

ID Cover Page

Summary of WP Student Team

The banking industry: digitalization, evolution and outlook

Group constitution:

Student Name	Program	Individual Title
Diogo André Sousa Pereira	Business Analytics	Neobanks growth and business model: sustainability as the main concern for the future

Work project carried out under the supervision of:

Advisor: João Castro

A Work Project, presented as part of the requirements for the Award of a Master's degree in Business Analytics from the Nova School of Business and Economics.

The banking industry: digitalization, evolution and outlook

Diogo André Sousa Pereira

Work project carried out under the supervision of:

João Castro

15-12-2022

Abstract:

The banking sector is under pressure from digitalization due to changing consumer needs. The new fintech players are managing to gain their space within a sector dominated until now only by traditional banks. Thanks to their level of digitalization, fintech companies have managed to arouse interest and at the same time arouse fear among the big players in the banking sector, thus, the need to understand how these digital actors can be so successful with their innovative products and services. The aim of this paper is to understand how traditional banks will react and how Neobanks will grow even more.

Keywords:

Innovation, Digitalization, Neobanks, Fintech, Customer Experience, Big Data

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

Table of Contents

Group Part – Introduction - Valentina and Diogo	5
How the digitalization is changing the financial industry	5
The customer experience: the importance of the CX in this process	6
The evolution of the fintech's industry	7
The impact of Fintech on financial industry	9
The importance of data	12
The PSD2	15
The Application Programming Interference (API)	16
What should we expect from financial companies in the future	18
Valentina	<i>Erro! Marcador não definido.</i>
The banks' race towards digital maturity	<i>Erro! Marcador não definido.</i>
The importance of an outstanding customer experience	<i>Erro! Marcador não definido.</i>
The future of the banks sector	<i>Erro! Marcador não definido.</i>
The opportunity of data	<i>Erro! Marcador não definido.</i>
The future is digital	<i>Erro! Marcador não definido.</i>
Front end only	<i>Erro! Marcador não definido.</i>
Wrap and digitalization	<i>Erro! Marcador não definido.</i>
Go digital native	<i>Erro! Marcador não definido.</i>
Which strategy?	<i>Erro! Marcador não definido.</i>
The future is digital	<i>Erro! Marcador não definido.</i>
Future scenarios of the traditional bank sector	<i>Erro! Marcador não definido.</i>
Diogo	19
How Fintechs are performing?	19
Social and environmental awareness	19
Customer Experience	22
Neobanks business model	23
The future of Neobanks	26
Conclusion	31
Group Part – Conclusion – Valentina and Diogo	33
Survey Results	33
What to expect from these institutions	34
APPENDIX	38
Group Part – Valentina and Diogo	38
Valentina	<i>Erro! Marcador não definido.</i>
Diogo	40
SOURCES	44
Group Part – Valentina and Diogo	44
Valentina	<i>Erro! Marcador não definido.</i>
Diogo	45

Group Part – Introduction - Valentina and Diogo

How the digitalization is changing the financial industry

As a result of the digital transformation brought about by new technologies, traditional processes of renewal and development are being strengthened, but new forms of innovation are being created characterized by sharp, rapid changes affecting every segment of society.

This research will examine the economics of this transformation, specifically enabling technologies, as well as the impact digital has had on financial services and consumers. "Banking" has undergone a profound change in recent years. Throughout the economy, the consequences and continuation of the financial crisis have been felt in every area, with the main effect being the credit sector. A market that is becoming increasingly risky, volatile, and competitive has forced credit institutions to rethink outdated, obsolete products. Increasingly stringent legislation on consumer credit policies, together with the evolution of demand behavior, has placed greater emphasis on the needs of retail investors, not only through an innovation on product types, but also a restructuring of the ways in which to offer the above products and/ or services.

At the base of this progressive and constant process of transformation is the increasingly evolved customer, attentive, educated and able to influence the market dynamics.

Therefore, it is necessary to redefine the ways of interaction between customers and banks, relying on increasingly advanced communication systems capable of developing increasingly loyal relationships. Banks will have to adapt to the changing needs of their customers with new business models, preferring alternative channels rather than traditional channels, and adopting more specific product and/or service policies. In this area, the European Parliament has already taken a number of impactful decisions. Since its inception, the capitalist system has rarely seen such disruptive changes as the onset of digital, internet, and mobile technologies. These innovations also involved the banking and credit system with the emergence of the so called

“fintech” in the second half of the new millennium. New infrastructures, devices, and accessibility to a huge amount of data and computational power at low cost, have brought out new dynamics of innovation, questioning the logic and the barriers of financial power, opening new scenarios and unlimited applications.

The ongoing disintermediation and reintermediation of traditional banking by technological finance is forcing banks to reinvent their services, to meet consumer expectations and to somehow approach fintech. Banks and financial intermediaries will increasingly be confronted with large international companies specialized in digital services; to compete with telecom operators.

Given this complex picture, some questions arise spontaneously: how will competition in financial services, particularly in the payment systems, change? How will traditional players, banks and financial institutions respond in order not to lose significant market share?

Moreover, what role will the legislator play in "regulating" new entrants?

The customer experience: the importance of the CX in this process

Technological innovation radically changes the customers' shopping experience, producing an impact on the main levels of the business relationship. Particularly, digitalization changes the physical proximity boundary between seller and buyer, developing a concept of virtual proximity, by which the customer can contact the supplier of products and/or services at any time and from any place to receive information, complete the purchase or request assistance. The real and virtual worlds are constantly adapting to each other, creating new business models and new forms of competition and relationships. In the search for the right mix, a fundamental factor is represented by the place where we live, which significantly affects the use of new technologies and the ways of exchange between different parts. The digital world works as a substitute

for the physical world, allowing you to find what is missing, and every physical experience experienced is shared and amplified in the digital environment.

Banks must improve the purchasing experience as a whole and all channels made available to the customer, with the aim of offering value-added services and increasing opportunities for contact and dialogue with customers. The traditional channel remains central to the opening of new relationships and value-added services (for example consultancy services or support for more complex operations).

It will be the online channel preferred by most customers for communication, advertising campaigns and information services. In the world of credit intermediation, commercial banks serve the community and customers. Banks are undergoing a phase of transformation that represents the response to changes in the market scenario whose main determinants must be sought in the evolution of the regulatory framework, in the changes produced by technological innovation, in changing customer behavior and increasing competition, including non-banking competition. It becomes necessary to elevate the degree of modernity of the banking business model.

The digital world works as a substitute for the physical world, allowing you to find what is missing, and every physical experience experienced is shared and amplified in the digital environment. Banks must improve the purchasing experience as a whole and all channels made available to the customer, with the aim of offering value-added services and increasing opportunities for contact and dialogue with customers.

The evolution of the fintech's industry

Bearing in mind the idea that consumers' needs and habits are always changing, we can understand how the concept of fintech came about. Even before some banks entered in the digital market, namely through the creation of their own applications for checking balances and bank statements, the idea of fintech had already emerged, back in the 19th century in USA where the

first electronic fund transfer system using technologies such as telegraph and morse code urged. This looks basic to our society standards but at the time, the idea of being able to make financial transactions over a considerable distance was innovative, even more so at a time when the concept of globalization was beginning to emerge, and the transports and infrastructures industries was undergoing through a completely structural change and evolution.

At the end of the 20th century, the first ATM appeared, by Barclays, which presented itself as a very useful tool to support consumers, marking the change from an analogue financial system to a more digital one.

This was also a very important phase for the evolution of financial markets that saw the emergence of NASDAQ, the world's first digital stock exchange and SWIFT, a protocol between financial institutions that would facilitate cross-border payments and transfers.

More recently, with the Internet phenomenon, the concept of online banking began to dominate the financial payments market. Since the 1980s, the number of people joining online banking applications has increased and this "new banking industry" has evolved towards a world without physical cash.

The first companies self-designated as fintech companies emerged at this time, as is the case of PayPal, which emerged as an easier and faster way to send/receive money or make an online payment that, 5 years after its creation, was sold to eBay for 1.5 billion dollars, which well explains the impact it had in the financial world. Right now, PayPal has more than 420 million users and increasing revenues year after year (*Appendix 1*).

