A

STUDY

on the future of payment

PAYMENT 2034

zukunftsinstitut

WORKSHOP

OSTHAVEN

driving strategy to execution

In ten years' time, two thirds of the major players in the payments sector will be new names.

Dr Jochen Biedermann,
FinTech Consult

> Payment systems are the arteries that carry the life-blood of finance.
>
> _Eswar S. Prasad, The Future of Money

THE FUTURE OF PAYMENT

INTRODUCTION

A parcel bot glides silently along the sidewalk and drops a delivery into one of the lockers in front of the municipal library. Through the large windows of the building, people can be seen working in small cubicles or reading intently in hammocks, while children play in a hilly carpeted play area. In near-silence, library trolleys filled with books and magazines follow librarians who distribute the books onto the surrounding shelves with skilful movements.

In the adjacent park, bees buzz through green urban areas. Children gather around public toy sharing boxes, while groups of adults at picnic tables use QR codes to place food orders from different restaurants with local delivery services. A self-driving electric bus picks up a few pensioners.

The fine struts of an exoskeleton for muscular support can be seen under a trouser leg or two of passengers boarding the bus. The images on the digital screen in the bus change at a rapid pace: An avatar concert announcement, a notice about a monthly antique market, a housing ad for the 3D printed housing estate that has just been built on the outskirts of the city, an advertisement for the latest SPF collection of a well-known clothing brand, a call to participate in a study for an AI-generated drug and an advertisement for an aquaponic supermarket with vertical vegetable production.

While edible mushrooms grow in the dim light of a basement and supply local restaurants, farmers harvest rosemary, basil and thyme on the market roof to stock the shop area. If you look up at the sky above the building as you pass by, you can see holographic announcements for open training positions in the local government through Meta glasses. If you look higher still, you might even spot a solar-powered airplane crossing the afternoon sky.

Have you ever been to the year 2034? Would you imagine it exactly as described on the left? Or completely differently? Our idea of the future significantly influences how many possibilities we see to help shape it ourselves (and this is directly related to how much desire we have to do so). The bigger the variety of different futures presented to us, the clearer it becomes that what will one day be the present has not yet been defined to a large extent. So please feel free to send us your alternative vision of the world in ten years' time when you have finished reading *Payment 2034*.

Payment 2034 – why should we be thinking about the future of payment at all?

Well, once we start thinking about what characterizes our everyday lives and the processes in them, in many cases it's payment: Paying for breakfast rolls on a Sunday morning, doing the weekly shopping, browsing through a shopping app on our smartphone, paying the monthly subscription for a streaming service, buying tickets for public transport, stopping at the petrol station, perhaps opting for CO2 compensation payment for a holiday flight, buying an afternoon coffee in the office, paying or receiving a monthly wage payment, child allowance or pension contribution.

In the midst of all the technological, social, climatic and economic changes that are currently taking place, we can safely assume that as our everyday lives change, so will the way we pay. If you work in the payment industry or are affected by it as a retailer or operator of an online store, this means that you too – whether on a large or small scale – will be making decisions that shape our future. To make sure that these decisions contribute to a positive future, it is helpful to look at various alternatives of the future and explore different developments of what payment could look like in 2034.

Behind this publication you will find a multidisciplinary team: A highly specialized management consultancy for the payment and banking industry, Osthaven GmbH deals with the operational challenges and practical implications of payment for the business world on a daily basis. In a sense, payment is

part of the company's DNA. The Zukunftsinstitut Workshop GmbH operates as at the interface between social change and economic transformation. Trendwatching, futurology and making possible futures tangible is its daily business. (→ *The Brains behind Payment 2034*) What you see here has grown out of the interrelationship between these two disciplines.

To create the content you will find on the following pages, we read studies and books, evaluated podcast conversations and identified signals of change that already show on a small scale what could one day be normal on a large scale. (→ *Methodology*) We also interviewed a → *Knowledge Council* consisting of 13 experts from the payment sector about their predictions for the payment of the future. We distilled all this information into six directions for the future of payment, namely the Age of Seamlessness, New Money, War for Data, Omniverse Pay, Planet Centricity and New Ecosystems. You can explore these different directions in the following chapters. Short scenarios at the beginning of each chapter hint at future worlds (showing some, but not all, elements of a possible future that you can further develop by adding your own ideas), which help you experience some of the facets of each of these futures. A contextualization for each chapter offers a contextualization of what you have read and possible starting points for your own approach. At one point or another, you may think that, for instance, a scenario from the New Money chapter would fit just as well in the Omniverse Pay chapter and vice versa. And this is absolutely right. After all, there is not always a clear distinction between future paths. The future is always made up of the overlapping and interplay of different developments.

Before you dive into the future of payment on the following pages, we would like to share one more insight with you. The point of departure for our observations was the interplay between three perspectives on payment: The perspective of retailers, payment service providers and end customers. However, at different points in our process, we noticed that most visions of the future ended up being from the end customer's point of view. We kept "slipping" into the user-centred perspective, even though we had set out to develop scenarios from all three perspectives of the outlined triangle. After many discussions and much contemplation during our team meetings, we came to the conclusion that perhaps this outcome was only logical. The future of payment is experienced by the individual. The point of view of the user ultimately describes the world we are shaping.

Because regardless of whether you work in retail or payment services, at the end of the day, you too are an end customer (perhaps in addition to your role as a payment provider or retailer) and work with or on systems that affect you directly or indirectly. The future, therefore, will be experienced on an individual basis.

Dive in.

CONTENT

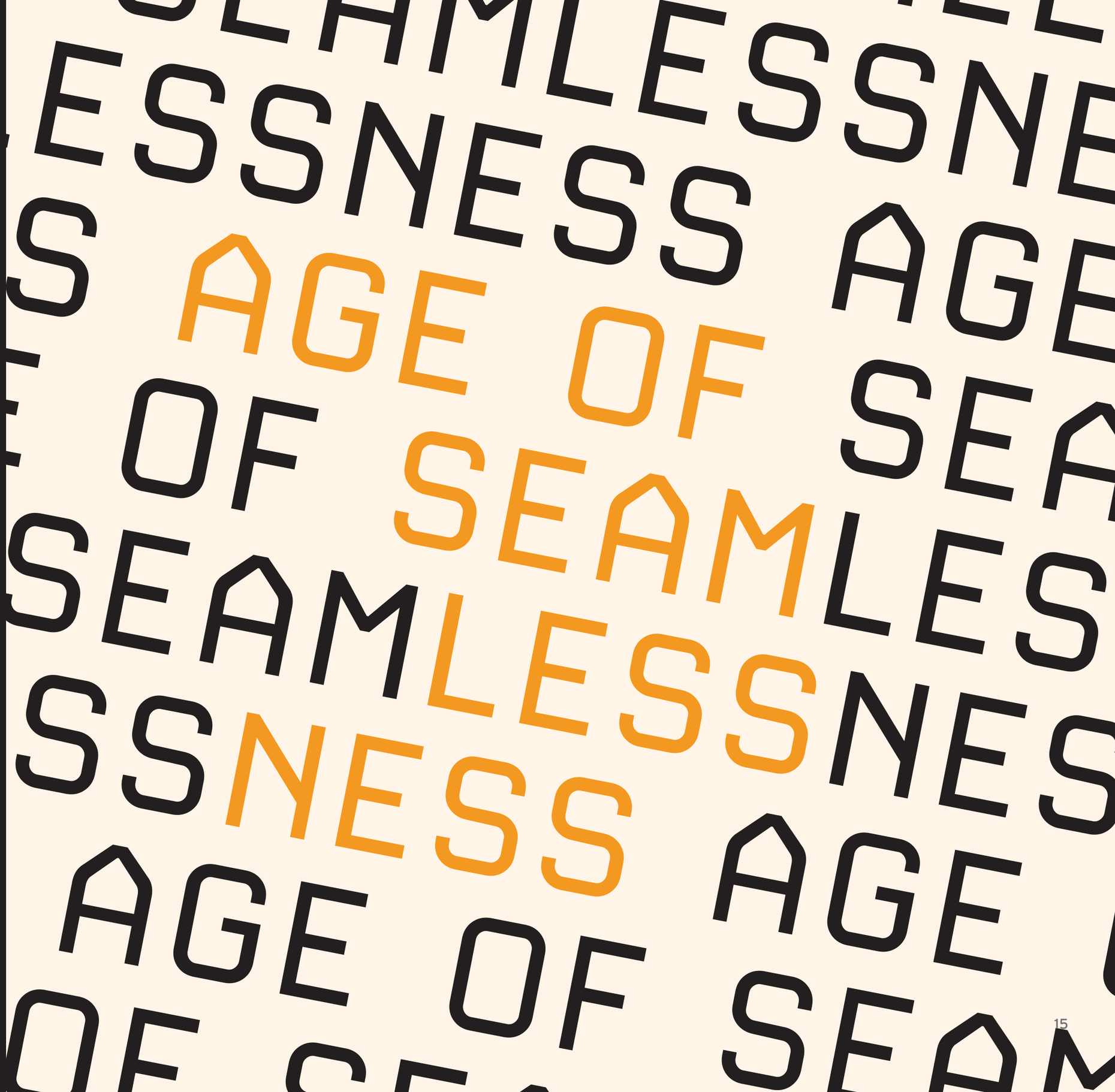
01 Age of Seam less ness

We are seeing the disappearance of payment as an active action of the customers and this process is accelerating.

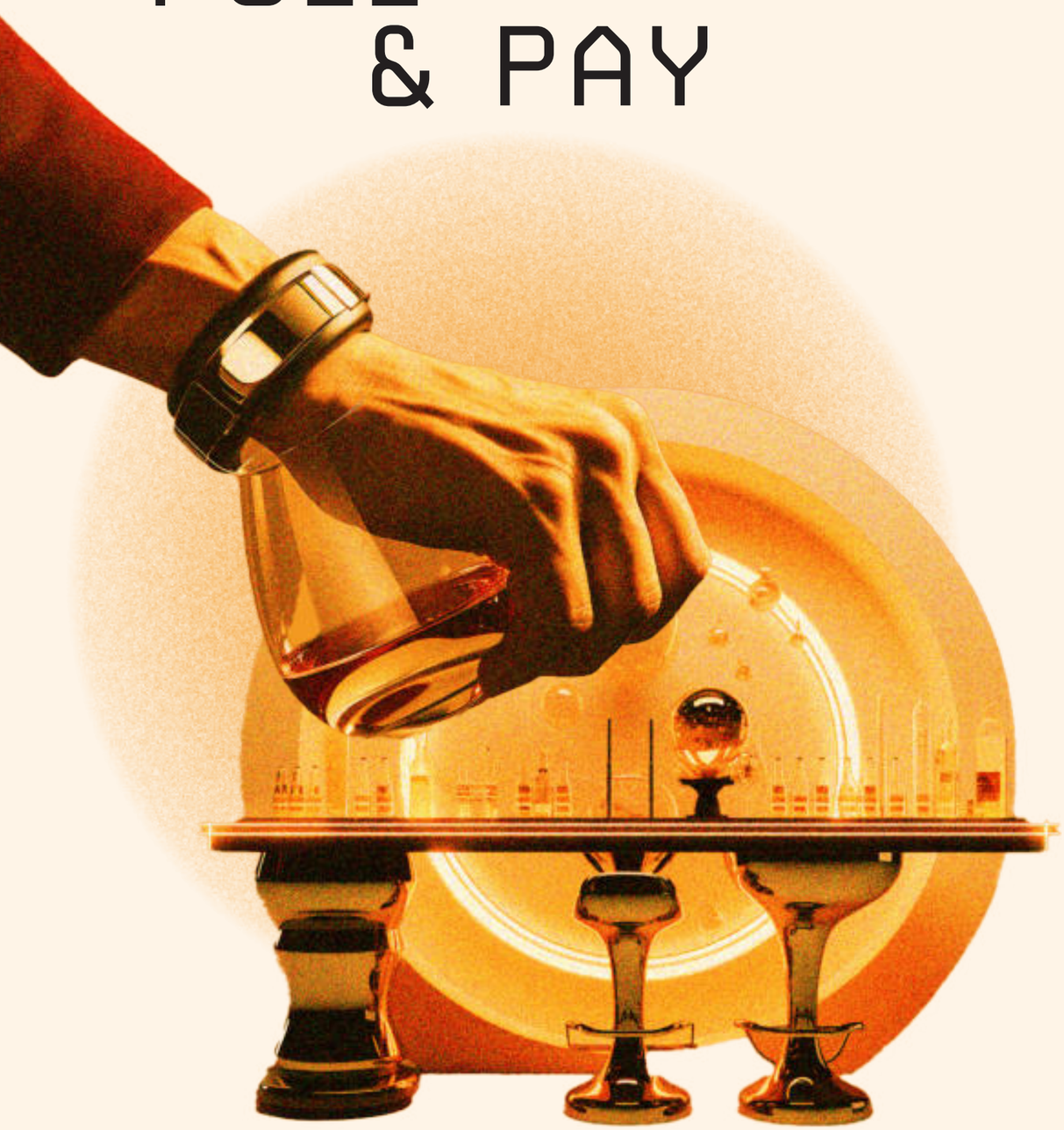
Mirko Krauel,
OTTO Payments

Age of Seamlessness: Payment becomes invisible

The future of payment is seamless. The slightest bit of friction in the payment process can make all the difference between a purchase and jumping off at the last second. Sellers who let consumers shop instead of holding them up with payment processes will create successful payment experiences. This is equally true for digital ecosystems, super apps, comprehensive payment and return options, the battle for the top position in digital wallets and invisible payment processing that runs behind the scenes. When finding a balance between convenience and security, retailers and service providers need to adapt their concepts to meet the future of payment.



PULL & PAY



Frankfurter Allgemeine Freitagszeitung
22.10.2034

Gliding through the evening

You would hear the ice cubes clinking in the glasses along the terrazzo counter if it wasn't so loud. The bass in the bar doesn't just get the people on the small dance floor moving – multi-coloured liquids also slosh up and down in tumblers, champagne flutes and stemmed glasses.
"A Zero Pinot Gris!" shouts a mixologist behind the bar, taking the non-alcoholic wine handed to her by the iMix robot. On contact with the robot, a few digits light up first on the robot's arm, then on a narrow band on the mixologist's wrist, indicating the price of the wine she has just picked up. "A Zero Pinot Gris!" she calls out again and looks around. A young man pauses his conversation with the person sitting next to him and raises his arm at the end of the bar, wearing an identical band to the one of the mixologist. The mixologist pushes past a colleague and two other iMix robots. Simultaneously, she and the customer glide their forearms across the bar towards each other: She to push the wine to him, he to move his Paycelet over the contact reader, checking the price as it lights up on his wrist and pulling the glass towards him in the same movement. The mixologist winks at him and disappears behind the bar, while the customer turns to the person sitting next to him, raises his glass briefly and then resumes his conversation.

Creative and unique – this Saturday, the atmosphere of Frankfurt's Skybar was raised to a whole new level. Once Germany's highest rooftop bar, the conceptual dreams of the operators are not restricted by mere architectural boundaries. The creative spirits are flying high here: After hip mix & pour robots "in a sleek chrome look" became an integral part of the service team in 2025 and a completely cashless concept was introduced in in 2026, the tech-loving Skybar team has upgraded their location once again: If one weren't paying attention, it would be easy to overlook the discreet grey, rectangular surfaces measuring around twenty by ten centimetres in size incorporated seamlessly into the bar surface. Customers can simply glide over them with their Paycelet (or another wearable device) to pay. The idea behind it is as simple as it is ingenious, and is described by Spanish-Japanese Paycelet founder Mirabel Kawamoto as follows: "You pick up your wine glass and pull it over the counter towards yourself – why shouldn't you also pay with this gliding motion when you are accepting your order?" and in the same breath promises "Seamless pay for a seamless day."

The company Paycelet was founded in Bilbao in 2024 and, after merging with Paypal over the last few years, has grown from a product design company for payment wearables into one of the leading technology service providers for the patented "glide" technology. As Frankfurt is a multicultural hotspot in Germany, it can be expected that the payment service will be very popular here, at least with an international audience. And what's more, members of the popular Sky Circle get the new Paycelets for free. Other visitors can decide for themselves if they want to jump on the bandwagon of the future and join fellow "gliders" or if they prefer to continue using the tried-and-tested Tap and Pay system with an extra movement. The least they could do is download the Paycelet app to their smartwatch. Activating Seamless Mode can already increase their payment convenience significantly. In the end, only the test run will show how sceptical smartphone lovers react to the new technology. We look forward to seeing what heights the Skybar will take us to next. Cheers!

ENTERTAINMENT

The Verge
22.10.2034

Merger of the month: Feel, nod, experience. Disney x Smart Eye

Disney Pay and the Swedish behavioural analysis experts from Smart Eye have joined forces to make Disney Life, the entertainment group's shopping integration service, even more convenient. With the introduction of the Disney Pay payment backend and the Disney Life frontend visible to users eight years ago, the consumption of films and TV shows changed significantly: End customers were suddenly no longer only able to buy fan merchandise online, but also clothing, furniture and other interior design objects directly from their favourite TV shows. More and more retailers listed their products on Disney Life.

No more endless browsing: In an effort to improve the user experience, the cooperation between digital giants Disney Pay and Smart Eye is now delivering an update that should make orientation within the extensive product catalogue easy again. Once the emotion recognition function in the personal Disney+ profile is activated, users will only see those products to which they have had a positive emotional reaction. If streaming is paused, new products appear on the pause screen.
But that's not all: Thanks to the new Pay per Nod biometric payment function, these products can bevordered simply by nodding your agreement. And as if that wasn't enough:

Users can select or adjust the account used for product payment at a later date – even if the order is already on its way. To do so, they only need to save a selection of payment options, for instance their Mastercard, their PayPal account or their World ID. Smart Eye bears the risk. And if a retailer listed on Disney Life offers bonus points, rewards and loyalty partners on its website, rewards points are credited directly to the accounts of Disney+ users. Writing this from our editor's couch fresh out of the 18th Mandalorian season we cannot stress it enough: That's what we call convenient!

SHOPPING

EVERYDAY

What a hassle it all was back then, Paul thinks. He remembers his life in the year 2024:

Checking the value of his share portfolio in his neobroker app just after getting up. Then, ordering milk for breakfast from Getir. The bus ticket on the way to the office was bought in the Rhein-Main-Verbund app. He used Apple Pay to pay for lunch at a fast-food restaurant. For afternoon appointments he called an Uber or unlocked a Bolt bike. And he used Airbnb to book a hotel for his annual holiday with friends.

What madness. As if life wasn't already complicated enough. When Paul thinks back to 2024, it seems to him like a technological Stone Age. Back then, very convenient services did exist – with a super app for daily life – just not in Germany. Things were very different in China, where more than a million services could already be accessed via WeChat: Food delivery, driving services, dating, parcel delivery, payment and so on and so forth. You could live your life and never had to leave the super app to coordinate it. In the meantime, WeChat has also become available in Europe – a novelty that was only made possible by the democracy movement and the country's warming relations with the West.

For Paul, however, Everyday is the only viable option. The Dutch super app simply combines everything that is important in everyday life. What's more, the B corporation behind it, Alledag, which reacted at just the right moment to the break-up of Google by US anti-trust authorities, has a strong ecological philosophy –

something he might not have paid much attention to ten years ago.

Today, Paul really appreciates the Daily Carbon Competition. People compete against each other in neighbourhood areas to see who produces the lowest CO2 emissions.Everyday awards bonus points for cycling to work, which are doubled if you choose a plant-based lunch. Of course, Paul is biking today.

He redeems the points at his supermarket in the evening. Even though he could afford to have his plant kangoroo burger delivered, he prefers to shop in actual stores. Why? Everyday recently introduced Food Dating: The Everyday in-store map guides people with a microbial match to the relevant supermarket shelf. Admittedly, it's pretty questionable. But it's also great fun. And who knows – maybe it does work. At least Paul finds Elin quite likeable at first glance. Their mutual microbial match is 97%. They decide to book a table at Solar Sushi with the Everyday voice booking service and use the bonus points from their joint walk to the restaurant when paying – with Everyday, of course.

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DON'T PAY _ EXPERIENCE

Commuting to work with a smooth transition between e-scooter, train and shared bike. The coffee you order with an app, which is delivered when you enter the office. The garage door that opens automatically as soon as you turn into the driveway. The light that comes on in the hallway when you slam the car door shut. The gig economy that delivers the pizza to your living room sofa at short notice for streaming evenings. The dishwasher tabs on a monthly subscription. The fridge that tells you when you have run out of food. The personalized muesli mix and the baby food that matches the stage of development of your baby.

These are just a few indicators of a world committed to reducing friction. A world in which seamlessness is the foundation of a good user experience. Steps that once required explicit actions are increasingly fading into the background. No one is interested in small-scale processes in which we need ten steps to to rent a bike, for example, or (as we are ultimately looking at payment in this text) to complete our purchase. If we look at the drivers of change, Apple has made a major contribution to the trend towards simplicity with the development and expansion of the iPhone and other products. When children can intuitively use an iPad almost better than their parents, then the developers must have done a good job. However, this also means that consumers have become more and more accustomed to these simple and very efficient applications.

If we were to design services from scratch today, we would probably consider the seamless nature of our solutions from the outset. But anyone who wants to create something new to improve what already exists must deal with precisely that: The existing product. The present does not appear out of nowhere. The moment that we are experiencing right now is the result of many decisions made in the past. These decisions are almost always made by different market participants at different times. The present grows out of many past situations. What does this have to do with payment?

Today's payment landscape is the natural result of the decisions and actions that various retailers, service providers and other market participants made in the past. Some of these different players have developed systems together, while others have developed alternative payment technologies, systems and solutions alongside each other. That is why today's payment landscape is fragmented, characterized by the coexistence of solutions, but not always by their interconnectedness. If we were to take stock of the current payment landscape, we would find ourselves in the middle of a payment archipelago: We would be standing in the middle of an area made up of many different islands trapped in a common body of water. This image can be applied to almost any other industry. However, why it is so important to visualize this image in the truest sense of the word is due to the fact that in the studies and articles, in the podcast conversations we analysed and also in the interviews with experts conducted for this publication, a vision of the future was formulated that makes us especially aware of our current payment archipelago. The forecast found in all these media is as follows:

The future of payment is seamless and increasingly moving into the background.

Payment is becoming natural

Experts see a future or the desire for a future of payment that is seamless or invisible. While there is a lot of talk about this future, many of us probably view the present as anything but seamless, that is, precisely as the fragmented archipelago described before instead of a singular large area of land. This begs the question: How can we make sure that this predicted seamlessness in payment does not remain mere rhetoric, but actually becomes the future of payment? How can we achieve a truly seamless payment experience in 2034?

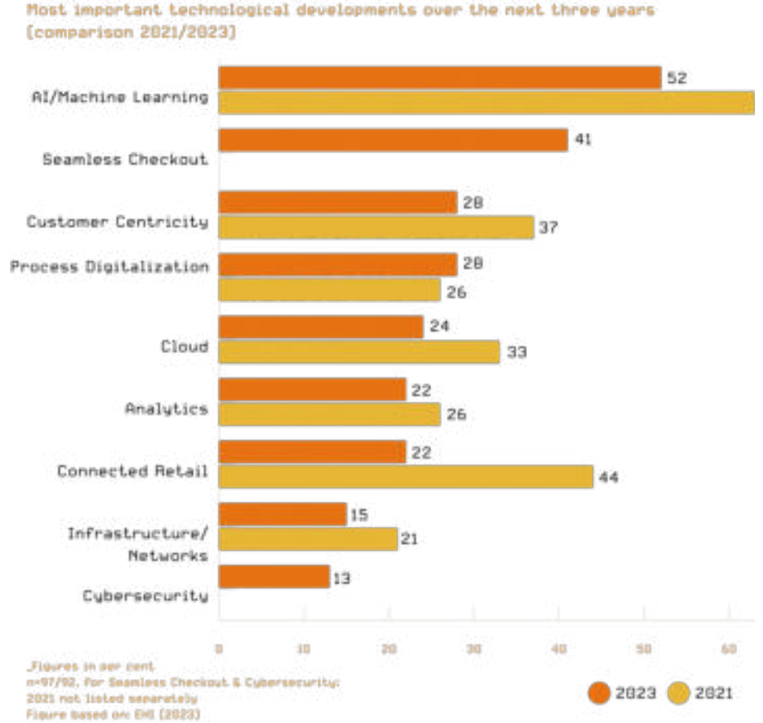
In the scenarios presented earlier, we are immersed in a world in which payment becomes part of us – remember the bar scene: A payment is made by gliding a wristband over a contact reader when a wine glass is accepted. Any movements we make are integrated into the payment process, so that payment takes on an almost natural form. It will become an extension of the human body without us having to have chips implanted in our skin. Form factors (chips, wristbands, apps, etc.) and the actual payment process (which payment method is stored where? Who bears the risk of payment? Which technology is used?) play a decisive role. There are already developments in this area.

The company Payletti from Rödermark sells payment bracelets. The focus here is on turning functional objects into fashion. In the Pull & Pay scenario, the emphasis changes: It is certainly conceivable that the Paycelet could be purchased in different designs, but that is not the point. Nor is it a question of whether we want to use a bracelet, a ring or our voice (difficult in a noisy bar environment). It is first and foremost about the interweaving of functionality and naturalness. The first Shop & Go concepts are already making use of this integration, as are an increasing number of mobility providers who are incorporating voice commerce or integrated payment solutions such as in-car payments into their service portfolios. Preferred means of payment will be stored once and customers will only need to select the products and services. This could give rise to completely new business models, for example car manufacturers integrating functions and services (that were once traditionally selected as optional extras when configuring "their" cars) as pay-per-use vehicles, leading to additional monetization options for the original equipment manufacturers (OEMs).

Hence, if you want to make the payment of the future seamless, you need a real talent for observation and a strong sense of context. This includes combining everyday movements, objects and technologies already in use and payment playgrounds with new solutions. These new solutions could, for example, build on objects that customers already own, such as pieces of jewellery that can be enhanced with a chip and used for payment, or watches that are connected to apps. Simultaneously, the question of what can actually be omitted at the moment of payment, for instance selecting a bank card, entering a PIN, etc., can also be used to compress a payment process on the user side, resulting in convenience, speed and the absence of friction. The challenge lies in providing something radically new with a feeling of familiarity on the side.

> We will see a trend where objects that are already used for another function can also be used for payment. Who knows whether these will be headphones or earrings? But one thing is certain: We have all the technology needed for this. This is no grandiose future scenario. If we are talking about a future in ten years' time, we will definitely be able to do this.
>
> _Laura Treude, Douglas

> Why do I have to pay rent once a month? I could also start thinking in terms of pay-per-use models. This makes things and services much more granular, much smaller, as well as more readily available and much more rewardable.
>
> _Jens Hachmeister, Deutsche Börse



Omnichannel: More than just online

Whenever friction disrupts consumer processes, the conversion of prospective customers into actual consumers is stopped. Does this only apply to e- and m-commerce or also to the point of sale (POS) in stationary retail? Although the topic of conversion originated in the online world, it is becoming increasingly important at the POS. The two worlds are becoming increasingly intertwined (→ *Omniverse Pay*) and the omnichannel topic is gaining importance due to the increasingly high demands of consumers, for example for truly interlaced consumption and seamless checkouts (→ *Figure: Most important technological developments over the next three years*) for a cross-channel shopping experience. Retailers and service providers offer approaches that are designed to allow for seamless shopping experiences as well as complaints processes. These processes also have an impact on payment and its processing. A shopping experience can only be said to be completely seamless when the payment processes are seamless, too.

It should not be forgotten that omnichannel solutions are interactions between organizations, business processes and IT systems (for instance ERP systems) on the retailer side and the payment solutions on the service provider side (for example PSPs, acquirers and providers of payment methods). These include the connection for authorization and processing of payments, clearing and settlement, reversal or crediting, reporting, etc. This means that the main challenges lie in the creation of an end-to-end omnichannel solution where it does not matter which channel is used to initiate a purchase or whether the purchase and return processes take place through different channels (such as a purchase in the online store and a return in the store with credit to the payment medium used online). On the other hand, the challenges lie in setting up the necessary business processes, which are supported or specified by IT platforms and ERP systems.

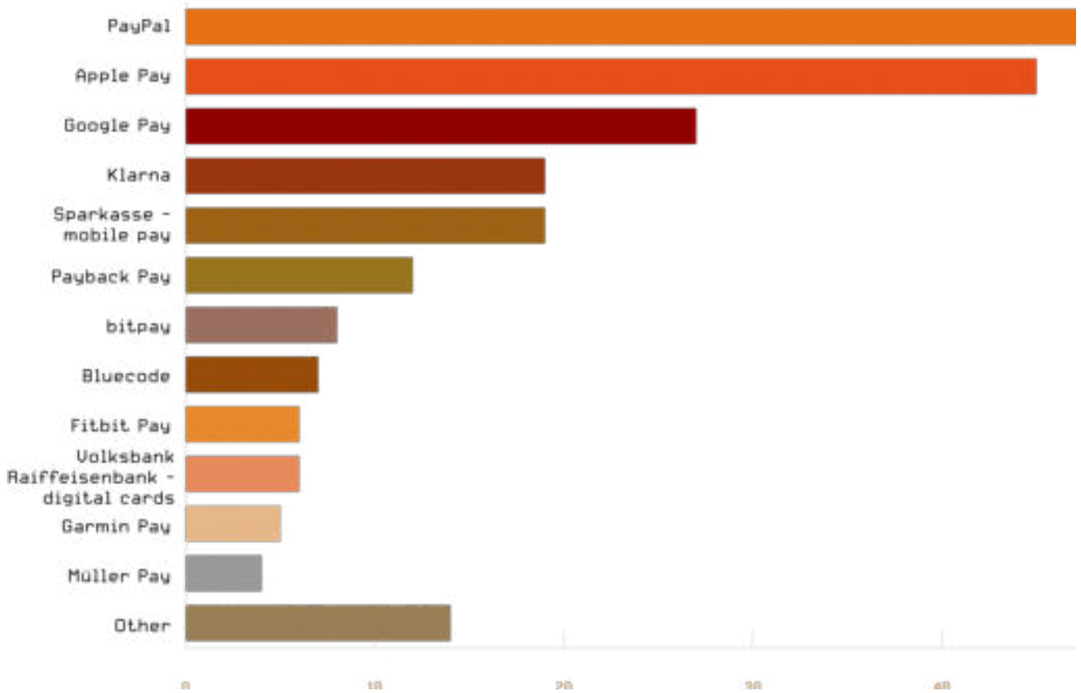
With these solutions, the individual payment transactions must be clearly identifiable in all systems and be applicable and modifiable for possible business transactions. This also includes the reporting functions for retailers and customers. And although these concepts are easy to work out in theory, many retailers fail to implement them in practice. This might be due to the organizational structure of a chain store (franchise), legacy systems, a lack of IT harmonization or a lack of cooperation across national borders. Young retailers or start-ups with a multi-channel strategy have it much easier because they focus on these approaches and processes in the shopping experience right from the start and build their organization in line with them. However, established companies such as Nike, Starbucks and Douglas also have very good omnichannel solutions, whereby the focus is more on appealing to customers across different channels and the shopping experience and less on the purchasing process. Even with these good examples, customers will often have to start from scratch when they switch from one channel to another.

