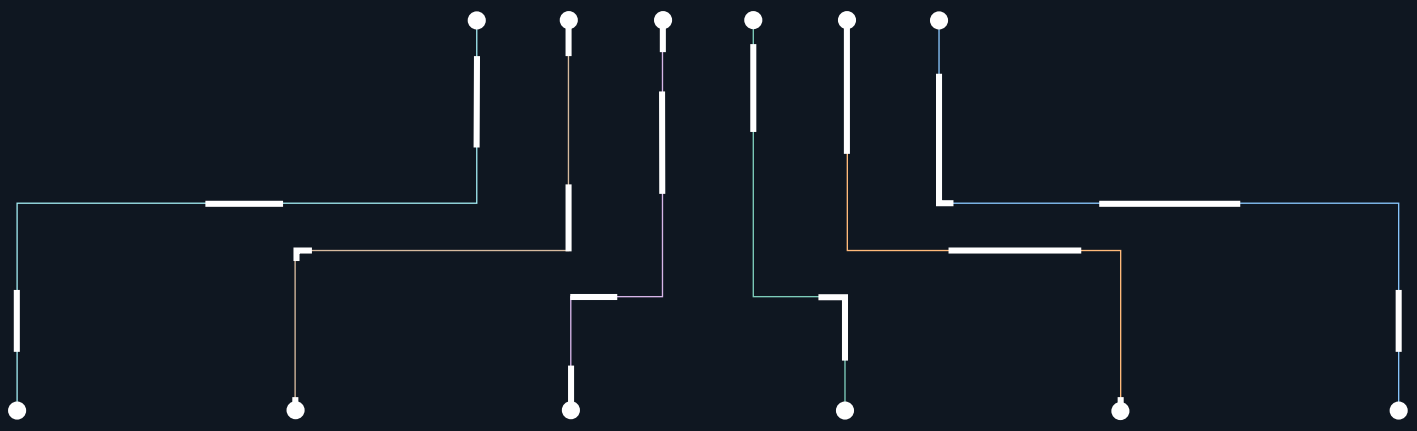
PAYMENTS
are eating THE WORLD



J.P.Morgan

Foreword

It's no surprise that payments is a business open to great disruption by fintech companies. Traditional payment systems were built long ago and customer expectations have evolved quickly and dramatically along with the technological advancements we've experienced in our personal lives.

As tough as the competition will be, JPMorgan Chase is well-positioned. We have an extraordinary number of products and services, huge economies of scale, a fortress balance sheet and a great, trusted brand. From small businesses to multi-national companies, clients of all sizes already rely on us to move more than $8 trillion (99% digital) a day for more than 52 million payments. Approximately 98% of value is done the same day, including 78% done in real time. And when these dollars are moved, they go through extensive screening for risk and fraud matters. We also have an extraordinary amount of data, and we are adopting AI and cloud as fast as possible so we can make better use of it to better serve our customers.

The future of payments will be shaped by many of the trends outlined in this paper and we will continue to do everything in our power to make JPMorgan Chase successful – and we are confident we can do so.

Jamie Dimon
Chairman and CEO
JPMorgan Chase & Co.

The payments revolution

In 2010, the fastest way to move money on the same day from New York to London was to catch a flight from JFK to Heathrow and deliver it yourself. Now, you can initiate a secure, real-time payment that's sent and received into your account in seconds at virtually no cost and in any currency. Not just from New York to London, but from New York to anywhere – including space.[1] The last decade for payments has been extraordinary. However, payments are on the cusp of an even greater revolution.

Over the next decade, payments will continue to connect people, devices, homes, cars and avatars spanning physical, digital and virtual worlds. We're already witnessing the development of these advances converging to make this payments revolution inevitable.

The smartphone revolution

The rapid digitization of the world over the last decade has been powered by the emergence of smartphones. In 2016, there were 3.67 billion smartphone subscriptions. That figure has now doubled – and by 2026, 91% of the global population will have a smartphone.[2]

The arrival of a device that can provide ubiquitous and instantaneous communication across voice, text and 4k video, is fueling further technological advancement, business model innovation and even societal shifts.

2x

Growth in smartphone subscriptions since 2016

of the global population will have smartphones in 2026

Connectivity from one to many

Perhaps the most obvious evolution we've all experienced – and enjoyed – is high-speed mobile internet. In the last decade, mobile networks upgraded from 3G to 4G, changing the way we spend our days. As download speeds have increased by more than 10 times, daily time spent online on mobile devices has increased from 32 minutes in 2011, to 143 minutes in 2020.[3]

The availability of fast, flexible, roaming internet has connected people from all walks of life and from all over the world, making communication simple, secure, scalable and affordable. This has fundamentally leveled the playing field for consumers and merchants alike by enabling digital marketplace access to anyone, anywhere – from Athens to Auckland, Beijing to Bangalore, and Sydney to San Francisco.

These foundational communication rails have fueled the digitization of commerce and driven unprecedented innovation across almost all industries, particularly in financial services, ushering in the era of fintech.

Digitizing financial services

Before 2011, the term fintech was virtually unheard of. Today, it's everywhere. Fintech refers to the use of technology to deliver simpler, faster and better financial services. According to FT Partners, there was over $1.5 trillion of fintech investment and merger and acquisitions (M&A) activity between 2010 and 2020.[4] By 2025, widespread adoption and greater use of digital financial services could increase the gross domestic products (GDP) of all emerging economies by 6%, or $3.7 trillion, creating 95 million new jobs.[5] This potential is already being realized. Today there are at least six payments and fintech unicorns – i.e., startups valued greater than $1 billion – in Africa alone.[6]

Last year, fintech investments grew even as GDP contracted globally. Fintech companies offering online and mobile solutions experienced record adoption rates and drastically accelerated their shift from the periphery to the mainstream. In Europe, fintech adoption and usage grew by 72% in 2020, and in the U.S., by 39%.[7]

Fintech is withstanding the challenges posed by the global pandemic largely because of the increasing presence of digitization in almost every aspect of our personal and professional lives. There is also a growing realization that our new shared digital capabilities require a new type of financial infrastructure, with payments at the heart of the system. Whether it's facilitating digital or contactless transactions, or allowing e-commerce marketplaces to better serve their customers and merchants, payments are the glue that holds the online business world together.

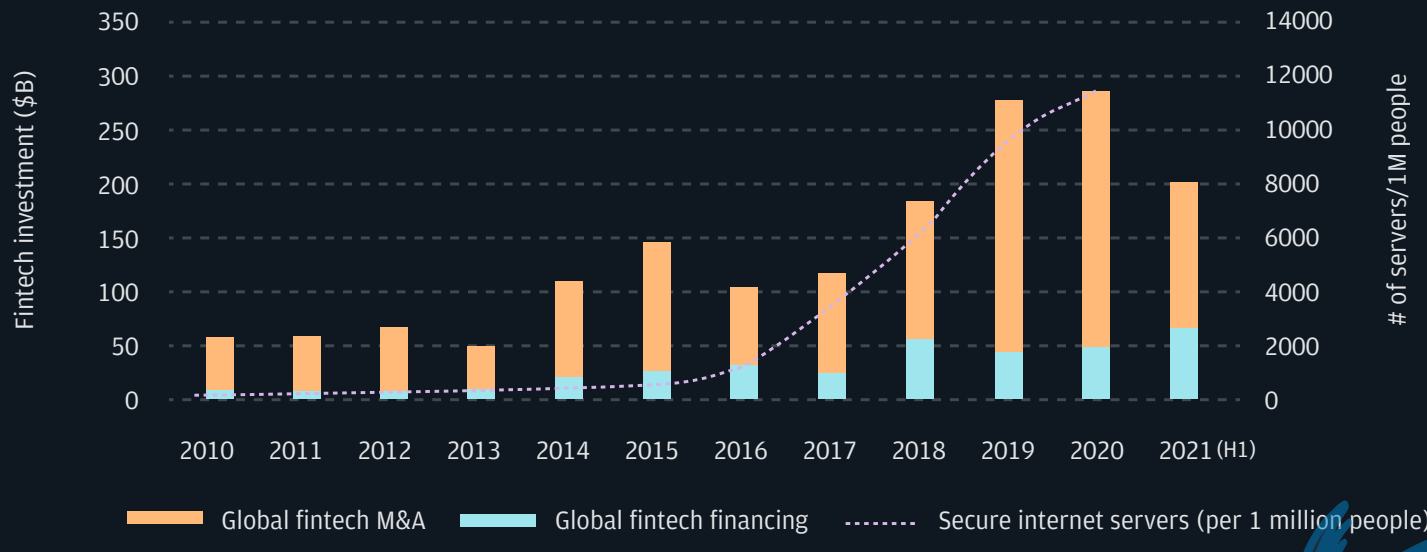
72%

Increase in fintech adoption and usage in 2020

39%

Increase in fintech adoption and usage in 2020

Global connectivity and fintech investment in the last decade



Source: FT Partners: https://ftpartners.docsend.com/view/igaby8kcxzv3bqu7
World Bank: https://www.imf.org/en/Publications/WEO/weo-database/2021/April