This whole phenomenon of change in the financial system seemed to be on the right track when we experienced a radical and global financial crisis in 2008 that came to stimulate technological innovation affecting the market in the coming years.

The period that proceeded the financial crisis was characterized by lack of confidence in banks, with some regulatory changes facilitating the emergence of new financial products and providers. One of them was Bitcoin, which, followed by so many other cryptocurrencies, ended up revolutionizing the perspective that most consumers had regarding the traditional monetary value of cash, by using blockchain technology. The truth is that, despite their notorious impact, these types of products won't be the main focus throughout this work.

This led us to a time where the impact of innovation began to be more and more prevalent and with the support of new technologies ushered in an era of open banking allowing third-party companies to access financial data.

To meet the different needs of consumers in this “new era”, innovative institutions have emerged, such as Neobanks, “fintech firms that offer apps, software and other technologies to streamline mobile and online banking”.

Some new tools such as Banking as a Service (BaaS) platforms have arisen, and financial institutions now have an easier way to avoid complication in legislation terms to create these Neobanks that improve the customer experience.

Considering these new tools that have arrived, we should be expecting that investment in FinTech's should be increasing. However, and explained by the recent pandemic we all experienced, Venture Capital Fintech investment dropped 6 billion dollars, the lowest funding value since 2019.

Even though, innovation and technology will continue to have a growing impact on this market, especially in an era where blockchain and open banking dominate.

The impact of Fintech on financial industry

Understanding the impact of fintech and its benefits requires an understanding of the theory of financial intermediation and the key role of intermediaries in the economic system.

The core function of intermediaries is to act as a conduit for the transfer of resources from deficit to surplus units. The financial market, belonging to the direct circuit, also participates in this function, which collects resources from surplus units and transfers them to those in direct deficit. The coupling of counterparties takes place directly, that is, the individual units in deficit or surplus seek their counterparts for the transfer of resources independently. Once the counterparty is found, a specific contract will be concluded for the type of financial instrument traded. The contract does not ensure that the creditor obtains the expected service, because the counterparty may be insolvent and not pay, in such a case the creditor should refer to the civil court and wait for the course of the judgment to obtain any reimbursement. The times of justice can be very long and for this reason the direct exchange of securities is considered risky and controversial.

In addition to the possible risk of insolvency, the individual retail investor should incur high transaction costs to find the most appropriate counterparty. Secondly, investors would need accurate counterparty information to determine the credit risk to which they are exposed. Such information is not available free of charge, the individual investor would have to turn to specialized agencies in order to obtain an accurate analysis on the own counterparty, also in this case it would be in contrast to particularly elevated transaction costs. These frictions could push surplus units to avoid exchange, due to too much uncertainty and too high cost, reducing the allocative efficiency of the financial market.

In this regard, the direct circuit is opposed to the indirect circuit, in which the financial intermediary has the task of intervening between the two economic entities, collecting resources from surplus units and lending them to those in deficit, and then invest them independently in the financial markets. Intermediaries effectively cancel transaction costs, taking advantage of the experience and large size, implement economies of scale, which involve reducing transaction costs as the size of the financial transaction increases. In fact, banks have the ability to

match more efficiently the various counterparties, as they manage to reduce the information asymmetries present in the markets, ensuring an efficient allocation of capital. Banks can reduce information asymmetry by performing activities such as delegated screening and monitoring. The first aims to reduce adverse selection, the second instead operates directly on moral hazard. The advantage of reducing transaction costs allows financial institutions to redistribute risk between entities. This redistribution allows the sale of financial instruments with different riskiness according to the risk adversity of the individual customer. In this regard, banks usually raise capital through deposits, usually short-term and with low risk, by reinvesting this capital in long-term assets, such as mortgages or loans, with a higher risk. It is precisely in this difference in risk between transactions such as deposits, on which the bank pays low interest rates and services such as loans, on which the bank requires higher rates, that it receives the main source of revenue.

New data analysis technologies can bring enormous benefits for banks in reducing adverse selection and moral hazard. Before looking at these benefits, let's look at what types of information banks currently use to estimate credit risk.

Traditional banks have some information about their customers, and they use it to determine their creditworthiness; this information is called hard information. This information follows a method of quantitative analysis, using data from balance sheets, guarantees given by the debtor, his income, and his employment. Hard information forms the basis of the screening process carried out by commercial banks, as it is the most reliable source for determining the counterparty's risk of insolvency. Banks, however, also rely on soft information, which is based on a qualitative analysis of the long-term relationship that the bank may have had with the counterparty, thus relying on the trust that the bank places in its customer. This type of information is widely used by cooperative banks, which, operating only in a specific local territory, have access to personal information, which allows them to better estimate credit risk, without having

to rely too much on quantitative analysis. The combination of this information allows the bank to formulate a credit rating that reflects the risk of default of the counterparty and consequently the exposure to credit risk that the bank would have in undertaking such an operation.

The importance of data

It is therefore clear that the more information the bank has, the better the estimate of the credit rating and the less exposure to credit risk. In this sense, innovations, based on big data analysis, have an extremely significant impact for banks. Big data are large volumes of data from multiple different sources: interactions on the Internet, information from social media, online sites, applications etc. The sources are potentially unlimited, and all this information flows into the databases of the companies that process and use them strategically. The banking sector has also started to acquire such information; however, banks mainly use structured data, which comes from internal sources: the bank's application, official social sites, its own website. This information is stored in the cloud, and used in addition to hard and soft, to profile their customers more efficiently.

The advantage that big data analysis can bring to banks is not only the analysis of information relevant for credit analysis. In fact, banks can use this information to keep up with their competitors, managing to better understand the needs of their customers. Big data, in fact, are widely used in the marketing area of banks, through this information you can trace the tastes and needs of customers, thus managing to provide a service that focuses on the needs of the end consumer. In addition, more efficient profiling allows the bank to obtain information about customer satisfaction with the services offered to it, so that it can quickly remedy possible malcontents. In practice, banks can take advantage of the analysis of large amounts of data, to get closer to the concept of 360° oriented enterprises towards their customers.

In addition to Big Data, an important role in financial innovation is played by machine learning, a type of AI that allows computers to learn independently, making them able to progressively improve their performance depending on the experience and data available to them. Fintech uses machine learning to implement algorithms, capable of learning for themselves, to traditional financial services. The potential of this innovation was experienced by Lenddo, a company founded in Singapore (*Appendix 2*) which cooperates with traditional intermediaries, especially in developing countries, providing an algorithm capable of estimating a credit rating based on unconventional information. This information comes from the analysis of data from social networks, the behavior of the individual on the Web, his research carried out, geolocation and other 12,000 alternative information, that the algorithm develops to estimate specific credit risk. The rating is then transmitted to the relevant intermediary who will use it as its own internal rating. The advantage for the banks would come from the possibility to extend the creditworthiness also to initially excluded subjects, without, however, incurring the risk of adverse selection. As already mentioned, Lenddo operates only in developing countries, where regulation is very permissive, it would not be possible to operate in the same way in the industrialized countries, since international regulation would prohibit the use of such an analysis.

A second application of technology to finance is to be found in the revolution that fintech has brought to traditional payment services.

The mobile wallet, for example, is a digital version of physical credit cards, loaded on an application, which allows, using the smartphone, to make payments connected directly with your bank deposit, without the need for its intermediation. This is possible thanks to the regulatory innovation brought by the PSD, which has introduced a concept of open banking, which requires the credit institution, if requested by the customer, access to the private account to third parties.

These entities are different from banks, but are well identified by regulation as *Third-Party Providers* (Appendix 3) where it's possible to find:

- **PISP (Payment Initiation Service Provider)** are authorized to carry out transactions using the customer's payment account, acting as a link between the payer and his online account. These services are provided through smartphones or tablets. Traders cannot in any way hold the funds of the account of the payer and cannot store his personal data, therefore, have only via functionality in the payment. PayPal, Google Pay or Apple Pay, are all external operators to the bank that play a role by way in economic transactions.
- **AISP (Account Information Services Provider)** offers customers the possibility to aggregate information about all their payment accounts, even if they are present on accounts of different banks. In this way the customer can have a complete information of the various accounts in his name. By doing so you will be able to manage your finances directly from a single smartphone app.
- **CISP (Card Issuer Service Providers)** are services to confirm the availability of funds, they are used in the scenario where payments are made with debit cards issued by a different operator than the one with which the account is held.

