



Banking in Pandemic Times

efigence

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What this book is about

The first cases of a new, pneumonia-inducing disease were found in mid-December 2019 in China. After a month, cases were diagnosed in Thailand, and on January 24, 2020 in France. On March 11, the World Health Organization announced a COVID-19 disease pandemic caused by the SARS-CoV-2 coronavirus. Events in the Western world have gathered pace. Rapid increases in the number of infections were recorded in successive countries, overloading healthcare systems. Countries wanting to halt this ominous unfolding of events began to react by introducing restrictions such as closing borders and sometimes regions or cities. Bans on the organization of public events and restrictions on trade and mobility were introduced. Such restrictions have now affected more than half of the planet's population. The new regulations have stifled many prosperous industries such as tourism, hospitality and beauty services. Thousands of entrepreneurs, in order to survive, have changed the way they operate and have adapted to the new reality. Restaurants and bars have introduced take-out sales only, and a lot of stores - even the stubbornly brick & mortar ones - have branched out to offer delivery.

Many companies have made the switch to remote working. In some industries, such as IT services, this was not a significant challenge,

but even the back-office departments of manufacturing companies began working from home. With the closure of schools, teachers – with varying degrees of success – have tried to keep in touch with their students, often through online lessons. The number of medical visits has been minimized, and remote advice and prescriptions have become widespread. All kinds of offices have also implemented mechanisms to minimize contact with their clients. The use of electronic correspondence has become more widespread and procedures simplified.

The pandemic has forced through digitization at breakneck speed in a significant part of our lives. Video conferencing tools, in the background for many years, have become an indispensable channel of contact between families and friends in private life as well as between colleagues, clients and suppliers in the business world. Some industries were not, and indeed are not, ready for such abrupt changes in the *modus operandi*.

Banking is an area where innovative changes to processes have been taking place for some years. All segments - from retail banking to corporate services – have seen investment in modern IT tools and platforms. In recent years, banks have undergone a transformation, abandoning the image of refined institutions welcoming clients in their marbled halls. Currently, they have much more in common with technology companies, offering their services mainly through digital channels.

The COVID-19 pandemic is proving to be something of a catalyst in the fusion of banking and technology, including FinTech in its broadest sense. Banking in Pandemic Times reflects on how the sector unwittingly prepared itself to operate in quarantine conditions, and tries to answer the question of what to expect next.

Who should read this book

Banking in Pandemic Times is aimed at:

- web enthusiasts, zealots and innovators who will once again feel satisfied that they were right in declaring that ‘the end is nigh’ for the world of banking services, which until recently had been doing so well
- young economists, designers and programmers who may pick up some handy hints on how to direct their careers
- managers of banks and technology companies who can save a fortune on consultancy fees by reading this book (it will tell you exactly the same)
- those bank employees who deal with innovation, the use of electronic channels, technology, and research and design of usability, because they will find some convincing arguments here to push their bosses for a raise
- bank employees who deal with something else entirely but have a sneaking suspicion that they should start looking for a job in another industry
- electronic banking skeptics who will finally come to accept and understand why digitizing banking services is the only way forward
- the John Does, Jane Does and Joe Publics, ordinary customers who will come to realize that in a relationship with a bank, you are part customer and part product.



A word from the authors

This material has been compiled by a handful of people who have, over the years, been passionately seeking innovative solutions in the world of modern banking. We have worked together for long hours and years, naturally complementing each other to bring our clients the best possible results. We share the joy of what we manage to accomplish together, but rather keep to ourselves the many issues we argue about and haggle over to finally come to a common opinion. We have worked in various projects for banks and finance companies, launching a string of innovative solutions. We have accumulated a wealth of knowledge about the world of innovative banking services and we have decided to share it with you. We also know that the most interesting things in banking are still ahead of us all.

Paweł Haltof is the head of innovation at Efigence. He dedicates himself to tracking trends, conducting research and persuading clients to boldly go where no one has gone before. He has been known to slip into professor mode and use a language incomprehensible to others, but his strategies win recognition from companies and end users.

Bartek Kozieł and Paweł Dunia deal with the design of UX/UI usability and interfaces - from initial prototypes to final graphic design. The quality of experience of the users of applications and platforms provided by our company relies heavily on their work.

Marek Lesiak, as Head of Technology, has been known to bring the boys back to earth. However, “it can’t be done” does not exist in his vocabulary, and the efficient and secure operation of the software that we create is down to his team.

Andrzej Szewczyk is the Managing Director who strives to harness the creativity of his aforementioned colleagues within the framework of projects implemented by Efigence. He has been gathering and analyzing his thoughts and musings for some time now and has poured them into the work that you now have in front of you.

We do not treat projects as a relay race, handing over the baton from one person to the next. We all live and breathe the projects, as a team, from start to finish. We share a passion for the world of innovation in banking services and will happily discuss any of the issues that this book covers.



Paweł Dunia



Bartłomiej Kozieł



Paweł Haltof



Marek Lesiak



Andrzej Szewczyk

It's the technology, stupid



DAMN IT! WE'RE GOING TO CRASH!

THE PILOT, A MOMENT BEFORE FLIGHT AF447 CRASHES

On May 31 at 19:03, the twin-engine Air France Airbus A330 took off from Rio de Janeiro en route to Paris. Around four hours into the flight, Captain Marc Dubois, the most experienced of the crew members, went to take a rest, leaving David Robert and Pierre-Cedric Bonin behind the wheel of the machine. The pilots had 6500 and 2900 hours respectively at the controls, so nobody had any reservations about their experience. Despite the bad weather and expected turbulence, the flight passed quietly with the autopilot turned on. Seven minutes later, icing on the Pitot tubes outside the aircraft triggered errors in reading the speed of the plane. In this situation, the automatic pilot turned off, and Bonin took over the controls. Based on incorrect instrument readings, he increased engine thrust and picked up the nose, starting a steep climb. The on-board computer warned the crew of the danger of a stall. Under normal conditions, the autopilot would make the necessary adjustments itself, lowering the nose of the aircraft and increasing speed. At this moment, however, the pilots were in charge, and in the following seconds they managed to stall the plane which then began a steep dive. Robert's attempt to take over did not help much, as each of the pilots tilted the

stick in the opposite direction. Seconds ticked by as the machine hurtled towards the surface of the ocean. By the time an alarmed Captain Marc Dubois returned to the cockpit and realized what was happening, it was too late. At 02:14:28 the plane hit the water. 228 people were killed.

The AF477 flight tragedy is a very vivid example of how much of our day-to-day functioning relies on machines. The pilots had a flight history of thousands of hours. However, this did not translate into quality experience, because a significant part of the flight of a long-distance aircraft is on autopilot. Routine, and the convenience of always having the right equipment to hand, resulted in glaring gaps in their training and an incorrect response in a stall situation, a situation that is practiced by all pilots almost from the very beginning of their training. Also, the system warned the pilots about the threat. If only the responsibility at that moment of misfortune lay not with the pilots, but instead with a well-developed algorithm, tragedy would probably have been avoided.

Who among us does not have interesting experiences with in-car navigation. Over the course of just a week one summer, a small glitch in a popular sat-nav application meant that as many as seven hundred people got a traffic violation ticket, directing their vehicles to a traffic-free street in the town of Zakopane. Similarly, unintended slip-ups sometimes occur in text messages or comments on social media thanks to autocorrect. “I wish you peaceful holidays spent in the family grave” being one such example.

And yet we are addicted to technology. There is no point in creating a list of pros and cons of this state of affairs, because we are no longer able to change it. We should still ask ourselves in many situations the question of whether to rely on our own judgment and experience or trust the machine - a veritable array of metal scraps, semiconductors and software. Of course, the machine usually wins. The computing power



of the smartphone, which most of us keep in our pocket, allows you to play chess games at grandmaster level, which most of us will never get close to.

In the fields of finance and monetary systems, and the principles of bank operations, practically everything has changed in the last century. We have long since abandoned systems in which a unit of money corresponded to a defined weight of gold. The time of financial globalization has arrived. Changes in the area of personal finances and in the use of banking services have accelerated significantly in recent years. We have been witness to the combining of the worlds of financial services and technology for a long time, and we use the word FinTech to describe this. FinTech as a word first appeared in Merriam-Webster's American Dictionary of the English Language in 2019, which symbolically suggests that the technological revolution in finance is just beginning.

Bank 1.0 is made of brick

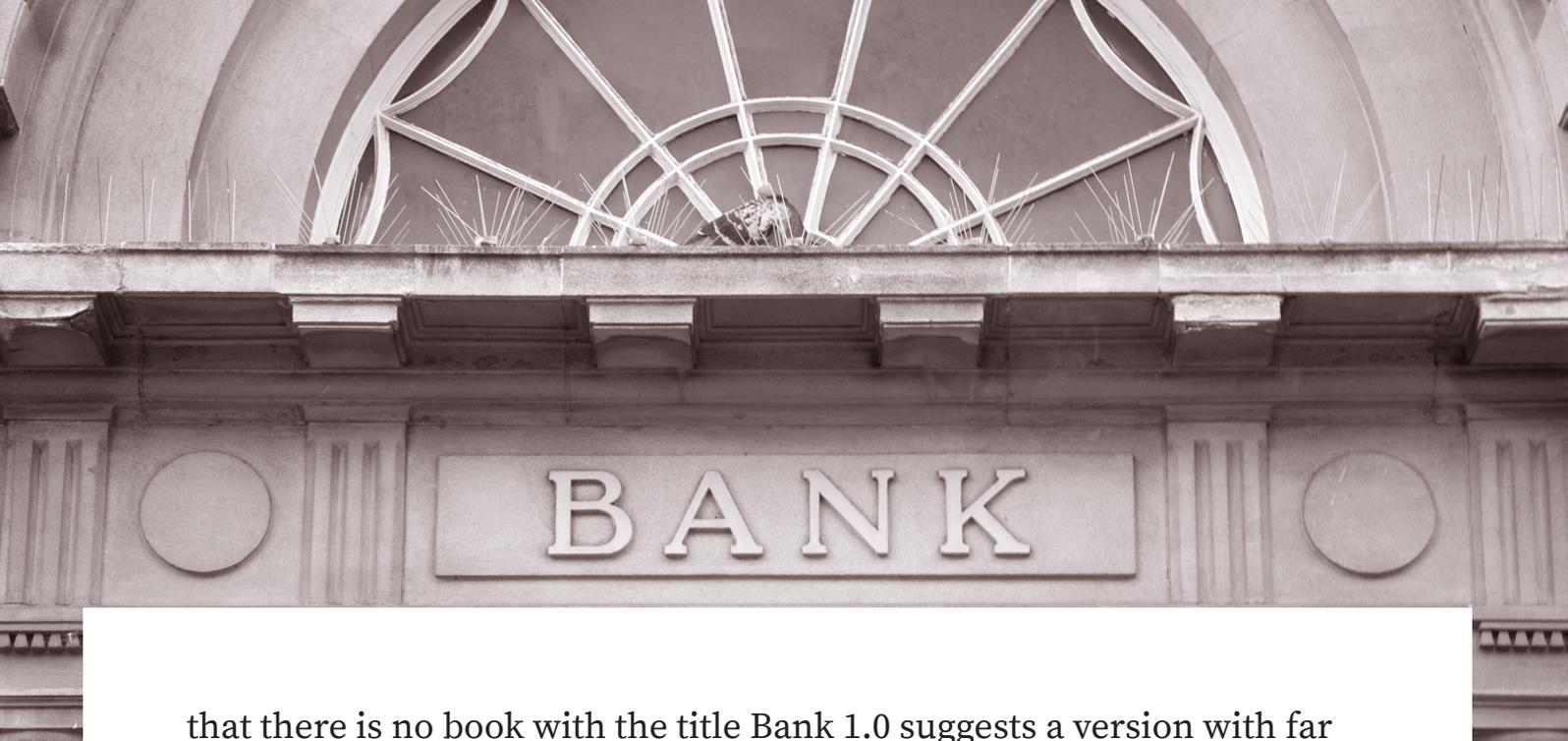


WE SHAPE OUR
BUILDINGS;
THEREAFTER
THEY SHAPE US

WINSTON CHURCHILL

Brett King, who worked mainly as an advisor to clients from the financial services sector in 2010, published a book entitled *Bank 2.0*.¹ For 18 consecutive months, the book remained on the best-seller list in categories related to banking and finance in the Western world. Brett opened the eyes of many managers - the reality that bankers have been preserving for years is ending! The author, of course, was right, although from a Polish perspective the world he described was rather familiar. Ten years earlier, mBank, Inteligo and Volkswagen Bank appeared on the market - the first completely internet-based banks with an offer for individual clients. The pace of implementing innovative solutions in Poland was already high then, and the banking markets of many more prosperous countries were far behind.

The title of the book perfectly captured the feel of the significant changes that were taking place at that time in banks. But let's go back in time a little, to better comprehend the 'previous version'. The fact



that there is no book with the title Bank 1.0 suggests a version with far less sex appeal than its successor. Let us rewind to the world of finance twenty-five years ago.

Bank 1.0 is an institution based on a brick-and-mortar branch network. Customers perform all operations with the assistance of bank employees. After standing for a short or longer time in the queue, you could go to the window, present your ID and declare ‘good morning, I would like to check the balance in my account’. The success of this operation was not down to whether or not the balance met our expectations, but rather whether or not the bank employee was able to help us. This was not a guarantee, because if, for example, we had an account with the bank, but had set it up in another branch, up-to-date account information would not necessarily be available to us.

Banking 1.0 is a world in which a customer feels like an individual colliding with an institution. Polite and professional service is not able to minimize the distance felt by the client entering the marbled halls of the branch.

