done a great job of protecting data privacy, but it has come at the expense of enabling financial institutions to engage in more meaningful collaboration to prevent fraud. Fraudsters know that data protection regulations mean they won't be followed when they move between organizations or even between lines of business. Consumer confidence in payments is vital to the health of the economy. Finding ways to protect both payments and privacy should be a priority, even if that means some compromise on today's regulations.

Without addressing these structural issues, the problem of real-time payment scams can't be solved and banks will be forced to resort to introducing yet more friction into the experience. That may prompt customers to desert them, which they can ill afford when fintechs are already eating into their market share with new payment experiences.

For their part, financial institutions must adopt the right technologies and take a wider, more joined-up view of their business. And to help, regulators should ask whether they're being proactive in creating an environment in which banks are able to use every tool at their disposal to fight fraud.

# LATAM Trends in Payments To Watch For in 2022



Author: Sonia Gomez, Director of Solution Consulting - ACI Worldwide

**The Latin America region is characterized by a number of countries independently operating at different levels of payments maturity, but all looking to drive further improvements and modernization.**

## Building on progress so far

Like in economies the world over, Latin American organizations see the benefits of real-time payments to drive efficiency, deliver innovation and reduce systemic risk. As a result, we will continue to see growth in real-time payment programs across the region.

In Brazil, for example, the central bank, Banco Central do Brasil (BCB) launched PIX in November 2020. It has seen incredibly fast growth since then, reaching 100 million users nine months after launch, and hitting 1 billion transactions per month after a year. And BCB has continued to expand PIX to further accelerate growth, with features such as enabling customers to withdraw cash at any retailer. It is a similar story in other countries. SPEI in Mexico — live since 2004 — will also see a focus on new use cases and connectivity in order to drive up usage, which currently sits at approximately 20% of transactions.

Other countries will also continue to move their programs forward through design or implementation phases, including Transferencias 3.0 in Argentina, CCE in Peru, TEF in Chile, SIPAP in Paraguay and ACH in Honduras.

## New market pressures

As we've seen in other geographies, as the uptake of real-time payments increases, so too can the pressure on other payment revenue streams and the wider financial ecosystem. It means that organizations operating in Latin America will need the ability and flexibility to deal with new market pressures, including new regulations, as they occur.

The global pandemic has had a significant impact here, causing millions of people without bank accounts to move into the banking system for the first time, often adopting digital payments at the same time. These customers are more likely to expect (and demand) digital processes and experiences, and will take their payments wherever they can find them.

In practice, this will drive an increase in the number of digital transformation projects we see. Not only to enable organizations to better manage the more basic requirements of real-time payments — like highly reliable 24/7 capabilities and fast response times — but also to create systems that are highly flexible and can enable organizations to respond more rapidly to changing market conditions.

## Adopting global trends regionally

Many of the same digital trends seen globally are also on the agenda for Latin American organizations, like the move to the ISO 20022 data standard and experiments with central bank digital currencies (CBDC).

Brazil's BCB, for example, is already working on the "Real Digital." We could see the first version of this in 2022 and there will be intense interest in how this impacts cross-border transactions and the role of real-time payment systems in enabling CBDCs to be successful.

Meanwhile, although some payment systems, such as PIX, are already based on ISO 20022, it hasn't historically been a focus for others. That has changed, with many Latin American organizations now convinced of its role as an enabler for delivering more data-enriched and value-added services.

ISO 20022 certification can differentiate an organization in a crowded marketplace, but it also enables simpler connections into existing systems from other markets and regions. And as more systems are built to ISO 20022 standards, organizations that don't act now risk being excluded from payment systems in the future.



## Preparing for internationalization

Accepting and sending cross-border payments can be challenging, thanks to relatively low numbers of bank accounts and a lack of standardization of infrastructure and regulations across the region. So, while Latin American organizations are looking to adopt more global trends, they will conversely also need to prepare for cross-border transactions.

Ultimately this will lead to a net of central infrastructures interacting between multiple immediate payment systems, allowing people to simply and cost-effectively make and receive payments in the format and currency they prefer.

## Open banking gaining momentum

Brazil and Mexico are leading the region's open banking initiatives, but it's a matter of time before more countries follow. Colombia, for example, already has a voluntary model, while Chile's Financial Portability law is also an early step toward open banking.

Wider adoption of open banking principles will certainly be of significant benefit to the region's consumers, and there is also the potential for there to be some big winners among the financial institutions that embrace it as an engine of innovation (rather than a competitive threat). It would enable financial institutions to better respond to changing behaviors and expectations, which is an even more highly prized capability since COVID forced many businesses and consumers to change the way they shop and pay.

**"Many of the same digital trends seen globally are also on the agenda for Latin American organizations, like the move to the ISO 20022 data standard and experiments with central bank digital currencies (CBDC)."**

## Economic Benefits of Real-Time Payments Remain Largely Untapped

Argentina recorded 25 million real-time transactions in 2021, resulting in an estimated cost savings of \$2.7 million for businesses and consumers. That in turn helped to unlock \$15 million of economic output, representing 0.003% of the country's GDP.

With real-time transactions set to rise to 316 million in 2026, net savings for consumers and businesses are forecasted to climb to \$50 million. This would help to generate an additional \$183 million of economic output, equivalent to 0.03% of the country's forecasted GDP.