These new operators offer payment services by accessing the online account information of customers, to do so, banks must disclose the data through the Application Programming Interface (API): an interface that interacts directly with the service provider, transmitting account data from the bank's database to the applicant's database. In the area of payment systems, the PSD2 Directive has provided a strong stimulus for growth for fintech companies offering this type of service.

Moreover, by regulating them and making them safer, PSD2 has at the same time safeguarded the final consumer.

The PSD2

The PSD2 came into force on 13 January 2018 with an attempt to harmonize payment regulation and consumer protection across the EU (including the UK). Of particular interest in the 2015 version, which updates the original 2009 directive, is the strengthening of online data protections and attempts to promote market innovation through open banking principles. The issue of data is at the heart of the directive. Indeed, access to data is only available with the prior authorization of the customers themselves. In general, the key objectives of PSD2 are the integration and support of a more efficient EU payments market, as well as promoting competition in an environment where a new generation of paid products and services is emerging from innovative fintech companies. Regulators also predict that PSD2 will increase healthy competition in the industry by providing more transparency, security, quality of service and lower prices for customers. To promote competition, the Directive requires banks to grant third parties' access to their customers' accounts and payment services in a secure manner with the customer's consent. In this context, the API was considered the most reliable technology to facilitate secure access to customer accounts (it is not mentioned directly in PSD2) (*Appendix 4*).

As a result of this obligation, the regulatory framework outlined the functions and responsibilities of providers of three new services: the initiation of payment transactions (PISP), advice on customer account information (AISP), and ultimately the control of funds (CISP).

The introduction of PSD2 thus allows the entry of new operators deriving from Fintech, called in the Open Banking model as "Third Party Providers" (TPP) that is, authorized third parties that allow merchants to accept a wide variety of payments through a single channel/application to manage the entire process from beginning to end.

The first PISP provider is responsible for initiating a payment order from the payer's online payment account to a third beneficiary through a direct debit.

The second AISP operator, on the other hand, shows the user the aggregate information of one or more accounts held at other banks. The provision of this data is done through an online platform (usually it is a mobile app). The third service offered by the CIPS concerns the method of checking the availability of funds called fund checking. The CIPS informs the payee's bank of the availability of funds in the payer's bank. PSD2 has therefore brought new obligations but at the same time opportunities for banks, new entrants and especially for the end customer. Through the API, new entrants will be able to collaborate with traditional banks to create new products and services. In addition, there will be the concept of data monetization, resulting from the fact that customer information will be interchangeable, allowing banks and new entrants to use this data to improve their key processes.

The Application Programming Interference (API)

This technology has been used for years, in particular in the US, to enable personal financial management software, for presenting billing details on bank websites and connecting developers to payment networks such as Visa and MasterCard. To date, however, these links have been used primarily to share information rather than to transfer monetary balances. An API is a set of connection points that allows an application to interact with another system. Put simply, you can see this technology as a kind of waiter who takes the order from the customer and transfers it directly to the restaurant kitchen. As for the financial services sector, going back to the operation of the Open Banking model, the process of continuous exchange of information (mainly customer data) between different actors through the API is central, which plays an enabling role in ensuring that new technological actors can develop innovative products and services in a more effective and efficient way than a traditional bank alone can.

The API can be open, partner or closed. The first concerns interfaces based on public standards (publicly available data). The second is based on standards designed by strategic partners (data exchanged between B2B), while the last concerns interfaces for internal use of the bank.

The ability to expand the offer resulting from the combination of open banking through the use of APIs has pushed the creation of new innovative payment paths.

One example of this is the world of payments, particularly real-time payments (Faster Payment Service), which have grown a lot in the UK over the last decade. Figures show that since the launch of the Faster Payment Service (FPS) in 2008, its transaction volumes have increased significantly.

A PWC case study shows how an international financial services company with over four million customers, through the full launch of its API platform in 2017, has managed to achieve excellent results.

The company, using this technology, has managed to collaborate with third parties who have managed to create innovative solutions very interested as the real-time payment and a mobile banking¹² solution outside the region. Overall, the bank noted that its digital customers, deriving from mobile banking, recorded a return on equity (ROE) of eight percentage points higher than traditional customers (27% for digital versus 19% for traditional).

With digital customers, accounting for 39% of the total, the bank manages to generate a ROE of 9.7%.

However, if the proportion were to increase from 39% to 55%, the ROE could increase to 14%. In addition, digital customers generated twice the revenue of its traditional customers together with a lower cost to serve customers.

The collaboration with these companies has allowed the bank to attract digital customers, thus improving its results. In conclusion, thanks to the entry into force of the PSD2 legislation, banks were asked to show some features of online payment accounts to authorized third parties, as a

result, there has been a strong growth in the use of the most effective and efficient tool for the exchange of this information, namely the API.

As digital transformation continues, API technology is used not only in payment services but also in other traditional services such as loans (mortgages), investment products and services (including financial planning and management).

What should we expect from financial companies in the future

Considering all that was mentioned and the impact that technology had on the financial system, it is normal to try to understand what we can expect from these institutions in the near future.

The truth is that innovation is a more important part of every business, and the way technology is used brings strategic advantages to companies that transform it into useful tools for their business. Therefore, it will be important to note how banking institutions will use these new tools and how they will impact the growth of fintech's and especially Neobanks.

It will be exactly these topics that will be analyzed from now on so that we can understand if there will be an impactful change in the European financial system.

Diogo

How Fintechs are performing?

As mentioned before, Fintechs have established themselves in the financial system and are here to stay.

The growth seen in recent years proves that the natural trend towards greater demand for the services provided by these institutions is a reality but what can we conclude regarding the comparative advantages of Fintech companies (namely Neobanks) or about a possible greater appreciation in the upcoming years?

To be able to give an answer to these questions, there are two very important concepts to retain: the growing need to improve the customer experience and the phenomenon of social awareness regarding environmental sustainability that directs us towards a contactless world concerned with the ecological footprint in the planet.

Social and environmental awareness

Considering this awareness for social and environmental responsibilities, the concept of contactless payments (payment that prevents the consumer from having to insert the card or put a pin to be made, also called tap-and-go or tap-to-pay payment) that can be done in different ways:

- With a digital payment wallet
- Using a physical debit/credit card
- Making an in-app purchase or ordering online

Digital Payment Wallet

By registering a credit or debit card in these wallets which, after having access to all the necessary information, can be used to make payments via NFC, “a system that use near-field

communication (NFC) technology to exchange data between readers and payment devices." This system is widely used, especially for the security it demonstrates to have and the ability to encrypt and carry out checkouts very quickly. The connection that is made between the two devices for payment to be made is possible using radio waves similar to radio-frequency identification (RFID) labels. However, the payment is only confirmed, and the money withdrawn from the digital wallet after confirmation by the customer, which is usually done through face id or fingerprint unlocking, something that has only been made possible by the development of technologies that have only emerged in recent years.

To better understand the growth and impact that this new form of payment has had, it makes sense to note that the digital wallet payments market has quadrupled in the last 4 years, having totalized a value of around 56 billion dollars in 2021, according to GlobalData (*Appendix 5*).

This growth can be quite threatening for traditional banks, given that technology companies such as Google, Apple and even Samsung ended up providing technological tools that facilitate this whole process, improving the payment experience for the customer. Also in 2020, the investment bank JP Morgan cancelled the possibility of using its Chase Pay digital wallet, due to its inability to compete with other more advanced and logistically better-defined applications.

This gives us the perception that, if this contactless trend is here to stay, some traditional banks do not have the innate ability to react, and a possible solution would be to merge with a technological company or even a Neobank.

Use of physical debit/credit card

A few years ago, the appearance of debit/credit cards was seen as an innovative payment method that greatly facilitated the customer experience but when paying they would have to place the card inside the payment device and enter the PIN. However, nowadays contactless

payments using physical credit/debit cards are increasingly used, in which the customer only needs to swipe the card over the ATM device, something that was only possible with imminent technological advances.