A loan is not just one of many products offered by the bank. A loan is something that you can apply for, and whether you can get it or not depends on magical decision-making processes conducted by very

well-dressed bankers on the upper floors of the building. The phrase “I got a loan!” stems from the times of banking 1.0, as if this act was directly associated with a happy twist of fate.

For a significant part of society, bank services are simply not needed. Wages are often paid in cash, the postman brings your pension, and children and teenagers literally get pocket money from their parents. We pay for goods and services in cash, we pay bills at a window, and the most popular investment in Polish conditions is hard foreign currency kept under the mattress.

The development of the internet has actually made online customer service possible at this time. Basic online operations are available through websites, but in the world of banking 1.0, the internet is treated as an innovative gimmick, not to be taken seriously, and anyway who knows if it is safe at all. The person responsible for the branch network occupies a high position in the bank’s employment structure. They directly report to the management board or possibly to the individual managing the retail banking sector. Meanwhile, an internet-related project is usually managed by an engineer in the IT department - an ambitious and educated person who speaks a strange technical language that is not understood by colleagues in managerial positions dealing with the grown-up stuff.

1. Brett King: Bank 2.0: How Customer Behavior and Technology Will Change the Future of Financial Services, Marshall Cavendish Reference; 2010

Bank in instalments - online, mobile, multi-channel



IF THERE IS
NO STRUGGLE,
THERE IS
NO PROGRESS

FREDERICK DOUGLASS

The development of call centers, ATM networks, and above all digital channels have made remote access to banking services more widespread. Not only did it become possible to use the bank facilities away from the branch office, but it could even be outside its opening hours! After the launch of the Polish mBank and Inteligo at the beginning of the 21st century, the biggest drawback was the inability to pay cash into the account. There were no branches of these banks that you could take cash to, and no one was imagined cash deposit machines yet. The account could only be funded with a transfer from another account. At a time when branch banking was still dominant, this was a jaw-dropping solution.

This opportunity for customers to serve themselves we will call, with deference to the author of the aforementioned book, Bank 2.0. The development of mobile services and new payment methods, as well as



the flourishing of social networking services meant that the 3.0 version could be completely detached from any physical place.

Following this path, banks transformed from being institutions handling transactions, into being entities responsible for providing the best possible customer service. More Polish banks joined the race, providing their clients with transaction services ensuring the highest level of usability and new innovative products. Over the space of just a few years, Poland has become a global leader in banking solutions in digital channels. In some entities, digital transformation has meant a completely new approach to organization - changing business processes, rebuilding product portfolios, creating new technology stacks and opening new access channels.

As new channels, such as websites and mobile applications, have emerged, banks have sought to establish a presence in them, adopting a multichannel strategy. In the next step, the previously distinct channels were integrated as part of a holistic omnichannel approach. Banks - regardless of how they reach or service their customers - try to ensure communication and quality of experience consistent with their brand.

Banks' pursuit of innovation has also unearthed some amusing anecdotes. Sometimes the modern facade of digital channels can hide

anachronistic processes from another age. For example, the online transaction service of one Asian bank made it possible to submit applications via customer-friendly online forms, unaware that the bank's internal systems were still slightly less innovative. The content of the completed form was sent to the employee of the relevant department in the form of an email message. They printed, signed and sealed it, and in the evenings a courier took all applications submitted on a given day to the headquarters. There, the applications were scanned and sent in digital form for further processing. In this way, an online request to change a credit card limit could take several days. The optimization of this process would seem to be relatively simple - since documents can be sent electronically, the transport of paper documents by courier should be eliminated. In fact, the processes of handling most applications were shortened to a single day by simply installing scanners at branches. One may think that such innovation has no sense and this story must be made up. Why print documents that are immediately scanned? In this case, changing regulations allowing you to do away with paper documentation (with the signature and stamp of the appropriate employee) would take months. Installing scanners has shortened the process by several days. The short-term goal has been achieved in this way, but in the context of digital transformation this example adds little.

In many cases, the implementation of innovative solutions in banks was and is forced by customers themselves. Strong competition means that access to innovative solutions is one of the criteria that users take into account when deciding which bank to choose.

A complete overhaul in the banks' approach to business is also forced by pressure from technology companies that we call FinTech. Services that, until now, were the exclusive domain of banks can now be provided by other players, so making competition within the banking sector even more fierce.

Integration, internal and external

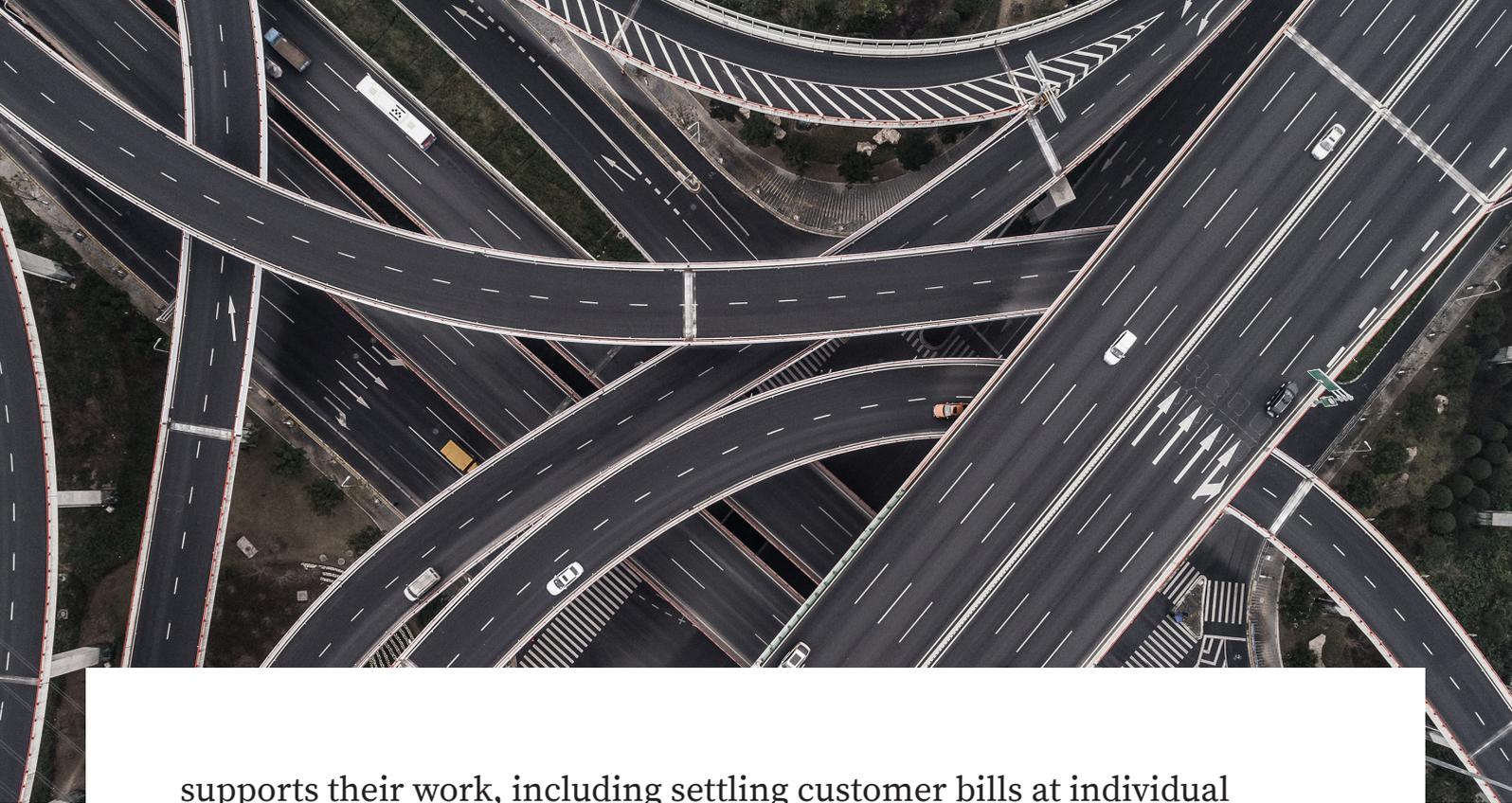


NATURE LAUGHS AT THE DIFFICULTIES OF INTEGRATION

PIERRE-SIMON LAPLACE

The history of computer science, and progress in the field of computer technology, can be viewed as a collection of projects of computers and software performing various tasks and provided by various manufacturers. The solutions available were rarely characterized by the kind of compatibility that would guarantee the cooperation of all the different computer systems and efficient data exchange. Computerization, however, involves the use of data available in one computer system by another.

Imagine the kitchen of a computerized restaurant. A computer program controls the preparation of dishes, manages the inventory of raw materials and the staffing of the kitchen by chefs and their assistants in a shiftwork model – the place serves breakfast, lunch and late suppers. Waitstaff record customer orders using a specially-prepared application that runs on their ever-present small tablets. The same application



supports their work, including settling customer bills at individual tables. The restaurant also prepares dishes with delivery that customers can order via the website. The online platform collects customer orders and is responsible for collecting online payments. Another application manages the work of couriers delivering orders. The kitchen prepares only dishes that were previously ordered via a waiter or via the internet. Couriers only deliver when the dish has been paid for and prepared. The kitchen management program, the waitstaff application, the internet platform and the courier management application must communicate with each other. They were prepared by various manufacturers using different technologies, but they use common rules of API (Application Programming Interface) communication. The program operating the kitchen accepts to a set standard orders to prepare dishes from the waitstaff application and from the website. The waitstaff application and couriers have access to information about dishes already prepared.

SOA (Service Oriented Architecture) represents another approach to the same challenges of communication between various elements of information systems architecture. As part of the IT system, an additional intermediate layer is added, called the Enterprise Service Bus (ESB), providing access to resources offered by individual components.

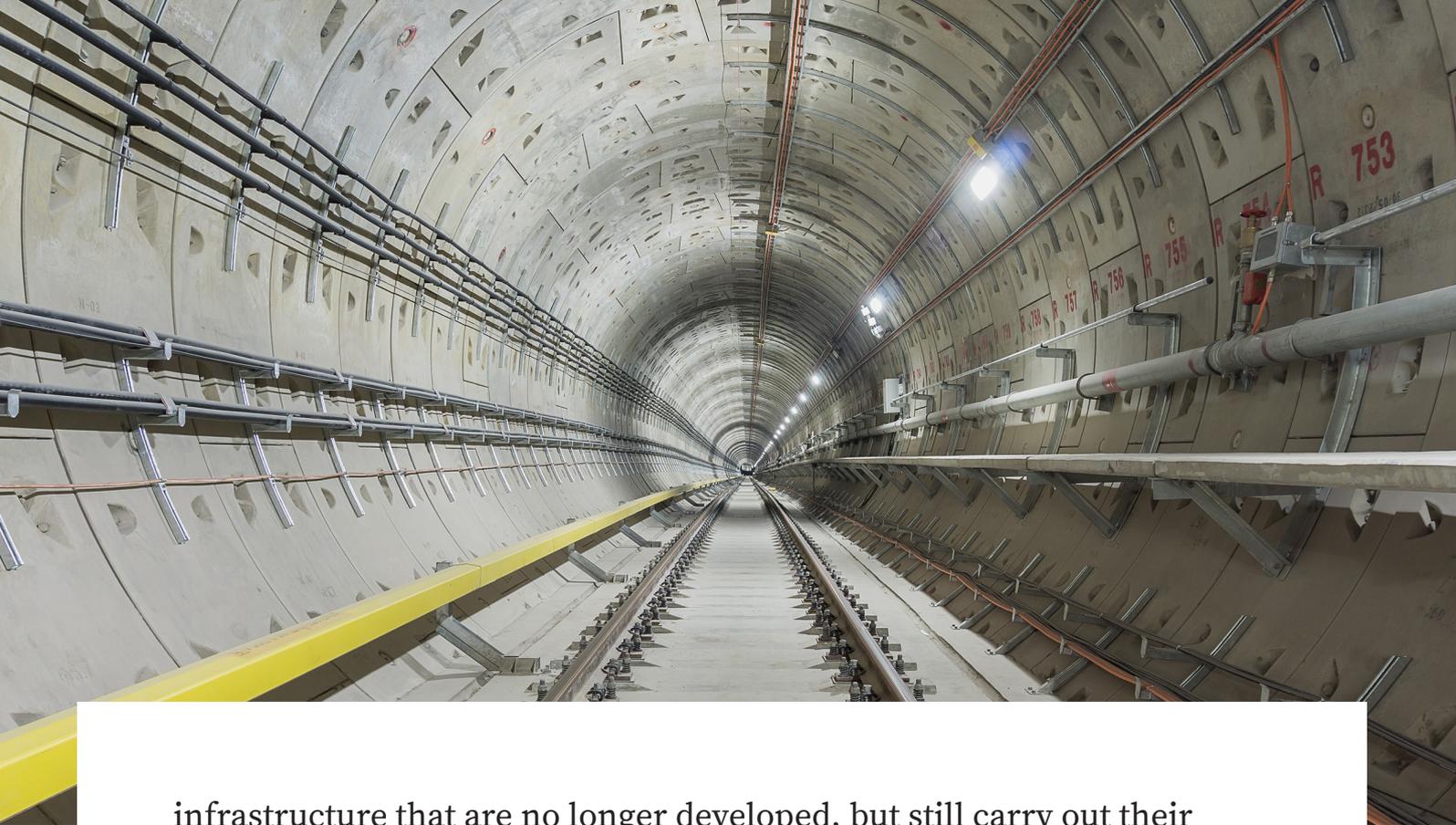
From an IT point of view, a bank is a complicated IT infrastructure that consists of many systems and applications that perform various functions.