Top of Wallet: Competition for the prime spot

When it comes to digital payments, wallets are becoming increasingly important. This is true both for storing digital payment cards for use at the POS through the NFC interface and for identification or registration for the payment applications mentioned in this text at REWE Pick&Go sites or at ticketless public transport applications as in the example of Stadtwerke Augsburg. Digital wallets are currently the bridging technology that may be expanded or even replaced by natural, process-based and biometric features in the future. They pave the way for a digital culture characterized by seamlessness. This digital culture will determine our future, and this future begins here and now.

For years, card providers have been engaged in a fierce battle for the top position in digital wallets. They have tried numerous approaches to come out at the top of wallet, including custom card designs, loyalty program integration and personal photos. However, as usage is shifting to the digital realm, the area of engagement is also changing: The future belongs to digital wallets. With the emergence of value-added services and digital ecosystems, service and card providers should focus precisely on this.

Most popular mobile payment providers in Germany in 2023

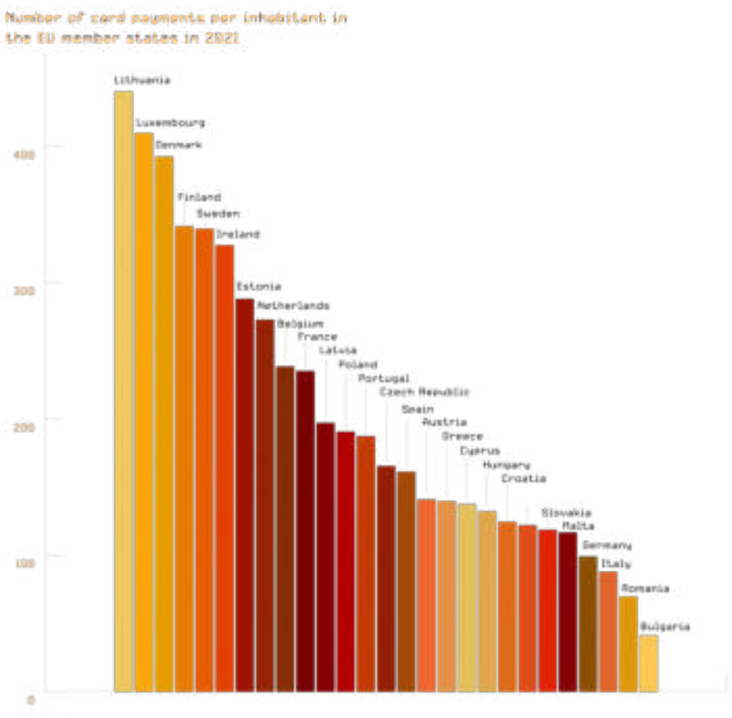


Figures in per cent.
n=1065 respondents who have made mobile payments in restaurants, shops and other points of sale in the last 12 months (Germany, April 2022 to March 2023; 18 to 64 years)

A study by Mastercard shows that around half the population of Great Britain believe that physical wallets will become less important in the future, with a fifth of them (and two fifths of millennials) saying they no longer expect to use a physical wallet or purse within five years.

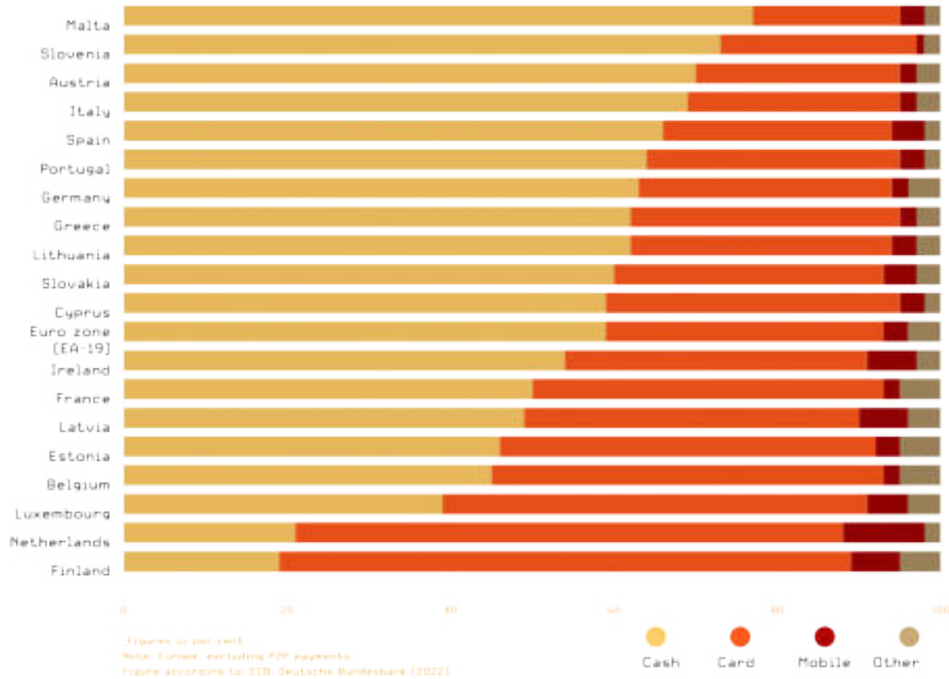
These opinions are linked to the continuing decline of cash usage. A decade ago, around 60% of payments were made with cash, and UK Finance estimates that this figure will fall to 6% by 2031. Looking to the future, these developments may of course occur sooner in some regions than in others due to cultural and individual consumer preferences. Nonetheless, the trend is clearly recognizable (→ *Figures: Number of card payments per inhabitant in the EU member states, Mobile payment in stationary retail, mobile payment providers*). VISA says "the digitalization of payment transactions is progressing faster than expected – and the battle for the top position in consumers' wallets is getting tougher and tougher as more and more new payment options are becoming available. However, card providers have one major advantage in this battle: The ability to understand transaction data can help them to meet the expectations of cardholders and build better customer relationships." VISA is clearly focusing on data and the associated added value for providers and retailers (→ *War for Data*).

Number of card payments per inhabitant in the EU member states in 2021



Note: Cards issued by domestic providers; without e-money card
Figure according to: ECB (2022)

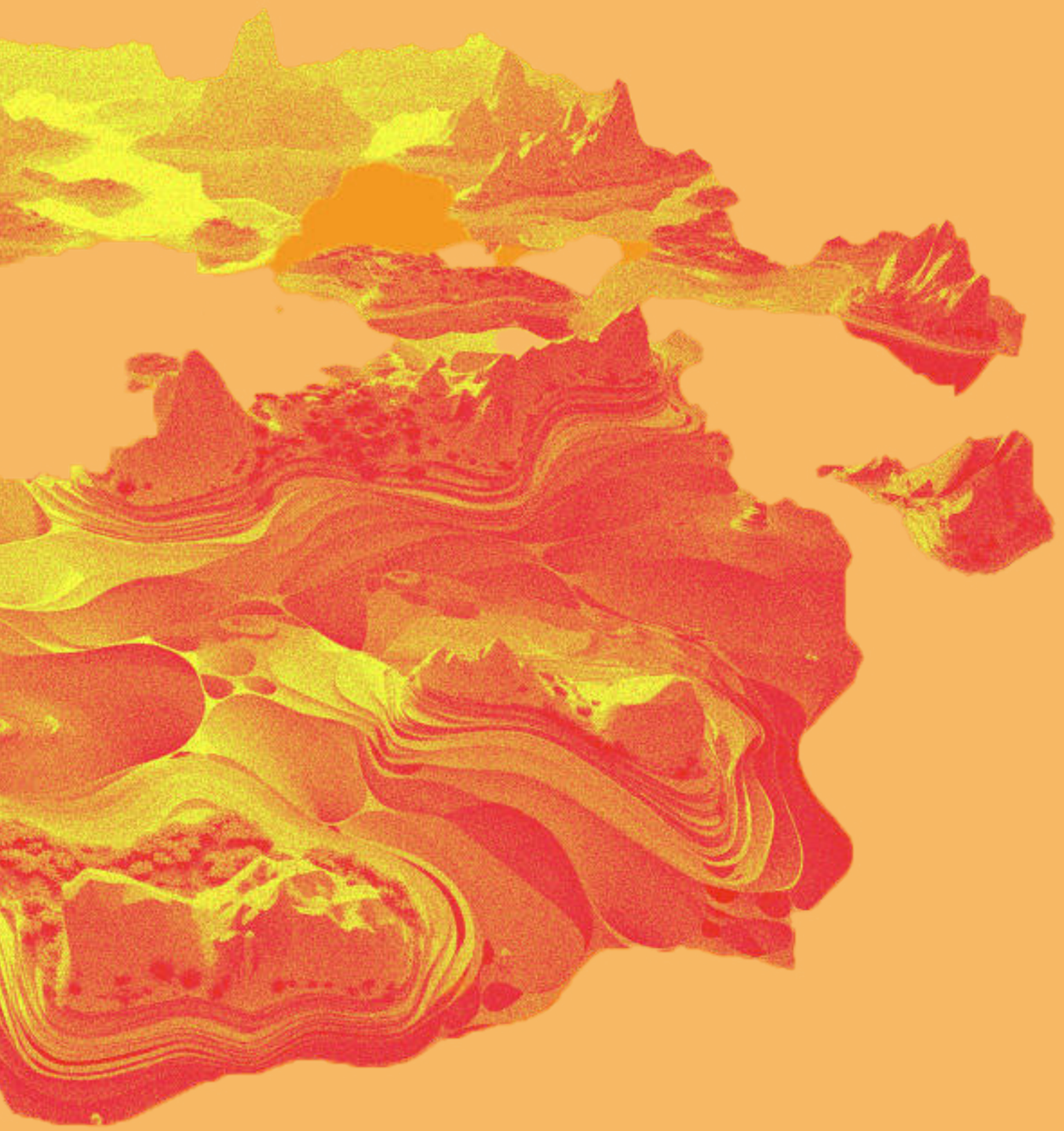
Share of mobile payment in stationary retail (POS) by country in the eurozone in terms of transactions in 2022



Figures in per cent
Note: Europe, excluding P2P payments
Figure according to: ECB, Deutsche Bundesbank (2022)

The exciting question remains: Who will ultimately prevail from a payment perspective? Who will win the battle for the preferred and stored payment medium? In terms of the technological interface, there is no clear winner – NFC and QR code-based payment methods are equally established in the market today. In addition, in-app payments are growing in importance and are increasing the lead of e- and m-commerce payment methods over traditional payment solutions in stationary retail that are generally seldom available in the online world, such as the girocard. In Germany, banks and financial service providers are struggling with restrictive data and data protection laws and

often find it difficult to develop value-added services. As a result, digital wallets from Apple, Google and PayPal currently dominate in Europe. In Asia, their counterparts are WeChat Pay, Alipay or Paytm. Ultimately, however, it is not about the specific payment method that is stored as a preference in the digital wallet, but about who wins the overall battle in terms of digital ecosystems, benefits, identity and data of the customer.



Payment stands for ambition

Let's imagine a future in which we can pay with just one technology in every situation – sounds too good to be true? It probably is. We only have to look at the present to see that this idea is a utopia. That's all right. Imagine you had to create a payment solution for everyone. With divergent needs, generational preferences and different technological capabilities, who has the confidence to shape this future? That means we have to be prepared for solutions to emerge gradually over the coming years. Different technological standards will continue to coexist in the future.

The future of a seamless and seemingly invisible payment process is still on the sidelines, not only when it comes to omnichannel solutions, but especially in the linking of products and services with added value, which often only arises from invisible payments. Examples can currently be found in local public transport, where different channels and many confusing price and fare systems increase customer frustration. With the swa BiBo app, Stadtwerke Augsburg has introduced a ticketing system that makes it possible to use bus and streetcars without having to purchase a traditional ticket. Trips are recorded by the app and billed automatically at the end of the month promising customers the best price. Passengers currently still have to check in and out in the app, but this step will also be eliminated in the future as the app will then automatically recognize when a person boards or leaves the vehicle. A similar solution has already been in use in London for many years with the Oyster card as a prepaid model. Other examples from the transportation sector are taxi apps such as Uber or FREENOW, which a passenger uses to book a taxi ride to a specific destination. At the end of the trip, you simply get out of the car while your payment is being processed in the background. The preferred payment method and the amount for the tip are already stored in advance in the app settings. Back to Augsburg and the ambition to offer a seamless mobility experience. With the swa BiBo app, you no longer have to worry about one-way tickets, day tickets or season tickets once you have registered and entered your preferred payment method: There is a best price guarantee from the public transport provider based on travel history. The added value of this solution is obvious, and in the future, we will probably only have to choose our preferred type of transportation because the rest will run in the background, including billing and payment. Solutions such as the swa BiBo app show that seamlessness is absolutely possible on a small scale. Now all that is left is for someone to harmonize the numerous regional public transport providers so that we as users don't have to switch apps when we change regions.

A seamless payment future won't happen if we only focus on small niche concepts. The central challenge we are facing requires solutions that do not violently push our fragmented payment archipelago into a single island, but ensure that firstly, payment transactions are seamless on each individual island and secondly, the individual payment islands are so well connected that it feels as if they were just one land mass. In line with the subject of mobility from the previous paragraph:
We need a boat that conveniently connects the islands of our payment archipelago. As a payment player, you can choose what you want to work on (first). What is certain, however, is that we need to make an effort if we want to create a truly seamless payment future, which should be the norm in around ten years' time.

> I find it surprising that we are celebrating instant payments when we know what is technologically possible. It is surprising that we are applauding the fact that transferred money is visible right away even though wallet solutions like PayPal have been enabling this for years.
>
> _Laura Treude, Douglas

It is of course important to celebrate successes. They provide the necessary motivational boost on the road to the future. However, it is just as important to always look at things from the point of view of retailers, service providers and end customers and critically examine the situation: Does the solution we are designing really create noticeably less friction, is it more natural, is it simpler, more invisible, etc.? And could it be even more seamless?

The second challenge essentially involves interweaving and bundling any decentralized and organically grown structures in order to create seamlessness. Let's make it concrete: In the second future scenario, Paul uses Everyday, an application that allows him to manage his daily life. Payment is part of this and becomes a self-evident service that is closely and conveniently interwoven with other services, leading to a better quality of life. For example, bonus points earned by walking will also become a means of payment in this future. If you want to offer a seamless payment experience, you have to ask yourself the question (as emphasized in the omnichannel section of this chapter): When, where and how should a payment be made? And even before that, there is the question: What experience do I want to offer my customers and how can payment become a seamless part of my service?

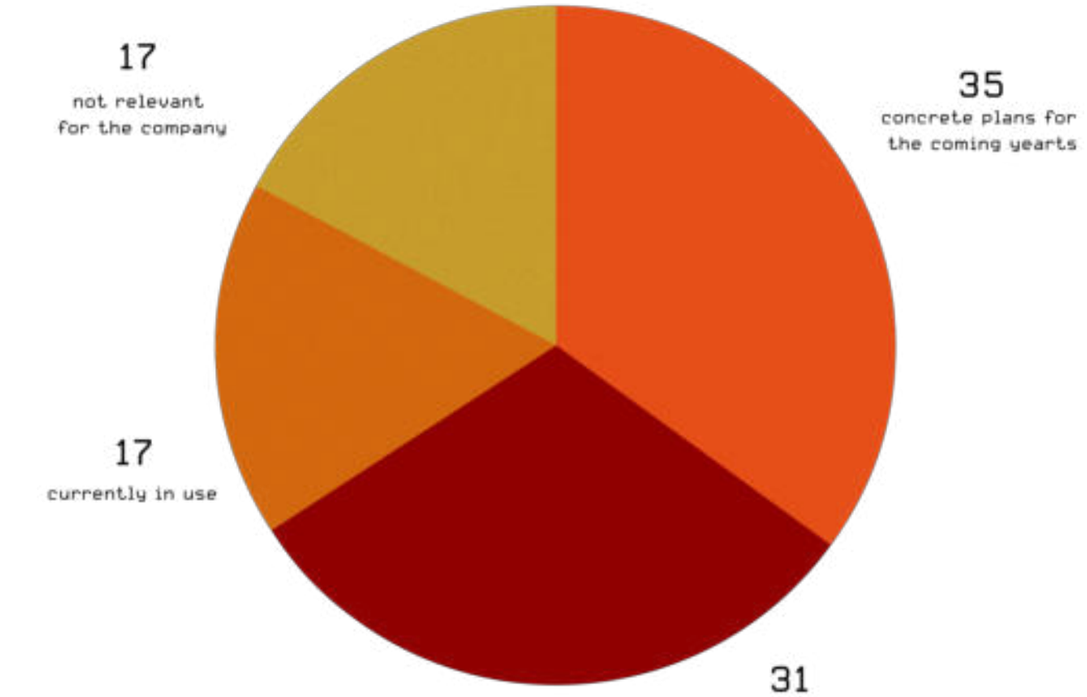
> Seamlessness, with its accessibility and simplicity, is a basic requirement for the younger generations.
>
> _Jürgen Schübel, VISA

Everyday is a fictitious super app. Although not yet widespread in Europe, we are already seeing a centralization of similar services in specific areas of life and on a small scale, for example, in the case of Jelbi in Berlin. The mobility app bundles all sharing options and local public transport services. If we look beyond our national borders, we can see much more ambitious projects. Gojek from Indonesia is a real super app. It can be used to buy groceries, medicine (with integrated medical advice), restaurant meals and basically "everything everywhere". Users can order taxis and taxi scooters, deliver parcels and even have their move from one apartment to another organized. You can stream movies and shows, play games and book tickets for concerts. And of course, with Gojek's motto of "Drop the wallet, go cashless", you can make mobile payments, pay bills, defer payments, take out insurance, invest and donate. Organizations can use it to manage employee transport costs and payments, set up a cloud-based POS and monitor the development of their own company. Gojek's business model is equally B2C and B2B. A look at such a range of services shows that in addition to the majority of internally developed services, there are a handful of external brands. A future that promises seamlessness needs alliances and partnerships (→ *New Ecosystems*). It requires economic thinking in terms of common goals and formulating the benefits for all sides to stimulate the necessary motivation to get started. After all, very few brands and organizations are already so prominent in the daily lives of end customers today that they can build a seamless super system on their own.

Don't pay – experience

The results of the biennial survey of CIOs and IT managers conducted by the EHI on the most important technological trends and developments in retail shows that artificial intelligence continues to be perceived as the most important future technology for retail. Organizations have already invested in initial projects but still see room for improvement. Driven by staff shortages, decision-makers are especially focusing on process automation. The Scan & Go and cashierless store approaches (→ *Figure: Cashierless store*) mentioned earlier are considered here with regard to future investments, as are personalized user journeys. Many large retail chains are now experimenting with cashierless stores, and we expect the number of these stores to increase enormously over the next ten years. There will certainly continue to be hybrid

Cashierless store



_Figures in per cent
n=92
Figure according to: EHI (2023)

models, but the opportunities offered by artificial intelligence in particular will massively reduce the investment required in new infrastructure and will also be able to meet today's requirements, such as weighing goods, even better. At present, the investment for this type of store for well-known discount chains or full-range retailers are in a very high range, sometimes seven figures per location. This figure will decrease over time and consumers will start to become accustomed to a more seamless shopping experience. Today's familiar self-scanning checkouts used by customers, just like app-based scanners, only serve as a bridging technology and are not really an experience worth mentioning from the point of view of many consumers. Who wouldn't much rather just go shopping instead of having to worry about paying or queuing at the checkout?

> Frictionless payments is about being able to pay with the least amount of fuss.
>
> _Nuutti Kotivuori, Nexi Digital Finland

So, what does this kind of future mean for service providers and retailers?

What are the promises of a transformed payment experience in an age of seamlessness? In our interviews on the payment of the future, many variables were mentioned that need to be considered when working toward seamlessness: Friction or the lack thereof, mobility, convenience, speed and time savings and emotionality. All of these points indirectly address the question of how payment can be a positive experience so that we can focus on shopping, eating or travelling, in short: On experiencing instead of paying.

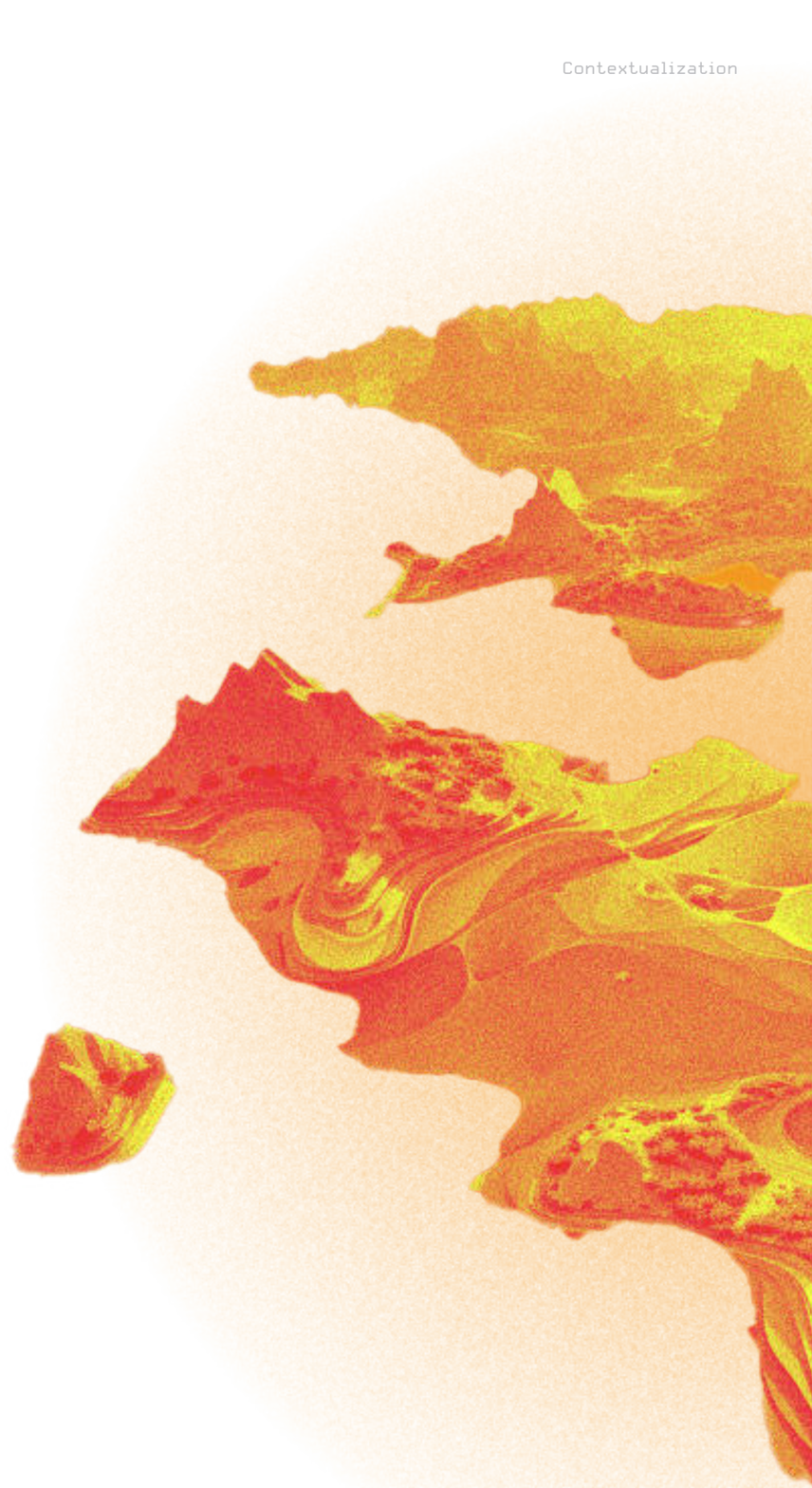
If an organization focuses on responsibility and not only on profit, the more serious aspects of payment are at least as important and need to be addressed: Data protection, legal requirements and the financial well-being of end customers.

> Is it important that payment really works seamlessly everywhere _ or is it equally important that payment is so secure that no one can hack a system?
>
> _Dr Lea Maria Siering, Token.io

The answer to the previous question is probably: Both.

Seamless payment appropriates supposed paradoxes and turns them into value-creating payment experiences.
If you want to be forward-thinking when navigating through the payment archipelago described above, you need good solutions for land and water in a figurative sense. Navigation hybrids that help us (whether retailer or customer) seamlessly wherever we need help. Anyone who successfully creates seamless processes in the future will therefore not only look at technological feasibility, but also at the reality of the users' lives, who should enjoy a seamless experience.

True seamlessness means recognizing pain points and integrating systems organically into end customers' daily routines and retailers' processes that have evolved over time. This means that payment must take on a central role for retailers and service providers so that it no longer needs to play a role for customers. Those working on a seamless future of payment will be able to offer a seamless payment experience in line with legal and security requirements and a keen awareness of the context, they will increase convenience responsibly. Not an easy task. But a desirable future.



CONCLUSION

The future of payment is seamless.

Simplicity and efficiency are moving to the centre of the customer journey and will form the strategic success factor for future services. We will then be talking about "experience" and no longer about "payment".

Omnichannel payment is gaining in importance.

Consumers have much higher expectations and demands for a cross-channel shopping experience. The payment processes must be invisible and fade completely into the background.

Invisibility becomes added value.

It is not only in the context of omnichannel approaches that the future lies in a seemingly invisible payment process which fades into the background. This is the foundation for linking products and services with additional added value.

Digital wallets are the bridge to the future.

In the future, they will be expanded or even replaced by natural, process-based and biometric features. Humans will become part of the payment process. Artificial intelligence is driving this development.

02

New Money

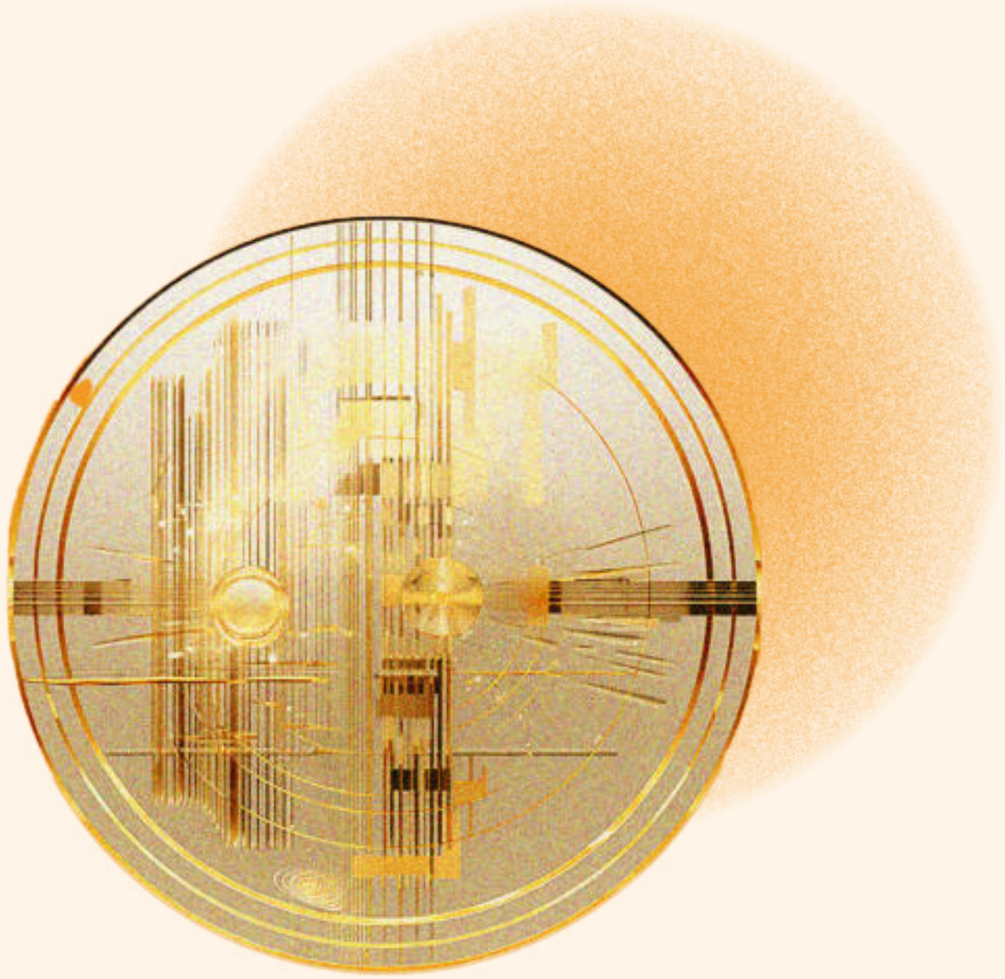
I would be delighted if the trend of digital payment in Europe were to become self-sufficient.