In-app purchase or ordering online

Nowadays, it has become a fad to shop online. While a few years ago it was unthinkable to do any kind of shopping without leaving home, this is now a phenomenon on the rise. Sitting on our sofa, it is possible to use the websites and applications of our favorite stores to search, pay and receive, just a few days later, various types of products. This type of purchase is usually paid using contactless or alternative pick-up methods and the rise of fintech means that many of these payments are made using Neobanks, such as Revolut or N26.

According to a recent study, the number of contactless purchases is increasing, and consumers use this payment method mostly in grocery stores, pharmacies and retail stores.

That are a lot of reasons why this method usage is increasing but the main reason why this is happening is the fact that the shopping experience for the consumer is greatly improved. Firstly, it is much more convenient to use contactless payments than to pay with cash. Secondly, many people are afraid to walk around with a relatively large amount of money in their pockets and, therefore, do not need to do so. And finally, the pandemic that we have been experiencing recently has alerted us to social distancing and, using contactless options, we don't need to touch any device or any other surface to make a payment.

On the merchants' side there are also advantages, namely faster transactions and operational efficiency, as contactless payments can be processed 10 times faster than other types of payments.

Customer Experience

The second major point that was mentioned before to explain the growth of Neobanks is the need to improve the customer experience.

From a global perspective, all processes in a traditional bank are much more elaborate than in a Neobank, mainly due to the number of rules and legislation addressed to their business. From the first contact, it is clear that opening an account in these two different types of banks is quite different, as in a traditional bank the customer needs to go to the bank's office and provide a series of personal information to be able to have access to a banking account, while in a digital bank it is much easier to create an account without having to provide access to so much personal information, or going to a physical location to complete the process.

The truth is that a few years ago this could even be seen as an advantage for traditional banks, as they end up creating greater contact with the customer from the very beginning. However, and with the emergence of Gen Z and Millennials, customer needs have changed and, nowadays, there is a much greater appreciation of ease and convenience than of physical contact with the entity.

Modern banking allows Neobanks' customers to be much more agile, as they only need access to a smartphone or tablet and internet connection to be able to carry out various banking transactions in just a few clicks.

In addition, the initial costs are also much lower, with most Neobanks offering their customers a debit/credit card that can be managed and used from the corresponding application or website. Possible transactions offer a variety of options ranging from online payments to international transfers or even exchange rates (in some cases).

Therefore, it is possible to conclude that Neobanks offer a much more comfortable and personalized user experience to their customers, providing monthly overviews, organization and cost management applications, etc. and providing a service that is most often open 24/7 for

customer support, to solve specific problems that may eventually arise or doubts that the client may have.

Neobanks business model

With the phenomenon of digitization on the rise, there are already more than 400 Neobanks in the world. However, it is important to understand the profitability of these businesses, especially considering that they are based on a business model with very low costs for their clients, which leads to low margins per customer.

Although we know several giants in this market like Revolut, N26, Monzo, etc. there are several challenger banks that have not yet managed to find their space in the market and that are involved in problems with their investors.

After a period of growth and very high investment in marketing, these digital banks are being pressured by their investors to shift their focus from growth to sustainable unit economics.

The main problem is related to the basis of this business, which is an asset light ("asset light business model means that the company has little ownership of assets, i.e., only a small amount of fixed assets on the balance sheet") and low-cost business model.

In objective and mathematical terms, this problem is easily demonstrated. According to Accenture's Digital Banking Tracker, in the UK Fintech market, the average cost per customer for Neobanks goes from £26 to £65 compared to the £230 value for traditional banks. In this sense, it seems that Neobanks have a comparative advantage over brick-and-mortar banks, which, when analysing profit, it is clear that it does not exist.

According to the same study, it was concluded that the income per customer of a digital bank is around £12 while that of a traditional bank is £360, with most of this profit coming from lending.

In an objective perspective, it appears that Neobanks end up losing between 14 and 53 per

customer, something that is clearly not straightforward but that demonstrates this financial problem for challenger banks.

To better understand how the profitability of Neobanks is calculated, it should be noted that it is determined through the LTV/CAC ratio, and so the greater the LTV value (customer lifetime value) or the smaller the CAC value is (customer acquisition cost), the greater is the profit.

- LTV (customer lifetime value) - is the amount a customer is expected to spend in the company products/services during the lifetime of an average business relationship.
- CAC (customer acquisition cost) - measures on average how much a business spends to acquire a new customer.

On one hand, it is clear that for the ratio to be high, it was important for the customer lifetime value to be high, which turns out to be not possible, taking into account that most of the revenues per customer of the Neobanks come from the use fee of their very low debit/credit cards, which results in a very low LTV value.

On the other hand, the customer acquisition cost should be as low as possible so that the profitability ratio is higher, something that, compared to traditional banks, ends up happening. However, this value is quite high when compared to the revenue generated per customer. A few years ago, the CAC for Neobanks was lower, taking into account that several potential customers were quite disappointed with the services offered by brick-and-mortar banks, which, not having much competition, had a low investment in the development of their products and services. However, with the emergence of digital banks, this investment began to increase, which led to the creation of increasingly personalized applications and services, making consumers less predisposed to opt for Neobanks, naturally increasing the CAC.

The truth is that nowadays even the biggest Neobanks are struggling to convince their consumers to transfer their main bank account from a traditional bank to a digital bank, something that, according to a survey carried out by us, is primarily due to the false sense of

security that consumers feel in relation to digital banks.

However, it's important to note that regardless of if we are talking about a traditional bank or a digital one, if they have a banking license, then they must abide by the same regulations and requirements to keep that license. Nowadays, many financial institutions leverage machine learning and artificial intelligence in their processes, such as in KYC (Know Your Customer). As fraudsters get more sophisticated, technology to counteract it will inevitably emerge as well and this explain why the sense of security that customers feel is false.

This ended up forcing the largest Neobanks to create new sources of revenue, namely through the creation of paid subscriptions, earning commissions from referrals, handling out loans or even expanding their list of services to investment and savings products.

But how do Neobanks make money?

Neobanks' way of making money is quite different from that of traditional banks. While traditional banks take advantage of some fees paid by their customers, the main source of income for Neobanks comes from fees paid by merchants when a customer makes a purchase using one of their digital cards.

Another less significant source of income is the money generated through their customers' use of out-of-network ATMs.

Concluding the analysis to this problem regarding the profitability of the Neobanks business model, there are 3 main issues:

- The notorious lack of trust from customers - which turns out to be seen through the non-transfer by consumers of their main account to a Neobank account.
- The notorious growing digitalization of incumbent banks - recently, traditional banks have increased their investment in IT and in digital solutions for their customers and, although they are unable to compete with a digital bank in this regard, this gap is becoming increasingly smaller.

- The growth of some Big Tech (Apple, Samsung, Google, etc.) in the banking sector - this type of companies is providing more and more digital payment services, namely through the availability of digital debit/credit cards that offer some identical advantages as the Neobanks and often greater accessibility.

This could lead us to a point where we believe that the Neobanks' business is quite threatened in the future, but the truth is that there are notable advantages in the world of banking that all Neobanks manage to have, namely in digitization, which could lead Neobanks to reposition themselves in the market and take advantage of these strong characteristics to stop competing directly with traditional banks.

The future of Neobanks

I believe the growth of Neobanks (and Fintechs in general) is inevitable. Many Neobanks started with the mission of making banking easy and even enjoyable for the end user. Many promised users more autonomy, independence, and flexibility. No more waiting in line at a physical branch to perform transfers, get a credit or start a new savings plan. Everything was accessible from the mobile phone.

Ten years ago, this was considered a revolution. Although many users were longing for modernization in the banking sector, many were also concerned with the perceived lack of regulation and security surrounding these institutions.

However, many Neobanks acquire banking licenses at some point of their journey and are obliged to follow the same rules and regulations imposed on any other bank. As traditional banks try to manage their risk and keep up with the times, some acquire smaller Fintechs and/or invest in in-house innovation, creating their own mobile banking apps, complementing their physical branch offers with digital solutions. What used to be considered a luxury is now a basic service: real time banking from your phone. In a fast-moving world that worships convenience,

players who do not adapt will lose market share and popularity.