The differences between API and ESB can be illustrated by comparing the bank's complex IT infrastructure to a living city. The bank has complex systems and applications that connect in a certain way, just like cities where apartments, offices and factories are connected by a complex network of roads, sidewalks, cables and pipes. API is a description of these connections, just like complex maps of urban infrastructure with a tangle of lines in different colors. If we were to tunnel all of these connections, so that a sidewalk runs next to the road, then a bundle of cables and pipes, we would get something reminiscent of an ESB service bus.

API provides greater flexibility - you can always hang an additional cable between the points of the city. The ESB approach allows for better organization and order - the London subway map seems complicated, but it helps a lot in getting around the city.

Banking systems and applications must be integrated with each other. It is difficult to imagine an architecture in which customer files and information about their products are stored in two places. Data must be clear and unambiguous, stored by a central system and accessed by platforms responsible for channel support, such as a mobile application or WWW transaction service. Thanks to the existence of API or ESB, the construction and development of banking applications is often possible without significant disruption to existing systems.

The consequence of the different pace of development of individual systems and platforms at the bank is leaving so-called 'legacy', sometimes referred to as legacy systems. These are elements of



infrastructure that are no longer developed, but still carry out their (often important) tasks. Over time, the cost of their maintenance increases, there is often a lack of specialists familiar with technologies from several decades ago, and the risks associated with their existence increase. In digital transformation processes, legacy systems are one of the main delay factors.

Legacy platforms are viewed by many managers responsible for technology in financial institutions as something of a can of worms. Everyone knows that it is there, but no one dares to open it.

API can not only be used to integrate bank software. Functions that were implemented by one component for another in the banking system can also be made available to completely external systems. A very good example of this is the possibility of using a digital identity confirmed by a bank in the process of logging into electronic administration services. The popularity of banking APIs is also encouraged by the PSD2 Directive (Revised Payment Services Directive) adopted by the European Union, one of the goals being to facilitate the integration of banking services.

PSD2 and open banking



BANKING IS JUST BITS AND BYTES

JOHN REED

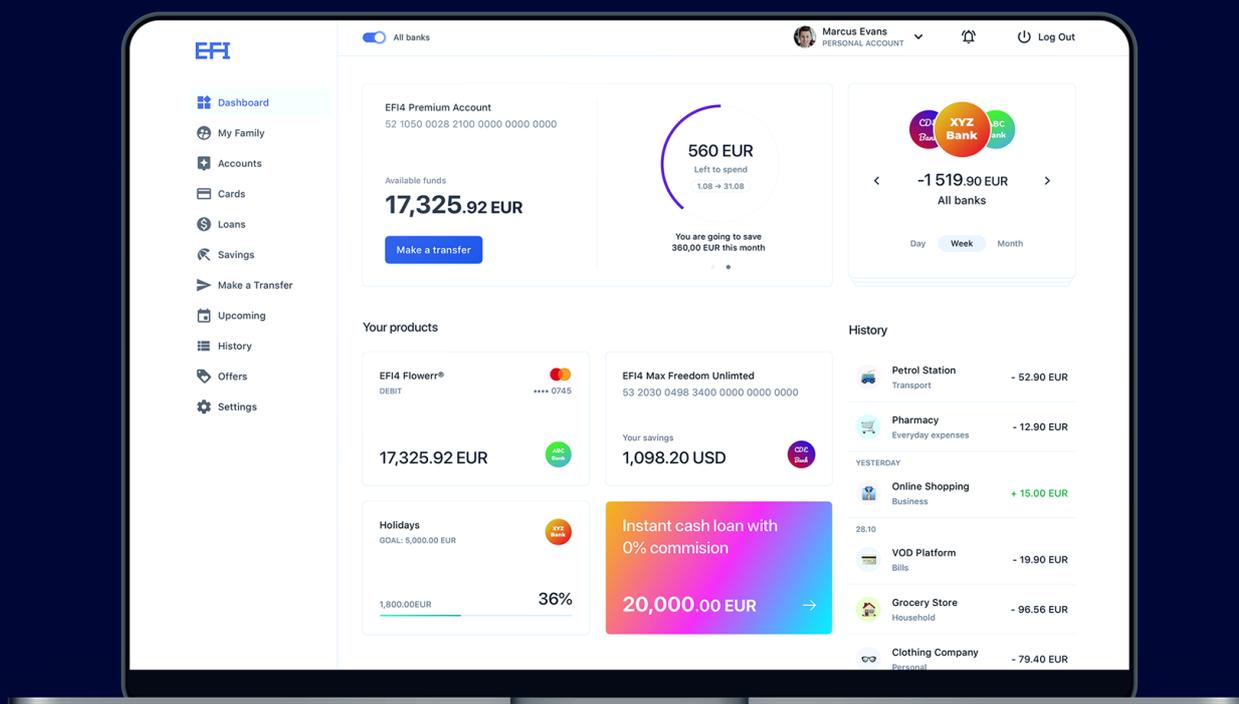
Directive 2015/2366 of the European Parliament and the Council of the European Union of November 25, 2015, called PSD2, and the Polish Act on Payment Services of June 20, 2018, adapting national regulations to EU regulations, introduced a number of revolutionary changes regarding the operation of financial institutions. In addition to the new provisions concerning so-called procedures of strong customer authentication and unauthorized transactions, PSD2 forces banks to provide TPPs (Third Party Providers) with information on accounts and payment infrastructure. This means that other entities, such as commercial networks, internet portals and social networking sites, may become operators of some services previously reserved exclusively for banks. From the point of view of bank representatives, the need to compete with, for example, a discount network poses a huge risk. Banks have been investing in their brands for years, striving to win customer loyalty. Leaving aside emotions, competition between the banks took place in the area of service quality - lately mainly in digital channels - and in products. But popular deposits and loans in the offers of individual banks differ in a rather small number of hard parameters.



Most often, these differences can be reduced to interest rates - the bank may offer money in a cheaper or more expensive way.

Discount store chains have been implementing customer loyalty projects for years. Collecting points, promotional stickers and gaining discounts are among the most obvious examples. How can a bank hope to compete with a store offering banking services in such an environment? With interest-free credit for purchases on a given day, or a free can of cola for each payment made to the store account? Retail chains have tools to maintain margins on this type of product bundling.

The PSD2 Directive introduced a new category of entities. An AISP (Account Information Service Provider) is an entity that manages account information. These may be banks that have previously had a monopoly or another type of organization in this area. A PISP (Payment Initiation Service Provider) is an intermediary in payments made directly from the account. So far, credit card operators have played an indirect role in payment processes, and they can be replaced by other payment operators, for example, integration with internet stores. PSD2 forces banks to provide APIs, thanks to which access to information previously held only by the bank becomes possible.



Let's return for a moment to the aforementioned discount store chain. To offer banking products integrated with your own offer, perhaps better and cheaper, you do not need to build the entire banking infrastructure. Through API services, the store chain can use the data and functions provided by the bank, while offering the product under its own brand. At that time, the bank operates in the IaaS (Infrastructure as a Service) model and completely loses access to the end customer and the opportunity of disseminating marketing communication.

Imposing on banks the obligation to provide API, so enabling TPPs to provide services of initiating payments, giving access to accounts and confirming the availability of funds for a transaction, is a solid regulatory foundation for the construction of open banking. This concept has technological dimensions (banks open up access to their APIs) as well as business ones (the banking world is becoming more open to new models).

It is worth mentioning that banks can also be beneficiaries of PSD2 by gaining access to wider information about their clients - for example, products in other banks or payment history. Thanks to this, they have a chance to offer a complete analysis of the client's finances, also in a very competitive market, when the client has accounts in different banks, uses different card operators and perhaps their mortgage was granted by another entity.

From the clients' point of view, the real benefit of implementing PSD2 can be the easy and authenticated sharing of the history of their operations in one bank through any other financial institution. Therefore, credit products can also be made available to a new bank customer, as their creditworthiness can be checked by downloading data from a bank that the customer used before.

One of the factors preventing customers from moving their accounts from one bank to another, despite a clearly better offer, is the existing account history. PSD2 eliminates this barrier, as setting up an account in a new institution may be accompanied by downloading the history of operations at the previous bank.

The Big Bang (or Big Data) Theory



WAR IS 90%
INFORMATION

NAPOLEON BONAPARTE

In 2013, Edward Snowden, a former employee and subcontractor of the Central Intelligence Agency (CIA) and National Security Agency (NSA), disclosed thousands of documents attesting to the mass surveillance of citizens, implemented mainly by the United States government. The services, it was revealed, are to have access to conversations, chats, video chats, email and information from social networking sites. Data collection and analysis were also to cover politicians and representatives of other countries.

The revelations of Snowden, who is wanted by the US authorities to answer to the charges of disclosing state secrets and espionage and is in hiding in Russia, intensified the ongoing discussion about the right of citizens to protect their privacy. To protect from other people and companies, but also to protect from your own state. Many of the mechanisms described in documents disclosed by Edward Snowden are in conflict with both US national law and international agreements.

There are, however, no shortage of voices declaring that in times of cyberterrorism and completely new technology-based threats to states and citizens, access to data by state institutions is to some extent justified.

In the early stages of the spread of coronavirus in 2020, countries adopted various strategies to protect their citizens. From doomed ideas to acquire “herd immunity” in the UK, to all sorts of closing borders and cities, and enforcing collective quarantine, as in China, Poland and many other European countries. South Korea was commented on particularly often for how it fought coronavirus. The local authorities were scathingly assessed by the public for their passive attitude during earlier SARS (2003) and MERS (2012) epidemics. Therefore, laws were implemented to counteract epidemics which were used in the fight against the spread of the COVID-19 virus. In short, during the ongoing epidemic, the authorities have the right to obtain and aggregate data from mobile operators, payment systems and CCTV cameras. If a person with a positive coronavirus test is detected, it is possible to identify a group of people who could potentially have had contact with the infected person in the preceding period. This group is then quarantined and tested. Geolocation data on the movement of infected people became publicly available on websites and in mobile applications. The social consequences of these activities have been serious - the press reported many cases of broken marriages, because spouses’ explanations of why they visited a colleague’s private flat several times a week did not always seem to add up. However, the vast majority of the Korean population accepted the mechanism by which it was possible to precisely identify those at risk of infection, and thus to be effective at flattening the curve and fighting the spread of the disease. Analyses are available showing how many potential citizens could have been infected by citizens who tested positive. Among the first thirty patients it was possible to indicate the source of infection. They were returning from China or



were infected by their spouses or family members. In the case of patient number 31, it was revealed that after being infected, she led an active social life and participated in the services of the sect that she was a member of, leading to the rapid development of the epidemic and the infection of thousands of people. However, thanks to active work with the data, these people were identified and isolated from society, stopping the development of the disease. At the huge cost of sacrificing the privacy of its citizens, South Korea has successfully taken up the fight against the virus without having to introduce nationwide quarantine or stifle economic life in the country.

Facial recognition systems in Asia have been developed to such an extent that city surveillance cameras can identify a person crossing the road on a red pedestrian light and display their personal details along with a warning on large-format screens located in the area. Even if the culprits are not fined for the offense, they are very publicly named and shamed. The mechanism can be very effective, but let's consider that somewhere in server rooms, data is collected for all the offenses of certain people. Perhaps data is also collected on how many times someone has ever crossed the road and where. It is hard to have reservations when it is only about increasing road safety. But if in the future a citizen receives a lower retirement pension or lower quality medical care from the state

because of a disregard for its rules, then we can certainly talk about violation of the fundamental right to protect the privacy of citizens.

Parallel to the activities of government agencies, data about us and our activities is collected by many commercial entities. Their goal is most often to influence the opinions of people and encourage them to make specific decisions, when shopping for example, but this is not all. The stand-out case of abuse of access to data, although certainly not the only one, concerns the US presidential elections and the Cambridge Analytica scandal. The company very precisely identified the personality types of voters based on data obtained from various sources, including government registers, insurance companies and social media. A particularly important role was to be played by the correlations of preferences regarding liked websites and profile features obtained from Facebook. Thanks to information about friends from this website, databases were built containing information about a very significant part of the population. Then, individual messages were directed to different people tailored to specific types of personality, interests, and beliefs. An advocate of the right to own a gun received a message that the candidate also supports such regulation. People who were afraid of the influx of immigrants received messages different to those who advocated relaxing border controls. The campaign did not have to be coherent as it was replaced by hundreds of thousands of personalized messages to target individual people.

According to some sources, entities affiliated with Cambridge Analytica had an impact on the election result in 32 countries in Europe, Asia, Africa and both Americas.

The above examples prove how powerful data can be in the hands of someone who can make use of it. Appropriate information analysis can save lives, but it also threatens fundamental civil rights. In Europe, GDPR

9:41



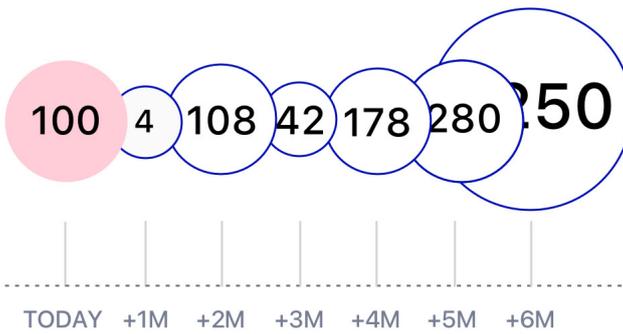
[Back](#)

Future

Day-by-day

Months

Years



Upcoming in EUR

100.00

You have a large payment to make in August for a hotel stay in Croatia. To prepare, you can start saving regularly now and/or buy cancellation insurance.