Dr Lea Maria Siering,
Token.io

New Money: Payment is driven by digital money and new values

The future of payment is digital and diverse. The types of payment used in the future will not be exempt from this. Cash is giving way to new payment methods and solutions such as cryptocurrencies, dentral bank digital currencies and wallet services. Retailers face the challenge of accepting the growing portfolio of exciting new forms of payment while traditional standards remain in place. Let's dive into this fascinating world of new money and look at the implications for payments.

UP-COIN



Nadira really needs a drink. Her pitch at the European Start-up Contest in Amsterdam was an emotional rollercoaster ride.

Schiphol Airport, Amsterdam, 06.06.2034, 5:54 p.m.

The number of spectators in the sold-out arena alone was overwhelming. She would never have thought that she would win the audience award with her greentech approach of a bacteria-to-energy grid. She certainly got some sympathy points because of her story: Born and raised in Jordan, she founded her start-up PowerBac and acquired digital EU residency at the age of just 16. She deliberately chose Romania as her digital headquarters: The virtual offices that the country offers provide the perfect VR setting for meetings. Visually, they were also the best match for her taste – minimalist furnishings, elegant wood, plus the digital twin of an Italian espresso machine of the finest quality, which she can use to send coffee to her business appointments anywhere in the world with the click of a button at the start of a meeting.

„What would you like to drink?" The bartender snaps Nadira out of her thoughts.

"A wheatgrass sour, please."

"How would you like to pay?"

"Do you take Up-Coins?"

"Up-Coins, of course. This is Amsterdam. We're open to anything."

Nadira activates her smart ring and makes the payment with a smile. Of course, she could have paid in digital euros or dollars. The Up-Coin doesn't give her any special price advantages.

"Cryptocurrencies are a well-established way to pay these days." The bartender raises a bulbous bottle of transparent orange liquid in front of his face as he speaks. "Is Up-Coin any good?" he asks, swirling the bottle back and forth, following the sprigs of rosemary dancing in the liquid with his eyes.

"Yeah, after some initial difficulties, the Up-Coin is quite successful now," Nadira replies.

She knows that by using Up-

Coin, she is bypassing traditional payment methods, as the Up-Coin runs on a blockchain-based infrastructure whose primary payment flows are not based on SEPA, SWIFT or similar established procedures. With Up-Coin, Nadira has chosen a fully-fledged currency to pay her bill. On the one hand, it uses many integration functions in subsystems (for instance loyalty schemes such as Payback), and on the other hand, it is also accepted by retailers as a valid currency.

Nadira sips her drink thoughtfully, not sure if she should give her standard speech to the bartender or just keep quiet.

"And Up-Coin hasn't just left the legacy of the cryptocurrencies of the past decade behind," she gushes. "It's a globally regulated monetary value with a fixed conversion rate to the euro. And whether people like it or not, Up-Coin has to a certain extent become a prestigious advertising tool for socially-oriented economic activity as the proceeds from the exchange into euros are used to support social sustainability projects throughout the EU."

The barman raises his eyebrows with interest. While he seems to be thinking about what Nadira has said, someone at the other end of the bar raises their voice: "Can we get two Crodino spritzers over here?" The bartender turns around and quickly says: "One second," to Nadira and turns to the couple who are pulling their suitcases next to the bar stools. Nadira watches as amber-coloured liquid is poured into two stemmed glasses. Thoughtfully, her finger wanders over the surface of her smart ring.

She likes the idea that Up-Coin is about more than just money. That it promotes development of a Eurasian start-up community. Nadira has earned most of her Up-Coins by acting as a mentor for other founders. She reflects on how the crazy idea of two students from Israel turned into a really big corporation – with the approach of in-vitro apples.

"Flight 743 to Amman ready for boarding" can be heard from the ceiling speakers.

Nadira downs the rest of her wheatgrass sour. Off to the gate.

E-NION

Voices fill the air on this mild summer evening. People fill the sidewalk of the side street in Leipzig where the gallery is located.

The large shop windows have been pushed open and glasses of water, wine and spritzers sitting on the wide windowsill are occasionally picked up, sipped, and put down again. The interior of the gallery is softly lit. That's all it needs on this July evening.

Yara pushes past an animated couple leaning inquisitively over a swirling salmon-coloured sculpture. Both are wearing sensory enhancement gloves. With transfigured gazes, they gently stroke the surface of the sculpture. Yara stops in front of the thick tapestry hanging from the ceiling on barely visible silvery threads. She looks attentively at the coarse fibres of the fabric, the nearly invisible seams and the iridescent colours of the materials sliding into each other. She likes the object even better than she imagined after the VR tour from her apartment in Ljubljana – and she had already been impressed then. The view and the atmosphere in the gallery alone made it worth taking a day off work at the bank and taking the night train to Leipzig. Yara slowly walks around the gently swaying fabric, but who is she kidding? She really wants this beautifully crafted tapestry. She has been following the works of the artist and his commitment to various social causes for many years. She knows his biography, his evolution, his brand. She has seen many of his group exhibitions and every solo exhibition in Europe in person. She pulls out her phone and scans the glowing green QR code on the floor. Her NION wallet opens:

Product data

Category: Art
Title: Minataurus
Material: Algae-hair-composite, avocado-stone-pigment, banana fiber, denim waste, fishing net
Year: 2034
Artist: Anas Hadid (Germany)
Price: 3.500€

Payment

Account: claudia_richter@e-nion.eu
Recipient: Galerie Claudia Richter
Amount: e-NION 3,395 (recommended transaction currency)
Reference: GCRMina2034

pay e-NION 3,395 now*

*Galerie Claudia Richter offers as 3% discount for this payment method compared to other payment methods – you save €105

other payment method from my wallet

Yara has made a conscious decision to pay with e-NION, the digitalized euro model from NION. She has spent the last few months dealing intensively with all the new payment methods and currencies for the Slovenian bank where she works. This is the only reason she knows that the transaction she is initiating is not taking the traditional route with the SEPA payment systems of banks and processors, but is instead processed in a closed-loop procedure on the NION platform without having to go through the traditional banking system. With this form of wallet-to-wallet transfer, the amount due is immediately credited to the recipient wallet. Yara sees this as a win-win situation for buyers and sellers: The seller, Claudia Richter, can immediately use her e-NIONs and Yara could immediately take her beloved work of art home with her – if it wasn't so big. What's more – and only an insider like Yara would know this – the retailer also pays lower transaction costs since there is no SEPA processing and therefore no fees to pay. Of course, the e-NION also offers more options for payment. However, Yara has chosen the solution that makes the most sense for her. Yara taps on the top button with the NION logo in the middle:

pay e-NION 3,395 now

The QR code on the bottom turns purple. This is probably a built-in feature of the gallery to indicate that the payment is being processed. A moment later, the colour changes and the QR code turns blue.

"There you go," Yara thinks while her phone screen lights up, confirming in Slovenian:

The money has been credited to Galerie Claudia Richter's NION account. Thank you for choosing e-NION as your payment method.

"Yara?" A young woman approaches her. "I'm Claudia, I think we've met virtually. I was in the middle of a conversation when you arrived, but I can see that you didn't need any help anyways." She winks. "I'm glad you've decided to buy Minataurus. Should we make an appointment to figure out the transport of your beautiful new artwork?"

FRIENDSHOP COIN

ShopFriends,
11.02.2034, 4:31:57 p.m.

Your
ShopFriends account

Paid at ShopFriends retailers in February:
€87.91

Your shopping list (17/23)

Apples, Dein Markt organic, 500 g – €3.49
Dijon mustard, Maille, 215 g – €5.45
Steak, Lab-Grown Not Slaughtered, 250 g – €4.37
Mushroom tea: Cocoa Relax,
Schrum, 200 g – €4.99
Carrots, Dein Markt Bio, 1 kg – €3.65
Oats, Kölln, 500 g - €3.88

show completed purchases

Your wish list

Curtain (linen) sea green, Hessnatur – €139.99
HBR 10 Must Reads on Circularity (2031) – €21.99
HBR 10 Must Reads on Work Health (2034) – €23.99
Air purifier 6, Purify - €385.00
Bamboo shaving brush, Winther Rasurkultur – €45.00
Vision Air (2034), Apple – €2549.00

move articles to shopping list

Available Friendshop Coins:

show fulfilled wishes

Available Friendshop Coins: 12,419 FSHC

Did you forget to get something from your shopping list? Pay now with Friendshop Coins and have it delivered to your home!

Convert e-NION to FSHC

Convert FSHC to Steam credit

Convert FSHC to local NFT

Convert FSHC to Green Token for your next trip abroad

Redeem FSHC at your favorite retailers EU-wide on ShopTok

Newsfeed

Your favourite brand has new products on display! Change your Friendshop Coins into euros in your banking app and drop by Eichhornstraße 47, 97070 Würzburg. Friendly Shopping!

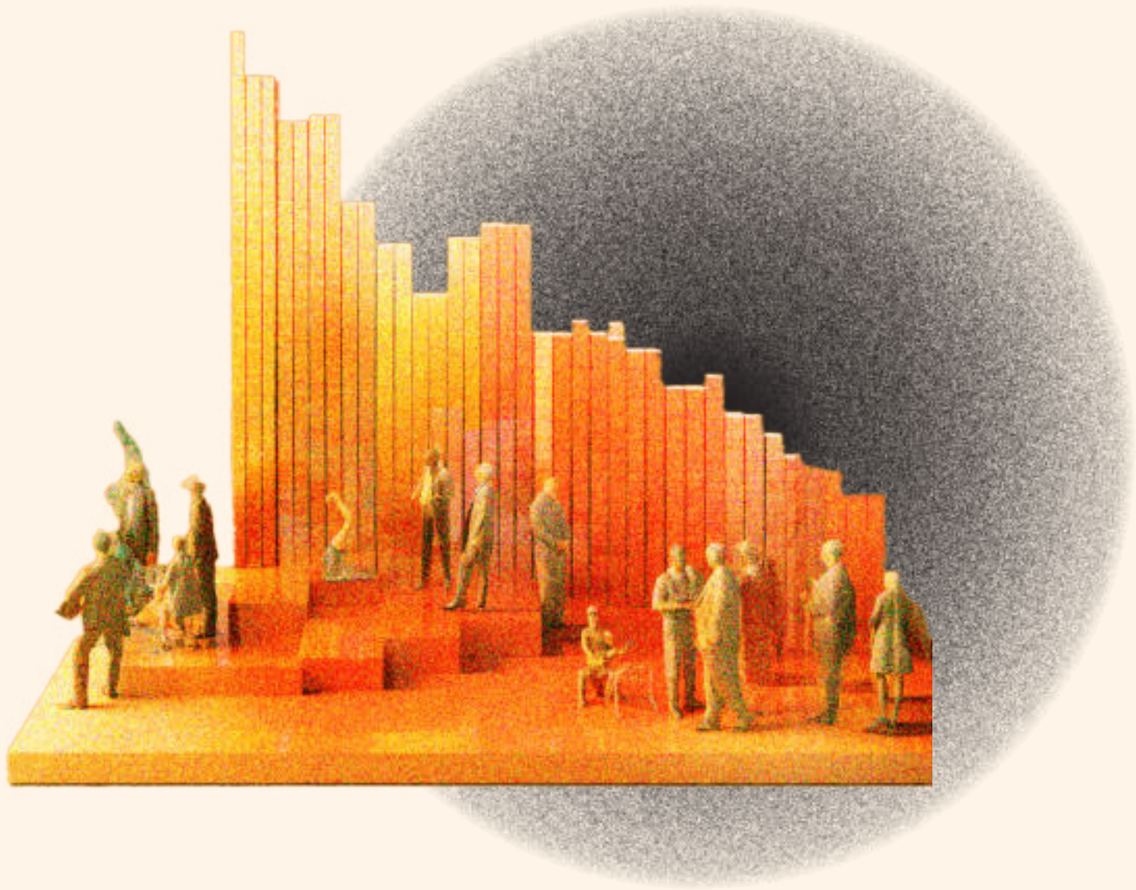
Thank you for your friendship!
Your ShopFriends

A.I.ntellify Your Life | AInatura | Avocado Tech | BioMarkt | irkenstock | Carbonfree Fly | Deichmann | Dein Markt | dm | Douglas | Fielmann | Flix Reisen | Farm Finance | Fressnapf | Galeria | Ikea | Jacques' Naturwein-Depot | nufactum | Media Markt | Penny | Shared Wardrobe | Social Commerce |

move item to shopping list

show fulfilled wishes

BENEFIT UNIT



Petko has just arrived at Hamburg Airport. Over the long holiday weekend, he visited his parents in his hometown of Sofia in Bulgaria, with one of the new solar-powered Airbus planes from Lufthansa.

During his visit, his father advised him to start building up long-term investments now in the increasingly popular Benefit Unit. Petko was completely unfamiliar with this financial institution. Benefit Unit – it sounds more like a corporate department than money to him. His father, who is not an expat who lives and works in another country like Petko, is a Bulgarian banker who has always had a penchant for new forms of money and new means of payment.

In the last decade, the Eastern European countries – especially the greater Sofia area – have been turning into the technology centre of the European payment industry, not least because the labour and office space were still cheap by European standards. For about the last five years, this has been changing as product management departments have been clustering around the technology centres. Sofia has become the European innovation hub of the payment industry over the years, which might have come as a surprise to outsiders. In contrast to his German friends, however, Petko is not at all surprised that not only new technologies, but also new funds, are now coming from his home country and not from the financial strongholds of Frankfurt or London.

Following his father's advice, Petko has initially invested a small sum of just under 2,000 euros in this new monetary asset. However, after talking to his enthusiastic father, the possibilities for trading and potential profit seemed almost limitless.

Not only does the Benefit Unit have fixed exchange rates in several global currencies and can be used worldwide, but trading in the TecDAX and the Dow Jones has been secured for two years. Petko has already looked into this in more detail and found out that the operator of the Benefit Unit apparently assumes the currency risk and offsets potential currency fluctuations through income from the use of various loyalty systems linked to the Benefit Unit. This means he has no risk to bear as a user of these new funds. This is real added value compared to traditional funds. In addition, the Benefit Unit as an investment value has also become an established option in the trading portfolios of European brokers. Although resistance from local banks was more than noticeable in the beginning – the Benefit Unit is a spin-off of a start-up and therefore has had significantly more hurdles to overcome than a bank product – the banks have now also recognized the enormous potential, albeit so far only in their own favour.

And that is precisely why Petko has decided to trade this small portfolio with the help of a private broker in London. Now he just has to call her to find out how he can pay out the profits in real time at the till; after all, he wanted to bring his wife and kids presents from the trip. Petko is running late again.


NEW MONEY NEW MONEY
MONEY NEW MONEY NEW
MONEY CONTEXT
NEW MONEY NEW MONEY
MONEY NEW MONEY NEW
NEW MONEY NEW MONEY

IN THE RACE FOR THE FUTURE OF MONEY

When we talk about the future of payment, we can't avoid talking about money – can we? What would you draw if someone asked you to draw money? Would you sketch a bill or a coin? Our visual and behavioural habits have a significant influence on our imagination when we think about the future.

Commerce – and retail in particular – is already experiencing very turbulent times due to changes in the payment landscape. The constantly changing mix of possible payment methods implies not only that there will be a change in retail payment devices, but also a change in the payment behaviour of customers over the same period of time. Whether the payment behaviour of the latter (and therefore the demand for new means of payment or money) or the devices offered by retailers for payment will expand more quickly remains to be seen in each specific case. However, it is certain that all these changes will have implications for the use of future payment methods. After all, what place can crackling bills and jingling coins have in a world where an island state introduces an official digital currency, where we mine crypto coins or where a German race car driver runs an entire motorsport team financed purely on NFTs?

New money unites the present and the future

The future of payment is digital. At least in part. The future is always a palimpsest, that is, a picture in which deeper layers of paint shimmer through the top layer. And in the same way today's standards will continue to exist alongside completely new types of payment. The challenge for payment players is to be forward thinking and cleverly interweave current and future standards. That is why the assessments on the right have to be considered when discussing possible futures.

In Germany, payment methods are developing in an evolutionary way. The adaptation of the procedures varies from one target group to another. Therefore, cash will be with us for some time.

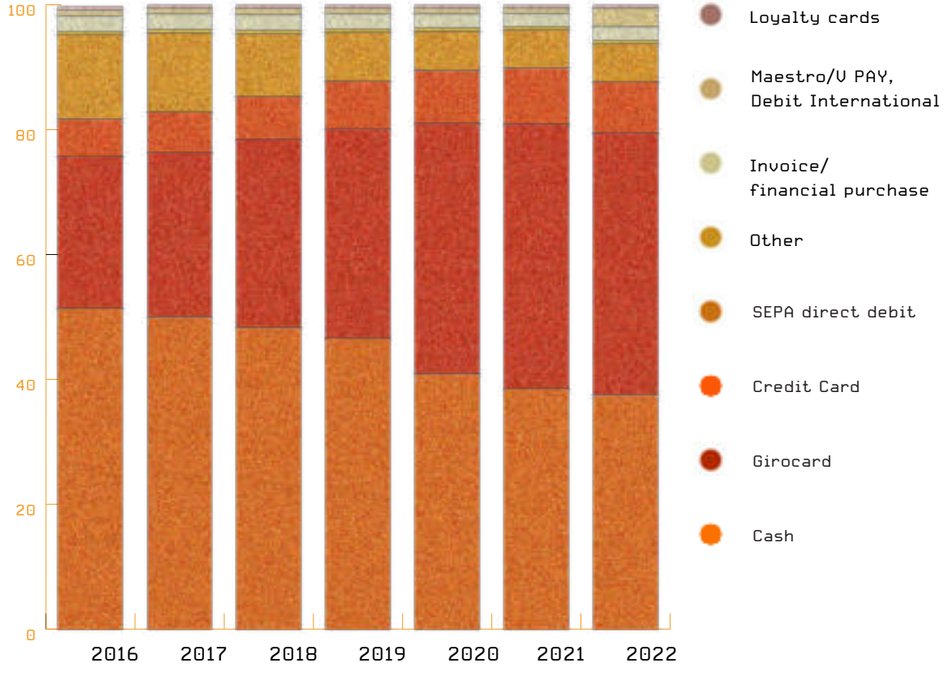
_Frank Büttner, S-Payment

Card payments will remain one of the most important payment methods over the next ten years.

_Delia König, Solaris

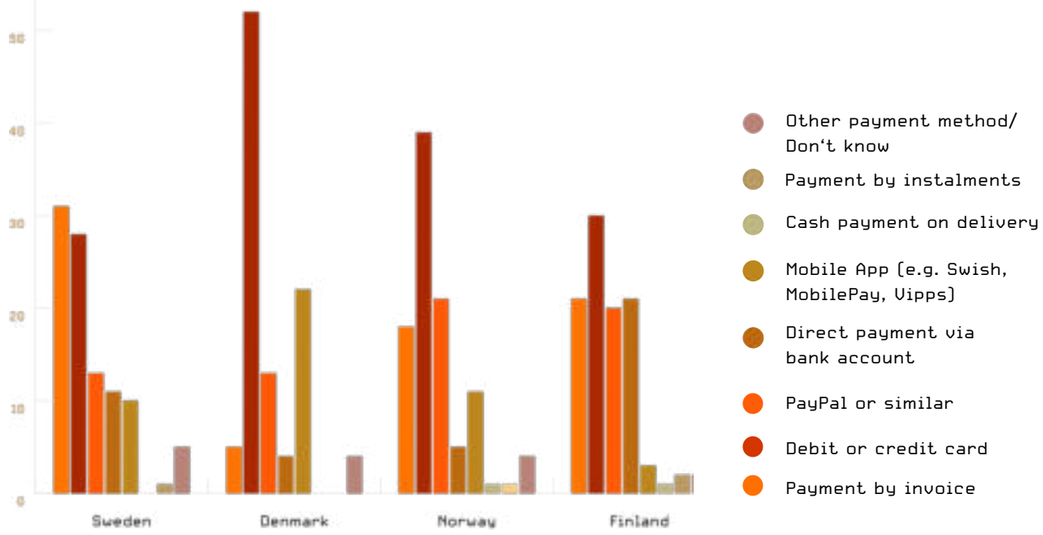
Germans are not only said to be emotionally attached to the automobile. They also tend to cling to cash in a world that is undergoing constant digital transformation. However, surveys conducted by the Deutsche Bundesbank show that the supremacy of cash has clearly waned and that the current development follows this trend. Developments such as these have certainly been spurred on by the years of the coronavirus pandemic but are not solely attributable to it. International influences from countries that have long ceased to regard cash as a primary means of payment (such as Scandinavian countries, for example) are increasingly pushing their payment methods onto the German market. Added to this are changed security requirements for payment and cash funds of the younger generations, which call the predominance of cash into question. Last but not least, the use of cash is also a costly procedure for banks, which are now showing interest in alternative means of payment.

Share of payment methods in retail sales in Germany from 2016 to 2022



_Figures in per cent
Figure according to: EHI Retail Institute (2023)

Which of the following payment options do you prefer when ordering online?



_Figures in per cent
Figure according to: PostNord (2021)

Money – what is it actually?

In general usage, money is described as a "means of payment that differs from simple means of exchange in that it does not directly satisfy the needs of an exchange partner, but can be used for further exchange on the basis of general acceptance." This explanation of the term already makes it clear that money is not just a medium of exchange but one that can also store value. Money can be used as a means of exchange to acquire or sell certain goods, but also as an investment which ideally increases in value over time.

In Germany, money is usually directly associated with cash. However, money is much more than just the coins and bills of the euro. It can also be available in other media (such as cards, smart devices, etc.) or take on digital forms with a direct or indirect link to fiat money (such as wallets or cryptocurrencies). The term "money" is often equated with the term "means of payment". According to the definition, this is incorrect, as money always represents an equivalent value to the object of exchange and the means of payment can also represent a non-monetary instrument, among other things (such as a wallet). As previously mentioned, the use of money – in whatever form – is a must-have in today's world for the processing of purchase transactions (bartering transactions), regardless of whether it concerns a tangible or intangible purchase transaction. However, the use of the available funds is highly differentiated and depends just as much on the assortment of goods offered as on the target group of potential buyers.

Furthermore, intangible means of payment are growing in popularity in everyday life. Payment by card – be it the popular girocard in Germany, a credit or loyalty card from the discount store of your choice – is gaining momentum at supermarket checkouts. Payment with wallet solutions, such as Apple Pay, Google Pay or Samsung Pay, are also becoming more and more popular with the middle and younger generations. Although wallet solutions do not satisfy the definition of money, they are often used as an equivalent, as they combine various funds in one payment instrument – a virtual wallet. Retailers are increasing their use of online business as additional distribution channels and thus market potential. Online payment processes have also recently undergone changes that will permanently change the traditional use of well-known payment methods. For example, in an overview published by the EHI Retail Institute in May 2023, PayPal beat its arch-rival purchase on account for the first time.

There are a number of catalysts for a future in which the question will no longer simply be cash or card, but: Cash or card or hardware wallet or smartphone (or smart watch, smart ring or smart glasses)? Crypto coins, tokens or digital euro? Bitcoin, Ethereum or Solana? And so forth. A digitally changing world does not stop at the payment process nor the means of payment.

Retail in particular is confronted with more and more forms of money and methods of payment that they have to accept as an exchange value in order not to jeopardize the conversion of their goods into purchases. On the other hand, there is a latent risk that the use of these additional means of payment will not cover the costs of processing them. However, one thing is certain: New contexts create new opportunities for the emergence of application oriented money. Retailers and payment providers need to understand which developments are or could become relevant for their customers. They need to understand the situations in which customers consume (→ *Omniverse Pay*) in order to provide suitable payment options and methods depending on the situation. Even if, from the customer's perspective, payment appears to be disappearing from the surface and is becoming less of something they are perceiving, there is still the opportunity to build brands and innovate payment experiences behind the scenes by increasing awareness with regards to this topic. Examination of new payment options may seem arduous at first, but at the heart of the transformation to new means of payment is the opportunity to shape your own market position by curating these authorized means of payment.

New money represents new values

The speculative money design project Seedbills by design duo Sharp & Sour uses banknotes as a vehicle for globally shared values. Instead of faces or landmarks, each banknote

> Card payment at the point of sale will gain in importance, international payment schemes will continue to spread in Germany and digitized forms of common cards will become the norm. In addition, closed-loop payment systems could become established in certain niche areas.
>
> _Mirko Krauel, OTTO Payments

Revenue shares
in e-commerce 2023

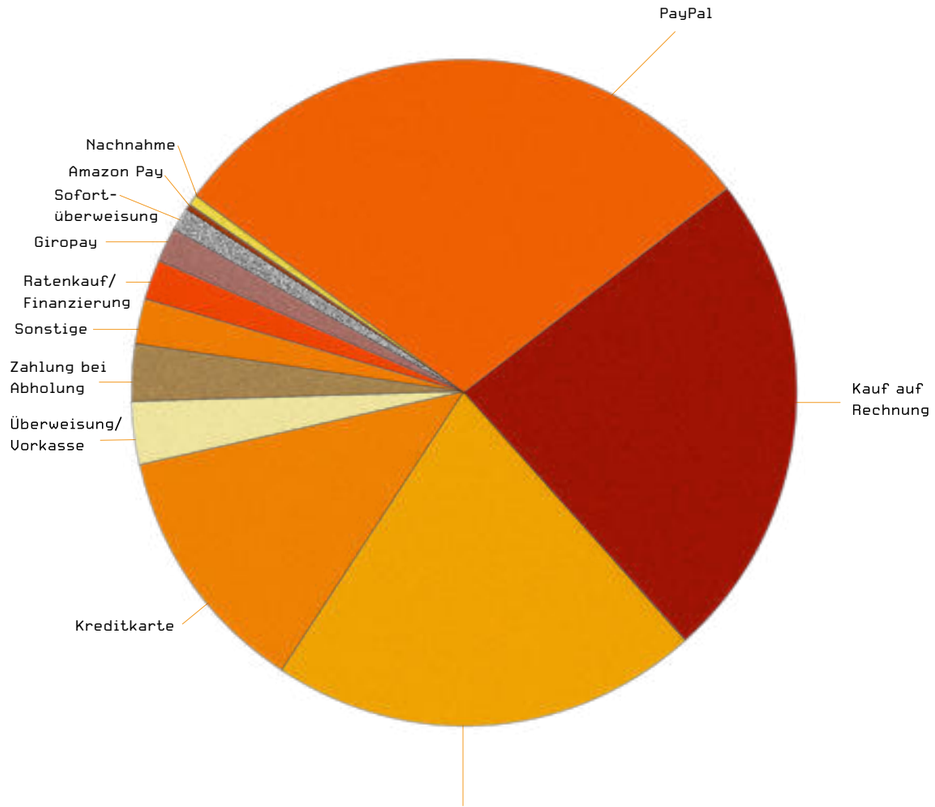


_Figure according to:
EHI Retail Institute (2023)

contains one of five grains representing a continent: Asian rice, Australian dhunbarrbila, European wheat, American maize and African fonio millet. When reaching for a seedbill, consumers should be reminded to act in the interests of global social growth rather than according to classic capitalist principles. In all likelihood, a globally standardized currency is not something that will prevail in the next ten years. However, we can already observe values held across all continents that are expressed through different means of payment, and catalysed by the digital revolution.

Digital funds known as "cryptocurrencies" are now manifold. OLEA, for example, is a highly limited cryptocurrency based on the Ethereum blockchain, and is issued with the purchase of an NFT: An OLEA NFT is linked to the receipt of a complementary OLEA token. In collaboration with olive farmers, OLEA aims to bring two worlds together, the agricultural and crypto economy. Starting as an art project that allows payers to symbolically express their appreciation for a resource, OLEA tokens are intended to find their way back to their origin in the long term and be used as a value-adding way of purchasing olive oil.

The two examples mentioned at the beginning of this paragraph (Seedbills and OLEA) are clearly of an idealistic and highly specific nature, but it is exactly these types of extreme examples that are such good signals for the future because they help us clearly identify needs and basic underlying principles for possible futures. Although the actual payment process (meaning the exchange of money for goods) is being pushed into the background, the advantages arising from the necessary expansion of payment methods in handling will eventuall be firmly anchored in the awareness of users.

Despite the increasing invisibility of payment, payment players are therefore focusing more and more on payment, which means that under the surface, new means of payment, the new money that we use, are coming to the fore. One of our interview partners put it aptly:

> What happened when you googled payment terms five years ago? (...) Nothing at all.
>
> _Laura Treude, Douglas

Payment has always been linked to the measurement of value. Today and in the future, it is and will no longer be just about value, but also about values. Which means of payment we use depends on the future we believe in. For example, a cryptocurrency can be used because it promises anonymity, because it expresses access to an exclusive community or because it might be perceived as sustainable in the future. The Up-Coin scenario from this chapter represents the aforementioned topic of value-based payment in a double sense: There is an exchange value that is used to pay for the drink at the airoprt bar, as well as an immaterial value that links the use of the currency with the investment in a certain company as Up-Coins are obtained through selected activities, such as mentoring work for young founders for instance.