However, the Neobanks future success on an individual scheme will largely depend on their ability to create an artificial-intelligence-powered banking model that is totally focused on the consumer experience and that brings technological tools that will be unable to compete with the main players in the financial market.

Despite their current ability to offer improved digital services, this small advantage turns out not to be enough to dominate the market, given the ability of traditional banks and other players such as some Big Tech to respond to these technological bumps that ultimately lead customers to continue to opt for other competitors when placing their primary bank account.

The real challenge for Neobanks then is to understand how they can use this comparative advantage to increase their market share and get closer to their customers.

Technological advances and in particular artificial intelligence could help Neobanks to deepen relationships with their customers, for example through the creation of mechanisms to perceive the needs that are not yet satisfied, systems of big data management to provide even more personalized products or even enhancing cross selling.

These technological mechanisms could also help challenger banks to solve the financial problem related to their profitability by maximizing customer lifetime value or even drastically lowering costs through greater automation.

According to a McKinsey study there were seven reasons that explained why some Neobanks showed themselves as successful players in the market:

- Launching products at high velocity
- Focusing on customer engagement
- Hyper-personalizing experiences and propositions
- Adopt conversational design
- Integrating open-banking features seamlessly

- Leveraging partner ecosystems to scale
- Using customer-lifetime-value (LTV) to guide actions
- Engagement layer
- AI-and-analytics-led decisioning layers
- Core technology and data layer
- Operating-model layer

Launch of product at high velocity

Through the rapid launch of products and services that serve the needs of its customers.

Focus on the customer engagement

Ongoing quest to understand how they can create a better digital connection with their customers, namely through the launch of "save and earn more", "get better deals" and many other campaigns. Also, the customer support that is live 24/7 in many cases is a way to have a better customer engagement.

Hyper-personalizing experiences and propositions

One of the foundations of Neobanks' business is the customization of the products and services it offers. Using artificial intelligence mechanisms, they are able to understand the context and historical behaviour of their customers, which makes the direction of this industry towards a maximum level of personalization, characterized by unique and distinct experiences for each customer.

Adoption of conversational design

Most Neobanks use chatbots to handle queries placed by customers. However, recently some

of them have been using AI mechanisms "replacing forms and questionnaires with conversational design in the form of chatbots, voice assistants, and live video consultations".

Integration of open-banking features seamlessly

While several banks are providing services that facilitate open banking, Neobanks end up having a competitive advantage by providing an open banking platform from the beginning, which allows them to have a broader ecosystem of open banking, facilitating the offer of better products and services.

Leverage of partner ecosystems to scale

Winning Neobanks have realized the importance that the connection with social networks, digital commerce and lifestyle brands has in acquiring new consumers.

In this way, it becomes crucial that these partnerships are carried out so that the emergence and growth of these challenger banks is even more noticed by potential customers.

Use of customer-lifetime-value (LTV) to guide actions

The way successful Neobanks measure the profitability of their business (LTV/CAC mentioned above) facilitates the planning and operationalization of their business to take more impactful and tailored actions in a short time.

In this way, it will be crucial how Neobanks use the technological advantage they hold and how they implement artificial intelligence mechanisms in their business, and these factors mentioned above could be key to the sustainability and growth of this digital business that would have the structure illustrated in *Appendix 6 (Structure of the AI – digital bank of the future)*.

Engagement layer

Considering the context of current digital development in the financial market, it is very important for Neobanks to be able to create experiences that meet the needs of their clients. The engagement layer needs to deliver personalized, targeted, and low-latency experiences for the customers.

Secondly, these products and service provided by the Neobanks should be not only available but exactly in the place where the customers need them to be, meaning that Neobanks should take care of their ecosystems, making the right partners to provide the best possible customer experience for their clients.

Lastly, challenger banks need to create product innovation mechanisms that allow them to discover their customer's needs that have not yet been explored. This could also make the introduction of innovative products flexible, suggesting personalized offers in real time and recommendations to the customer.

AI-and-analytics-led decisioning layers

Considering the creation and development of machine learning models, access to data about your customers will be key. For that, Neobanks should create pipelines and aggregate customers' data namely transaction data, clickstream data or even multi-platform partnership data, keeping them together in a platform that allows the bank to have an overview of all its customers providing a sense of the interaction between the customer and the product/service that is provided.

Next, models should be created and deployed so that Neobanks are able to test and iterate quickly in live production UATs (test environments).

Core technology and data layer

Considering the hyper-customization of their products and services, Neobanks are required to have modern technology and a data core, increasing investment in creating new cloud tools, data, or API.

Their focus should be to develop a highly configurable, flexible, cloud-based banking core that will help engineering teams launch new product variants quickly through easy configurations, using cloud-based infrastructure as their main core.

This must scale efficiently, allow for high reusability to reduce time-to-market for new features and overall cost for the development of new products.

Operating-model layer

The final and crucial layer to the success of Neobanks is their ability to attract talent and organize teams so that they can achieve their goals. Considering the growth of these organizations, it is very important to incorporate an ambitious vision and culture and to attract talents that have those same visions, not only with critical banking skills but also experts in other areas of IT such as IT architects and engineers and business analysts. These teams also must be well interconnected so that the common objective is fulfilled and so that the banking and IT departments are complementary rather than acting individually. Finally, the organization's culture must promote innovation without breaking with regulatory and compliance standards.

Conclusion

Considering all the weaknesses mentioned and the comparative advantages that challenger banks have, I think that in a future that will be increasingly digital and where the Customer Experience will be increasingly valued, these institutions will have growing importance and,

by using optimized technological tools, they can overcome some of these fragilities namely in terms of security and transmission of information/customer interaction.

Group Part – Conclusion – Valentina and Diogo

Survey Results

To have a better understanding of the customer perspective, we share the data collected through a survey where we decided to target young people living in Europe aged between 18 and 30.

In particular, we first identified who is resident in Europe and then we identified three interest groups in terms of age:

- 18-21
- 22-26
- 27-30

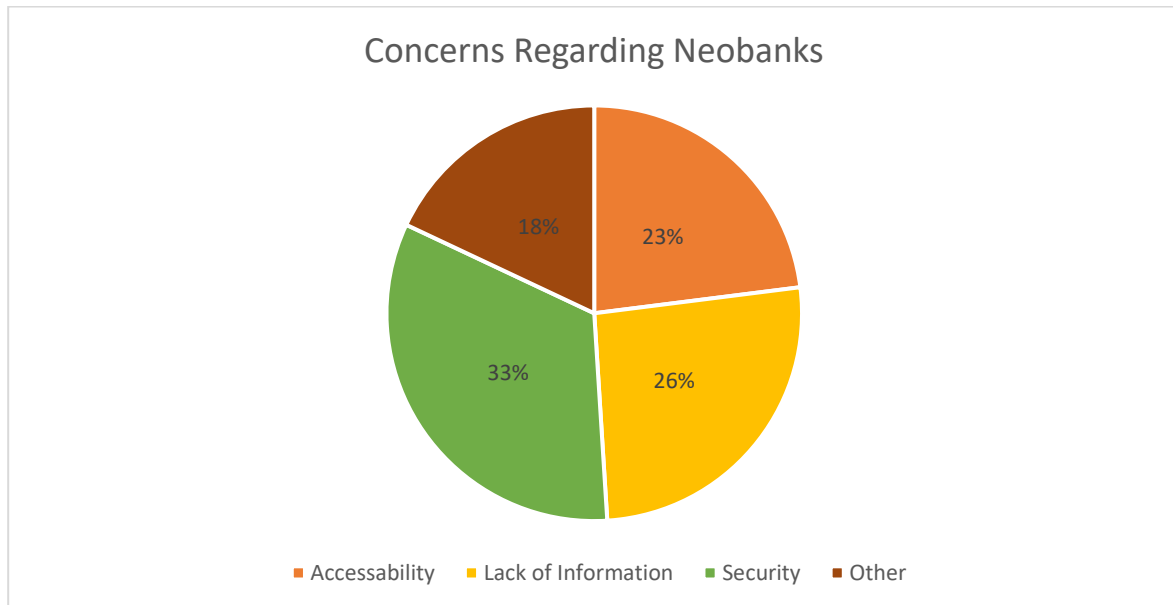
Considering the content of the critical analysis that we intended to carry out, the topics that were mentioned in the survey were based on the use frequency of financial institutions that were already the target of exploration throughout the thesis (Incumbent banks and Neobanks) and on the perception of the reasons that explain why the voters did not prefer the use of digital banks (since almost all of them grew up in a digital age and so it would be more predictable that they would be more inclined towards this type of services).