Payments are eating the world

Over the last decade, payments have evolved to a simple equation of connectivity and data transfer. With the emergence of ISO 20022 as a global and open standard for payment messaging, for the first time we will have a common language in which to transact with anyone, anywhere.

Ten years ago, tech investor Marc Andreessen famously proclaimed "software is eating the world"[8] – a tongue-in-cheek prediction that turned out to be true. As the world has become globally connected, interoperability and data transfer between platforms, which are the heart of payments and money movement, will drive the future. Looking ahead, we believe payments will eat the world.

In the next decade, we expect to see new foundational changes with the introduction of 5G coupled with advances in artificial intelligence (AI) algorithms, quantum computing and blockchain. Such radical progress and innovation will enable new technologies to flourish, including next-gen conversational AI, the Internet of Things (IoT), connected cars, and scalable augmented and virtual reality. As these new technologies are introduced to the marketplace, they will undoubtedly have a profound impact on how we live, work and consume – shifting value pools and investment allocations, and reshaping our economy.

"Payments are eating the world, and anybody who doesn't recognize that and adapt will not survive. At J.P. Morgan Payments, our purpose is to empower your business to last. And we believe that POWER+ is the key to unlocking the future of payments innovation and ultimately lasting business success."

Takis Georgakopoulos
Global Head of Payments,
J.P. Morgan Payments

So what's next for payments?

The modernization of payments, and the value-added services that surround the transaction, will be crucial for these exciting new business models to become a reality. That's why we believe that, over the next decade, payments will eat the world.

At J.P. Morgan, we take a holistic and thematic view toward innovation and our payments strategy. In this report we introduce the POWER+ framework that identifies five mega-themes (Platforms, Online, Wallets, Embedded, and Real Time) and 20 micro-themes and value-added services that are shaping the future of payments globally. These are fast-growing and deep value pools that are early-to-mid stage in terms of maturity. They offer tremendous potential in the years ahead.

Introducing the POWER + framework

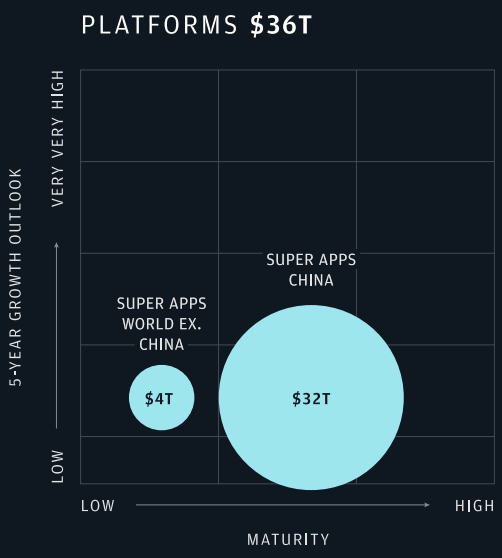
In 2020, of the $240 trillion[9] in global payment flows, approximately $54 trillion could be attributed to five mega-themes: Platforms, Online, Wallets, Embedded and Real Time. The integration of valued-added services (+) will bring these payment flows to life for consumers and merchants.[10] Within the mega-themes of the POWER+ framework, we have identified 20 micro-themes and value-added services, which we'll explore in this report.

Click below to learn more

P	O	W	E	R	+
PLATFORMS	ONLINE	WALLETS	EMBEDDED	REAL TIME	
Super apps	E-commerce	Wallets and loyalty	Connected cars	Global trade	
Chinese vs. global	Digital identity	Cryptocurrencies	Wearables	Money transfers and remittances	
	Gig economy	Stablecoins	Internet of Things		
	Creator economy	Central bank digital currency (CBDC)	Virtual worlds		
			Neobanks		
			Banking-as-a Service		
			Infrastructure and open data		
			Buy now, pay later		

Platforms

As digital platforms, ecosystems and marketplaces continue to disrupt traditional industries, they are further coalescing their power and transforming themselves into "platforms of platforms," more commonly known as super apps. In just over a decade, global payment volumes for these entities have increased to $36 trillion, making them huge disrupters to both traditional retail models as well as the world's banking and financial systems. Here are some features that give super apps their superpowers.



Super apps

The stage has been set for super apps to flourish for some time. An average adult has 80 apps on their phone in total but only uses about nine on a daily basis.[11] Clearly, customers are drawn to the idea of a one-stop shop, which gathers up and organizes the best features of all their apps – like an operating system for their life.

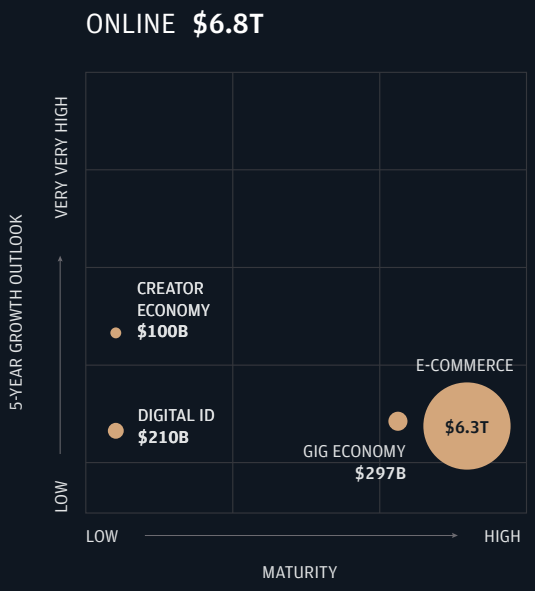
Super apps offer this. They are a destination platform for consumers and merchants that aggregate a broad set of services, both lifestyle and financial-based, with the added value of embedded payment capabilities so that users can transact without leaving the app. This creates a frictionless experience for consumers, who can access and pay for a variety of different products and experiences with a simple tap or swipe of a finger.

For merchants, joining a super app means they no longer need to invest in critical infrastructure for digital customer acquisition. Instead, they can benefit from the scale, customer insights and distribution of the super app, which hosts and facilitates transactions for them. Sometimes, however, that comes with risks. The platform can learn from customer behavior and use that data to create products and services in direct competition with the merchants, cannibalizing their business in favor of the platform's business. The cut that super apps take from merchants can also be high. Additionally, it's possible that stringent data protections may prevent super apps from flourishing in other regions in the way they have in China.

> *Super apps are a destination platform for consumers and merchants that aggregate a broad set of services, both lifestyle and financial-based, with the added value of embedded payment capabilities so that users can transact without leaving the app.*

Online

Since the birth of the internet more than 30 years ago, the online world has been characterized by a constant flux of new innovations and omnichannel business models. We look at some of the key themes currently shaping online payments, like the ongoing rise of e-commerce, the growing need for digital identity solutions and how online platforms are fundamentally changing the structure of the labor force.