In the future, retailers who accept a certain means of payment will not only use it to exchange products for value but to express their own values and signal to customers that they are part of their community. Accepting various and carefully selected means of payment can therefore be seen as an act of identity building, especially for retailers. It is about gaining clarity on the following questions: Who are we as an organization today? What customer needs do we want to serve? What will we stand for in the future? And beware:

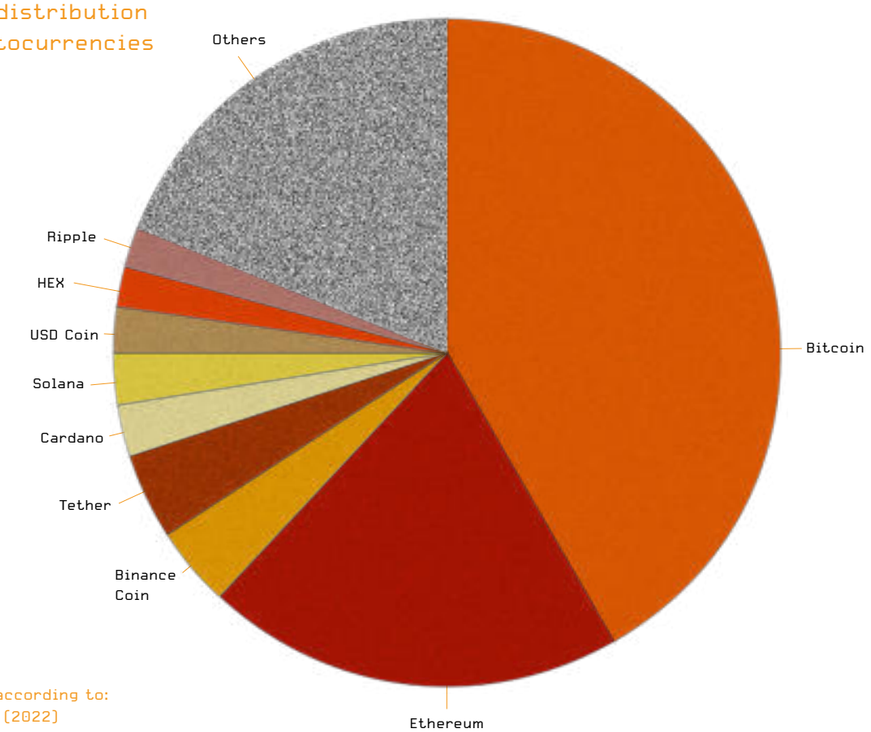
Even for those companies that emphasize their heritage and longstanding traditions "Business as usual!" in payment will not work in the long term if the world around us is already busy transforming itself.

Money as an instrument for investment

When money is not being used as a medium of exchange, it can be saved and is therefore ideally suited to be used profitably with investment funds. Although digital currencies such as Bitcoin were originally introduced as digital money and were intended as a means of exchange with monetary value, today it is being used less and less for exchange transactions focused on merchandise but more and more for profitable use as a form of investment (possibly even as an object of speculation).

Nevertheless, these funds, known as cryptocurrencies, also meet the criteria of money and could be used differently in the near future. The new digital funds are already proving to be profitable, albeit volatile, investments. In 2034, there will be a few more digital funds, which will then be regulated by a supervisory authority and will also become much more attractive for an investor community that is not so risk-averse. Furthermore, the diversity of digital funds that will prevail will cause an interaction between them – similar to the FX interactions already known today with fiat money – which will also enable reasonably predictable FX trading between precisely these currencies. This means that the new digital money might also become an asset in 2034 that can be offered widely via established banks (or other investment companies) and is likely to enjoy significantly higher acceptance rates than we see today.

Market distribution of cryptocurrencies in 2022



_Fugure according to: Statista (2022)

New money is digital

It can be assumed that AI technology, which is still being developed today, will represent a significant step forward, particularly in the product design of fraud prevention systems (FPS). Spurred on by broad-based quantum computing technology, for example, it will be possible to prevent payment defaults much more effectively in 2034. This means that nothing stands in the way of its use. This development reduces the risk of payment default for potential new payment service providers, providing fertile ground for significantly more new funds. That means we can assume that the major wallet operators (such as Klarna, Apple Pay, Google Pay, EPI, etc.) will even have an independent means of payment in 2034 which customers will be able to use to pay in stores.

> Cash transactions will decline more sharply.
>
> _Dr Markus Escher, GSK Stockmann

Although centralization of these wallet systems would certainly be desirable from the buyer's point of view (who wants to "carry around" 10 virtual wallets?), it will probably remain a pipe dream for the time being. A centralized wallet in 2034 is unlikely, as the interests of current wallet operators are unfortunately still very entrepreneurial rather than cosmopolitan.

Money in 2034 will be digital and cash will be reduced to smaller and smaller niches. This does not mean that cash will disappear completely, because it will still be highly valued in grey areas of retail outlets in 2034. However, it can be assumed that it will have almost disappeared from the retail sector.

In addition to the emergence of thousands of decentralized cryptocurrencies worldwide, countries and confederations are also discussing the future of money. In a world where Singapore is pursuing systematic urban development to become a digitally savvy smart nation and where South Korea's capital Seoul is implementing a multi-year plan to create an urban metaverse, the question also arises as to what extent cash will still have a place in it.

The pressing question then is: What could new, digital money look like that offers the same (or more) security as cash? On October 20, 2020, the Bahamas became the first country in the world to introduce a digital currency issued by the local central bank. The Sand Dollar exists in the island state as an alternative to the Bahamian dollar. The so-called central bank digital currencies (CBDCs) are already available in eleven countries worldwide. At least 18 other countries are in the pilot phase of distributing their own CBDCs (as of June 2023). China is one of these countries whose test phase is in no way inferior to some official launches due to the sheer size of the country. In the same year that the Sand Dollar was officially introduced in the Bahamas, China began testing the digital yuan with the abbreviation e-CNY. Since then, the test area and use cases for the officially authorized and legally controlled digital currency have been expanded at a steady pace.

> The digital euro will really shake up the payment world because _ unlike cash _ it can naturally be used in e-commerce, too.
>
> _Dr Markus Escher, GSK Stockmann

The European Union, too, is investigating the potential of a digital euro issued by the European Central Bank in a research phase that is

Digital Currencies

It is unlikely that there will be so many more different funds in 2034 compared to today that they will account for a substantial proportion of total sales. As previously mentioned, the cost of establishing new means of payment is disproportionately high compared to the short to medium-term benefits and will be significantly hindered by the predominance of the already established means of payment. It is to be expected that a much broader range of digital currencies will be available in 2034 than is the case today. However, the use of these types of payment in retail in 2034 is rather marginal or at least in the early stages in terms of consumer acceptance. Although these digital currencies are likely to be largely regulated by 2034 (which is only the case to a very limited extent today), even this advantage in terms of trust will not help to make digital currencies the preferred means of payment. This is simply due to the position of the established currencies and money at the time of the introduction of the new digital currency.

prognosed to last until 2023. Looking at other examples in the world can be a good source both for inspiration and sounding out risks and opportunities of the possible futures of a digital euro. So how could a CBDC become part of our everyday lives? In the scenario in the art gallery, our Slovenian protagonist wants to buy a work of art during a visit to Germany. We observe that scanning a product QR code takes her directly to the interface of her NION wallet, where the product price is displayed in digitized euros (e-NION). Although a 1:1 exchange rate to fiat money is assumed in this future world, the use of the digitized euro is incentivized by a discount. A future in which digital federal funds are used as an alternative to cash has different levels of attractiveness depending on the application. In regions where people can experience financial inclusion through a digital currency despite having no access to banks, the introduction of a CBDC makes intuitive sense and is plausible. Suddenly, money could be sent and received without a bank account simply by using a wallet, regardless of the location. In the European Union, where every person is entitled to a basic bank account, this problem arises in very few cases and, therefore, attracts fewer potential users. A probable future of the digital euro depends on finding other ways to make a central digital currency attractive to European consumers. While these consumers might understand that this type of currency offers more security than a cryptocurrency which constantly changes in value, they do not intuitively understand what new payment features digital federal funds (such as account-to-account (A2A) payments, instant payments, etc.) would bring, except that they seem to restrict their privacy because all cash flows can be digitally mapped and centrally pooled.

> If we had a central bank digital currency in the form of a digital euro, there would be more opportunities to build completely different payment interfaces.
>
> _Dr Jochen Biedermann, FinTech Consult

The digital euro

As euro cash is not suitable for e-commerce and also due to the alternative means of payment that have been established in this environment over the past few years, the European Central Bank, in cooperation with the national central banks, has developed a concept ("Report on a digital euro" from October 2020) for the introduction of a digital euro. This is under review until October 2023, so it has not been finalized as this text is being written. Nevertheless, details are already available that show the main features of the use and processing of the digital euro.

A key aspect of the digital euro landscape is regulation by the central bank.

Regardless of whether the general ledger of the digital euro – and therefore the user accounts – will be held by the central bank itself or by intermediaries in the future, all instances are subject to regulation by the central bank. This contradicts many of today's common crypto designs or wallet models. However, the planned digital euro is intended to build user trust, also in light of the experience with the physical euro (cash business). The concept supports both traditional payment transactions through familiar networks (SEPA, SWIFT, etc.) and account-to-account transactions (A2A), in which payments between two parties can be transferred directly on the digital euro platform without using payment networks and external accounts.

The basic idea behind the digital euro is both innovation and protection. On the one hand, the ECB wants to finally provide a pan-European currency that can be used across all distribution channels. On the other hand, it wants to point out a line of demarcation towards the crypto and wallet competitors. By introducing a digital euro, the ECB could succeed in generating trust among users in a fully-fledged digital currency, something that previous crypto and wallet operators have not yet succeeded on a mass scale due to the lack of regulation. The digital euro therefore joins the ranks of the other central bank digital currencies cited in this article and is primarily intended to offer EU citizens a digital equivalent to the euro currency.

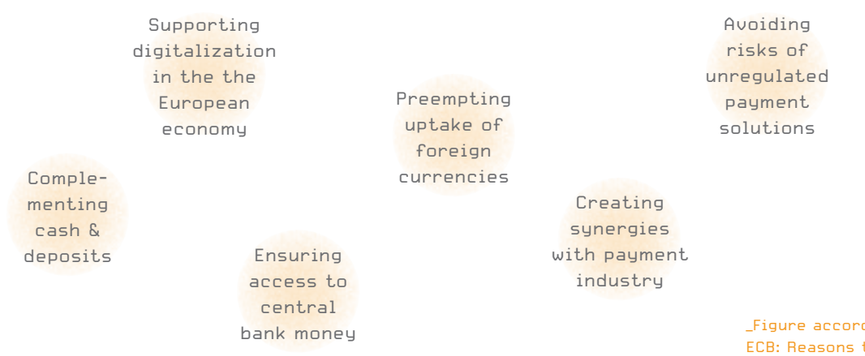


_Figure according to: ECB: Reasons to issue a digital euro (2020)

One can hardly talk about new money without discussing ways in which this money can be received, stored and used for payments. In addition to the attributes of a currency (we remember the section on values), it is the application possibilities that make new money so compelling. The current payment trend in stationary retail is developing strongly towards seamless payment (→ *Age of Seamlessness*), whereby the payment itself is significantly simplified, time-optimized and integrated into the infrastructure of the seller. This trend has also been evident in online retail for some time, such as in the use of one-click payment methods. A parallel development is the use of omnichannel sales, in which payment processing components are handled through different retail distribution channels. A prominent example of this is Click & Collect. The money of the future must therefore take these developments into account and optimize them. It is to be assumed that new shopping experiences initiated as pilot projects by the GAFA companies (Google, Apple, Facebook and Amazon), such as Amazon Go, will become increasingly popular in the coming years and the idea of "payment as a service", meaning payment as an integrated part of the shopping experience, will become more prevalent. As a result, significantly more wallet-based and cashless payment methods will come to the fore. A side effect of this development is the closer connection of loyalty systems with corresponding funds, as in the scenario described at the beginning of this chapter. Here, a retailer network offers cross-shop payment with loyalty-linked Friendshop Coins, which can even be converted into euros in the user's banking app. In the case of in-game coins, which are used to pay for virtual items, the application is woven into the DNA of the payment method. It grows more or less organically from its context. CBDCs must impress users through innovation and genuine added value. A look at other countries can offer hints on possible future developments within Germany or Europe. It can inspire people to explore their own approaches without having to copy an idea exactly.

In the conversations conducted for this publication, the interviewees agreed that convenience is one of the most important payment variables for end customers. For example, the e-yuan allows parents to digitally top up their children's pocket money so that they always have enough money for a snack. Even if there is no internet connection and the smartphone battery is dead, users can pay by smartphone – just like with cash, but digitally.

> We should look at China if we want to see our future.
>
> _Dr Jochen Biedermann, FinTech Consult

New money communicates its reason for existence

While value-oriented cryptocurrencies can work very well in exclusive application contexts, CBDCs need one essential characteristic to be seen as an equal alternative to cash and that is: Size.

Back to China. In May 2023, salaries for the city's civil servants and public employees were paid with the e-yuan for the first time. At the same time, urban payment structures were to be geared towards the digital currency. New money means new applications. Whoever works on the former (money) is responsible for the latter (application). Acceptance and dissemination must be expanded through interaction. This requires a willingness to experiment and – as is so often the case – to have a dialogue. It also involves thinking about interfaces between different funds and countries.

Under the label of Project Icebreaker, the central banks of Israel, Norway and Sweden, together with the Nordic Innovation Hub of the Bank for International Settlements, investigated the interoperability between different digital federal funds in 2023. One finding here was that the installation of central hubs could be quite simple as a hub-and-spoke solution: A country would only have to dock its digital currency to one central hub instead of setting up interfaces with many different countries.

Experiments like this one, as well as the many use cases of existing digital federal funds within their national borders, can be used as inspiration, but not as a simple blueprint for introducing a digital euro, for example. By taking cultural values into account and the confidence to use innovation to combine supposedly conflicting needs (such convenience and security), digital federal funds, in fact any new digital means of payment, can be introduced in a way that breaks down barriers. It is essential that the reason of existence of a currency is not only clear, but also clearly communicated to all payment players, including the paying end users.

We would want to know why we should use a certain currency after all, wouldn't we?

CONCLUSION

E-commerce compatible Payment methods and wallets become standard.

With enhanced functionality, by 2034 they will make up a significant proportion of the funds and payment used by then. Types of payment that cannot be used in e-commerce will only serve niche markets in the future.

Cryptocurrencies will be part of every-day life in 2034.

After having matured cryptocurrencies will hold their own in a heterogeneous monetary policy of 2034, both in everyday life and on the capital market. The self-confident digital currencies will round out the new money market.

Old habits persist in selected cases.

The funds and payment primarily used today will still exist in 2034. The replacement of primary payment habits such as the use of cash in Germany will take decades and is strongly influenced by local characteristics.

Strong niche providers force big players to innovate.

Visa, Mastercard, PayPal and the like will still be at the forefront of the most popular funds and payment. However, they will adapt their products in line with the times as they will be driven by significantly more niche providers with a specific market and application area.

New money stands for new values.

In 2034, the choice of payment method will be based more and more on which organization issues it and what social impact is associated with it. Value-based money wins over critical consumers.

03

War for Data

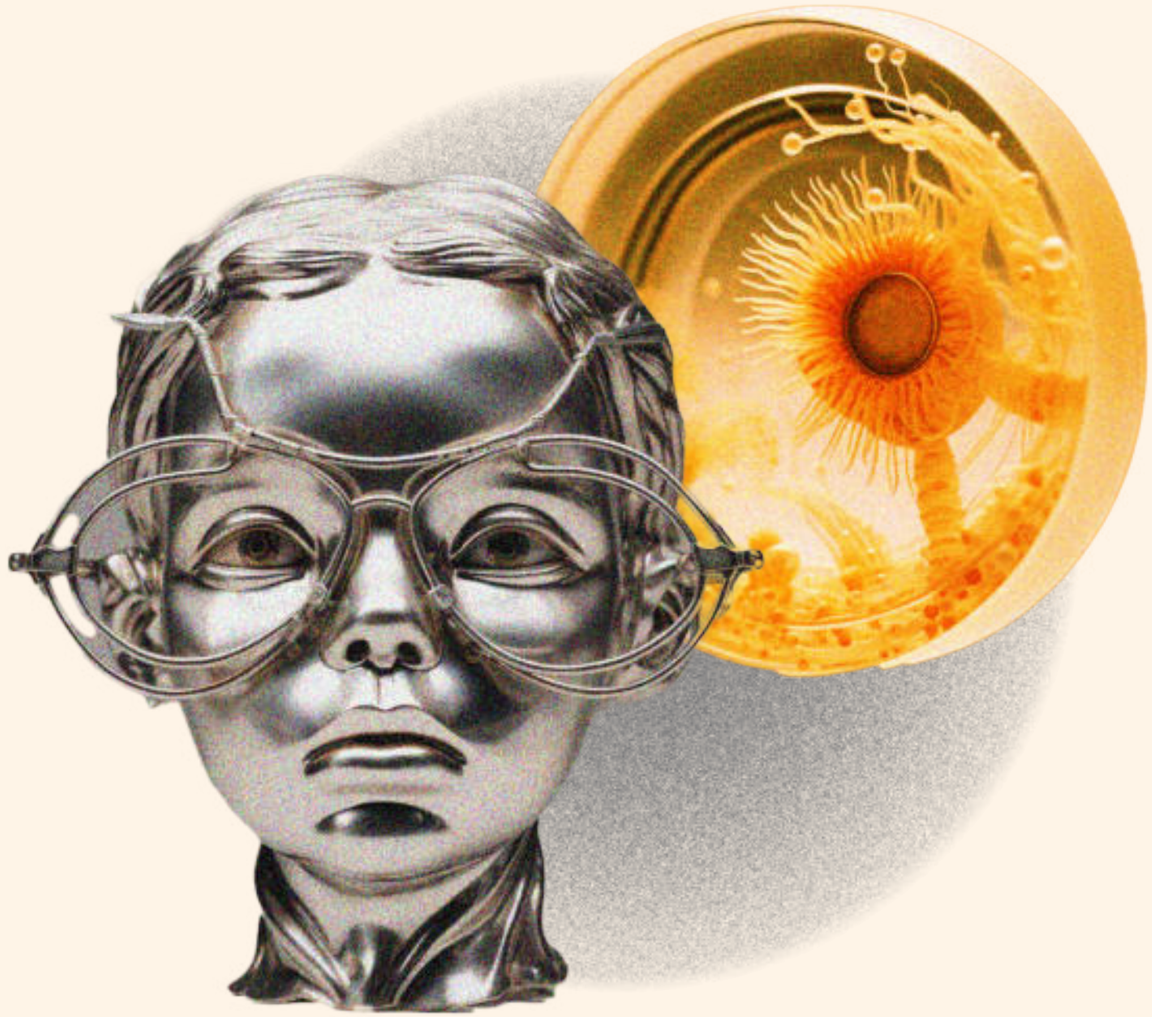
Increasingly, we'll witness shopping through biometric payments (...), relying heavily on trust.

Nuutti Kotivuori,
Nexi Digital Finland

War for Data: Security becomes a top priority

Driven by ever-increasing amounts of data, the tension between convenience and security is intensifying. In light of this, the payment of the future must be constantly renegotiated between retailers, service providers and users. Will biometrics become a guarantor of trust or a security risk? Can European self-sufficiency in terms of payment lead to both consumer protection and economic prosperity for retailers? What risks does the Internet of Things pose for payment processes? In the midst of the battle for data, expertise, a convenient payment frontend and a stable backend become competitive advantages.

PATRONA



"Mummy, mummy, what have you got there?" Henriette closes the lid of the delivery bot shut and, with the package in her hands, turns back to her daughter, who looks up at her from her bike with interest.

"I designed a new product at work and today the prototype, which is like the first produced version of a product, was printed and assembled. The workshop sent me the prototype so I can see if it works."

"Prototype." Henriette sees Ana form the word with her mouth.

"Do you want to unpack it?" Ana nods. "Good, then lock up your bike, we'll go upstairs, wash our hands and take it out." Ana pushes her bike into the sharing station, the handlebar display flashes to confirm the return, and the girl skips ahead of her mother through the door of the old building, which she holds open for her.

"Did you wash your hands yet?" Henriette asks, as her daughter carelessly kicks off her sandals and holds out her arms expectantly. Ana rolls her eyes, runs into the bathroom and appears in front of her again a moment later. Henriette hands her the padded fibre bag. Ana carries it into the living room, pulls off the security sticker in a quick motion, sits down on the sofa, loudly opens the Velcro fastener and pulls out a silvery, transparent sculpture similar to a pair of spectacles. Curious, she lifts it in front of her eyes, turns and twists it around. Then she puts it aside uncertainly and looks up at her mother questioningly.

"It's a shield for protecting your identity. We call it the Patrona. You can put it on like this, look."

Henriette carefully places the slightly oversized frame over Ana's right ear and the bridge of her nose. The girl squints through the almost invisible film, which seems to grow out of the artfully curved metal.

"Am I being protected now?"

Henriette laughs at the sight of her eight-year-old daughter, who could have stepped out of a magazine for high-end fashion accessories with the Patrona on her face.

"Theoretically, you are protected, yes. But you don't actually need protection because your eye isn't registered with Pay Lens. But if it were, so if you – like I sometimes do – paid with a blink of your eye or accepted payments with your iris, then the Patrona would help you protect your biometric data.

That means it would protect the unique characteristics of your eye, so that you wouldn't accidentally buy something you didn't mean to buy."

"Do I always have to wear a Patrona then?" Ana asks, carefully readjusting the jewellery that is threatening to slide off her ear.

"No, the Patrona is mostly meant for situations when you're out. For example, if you're walking down the street and someone takes a photo that you happen to be in, that person shouldn't be able to automatically get your biometric data from that photo. It's great to be able to take high-resolution pictures, but if they end up in the wrong hands, they could also be used for fraud, so to buy things with your money."

"So could I use a photo of you just like that to go and buy sweets?"

Henriette rolls her eyes, takes the Patrona off her daughter's face and puts it on herself.

"You could. At least at the self-checkout in a cashierless supermarket. I can imagine that Martina at the bakery next door would at least ask if you should really be buying ten chocolate rolls with my photo. And even the in-store sales bot can probably distinguish between people and photos. With online shopping, on the other hand, that could work pretty well."

Ana tilts her head to the side thoughtfully and moves closer to her mother.
"What if you forget your Patrona at home?"

"Well, I told you that the Patrona is just a prototype. My colleagues and I have thought of a few more ways to protect the data of Pay Lens users. For example, you could set restrictions in the Pay Lens payment profile so that payments can only be made with Pay Lens in certain places or that only small amounts can be paid just like that. For everything else, you would also have to prove your identity with a fingerprint to authorize a payment.

I could also say that paying with my eye is always deactivated at night because I'm asleep and my eyes are closed. If someone then tried to use my Pay Lens account, the payment would be rejected. All of this means that the Patrona could also just be a set of restrictions that I set up myself and that is then added by an intelligence so that there are no loopholes for chocolate roll thieves, for instance.

Of course, this all relies on users valuing security over convenience for a brief moment when setting up their profiles. So perhaps we will rather see water-soluble security tattoos in the corner of users' eyes. More permanent, but just as decorative as safety goggles, and at the same time less work than creating restrictions. What do you think?"

Henriette strokes Ana's head and places the silver frame on the coffee table in front of them.

"Which Patrona would you like?"

NEURO SECURE

Payment Neuroscience
22.05.2034

Neurosecure procedure in payment transactions: Semantic reconstruction of procedural language from non-invasive brain recordings for forgery-proof identity verification

Traditional identification methods for payment with iris or fingerprint scans are no longer forgery-proof due to the misuse of "image-to-life" AI applications. Photographic 2D images of fingers or eyes are becoming easier to transform into digital 3D models that can be used for criminal purposes. This problem is addressed by the Neurosecure procedure described here, which enables invisible and therefore forgery-proof and unique identification: The neural fingerprint. In this article, the research team of Gundlach Weller, André Ling and Nastassia Debrovka from the Payment School of Frankfurt describe the experimental suitability of non-invasive decoders (brain scanners) for neuronal activity.

With the help of AI (large thought models), the neuronal activities that arise during thought processes are clearly decoded as voice commands without the need for them to be spoken out loud. For this purpose, the decoder is first trained by reconstructing speech from cortical semantic representations recorded using functional magnetic resonance imaging (fMRI). The neuronal activity involved in thought processes is unique to each person, which is why it is referred to as a neuronal fingerprint. The thought but not spoken voice command "I want to make this bank transfer" generates a different neural pattern in every person.

Since brain-computer interfaces must respect intellectual privacy, despite countless hacking attempts to violate them in the past, tests were also done to determine whether successful decoding requires the cooperation of the subject. It was clearly established that the subject is required for both the training and the use of the decoder.
That means Neurosecure can pave the way for a forgery-proof and at the same time convenient identification system in payment transactions that respects personal rights. This requires additional research that could clearly prove the continuity of the neural fingerprint over a person's lifetime or, in the opposite case, would allow for update procedures.

PAYMENT BY THE NUMBERS

The European Payments Initiative (EPI) has come a long way since its launch almost ten years ago. Today, it is hard to imagine Europe without it as a pioneering and integrative payment infrastructure that has revolutionized European payment. Our editorial team took stock for our magazine focus on €urope.

Number of European banks that originally joined forces to create a single payment infrastructure for Europe
16

Number of European countries from which these banks originated
6

Number of participating European countries that have overcome the fragmented payment landscape in Europe and created a harmonized European payment area

38

Year in which the Nordic Payments Initiative P27 joined the EPI network
2027

Number of financial institutions that support EPI as part of their network today
104

Percentage of retailers in the EPI network that currently accept payments through the initiative
98

Percentage of the European population with access to EPI
97

Percentage of the European population using EPI financial services
83

Average transaction growth per year since the large-scale implementation of the first EPI solution in 2024, in percent
50

Transactions processed through the EPI's four-corner scheme last year, in billions
102

Reliability in the form of availability of EPI payment systems in percent
99.99

Percentage of transactions processed by financial institutions participating in the EPI network
97

Average cost savings since introduction for companies and consumers thanks to the standardized infrastructure and reduction of fees and settlement processes in payment transactions, in percent
30

Year in which the guarantee of a pan-European payment option became mandatory in EU member states
2028

Number of different European payment areas in 2034
1

THRILLED

THRILLED
23.05.2034

+++ Shocking News +++ Shocking News +++ Shocking News +++

11 billion just gone!!! Spectacular attack on blockchain exchange BitSerpent. Hackers from the cyber mafia broke in through the gaming console of the company boss. Collected data on stored payment methods, purchasing preferences, game and consumer profiles, in-game assets, player-to-to-player transactions and biometric log-in data are assumed to have been read. Hundreds of Germans affected. Ex-crypto millionaire Mio, 32, desperate: “How am I supposed to pay for my Bentley with my normal income?”

Watch the 4D video here

Reader information
Invest in digital diamonds now. Become a millionaire in one year ONLY TODAY!!!

CONTEXT

WAR FOR DATA

CONTEXTUALIZATION

BETWEEN CONVIENCE AND SECURITY

> The topic of data and the misuse of it is not talked about enough, in my opinion. This will change in the next few years. We are already seeing how geopolitical conflicts are not only being fought with weapons. We are observing the expansion of energy and data hacks, which are attacks on strategic as well as system-critical infrastructures.
>
> _Jens Hachmeister, Deutsche Börse

Data is the new oil

The origin of this headline, which has been used in various forms, is an article in the Economist from 2017, which originally stated: "The world's most valuable resource is no longer oil, but data." The gigantic market capitalization of the dominant US companies in the digital market, such as Google, Meta, Amazon, Apple and Microsoft, reinforces this statement.
Together, they have a market capitalization of over 8 trillion dollars (as of July 2023).
Looking at this market power, the Economist article also uses the comparison of data as oil with regard to former monopolies in the energy sector. The growing calls for the big tech companies to be broken up follow this logic. Just as Rockefeller's Standard Oil was broken up into 34 smaller companies, Alphabet or Meta could face a similar fate.

When we look to the future, we see the emergence of monopolies and, above all, that emphasis is placed on the potential for additional value creation from big data using artificial intelligence (AI), machine learning and data science. This is particularly evident in the automotive sector: Those who, like Tesla, can offer additional features over the air with software updates time and again can secure recurring cash flows. If you know where your customers drive, you get to know their preferences, habits, and lifestyle and can make personalized offers. This is why manufacturers do not want to lose the digital interface connecting them to their customers to Google and the like. The war for data is already raging and closely linked to the war for talent. After all, data is useless if it is not turned into added value by data scientists and data engineers. To do this, data must be located, tapped and extracted like oil before it can be processed and refined.

One example that stretches from the past to the present is the battle over cookies on the internet. From the late 1990s onwards, cookies were used to collect huge amounts of data about consumers on the internet and use it for marketing purposes. Companies such as Apple, Google, Facebook and Amazon were able to massively expand their sales thanks to this. From the end of the 2010s, regulations at EU level reduced the scope for using cookies. Customers had to explicitly consent to the storage of cookies, and from iOS 14, Apple enabled its users to generally reject data collection by third parties. Google has promised to completely abolish cookies by 2023. As a result of these initiatives, major changes are underway in the advertising market. Advertisers are looking for new sources of data so that they can continue to target their advertising. More and more retailers are creating media platforms with which they can market their (anonymized) usage data for advertising purposes. At the same time, more and more new customer loyalty programs are being created in which consent to data use is mandatory. It can be assumed that the big players will do everything in their power to continue to be able to use data about their customers. By restricting the use of cookies, consumers have won a battle in the war for data. But the war is not over.

Buy now. Pay never.

With the increasing digitalization of payment transactions and the monetary system, the war for data is also becoming a defining topic in the payment sector. US tech companies are expanding their dominance by linking their offerings even more closely with their payment systems and binding users ever more deeply to their ecosystems, be it through Apple Pay or Google Pay. And just as Tesla is constantly coming up with new digital features for its customers – with the help of the so-called Toybox, for example, the car can play a light show coordinated with the music playback in parking mode and it even lets car owners pull a prank on passengers by secretly activating the fart cushion feature – in the future, payment will be about new needs and customer experiences. If the motto today is: "Buy now. Pay later," in the future it could be: "Buy now. Pay never." Why not transfer personal data instead of money to Amazon when ordering and get the product for free?

This principle is already being used to some extent by Amazon Freevee, Amazon's free, ad-financed video-on-demand platform. However, other interesting developments for payment are also conceivable, allowing customers to become sellers of their own data. The British company Gener8 allows internet users to pay by installing a Chrome extension or the Gener8' browser to regain control over the use of their own data. Tracking and advertisements are blocked by default and users can decide whether to surf in Privacy Mode or share their data in Rewards Mode and collect points in return, which can then be redeemed at Spotify, Netflix or Aldi, invested through Wealthify or donated to charities.