What has emerged from our research is that out of 189 people who voted, there are 170 people living in Europe, and that's why, considering that our target is focused on European residents, we have 170 answers to analyze.

Of these 170, we noticed that more than 90% are aged between 18 and 26 years old and so most of them belong to the "Gen Z", the age group most affected by the digitization phenomenon. Furthermore, it emerged that of these 170 people, nearly 92% are active users of credit cards. Considering the 127 users who preferred to use traditional banks' services over Neobanks', 121 voters specified that there are three main reasons why they do not prefer Neobanks over traditional banks: accessibility, lack of information and security concerns.

In particular:

- 33% consider security concerns as the main reason
- 26% consider that the main concern is related with the lack of information available
- 23% consider that the main concern is the accessibility of Neobanks



Graph "Concerns Regarding Neobanks"

What to expect from these institutions

Bearing in mind the analysis carried out previously throughout the work, there are two clearly obvious points that we can conclude:

- The future sustainability of the traditional banking business in a world increasingly dominated by digitalization is in danger, mainly due to the appearance of new players in the market that dominate digital art.
- There are some problems directly related to the financial sphere of the Neobanks, namely the inability to present profitability per customer that could keep these companies financially healthy and capable of facing the extreme financial security that incumbent banks have.

Therefore, we perceive that, with space for both institutions in the market, there are comparative advantages that one of them presents in relation to the other.

- Traditional banks tend to be more sought after for large transactions and for international transfers of great importance, especially given the false sense of greater security that consumers feel in these institutions, since, as seen previously, there are also regulations and legislation from the European Central Bank that some certified Neobanks need to comply, so they provide security for their customers. In addition, there are more and more key tools that challenger banks have in their possession that end up reducing all the risks inherent to their use by customers. For example, Regulatory Technology (also known as RegTech) is a new instrument that ensures that consumers, DevOps Teams (developers and IT operators responsible for the software improvement and deployment) and administrators act in compliance with the protocols and follow the European financial laws. However, we believe that this will be an advantage that, despite being somewhat mitigated, will never cease to exist, considering the way customers look at financial institutions nowadays.
- Neobanks are used more by younger generations who end up being more affected by new tools and the use of innovative payment methods. Thus, when shopping online or even making small/medium physical payments, they end up preferring to use these institutions that facilitate the contactless future, even because some of these challenger banks have certain advantages, such as the case of cash back option in certain stores with which the Neobank has partnership.

In this way, we realized that, from the consumer's perspective, there would be a world of perfect payments in which both institutions would coexist, connected between them. Thus, the sense of security felt by the proximity of the incumbent banks to the European central bank would eventually prevail and would be combined with technological tools made available by the

Neobanks that would make this partnership a win-win situation. The truth is that, in our opinion, this would not only be a perfect world for consumers, but it is also a reality that is getting closer and closer, and it will be in this direction that we will be moving from now on.

According to *The Economic Times*, “traditional banks are using Neobanks to reach out to tech-savvy customers” which means that partnerships between them are starting to take form.

The movement of the market, perfectly coordinated with the digitalization of services, will oblige incumbent banks to provide increasingly optimized tools.

Thus, with the help of Neobanks, cooperation departments could be created and developed in which institutions would support and complement each other. These partnerships would not only have an evident and visible effect for consumers but could also enable a lot of tools and features for both institutions that would profoundly improve the way they operate and expose themselves in the market.

The European market, typically quite conservative, may also be trying to understand what are the effects of partnerships that are being carried out in other markets to conclude whether such partnerships are, in fact, advantageous for the European financial system.

Thus, to conclude the idea that this is the direction of the financial future, we would like to reinforce the need to analyze, in particular, the results of the cooperation carried out between the Bank of Maharashtra (Indian institution) with the National Payments Corporation of India (non-financial institution) to facilitate fintech engagement and meet customers digital payments changing needs.

Although this is not a partnership between a traditional bank and a Neobanks, it ends up showing whether this type of agreement and mutual help will be advantageous for these organizations. Another tool that would have been very useful for us to test the possible results of our future prediction would be to carry out a survey to understand what the expectations of consumers regarding the creation of tools and departments totally focused and specialized in

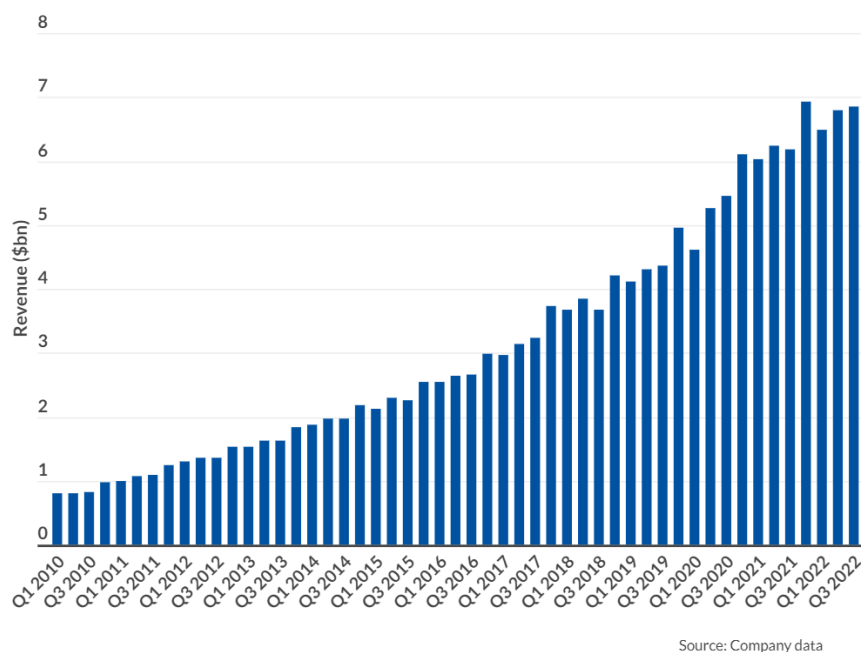
improving the digital features of traditional banks (an area that would affect Neobanks professionals) would be and whether this would end up being well accepted by users namely in the digital payments market.

As time is scarce and, despite not having been enough to carry out this type of survey, considering the research and analysis we carried out, we conclude that this will certainly be the path taken by the European financial system and that, therefore, we can expect an increasingly secure and digital financial world.