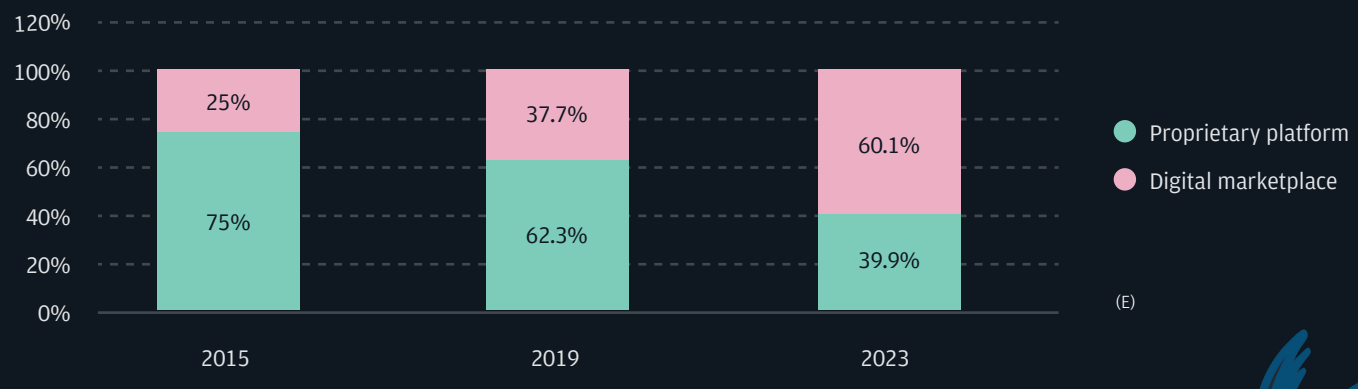


E-commerce

According to Boston Consulting Group, $5 trillion in annual global retail sales shifted from offline to online due to the pandemic,[12] and the shift is likely here to stay. For instance, in 2020 about 40% of online grocery shoppers were first-time users, of which 90% had a positive experience and were likely to come back.[13] Business-to-business commerce is also gaining a share of overall e-commerce volumes, with Forrester forecasting a compound annual growth rate (CAGR) of 10% for business-to-business e-commerce over the next five years.[14]

Before the pandemic, e-commerce was already shifting from proprietary websites toward online marketplaces that are often highly concentrated in volume and increasingly vertically integrated.

E-commerce volume shifting to marketplaces



Source: McKinsey

Digital identity

With the accelerating shift to online shopping, digital identity solutions are emerging as a key new value driver. Digital identifications provide an accurate and secure way of recognizing an online customer and are crucial to building trust between transacting individuals, their devices and businesses. Demand for new approaches is strong, because customers are frustrated with the highly fragmented experience that exists today.

150

online accounts requiring passwords by the average internet user[15]

$16B

the cost of fraud and theft for consumers in 2020[16]

25%

of financial services applications are abandoned due to friction during onboarding[17]

80%

of Americans are very or somewhat concerned about how companies use their data[18]

1 in 4

consumers consider themselves uninformed about cybersecurity[19]

$0

Consumers don't want to pay for these problems to be solved

Presently, digital identity solutions are primarily focused on customer onboarding via identity-verification-as-a-service (KYCaaS and KYBaaS).

More broadly, digital identity is an astounding $210 billion market that is growing at 19% CAGR[20] with 3,000-plus companies applying technologies like AI and biometrics, as well as concepts such as self-sovereign identity. A logical end point from the customer's perspective is a universal digital identity verification service that can be seamlessly used across both private and governmental services. Imagine being able to use a single identity to make a payment in your bank, access your health records or claim a loyalty reward in a store. Further, imagine being able to do so securely and with full ownership and control of your private data.

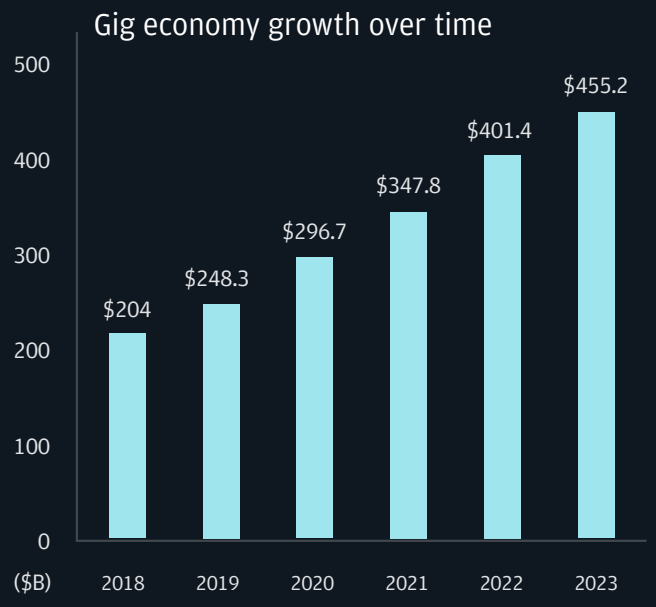
Who has the right to operate the identity layer?

The digital identity ecosystem has many relevant stakeholders including governments, banks, nongovernmental organizations (NGOs), healthcare companies and major tech firms. The organizations at the forefront of developing the crucial standards and technology will have to balance trust with ubiquity. We believe banks are very well positioned to lead in this space because of their trusted role dealing with consumers' personal information and managing their financial assets. Any digital identity solution will have to involve this financial layer, giving banks, which already have extremely strong systems for security and safeguarding sensitive information, a central role.

Gig economy

According to Mastercard®, the gig economy – characterized by temporary, flexible jobs brokered by online platforms and fulfilled by independent contractors or freelancers – reached nearly $300 billion in gross transaction volumes in 2020, and is projected to grow to $455 billion by 2023.[21]

Platform-powered gig work has been around for more than a decade (Uber was founded in 2009), and currently represents about 1-3% of total employment, according to the OECD,[22] but it is predicted that freelancers could make up nearly 50% of the U.S. workforce over the next decade.[23] While there is tremendous potential for growth in the gig economy, it will depend on the ability of society, policymakers and employers to create a future working model that is truly flexible and fair to nontraditional workers when it comes to financial matters.



The gig economy is projected to grow to $455B in gross transaction volumes by year-end 2023

Fintech is a game-changer for gig workers' needs

Gig workers have a distinct set of financial needs and circumstances that traditional financial products aren't providing for. Fintechs are stepping in to fill the gaps:

- **Need to get paid quickly:** According to a recent Marqeta survey, nearly nine of ten respondents (87%) said they were likely to choose one gig platform over another if it could pay them instantly without fees.[24]
- **Low savings:** In the same survey, nearly four in five respondents (79%) reported they had an emergency savings cushion of less than $500. In the event of a financial emergency, two in five (42%) reported they could not access funds other than their primary bank account.[25]
- **Volatile income:** Most gig workers don't know when their next paycheck will come and how much it will be. They need to smooth out their cashflows to meet their monthly expenses.
- **Fragmented income and unique tax needs:** Gig workers often work across multiple different platforms, so their income is spread across different platform wallets.

Long-term outlook

While the gig economy is robust in the short-to-medium term, multiple uncertainties could impact its fate in the long term. Will flexible work replace traditional nine-to-five jobs, or will gig work continue to be a supplemental source of income for the cash-strapped? As mobility becomes autonomous, will self-driving cars and drones replace human delivery drivers? One important question is whether the gig economy will be superseded by the creator economy.

Creator economy

While the gig economy monetizes commodity skills, the creator economy monetizes passion and individuality. Kids today want to be YouTube stars, not astronauts.[26] And why not? In 2020, the top earner on YouTube was nine-year-old Ryan Kaji, whose videos of him playing with toys earned him $29.5 million.[27] Meanwhile, teen queen Charli D'Amelio made $4 million on TikTok posting dance videos and now has her own show on the streaming service Hulu.[28]

Every individual is a small business — monetizing individuality

The creator economy — where self-employed individuals, such as social media influencers or bloggers, directly monetize their creative content via online platforms — is worth $100 billion in 2021 and is growing rapidly. It is already one-third of the size of the gig economy, and over 50 million Americans now consider themselves to be creators. More than 2 million of them earned six-figure incomes in 2020, suggesting the growth of a new creator middle class. It is estimated that sponsored creators will have a combined wealth of $15 billion by 2022.[29]

Financial solutions for the creator class

Professional creators operate very much like small-to-medium-sized businesses and, like gig economy workers, they have unique financial needs that are not being adequately met. Specialized players are emerging to meet this demand, which could result in an "unbundling" of large platforms.