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Dashboard



Products



Transfer



History



More

(General Data Protection Regulation) applies, which protects individuals from the processing of their data. Similar solutions are implemented in the legal systems of many other countries around the world. There is no doubt, however, that with the further development of technology, the discussion about the collecting of and working with data will continue and regulations will be changed. Perhaps the right balance between the right of individuals to protect privacy and the use of the potential of data analysis can be achieved by building trust in institutions that are responsible for this area of our lives.

In the context of banking services, better data analysis can give a lot of benefits to customers, although of course risks also exist. The analysis of hard customer information such as age, gender and place of residence, combined with the huge amount of information on account operations and the way products are used, enables banks to segment their users more accurately and in more detail. As a result, it is possible to better tailor services and prepare precise recommendations – say, investment or savings options – for the client.

Let's put ourselves in the shoes of the pervasive algorithm for a moment and analyze the example of the Kowalski family. For several years in August we have seen a large number of card transactions in Croatia. Mainly spending in bars, restaurants and other entertainment categories. In addition, a large amount was transferred to a hotel account. We already know where this family spends holidays and what (more or less) they spend money on. Perhaps after the Christmas break the bank could offer the Kowalskis a regular savings program so that the August trip would not be associated with financial stress. Let's also take into account unpredictable factors that may mean that traveling abroad this year may prove impossible; the bank may offer travel cancellation insurance.

Artificial intelligence



I DON'T WANT TO
INSIST ON IT, DAVE,
BUT I AM INCAPABLE
OF MAKING AN ERROR

HAL 9000, ARTHUR C. CLARKE, 2001: A SPACE ODYSSEY

The main desire of many passengers on long-haul flights is to fall asleep as quickly as possible in a chair that is rarely comfortable. Sleep significantly reduces the travel time itself and often helps to overcome the time difference after landing. Cabin crew at decent airlines are well aware of these expectations, so after the meal, alcohol is usually served, followed by a slight temperature correction and a dimming of the lights. None of the crew or passengers have objections to entrusting their lives to the machine in such conditions. The not-so-advanced autopilot computer then controls the aircraft while the passengers inside drift off to sleep.

Some of us have also found that cars can be autonomous, to a certain degree. Parallel parking is one of those situations where minor dents and scratches occasionally occur. And yet we have no fear leaving

this activity to an electronic parking assistant, added to an increasing number of models.

Although we may not fully realize it, in the selection of information presented to us on the web, in the process of our medical treatment, in determining the severity of penalties awarded by courts and in many other areas we give machines control over our property, health and even lives.

One impact of the digital transformation of banks is the growing role of algorithms that replace people not only in internal processes, but also in customer service. In the area of financial and investment consulting, robo-advisory systems are being developed, which are used to automatically analyze specific data sets with very little human participation. Based on information about a client's financial position and goals, profiled investment recommendations are prepared. Artificial intelligence projects are also being developed, in which the data collected by the algorithm is used to make decisions.

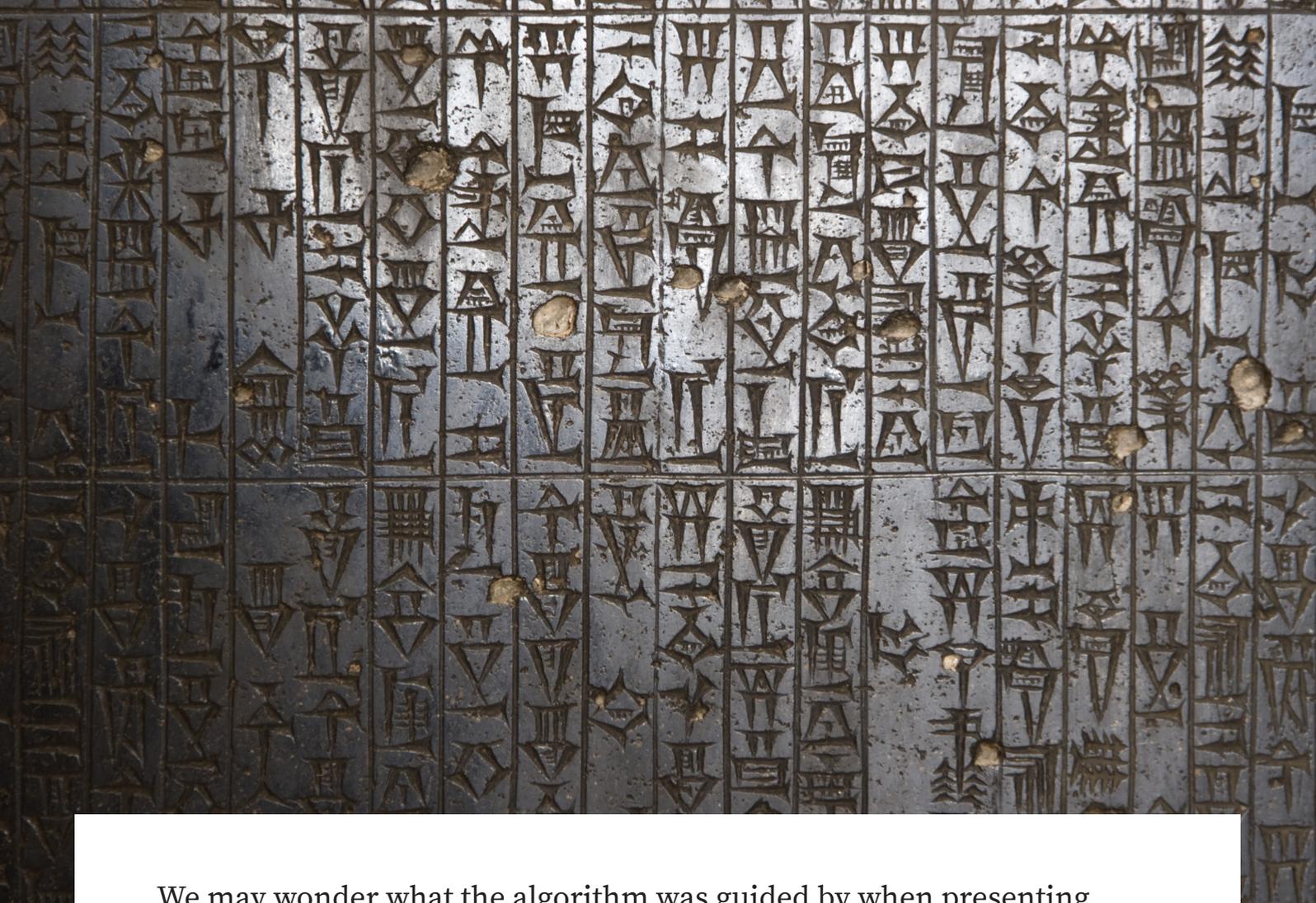
Artificial intelligence – what it is and what it isn't

A few years ago, a virtual advisor service appeared on the website of the Polish Social Insurance Institution. A clerk in a suit introduced herself and offered to answer all frequently asked questions and help navigate the site. Records of conversations appeared in social media, in which internet users tried to pick up ('wanna go out with me?'), confound ('when is the end of the world?') or make fun of the app ('why are you robbing me?'). The advisor was doing quite well at fending off these questions, as evidenced by its answer to the last question: 'Sorry, but I am unable explain that to you'.

It is difficult to classify this application as an example of the use of artificial intelligence. We do not know if the algorithm was able to learn and what would happen after weeks of harassment by internet users with such questions. The rules matching an answer to certain keywords appearing in the user's question worked well.

A far more advanced class of software can be found in recommendation engines on online stores, which aim to achieve two non-mutually exclusive goals. Let's assume that the first of them is the aim to pamper the customer and guarantee the best possible shopping experience. This is usually done through the role of a competent advisor who, based on the knowledge that the store has about the user, their interests, search history and previous purchases, will propose an item that will pleasantly surprise the customer and meet expectations. The second goal is to achieve the business goal of the store owner - generating sales with the highest possible margin.

Looking through the online offer of one of the leaders of the book industry, I come across a biography of Marshal Józef Piłsudski, Head of the Polish State 1918-1922. I also learn that customers who buy this book often buy a biography of Krzysztof Wielicki, a climber, conqueror of the Himalayan Crown and Karakorum, the first to climb an eight-thousand-meter peak in winter. I learn that customers who were interested in this product also viewed a book called Nightingale: Condemned to be a Gangster. The Head of the Polish State, a brilliant climber and the head of the infamous Pruszków Mafia - how does the algorithm that came up with these biographies work? Yes, I am interested in the history of Poland, I enjoy a stroll in the hills and I happen to live in the Pruszków area. Is that how they came to their conclusions? Perhaps a large group of clients really do share an interest in these three people. Or maybe a free space on the website was just filled with something that sells well in the "biographies" category.



We may wonder what the algorithm was guided by when presenting such a selection to me. If artificial intelligence is behind this in any way, then even the most experienced programmers of this store platform will not be able to answer this question. Algorithms do not have to behave predictably, especially when the recommendations they prepare are based on unstructured data covering millions of transactions, hundreds of thousands of products and data on users and their interactions.

Machines do it better

Compiled in the 18th century BC, the Hammurabi Code was a fairly clear instruction about the laws and how to enforce them. The law was casuistic, so not detached from moral principles and what it means to be good. 282 paragraphs were formulated in a very algorithmic way, each of which sounds like a conditional statement: if the logical expression is true, execute the specific statement. For example, the content of one

paragraph reads as follows: “If a citizen steals and is caught, he will be executed.” It is now obvious that you should not steal, and if you do, then do not get caught, because the consequences can be very serious.

A computer program that cataloged crimes and decided punishment in a manner known to Babylonians would be fairly simple. The law that applies to us today is far more complicated, but still defined in a similar way. A specific type of offense is accompanied by information about the level of punishment if committed. For example, in the Polish Penal Code, murder is punishable by imprisonment for not less than 8 years, a possible penalty of 25 years imprisonment or a life sentence. Special cruelty, the use of explosives, a greater number of victims or actions under the influence of strong duress are examples of circumstances that modify the level of possible punishment. The final decision about the level is taken by the court. And regardless of the state or the binding laws, it is not an easy decision.

Themis, the Goddess of Justice in Greek mythology, is depicted with a blindfold covering her eyes. This is to symbolize impartiality, and in similar cases citizens should expect identical treatment regardless of social status, skin color, religious belief and other characteristics.

The story of gangster Al Capone in many Hollywood productions is a good example that the law is not always applied in the same way. The boss of the Chicago Mafia was associated with a very long catalog of criminal activities, ranging from those related to prostitution and trafficking alcohol during Prohibition, to extortion and a series of murders. The federal agents pursuing Al Capone, however, failed to prosecute him for these crimes. After painstaking examination of certain documents, he was finally convicted of non-payment of taxes. He almost certainly deserved his stint behind bars, and tax fraud in the United States has always been treated very severely. However, we



can safely assume that for the same class of crime, someone without a past as a gangster would be treated a little differently. Although the jury dismissed 18 out of 23 charges, Al Capone eventually ended up in Alcatraz prison – a place built for worse cats than citizens who do not pay tribute to the state. It is reasonable to say that, due to the general reputation of the accused, the penalty was exceptionally high and the trial was conducted with excessive zeal, including allowing evidence from conversations about a possible settlement, which generally should not be the case.

Decision-making judges can be biased, not necessarily related to any kind of corruption. For example, solid research by scientists shows that judges who are fathers of daughters are likely to be more lenient on penalties imposed on women.² It can be assumed that family circumstances, personal experiences, and even – as some studies show -- issues as secondary as part of the day in which the trial is taking place may affect the final judgment.

Meanwhile, computer programs do not succumb to emotions and – when well designed – are not susceptible to outside pressure. In many countries, judges use software to make decisions. For example, it is fairly easy to measure the validity of judgments in parole proceedings. If the accused returns to the court as a repeat offender, it means that their earlier release did not benefit the public. Studies have shown that in this type of analysis significantly better quality of decisions would be issued by properly programmed machines.

Intelligent Banking

A large number of existing banking programs are rule-based systems. Based on the data provided, they implement an algorithm consisting of multiple nested instructions: if a specific condition is met, do it.

Meanwhile, the real challenge in banks is making decisions based on data that is hard to reach and rules that are not always possible to formulate. Artificial intelligence is widely used in the field of image and speech recognition. Memorizing an image of characteristic facial elements and gestures can be very useful, both during the registration of a new customer and subsequent authorization. Speech analysis can also be used to identify a specific customer, but its correct understanding allows the use of all types of chatbots.

Solutions based on artificial intelligence are used in banking fraud prevention systems that capture attempts of unauthorized account access and identify unusual behavior or operations.

An especially interesting application of artificial intelligence is the analysis of the financial situation of clients and matching this to credit, savings and investment offers available on the market. A properly



programmed computer is able to analyze an incomparably greater number of possibilities and available variants than a human. In the analog world, these types of consultancy services are regulated and their provision requires a license. Certifying algorithms that take over such tasks from advisors is a challenge that the banking market will soon have to face.

2. <https://scholar.harvard.edu/files/msen/files/daughters.pdf>

Phygital



CAN'T TOUCH THIS
LOOK MAN U CAN'T
TOUCH THIS

MC HAMMER

In many areas, digital solutions eliminate products and services that have been with us for years. The printed press loses the fight for the reader with information portals. Letters sent from the post office are a rarity. Music and movies on 'hard copy' are only bought by collectors. Online stores are beginning to dominate in many categories of commerce.