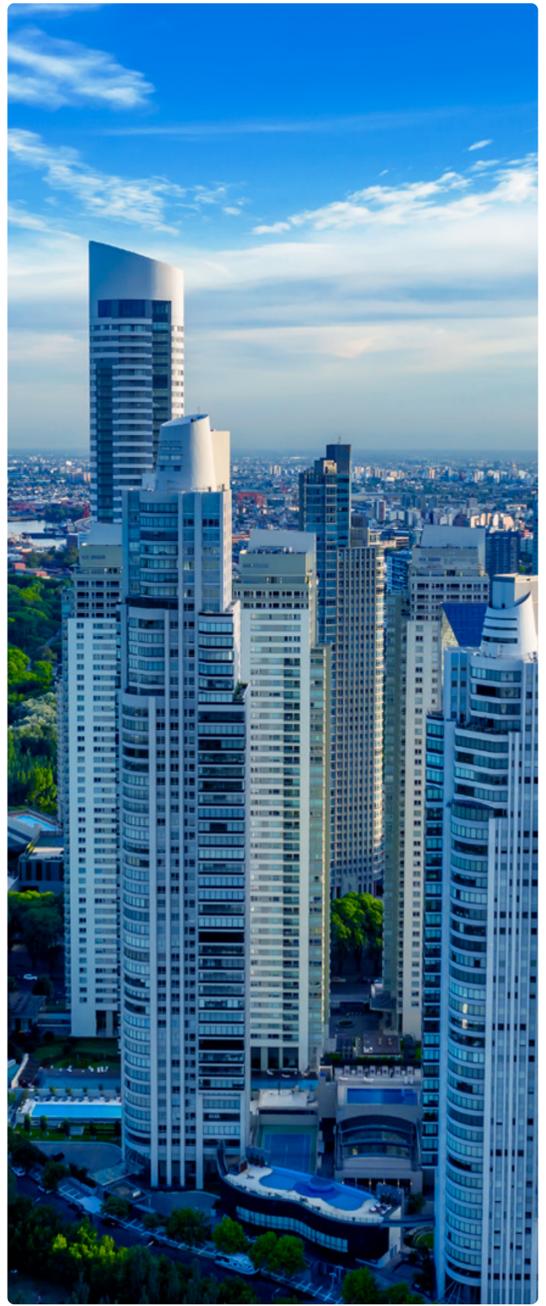
That means for the second largest economy in South America, the economic benefits of real-time payments remain largely untapped. According to the Cebr, the theoretical impact of all payments being real-time could add 4% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Argentina has three real-time payment schemes. The first scheme, Pago Electrónico Inmediato (PEI), was launched in 2016 and facilitates P2P transfers between mobile wallets and supports real-time payments on mobile POS devices and online websites. DEBIN, the second scheme, is a real-time direct debit system launched in September 2017.

While these systems were available for quite some time, their contribution to the growth of real-time payments in the country remained low due to their limitations. Due to this, in October 2020, the central bank approved the Transfers 3.0 scheme to create an open and interoperable payments system.

As part of the first stage implementation of Transfers 3.0 in December 2020, a standardized QR code payments interface was launched allowing users to make payments by scanning any QR code with any mobile banking app or digital wallet solution. The system aims to eventually replace the existing real-time payment systems DEBIN and PEI.

The launch of this new real-time payments scheme and accelerated shift towards electronic payments amid the COVID-19 outbreak will see real-time payments volume grow at a CAGR of 66.3% from 2021-2026.



### ACI's Take

Since the Transferencias 3.0 standard came into effect in December 2020, Argentina has the foundations for a robust and vibrant real-time payments ecosystem (the scheme is compatible with all bank accounts and virtual wallets).

On the central infrastructure side of things, Prisma (a leading acquirer and issuer), Red Link (a leading acquirer) and Coelsa (the electronic clearing house) have been chosen by the central bank to operate Transferencias 3.0. Their task, in our view, is to develop a technology roadmap that supports the running of resilient, secure and flexible real-time rails. That will require a future-ready infrastructure that does more than fulfill normative and undifferentiated real-time capabilities; there is more to the business of real-time payments than the immediate transfer of funds. The current strategy of implementing simple real-time capabilities on the country's aging CREDIN/ DEBIN scheme can only ever be a short-term fix, then, since the platform cannot grow and adapt to higher-value use cases like Request to Pay or B2B payments.

For banks, much of 2021 was spent gearing up for the mandated requirement to be able to process P2P real-time payments by December. Looking ahead to the first half of 2022 they are expecting the operators of Transferencias 3.0 to define the scheme's roadmap for ISO 20022 modernization so that they can begin work on theirs. For their part, the banks seem receptive to making the transition from the older ISO 8583 to the newer, data-rich alternative and the new revenue streams that should open up. That means there is much riding on Prisma and Red Link's time to market on their own support for ISO 20022. ISO 20022 modernization would also enable long-term benefits around cross-border real-time payments and other regional value-added services, thanks to simpler inter-scheme integrations (between PIX in Brazil, CCE in Peru, T3.0 Argentina and SPI in Paraguay, for example).

The recommendation, then, is for all parties to embrace their role in modernizing real-time payments infrastructure and standards, and to accelerate adoption with the development of use cases that go beyond the basic. Running new services on legacy architecture will only unleash a fraction of the potential revenue growth available from real-time payments in the long term.

### Trends + Data

#### Cloud

Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



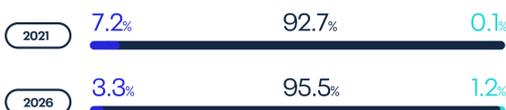
### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

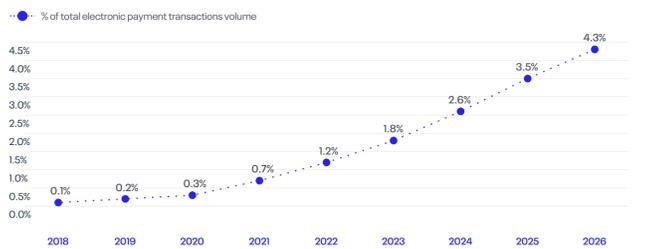
Transactions



Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2018-26f



Real-Time Transactions



### History

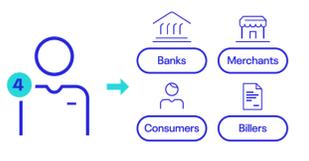


### Key Stats

Mobile Wallet Trends



Real-Time Acceptance



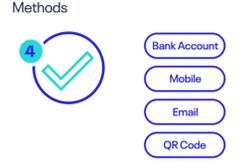
Real-Time Total Participants

All Domestic Banks  
DEBIN  
Majority of Banks  
Pago Electrónico Inmediato (PEI)  
Unavailable  
Transfers 3.0

Real-Time Payment Types



Initiation/Authorization Methods



Population Banking Level



Year of Real-Time Payments Launch



Availability



Message Standard

Unavailable  
DEBIN and Pago Electrónico Inmediato (PEI)  
Expected  
ISO 20022  
Transfers 3.0

### Cebr

Argentina is the second largest economy in South America. It is an upper-middle-income country, which ranked as the 31st largest global economy in 2021 (Cebr World Economic League Table, 2022).

In 2021, total net savings for consumers and businesses through the use of real-time payments at current adoption rates generated benefits worth \$2.7 million. This was led by the reduction in payment system costs, accounting for 73% of this total. On a per-transaction basis, real-time payments in Argentina in 2021 had an 11% lower average payment cost compared to non-real-time payments.

The relatively low net savings compared to other economies of a similar size is driven by the fact that as of 2021 the majority of transactions are paper based (67.7%). Real-time payments accounted for only 0.2% of all transactions.