Today, most of the value in the creator economy is being retained by the dominant media platforms. But the ecosystem is heading toward specialized players, who can meet the requirements of creators and provide new tools to empower them in all areas of their business. In parallel, we've seen fans - the creator economy's consumers — demonstrate an increased willingness to directly financially support the people they watch and interact with daily. This has given way to an influx of new creator tools that support direct monetization.

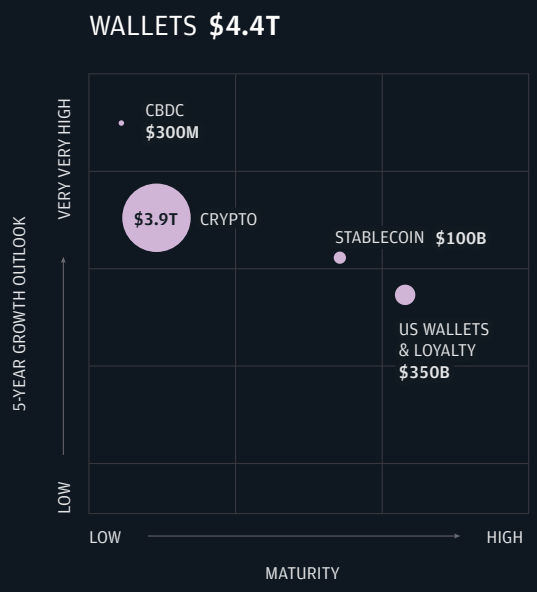
So, where is this landscape headed? Will the best vertical players re-bundle to compete against the horizontal platforms? This could involve adding additional functionalities such as payments, tax calculation tools or credit services.

Creator hierarchy of needs: Monetizing individuality

Source: creatoreconomy.so

Wallets

It's hard to talk about wallets without talking about what they have historically been used for: to store money. Economists define money as something that serves as a medium of exchange, a unit of accounting and a store of value. Digital money is now capturing a growing share of total transactions with cash falling from a 40% share a decade ago to a 26% share today.[30]



The growth of digital technology is not just transforming how we shop, work and pay, but is also disrupting the traditional concepts of what is and what is not money. In today's economy, there are multiple forms of money, including traditional fiat currency (cash or commercial bank deposits), cryptocurrencies, stablecoins, tokens, central bank digital currencies (CBDCs) and "narrow money" such as Starbucks© or Amazon rewards. According to Morgan Stanley, each differs in its type, value, backstop mechanism and underlying technological approach.[31]

This emerging and evolving ecosystem poses interesting questions about where value is stored in the modern economy. It used to be that commercial banks had the sole right to store value, but today, as technology changes and security improves, digital wallets are effectively playing that role for millions of consumers.

> *It used to be that commercial banks had the sole right to store value, but today, as technology changes and security improves, digital wallets are effectively playing that role for millions of consumers.*

A brief history of wallets

The first physical wallet as we know it today emerged in the early 1800s, 700 years after the Song dynasty in China invented paper currency. That wallet was designed to hold physical cash and didn't get significantly disrupted until PayPal was launched in 1999. In its early days, PayPal served primarily as a store of payment credentials – things like a customer's credit card number and bank account information. Over time, PayPal became a "true" wallet where funds could be held outside of bank accounts and money could be moved between a customer's wallet, bank account and other users. You can now store a range of non-money value types in your PayPal account, including cryptocurrencies, stablecoins and loyalty points.

With rapid mobile penetration, the number of digital wallets proliferated. M-Pesa launched in 2007 followed by Apple Pay® (2014), Samsung Pay® (2015) and Android/Google Pay™ (2015). As the sector has developed, smartphones have evolved into a "wallet of wallets" that can be used for online, mobile and in-store transactions. Customers can also transfer funds from a range of different cards, bank accounts or digital currencies.

> *The first physical wallet from the 1800s was designed to hold physical cash and didn't get significantly disrupted until PayPal was launched in 1999.*

Future outlook

The ongoing evolution of wallets leads to interesting questions about where their future is heading. We believe they could take two different directions:

- **A universal wallet** – This is a single wallet that works everywhere and typically uses a biometric identifier such as your palm, face or fingerprint.
- **Contextual wallets** – In this scenario, people will have separate wallets for different functions. For example, you may have a wallet for your car to enable frictionless payments in gas stations, or a wallet in your fridge that can be used to pay for food and drinks.

Cryptocurrencies

With the rise of cryptocurrencies, the concept of value being stored primarily in a bank account is being further transformed. What makes blockchain technology so unique is that there is no centralized ledger or intermediary. Instead, value is stored in decentralized networks, which by their design create an immutable record of transactions. As of July 2021, there were over 75 million blockchain wallet users globally, a growth of 23 times since 2015.[32]

This number is only expected to increase with the growing acceptance of cryptocurrencies by merchants and financial institutions. Despite the excitement, there are a number of barriers to the wider acceptance of cryptocurrencies, including high price volatility and issues with the speed, scalability and security of blockchain networks. Innovation in these areas will be essential to support the further adoption of digital currencies.

Certain fintech infrastructure solutions that take on volatility risk for cryptocurrencies seem promising for merchants, as they will enable merchants to accept cryptocurrencies for retail payments. This could help increase the uptake of cryptocurrencies with stores and retailers, but we caution that merchant payments are only a minuscule percentage of total cryptocurrency transaction volume, which remains largely driven by trading activity.

75M

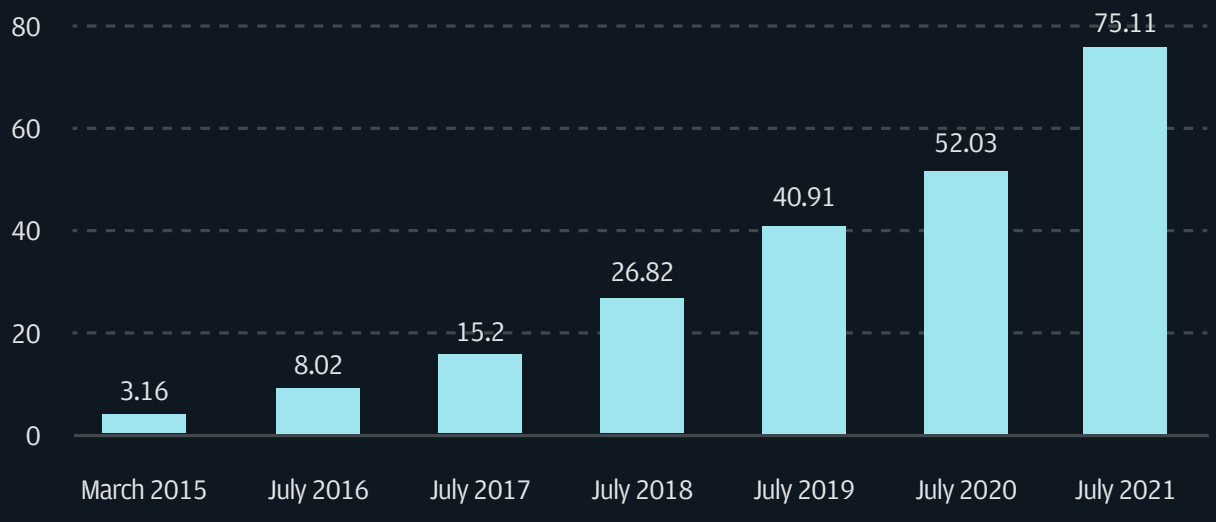
The number of blockchain wallet users globally

23X

Growth since 2015

Number of blockchain wallet users worldwide

2015-2021 (in millions)



Source: Blockchain 2021

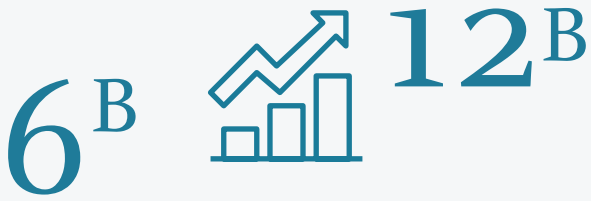
Stablecoins

Stablecoins are cryptocurrencies that are pegged to other assets such as fiat money or tangible commodities like steel or gold. Emerging in 2015, it took five years for stablecoins to reach a supply of 6 billion, according to Bitstamp. But it took only four months in 2020 to double that supply to 12 billion.[33] Today there are already stablecoins worth >$100 billion in circulation.[34]

One feature of stablecoins is that when coupled with smart contracts, they are "programmable money," i.e. they can be programmed to autonomously validate that transaction conditions agreed between transacting parties have been met prior to executing transactions. Decades from now, this feature – if applied beyond trading to lending, payments and insurance, for example – could have the potential to create a whole new system of faster and cheaper financial services collectively known as DeFi (decentralized finance).