However, for a large number of users and customers, real world experience is very important. For motoring fans nothing can replace the growl of the engine during a test drive of a sports convertible. A wedding suit is also not something that we order online with a possible free return option. The ROPO (Research Online Purchase Offline) phenomenon, consisting of searching for product information on the web and finalizing transactions in-store, has long been seen as slowing down digitization. Meanwhile, the trend of combining the experience of the physical world (physical) and digital technologies (digital) is gaining in importance and has given birth to the tongue-twister 'phygital'.



A quarter of a century has passed since July 1995, when the first book was sold at the Amazon online bookstore. The company, one of the global giants in online commerce, has significantly contributed to changing consumer habits and developing sales in digital channels. Currently, however, Amazon is opening traditional bookstores, enabling customers to return to the pleasure of book shopping with the rustle of turning pages and the smell of fresh print. Books are presented in the bookstore – always with the front facing the customer – along with their ratings from the online store. Prime internet subscribers in the real world have the same discounts as on the web, and the cover price applies only to customers who do not use the services of the virtual bookstore. Ordinary store shelves present information from the online system. For example, placed between two books may be an inscription stating that readers buying the book on the left also often go for the one on the right, so bringing the recommendation mechanism based on customer behavior online directly to the analog bookstore. The payment mechanism in physical stores is of course based on the online user profile.

A great example of the phygital approach, with omnichannel data and service integration, is the notification of the estimated time to cover

a route, delivered right after starting the engine in a car. Intelligent software in the smartphone knows that I sat behind the wheel and knows my habits (including where I go on specific days and at what time). It integrates this knowledge with current traffic data and route speed from other drivers.

Phygital is great at marketing. Information for users of a mobile airline application that their flight is delayed is often the trigger of a crisis in communication between passengers and airport staff. But this message can be combined with information that seventeen meters from the gate, a decent cup of coffee is waiting for you. That's how you need to think about modern marketing over many channels.

In the banking world, we can see a growing number of projects that fit into the idea of phygital. An example is perhaps the transformation of banking branches into real world coworking spaces, reserved by customers through various types of digital applications. One bank in the Persian Gulf links the benefits offered to customers of savings products with their physical activity under a so-called fitness account. The more calories a customer burns on a treadmill, or the more steps they take each day, the higher the interest rate on the deposit offered by the bank. Combining real experiences with information from the virtual world can be based on geolocation supported by the user's smartphone or smartwatch. In addition to technology, however, conversations and interactions with other people are important.

Modern solutions often dehumanize the user's contact with the service and its provider. Connecting online and offline worlds in an appealing way can only succeed if, instead of designing user experience, suppliers of products and services manage customer experience as a whole, regardless of the channel.

Invisible payments

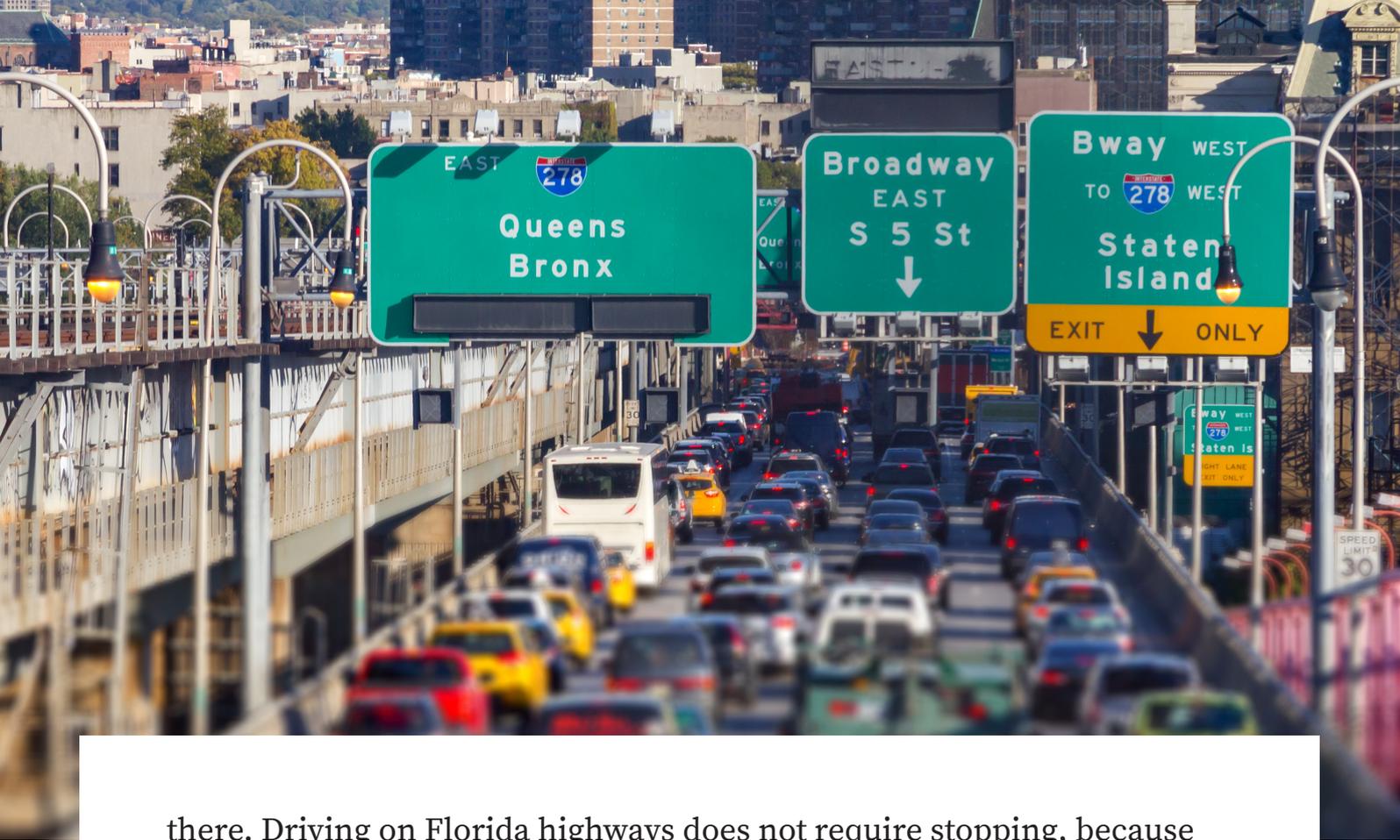


INVISIBLE THINGS ARE THE ONLY REALITIES

EDGAR ALLAN POE

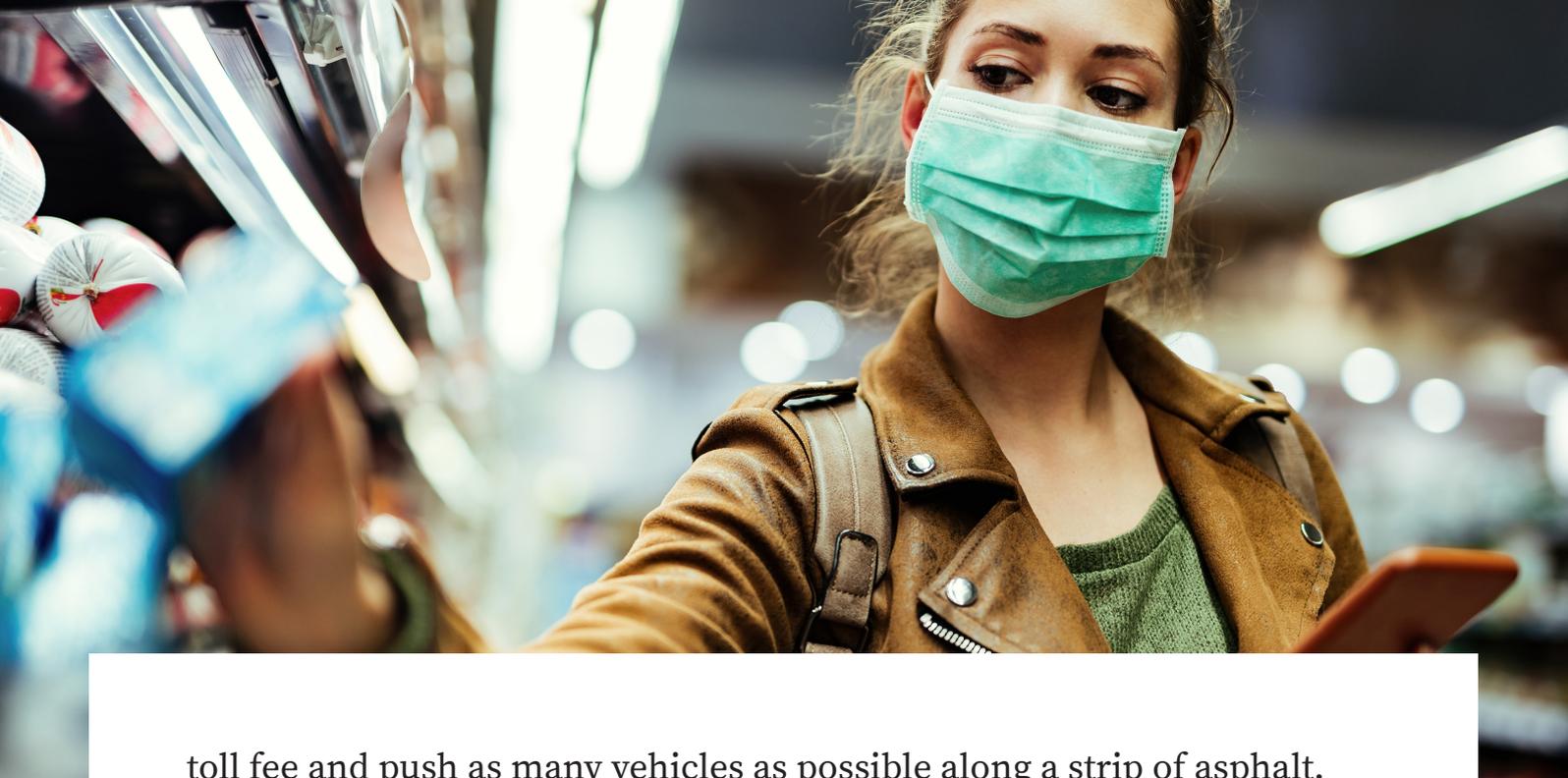
In the first years of the 21st century, we could already boast several advanced online banking projects in Poland, which was a good sign of the development of banking and technology. We remained far behind in real infrastructure - our motorway network was limited to a short section connecting Katowice and Kraków. It took half a day to cover the 300 kilometers from Warsaw to Poznań. Along the way, you had to eat something and usually refuel somewhere, requiring the handling of money. Today, Warsaw and Poznań are geographically in the same places as they were, but they are connected by highway and the distance can be done in less than three hours. However, we still have traditional toll booths on the route - a one-day trip from the country's capital to the capital of Greater Poland means at least six instances of cash or card operations.

Meanwhile, across the Atlantic, the situation in some states is reversed. We can make fun of paper checks, a US symbol of a less-than-innovative banking system, but the car has always been a symbol of independence



there. Driving on Florida highways does not require stopping, because the toll system works based on transponders that vehicles are equipped with. A similar system works in Poland for vehicles over 3.5 tons and buses traveling on national roads. When in Florida we want to accelerate a bit or drive in a less congested lane, we take the left lane. Each stretch of road driven in the left ‘Sunpass’ lane is more expensive, but the fact that all payments are invisible adds greatly to the driving pleasure. We can choose whether to use a cheaper or more expensive lane, but we do not use cash or a card and we do not have to stop. Once a month, the operator charges the card and provides billing of miles traveled. That means dozens, perhaps hundreds, of financial operations each month combined into one, and a vast reduction of those moments of contact with the bank, holding a piece of plastic with that familiar printed logo in our hand.

Is there really no room for the bank in the modern payment model for road use? Of course, no one would like to receive a message after every mile, even though each mile translates directly into spending. The motorway operator has its own goals - to collect the highest possible



toll fee and push as many vehicles as possible along a strip of asphalt. Perhaps an intelligent application analyzing my finances would be able to advise me to use the right lane more often, bringing me real savings on a monthly basis. In the technological ecosystem that surrounds every driver (screens in the vehicle, applications and connectivity via smartphone, and a banking application equipped with API), there is every reason to collect, analyze and present this information.

In retail sales, examples of successfully giving up traditional payments – what we think of as banking – can be found in abundance. In many stores, both smaller and larger, cash registers are automated, but projects like Amazon Go eliminate them completely. The customer enters the store, selects the goods, and exits. Somewhere around the exit, collected goods are automatically scanned and paid for by directly debiting the card or account.

Shopping also ceases to be an opportunity to handle money, a card or a payment operator. This trend shows no sign of stopping when we consider innovative solutions implemented, for example, on the Chinese market by the Alibaba group, which is one of the three largest retailers in the world. The growing Smile-to-pay service means that the payment process initiated by the customer is instant and does not deliver any kind

of special experience. It's not like we'll get a meal at a KFC or McDonald's restaurant for a smile. The customer still needs money but smiling for a moment in front of the camera allows advanced systems to perform a face analysis and compare it with the biometric database, and then authorize the transaction.

In the above examples, the bank remains in the background. We need money, widely understood as being in our account, but do we need to contact the institution that stores information about our balance?

The role of the bank is reduced to infrastructure, i.e. a system serving the economy, but presenting a completely different marketing value than in the model known to us so far. Currently, banks are well-known brands that are supposed to trigger emotions, and very serious budgets are invested in promotion.