APPENDIX

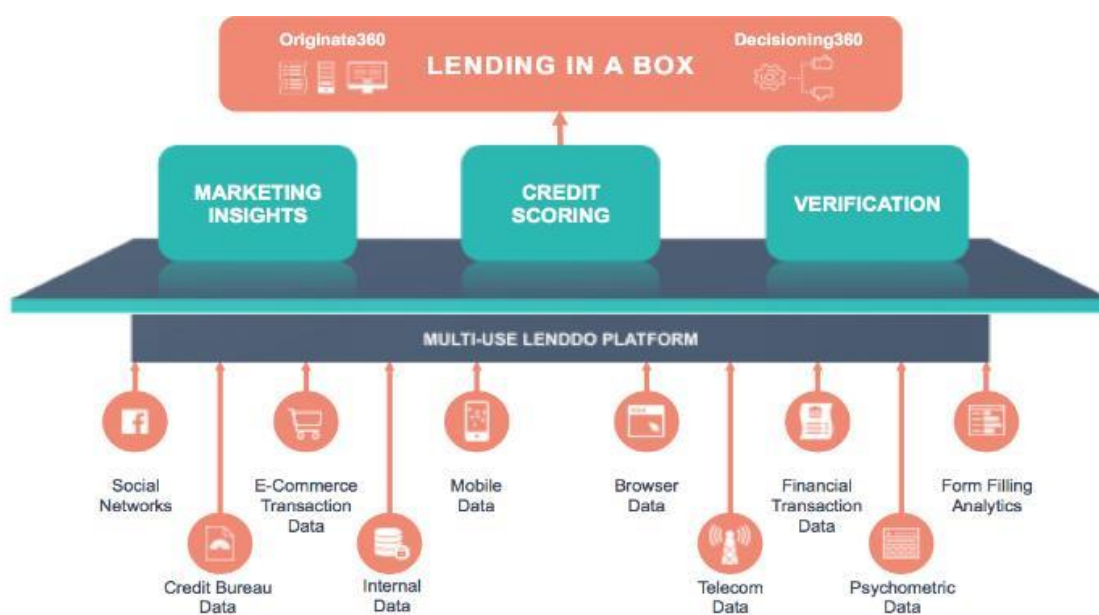
Group Part – Valentina and Diogo

Appendix 1



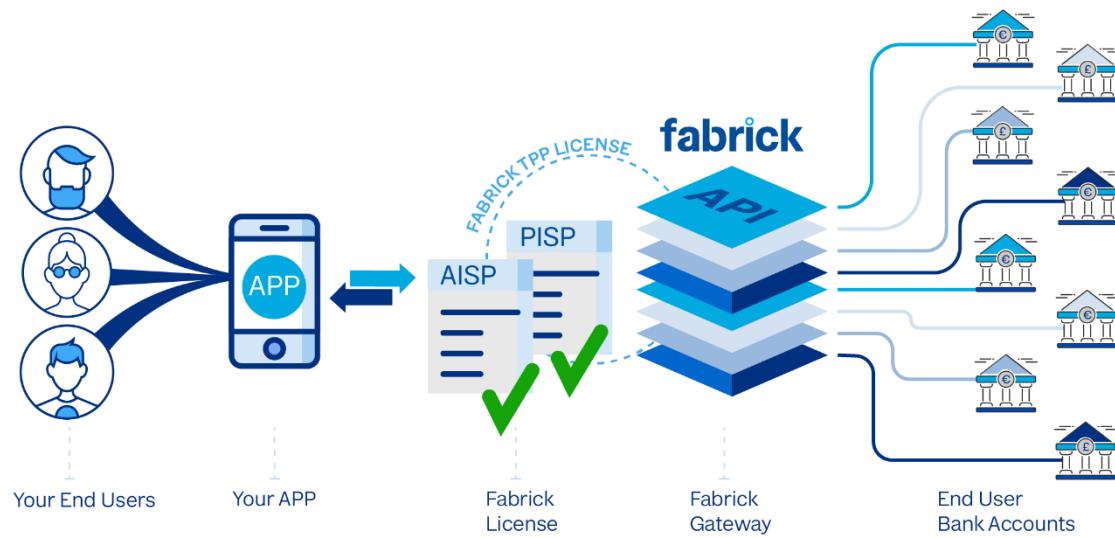
PayPal quarterly revenue 2010 to 2022 (\$bn)