Interesting use cases are already emerging. On the merchant side, Circle has partnered with Visa to launch a corporate card allowing users to spend stablecoins at 60 million Visa merchants. Stablecoins focused on underbanked markets are also coming on the scene. Walmart has filed a patent for an underbanked-focused stablecoin, and PayPal-backed Tala and Visa are exploring a wallet for this demographic to convert, store and use the currency.

In 2019, J.P. Morgan launched the JPM Coin system. JPM Coin is not a stablecoin. However, the JPM Coin system uses a permissioned blockchain to offer J.P. Morgan deposit accounts, and a payment rail for transacting on those accounts, which can support real-time cross-border money movement.



Stablecoins only took four months to go from 6 billion to 12 billion in supply

81
countries representing
90%
of global GDP are now exploring some form of CBDC

Central Bank Digital Currency (CBDC)

With the exponential growth of digital currencies proliferating through private networks, central banks are responding by issuing their own digital currencies to maintain sovereignty of the monetary system.[35] Having invented paper currency in the 1100s, China became the first country to launch its own Central Bank Digital Currency (CBDC) in 2020, over a millennium later.

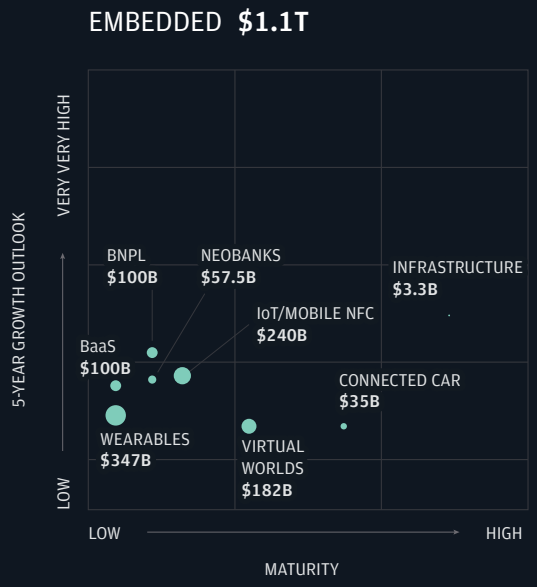
According to the Atlantic Council Geoeconomics Center's CBDC tracker, 81 countries representing more than 90% of global GDP are now exploring some form of a CBDC. A year ago, that number was 35.

CBDCs may provide streamlined settlements and give governments the ability to send money directly to citizens, especially in times of crisis. If CBDCs gain wide adoption, central banks would have access to unprecedented amounts of transactional data that could be used to facilitate for further distribution of financial and other services at the national level. On the other hand, increased government surveillance and vulnerability to cyberattacks are systemic risks.

In designing a CBDC, each country has options to choose from that depend on the extent of access provided, the level of central bank control and the type of technology leveraged. In the global race to develop CBDCs, the design that is ultimately adopted as the interoperable global standard remains to be seen.

Embedded

Embedded payments refer to the increasingly effortless way consumers are able to make contextual and contactless financial transactions – anytime, anywhere – through connected devices that serve as wallets, like cars, homes or wearable technology. Embedded solutions add a new level of convenience and speed to the payment process and are a key element of the invisible banking concept. In this scenario, financial services are seamlessly embedded into daily activities and have become so automated and frictionless that consumers no longer notice them.[36]



Connected cars

By 2030, about 95% of new vehicles sold globally will be connected, up from around 50% today. The modern car has the computing power of 20 PCs, features approximately 100 million lines of code, and processes 25 gigabytes of data per hour. The data gleaned from a vehicle can include everything from driving patterns to online interactions and purchases through the in-car digital display. There is great potential for ancillary industries, like insurance, to use this information to provide drivers with tailored services and products. This value pool is expected to reach $450 billion by 2030, but there are questions about who will take the lion's share of the prize.[37]

Rise of car data marketplaces

Emerging software companies are increasingly leading the way when it comes to monetizing car data. By creating a standardized API layer, they are removing the friction of data-sharing between parties. Additionally, these software companies are making a customer's consent to share car data more explicit and trusted by using smart contracts.

of new vehicles sold globally will be connected by 2030

$450B

Value pool of information gathered from connected cars by 2030

Wallet on four wheels with loyalty and rewards creating sticky in-car experiences

Convenience and incentivization are key to encouraging drivers to share their car data, and embedded payments are central to this. For example, by using an in-car wallet, drivers will be able to purchase coffee, gas or even make restaurant reservations from their vehicle.

Further, customers can earn rewards and loyalty points directly into these wallets, which can be used for more purchases at the service providers.

In September 2021, J.P. Morgan entered the payments mobility market by announcing it would acquire a majority stake in Volkswagen's payments arm. This acquisition represents the firm's commitment to playing in the deep value pools we have identified in this report.[38]

> *Embedded solutions add a new level of convenience and speed to the payment process and are a key element of the invisible banking concept.*

Wearables

Wearable technologies are a category of electronic devices that can be used as accessories or are embedded in clothing and even implanted in the user's body. These devices are hands-free gadgets for various purposes that are powered by microprocessors that can send and receive data via the internet. Across healthcare, fitness, professional sports, industrial applications and more, wearables have the potential to enable all manner of connected economy experiences. The number of connected wearable devices worldwide is expected to grow to over 1.1 billion in 2022.[39]

Wearables surpassed the novelty phase some time ago and are now a key channel for contactless payments. Paying for goods and services with a simple flick of the wrist is faster and more efficient than by paying with cash or even tapping a credit card. And wearables offer an even greater convenience than contactless cards and mobile payment apps by removing the need to fumble with a wallet, purse or phone. Revenue in the wearables segment reached $4.1 billion in 2020, and average revenue per user amounted to $83.99.[40] As both merchant and consumer acceptance continue to rise, the opportunities for issuers will only become more significant to participate in the wearable payments space.