Looking for analogies, let's view the bank as an important element of a framework on which finance is built. Similarly, high-voltage poles and switchgears create electricity infrastructure, while pipes and pumping stations are infrastructure for water supply. These are extremely important and strategic systems, but the end customer does not have conscious contact with them every day. Yes, we use electricity and water, but it is rarely accompanied by reflection on the methods of distribution of these goods. Invisible payments in a very measurable way eliminate a number of customer contacts with the bank, which still remains necessary, but rather as part of the background of everyday life.

Subscription models



NOTHING SO NEEDS
REFORMING AS OTHER
PEOPLE'S HABITS

MARK TWAIN

Just a few years ago, at the beginning of each month, came that less-than-pleasant evening, when we logged into the banking system and paid the bills received in recent weeks. Not only did the balance in our account decrease with each subsequent payment, but the activity itself was not exactly exciting.

Today, a greater part of bills and invoices pay themselves. Access to paid Netflix content, music from Spotify, Uber and scooter rides, subscriptions to the electronic version of one of the dailies - my money goes on all of this, but I don't waste time making payments.

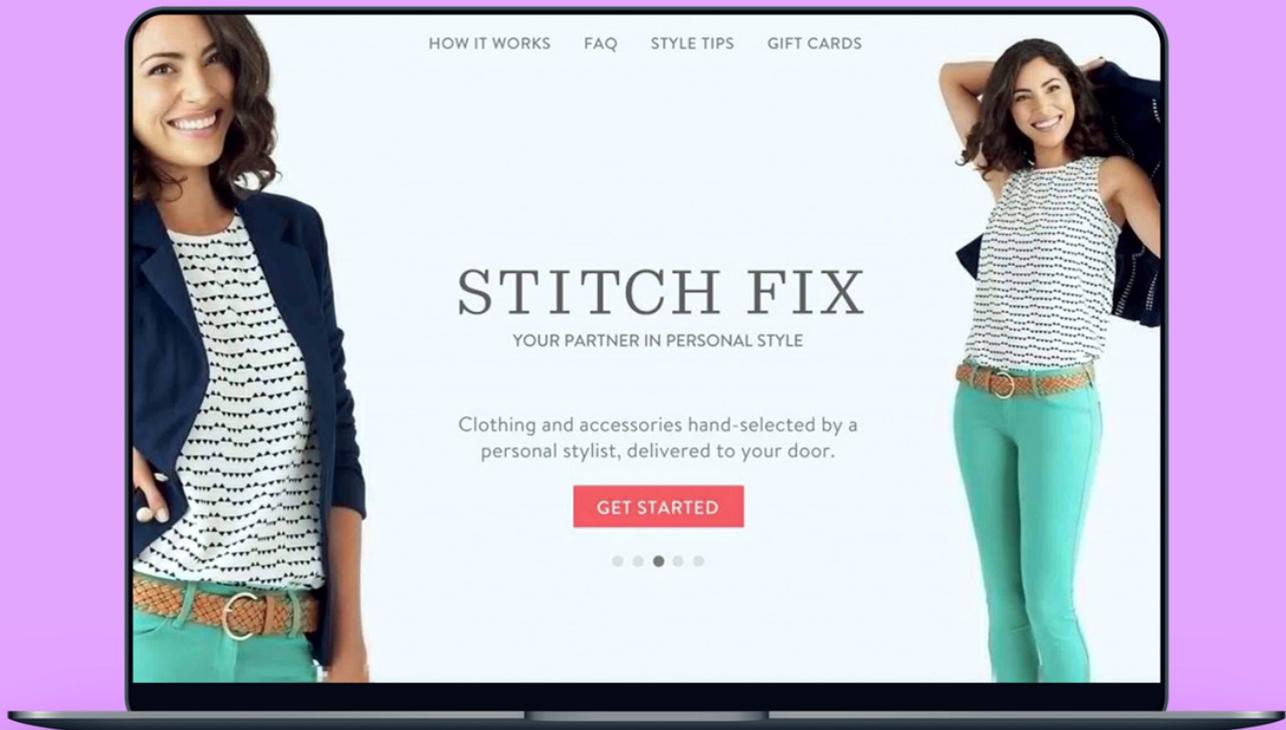
Winc, a subscription-based store, is one of the top US wine companies. Every month, customers receive a bottle of wine tailored to their individual tastes as part of the fixed fee. We start the adventure by completing a survey with our preferences. Based on millions of wine reviews made by different users, the algorithm prepares a set of bottles



Winc.com

that should suit us best. Each subsequent evaluation of a specific wine teaches the service mechanism about our taste and increases the likelihood of our satisfaction with the choice that it will make when selecting products for our next shipment.

During the internet bubble at the beginning of the 21st century, a lot of ambitious internet ventures appeared in Poland. One of them was the czarneskarpety.com website, which provides an elegant pair of black socks as part of a subscription every two weeks. Bankers were probably the main target group. Two decades ago, the market was not ready for such a business model. Today, black socks are rare - even for a suit - but sites such as Stitch-Fix are gaining popularity. As part of the subscription, customers receive clothes tailored to the client's style, size and budget. The service takes on the role of a personal stylist.



stitchfix.com

Subscription mechanisms eliminate payments and again the role of the bank is decreasing. But somebody has to help me manage all these subscriptions. I don't know who syphons money from my account anymore, or how often, or what for. The first three months were free, then I forgot to turn off payments. Perhaps this is a role for the bank. In banks we trust. The bank is fully capable of honestly advising me what I use and how.

9:41



[Back](#)



Payments and subscriptions



VOD Platform
€9.99/month



Music Streaming Service
€4.99/month



XYZ Telco
€14.99/month



You can pay less for internet and phone by switching from XYZ Telco to ZYX Connect

XYZ €14.99/month **ZYX €12.99/month**



Fitness Club
Turned off



CDE Electric
€14.99/month



Dashboard



Products



Transfer



History



More

The pandemic: rapid acceleration



IF EVERYTHING SEEMS
UNDER CONTROL,
YOU'RE NOT GOING
FAST ENOUGH

MARIO ANDRETTI

One of the first recommendations issued after the introduction of the COVID-19 state of emergency was to avoid cash and use contactless payments instead. Digitization processes, associated primarily with convenience, have become mechanisms to increase customer security. It turned out that a number of innovations introduced in banking over the years work well during a pandemic. These include widespread secure payment methods and completely remote customer service.

A well-designed and functional banking system interface should give users a sense of comfort. It should also ensure that every interaction is clear for the user - the consequences of using a particular option are known and finding the right function does not take longer than it

9:41



You're sharing your screen

[Back](#)

Chat with bank teller

Hello, could you explain how to change payment date of my personal loan? I can't find this option in the app.



Amelia Cabal

Hello. Yes, I can. If you agreed to share your screen with me, I could show you where to click.

Do you agree to screensharing with Amelia Cabal?

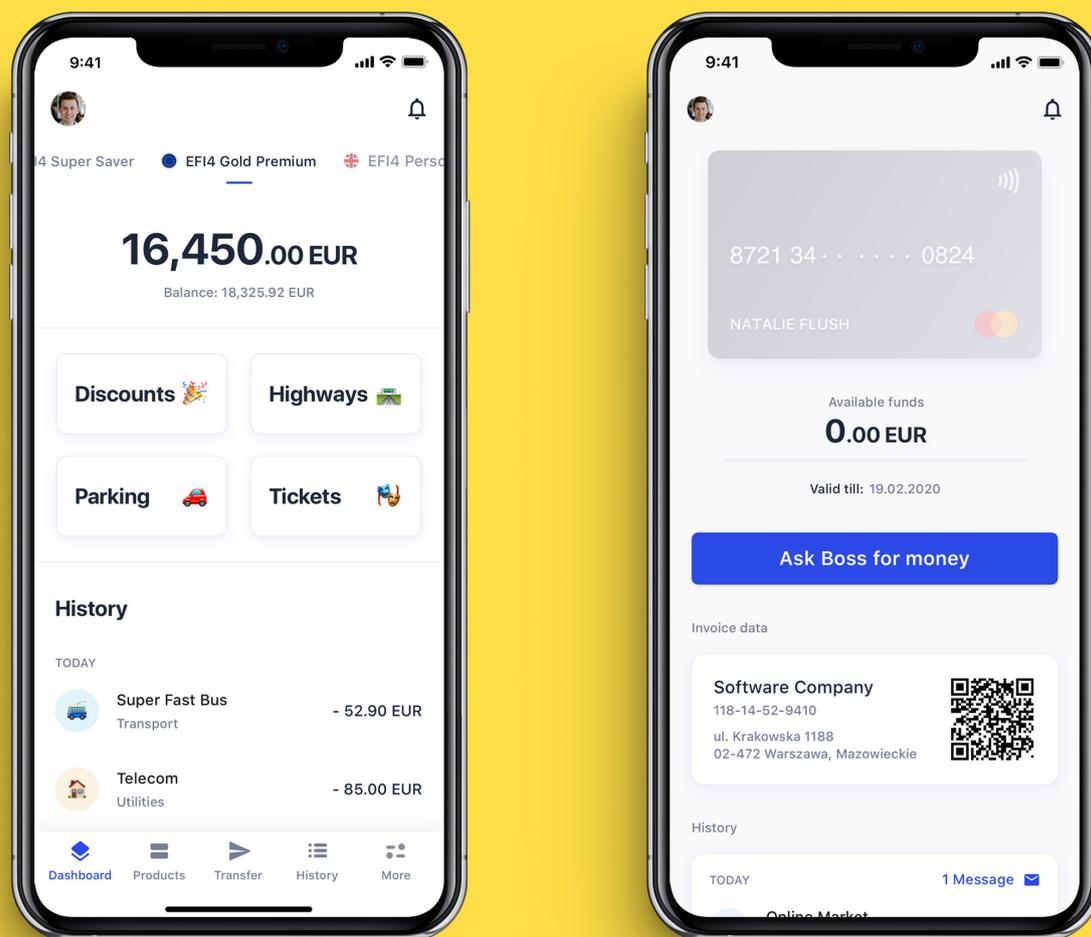
I agree

You're sharing your screen now.