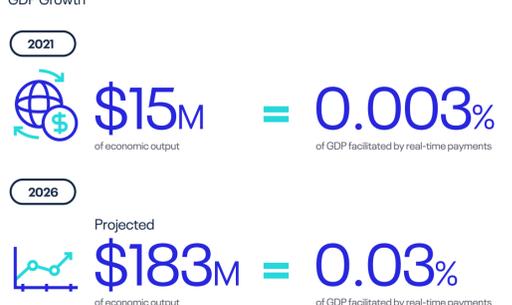
At the macroeconomic level, GDP facilitated by real-time payments amounted to \$15.3 million in 2021 (<0.01% of formal GDP), with the increase driven by real-time payments formalizing \$15 million of shadow economy activity through reduced cash usage.

It is estimated that the share of real-time payment transactions will increase more than ten-fold by 2026 to 2.2%. Net savings for consumers and businesses are expected to increase to \$50 million. The macroeconomic impact of real-time is estimated to be \$183 million of economic output (0.03% of formal Argentinian GDP) in 2026, equivalent to that produced by 4,969 workers annually.

For Businesses and Consumers



GDP Growth



## Real-Time Payments Forecasted to Help Generate 2.08% of GDP by 2026

Brazil is a real-time payments success story; of all countries covered in the Cebr economic impact study, by 2026 the country has the largest forecasted GDP facilitated by real-time payments in percentage terms (2.08%).

In 2021, the country recorded 8.7 billion real-time transactions, mainly due to the popularity of the PIX real-time payments ecosystem. The widespread adoption of real-time payments resulted in estimated cost savings of \$5.7 billion for businesses and consumers in 2021, which helped to unlock \$5.5 billion of additional economic output. That represents 0.34% of the country's GDP.

With real-time payment transaction numbers expected to rise to 82.4 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$37.9 billion. That would help to generate an additional \$37.6 billion of economic output, equivalent to 2.08% of the country's forecasted GDP.

Brazil has two real-time payment infrastructures in operation: SITRAF and PIX. SITRAF was the first to be introduced in 2002 and PIX was introduced in 2020. SITRAF only provides operation during banking hours, which limits the volume of activities the platform can manage. PIX is a real-time payments system that operates 24 hours a day, seven days a week, 365 days a year. Since its launch in 2020, it has already surpassed SITRAF adoption among participants, as it is available to the customers of 761 financial institutions whereas SITRAF only has 104 participants.

In 2021, real-time payments represented a 5.3% share of total payments volume: much smaller than electronic payments (excluding real-time payments) and paper-based transactions, which were 29.4% and 65.2%, respectively. But its market share is expected to grow significantly by 2026, reaching 34.3% share of payments volume and surpassing electronic payments (excluding real-time payments), which will decrease to 26.3%, and challenging paper-based transactions, which will be at 39.4%. In terms of payments spend, real-time payments represented a 13.4% share of total payments spend while electronic payments (excluding real-time payments) stood at 83.6% and paper-based transactions were at only at 3%.

We are expecting real-time payments to carve itself a bigger share of payments value by 2026, as it is projected to reach 42.8%. PIX, which makes it easy for consumers to use real-time payments at merchants and for daily expenditures, is the main driver of this shift. Its full integration into the financial system and the strength of its backing from the government has given it a strong start, and it is projected to significantly impact the Brazilian economy as a result.

### ACI's Take

Since its launch in November 2020, the PIX real-time payments transfer system has taken off far faster than anyone expected: by July 2021, it had 100 million users, and by October 2021, it was processing 1 billion transactions per month.

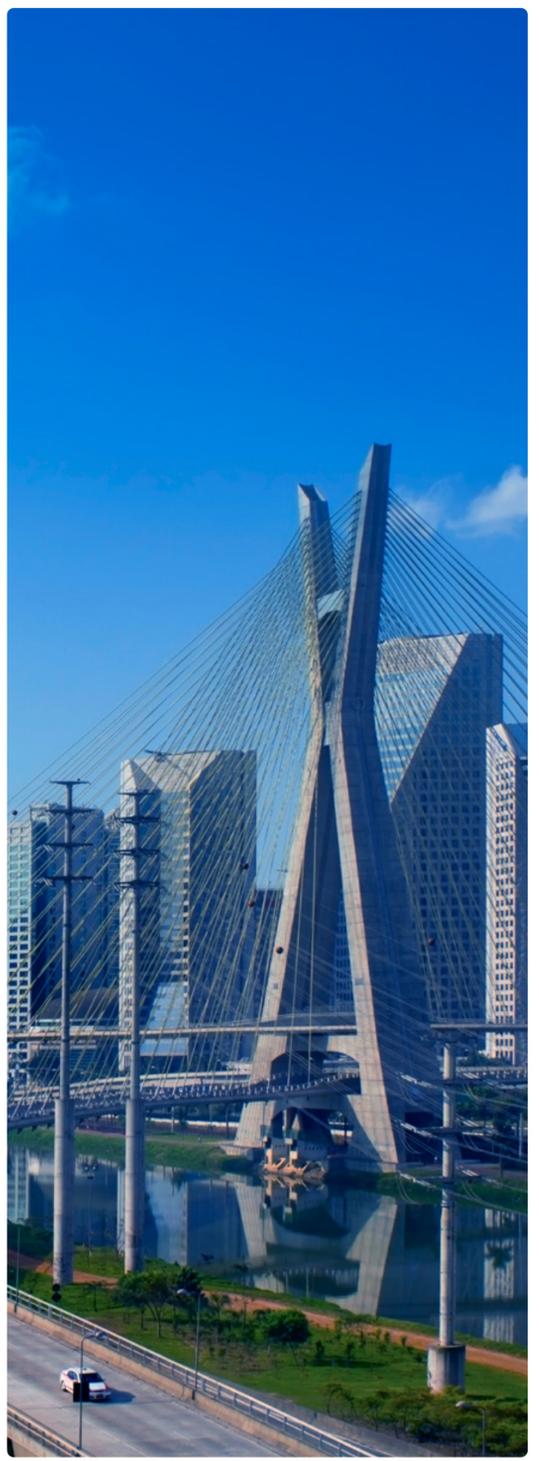
Incoming new features — such as PIX Withdraw and Change, which enables customers to withdraw cash at any participating retailer; new open banking standards and additional account identifiers — will further accelerate growth and increase the average transaction value. Request to Pay, using QR codes, is also on the way. And the Central Bank of Brazil plans to add credit payments, which will help to drive growth in C2B payments on the platform, and PIX International for cross-border real-time payments.

Current growth already threatens to overwhelm legacy architectures, so the pressure is growing on payment players to ensure that they can reliably cope with still-rising volumes without increasing their costs. This, combined with the central bank's frequent updates, has increased interest in managed payment services, which can instantly scale with demand and greatly simplify ongoing compliance.