The hunger for data and the resulting innovative value creation models will bring new players onto the scene. The company that could overtake PayPal or Mastercard in payment transactions in the future may not even exist today. But in 2034, we will see new unicorns that reinvent the payment experience in a disruptive way. This does not necessarily include reinvention of the actual payment methods, but in many cases a new option for initiating and authorizing payments. In one of the scenarios, for example, the protagonist uses Pay Lens, a payment system in which identification is done with her iris and the payment order with the blink of her eye.

Europe in cyber war

However, the brave new world of data also has its downsides. The more data is in circulation through more and more interfaces, the more data leaks will occur. Why?

Because a software code is faulty. Because employees are careless or unknowingly open the door to scammers because of social engineering. Or because companies are attacked by hackers. The value of data arouses interest on the part of organized crime. There will only be two types of companies: Those that have already been victims of a cyber-attack, and those that will be in the future. According to a study published in 2022 by Bitkom (the industry association for the German information and telecommunications sector), the damage caused by attacks on German companies amounts to 203 billion euros per year. Nine out of ten companies are victims of data theft, espionage or sabotage. 45% of companies believe that cyber-attacks can threaten the existence of their business – in the previous year, the figure was just 9%. A prominent victim was the automotive supplier Continental. The cyber criminals remained undetected in the company's internal network for a month and captured 40 terabytes of data. In addition to data from Continental itself and from corporate customers such as Volkswagen, they were able to copy personal data of active and former employees.

What if it hadn't been a German automotive supplier that was affected, but an American payment service provider that had the account data of its European customers stolen?

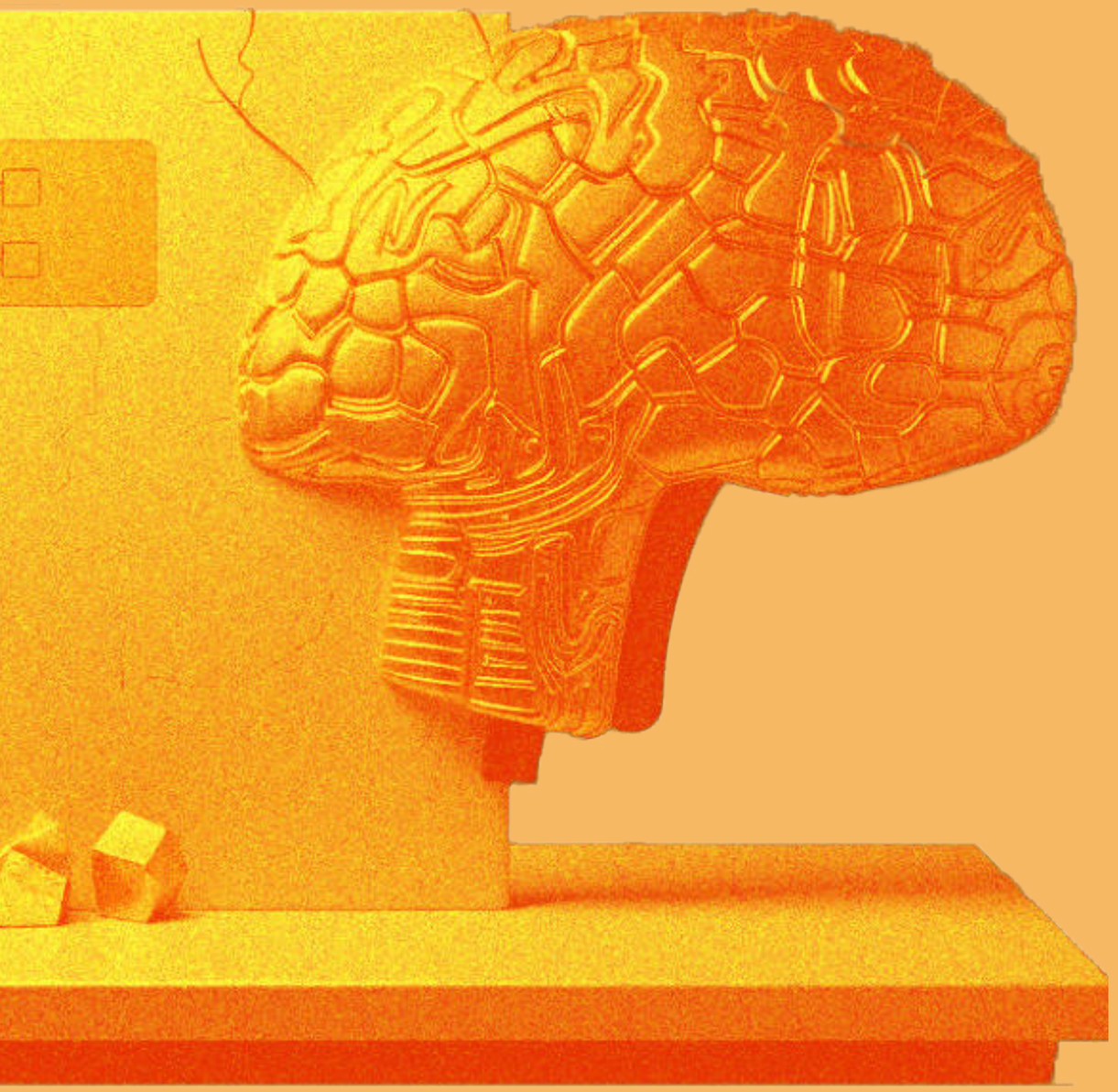
> What we are seeing in the banking market is a massive increase in cyber attacks: Cyber fraud and phishing attacks can cause incredible damage. And it is right that attempts are being made to get a grip on this through regulation centrally on a European level.
>
> _Dr Markus Escher, GSK Stockmann

And what if this attack came from the Middle Kingdom as a result of a new Cold War between the world powers, the USA and China? The scenario is a realistic one, and we should assume that it could happen. The political dimensions of the war for data can be seen not least in the record fine of 1.2 billion euros imposed on Meta for its involvement in mass surveillance by US intelligence agencies. All of this will further fuel the debate about data sovereignty and encourage European countries to work towards an independent European payment cosmos. If cyber attacks are already on the rise, the logic is understandable: At least we want to be able to defend ourselves.

EPI as a digital moat

> It would be important for us in Europe to have our own back-up services and to know who actually handles what and how.
>
> _Dr Lea Maria Siering, Token.io

Back in 2018, 47% of respondents in a Statista survey said that the government should allocate more money to combat cybercrime. 23% were of the opinion that it should impose greater restrictions on network operators. In view of the sharp rise in public awareness since then – particularly since the start of the war in Ukraine – it can be assumed that even more people would be in favour of greater efforts to combat cybercrime. And even more would support measures against network operators, which in turn could help European or state initiatives such as the European Payments Initiative (EPI) to achieve a breakthrough.



Admittedly, the EPI had a difficult start, but the initiative may have a promising future. European regulators could use it as the most effective weapon in the war for data – as a digital moat, so to speak, that protects fortress Europe from cyber attacks. The Payment by the Numbers scenario illustrates this development. Possibly as a reaction to a catastrophe of unimaginable proportions caused by a cyber attack, the European financial institutions are required by the European Banking Authority to participate in the EPI. What was once planned to counter the major US credit card companies such as Visa and Mastercard and to stand up to non-banking solutions such as PayPal and Apple but was met with little investment enthusiasm and participation is now becoming a mandatory political program. The EPI is both highly relevant, especially from a geostrategic perspective, and a very sensible idea. It would be only logical if this idea were also fully supported by politicians and regulators. Making instant payment the new de facto SEPA standard (mandatory) is the first important and necessary building block. Theoretically, one can think of further accompanying steps, including protectionist measures, to give EPI a competitive advantage and thus a chance of large-scale success. Oftentimes, the argument that "nobody needs another PayPal" is posited when discussing the EPI. Hence, it would make sense to think about the future of the initiative purely from the perspective of end customers. What are the requirements and applications that users need and are looking for? Which pain points are not yet covered by established players? What is the big differentiator compared to PayPal and the like? These questions must be at the centre of further EPI development. With regulatory support, the EPI could become a success and ensure that not only American companies will collect and own payment information in the competition for European payment data.

> As the central legislative and supervisory authority, Europe will show a lot more muscle and also regulate the global monopolies and big techs more closely.
>
> _Dr Markus Escher, GSK Stockmann

Biometric payment on the rise

> In the future, more and different types of biometric, behaviour-based and personal data will be used in the identification process for payment.
>
> _Jürgen Schübel, VISA

The issues of security and trust will take centre stage in the future payment world for the simple reason that the threats and cases of abuse will increase in the coming years. The big challenge for retailers, service providers and payment providers will be creating the best balance between security and convenience. Biometric identification methods will play a greater role in this. Various trends can be observed in this context. The Mastercard Biometric Card, for example, combines established chip technology with a fingerprint sensor to make it easier for users to identify themselves when making in-store purchases. As early as 2022, almost half of the Swiss population surveyed considered this type

of authentication to be useful in order to increase security when paying. And iPhone users too can already use their Face ID to authorize payments with Apple Pay. In terms of convenience, it would be ideal if customers had one technological answer to a wide range of applications. The existing Nymi Band, for example, aims to provide a solution for this. It is a biometric wearable device that stores data for different apps, workflows and networks and is (de)activated by fingerprint. This allows Nymi users to log into the digital world with the wristband without having to remember complicated passwords or go through the hassle of authentication.

The balance between security and convenience will have to be constantly renegotiated in the future. In the Patrona scenario, an additional protection mechanism is provided in the form of a a wearable device. For the identification process with an iris scan and the payment order with the blink of an eye, it ensures that no third parties can steal high-resolution images of someone's eye and go on a shopping spree with the stolen biometric data. Even more secure would be an identification procedure that is biometric but invisible and therefore forgery-proof. This again is the aim of the scenario, written in the form of a scientific article, in which money transfer by thought is possible. What at first glance may seem like crude science fiction has a serious scientific basis. Using a brain scanner and AI, a team of US researchers succeeded in at least roughly recognizing certain types of thoughts. Neuroscientists have been working on brain-computer interfaces for some time now. They are based on the principle of reading human thoughts through technical circuits and translating them into movements or speech. In the new approach, a computer creates words and sentences based on brain activity. To a certain extent, the neuronal activity in the brain is read, which, depending on its characteristics, stands for certain words and sentences. It is therefore not so far-fetched that we might be able to read thoughts in the future. And since the neuronal patterns are unique to each individual and are therefore also referred to as neuronal fingerprints, a transfer could actually be ordered by a mere thought. What do you think?

> It is easy to discuss the importance of trust for different generations in comparison to convenience. Convenience is something that is growing in importance in terms of customer needs. I think in the future, the market and payment will be dominated by players that customers already trust today.
>
> _Delia König, Solaris

New technologies will significantly change the way we pay in the future. Security will always remain a key aspect of this. After all, I don't want everyone to be able to shop at the supermarket with my latest high-resolution Instagram photo.

_David Lais, ecolytiq

CONCLUSION

Customers in 2034 want convenience above all.

They continue to be carefree with their data and primarily focus on user-friendliness when using new technologies – with the exception of those who have already been compromised. The already great importance of payment security will continue to increase with every data breach.

Trust is becoming the most valuable asset in retail.

Retailers must respond to the increased security requirements of customers and supervisory authorities in order to continue to offer accepted procedures. Every data leak that becomes public harbors the danger that retailers will lose trust in the market and also lose business.

Additional data means additional sales.

It is increasingly becoming critical to retain sovereignty over customer data as it is the key to keeping customers loyal and generating additional sales. Linking and using data with the help of artificial intelligence plays a decisive role in this process.

The pressure on payment service providers continues to grow.

They have to constantly work on their security procedures to be protected against the increasing number of attempted attacks. In addition, they need to innovate at a high pace to hold their own against new competitors. These cost-intensive measures will further fuel the current wave of consolidation among payment service providers.

AI

Excursus

On the one hand, trying to regulate technological security risks centrally is absolutely the right thing to do. On the other hand, we must make sure that innovations do not pass by Europe.

Dr Markus Escher,
GSK Stockmann

Artificial intelligence: Drivers of change

The term "artificial intelligence" (AI) has been experiencing a lot of hype in recent years, especially since the high-profile launch of ChatGPT. There is hardly a keynote speech, newspaper article, product announcement, company foundation or the like that does not mention this or a related buzzword.

Due to its extremely rapid development, it is difficult to make a reliable forecast about the extent to which this topic will influence the payment landscape in 2034. Even today, however, there is little doubt that the topic will be as profound a technical achievement as the steam engine, electricity, telephone, television computer, internet or smartphone have been in recent decades and centuries. Based on this, we can assume that this topic and resulting innovations will be omnipresent and completely normal in 2034 – just as smartphones with internet connections are today. We see artificial intelligence primarily as a kind of basic technology, as an enabler for new processes and products, especially when it comes to automation. Tasks and problems that for decades had to be solved algorithmically with elaborate programming will in the future be (partially) done by self-learning systems.

Consider if you will an algorithm that searches for its own results. Or to put it another way: AI represents a function for solutions by abstracting known input parameters and expected results in order to then also deliver results for unknown input parameters.

Today, we can only guess at the dimensions in which AI will influence our businesses and lives in 2034. You may have already discovered some proposals for AI applications in the future scenarios in this publication. The following are a few areas from the payment world where we believe that the basic technology of artificial intelligence will play a key role.

Fraud prevention & fraud execution

Artificial intelligence in the form of pattern recognition software is already common practice in fraud prevention. These systems are likely to evolve considerably in the coming years and will have to continue to develop. Just as fraud prevention will be boosted considerably by the development of incredibly complex and precise machine learning models based on gigantic amounts of data and computing capacities, the other side – the fraudsters – will also discover this technology and try to use it to circumvent precisely these fraud prevention systems. In the future, smart systems will increasingly try to outsmart other smart systems at a level of complexity that we humans can probably only imagine with difficulty. Security, especially security in the world of the internet and payment transactions, is based on cryptography, which (to put it simply) is very complex mathematics. And if there's one thing computers are good at, it's math. Just imagine the damage that could be caused by AI systems that solve the most complicated math problems in milliseconds in the world of cryptography, which is based precisely on the fact that solving complex mathematical problems is insanely difficult and time-consuming. Combine that with the incredible computing power of quantum computers and you have a race of epic proportions of – to put it bluntly – good versus evil.

Analysis of payment data

Whether it is the analysis of transaction data on end customers' accounts (for instance via account information services) or the analysis of customer payments from a retailer's perspective, these topics are already relevant today and at the same time still find themselves in their infancy stage. Companies such as Finanzguru help users get a clear picture of their finances, keep automated household accounts including budgeting, automatically record contracts, or point out anomalies, etc. Many payment providers are courting their customers with ever new ideas for smart dashboards and automated reporting.

However, all of these things have one aspect in common: They only offer exactly the functions and possibilities that developers have granted users. We expect these issues to experience a major boost in the coming years based on the technologies that are possible with the support of AI: The automated evaluation of large amounts of data, pattern recognition and the derivation of insights and information that the human eye cannot easily recognize. AI will presumably make great leaps possible in the next few years, which, from the customer's point of view, should feel quite "magical", similar to trying out ChatGPT for the very first time.

Reconciliation processes

Another area characterized by a great deal of manual work and diligent employees in financial accounting is reconciliation. This refers to the allocation of incoming payments with postings in ERP systems, checking credit card statements, checking charges and, above all, analysing all kinds of anomalies, be it missing amounts of money, double refunds, overpayment of fees or currency conversion errors. These hard-working employees in financial accounting can deal with the most creative problems. Here, too, AI technology offers enormous potential for automating and simplifying work processes. AI is virtually made for identifying anomalies and errors, perhaps even eliminating them on its own. We expect innovations in this area and are certain that many financial accounting departments will be very grateful for these new AI-supported opportunities.

Personalized experiences

As described before, AI systems are characterized above all by the fact that they do not represent a set of rigid algorithms, but can react flexibly to individual data situations, making them "flexible algorithms", so to speak. This is especially useful when it comes to personalized user experiences: In the form of systems and processes that are extremely individualized for all users and precisely tailored to the specific needs of the individual. In this way, customized products and processes can be designed that feel just right for customers, as if they had been created just for them. When it comes to payments, for example, these could be customized checkout solutions, recommendations, discounts, etc.

Voice and face recognition

Facial recognition already plays a major role in security (for instance with Apple's Face ID). This will presumably continue to grow in importance with biometrics becoming more widespread in order to secure payments. In the field of voice commerce, language is also conceivable as an authentication feature. It is to be expected that further innovations in shopping and payment experiences will occur that that will blur the boundaries between analogue and digital worlds eventually.

Compliance

AI will also be able to make a greater contribution to complying with increasingly complex compliance rules, for example with anti-money laundering and customer identification. Many of the processes can be automated even farther or at least designed in a way to include AI support. Just like it is the case with fraud prevention, AI systems will help to recognize increasingly elaborate fraud attempts and to extract fraud patterns and suspicious facts from the vast amounts of daily transaction data.

> We will go to a restaurant, eat, leave and the mobile phone - or whatever we use in a few years' time - will automatically pay for us. The integrated artificial intelligence will make sure that all possible discounts are carried out and the artificial intelligence will also know that the bill is split when we go out with certain people, so it won't have to ask time and again. Many things in the financial sector will become more and more automated. People will only have to take care of things in exceptional cases, such as when a loan needs to be taken out."
>
> _Dr Jochen Biedermann,
> FinTech Consult

Technological potential

With regards to a future in 2034, it is particularly difficult to identify specific developments and breakthroughs in technology and their impact on the payment world. Listed in the following are a few areas in which potential progress may be made based on current trends and research:

Deep learning breakthroughs

Deep learning, a subset of AI, is likely to make significant progress. We may see the development of sophisticated neural network architectures that can process and analyse payment data with even greater accuracy and efficiency.

Explainable AI

With the increasing integration of AI into critical systems such as payment processes, the need for transparency and interpretability of AI decisions will increase. Advances in AI techniques that require explanation could enable more understandable and responsible AI systems, which could be important for building trust in payment-related AI applications.

Improved natural language processing (NLP)

NLP techniques could evolve into more accurate and contextualized interactions related to payments. AI-powered chatbots and virtual assistants could offer improved language understanding and natural conversational capabilities, enabling seamless and more efficient customer support.

Applications of reinforced learning

Reinforced learning, in which AI agents are trained by trial and error, could be used more widely for payment transactions. AI systems could develop optimal strategies for fraud detection, risk assessment or personalized payment experiences by continuously interacting with payment data and receiving feedback.

Effects of quantum computing

Quantum computing has the potential to revolutionize various fields, including AI. By 2034, advances in quantum computing could enable more complex AI models and algorithms that lead to significant improvements in payment-related tasks such as encryption, fraud detection and optimization problems.

Improved security measures

AI is likely to play a crucial role in increasing payment security. Advances in AI-powered anomaly detection systems could improve fraud prevention capabilities, while biometric technologies such as facial recognition or behavioural biometrics offer more secure authentication methods for payments.

At the same time, the same technological advances will also be available to the other side, the fraudsters, and help them to circumvent security measures. In the end, the competition between good and evil mentioned at the beginning of the text will be waged at a higher level of evolution.

Advanced analytics

AI can support human analysts in payment-related tasks by automating data collection, analysis and reporting processes. Advanced analytics techniques combined with AI algorithms could enable more accurate predictions, actionable insights and real-time monitoring of payment transactions.

Integration of AI and IoT

The Internet of Things (IoT) is expanding rapidly and the integration of AI with IoT devices could lead to new payment experiences. AI-powered smart devices and sensors can enable seamless and secure payments in different contexts, for instance in smart homes, connected cars or wearable devices. This raises the question of ethical AI frameworks – in payment transactions as well.

Regulation and data protection

Alongside the many positive aspects of AI, critical voices are becoming louder and louder, pointing to data protection problems and calling for strict regulation of this potentially dangerous technology or technologies. Looking at the current discourse, it seems likely that we will see some movement in this area by 2034 and probably extensive regulation and data protection measures as well.

It will be interesting to see to what extent this regulation can be designed in such a way that it meaningfully protects the various parties and at the same time does not significantly slow down progress.

A few years ago, the US television series *Person of Interest* portrayed the dystopian world we might one day live in if AI technology reached an advanced level of maturity and achieved a so-called "general artificial intelligence", meaning a human-like level of intelligence and abilities. In the series, two super AIs fight each other with every conceivable means, one for "good" and one for "evil." In our reality, we are more likely to see an almost infinite number of AIs with individual specialties, but the idea that these AIs will one day become so powerful that they will also be dangerous to us humans is indeed a topic of hot debate. To avoid ending up in this dystopian future, a regulatory framework will be useful and probably unavoidable.

From the perspective of the payment world, the main focus will certainly be on the continued security of digital payments. Anything else could lead to a very unexpected comeback of bills and coins.

04

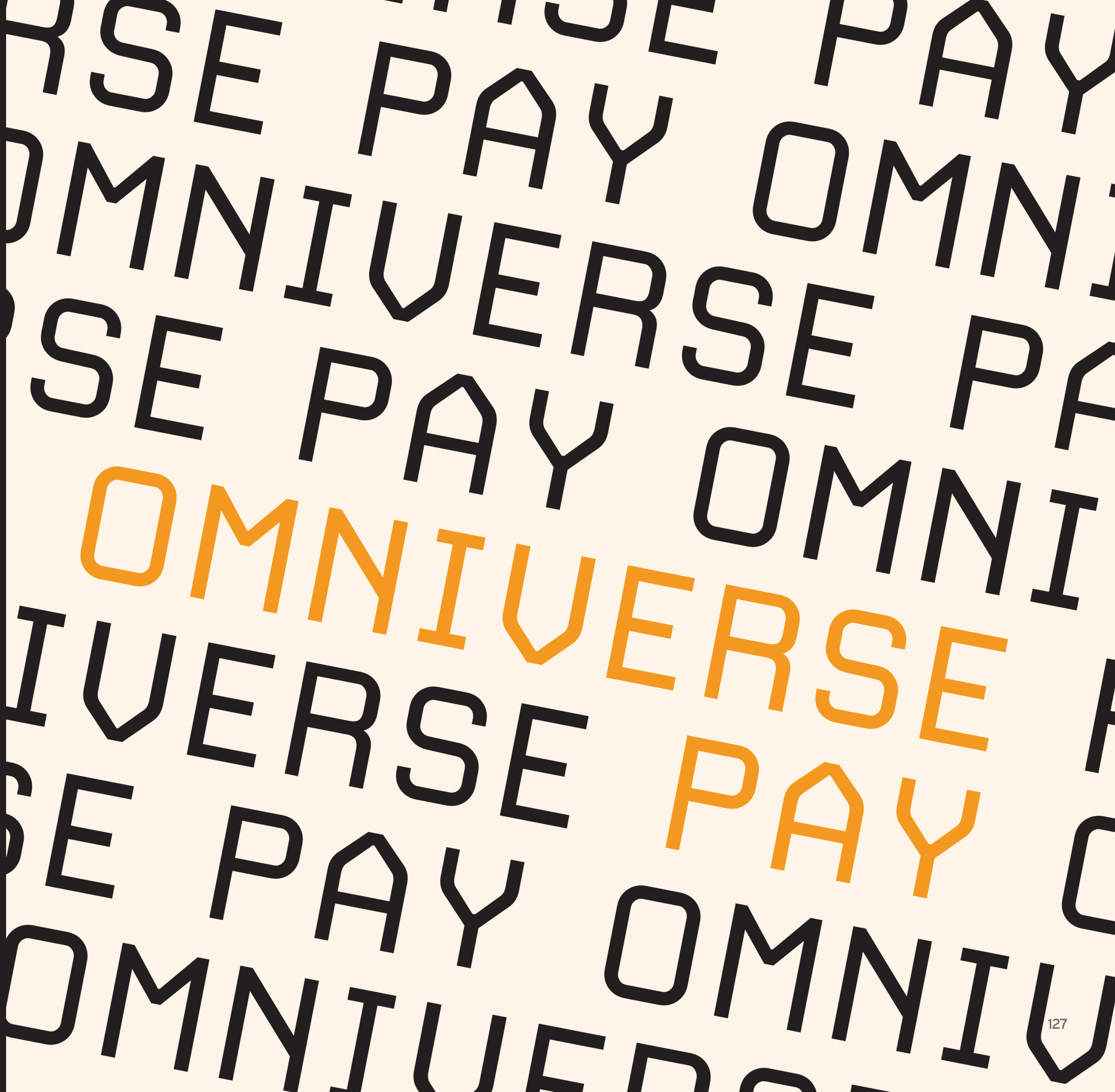
Omni verse Pay

The metaverse will come and it will offer entirely new possibilities compared to the two-dimensional worlds of today.

Frank Büttner,
S-Payment

Omniverse Pay: New worlds of payment are emerging

Simulations in the form of digital twins, a surge in the popularity of online gaming communities and visions of metaverses in which we collaborate via hologram or which cover our analogue world with an additional digital layer through augmented reality – more and more, the world we live in is becoming the starting point for other worlds that we immerse ourselves in. In most cases, these new universes exist independently of and yet alongside each other in a large omniverse in which payment must be designed to be in sync with different worlds.



PAY PER WORLD

The transparent automatic doors slide open and Noah enters the department store, where people stroll between colourful shelves.

Soft music fills the high halls. Here and there, someone stops to scan a product code or tap on one of the info screens, which are mounted at different levels and send information to the headphones of the user when activated. Noah examines the map of the building until he finds what he was looking for: *Returns, exchanges, complaints: 2nd floor.*
He walks towards the escalator with determination, dodging a group of giggling teenagers putting their hands under the AR screens at a nail polish display and heads to the second floor.

Arriving at the exchange counter, he sighs. It is analogue. A friendly-looking consumer advisor looks at him and tilts his head questioningly. Noah approaches the counter.

"Hi, uh, isn't there a self-service terminal? I just want to return something and don't need any advice."

"The terminals have been out of order for days. A security update that's been going on forever at RetailReturn, the company that verifies our refund claims." The advisor shrugs apologetically. "But I'm happy to help you. I'm Tristan."

Noah resigns himself to the situation. He had hoped for a break from social interaction between all his work meetings today. "Fine, thanks, Tristan. I'd like to return a shirt." He slides the bag across the counter.
Tristan pulls out the beige shirt, opens it and examines it closely. He scans the code on the product label.

"You bought the shirt on … June 12th, 2034?"

"Yes, exactly four days ago," Noah replies.

"And why would you want to return it?"

"The analogue fit isn't very good."

"Analogue?" Tristan takes a look at the screen where the product data appeared after the scan. "Ah, I see. You've already unlocked the avatar license for Mesh."

"Yes, I wore the shirt in a VR meeting."

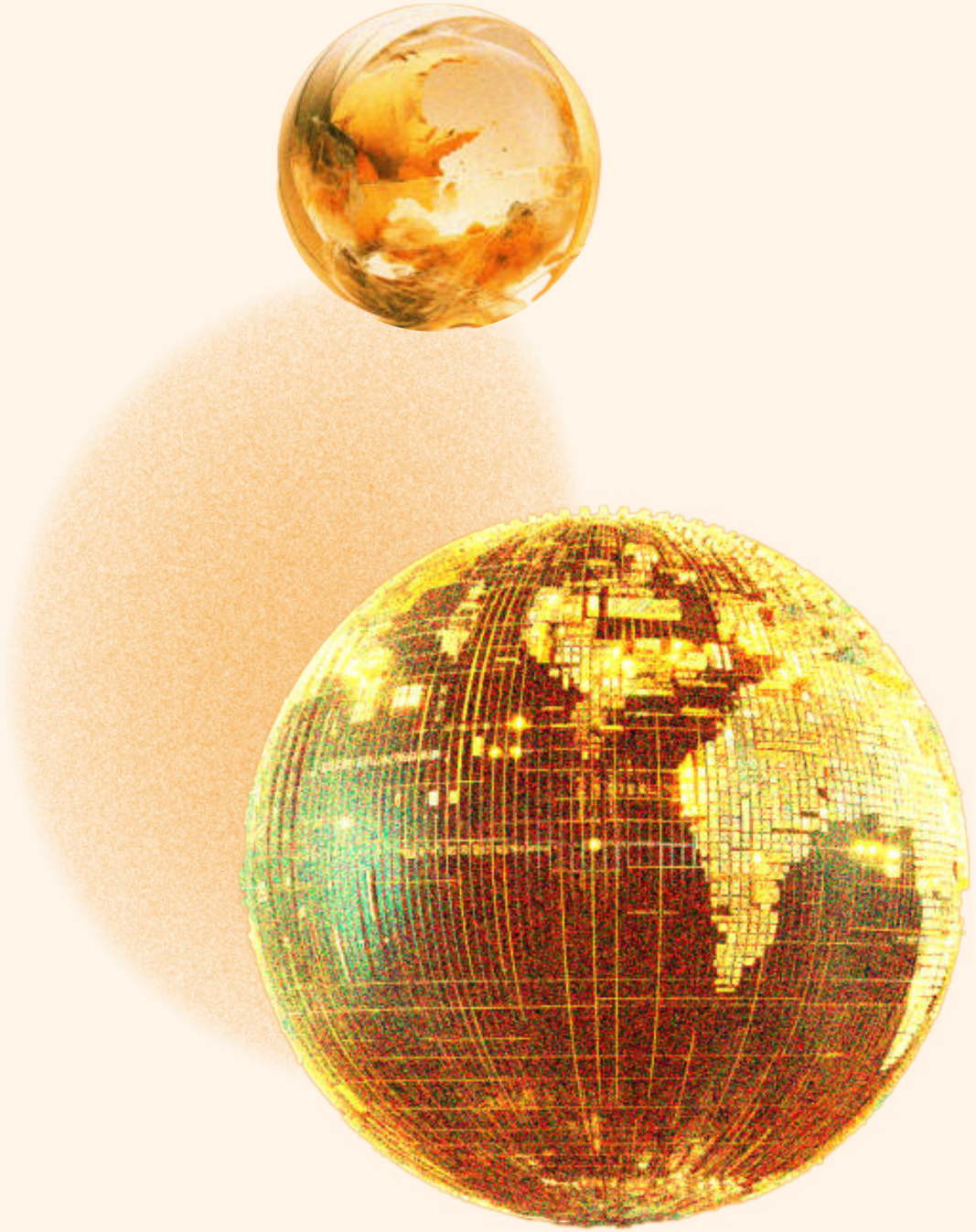
"In a VR meeting? With vision glasses and everything? Pretty old school of you. You probably haven't got any panorama conferencing sensors at home yet?" Tristan raises an eyebrow with a grin.