Stop screen sharing

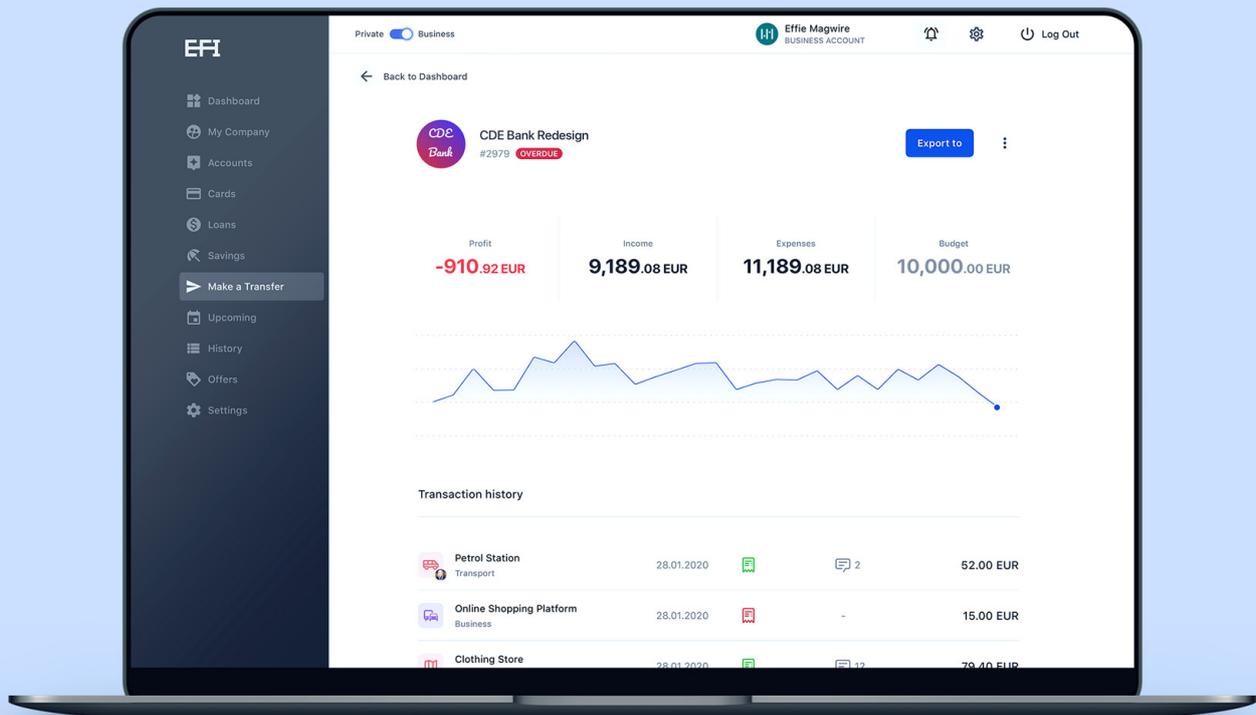
How about n|





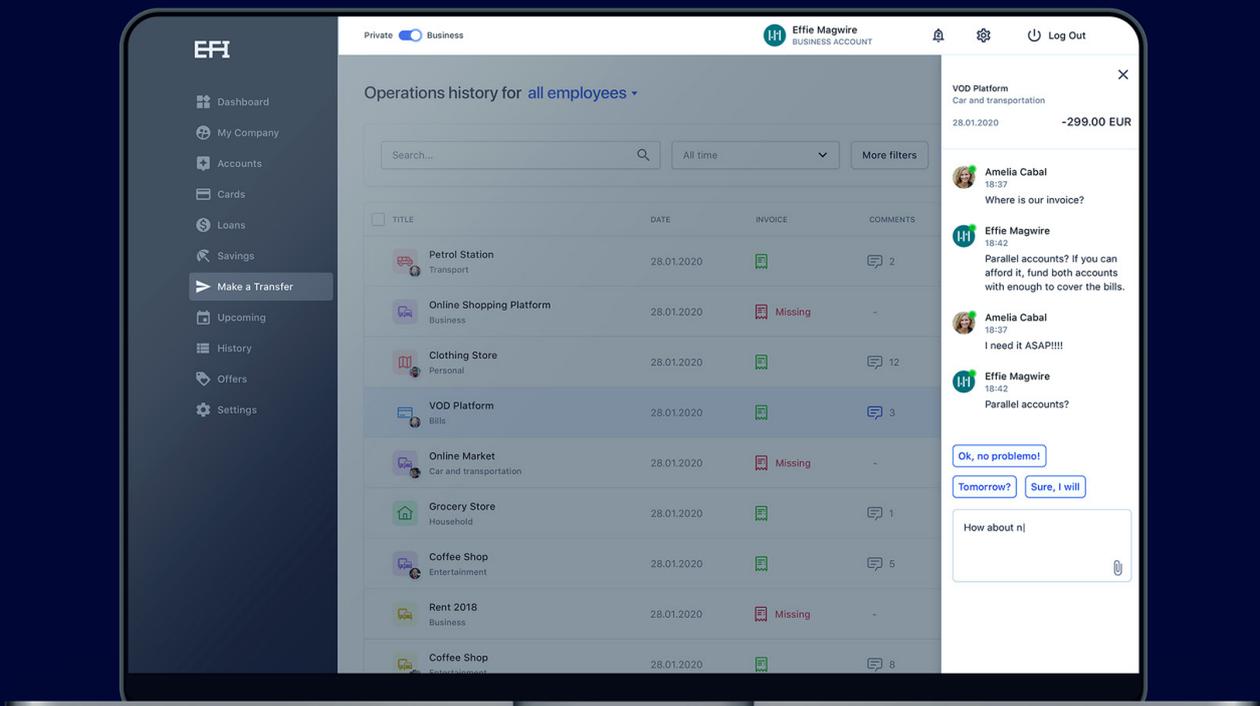
An online chat with the customer also allows you to work together on documents, which is helpful in explaining the complexities of products, but also in solving any customer problems with the service or the application. A screen-sharing feature, accessible by the customer or the consultant, is extremely helpful in these types of situations.

The new payment mechanisms mentioned previously can drastically reduce the number of contacts that we have with cash. Another mechanism, well-known to users, is the ability to use the banking application itself as a channel for settling all kinds of additional VAS (Value Added Services). Payment for tolls, parking lots and public transport tickets are the most common scenarios integrated with the banking application, which we can treat as a handy wallet.



The swift introduction of isolation strategies to stop the spread of the epidemic has forced many small and medium companies to switch to a remote working model without prior preparation. The lack of systems supporting this way of doing business significantly slows down the implementation of previously simple and straightforward processes. In some cases, such as when a company employee requires company expenses, banking applications may step in to assist. In some companies, the expenses process requires appropriate approvals and a cash advance. Modern banking can help implement this process differently: the employee receives a virtual ad-hoc card issued with the appropriate amount. All communication takes place online, without cash.

The banking application can also be used for communication, for example with employees of the accounting department, for the simple



annotation of documents, associating transactions with invoices and receipts, or exchanging comments.

Bank transactions, along with associated accounting documents, can be grouped into projects. On large enterprise platforms, project analysis functions are performed by far more advanced tools, but for the needs of a small organization, organizing information in this way can be extremely helpful.

KYC: Know Your Customer



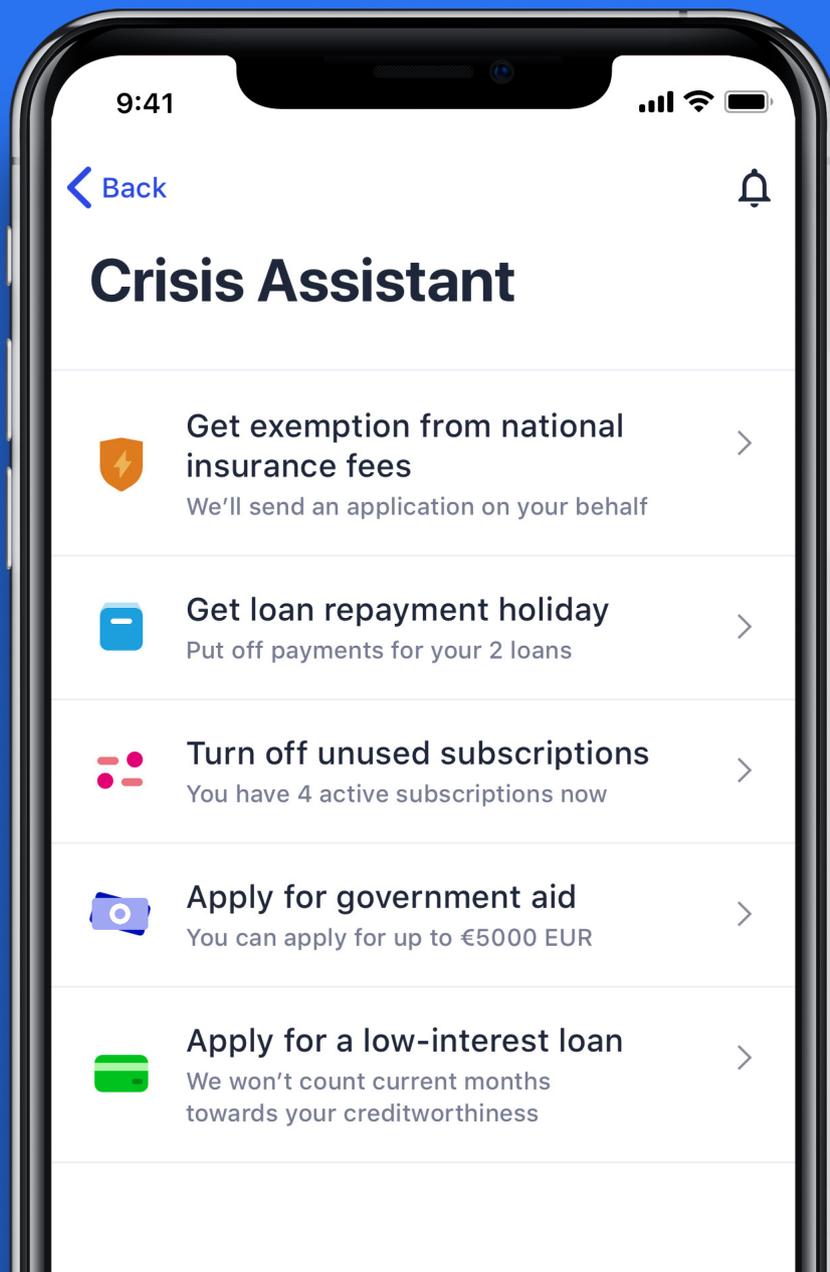
SUSPECTING AND KNOWING ARE NOT THE SAME

RICK RIORDAN

KYC (Know Your Customer) guidelines play a special role in a strictly regulated banking market. Financial institutions must be able to correctly confirm the identity of their clients in order to provide services to them, as well as counter all types of fraud and - as part of the global financial system - support the counteracting of money laundering, corruption and financial terrorism.

Thanks to the diligence of the KYC guidelines that must be followed in order to start providing services to a new customer, the bank becomes a guarantor that allows the confirm of identity. Through integration, it can become a link in digitization processes, for example, in various types of e-government services.

In the past, banks also offered help in submitting applications to administrative bodies as way of attracting customers. An example is the assistance offered by banks in registering a new business or applying for 500+ (childcare support introduced by the Polish government). In



a pandemic, support from banks in the digitization of administrative processes increases customer security, as many issues can be handled without leaving home. In addition, it saves considerable time by replacing the paper circulation of documents with a computer system based on the user's confirmed identity.

Onboarding: welcome on board



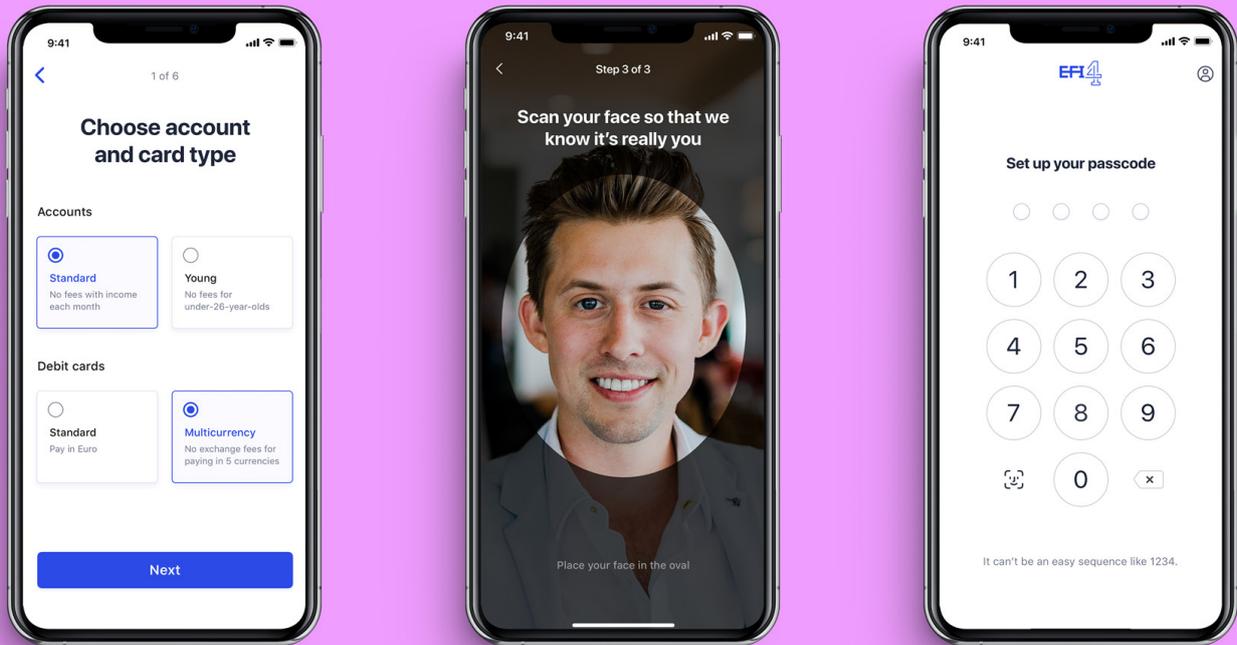
SMALL CHEER AND GREAT WELCOME MAKES A MERRY FEAST

WILLIAM SHAKESPEARE

In a bank, as in any enterprise in any field, the processes related to acquiring a new customer play a particularly important role. Due to a number of regulations in banking, this process is particularly complicated, but it can also be carried out without the need for physical contact.

Let's say that through marketing activities, we acquire a website or app user who in the next steps chooses a product that suits their needs.

It is then necessary to carry out the KYC procedure, which can consist of different stages. From the customer's point of view they can include phone number verification, ID document presentation and verification, face scanning, data collection and verification via forms. At the



same time, verification takes place in the bank's internal processes, with access to anti-fraud systems. The potential client is also verified in external databases. A product configuration that includes rules of access would be a successful end to the process.

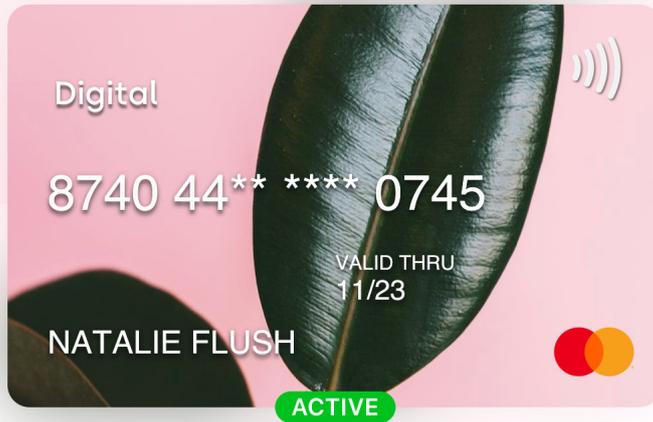
A poorly designed onboarding process can deter potential customers. It also doesn't make a good impression if the completed onboarding process does not allow the customer to start using the product right away. For example, setting up an account is of little use if the customer needs to wait several days for a card to be delivered. To remove this unnecessary obstacle in the development of relationship between the bank and the customer, instead of a physical card, the bank can issue a virtual card that can be immediately integrated with applications such as Apple Wallet or Google Pay. In this way, the timespan from acquiring a client to starting using the services becomes as short as possible.