With the stunning success of PIX, traditional payment channels are also under pressure to create new products and services to stay relevant. A major target for PIX is to reduce cash-based transactions, but it is also reducing card usage at a high rate. As a result, issuers and acquirers urgently need to develop PIX-based services to replace dwindling transaction fees. This won't be news to them, but the speed with which PIX has taken off has taken them by surprise. Now they must get to work with their technology partners to accelerate time to market on new offerings.

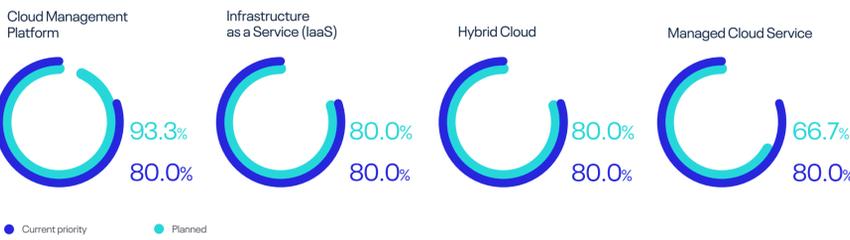
There is a darker side to PIX's huge success, however: robbers have taken to forcing people at gunpoint to instantly transfer money to mule accounts. In response, the central bank introduced customer-managed payment limits for which requested changes are actioned after a 24-hour waiting period. But that simply led to people being kidnapped and held until their funds could be transferred.

Measures such as this can only ever be temporary. Not only have they not worked, but the customer experience is also being harmed. Instead, the market as a whole needs to make better use of machine learning for payments risk management to quickly and automatically identify and respond to risky transactions at scale.

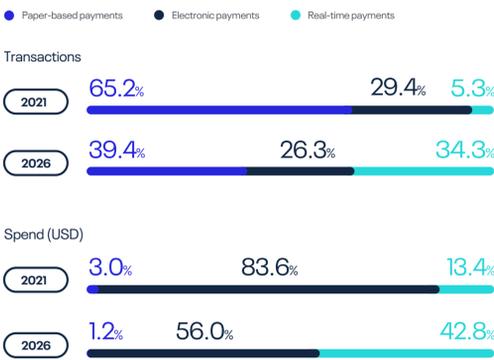


### Trends + Data

#### Cloud



### Shares of Volumes by Payments Instrument



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



### History



### Key Stats



### Cebr

Brazil counts as an upper-middle-income country and ranked as the 11th largest global economy — and the largest South American economy in 2021 (Cebr World Economic League Table, 2022).

Real-time payments generated consumer- and business-level benefits of \$5.7 billion in 2021, meaning Brazil ranked third in that league table. The largest contribution to this total was from the reduction in payment float costs. Based on current adoption rates in Brazil, real-time payments unlocked a total transaction value of \$8.4 billion per day in 2021 through a reduced float time. This working capital facilitated an estimated \$3.2 billion of business output in the same year.

At the macroeconomic level, the realized benefits in 2021 in terms of GDP facilitated by real-time payments were estimated at \$5.5 billion, equivalent to 0.34% of formal GDP or the output of 287,209 jobs.

However, the economic impact is expected to rise dramatically by 2026 as real-time transaction volume in Brazil is expected to rise to 34.3% from 5.2% in 2021. This expansion is expected to result in a significant spurt in realized benefits, with net savings for consumers and businesses to rise to \$37.9 billion. Macroeconomic efficiency gains are expected to total \$37.6 billion in 2026. This is equivalent to 2.08% of formal GDP or the output of 1.9 million workers, and in absolute terms is an impact more than seven times larger than 2021.

### For Businesses and Consumers



### GDP Growth



Real-time payments in Chile have been available since the launch of **Transferencias en Línea (TEF)** by **Centro de Compensación Automatizado (CCA)** in 2008. Although Chile remains a cash-dominated society, the country has made significant progress towards electronic payments supported by the government's initiatives, an increased banked population and improved payments infrastructure.

The **COVID-19** pandemic has now highlighted the importance of electronic payments, further boosting the shift towards digital payments, which has also helped real-time payments to grow over the last few years. The real-time payments volume is further expected to increase at a **CAGR of 13.7%** from 2021-2026.



### ACI's Take

Early in 2021, the Central Bank of Chile released a draft regulation creating a normative sandbox for modernizing the market's real-time payment capabilities. The plan is to decentralize the real-time payments operation in order to stimulate competition, and payment providers now have a year to stand up their own infrastructure before discussions begin around how regulation should be applied.

Those who build a solution early will be best placed to define the market's standards, putting them in a stronger position compared to those who follow later. As such, 2022 is a unique, once-in-a-generation opportunity to seize market share and launch new services beyond those currently supported by the country's aging, first-generation, real-time transfer services.

Ultimately, we expect to see two or three leading real-time payment operators emerge, using their own rails but connected to each other via APIs. Initially banks will connect using their legacy messaging, but they should be careful to ensure that this does not restrict their ability to compete in the future. New service-driven architectures will eventually be required to cost-effectively support interoperability with other schemes, the introduction of new use cases such as Request to Pay and the onboarding of

any future developments. They should also pursue ISO 20022 modernization for its long-term benefits around potential inter-scheme integrations (between PIX in Brazil, CCE in Perú, T3.0 Argentina and SPI in Paraguay, for example) for cross-border real-time payments and other regional value-added services.

One of the drivers behind decentralization is Chile's experience with its legacy real-time payments service, which has been in place for more than 20 years. It is proprietary and operated by a company formed by the banks. Use is declining because of its cost and limited features, so opening up real-time services to greater competition will help to drive down costs and stimulate innovation.

Some of that innovation will come from outside the traditional banking industry. There is no formal open banking initiative in Chile yet, but there have been discussions about how willing the banking sector is to participate. Our recommendation is that they be proactive, taking the lead on open banking to enable more nimble players that can expand their footprint more quickly than would otherwise be possible. These new entrants will come to market with services that are differentiated on price and user experience — there are more advantages to be had from collaborating with them than there are from shutting them out.