Noah breathes in and out slowly. "Not yet. But in this case it was good because the analogue shirt doesn't fit well," he replies, unsuccessfully trying to suppress the irritated note in his voice. "On the other hand, every item of clothing fits a digital avatar twin."

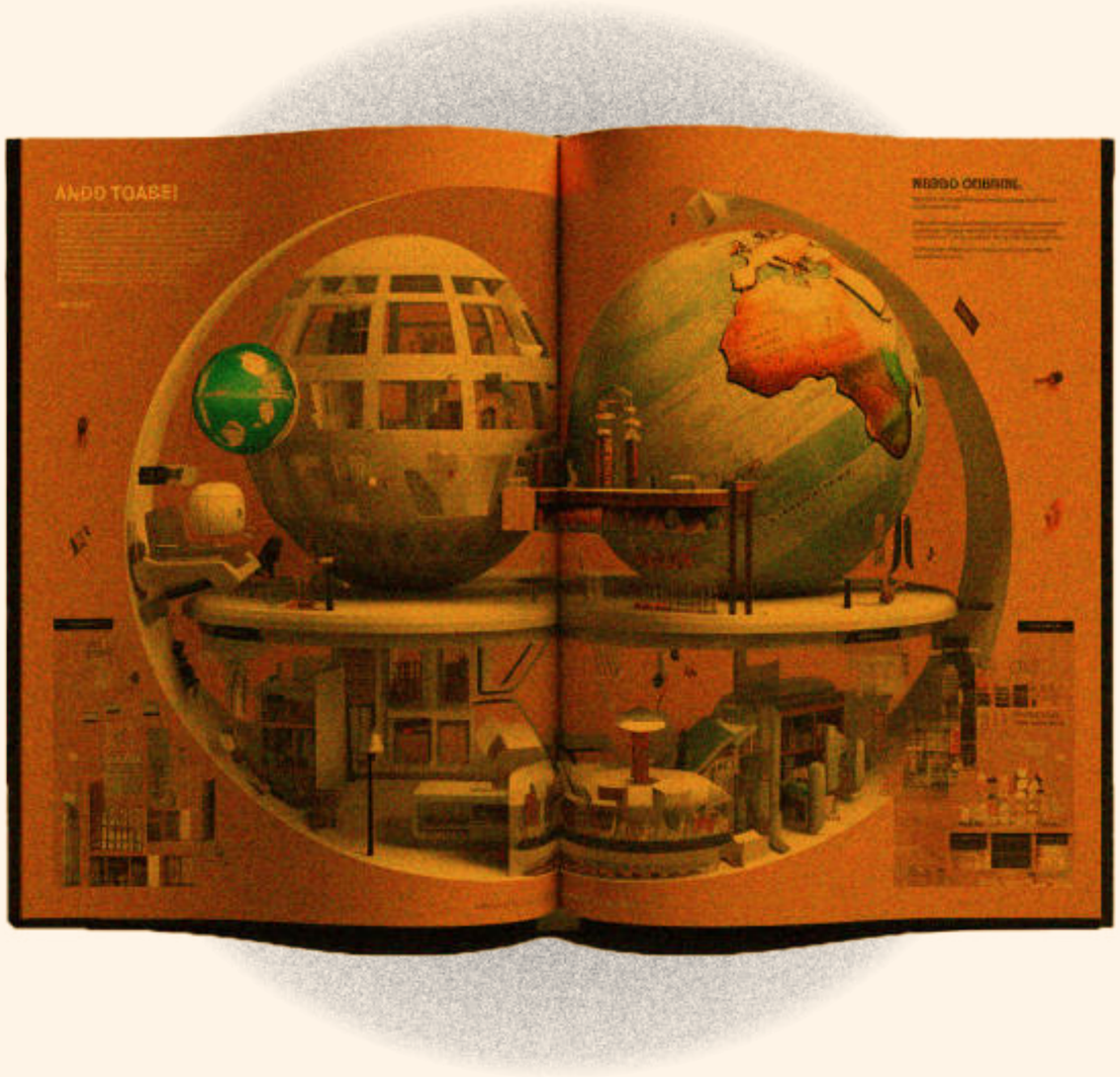
"You're right. 360-degree sensors can feel more like some kind of digital humiliation that confirms a bad fit. Not all new technology is a good thing." Seemingly immune to Noah's microaggression, Tristan talks on cheerfully to himself as he confirms a few release messages on the screen. Then he turns back to Noah: "Since you've already claimed the shirt's digital license, I can only give you a partial refund for the analogue product." Noah nods.

"Good, then that's done." Tristan hangs the shirt carefully on a hanger behind him. "You will still find your license token in your registered avatar closet and the remaining amount should have already been credited to your account. We also have a digital scan-and-measure service for custom-made products. It only takes five minutes, and you get loyalty points to redeem on your next purchase in a physical store or in our meta store. Maybe interesting for when you start having panorama conferences."

"Yeah, maybe. Thanks," Noah mumbles as he walks away and glides out of Tristan's field of vision on the escalator.



RETAIL-NOMADS



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Retail radar
Unicorn, many worlds: Retail Nomads

Retail Nomads. The name of the German start-up brings to mind travel, movement and foreign worlds and has become a unicorn in record time.

The name says it all. Retail Nomads wants to promote a retail sector that is on the move rather than stand still. With the help of Retail Nomads retailers will be able to open up new worlds and expand their own universe. How that works? The verse tech start-up uses a combination of digital twins, location-based urban source data sets, generative agents and AI-supported strategy recommendations to help small and medium-sized retailers in particular to expand into new worlds, be they physical or virtual (and let's be honest: Who cares about the distinction these days when the relevance is nearly the same?).
Let's take a closer look at the whole thing. Where it is not yet available, the Retail Nomads team creates a digital twin of the existing store for their client. The data collected is used to identify customers' favourites and gaps in the product range, to create anonymized customer profiles and to digitally clone store processes.

By implementing generative agents, for instance AI-supported virtual consumers, consumer behaviour is simulated in the expansion region (without violating privacy rights, according to Retail Nomads). This includes data on age structures, dietary preferences, shopping times, occupational groups, payment behaviour and the mapping of local producers. In addition, there are local association memberships, annual event calendars and the analysis of tourism flows.

Retail Nomads uses all this data to simulate up to a year of trade in real time. By comparing the digital twins (of the existing store and the expansion region), AI-supported strategic recommendations for action are generated in relation to the cornerstones of the new location: Product range, store space and processes as well as locally anticipated payment preferences.

But Retail Nomads is not only looking at stationary expansion. The verse tech unicorn also offers expansion support in as many as 300 recreational and corporate metaverses in order to create retail points of contact that are tailored to users' consumption and payment preferences.

Installing a virtual organic kiosk in the Microsoft Mesh canteen with home delivery? The interface hub forpayment with in-game tokens? Logistics that allow a garden plate ordered in the metaverse to actually be delivered in the real world? Retail Nomads does it all.

Thanks to these amazing nomads of retail, retailers can now become nomads themselves, courageous adventurers who set off into new worlds with their company and set up camp there as a phygital hybrid.

BLENDED WORLDS

Mia swipes her hand over the 30 x 30 centimetre sensor plate on the table in front of her.

Fingerprints and pretzel crumbs collect on the pale blue material and the mixed reality headset presses against her sore ears, even though they were advertised as *light as air* last year. Mia chews on her lower lip as her hand glides expertly over the game mat. Sometimes she taps with her index finger, sometimes she taps her thumb in the corners, pulls all her fingers together or pushes them apart. "Come on," she presses through clenched teeth, swiping left and right. Then: "Finally."

With an exhausted sigh, she sinks down onto the sofa next to the table, pulls the headset off her head and wipes her flushed forehead with the back of her hand. She then puts the headset back on, leaning her head back.

Level completed!

Back in the game, large, three-dimensional letters float in the virtual company canteen overgrown with plants, which she has explored looking for clues and valuable items.

You collected 43 corporate points in this level. This means you were better than 73% of all players, the score summary floats in the same place where the *Level completed* was just displayed. *You have unlocked 2 new skins, 3 CokeCoins, collected 112 TCH and found 4 corporate NFTs. Would you like to move the NFTs to your gallery? James2020 has offered you 732 stableFRAX in exchange for the Alphabet ID you found. According to the current exchange rate that has experienced minimal fluctuation for the last 217 days, 732 stableFRAX is equal to €183.42.*

"Accept transaction," says Mia.

Transaction completed. Should the three remaining NFTs be moved to your gallery –

"Yes, move them to my gallery," interrupts Mia. "Also, exchange 1 CokeCoin for real commodities. Place the remaining CokeCoins and the 112 Tyche in my wallet."

CokeCoin exchange completed (transaction fee charged: 0.045 milli TCH). CokeCoin storage completed. Tyche storage completed. On 12.08.2034 at 5:38 p.m. CET, your gallery contains 109 NFTs, 12 of which are advertised for sale to stableFRAX, Ethereum and e-EUR buyers with AI-based pricing. Your Play wallet contains 7 CokeCoins, 22 Star Bucks, 94 Ethereum, 832 e-EUR, 2,541 stableFRAX and 7,089 TCH (of which 250 TCH are secured for deposit for storing your currencies on the Tyche chain).

"All right," mumbles Mia and hangs the headset in the charging bracket on the wall above her. She adjusts her T-shirt, which is damp with sweat, as her phone lights up.

Mia, your Coke is here.

Sluggishly, she gets up from the sofa, opens the window behind the desk and grabs the can of Coke from the AMZN Fresh drone carrier, which is humming softly as it dances up and down in front of the delivery sensor in the window frame.

"Thank you for playing Corporate Renaissance, powered by Coca Cola. Enjoy your cool down!" a melodic male voice says through the loudspeakerattached to the small drone. It is barely audible through the hum and the evening traffic on the street below, but Mia knows the words well enough already to guess what they are. She opens the metal cap with a loud hiss and takes a sip of the sparkling drink.

Unburdened by the weight of the soft drink, the delivery service drone bobs up and down in the air as if it were on springs. Sipping her drink, Mia watches it as it disappears into the clouds of the Bonn cityscape on this summer evening.

OMNIVERSE PAY OMNI
VERSE PAY OMNIVERSE PAY
Y OMNIVERSE PAY OMNIVE
RSE PAY **CONTEXT**
VERSE PAY OMNIVERSE
OMNIVERSE PAY
ERSE PAY OMNIVERSE PAY

OMNIVERSE PAY CONTEXTUALIZATION

IN WHICH WORLD WILL THE PAYMENT OF THE FUTURE TAKE PLACE?

Imagine you are visiting an art gallery in the metaverse. You have your 3D glasses on and see pictures hanging on the walls. You can look at them very closely, and then you see one you like so much that you want to buy it. It would be great if you could make the purchase straight away. Of course, you don't want to take off your glasses and pull out your physical credit card when you're in a virtual environment. That would be kind of stupid. At that moment, I need the interface between a metaverse environment and a real payment process.

_Dr Jochen Biedermann, FinTech Consult

Where will the future of payment take place? In the store? On the sofa at home in front of the TV? On the toilet? In your social media feed? In the driver's seat of a self-driving company car, on the deck of a wind-powered cruise ship, in a space capsule on a suborbital day trip, in an online game or in the metaverse of the organization we work for? Probably – and if various studies are to be believed, most definitely – everywhere. The estimated market volume of all metaverses is forecast to grow at an average rate of 37% by 2030. So let's explore this "everywhere" together. In a future of payment in the omniverse (meaning a world of worlds), as is being hinted at in this chapter of Payment 2034, there are many possibilities for shaping the future. In many

cases, new terrain creates the opportunity for innovation. The following paragraphs will examine some facets of this future. What would payment feel like if we lived in a world that contained many other worlds? What does it mean for payment if we begin to move between physical and virtual spaces and if these worlds themselves begin to merge more and more?

Omniverse – travelling through a world of worlds

Where are you as you are reading this paragraph? Do you find yourself in a place where you can make payments? Probably yes. Because even if there is no tangible payment terminal at this location, you probably have your smartphone with you. You can use it to visit quite a few online stores while sitting in the park or climbing a mountain peak. You can enter new places using the device in your hand and make mobile payments there. This is the present.

A good twenty years after Second Life, the virtual platform for life simulation launched by US company Linden Labs, is once again experimenting with new worlds. In the early 2000s, Second Life made it possible to buy virtual properties, open virtual trading outlets and pay with the early virtual currency Linden dollars. Looking to the future, we see how it has been foreshadowed in the past and is beginning to unfold in the present. Discussions about holographic work meetings, metaverses for playing, meeting and learning, and technologies for virtual and augmented reality are indicators of a future increase in spaces. Driven by the development of new technologies, entire universes are emerging around collaboration, consumption and new experiences.

> For the economy to run in digital contexts, all the technologies we see now are steps on the path to the future. Whether we are talking about the blockchain or AI, we are only at the beginning. In 10, 20 and 25 years, this will have been distorted many times over. But we will see these technologies embedded in the payment solutions of the future.
>
> _Jens Hachmeister, Deutsche Börse

Still a virtual world today in which workers can collaborate as avatars, Microsoft is pursuing a vision of location-independent work with Microsoft Mesh. Using hologram and VR technology, meetings and work sessions are made to feel as physical as possible, with actual eye contact and the chance to touch the holographic 3D models. With Qverse, Qatar Airways is offering a virtual check-in experience in the user's browser window, where they can check into the Qverse with a virtual boarding pass, enter the premium lounge, walk through the airport and explore the duty-free shopping emporium. In the exclusive metaverse community of The Row, in turn, 30 aesthetic works of art can be purchased in the form of NFTs, which also provide access to a virtual world in which the buildings look like antique statues or change colour over the course of a day. And in 2022, Millennium Hotels and Resorts became the first hospitality group to open a new hotel called M Social – located prominently in the metaverse of Decentraland. Users can interact with an avatar in the hotel lobby, take a hotel tour and share a selfie as a screenshot when they arrive on the top floor, allowing them to discover surprises in the "real" world of Millennium Hotels.

These examples show that brands are experimenting with new worlds to gamify their user experiences or offer real value in the form of new services, playful adventures and offers. As end users, we can travel through these worlds until we have put together a handful of new places that fit our lives and that we want to move back and forth between. If you are a retailer or payment service provider, you, dear reader, are now faced with the challenge of evaluating the significance of these new worlds for your business model.

Payment is synonymous with software

Payment players in the omniverse must be aware of the place or world where payments will be made as well as the specifics of this world. Are there preferences when it comes to payment methods in this environment? What speed are end users used to? Does someone want to have interpersonal contact in one place or would they prefer to remain anonymous and keep to themselves? Payment providers and retailers need to understand requirements in and between different worlds and decide how to deal with them. Especially in virtual worlds, but also in the physical context, it is conceivable that the future of payment will not involve a tangible payment terminal that offers fixed functions and that it will be replaced for a new one when new functions are required.

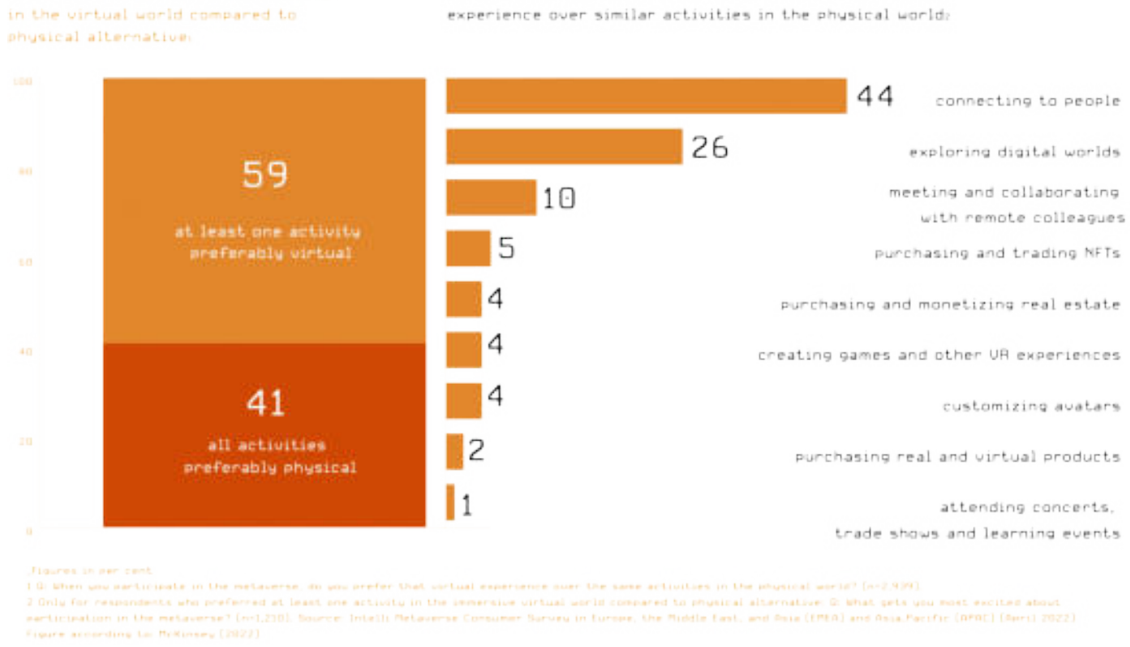
Will the payment of the future be synonymous with software services that are adapted to the regulatory and user requirements specific to the location and the world? Above all, white label solutions from payment service providers can offer retailers the opportunity to expand and adapt their payment services to the situation using plug-and-play applications or, as McKinsey Payment defines the first level of the metaverse: To "enable" a transaction.

> As a restaurant owner, you might intend to buy the software for your restaurant rather than a terminal, a generic accounting package, and a generic payments package. Maybe you'll just say, 'yeah, I want software to run a restaurant'.
>
> _Matt Rowsell, Nexi Group

New worlds allow for transformation

When we imagine worlds of the future, we are not talking about trips to Mars (although French company Zephalto is already planning to offer suborbital dining experiences in the future – how and what will we pay for in a low-emission hot air balloon several thousand kilometres above the Earth?). In recent years, we have seen our working lives become more mobile and increasingly remote. But we are not only observing a change in working culture. Current social developments point to a society that is becoming more decentralized, in which we are changing where we live and work. This is a society in which we build economic, social and even romantic relationships over long distances – in worlds of social media, in worlds of business networks, in gaming worlds, etc. (→ figure: *Activities in the metaverse*). This also means that we are constantly finding ourselves in new payment situations. The examples at the beginning of this text are representative of many other experiences that are emerging in the form of new universes. Technological developments are aimed at multi-sensory connections between spatially separated people, as well as exploring new, particularly virtual worlds.

But virtual worlds are just one facet of the payment omniverse of the future. The metaverse discourse, which has attracted a lot of attention in a while ago, has possibly become exhausted in the mere term of the "metaverse". However, the trend examples listed in this text, such as the Qverse, The Clinique Lab and Microsoft Mesh, as well as product launches like for Apple's Vision Pro headset, are indicators of the development of the vision that underlies the metaverse. This all-encompassing term does not differentiate between a digital and an analogue world, but anticipates the addition of a digital layer to our analogue world. This would mean that in



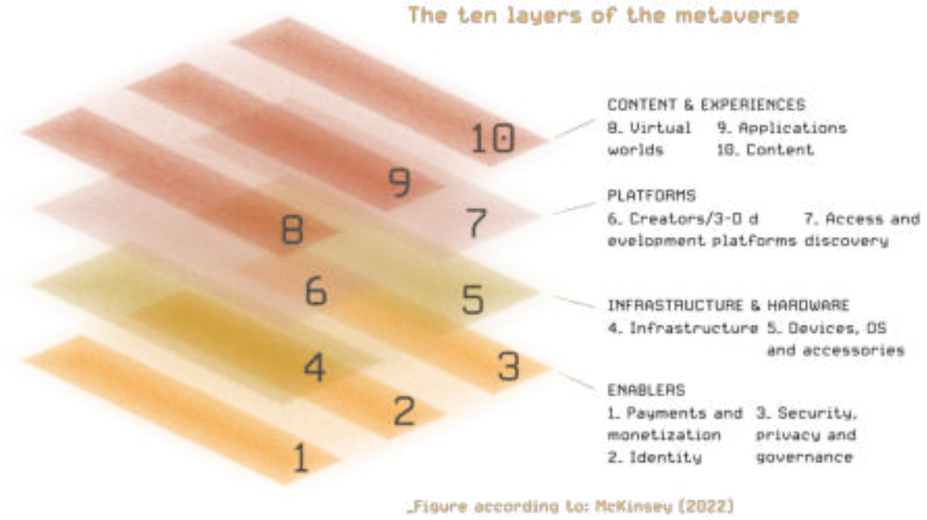


_Figure according to: McKinsey (2022)

> The metaverse is already there for some applications and more are coming.
>
> _Matt Rowsell, Nexi Group

the future we will be traveling in two worlds at the same time, so to speak. The software idea formulated earlier also applies here when combined with augmented reality technologies. Instead of payment terminals, will there be payment glasses or contact lenses, or the AR payment function on smartphones that customers carry in their trouser pockets or on the bridge of their nose? Or will there be nothing at all in the future because people themselves will become the payment method in line with the development towards invisible payments? In the future, will a payment method be activated when you enter a certain location? How mobile will the payment terminal be and who will purchase it?

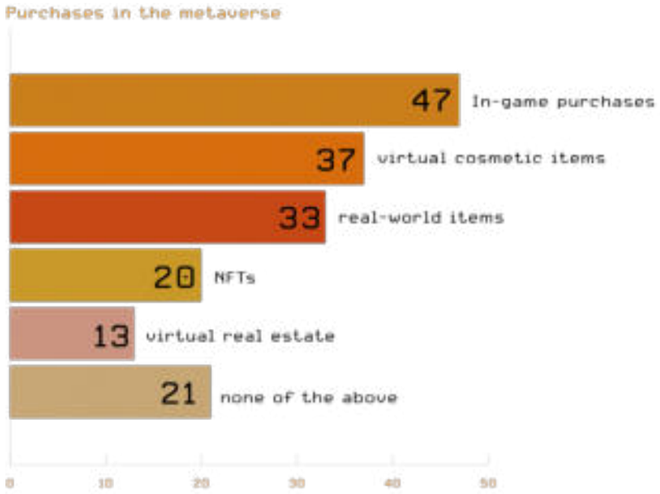
When it comes to micro-transactions and P2P payments, this development is already happening (without AR glasses, though). People use their PayPal app to send each other very small amounts of money to pay for meals. With the World app, the same is also possible with the digital currency Worldcoin with blockchain support after an iris scan and the creation of a World ID. Flea markets now offer mobile payment processing thanks to local payment service providers such as Bizum or Swish. With Reachdesk, organizations can give away digital gift vouchers and pay only the amount that is actually used. Let's go even one step further and assume that there is not only a gift digital (→ Figure: *Purchases in the metaverse*), but also that the the person receiving it is located in a virtual world. The question then arises: Is the future of payment the D2A model, meaning direct-to-avatar payments?

In 2021, Bloomberg Intelligence forecast a potential metaverse market value of almost 800 billion USD in 2024 compared to 500 billion USD in 2020. The drivers here are social media, entertainment, gaming software and hardware, virtual and augmented

reality as well as advertising campaigns in all of these fields. How can brands apply these developments in new worlds?

In 2022, H&M opened a virtual showroom that is designed to showcase products and educate consumers about ecological initiatives connected to the clothing range. H&M Home products can also be showcased quite well in this space. The beauty brand Clinique opened the Clinique Virtual Lab in 2023 together with metaverse pioneer Journee to embark on the journey from e-commerce to immersive commerce. In the Clinique Lab, users can create an individual avatar and explore the six territories of the world. These include product stories, gamification elements, personalized interactions with Clinique consultants, unique offers and immersive shopping "on site". Like many worlds currently being created, the Clinique Lab is simply accessible through a web browser at the click of a mouse.

A future in which consumption and payment options are integrated into showrooms and immersive laboratories is easily imaginable. But how do we pay in such a world? A Web3 experience that markets itself as "with love", as in the case of the H&M showroom, should probably also offer a particularly lovable or loving payment experience, right? Depending on the character of a virtual world that you create or enter, the question of what a fun, lovable, entertaining, adventurous or educational payment experience could look like can function as the gateway to innovation. The appeal of new virtual worlds today lies above all in the fact that these worlds are just this – new and unusual.



_Figures in per cent
Q: When you are participating in activities in the metaverse, have you purchased any of the following products/services in past 12 months? (n=2,093). Source: Intelli Metaverse Consumer Survey in Europe, the Middle East, and Asia (EMEA) and Asia_Pacific (APAC);Rewesh Next Gen Consumer . Metaverse Survey in United States
Figure according to: McKinsey (2022)

Interoperability: Lost in translation

How do we manage not to lose sight of the omniverse of worlds? And what is the key challenge for payment players? Interoperability between the different worlds plays a crucial role for a seamless and user-friendly payment experience. In order to ensure this interoperable payment experience, certain things are necessary: A clear agreement (such as in terms of interfaces, liability and responsibilities) is required between the players in the various payment systems to ensure that they can communicate effectively with each other. Such an agreement enables the familiar payment players in the new world to continue integrating their existing infrastructures and payment mechanisms seamlessly into the new systems.

Another important aspect is the network effect resulting from interoperability. The connection of payment systems creates an advantage for established players, as they have a larger user base and broader acceptance. By integrating their services into an interoperable

payment network, they can expand their reach and market power. At the same time, interoperability offers new opportunities for new players in the payment sector. By creating a good customer experience, they can set themselves apart from established players. New players can develop innovative payment solutions and user-friendly interfaces to better meet the needs of customers. This turns an overall good customer experience into a competitive advantage for these players that helps them gain market share and establish themselves in the industry.

Payment means curation

What is remarkable about all the developments mentioned above and when considering the requirements for a global payment system is that - and this is also evident in the other chapters of Payment 2034 - payment should be consciously considered and can be used strategically to offer an enriching experience. However, this payment will probably not be particularly visible in the end. For end customers, the overall experiences that we create (in new worlds) come first. The payment experience is only a downstream component of these overall experiences.

The payment innovators of the future will probably be characterised by the fact that they create innovations that are invisible from the outside, e.g. innovations that ensure a smooth user experience. If we look at a possible evolution of digital payment, the coexistence of worlds is likely to be at the forefront. The idea of a single virtual payment cosmos seems rather challenging and unlikely. This is precisely why it is important for the immediate future of payment to focus on the idea of the omniverse and to think about the following: Between which worlds do my (potential) customers move back and forth? Into which of these worlds do I want to accompany them as a payment player? And how do I manage the migration, how do I manage the commute between these worlds? Users choose worlds and experiences. It is up to merchants and service providers to integrate payment into these worlds as naturally and smoothly as possible. Despite all the invisibility, for decision-makers, the payment of the future is therefore about nothing less than the curation of payment worlds, payment methods and payment solutions.

Payment becomes an anchor of trust

US coffee company Starbucks launched Starbucks Odyssey in 2022. In the virtual world, approved members of the brand's own loyalty program could experience adventures and master challenges. But Odyssey is intended to be more than just a game world: Those who embark on journeys through the new universe will have the opportunity to earn or purchase tokens. For example, users can purchase NFTs in the form of limited-edition stamps and works of art. But tokens can also be used to unlock exclusive offers or VIP experiences, including a virtual espresso martini cocktail workshop, access to the aforementioned works of art and unique merchandise. Odyssey also offers access to special events in analogue cafés and even a trip to a coffee plantation in Costa Rica. Customers can pay for everything by credit card. Neither the possession of cryptocurrency nor a crypto wallet is necessary to benefit from the virtual world. The brand is becoming a trailblazer as customers can use it to explore new worlds – and find a familiar anchor in the payment system.