Appendix 2



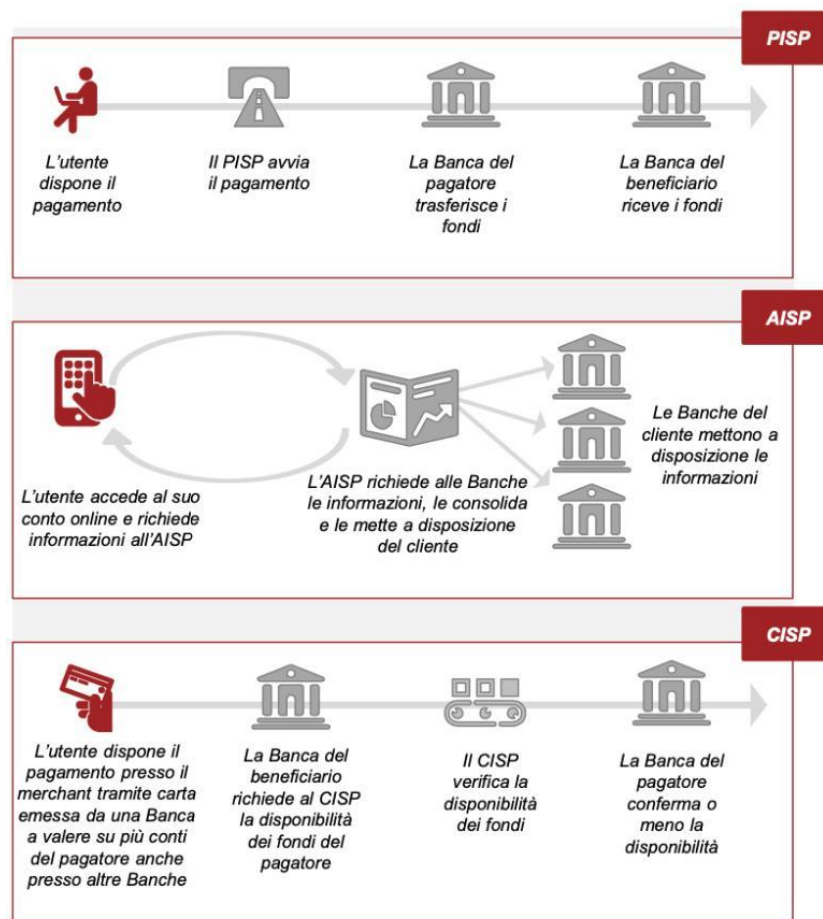
Lenddo Suite of products and services

Appendix 3



Third-Party Providers: AISP, PISP, API framework

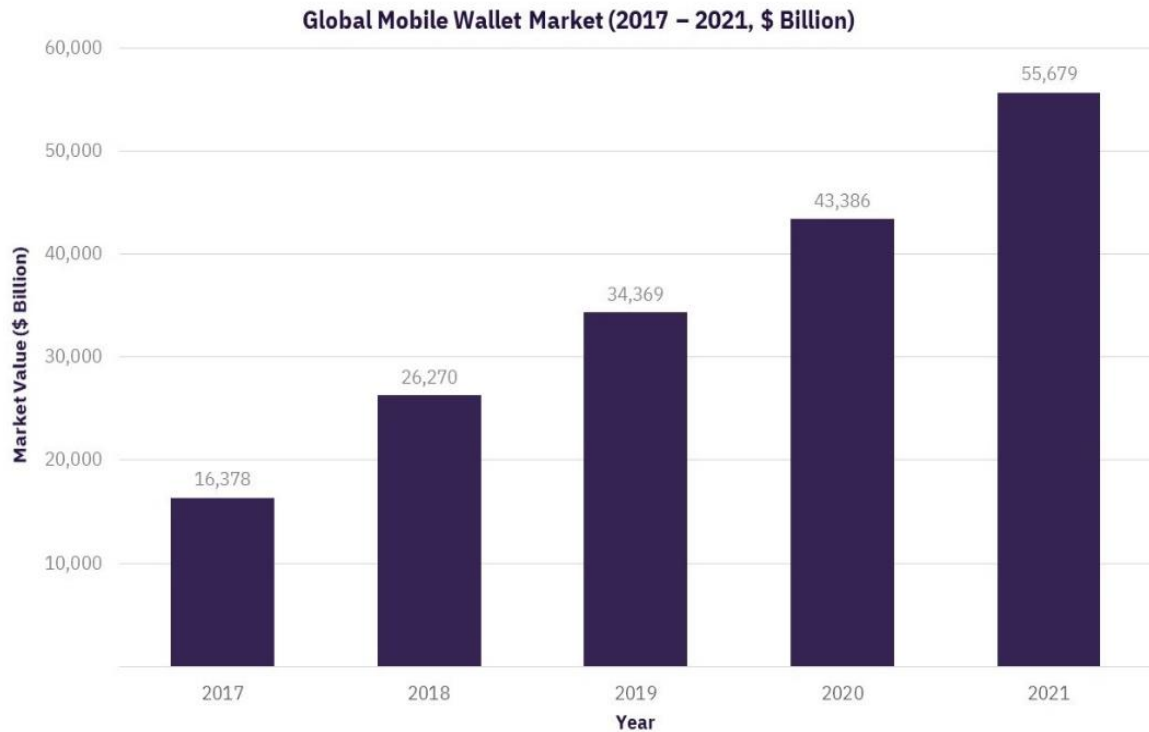
Appendix 4



PSD2: new users

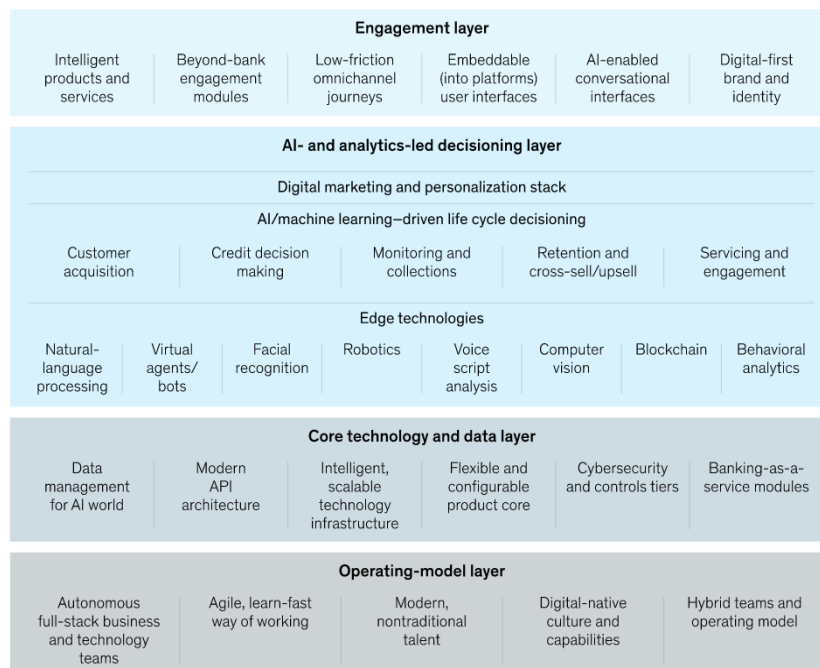
Diogo

Appendix 5



Global Digital Wallet Market since (2017-2021, \$Billion)

Appendix 6



Structure of the AI – digital bank of the future

Appendix 7

Interview with Ana Paula Miranda, Product Manager at Klar and ex-Banking Operations Analyst at N26

Q: One of the main concerns regarding Neobanks usage is the lack of security that consumers see on their business process. Is this just a myth or, in fact, traditional banks can offer more security to the consumers by having a lot of institutional standards and rules with the European Central Bank?

A: Lack of security does not need to be a concern if the Neobank has a banking license. According to the European Central Bank: “Only robust banks which comply with all legal requirements can get a license. The same process and criteria apply to all banks – those with more traditional business models as well as those whose business models are based on technological innovation.” Banks (both traditional and Neobanks) who fail to keep up with the established requirements risk losing their banking license, which would have severe reputational and financial implications, so consumers can at least rest assured that regulatory and supervising authorities will keep their watch. Not all Neobanks hold a banking license though. Some hold other licenses with fewer requirements and consequently cannot offer as many products/ services as a fully licensed bank. However, they should still be under supervision of a regulatory body. When in doubt, the user should check the respective Central Bank or banking regulatory/ supervision body to see which type of license has been awarded to the Neobank in question. Nowadays there are several fully licensed Neobanks with great digital solutions. There is no need to compromise security or convenience.

Q: How do innovation and technology help Neobanks and other fintech companies reach more and more success namely in the financial payment services industry?

A: Technology and innovation improve user experience, which, in my opinion, will be the differentiating factor among different competitors with the same type of license and technological capabilities. More and more banks will need to invest in user research and product design to increase their market share.

Q: Something that has always been seen by consumers (namely Millennials and Gen Z) as a strength of Neobanks was the accessibility and facility of making digital payments. With traditional banks moving to a more digital world since most of them already have their own application where digital payments can be done in a click, could we conclude that Neobanks are losing their best strategic advantage?

A: Neobanks were a revolutionary concept several years ago. Nowadays there are many competitors in the market and traditional banks have joined the race. Payments are just one aspect of the banking experience. Users want to oversee their finances. In my opinion, the fully licensed banks who will thrive are the ones who invest more in user experience (UX) and come up with innovative solutions, regardless of their origins as traditional or Neobanks. Innovation in the banking industry will be faster and faster and many banks bet on agile methodologies to experiment and iterate their features according to user feedback. Below are a couple of examples that might be differentiating factors today (but might be the industry standard very soon):

- Users want to know how much they save and spend. Excel spreadsheets are old school and users want to have the data at the tip of their fingerprints. Some Neobanks offer spending

statistics to their users where they can check detailed breakdowns of their spending per category for different time periods.

- Enjoy flexibility. In the past, users had several banking accounts for different purposes. One for savings, one for current expenses, one with the bank who offered them a mortgage, etc. Nowadays, some banks offer sub accounts. The user can set sub accounts according to their needs. Maybe one sub account to save for their next holiday, another sub account to save for their first home, another sub account for current expenses. The same bank can offer them credit and saving options in the same app. Many banks use Payment Service Providers and many banks might even use the same PSP. When technology is open to all competitors, what will differentiate them, in my opinion, is the user experience.

SOURCES

Group Part – Valentina and Diogo

CheBanca!(2022). Operatori Terzi: chi sono e quali servizi offrono? CheBanca! Retrieved December 4, 2022, from <https://www.chebanca.it/public/footer/psd2/operatori-terzi>

Fabrik Insights (2022). “Terze Parti: le Third-Party Providers, chi sono e cosa possono fare con la PSD2”. Fabrik. Retrieved December 4, 2022, from <https://www.fabrik.com/it/terze-parti-le-third-party-providers-chi-sono-e-cosa-possono-fare-con-la-psd2>

KPMG. “Digital Banking. L'evoluzione Delle Aspettative Dei Clienti Tra Rivoluzione Digitale, Sfide Regolamentari e Nuovi Competitor.” KPMG, 2018.

Mogini, David. “Open Banking e API Economy. La Banca Del Futuro.” Deloitte , 2019.

PwC. “Robotic Process Automation nel Back-Office”. PwC, 2018

PwC. “The future of banking is Open”. PwC, 2018

PwC. “Specialty Finance Challenger Banks in Italy” PwC, 2019

PayPal Revenue and Usage Statistics (2022). Business of Apps. (2022, September 6). Retrieved December 4, 2022, from <https://www.businessofapps.com/data/paypal-statistics/>

Scott. (2020, October 12). Fintech: The history and future of Financial Technology. The Payments Association. Retrieved December 4, 2022, from <https://thepaymentsassociation.org/article/fintech-the-history-and-future-of-financial-technology/>

Walden, S. (2022, March 24). What is a Neobank? Forbes. Retrieved December 4, 2022, from <https://www.forbes.com/advisor/banking/what-is-a-neobank/>

Diogo

- Bhattacharjee, A., Chung, V., Singh, S., & Thomas, R. (2022, December 3). Building a winning AI neobank. McKinsey & Company. Retrieved December 4, 2022, from <https://www.mckinsey.com/industries/financial-services/our-insights/building-a-winning-ai-neobank>
- Industry Today. (2021, October 7). The shift to a contactless world. Industry Today. Retrieved December 4, 2022, from <https://industrytoday.com/the-shift-to-a-contactless-world/>
- Intelligence, I. (2022, January 10). Neobanks: Explained + list of top neobanks in 2022. Insider Intelligence. Retrieved December 4, 2022, from <https://www.insiderintelligence.com/insights/neobanks-explained-list/>
- IT Insight. (n.d.). As tendências do Fintech Nos próximos anos. IT Insight. Retrieved December 4, 2022, from <https://www.itinsight.pt/news/insight/as-tendencias-do-fintech-nos-proximos-anos>
- NFC payments: Everything you need to know about contactless payments. (n.d.). Retrieved December 4, 2022, from <https://fitsmallbusiness.com/nfc-payments/>
- Plc, G. D. (n.d.). Growth of Mobile wallets. GlobalData. Retrieved December 4, 2022, from <https://www.globaldata.com/data-insights/financial-services/growth-of-mobile-wallets/>