### Trends + Data



#### Cloud Management Platform



#### Infrastructure as a Service (IaaS)



#### Hybrid Cloud



#### Managed Cloud Service



#### Platform as a Service (PaaS)



#### Private Cloud



#### Software as a Service (SaaS)



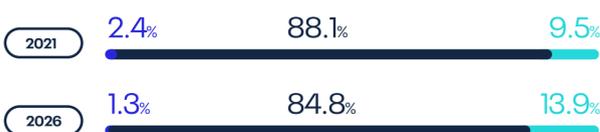
### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

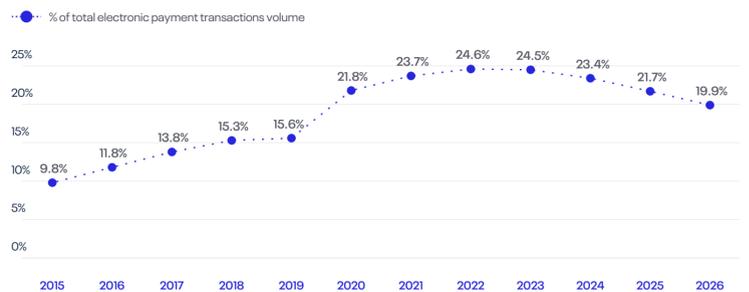
#### Transactions



#### Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



### Real-Time Transactions



### History

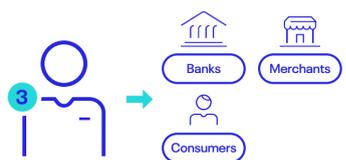


### Key Stats

#### Mobile Wallet Trends



#### Real-Time Acceptance



#### Real-Time Total Participants

14

#### Real-Time Payment Types



#### Initiation/Authorization Methods



### Fraud



#### Population Banking Level



#### Year of Real-Time Payments Launch

2008

#### Availability



#### Message Standard

ISO 8583

Colombia made real-time payments available in the country with the launch of Transfiya (also known as Transferencias YA) in September 2019. Real-time payments volume and value are relatively low compared to paper-based payments, accounting for just a 0.1% share both in terms of volume and value. This can be attributed to less participation from financial institutions, a low transaction limit, restrictions on the number of transfers that can be made in a day and a large unbanked population within the country.

With ACH Colombia planning to add B2B and QR code payments functionality to the Transfiya system, the future of real-time payments in the country looks promising and is expected to register robust growth both in terms of volume and value, increasing at respective CAGRs of 61.6% and 73.7% from 2021-2026.

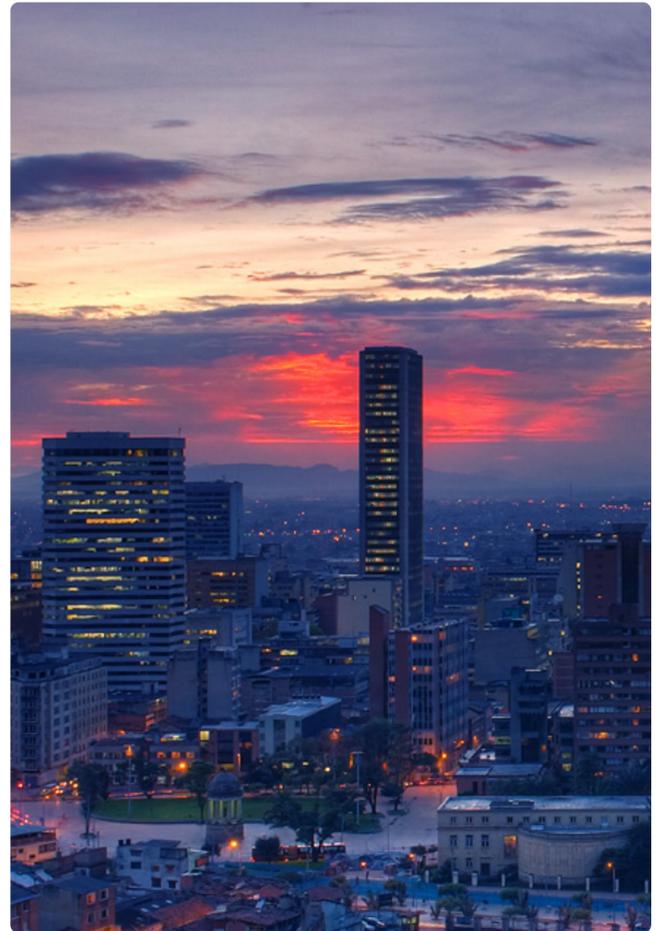
## ACI's Take

Colombia does not yet have a general purpose domestic real-time payments scheme — but an independent effort has broadly filled that void. Transfiya is open to the entire banking system and has attracted hundreds of thousands of users — a good start in an economy still heavily driven by cash and where 46.7% of the population is effectively unbanked. However, any drive toward financial inclusion could potentially be stymied by a lack of participation from banks and financial institutions, which remains far from ubiquitous.

Elsewhere, broad success in virtual wallets like Nequi and Daviplata continues apace, with much higher adoption than Transfiya. Use of such wallets has further accelerated due to the pandemic, in part because government subsidies have been disbursed through them. This has inspired further newcomers to attempt to enter this space, including partnerships with Visa that offer banks products related to real-time payments, via Visa Direct.

Any central real-time initiative is likely to be far off, but there is a new central-bank-driven project to modernize banking and payment rules within Colombia. Although primarily oriented toward open banking, it will expand payment origination methods and P2P use cases. However, rather than herald any big centrally driven real-time interventions, this ongoing push for broader modernization and innovation is likely to further boost the market's existing independent schemes.

Banks must also be mindful of a new law that potentially opens up the acquiring arena and implies current acquiring banks will need to transform to act more like processors. At this time, it is unclear whether this will prompt a strategic shift from banks to act as direct acquiring platforms. Nevertheless, banks now understand new possibilities exist regarding having — and growing — an acquiring business, and that they have an opportunity to be more proactive rather than relying on classic payment networks. If there is a new movement of banks trying to deploy new direct acquirement schemes, this will almost certainly impact alternative payment methods and — eventually — real-time payments.



## Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



● Current priority ● Planned

Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



## Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

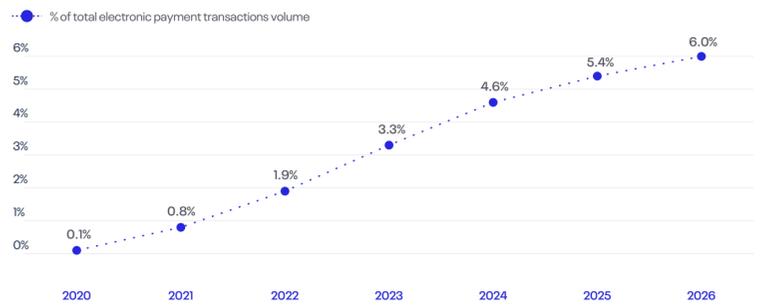
Transactions



Spend (USD)



## Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2020-26f



## Real-Time Transactions



## History

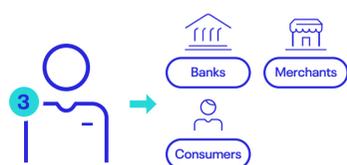


## Key Stats

### Mobile Wallet Trends



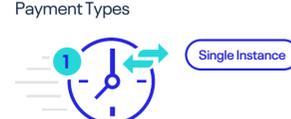
### Real-Time Acceptance



### Real-Time Total Participants

13

### Real-Time Payment Types



### Initiation/Authorization Methods



### Population Banking Level



### Year of Real-Time Payments Launch

2019

### Availability



### Message Standard

Proprietary

### Fraud

Payments Fraud Rate: 15.9%  
Population who reported being a victim of fraud in the last 4 years

Top 3 Payment Fraud Types (% of fraud victims):

- Confidence trick: 26.8% (Trend: ↑)
- Card details stolen online: 19.5% (Trend: ↑)
- Other: 13.4% (Trend: ↑)

## Real-Time Payments Provide Huge Opportunity for Economic Growth

Mexico recorded 1.6 billion real-time transactions in 2021, which resulted in an estimated cost savings of \$1 billion for businesses and consumers. This in turn helped to unlock \$1.9 billion of additional economic output, representing 0.15% of the country's GDP.

With real-time transactions set to rise to 2.6 billion in 2026, net savings for consumers and businesses are forecasted to climb to \$1.3 billion. That would help to generate an additional \$2.8 billion of economic output, equivalent to 0.19% of the country's forecasted GDP.

Mexico is one of the countries for which real-time payments provide the biggest economic growth opportunities. According to the Cebr, the theoretical impact of all payments being real-time could add 5% to formal GDP by 2026. However, these are theoretically modeled benefits; they do not suggest that there is no place for non-instant electronic payments or paper-based payments in the future.

Mexico was an early adopter of real-time payments, with its Sistema de Pagos Electrónicos Interbancarios (SPEI) system in place from 2004. Despite the head start, adoption of real-time payments grew at a slower pace due to the country's high unbanked population and lack of awareness of electronic payments. However, the growth of real-time payments gained some traction in recent years, with the launch of Cobro Digital (CoDi) in September 2019, which extended the use of real-time payments to low-value, day-to-day payments through QR codes and NFC technology. With rising adoption of mobile wallets, increasing preference for electronic payments amid COVID-19 and growing consumer awareness, real-time payments volume is set to record a 10.9% CAGR from 2021-2026.

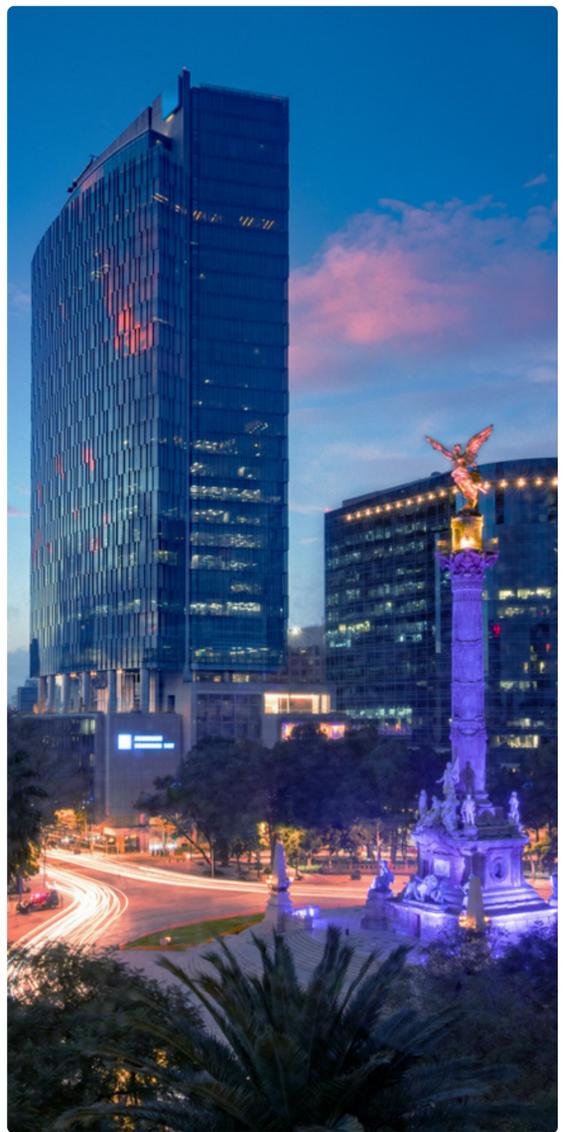
### ACI's Take

Central bank Banco de México's SPEI system has long provided real-time payments infrastructure in Mexico, and CoDi (Cobro Digital) was launched as an overlay on SPEI rails in 2019 to facilitate new digital modes including payments based on QR codes, bar codes and NFC. But banked citizens are low in number and so just 4% of the country's total population has adopted the scheme. 86% of transactions remain paper based.

Base-level readiness is there, though, as is scope for value-add services that would draw more people to real-time payments. But while there's also a broad willingness from banks and fintechs to enable QR-based payments, banks don't yet see a business case in the scheme as a whole. This is because in Banco de México trying to convert the unbanked, it has stipulated that banks and acquirers can't charge a fee. This lack of revenue for acquirers has become a barrier to adoption and resulted in the wider banking industry refusing to participate and invest further.

Banco de México appears disinterested in modifying the current scheme, but there is hope other organizations will produce their own IP infrastructure that would create the competition needed to drive modernization and innovation. This would also alleviate concerns surrounding distrust in the government that leads to some citizens and organizations being hesitant to use the existing scheme.

However, the market can't be characterized as being particularly open and any new scheme would likely need to be aligned to Banco de México rules to be allowed to operate. The central bank might also impose too many requirements for said infrastructure to become a reality. It is a complex political and regulatory situation. Today, then, a basic real-time payments solution exists in Mexico, along with a lot of potential. No one has yet stepped up to differentiate and offer value-add services and functionality. But move first and the opportunity could be big, and some important payment card processing providers are evaluating this market's opportunities to become direct participants.