9:41



[Back](#)

EFI4 Flower®



Available funds

17,325.92 EUR



Limits



History



Lock card

[Order physical card](#)

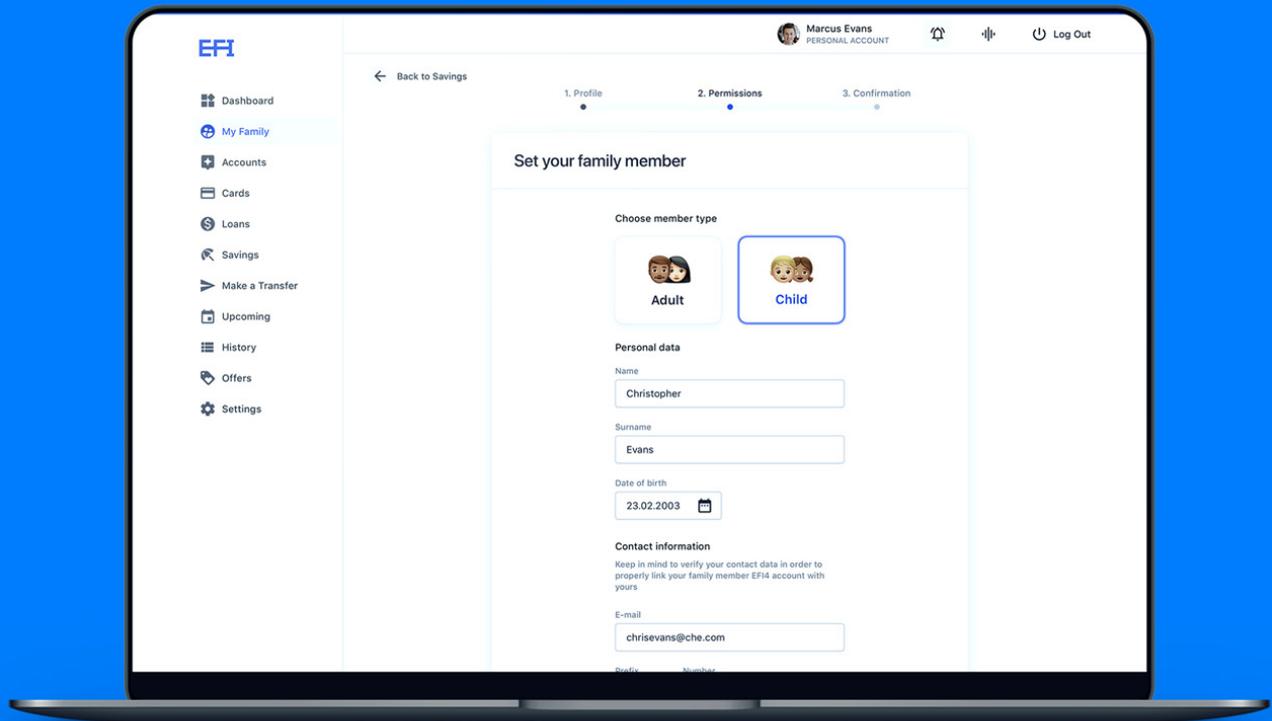


Security

Abroad card lock

Active



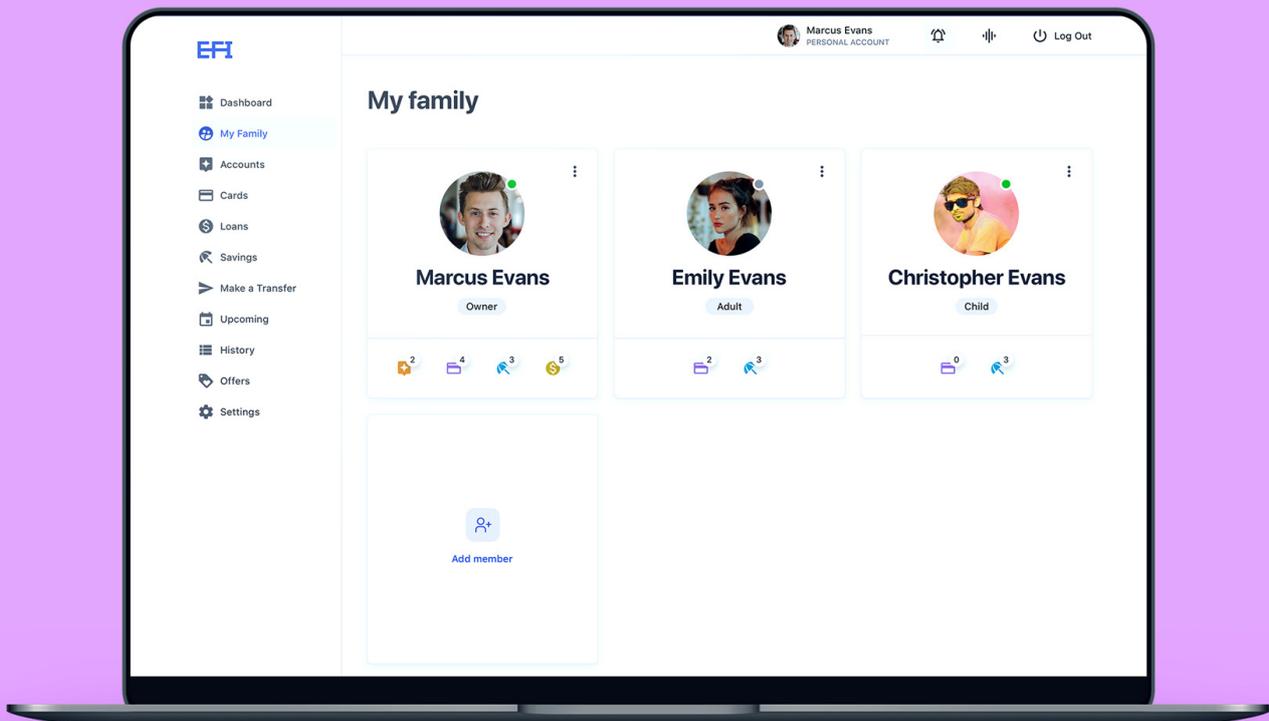


Family banking



FAMILY IS
A LIFEJACKET
IN THE STORMY
SEA OF LIFE

J.K. ROWLING



Couples organize their finances in different ways. Sometimes they use joint banking products, sometimes they independently deal with their revenues and expenses. Family banking allows you to integrate bank accounts, which can bring many benefits associated with optimal spending and support the overall picture of the family's financial situation. In addition, some banks have been developing applications for minors for years. In this way, they address actual needs, and at the same time build their brand among people who become their clients over time. A bank account created by parents for a child is a great tool for education in the field of financial products. Pocket money transferred in this way can also teach you to save, and there is no doubt that in the pockets of the younger generation you can now find a smartphone more often than banknotes and coins.

New generation PFM

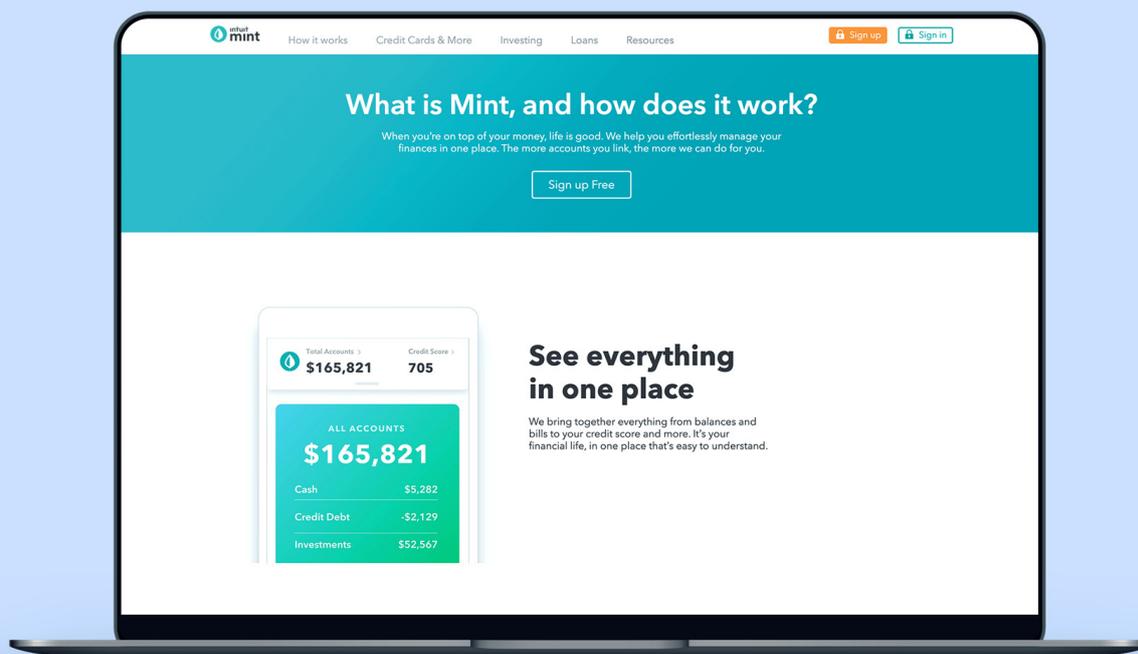


MANAGEMENT IS
ALL ABOUT MANAGING
IN THE SHORT TERM,
WHILE DEVELOPING
THE PLANS FOR
THE LONG TERM

JACK WELCH

Each month, bank statements present dozens of transactions that are difficult to figure out. PFM (Personal Finance Manager) was a tool that was supposed to help clients in this, supporting personal finance management with planning of income and expenses. One of the first websites offering this service was Mint.com operating in the United States and Canada. The service is able to aggregate data from thousands of different financial institutions and then categorize individual operations, supporting users in analyzing their personal finances through friendly charts and reports.

Banks began to invest in PFM applications, developing their platforms with this module. Proper categorization of banking operations allows



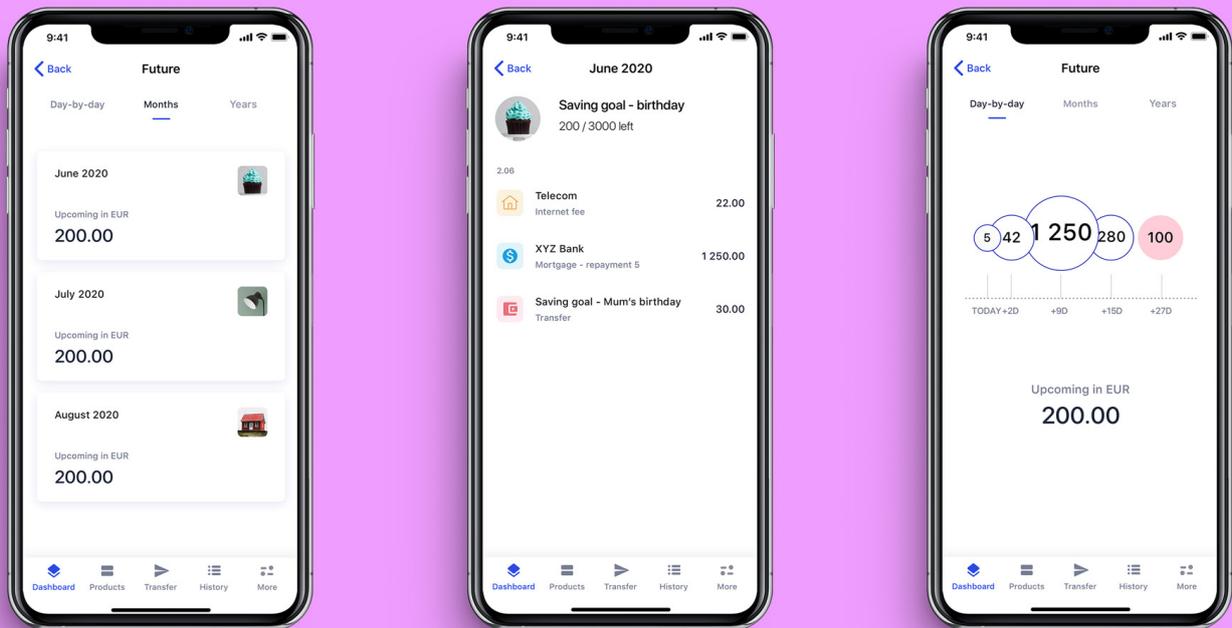
Mint.com

you to track trends in personal finance, anticipate upcoming expenses, and define budgets and savings goals.

The potential of PFM tools for banks is very promising. Understanding how customers use financial products allows them to better tailor and reach out with their offer at the best possible moment. An example would be supporting savings goals with credit products or a systematic savings program.

The basic barrier to the development of PFM is the inaccuracy of automatic categorization, and few customers are ready to devote their time to improving the algorithms themselves for better quality listings.

The first reason for the imprecise assignment of operations to the appropriate categories stems from the data available to the bank about each transaction. For example, expenditure incurred at a gas station in Poland does not have to mean the purchase of fuel. Especially at night



and outside the opening hours of shops, amounts less than a full tank probably reflect spending on snacks and alcohol. Assigning this type of transaction to the right category can be done manually or with the help of artificial intelligence mechanisms that analyze a customer's individual shopping habits.

The second group of transactions difficult to categorize are those using cash. When withdrawing money from an ATM, the bank loses the opportunity to acquire knowledge of what it was spent on. In pandemic times, when customers try to avoid using banknotes and coins, the role of cash is decreasing. A greater part of transactions are done electronically, increasing the accuracy of categorizing algorithms.

Precise data supplying PFM means that the quality of recommendations from this tool increases. The economic downturn caused by the pandemic means that many bank customers are much more careful in analyzing their expenses, and here the Personal Finance Manager has a role to play.

So do we need banks at all?



THE WORLD NEEDS BANKING BUT IT DOES NOT NEED BANKS

BILL GATES

The main driver of change in retail banking and the way customers use it is the development of technology. It is a similar story with the computer game market; this form of digital entertainment has always required the best equipment, better graphics acceleration, faster connections for multiplayer games and even more disk space.

Many customers associate banking with cycles of events occurring each month. The salary comes in, we use it to pay the bills, then monitor spending until the next salary payment. In the world of gaming, this model of banking use corresponds to a Soviet-era toy where the user controlled a basket that eggs would fall into. Pretty simple, pretty addictive, but one small mistake could spell disaster.

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