1.1B

Total number of connected wearable devices worldwide by 2022

$4.1B

Revenue in the wearables segment in 2020

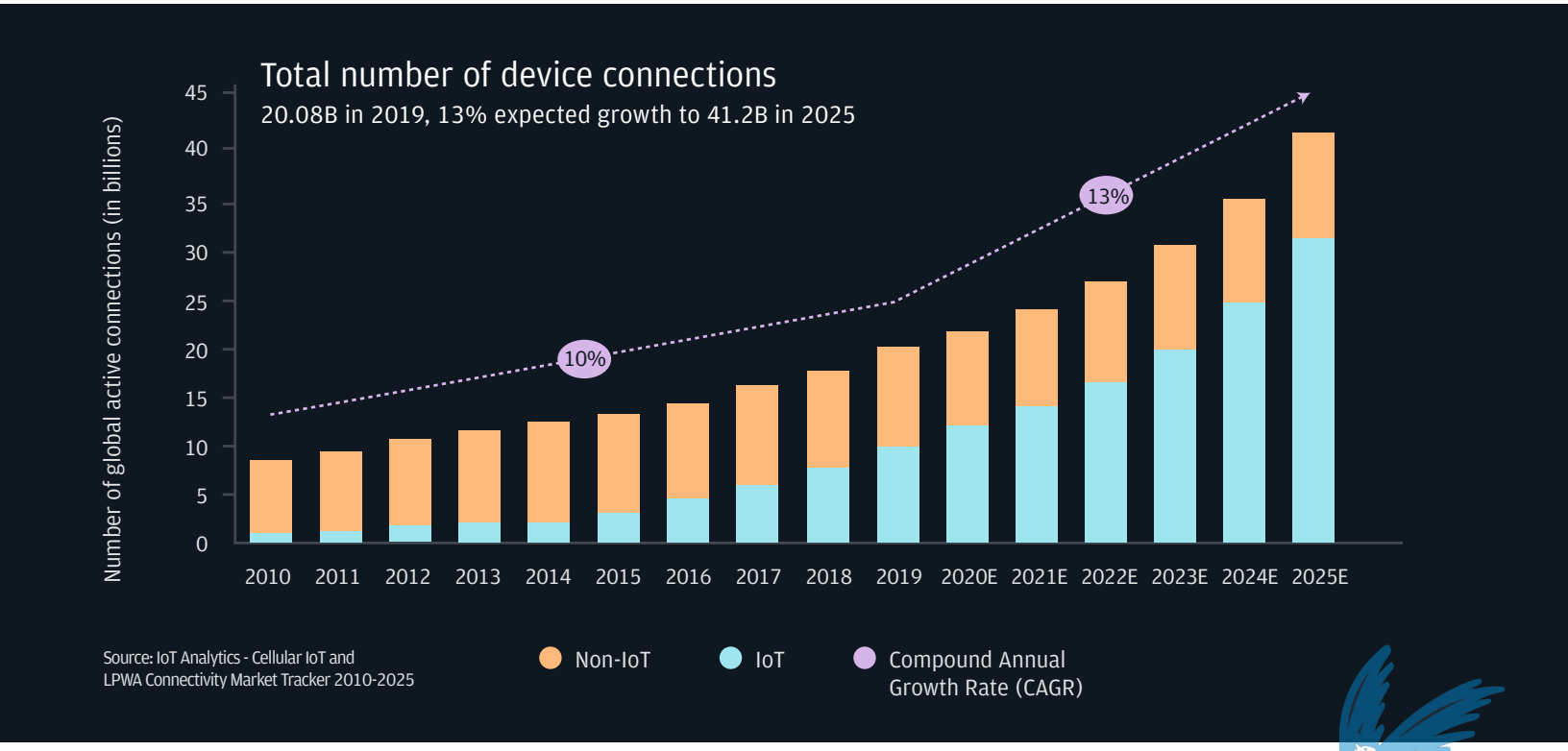
Internet of Things (IoT)

Internet of things (IoT) refers to the network of physical machines, industrial assets and consumer products that are able to share data and communicate over the internet. Connected devices already outnumber conventional smartphones and laptops and present a significant opportunity for merchants that embrace IoT payment platforms. Essentially, these enable consumers to use their surrounding ecosystem as a method of payment, including their home, vehicle, appliances or wearable device.

Take Samsung's Family Hub™, for example, an award-winning refrigerator that was co-developed with Mastercard.[41] The smart fridge allows customers to search for deals and coupons for stores in their area, order products and meals from Amazon and Grubhub, shop and pay for groceries with Instacart, and have them delivered within one hour.[42]

But payment-by-fridge isn't the only option. There are endless possibilities for IoT payments, especially in the pandemic era when consumers are spending more time at home, in vehicles and on their devices. For instance, IoT car payments could make touching a parking meter a thing of the past. Gas can be paid for as you pull up to the pump, and your car's voice assistant will allow you to order and pay for food as you wait in line at the drive-thru.

Biometrics can also play an interesting role in IoT payments. By linking a unique token to users' voices, IoT-enabled payment platforms can address fraud concerns and help ensure only genuine payment transactions are approved.



Virtual worlds

Gaming, augmented reality and virtual reality

A virtual world is a computer-simulated model of a world where users communicate with each other via virtual versions of themselves, called avatars. Virtual worlds are like video games, but without the objective of winning; being in the virtual world is an end in itself. The goal, if there is any, is to continue to spend time obtaining status or experience within that world.

One virtual world, Second Life, has a community of people who, just like in real life,[43] make friends, build homes, run businesses, watch TV and go shopping. They even have their own currency, called Linden dollars, which can be converted to U.S. dollars. A typical article of clothing would cost around 200 Linden dollars, which is about 50 cents. Second Life claims that $500,000 a day in transactions occur in its virtual world, and this figure is growing by as much as 15% every month.

When combined with augmented reality and virtual reality, virtual worlds will become interactive "third spaces" beyond work and home where people will spend time and make transactions for subscription-based services, which will be paid for via embedded systems. By 2025, revenue in these virtual spaces will reach $390 billion, according to Ark Research.[44] In the future, there is also potential for these virtual worlds to merge into what some futurists are calling the "metaverse," expanding the potential for building a second virtual economy that sits on top of, and even competes with, the existing one.

$500K

Value of daily transactions that occur in Second Life's virtual world

$390B

Projected revenue in virtual spaces by 2025

Neobanks

Neobanks are digital-only banks that operate without physical branches. Like a personal bank branch on your smartphone, neobanks use APIs to bundle products and services around a highly engaging and sometimes autonomous customer experience.

There are now 200-plus neobanks live globally that have collectively secured billions of dollars in funding to spend on marketing to achieve critical mass.[45] Yet profitability remains elusive for many – most neobanks make money from debit card interchange fees. In the current interest rate environment, this is not a viable long-term plan. Neobanks are now shifting their priorities to streamline their cost structure. In October 2020, the U.K.'s Starling Bank became the first retail neobank to become profitable.

We are watching a second wave of neobanks emerge that are focused on the needs of a specific vertical. In July 2021, European neobank Juni raised $21.5 million in its Series A only 12 weeks after officially opening for business.[46] Juni is built specifically for merchants selling online. Lance is another example of a niche neobank, focused on the needs of the gig and creator economy. And we ourselves are offering a simple and exceptional experience to consumers in the U.K. with our newly launched Chase digital bank.

After a pandemic-induced decline, digital bank account openings in the U.S. are projected to grow to 47.8 million by 2024, representing 17.9% of the population.[47]

$21.5M

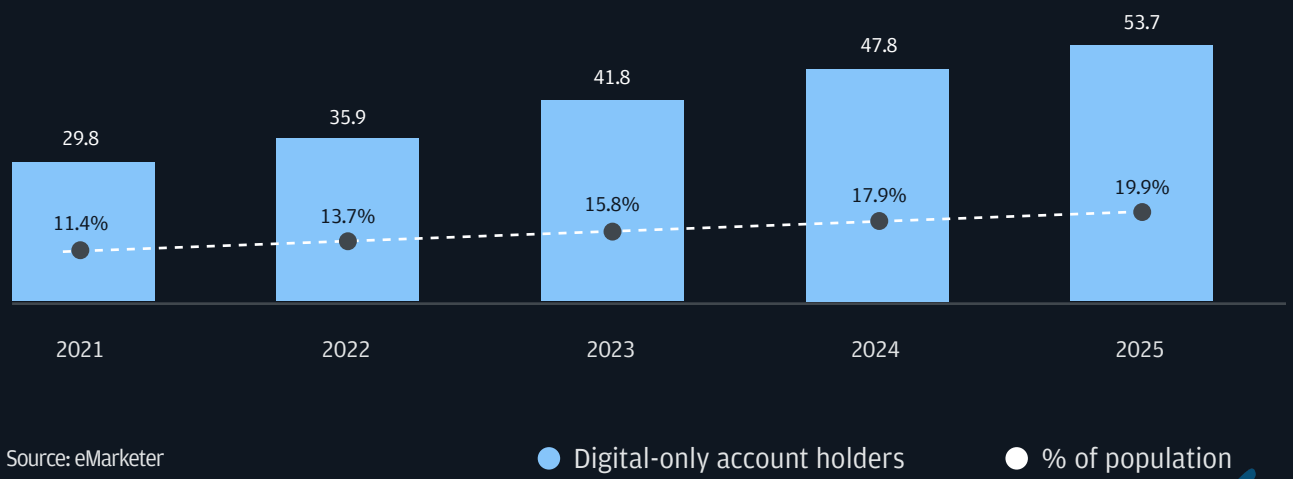
European neobank Juni raised $21.5 million in its Series A only 12 weeks after launch

47.8M

Digital bank account openings in the U.S. by 2024

Digital-only bank account holders (U.S., 2021-2025)

Millions and % population



Source: eMarketer

Banking-as-a-Service (BaaS)

Just two years ago, Angela Strange of Andreessen Horowitz (a16z) predicted that "every company will be a fintech company."[48] This is already playing out. Today, APIs mean any software company can add payments and banking products and services directly to its customers under its own brand. Adding payments products is not only an additional revenue stream, but it has become central to software companies' brand and profitability. Embedded finance enabled by BaaS could be worth $3.6 trillion by 2030.[49] For customers, this means that payments and banking products and services can be embedded deeper into customer journeys, at the point of need.