### Trends + Data



Cloud Management Platform



Infrastructure as a Service (IaaS)



Hybrid Cloud



Managed Cloud Service



● Current priority ● Planned

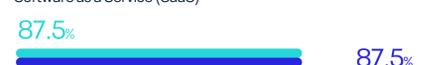
Platform as a Service (PaaS)



Private Cloud



Software as a Service (SaaS)



### Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

Transactions



Spend (USD)



### Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2015-26f



Real-Time Transactions

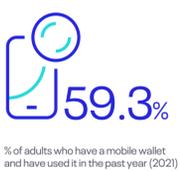


### History

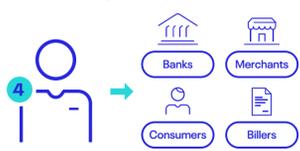


### Key Stats

Mobile Wallet Trends



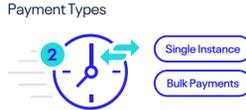
Real-Time Acceptance



Real-Time Total Participants

85

Real-Time Payment Types



Initiation/Authorization Methods



Population Banking Level



Year of Real-Time Payments Launch

2004

Availability

365 / 24/7

Message Standard

Proprietary

### Cebr

Mexico is Latin America's second-largest economy behind Brazil. In 2021, it ranked as the 15th largest global economy (Cebr World Economic League Table, 2022).

While 3.1% of payments were real-time in 2021 — a volume share greater than Germany's or the United States' — 85.8% of transactions took place via paper-based instruments that year.

In 2021, net benefits of real-time payments for consumers and businesses hit \$1 billion and are expected to rise to \$1.3 billion in 2026. The high percentage of paper-based transactions means that significant benefits were or are expected to be generated through the impact of real-time in reducing the payments float, since paper-based instruments typically have the longest clearing times. In 2021 and 2026 respectively, 109% and 99% of the net benefits for consumers and businesses are or will be derived by reducing the payments float.

The negative impact of real-time for businesses and consumers through greater payment system costs is due to the current very high share of paper-based payments. This generates significant enough economies of scale that ultimately leads to lower estimated unit costs per transaction for paper-based instruments than electronic alternatives in Mexico. However, net cost savings will turn positive and grow over time once the technology matures and real-time transaction volumes increase. However, it is estimated that based on forecasted adoption rates, this will occur some time beyond 2026.

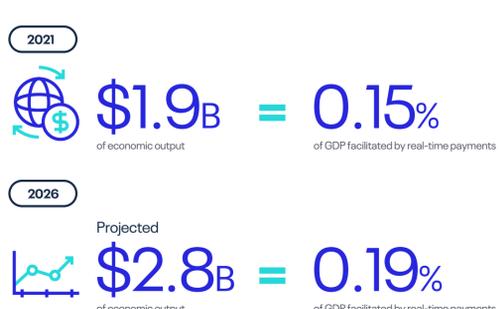
Consumer and business level benefits contributed to wider annual macroeconomic gains of \$1.9 billion or 0.15% of formal GDP in 2021. This impact is equal to the output facilitated by 83,161 workers.

In 2026 these benefits are expected to rise to \$2.8 billion or 0.19% of formal GDP, equaling the output of 114,096 workers.

For Businesses and Consumers



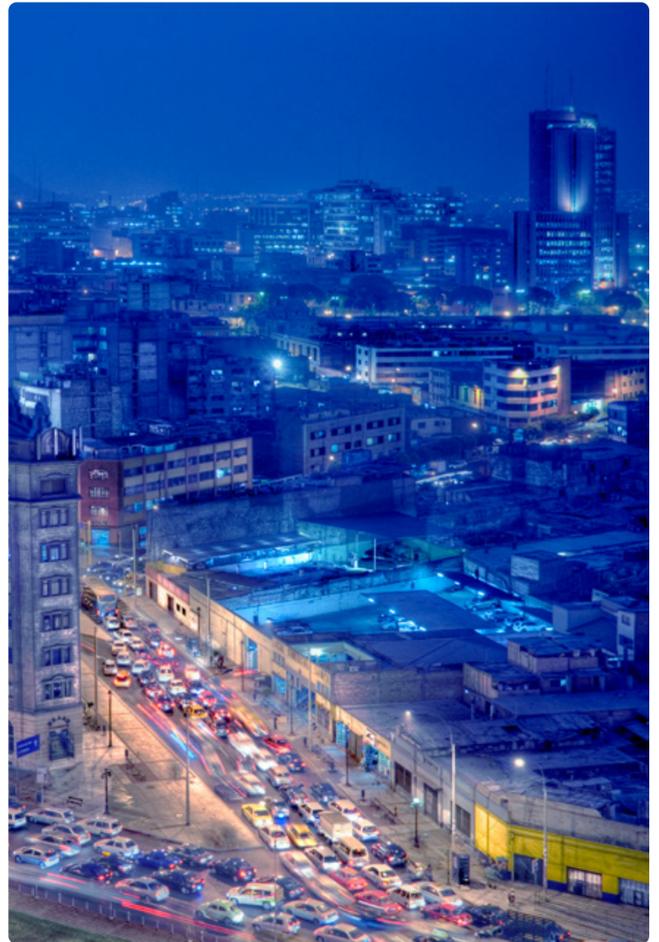
GDP Growth



Real-time payments went live in Peru with the launch of Immediate Interbank Transfers in 2016. Although real-time payments have been available for quite some time, their adoption and usage have not gained significant traction due to the country's high unbanked population, inadequate banking infrastructure, lack of awareness about electronic payments and preference for cash.

While real-time payments accounted for just 0.2% of total payments transaction volume in 2021, paper-based transactions occupied a 94.1% share. However, with Cámara de Compensación Electrónica (CCE), the operator of the real-time payments system, focusing on modernizing its system in line with international standards, real-time payments volume is set to record significant growth, increasing at 80.7% CAGR from 2021-2026.

The CCE made the real-time payments system available 24/7 starting December 7, 2020. It also partnered with Mastercard and ACI Worldwide in February 2021 to enable real-time payments based on the ISO 20022 standard.



ACI's Take

The pandemic has put pressure on Peruvians to avoid cash and boosted electronic transfers, in part through government benefits being distributed via digital payments. Volumes on the nation's first-generation real-time payments scheme have soared as a result (as has the use of digital wallets), as people looked to send money to others in a way that is instant and convenient. This presents a great opportunity for Cámara de Compensación Electrónica (CCE), the Peruvian clearing house, which orchestrates real-time payments and is in the process of modernizing the country's existing first-generation scheme.

Their goal is to be ready to handle further projected transaction growth, as well as enable new use cases for large numbers of Peruvian citizens joining the banked population. CCE's aim is to become the facilitator of absolute interoperability between all of Peru's payment systems and financial services to better meet the needs of the 70% of citizens who have yet to be financially included.

Financial institutions will be able to use modern APIs to connect to the new scheme ahead of the GA testing period, via a solution that also provides message transformation and data enrichment between CCE's current ISO 8583 message specification and the new scheme's ISO 20022 spec.