This example illustrates that thinking about the future of payment must include the question of which function we want to assign to payment. Positioning a player as a payment pioneer requires a new world awareness: Does a payment situation take place in the analogue world? Then it can shine in a familiar context with new payment technology (→ *Age of Seamlessness*), elaborate collaborations (→ *New Ecosystems, Planet Centricity*), new security features (→ *War for Data*) and exciting methods

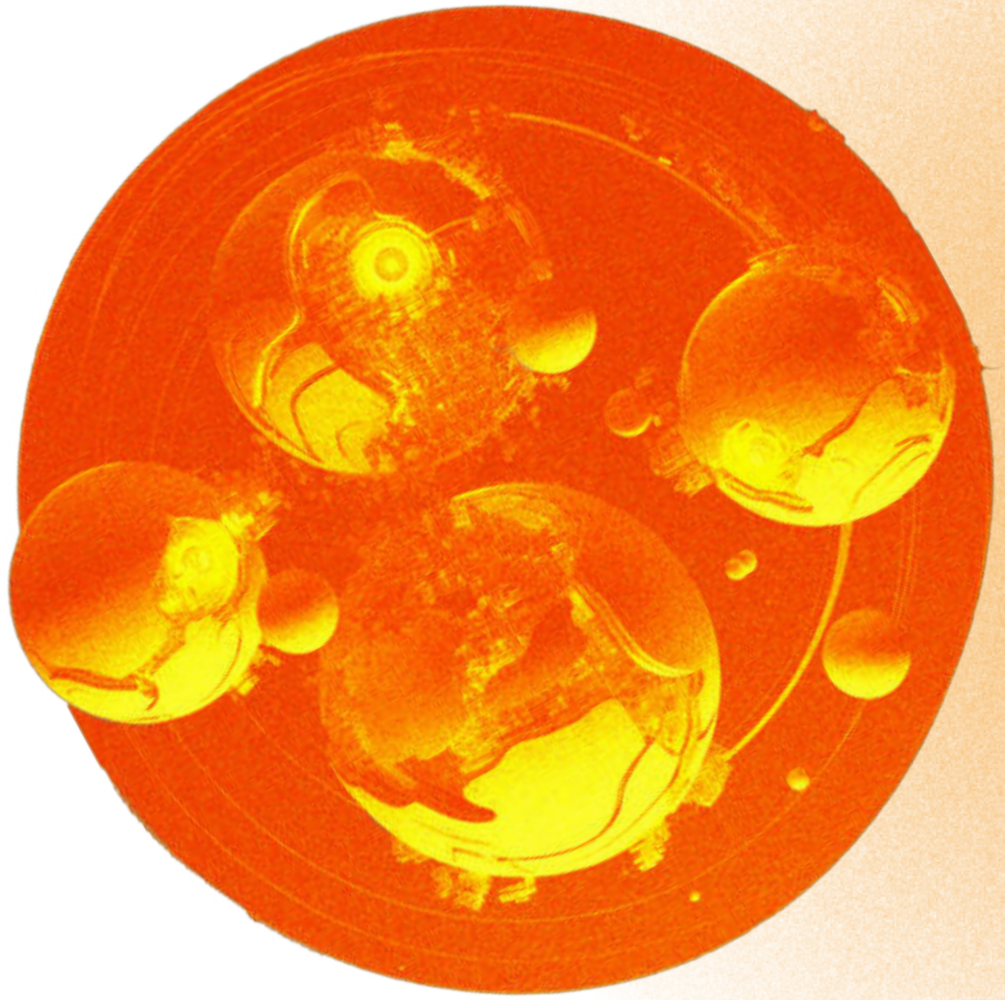
of payment (→ *New Money*). Do you want to establish or strengthen your own market position in a new world? Then payment can act as a variable of stability if the means or method of payment has already gained user trust during previous encounters.

It doesn't work without rules

Let's return to the present for a moment. In the physical world, there are clearly defined boundaries that also define the legal space in which we find ourselves. We always play by regional rules. In what we have so far defined as the digital world, things are a little more difficult. Discussions about the location of the transaction and the associated regulation involve thousands of people around the globe. When an indefinable number of worlds form an omniverse, we can quickly despair at the complexity. What might be an Eldorado of legal freedom for some is an absolute nightmare for payment designers and certainly one of the most important (if not necessarily one of the most exciting) areas that we will have to deal with in the future.

The Omniverse is about experimentality and a thirst for adventure

Have you reached the end of this text unscathed by our journey through the worlds? Which point in particular has remained in your memory? The interoperability and migration from one world to another? The question of the software required to operate globally? The challenge of curating payment methods and options for your corporate cosmos? Considering how trust can be promoted through payment in a decentralized world? Do you want to think more about the necessary regulations for a future in the omniverse? And the most important question: Which of the futures outlined at the beginning of this chapter would you like to live in? You haven't read the scenarios yet? Then let's get started: Immerse yourself in what is possible.



CONCLUSION

Digital borders are being torn down.

In 2034, there will be a multitude of digital worlds in in which we will spend more or less time. That means it will therefore become increasingly important to ensure interoperability in payment and other areas, that is, a seamless transition between these worlds.

A consistent customer experience is key.

Only those who manage to provide people with a means of payment that offers the same payment experience in all worlds, in addition to a certain level of security and convenience, will be successful in the long term. This applies to the metaverse, to smartphones or to the point of sale.

Metaverses require regulation.

The new digital worlds are mainly hosted by private companies that do not have consumer protection at the top of their agenda. That is why it is essential that uniform regulation is developed. This applies even more in a professional context than in a private one.

New worlds require new currencies.

While traditional fiat currencies are too inflexible for digital worlds, unregulated cryptocurrencies are not widely accepted by the population. The key to success lies in digital variants of classic currencies, which combine the advantages of both worlds.

05 Planet Centricity

Payment will become a key factor in the circular economy.

David Lais,
ecolytiq

Planet Centricity: Paying means taking responsibility

Payment as a necessity can benefit and support the sustainability movement by becoming a green companion in daily life and helping users to take on ecological responsibility. This requires a transfer of information that goes beyond the price and collects and evaluates variables such as material, product reuse (instead of disposal) and payment method. The circularity of products can become part of payment of the future. The proof of purchase becomes a proof of resale. If cleverly positioned, payment players can become key players in an ecological future econonmy.

AI STANDS FOR ATMOSPHERIC INTELLIGENCE

A reusable coffee mug,
click, a used blouse, *click*,
a coffee table made from
pressed nettle straw, *click*.

Palina looks around her living room in search of other things she could photograph. Her camera automatically sends the photos to her new AI assistant Clime, which Palina has just installed. Clime also constantly synchronizes with her household appliances and wearables as well as her social, entertainment and shopping accounts. Palina walks over to the shelf on the wall and takes photos of the spines of some books: *We Are the Weather: Saving the Planet Begins at Breakfast, The End of the Ocean, The Ministry for the Future, Carbon Detox, ÖKOnomie, The Climate Book* – these are now outdated, but they will be useful for training, Palina thinks.

"Clime, what are you missing?" she asks into the empty room. Silence. Outside the window of her high-rise apartment, bees are buzzing in the urban beehive that she installed there a few years ago. A delivery service drone from Too Good To Go flies past outside. "Clime, do you have enough information?" Palina repeats her question.

"I understood you the first time. Give me some time to process." Palina raises an eyebrow.

"Based on the training, I have identified the following attributes as very important: Fairness, transparency, circularity, zero waste. The following were classified as important: Gender equity, speed, convenience, quality, regionality. I also identified the following as relevant: Affordability, health, safety, reliability. You can see the overview in your Clime app."

The Clime logo lights up on Palina's watch as she sinks into her desk chair and scrolls through the window on her laptop, which popped up during the dialogue with Clime.

"Classify affordability and regionality as very important." Palina stretches her legs while the attributes on the display in front of her shift from one category to another.

"That's done. I have stored other values and attributes for which there is not yet enough information in my memory. You can access these attributes at any time in the Clime application. There, you can also review them and manually classify them as relevant, important or very important. Otherwise, if you give me permission, I will monitor your consumption decisions and adjust the value index over time. For this, I will analyse your payment receipts and wish lists."

"No, I prefer to keep my consumption private. Exception: My purchases at Penny, tegut, dm, Biocompany and Veritas. Maybe others, but I can't think of them right now. I'll add them later. You can look at the receipts for the stores I just named and evaluate them using the – what did you call it? – value index."

"Would you like to receive monthly, bi-weekly or weekly reports on your consumption behaviour? Should I create recommendations after each purchase to better match your values?"

"Bi-weekly reports are good and yes, let's give the recommendations a try. Is that all?"

"That's it. I'm ready to go."

"Great, I need to buy more dandelion coffee anyway. I drank the last of it this morning. I'll try you out right away."

Palina grabs a mesh bag, slips into her clogs and pulls the front door shut behind her. She hears her Vacuum Bot begin to whir quietly behind it. A quick glance at her wristwatch confirms that the lights behind her have gone out. She nimbly trots down the stairs.

"Palina?"

"Yes, Clime?"

"By the way, I've put some information about a few more ecological payment providers and banks in your Clime inbox. The Future Bank, for example, would be better suited to your values. If you'd like to find out more, just let me know. If you're interested, I'd be happy to organize the transfer of your account and data for you."

"Okay, hit me. Let's play the information over my headphones," says Palina as she heads for the supermarket, the front door closing behind her.

CIRCULATE

Account balance on 15.07.2034: €1,087.32

**14.07.2034 Credit; Circulate:
amount €55.50**

**→ circulate out: lamp SWEDISHSTOCKINGS;
product code: SWSTCKNGSS31/
Lamp/GREIGE/HumanHairWaste/
EUR150.00/310505**

12.07.2034 direct debit; Too Good to Go:
amount €-4.32

**06.07.2034 direct debit; Dlvrd:
amount -83.89 €**

**→ circulate in: T-Shirt ARMEDANGELS;
Produktcode: AANGLS34Spring/T-Shirt/
XL/BLCK/WoolWaste/BacteriaDye/
EUR83.89/340706**

07.07.2034 direct debit; Vytal membership fee:
amount €-10.00

06.07.2034 direct debit; Espresso House:
amount €-0.70

01.07.2034 direct debit; Green Energy
membership fee: amount €-20.49

01.07.2034 direct debit; Penny:
amount €-18.93

BLUEBANK

LENA LIMBURG'S 2034 LETTER TO NON-CEOS

Bluebank, the locomotive of ecological capitalism

Dear non-CEOs,

As the former CEO of one of the world's largest asset management companies, I am staying true to my long-standing tradition and addressing my non-CEO letter to the decision-makers of this world. In other words, to all the many millions of Bluebank members. To the many individual citizens who, with their commitment to green finance and sustainable payment, are helping to make our planet climate positive. It is your actions that set the biggest lever in motion: Steering global financial flows towards ecological capitalism.

Together, we have not created a bank, but a global movement that is more powerful than all the corporations in the world. Because it does not represent national interests but pursues a universal goal: To leave the planet in a better state for our children and grandchildren. To achieve this, every corporate action must be climate-positive – every company must leave the planet and its ecosystems better than it found them. And every action can be entrepreneurial if we link something as fundamental as account management and payment to the unconditional purpose of climate positivity.

Every entrepreneurial action must result in climate positivity.

I say this from the position of a simple honorary member of Bluebank and would like to encourage others to also promote ecological capitalism. Many accused me of greenwashing when I co-founded Bluebank five years ago with the Whitefall Foundation as a major investor. From other quarters, I was accused of being a communist because I advocated stakeholder capitalism that takes into account the well-being of all interest groups– employees, suppliers, local communities. I can assure you: Even at the age of 72, I refuse to be pigeonholed. The world is complex. So are people. Solutions have to respond to this.

I am also a capitalist at heart. I believe in the transformative power of capital and the positive disruptions that properly managed financial flows can trigger in the markets. A lot has already happened in recent years. Non-planet-centric companies have been largely cut off from global credit flows. They have lost their raison d'être. They have been replaced by countless start-ups and new unicorns that have scaled greentech globally. Now we need to pick up the pace, and we need everyone on this planet to do so. Bluebank's goal is 8 billion members.

We need more speed and 8 billion Bluebank supporters. We need to think big if we want to prevent harm to our planet and therefore ourselves. Bluebank sees itself as a global bank in the hands of the planet. The most valuable assets it has are intact ecosystems. It is the locomotive of ecological capitalism. Let us take you along with us.

Sincerely, Lena Limburg

CONTEXT

PLANET CENTRICITY CONTEXTUALIZATION

THE GREEN SHIFT IN PAYMENT

A new stakeholder is changing the economy

The world is changing. For some years now, a new stakeholder has been moving further and further into the focus of organizations and companies: The planet on which we live. Larry Fink, CEO of the world's largest asset manager BlackRock, wrote in his annual CEO letter back in 2020: "Climate risk is investment risk." Companies that do not adopt a sustainable approach are taking incalculable risks. They are therefore out of the question for long-term investors. This perspective is widely accepted. Of course, Larry Fink's approach is a highly capitalistic one, some people may criticize, but this does not change the fact that the sustainability discourse is relevant to society as a whole. Larry Fink speaks of a tectonic shift that is emerging. Sustainable investments have now reached a volume of 4 trillion US dollars, and the trend is rising. The reasons for this are obvious. In the anthropocene, man-made global warming continues to progress – with all the climate catastrophes that arise as a result: Heat waves, droughts, heavy rainfall, floods.

The associated costs are exploding. In other words, it is becoming increasingly expensive to do nothing. Or as the renowned climate researcher Johan Rockström says: The twenties of this century offer the last opportunity to turn the tide. Every decade we must divide our greenhouse gas emissions in half. This ambitious goal can only be achieved through a combination of many measures. At the heart of this is the transformation of modern economies towards a circular economy in which growth is separated from resource and CO2 consumption. This requires massive investments in new green technologies that will have to scale up radically over the next ten years. For example, in the field of carbon capture, where Swiss company Climeworks is active. It uses giant "hoovers" to filter CO2 out of the air, which can then be reused for industrial processes. As the world's leading start-up in this field, it raised over 600 million euros in the last financing round. The unicorns of the next ten years will probably not be search engines or social networks, but greentech companies that make a contribution to decarbonization. To put it more broadly, you could say that those who tackle the issue now will secure an advantage for future economic activity. Planet-centricity, meaning ecological, sustainable and ecosystem-based thinking, means future viability. Those who act sustainably today create the freedom to catalyse innovation and take on other challenges in the future. In addition to the green shift in business models, stricter legal and regulatory requirements will make companies and citizens take responsibility over the next ten years. This will affect all areas of social life and business, including payment transactions.

> There will be a systemic push towards sustainability.
>
> _David Lais, ecolytiq

Cash will be banned in 2028 for environmental reasons

This may not be the case in Germany, where only 16% of respondents can imagine giving up cash. However, digital pioneers such as Estonia could actually take this step. In addition to the positive effect of preventing a large proportion of money laundering, digital payment methods also have an ecological advantage. For example, a research team from the Netherlands analysed the environmental impact of card payments compared to cash payments. This research showed that the carbon footprint of cash payments is 36% higher than that of card payments. The reason for this difference lies in the supply chain. Most emissions are caused by cash transportation, followed by the production of coins. The energy consumption of ATMs is also not insignificant. Compared to other emission drivers such as mobility, for example, the ecological payment footprint may seem small. But with an increasingly holistic awareness of the environment, the no-cash movement will get louder and louder. Those who want to be trendsetters will do without the unecological alternative of cash.

Bitcoin goes green – or is no longer allowed

With the amount of energy it takes to produce a single Bitcoin, an electric car could drive 950,000 kilometres, according to Joanneum Research (as of 2023). The total emissions generated by Bitcoin mining are equivalent to the annual CO2 emissions of a country the size of Greece. These comparisons show the ecological madness behind the cryptocurrency. In 2034, this problem will have been solved either by new mining processes or by banning the currency because today's climate targets will otherwise be even more difficult to achieve then. The Swedish Financial Supervisory Authority and the Swedish Environmental Protection Agency recently published an open letter calling for the standard proof-of-work system for mining cryptocurrencies such as Bitcoin and Ether to be banned in the EU. As new digital currencies continue to spread, the ecological damage they cause is growing and so are the calls to regulate them. For instance, crypto mining has already been banned in China due to its massive energy consumption.

Payment must – and will – be sustainable in the future

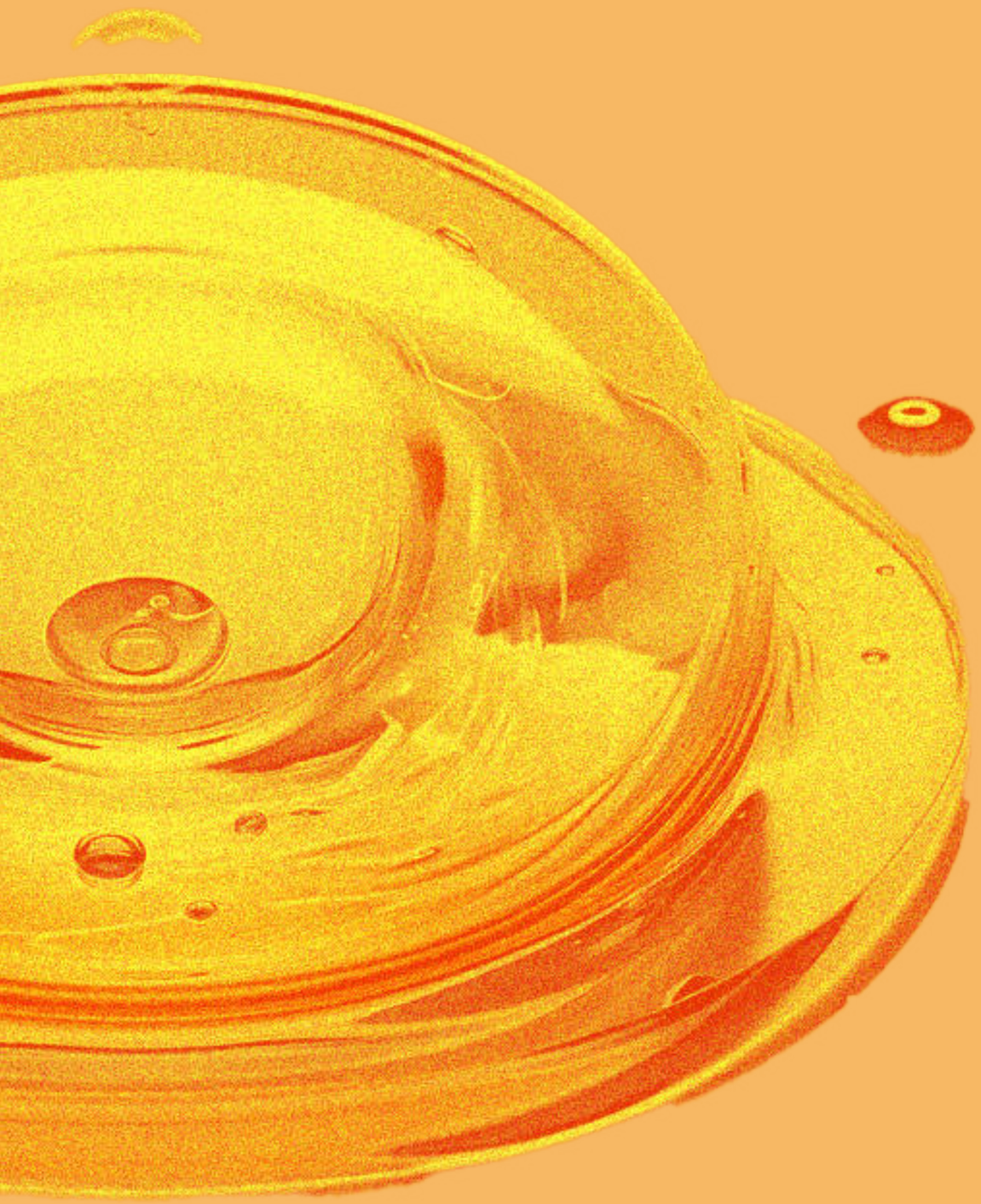
In the future, life cycle assessments will be just as much a part of a payment method as is nutritional information on food. And just as a CO2 price is charged for heating, charges could also be levied for certain payment methods. Anyone who insists on using cash will have to pay extra. Emission levies as a controlling market authority will reach large parts of the economy by 2034. The link between payment and sustainability will also gain importance on another level, namely in relation to the collection of additional environmental information. With a digital payment method, information on the impact on the environment can be provided with every purchase, for example the overall CO2 balance of a week's shopping. If a consumer buys less meat on the next shopping trip, their figure would improve. A circularity ranking could offer additional information. Vegetables from regenerative agriculture would get the top score, while a disposable barbecue would get an "unsatisfactory" grade. Payment transactions offer a range of options that can help classify the environmental impact of a purchase. In addition to basic information about the type of retailer, the payment methods used, the amounts and times and more detailed information on the contents of the shopping cart become part of the transaction in the future. This is how payment can provide relevant information to support positive changes in behaviour in terms of sustainability and can become the linchpin of an ecological transformation.

Individual payment service providers (such as Mastercard with the motto "Shop and do good") already offer CO2 calculators that calculate monthly CO2 footprints. This allows users to see where their consumption is especially CO2-intensive. With the help of recommendations on CO2 reduction and compensation payments, for instance in reforestation projects, a climate-positive lifestyle can be achieved. This is a great opportunity for retailers in particular: They can accompany their customers on a journey to a sustainable future. Payment becomes a form of differentiation in the competition for customers. If we continue on this journey, payment will become an integral part of the developing circular

> We are definitely seeing a growing demand for sustainability, both from customers and from our partners who offer financial services.
>
> _Delia König, Solaris

Ecology & regulation: Which cryptocurrencies can prevail?

According to the Electricity Consumption Index of the Cambridge Centre for Alternative Finance, the current annual consumption of Bitcoin is around 114 TWh with a range of 68 to 204 TWh. The uncertainty in the consumption forecasts is partly due to the fact that very different computers are involved in the processes worldwide, electricity consumption is not recorded centrally, and their energy efficiency varies greatly. In addition, the number of Bitcoin transactions fluctuates, as does the speed of mining. Like many other cryptocurrencies, Bitcoin is also based on the so-called proof-of-work concept, which is associated with high computing power and therefore high power consumption. Alternative concepts use the proof-of-stake mechanism, which works much more efficiently and consumes much less energy. However, no clear market leader is emerging. This is certainly also due to the fact that (global) regulation surrounding cryptocurrencies has increased significantly, and a number of scandals, such as the events surrounding the FTX crypto trading platform, have fundamentally shaken trust, leading to a stagnation or even decline in the use of cryptocurrencies. A return to the actual added value of cryptocurrencies and blockchain principles is to be expected, but is currently impossible to predict. The projects of various central banks on electronic money, such as the digital euro (→ *New Money*), seem much more tangible, even though this is not a cryptocurrency in the true sense of the word, in whose nature decentralisation is a decisive factor.



economy. For example, when you buy a jumper in the future, the warranty and sustainability balance of the item can be stored so that the value of the product can be automatically determined if it is resold at a later date, similar to the Circulate scenario at the beginning of this chapter. Items that are not recyclable are excluded from the system, which motivates manufacturers to convert their production processes into sustainable ones.

Payment makes planet

With a new social awareness of the planetary and climatic impact of human activity, a variety of issues are coming into focus. For example, climate protection is sometimes the decisive factor in consumer decisions. Consumption, in turn, is inextricably linked to payment. That makes payment a part of consumption and climate responsibility. If we take a closer look at these two aspects, the question of the carbon footprint of the actual payment arises. This is not an easy question to answer, as it has to be backed up with a series of assumptions in order to obtain quantifiable results. The Life Cycle Assessment of Card Payments study, which was commissioned by De Nederlandsche Bank, found that POS debit card payments emit 86% less CO2 per transaction than cash payments. The share of debit card payments in total CO2 emissions in the Netherlands is 0.0014%. Production and operation of plastic cards and terminals account for the largest share. Purely digital payments without physical cards and dedicated POS terminals would reduce consumption by over 60%. However, the overall effect remains small.

Number of transactions:
CO2 footprint in comparison

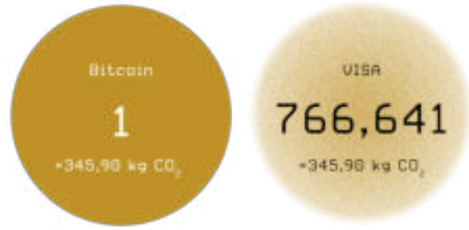


_Figure according to: Digiconomist (2023)

In light of this, let us take another look at Bitcoin. According to Digiconomist analyses, the carbon footprint of a single Bitcoin transaction is equivalent to around 800,000 Visa transactions (→ Figure: *Number of transactions: CO2 footprint in comparison*). There will be around 800 million Bitcoin transactions per month worldwide in 2023. In comparison, the number of PayPal transactions is two billion – so Bitcoin cannot be classified as a marginal phenomenon. The environmental aspects of its use are just as relevant. To summarize, replacing cash with digital solutions would be desirable, ideally with those that do not require a physical infrastructure. These could also include cryptocurrencies, although not the currently dominant ones, Bitcoin and Ethereum. On the other hand, payment could act as a central anchor in any consumer behaviour and play a role in the creation, control and management of one's own and establishing a benchmark for assessing the environmental balance sheet. This enables transparency and comparability, both of which are prerequisites for setting goals. Rewards could also be given directly for the set targets. Apart from the fact that the environment is better off if people consume more consciously, there could also be discounts that are not just of a monetary nature, but also have an effect on the energy balance of consumers. But that also means that there is more (digital) data that needs to be

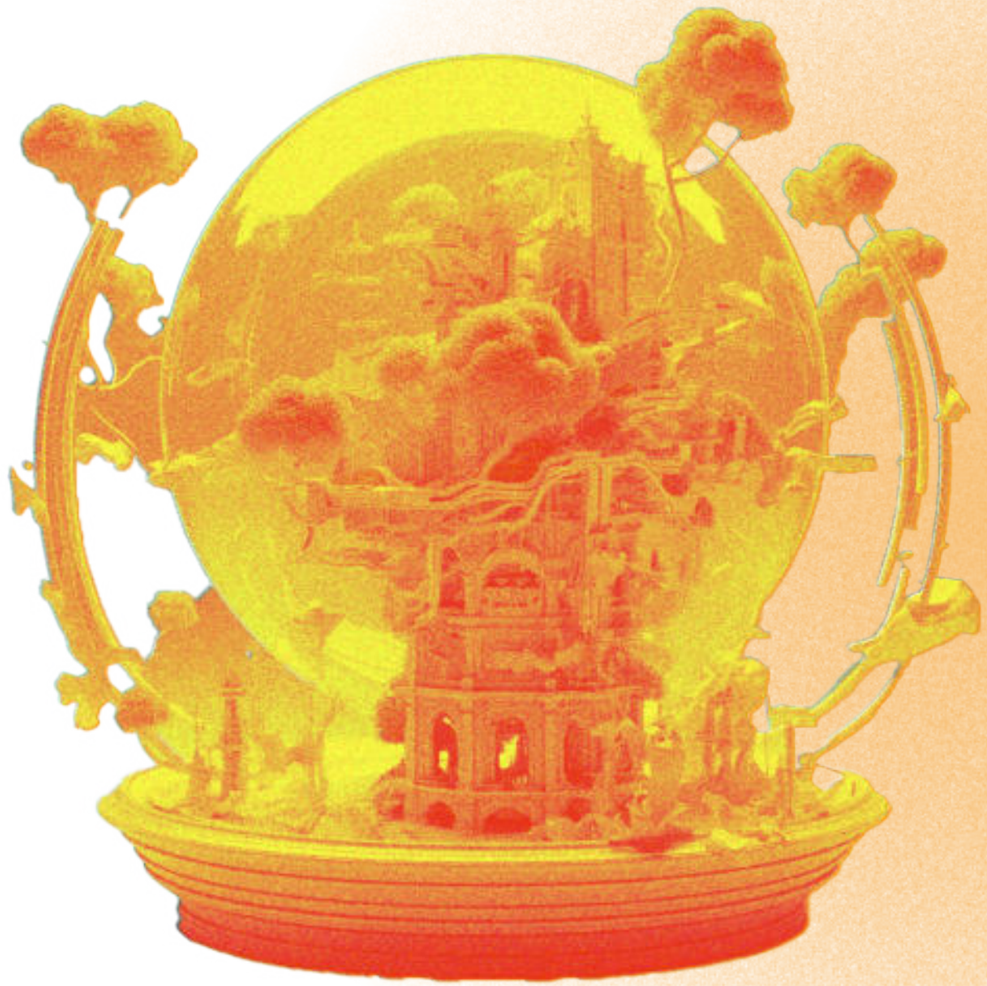
handled sensitively. In terms of data protection, a personal score may initially have a deterrent effect and create a feeling of being watched in consumers. Therefore, the main focus must be on legally compliant transparency, not on a tax or even emission papers that can be traded to achieve a better score. Regardless of these aspects, payment is in any case one of the central anchors for measuring one's own carbon footprint.

> I am firmly convinced that we will have an artificial intelligence that manages all basic financial services for us according to our needs. What is important here is that this will not be an artificial intelligence that I get from a bank or even a retailer, but that it will be my artificial intelligence that I have trained and that knows exactly what my preferences are.
>
> _Dr Jochen Biedermann, FinTech Consult

Outlook: Planet-centered payment

In conclusion, let's take a mental journey to the (completely planet-centered) year 2034: What has happened? A culture of sharing and reuse has become established in Europe. Carpooling has replaced individual transportation as the dominant mode of mobility. Self-driving vehicles have become an integral component of transportation across the board, with a few exceptions. The first climate-neutral passenger airplanes are flying on green hydrogen. And the meat we buy in the supermarket is largely cultured meat, meaning it was grown from animal cells in a bioreactor. Sustainable investments dominate the financial world. A global eco-tax, which is levied as an environmental tax on day trading and high-frequency trading, goes to the United Nations Global Environment Fund, which uses it to make compensation payments for not using nature conservation zones such as the Amazon. There are only a few banks in Europe that do not offer CO2-neutral account management. Payment methods that use virtual reality payment to illustrate the CO2 impact and circularity index have also become the norm. However, the feature that customers are most excited about is the integrated value-based AI assistance. It is linked to the personal accounts of users and acts as a filter for online shopping, among other things. It gives preference to retailers that match one's sustainability profile. The value AIs are like good friends who look over people's shoulders when they shop and invest and help them make better decisions.

What do you think?
Is this what a planet-centered future looks like? What role would you play in it? And what would you do differently?



CONCLUSION

The green shift is moving into the world of finance.

Sustainable investments, green financial instruments and a new foundation of values are becoming the norm in the global world of payments.

Payment supports responsibility.

Thanks to clever service enhancements such as CO2 calculators, payment comparisons and ecologically oriented accounts, payment can play a key role in promoting sustainable consumption in the future.

Planet-centered business models emerge.

The planet is becoming an increasingly important stakeholder in organizations and companies. Taking ecological responsibility is becoming a central issue in business.

Sustain-ability equals future viability.

The environmental impact of payment methods is being taken into account more and more. Those who are already working on ecological alternatives today will win the race for the future.