Today, BaaS offerings include bank accounts, branded cards and payment solutions, but will extend to lending, investing and other fintech products in the near future. Some of these services are hyper-niche, such as Uber's Visa debit card, which is designed specifically for its drivers, offering no fees, instant pay, overdraft protection and highly targeted rewards.

In the U.S., over the last decade, the number of "partner banks" – banks that offer software companies access to their banking suite – has grown more than five times.[50]

$3.6T

Embedded finance enabled by BaaS could be worth $3.6 trillion by 2030

Infrastructure and open data

Markets throughout the world are moving in the direction of open sharing of financial data. Initiatives such as the U.K.'s Open Banking scheme, and the European Union's revised payment services regulations (PSD2), are setting standards for open sharing to occur at scale. Economies that embrace open data could see 1-5% gains in their GDP by 2030.[51]

These gains will be realized by the entire digital ecosystem, but open data has brought API providers in particular to the forefront. Companies such as Plaid, Yodlee, Tink and Yapily provide the critical infrastructure layer that facilitates easy sharing of bank and transaction data with nonbank entities. This has seeded a whole generation of API-first fintechs that are able to monetize this data to create new business models. Personal financial management apps, lending marketplaces developing accurate credit scores using alternative data, real-time underwriting, personalized customer service, stronger fraud protection, and niche payroll products are just a few of these.

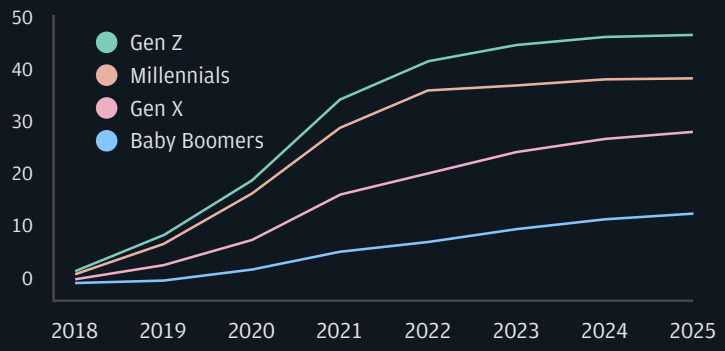
1-5%

Economies that embrace open data could see 1-5% gains in their GDP by 2030

Buy now, pay later

Millennial and Gen Z shoppers are demanding more flexible, inclusive and transparent ways to pay rather than traditional interest-bearing options. That's why they love buy now, pay later (BNPL) solutions. And they are not the only ones. For merchants and marketplaces, BNPL is a way to increase conversion and cart size. For payment companies and banks, it's a new source of transaction flows and interest revenue, bypassing traditional networks.

U.S. BNPL users, by generation (2018-2025)
% of digital buyers in each group



Source: eMarketer

Depending on the business model of the provider, BNPL can act in one of two ways:

- **Retail financing** – Unlike white-label merchant financing that is available for high-value purchases such as cars or electronics, BNPL allows retail shoppers to pay in installments even for small purchases (e.g., clothes) without needing a credit check.
- **Payment method** – Unlike credit cards, in many cases, BNPL plans are offered interest-free to consumers, in which case the merchant pays for the financing. In this model, consumers perceive BNPL as more of a payment method than a financing option.

There are also two main business models for BNPL providers:

- **Merchant-focused** – BNPL providers sell to merchants who embed the financing solution earlier in the customer shopping journey, either online or in-store at the point of sale, increasing the likelihood of a purchase (e.g., Affirm, Klarna, Afterpay).
- **Consumer-focused** – BNPL providers sell directly to consumers in order to capture their payment volume and interest revenue. Klarna recently introduced a new virtual credit card on its marketplace app that allows customers to pay in installments at merchants that don't participate in its marketplace. In this instance, Klarna takes the customer payment flows away from competitors.

Buy now, pay later is poised for long-term growth

BNPL is already posing a threat to credit cards. In Australia, the number of credit cards declined by 6.6% in 2019-2020, while BNPL revenues grew. According to a CBInsights analysis, for many shoppers, "BNPL is their sole source of deferred payments, with many users appearing not to have a credit card at all." By 2025, BNPL industry could top $1 trillion in annual gross merchandise volume.[52]

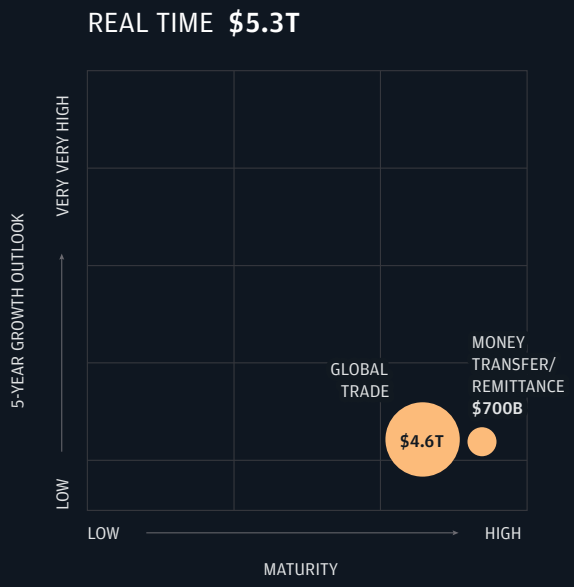
$1T

BNPL could top $1 trillion in annual gross merchandise volume by 2025

> *Consumer-driven expectations are pushing institutions and businesses to adopt real-time payment rails for person-to-person, business-to-consumer and business-to-business payments.*

Real Time

Whether it's a business making a cross-border payment, a worker sending remittances to his own country, or e-commerce consumers wanting to make instant transactions, the demand for real-time payment capabilities is growing. While there is much work to be done before the reality of instant payments can be realized in more than a handful of use cases, significant progress toward this goal will be made in the coming decade.



Global trade

The pandemic tested global industrial supply chains to their limits. McKinsey estimates that up to $4.6 trillion in trade flows may shift across a range of industries, from machinery and equipment to transportation and aerospace.[53] This reorganization presents both challenges and opportunities for the future of global trade.

One immediate challenge posed by pandemic-related disruption is the skyrocketing of the global trade finance gap. In 2019, the trade finance gap was already at $1.5 trillion, but this figure has shot up to between $1.9 to $5 trillion according to latest estimates from the International Chamber of Commerce.[54]

The digitization of trade finance is the key to a sustained recovery. Banks and fintechs will play a huge role in providing the critical financing needed for businesses throughout the world to recover to pre-pandemic levels of activity. We will continue to see investment in marketplaces for invoice financing as well as adoption of AI, cloud and blockchain to provide real-time dynamic discounting and access to early liquidity.