But banks and participants must think beyond merely being connected to the new real-time payments scheme. They must explore ways to build a business out of these payments, not just a processing capability, and work with partners who have global experience to ensure success. It will be vital for innovators to consider how to add value beyond purely shifting money. That means expanding their efforts into adapting and improving infrastructure so that future changes are easier to manage. It means devising new business models, too, and standing up digital API connectivity to be able to include real-time payments across the entire payments ecosystem.

Trends + Data



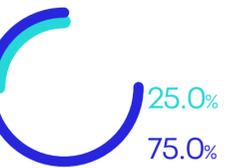
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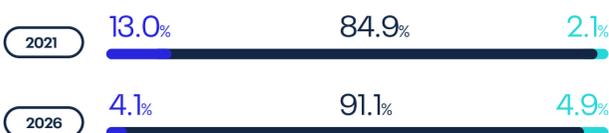
Shares of Volumes by Payments Instrument

● Paper-based payments ● Electronic payments ● Real-time payments

Transactions

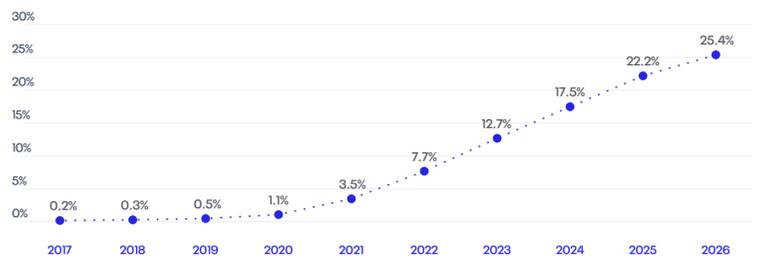


Spend (USD)



Real-Time Payments Volume and Its Share in Overall Non-Paper-Based Transactions, 2017-26f

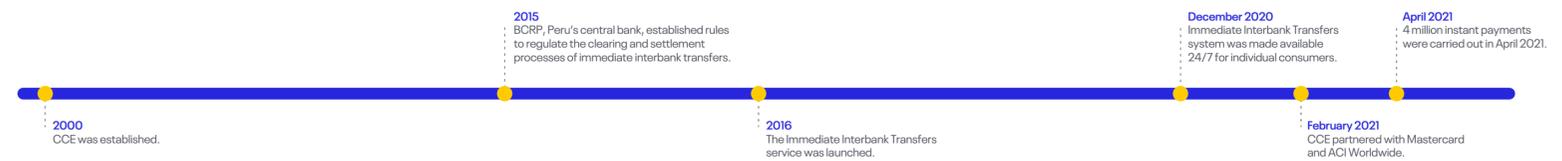
● % of total electronic payment transactions volume



Real-Time Transactions



History



Key Stats

Mobile Wallet Trends



Real-Time Acceptance



Real-Time Payment Types



Initiation/Authorization Methods



Fraud



Population Banking Level



Year of Real-Time Payments Launch



Availability



Message Standard





## Real-Time Payments

Real-time payments, also known as instant payments, faster payments and immediate payments.

Key features include:

- Immediate availability of funds to the beneficiary of the transaction
- Irrevocability, meaning once a payment has been made, the sender cannot deauthorize the transfer
- Confirmation of funds via real-time balance. Once a payment is authorized, the sender's account balance reflects the deduction instantaneously
- While settlement timing may vary by scheme, it is often completed within a matter of seconds
- Newer real-time systems are often based on ISO 20022, the de facto real-time standard

## Digital Overlay Services

Digital overlay services have appeared in global markets, particularly where we see high levels of real-time payments adoption. These ancillary services often ride the real-time payment rails and are flexible, nimble drivers of innovation. They enable many kinds of alternative payment methods. The front-end touchpoint for consumers, merchants or corporate customers is a digital overlay service, as it's about connecting real-time payments to a purchasing experience, billing scenario or accounts payable process. Google Pay, WhatsApp Pay, Amazon Pay, Paytm and Walmart PhonePe are all examples of real-life overlay services.

## Request to Pay (R2P)

Request for Payment/Request to Pay can be both a digital overlay service used by an end user to request or make a payment, as well as a core functionality of a central infrastructure (usually a real-time payments central infrastructure) that provides the R2P transaction flows and rules to play by in the R2P network. R2P has use cases across P2P, M2C and B2B scenarios, where real-time payments must be integrated into a seamless workflow or interaction.

## Central/National Infrastructure, Payments Network

A centralized system for a payments network, including for real-time payments. Referred to as a scheme, system or platform depending on locale and providing a framework and/or rulebook for payments messaging and processing as well as digital overlay services. From a central infrastructure point of view, R2P is either a capability within the real-time central infrastructure itself or a closely related offering by the same central infrastructure provider. In some markets, the central infrastructure has powers to fine participants for missed SLAs, set variable fees for participants and mandate centralized fraud reporting.

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## Payment System Costs

In this study, the payment system costs take into account not only the direct costs of making payments (e.g., bank account fees or ATM withdrawal charges), but also the wider indirect or social costs (e.g., shoe leather costs or central bank costs in producing and processing banknotes).

## Payments Float

The inefficiencies that result from money being locked in the financial system as payments between two parties waiting to be fully processed.

## Cost of Failed Transactions

The wider costs associated with failed transactions. A failed transaction incurs a cost due to three main channels: the cost of fees that individuals and organizations incur from a payment failing, the labor costs per organization for repairing a failed payment and the costs that are associated with lost business through consumer attrition or churn.

## Total Agent-Level Impacts

The sum of the efficiency savings for businesses and consumers. This comprises the country-specific gains across the three channels: the payments system, the payments float and failed transactions.

## Informal Economy

As per the International Monetary Fund (IMF), the informal economy represents the "illegal activities and unreported income from the production of legal goods and services, either from monetary or barter transactions, that would be taxable were they reported to the tax authorities." It should be noted that throughout this report, we use the terms "informal economy" and "shadow economy" interchangeably.

## Macroeconomic Impact

The aggregate macroeconomic impact is defined as the magnitude of economic output in each country that is supported by real-time payments. We present this as a dollar figure, as a percentage share of GDP and as an equivalent jobs figure.

## Equivalent Jobs Supported

The final metric of the macroeconomic impact is an equivalent jobs figure. This represents the number of employees required to produce the equivalent level of economic output that is supported by real-time payments in each country, given country-specific average productivity rates.

## Realized Benefits

The estimates for the economic impacts of real-time payments in 2021 and 2026, per real-time's current and forecasted share of the payments mix in the respective years.

## Maximum Additional Benefits

The maximum additional benefits are the estimates for the economic impacts of real-time payments in 2021 and 2026, based upon a hypothetical counterfactual scenario of 100% real-time payments utilization across the payments mix in each country.

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Real-Time Payments

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