06

New Eco systems

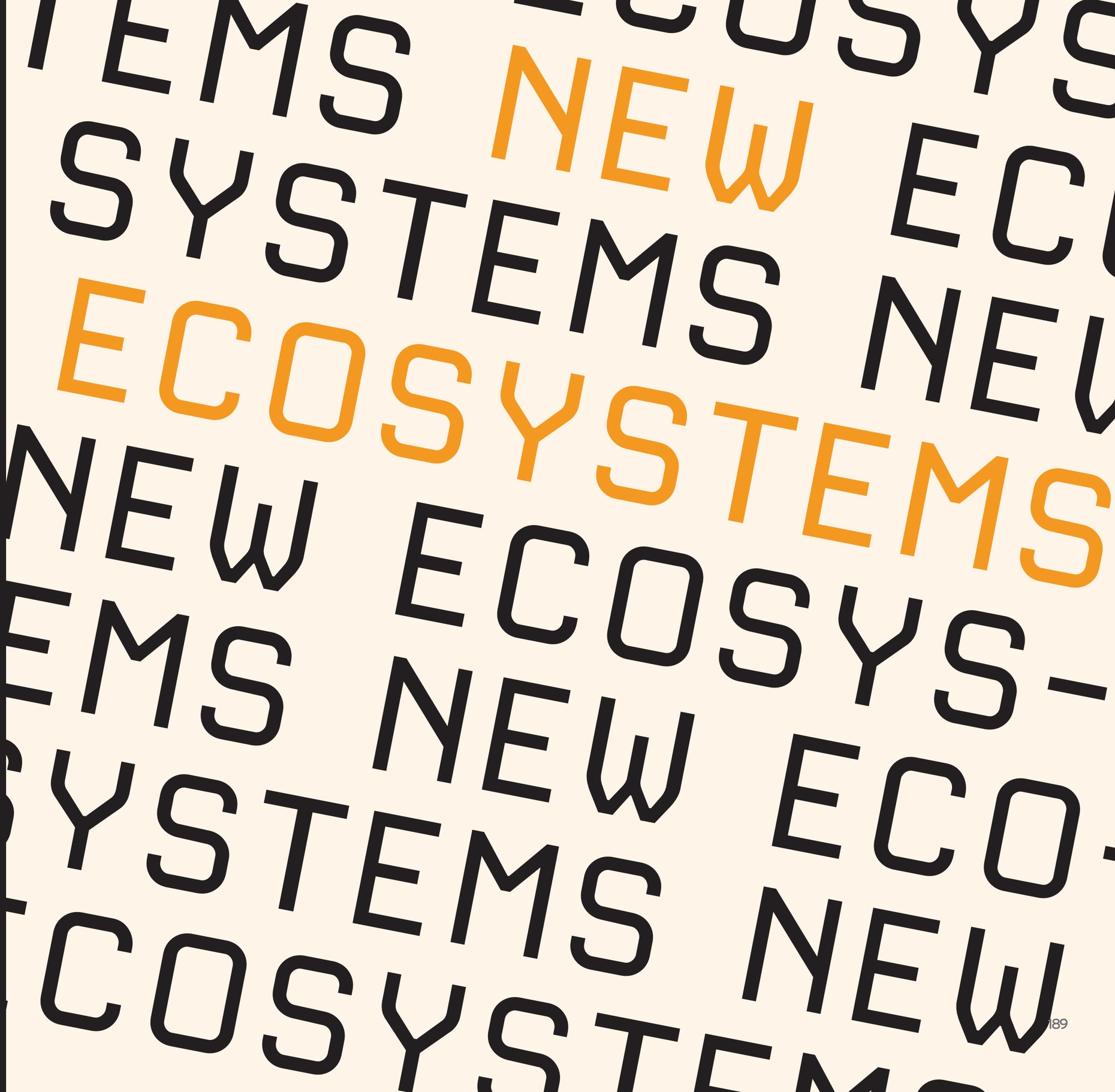
Isolated solutions will have difficulties finding success.

Delia König,
Solaris

New Ecosystems: Payment becomes a holistic experience

What if payment was no longer just payment?

In the future, payment will become a holistic service. A payment player will become an ecosystem player. In new ecosystems, payment will go beyond simple transactions and interconnect with a wide range of services that are being developed across industries. This is about anticipation, personalisation and digitalization. Whoever succeeds at continuous renewal gets the upper hand in the race for customers whilst others die out unable to build an ecosystem that is fit for the future.



BEYOND COFFEE

Steam rises from the Italian coffee machine and hot milk flows into the grey glazed cup underneath.

The display on Ayo's watch lights up: *Table no. 6 is free. Have a nice stay, Ayo!* Ayo raises his wrist to his mouth and mumbles: "Send reservation to Linus," and pushes past a group of young people. He weaves his way between occupied tables, glances occasionally at the display on his watch and follows the direction of the arrow on it, which swings gently to the left and right like a compass needle to guide him to his reserved seating area. Once he arrives, Ayo slides onto the wooden bench at the far end of the room, the arrow icon changes to a checkmark and the clock display goes black again.

Just as Ayo starts to have his emails read out to him, Linus appears, drops onto the seat next to him and puts his arm around Ayo's shoulders. "Did you order already?" he asks, raising his phone in front of his face with his elbows propped on the table. The lock screen disappears, Linus swipes the green tick upwards and scrolls through the menu. "No, not yet." Ayo looks over Linus' shoulder and also studies the menu. "I'll have a coffee." He lifts his watch to the side of Linus' phone.
"I don't know why you're even reading the menu, you're such a creature of habit," smiles Linus, wiping the coffee order to the right with his index finger, where it appears on Ayo's watch.
"A cactus water kefir with extra calcium and a prebiotic shot for me." Linus double-taps the menu and puts his phone back in the pocket of his jacket.

"How was your evening?" he asks, and Ayo lets out a sigh. "Exhausting. These medical data diagnosis meetings are always so exhausting:
Senior physicians always want to understand the data set behind an ambiguous AI diagnosis down to every last detail. Then the over-achieving medical students think they know better than everyone because they've just taken a course in algorithmic diagnostics. And hyper-empathic assistant robots are constantly interfering because no one in the room knows how to mute them."

"Here are your drinks." A young woman carefully places two ceramic mugs on the table before Linus can answer.

"Carla! Nice to see you here."

„How are you?"

"Good, good. Ayo needs to cool off for a bit."

"Diagnostic meeting?" Carla asks knowingly, pulling up a chair and sitting down at the table. Ayo nods.

"How's the coffee shop going?" Linus takes a ship of his drink.

"Oh, great. I'm going to Farm Finance next week. Maybe you remember, it's that fair where we can meet potential new community brokers to expand our financing network. The preparations for that are in full swing on the second floor. But things have really been going much better since we switched to a crowd-funded coffee cultivation approach. Mario and I are more relaxed about running our cafés and local interest is stronger than ever."

"That's good to hear." Linus glances at Ayo's watch.
"Oh damn, I've got to go. I've got a customer appointment in a minute. Bye, Carla. Ayo, I'll see you tonight!" He hastily empties his cup, gives Ayo a quick kiss and winds his way between the tables towards the exit.

"Don't forget to pay!" Ayo calls after him.
Linus raises his arm to confirm that he has heard him, stops just before the exit and, after a brief verbal exchange with the barista, leaves the café.
Ayo's watch lights up: *Someone from your group has just paid a partial bill.*
Carla stands up with a smile and looks at Ayo, who is just finishing his coffee and also standing up. "Do you need anything else? A drink or a bite to go?"

"I'll take another coffee for the road," he says, and holds his watch in front of his mouth. The display lights up in confirmation.

"I'll walk you to the door." Carla and Ayo wander between the other groups of seats.

"See you next time." Carla hugs him before disappearing into a room behind the bar with a wink. Ayo's watch vibrates: *Your order is ready. High five and enjoy your coffee, Ayo!* A barista with shoulder-length silvery-brown hair calls out: "Ayo?" Ayo nods. "High five!" the barista repeats the message from Ayo's watch and hands him the cup. Ayo grabs it with one hand and places his free hand with his watch flat against the milky transparent glass plate mounted vertically above the counter. At the same time, the barista presses his palm on the other side of the plate. A white light flashes and Ayo's watch vibrates.

"See you next time!" the barista calls out as he lowers his hand. Behind Ayo, a purple UV disinfection light glides up and down the glass plate as he pushes open the café door. The display on his watch lights up: *During your visit to Amici del Caffè, you borrowed a reusable cup and consumed two coffees. You have collected 4 points, Ayo. You can donate them, keep them in this part of your wallet for your next visit to a community coffee partner, send them to friends, credit them to your bank account or have them converted into a currency of your choice and moved to another part of your wallet.*

"Convert the points into tips," Ayo mumbles into his wrist and turns onto the street outside the café as the door silently closes behind him.

PAY PER HORMONES

12.04.2034,
WhyApp

Craaazy shit, I'm telling you. I'm at the Neflix-Cineflix right now. *Faster & Furious 19.* It starts off so great. The first two minutes are pure adrenaline!!!!! I wonder what the bill will be. Doing "Pay per Hormones" today. Direct link between adrenaline rush and ticket price. The movie has just started. I'm already at €1.43. Oh boy! If I keep reacting like this, it'll be a good €30. I think the price is capped. But hey. What you feel is what you pay. Shit. I just overreacted again. 20 more cents!!! Just because of a huge explosion. FLAME!

THE RE-INVENTION OF THE BANK

Your Country Magazine,
14.06.2034

Origami-like, the milky transparent doors fold open to reveal the interior of the two-storey building, which for years housed a regional bank.

A few years ago, even the last of the lovers of the past had to admit that a bank that insists solely on tradition no longer really fits in a rapidly changing rural area that has become the new home of scientific and technological innovation centres and urban elites who want to get out of the city.

The newly opened location, simply called the bank/, is sure to become a meeting point in the region – and it is already happening: Noise-insulated work cubicles are filled with concentrated remote workers who are using the mobile office terminals that their companies have set up for them. They are surrounded by attractive colourful pop-up bookshelves from the regional library. With an espresso or a soft drink in hand, people of different ages browse through the physical and electronic book spines. The trained eye recognizes what this place used to be thanks to many of the titles. In addition to the latest bestsellers, you will find titles such as *Financial Basics for Founders*, T*he Happiness of Money*, *A Short History of Poverty Among Seniors, Money Makes the World Go Around, My First Financial Portfolio* and *How to Become a Community Farm Finance Broker*.

Along the windows are groups of breakfast guests who are chattering happily, a few flies buzz under the solar-powered ceiling fans and music from the social livestreams of regional performers can be heard from the loudspeakers.

People line up in front of the street food capsule outside, where food is served by local food producers that change every month. The customers use their phones, watches and glasses to read the menu and place their orders in the bank/ app. At the front of the queue, a father picks up a selection of drinks and snacks for his family, balancing them expertly in one hand, holding his son with the other one. A counter in the background jumps from 12,079 to 12,084 displaying the number of bank/ coins that have already been collected at the bank/ this month by supporting local businesses.

An orange locker is being filled with parcels. Anyone who orders products from regional brands to be delivered to the bank/ locker for self-collection can also collect bank/ coins here. Users who choose a local logistics provider receive additional points and discounts, which in turn can be used in the bank/ and the extended ecosystem of the Local&More program.

The idea behind it: Human-scale organizations – a term that has become popular in recent years for small, local businesses whose economic success contributes directly to the well-being of all the people behind it – are promoted to support the local economy and increase the quality of life in the region. This includes educating those involved in this system, especially when it comes to finances, which are seen as a prerequisite for having a good life. This is why visitors of the bank/ can manage their financial services on site if they need to in specific situations (and this is essential!), meaning that they can choose which payment providers they want to use (regardless of whether they were developed by the bank/ or added to the portfolio as a local service provider), which integration they use for their value-based portfolio, whether they want their credit rating to be checked in the traditional or community-based way, which cooperative loans with local partners are of interest to them and which white label provider they as local shop owners want to use to set up their payment system.

All of this can be done more comfortably whenever you have time and feel like it, for instance when you are waiting in the queue for the street food capsule or taking a coffee break in front of the bookshelves. The place discreetly invites people to take care of their finances. The focus is on enjoyment and a place to go to experience a simpler daily life. Because let's be honest: When was the last time you actually went to a physical bank? Places like this redefine the term. Because only then does a bank, or, sorry, a bank/, finally make sense again.

NO WORRIES ABOUT ANY-THING PAY

New service NWAT Pay Tax™ from 01.07.2034: Automated recording of all country-specific split data for invoicing and tax returns

NWAT Pay™ press release, Gadheim, 19.05.2034

From 1 July 2034, we will be offering all NWAT Pay™ (No Worries About Anything Pay) customers the opportunity to record all invoice and tax-relevant data divided up by country by expanding our digital factoring services. Especially our many customers in logistics, most of whom operate as teledrive providers, the new NWAT Pay Tax™ service is not only a huge relief, but also a legal necessity.

A classic case: A teledrive specialist from a Georgian transport company starts a truck in Tbilisi from the home office in Batumi. Once the maximum driving time has been reached, a second teledrive specialist from a transport company in Istanbul takes over the truck and, at the end of that maximum driving time, hands it over to a teledrive specialist in Regensburg, who will drive the truck to Berlin. This means one route, three employees working in three companies and several countries that are passed through – all with different wage costs and social security contributions that come into play according to the distance travelled by the truck. NWAT Pay Tax™ automatically generates three invoices for the three transport companies, each with different VAT rates. This also includes a split of the truck's fuel and usage fees.

The invoices are automatically sent to the client when the cargo is unloaded. This kind of smart contracting is possible thanks to the blockchain-based verification structure and the framework agreements that NWAT Pay™ concludes with all its customers. Thanks to the real-time tracking of trucks and the rerouting option for goods that were dispatched before the purchase was completed, NWAT Pay™ enables a flexible, up-to-the-minute just-in-time invoicing and payment model that automatically pays independent teledrivers and transport companies.

An additional advantage of the new NWAT Pay Tax™ service is that all tax-deductible charges such as tips, which the teledrive specialist gives when the truck is being refuelled, are also recorded automatically for the annual tax return with an integrated DATEV interface. No Worries About Anything Pay is not only the name, but also the motto and promise of NWAT Pay™.

About NWAT Pay™: The logistics service provider specializing in digital invoicing and factoring was founded in 2024 by two independent truck drivers, Horst Klause und Sophie Obenstetter. They knew from their own experience that the biggest enemy of (teledrive) truckers are missing receipts and defaulting customers. This is how NWAT Pay™ was created, handling the entire invoicing process between clients and contractors ever since. The founders' vision is to relieve logistics companies of all the annoying work, from hiring of teledrive specialists through to complete tax returns.

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CONTEXT

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NEW ECOSYSTEMS

BEYOND PAYMENT

Back in 1993, James F. Moore described the concept of economic ecosystems in the spring issue of the Harvard Business Review, referring to the original ecological model. According to him, companies should not see themselves as part of an industry, but as players in a so-called business ecosystem. Some thirty years later, this chapter here should not look at the past, however, but point to possible futures. Today, the concept of the business ecosystem seems to be an integral part of economic thinking and is no longer worth mentioning. And yet anyone who finds themselves at precisely the strategic point of setting up their own (payment) ecosystem or making it fit for the future can find inspiration in Moore's thoughts.

What actually constitutes an economic ecosystem? According to Moore, an economic ecosystem is characterized by cross-industry players that develop both together and side by side. They develop capabilities through cooperation and competition to bring new products to market, satisfy user needs and ultimately weave the next round of innovations into their system. Changing social, political, legal, scientific and technological standards may contribute to certain players suddenly emerging or experiencing an unexpected upswing. In reality, most future-relevant developments are already emerging today. If we look at evolving and new payment ecosystems, these are no exception.

Anticipated payment situations

In the interviews conducted for this publication, indicators for the emergence of new payment ecosystems could be found again and again – or, put differently, payment could be observed as becoming an essential part of self-renewing ecosystems that originally might not have had much to do with payment at all. If we look at the components of the vision that Mercedes Pay is pursuing (the existence of such an organization is a valuable trend signal in itself), the automobile is transforming into a payment vehicle: All payment touch points should be integrated into the car ecosystem as conveniently, organically and comprehensively as possible. The credit card used for the (down) payment is stored in a customer profile and can be used for charging a car at a charging station or parking in a car park. Anyone who has forgotten the add-on for a digital radio when purchasing the car can order it directly from the car's mini ecosystem. Customers should not only be given answers to their mobility needs, but their payment preferences should also be taken into account. Using the metaphor of a smartphone on wheels, new features that come onto the market after

> In the future, payment will not be a necessary evil at the end of a purchasing process: It will stand right at the beginning.
>
> _Jürgen Schübel, VISA

the purchase of a car can be purchased at a later date - similar to apps that are added to a smartphone. Players in new ecosystems react to customers' desire for personalization and change and create new, anticipatory payment situations to fulfil these wishes. As in the case of seamlessness (→ *Age of Seamlessness*), building a successful payment ecosystem is about contextual awareness and empathy with your own customers, be they end consumers or retailers.

Holistic, digital

> Every payment is going to be digital, and that's it. It's not a priority, but that will happen.
>
> _Nuutti Kotivuori, Nexi Digital Finland

We can already see that payment combined with social media, online shopping and messaging services is leading to the formation of closed or semi-open ecosystems. Examples include Alipay and WeChat as well as WhatsApp, Facebook and Instagram. Apps and platforms are offering more and more services within their own ecosystem, including payment services. Conversely, we see that services linked to payment are integrating new applications: For example, since 2023, Google Wallet users in the US have been able to digitally integrate their driver's license and, in some states, an official ID document into their e-wallets so they have all important documents in their virtual wallets. This trend is sure to consolidate in the years leading up to 2034 and we will see more and new players jumping on this bandwagon. Above all, the trend of ever-growing marketplace platforms has led to an increasing number of these platforms (Amazon, Zalando, OTTO, etc.) launching their own payment service providers and essentially providing and managing a large part of the payment services on their platform themselves.

Payment is never just an end in itself, but always a means to an end or part of the retail process – at this, however, it forms an integral part. The exchange of goods or a service for money is handled, usually digitally, via the payment process. That is why it is understandable that retail and service platforms not only want to gain control over the actual sales process, but also over the handling of it. The trend towards operating in-house payment service providers means that platforms no longer only have great market power on the retail side, but are also increasingly gaining market power over payment processes. The dominance in payment processing enables a few players to collect valuable data on purchasing and payment habits (→ *War for Data*) and use this for personalized payment offers and recommendations. The shopping experience becomes a seamless process, and in many cases, the actual payment becomes almost invisible and effortless, which in turn ideally leads to even more consumption, so more revenue for the platforms.

It is becoming apparent that payment will no longer be just payment in the future. Instead, we are looking at payment plus or a future labeled "Beyond Payment". Future-oriented payment service providers are looking at the entire process, including the before and after of the actual payment and using the newly opened space for innovation. Digital technologies make it possible to offer a wide range of bundled services.

In the café scenario at the beginning of this chapter, we see how a central application can be used to coordinate table reservations, seating, the opening of consumer communities, placement and splitting of orders, loyalty programs, digital currency exchange and currency storage and, last but not least, payment.

New payment systems map entire customer journeys. For example, the French app Pulp offers restaurant operators the opportunity to manage restaurant guest queues and digitize menus by placing QR codes outside and inside their establishments as well as register food orders and process payments. As a result, restaurant operators have fewer work steps and arrangements to coordinate. Guests are offered guidance through clear messaging. They are able to put themselves on waiting lists, track their progress there and place orders when they are ready. They are given the opportunity to pay and split bills digitally by simply scanning a QR code. Customers can complete all of these steps in the many restaurants where Pulp is used, even with human contact and arrangements. By integrating a holistic digital payment system, a restaurant demonstrates empathy for the customer's need for efficiency and independence. The payment experiences of the future are therefore at least partially digital and take different behavioural preferences into account. In the café scenario, for example, the entire payment experience could be designed from the smartphone or a wearable, like a smartwatch. However, conscious moments of human contact were incorporated (as in the example of the "high five" for payment). Put simply, It's about creating offers and inviting people to create a diverse, vibrant ecosystem. Which of these invitations users accept is up to them.

> My personal utopia would be to effectively merge payments and loyalty into one place. There would be a set of rules to define which payment method was used for which transactions and an automated check to see if there was a loyalty scheme. After that, the payments just happen.
>
> _Matt Rowsell,
> Nexi Group

Pay-per-use redeems pain points

A sustainable ecosystem thrives on the symbiosis and co-evolution of diverse players. What would happen if teledriving, payment and the processing of tax-relevant data were brought together? The result could be, for example, the scenario of the payment service that is specifically designed for truck drivers and logistics companies, that bundles work processes, saves time and noticeably increases convenience.

In the age of connectivity, the digital revolution enables an evolutionary merging process of previously independent services. The key point here is that payment plays an important role in new situations, as in the case of the car updates mentioned at the beginning of this section. It is becoming the focus of ecosystems as a value-adding service. Secondly, there is a conscious examination of payment methods (→ *New Money*) and the question of what can and must actually be paid for. Payment is directly linked to value and in in many cases with the desire to make a good deal. So it is not surprising that the topic of pay-per-use came up again and again in the interviews and research for this study. Sharing food bills, charging only for the fuel actually used, paying for the kilometres actually driven are just a few examples that are already possible today. But how can "use" be calculated when we are talking about immaterial services? A somewhat more daring speculation about the future could be the approach of paying or determining value on the basis of recorded emotions. When we look at highly specialized payment service providers, a concept like the pay-per-hormones scenario is quite realistic as part of the customer experience. The price and payment – for a movie ticket, for example – would be linked to the release of hormones that can be recorded via a smarter watch. With an action movie, the more adrenaline that is released while watching, the higher the ticket price would be. After all, an action movie is all about excitement. When watching a romantic movie, the ticket price could be measured by the release of the amino acid complex oxytocin, known as the cuddle hormone. Does that sound far-fetched? An interesting experiment was carried out using the pay-per-emotion approach by a theatre in Barcelona back in 2015. At the time, the Spanish cultural industry was in a serious crisis because the government had massively increased taxes on cultural events. To counteract the resulting decline in audience numbers, the comedy theatre invented the pay-per-laugh principle. Admission to shows was free, but the audience was charged 30 cents for every time they laughed. The chairs were equipped with tablets that recorded the laughter via a facial recognition feature. The maximum ticket price was capped at 24 euros, which corresponded to 80 laughs. That meant the average price for a ticket rose by a whole 6 euros. And the audience loved it. After all, you go to a comedy to laugh. In addition to this very transparent and honest form of pricing, the payment method itseld becomes an integral part of the customer experience.

> Only in the last five years, have customers begun to ask themselves the question
>
> "How would I like to pay?"
>
> _Laura Treude,
> Douglas

Displaced banks

The earlier contemplations showcase the emergence of new payment players and services. They describe how entire ecosystems are currently developing around payment. In this context, if we turn our attention for a moment to the prominent payment players of today, we can already see a shift that is pushing one group of players – especially from the point of view of end customers – more and more into the background: Banks. Anyone who builds up a personal payment ecosystem through the curation of individual payment services will see a changed interface. Regular interaction with a bank through its website or in the branch is decreasing because we regularly use PayPal, Klarna, Google and Apple, for example. So we are seeing brands and names that help make payment fun, easy or such that we no longer have to deal with it at all. The future vision of new payment ecosystems can mean a crisis for the bank customer relationships in the best sense of the word: The crisis is not meant here as a hopeless situation, but as a turning point, as an opportunity for future decisions. The /bank scenario describes a possible renewal as a reaction to this turning point where the role of the bank branch is reinterpreted as a hub for everyday services that go beyond banking. Remote work, recreation, consumption and financial education are linked as new services to a digital/analogue location that reinterprets, nurtures and symbiotically links the local economy beyond the payment itself.

To be perceived as attractive, new ecosystems need partnerships that enable an evolution aiming at added value for all participants. Any (payment) player who wants to build this type of new ecosystem around themselves in a profitable way, has to think a lot about others instead of just their own needs and goals.

By the way, according to Moore, ecosystems go through four phases:

Birth, expansion, leadership – and self-renewal.

Those who do not succeed in regularly renewing their ecosystem will eventually die out.

> A payment expert puts people and their needs first. When buying a mirror, they should offer me transport insurance at the same time. And they would ask me whether I also need transport as such.
>
> _Frank Büttner, S-Payment

CONCLUSION

Banks need to re-position themselves.

Large platforms will not only control the sales process, but will also dominate payment processing and collect valuable data on purchasing behaviour. Traditional banks will therefore have to reorganise their services and interfaces with customers in order to avoid being completely pushed into the background.

The way forward is characterized by a digitalization plus.

Payment will become an integral part of a more comprehensive range of services that encompass the entire customer journey. Digital ecosystems will continue to evolve, offer integrated services and incorporate payment into users' everyday lives in a needs-orientated manner.

Payment situations are anti-cipated early on.

This guarantees frictionlessness. Future payment ecosystems will aim to identify and fulfil needs at an early stage. This requires the development of innovative payment solutions that are based on the context and usage preferences of users. The payment process will be seamlessly integrated into the entire interaction cycle.

Pay-per-use creates new pay-ment methods.

In the future, payment will be increasingly individualised and adapted to the needs of users. This means that payments will be based on the actual application. Individualised pricing will emerge. The way we pay for products and services will change fundamentally and enable a higher level of customer satisfaction and participation.

Back

ground

METHODOLOGY

The work process behind Payment 2034

25 and more studies read

595 minutes and 10 seconds of individually conducted interviews

13 interviewed financial experts from our Knowledge Council

64 future hypotheses derived from the interviews – clustered in a futures cone according to probable, plausible and possible futures

32 future categories derived via qualitative content analysis

9 distilled focus topics for the interview phase

7 future fields synthesized from the future hypotheses - with the help of futures wheels in terms of their economic, social and technological consequence

21 scenarios developed for further thinking

72 developed questions on the focus topics, combined in one interview guide

THE PAYMENT 2034 KNOWLEDGE COUNCIL

Frank
Büttner
S-Payment

In future, payment will be secure, imperceptible and convenient.

Having been responsible for DSV's payment division since 2012, Frank Büttner has been Managing Director of S-Payment GmbH since 2015.

David
Lais
ecolytiq

In future, payment will continue to be simple, secure and reliable. That's all it needs.

David Lais is a social entrepreneur. He uses his payment expertise to promote responsible consumption. He is CEO of the Organisation für nachhaltigen Konsum and co-founder of ecolytiq GmbH.

Jens
Hachmeister
Deutsche Börse

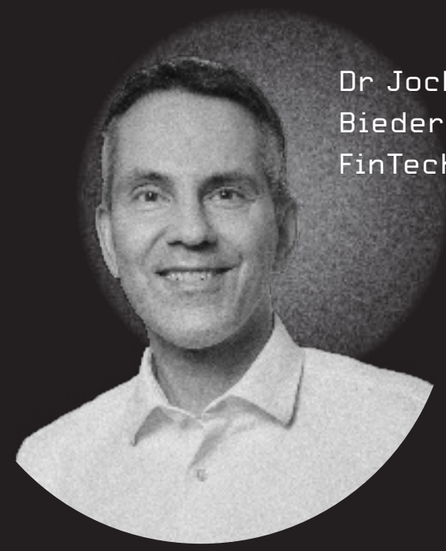
In future, we will pay even the smallest amounts seamlessly with a wide variety of solutions.

Jens Hachmeister, Managing Director, is Head of Issuer Services & New Digital Markets at Deutsche Börse and a member of Clearstream's Management Committee.

The payment of the future is natural, anytime and anywhere.

As Chief Product Officer, Delia König is responsible for the product development of Solaris, Europe's largest embedded finance platform.

Delia
König
Solaris



Dr Jochen
Biedermann
FinTech Consult

In future, payment will be much cheaper than it is today, convenient and transparent, so that I won't even notice that I'm paying.

Dr Jochen Biedermann is Managing Partner of FinTech Consult and Managing Director of the World Alliance of International Financial Centers.

Jürgen Schübel
Visa

In future, payment will be fast, simple and secure.

Jürgen Schübel is Head of Merchant Solutions & Acceptance Central Europe at Visa. Earlier in his career, he worked for Mastercard and Deutsche Bank, among others.

Laura Treude
Douglas

The payment of the future is mobile, fast and transparent for all parties,

Originally from the finance and marketing environment, Laura Treude has been building up online payment at Douglas since 2015 and is now responsible for E2E across all shops and stores throughout the Group.

Dr Lea Maria Siering
Token.io

In future, payment will be convenient, secure and easy.

Dr Lea Maria Siering is an expert in regulatory issues, particularly in the area of open banking and payments. She is a managing director at the payment services institute Token GmbH. Previous positions in her career include Taylor Wessing, Crosslend and finleap.

Dr Markus Escher
GSK Stockmann

The payment of the future is more digital, simpler and more integrated.

Markus Escher has been providing legal advice on electronic money, mobile payment methods and international card systems since 1997. He also worked as an expert in the German Bundestag on PSD2.

Matt Rowsell
Nexi Group

In the future we will see a convergence between offline and online, a focus on speed of interaction, as well as ubiquity, that is the ability to use every payment method in every situation.

Matthew Rowsell is Chief Product Officer of Nexi Merchant Services. He has worked in the payments industry for over 15 years in both business and technical roles and previously worked at Paysafe and Worldpay.

Mirko
Krauel
OTTO Payments

Convenient, digital, secure – that's the payment of the future.

With more than 15 years of experience in payment transactions, banking, debt collection and digital business, Mirko Krauel is an expert in financial services. He has been Managing Director of OTTO Payments GmbH since 2020.

Nico
Kersten
Mercedes Pay

In future, payment will be as simple as possible, invisible and transparent at the same time.

Nico Kersten, who can look back on over 20 years of experience, has been CEO and Managing Director of Mercedes pay GmbH since July 2021.

Nuutti
Kotivuori
Nexi Digital Finland

Payment in the future will be frictionless. It will be about paying with the least amount of fuss.

Nuutti Kotivuori has worked as a programmer and entrepreneur in the technology industry for over 25 years and has specialised in payment transactions for 15 years. He is currently shaping the terminal strategy for a bright future.

THE PEOPLE BEHIND PAYMENT 2034

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