Real-time payments

The average length of a TikTok video is about 15 seconds, and it takes even less time to tap and purchase a product from an influencer conducting a livestream. With 15-minute grocery delivery now available in some areas, instant commerce is the new e-commerce. And it is not just limited to consumers. Creators and gig workers want to be paid instantly. This means daily or even hourly payroll could become a reality. In such a world, daily mortgage payments or tax payments wouldn't be inconceivable either. Such consumer-driven expectations are pushing institutions and businesses to adopt real-time payment rails for person-to-person, business-to-consumer and business-to-business payments.

Global adoption accelerated by the global pandemic

Globally, several countries were already making progress toward creating centralized real-time payment infrastructures before the pandemic hit.

But the pandemic has increased digital adoption at a dizzying speed. At the beginning of 2020, The Clearing House's Real-Time Payments System had 19 large institutions participating. Today, it has 114 banks and credit unions as direct members. The Federal Reserve is now expecting to launch FedNow – its service to support instant payments – in 2023, not 2024 as previously expected.[55]

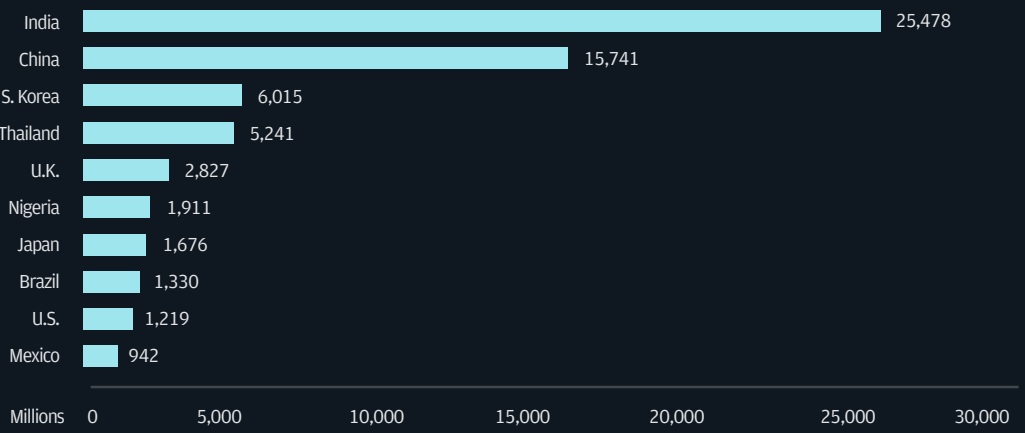
Other countries are moving ahead even faster. In 2020, India established itself as the global leader in real-time payments with both its Immediate Payment System (IMPS) and Unified Payment Interface (UPI) seeing record volumes.[56] Use cases are already evolving quickly from person-to-person transfers and merchant payments to request to pay, utility bills, donations, school fees, taxes, subscriptions, tolls and more.

In August 2021, J.P. Morgan launched request for pay, a real-time payments service that lets corporate clients send payment requests to the bank's roughly 57 million retail clients who use the J.P. Morgan app or website, cutting the cost and time it takes for those companies to get paid.[57]

Looking ahead to real-time cross-border payments

While countries travel up the adoption curve of their own centrally managed real-time payment networks, it is equally critical to help ensure these networks are interoperable. Several strategies are being adopted. In a recent example, J.P. Morgan, DBS and Tamasek are working together to leverage blockchain to improve interbank transfers via a new entity named Partior.[58]

Top 10 markets in 2020
by real-time transactions (millions)



Source: ACI Worldwide: Prime Time for Real-time, https://go.aciworldwide.com/2021primetime.html. March 2021.

Money transfer and remittances

Facilitating digital cross-border payments could also transform the global remittances system. According to Credit Suisse, in 2020 the market for remittances was $700 billion and is expected to grow at 4% CAGR.[59] The industry is also becoming increasingly competitive. Sending money home costs a global average of 7.13%, according to the United Nations.[60] New entrants are attempting to leverage technology to cut these fees, while also making the process faster and more convenient.

Traditional platforms versus fintechs

Traditional money transfer operators (e.g., Western Union©) have many entrenched advantages. These include global breadth, local market knowledge, compliance knowledge, local licenses and a well-known brand, especially with underbanked customers. Despite spikes from the global pandemic, digital remittances represent only a small percentage of their overall business.

On the other hand, digital-native fintechs (such as Wise, which is already at $5 billion in volumes per month) offer transparency through real-time pricing data and provide low-fee alternatives for subsets of banked customers. Often the lack of a bank account is a barrier to adoption of digital remittances. Fintechs such as Remitly are solving this challenge by conducting identity verification digitally and then offering zero-balance zero-fee accounts to the otherwise unbanked.

While in early stages, there are also companies – such as Wirex, BitPesa and Sentbe – that are utilizing blockchain networks to reduce cost and increase transparency and speed of cross-border payments in both fiat and cryptocurrencies.

Despite these innovations, there are many gaps that need to be filled in this space to get to the U.N. target of a 3% global average cost for remittances.

> *"Payments are not only the new connective tissue of the world, they are also the nervous system providing cohesion, support and intelligence to global commerce."*

Neha Wattas

Head of Strategic Insights, Innovation & Corporate Development
J.P. Morgan Payments

$700B

In 2020 the market for remittances was $700 billion and is expected to grow at 4% CAGR

Payments' singularity moment

In technology parlance, the singularity describes a hypothetical future where technology growth has become so autonomous and irreversible as to vastly and unpredictably transform our reality.

This artificial intelligence explosion will significantly impact human civilization. We see little doubt that quantum computing, 5G and AI will eventually converge into super-intelligent machines with cognitive capacity beyond human capabilities. We also see that consumers who optimize these technologies will adopt superhuman productivity and capabilities in their personal and professional lives. As these platforms become interoperable and interconnected, the trajectory for reaching the singularity becomes more acute.

Now, apply this to payments.

> *"The last decade was about connecting people, this decade is about connecting platforms. That's why payments are going to win."*
>
> **Jeremy Balkin**
> Former Global Head of Innovation & Corporate Development, J.P. Morgan Payments

Are payments approaching their own singularity?

The foundational role of payments as the new connective tissue in the physical and digital economies is one of the most significant evolutions of the 21st century. The last decade was about connecting the world with internet and mobile communications and the resulting fintech and software revolution that followed. But now the world is essentially online, and the barriers to entry for new digital business models no longer exist. The winners of the future will be those who "connect the connected" and the interoperability between platforms with safe, efficient and reliable data transfer will define the future. Payments as the value exchange is the solution to this interoperability challenge between platforms and is at the heart of our exciting digital future.

As we've described in the POWER+ framework, as payments and value-added services are becoming more intelligent, ubiquitous and seamless, they are converging into the five value pools – Platforms, Online, Wallets, Embedded and Real Time. Payments will be everywhere, whether we are consciously aware of them or not, and they will morph from being the last stop at checkout to being an enjoyable, invisible and a seamless experience. We believe payments are about to experience unmatched scale and growth. Economies, business models and societies will benefit from the innovation and economic prosperity created as payments become even more important to every aspect of our lives.

This is already occurring before our eyes, but we believe these value pools will grow deeper not only incrementally, but also exponentially.

This is why payments are eating the world.

Summary

Payments and value-added services are on a trajectory of tremendous evolution as they converge across five value pools:

P PLATFORMS

Platforms – a digital destination that combines lifestyle and financial services for both consumers and merchants that has embedded payment capabilities.

O ONLINE

Online – e-commerce, digital identity and the gig economy are fueling new innovations and digital-first business models.

W WALLETS

Wallets – a digital tool that can sit outside traditional banks and which people can use to store value, transfer funds and make purchases.

E EMBEDDED

Embedded – the ability to make contextual and contactless payments with a connected device that serves as a wallet.

R REAL TIME **+**

Real Time – the instant transfer of funds between people and businesses across a range of use cases like cross-border payments, remittances and e-commerce.

As such, payments will fuel innovation, while innovation will push payments beyond a purchasing function into a role that connects our digital societies.

SIGN UP FOR MORE INSIGHTS

Jeremy K. Balkin
Former Global Head of Innovation & Corporate Development
J.P. Morgan Payments

Neha Wattas
Head of Strategic Insights, Innovation & Corporate Development
J.P. Morgan Payments

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