

Open Banking As A New Approach: A Model Proposal For Turkey

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Abstract

Open banking involves banks sharing customer information with third-party service providers with the customer's permission, allowing these companies to offer new products and services. Banks provide the necessary infrastructure using Application Programming Interface (API) for approved transactions and transmit the permitted information to service providers. This comprehensive approach allows customer financial data to be processed and processed in one place. Financial technology organizations, also known as service providers, also participate in the service process between banks and consumers.

Open banking applications have begun to emerge in the field of payment systems and the importance of the need for security and uniformity has become evident. Legal codes and standards have been established in countries such as the United Kingdom, the European Union and Australia to promote competition in the banking sector and provide beneficial goods and services to customers. The number of applications submitted since the entry into force of the Payment Systems Directive (PSD) 1 and 2 has increased significantly, especially among EU member states.

In the study, first of all, the historical development of the open banking concept within the banking sector is explained and its development in the world and in Turkey is compared. Finally, a bank model that will serve in Turkey has been proposed based on services abroad. The bank model is designed to target credits, treasury, banking operations and payment systems and accounting department.

Keywords: API; banking history; fintech; PSD; open banking.

INTRODUCTION

A digital and interconnected universe that has become more intertwined with economic activities over the last decade. The renowned 'marketplace' is no longer a physical location, but rather an activity that permeates digital lives. People's ability to comprehend the nature of their online economic transactions is undermining the foundations of a free market economy as technology becomes more pervasive. The combination of digital technology and business presents new information asymmetries. The global economy is enduring a profound digital transformation, and the rate of change is accelerating.

Numerous new internet-based businesses rely on consumers' 'consent' to share personal data (including online behavioral profiles and demographic information) as part of the purchasing process. This type of 'surveillance capitalism' is gaining more and more attention. Professor Shoshana Zuboff stated, "In the early years of the twenty-first century, Google became ground zero for an entirely new subspecies of capitalism in which profits were derived from the unilateral surveillance and modification of human behavior." He also stated, "Without internet access and knowledge, it is nearly impossible to conceive of effective social participation in employment, education, and health care."

1.1. Developments in the Banking Industry and the Concept of Open Banking

The banking industry is not immune to the effects of information digitization and the social data dynamics that result from it. But acceptance and spread of technology don't happen at the similar rate in all businesses (Milne, 2006). The banking sector is highly regulated by the government, and a license is required to provide financial services. This makes it more difficult for new firms to enter the sector and protects banks from outside competition (Gozman and Currie, 2014). In the past, banks were less likely to experiment with novel concepts because they posed less of a danger to the market. In addition, consumers frequently have limited swapping options and must pay a premium for them. (Beerli et al., 2004) Therefore, banks prioritize customer relationship management (CRM) over novel product and service concepts.

The 2008 financial crisis led a lot of people to lose trust in traditional banks, so people started looking for alternatives (Vives, 2019). Companies that focus on financial technology (fintech) have started to offer new services, such as mobile payments and deals with cryptocurrencies (Constine, 2017). After Industry 4.0, the usually slow-moving

banking sector sped up a lot and gradually caught on to the digital trend. "Challenging banks" are a new type of bank that has grown out of changes in technology and changes in what people want from their banks. As the name suggests, they have used new digital technologies to compete with established institutions and offer more value to their customers (Bataev and Rodaenov, 2020).

Open banking is a technology-enabled approach to financial services makes use of aggregated, authenticated data that is accessible via APIs to provide customers more ways to access their financial data and increase transaction security (Hoppe & Duffy, n.d.). In the context of banking, "open banking" refers to the practice of making customer banking, transaction, and other financial data available to third-party financial service providers via application programming interface (API) access from banks and non-bank financial organizations. Through open banking, customers, banks, and ancillary service providers can share information about their banking relationships with one another. It is widely agreed that open banking will revolutionize the financial services sector (Chappelow, 2020). Customers gain from open banking because it encourages innovation, increases competition among financial institutions, and creates new markets in which consumers may shop for financial services. However, it also raises concerns about regulation and data privacy, which helps to explain why different global markets adopt different approaches to governance and make different amounts of development (McKinsey, 2020). The banking sector has strict standards governing the importance of trust. Because customers have faith in banks and give those institutions their hard-earned cash. This is why financial institutions have opened up their services through exclusive channels. But the rise of digitization, the development of security technology, and the increased demands of bank clients have compelled the use of other platforms to gain access to banking services. There are times when customers would rather use a mobile device or loyalty app to do banking transactions. These customers could have more than one bank account and like to monitor and manage everything from a centralized location. With customer permission and a robust security perimeter, banks can share customer data and basic banking apps with other platforms (Okay, 2019).

1.2. Open Banking in Europe

In light of all this technological development and change, the EU is actively pushing for more digitalization by putting in place policies that both make technological change possible and keep it under control. The EU says that the European Digital Economy is the future of the European economy (EC, 2015). It says this in its complete EU Single Digital Market plan. The whole economy is becoming more financialized at the same time that it is becoming more computerized. This is called "the increasing role of financial incentives, financial markets, financial actors, and financial institutions in the functioning of national and international economies" (Epstein, 2005). As the financial sector becomes more important to the economy, people are more likely to use digital versions of the services it offers in their daily lives. So, the way the two processes are made and how they work are linked and closely related. Application programming interfaces (APIs), block chain, data analytics, and smart devices will drive the next generation of banking services. In light of the increasing interconnectedness of the global community, financial institutions are actively seeking novel avenues to capitalize on these developments. Concurrently, emerging technological advancements are fundamentally transforming the manner in which engage with financial transactions. This is especially clear in the highly digitalized Scandinavian countries, where people are buying digital services quickly and using them more. For example, more than 80% of people in Sweden, Norway, and Denmark use mobile payments, even though the first mobile payment apps were launched more than a decade years ago by institutions (Deloitte, 2018). These developments are not limited to payment services; they impact the entire financial services value chain, transforming employment, skills, and organizations (Mühleisen, 2018). The connections between financialization and digitalization have not escaped the notice of EU regulators, whose latest Payment Services Directive II (PSD2) aims to promote competition and innovation in the financial services industry. This directive is central to the most recent chapter of the EU's digitalization of financial services: Open Banking. As a concept, Open Banking has been utilized primarily by practitioners and "...represents a shift from an old regime of corporate transparency to greater openness and transparency" (Gozman et al., 2018). Open banking enables retail customers and small businesses to share their data securely with other banks and third parties, compare products based on their requirements, and administer their accounts without ownership using institutions" (Deloitte, 2017).

Therefore, open banking can be understood both as a structural shift in the institutions of the financial services sector and as the mechanisms that bring about this shift.

In addition, the outlook for the European banking sector has changed with the implementation of the revised PSD2 in 2018 (Noctor, 2018). By enacting PSD2, banks were required to share consumer data with independent fintech firms. The availability of data has spurred financial innovation and allowed fintech companies to provide integrated financial services to their customers (Brodsky and Oakes, 2017). Before PSD2, banks were hesitant to exchange customer data for fear of security breaches and because no one bank stood to gain from the introduction of this service (He et al., 2020). This deal sped up the development of open banking. Open banking as a cooperative approach in which financial data is exchanged through APIs. APIs are widely used in software technologies to facilitate data flow both inside and outside of their governing organization. APIs allow third-party providers (TPPs) to access a bank's data, which might lead to the creation of innovative service models. Because of their improved digital agility and data-intensive usage, fintech organizations may create new value propositions. Many challenges have arisen for the banking sector as a direct result of open banking. A bank's main concern may be intermediation as TPPs gain more customers and develop their own platforms, and as a result, customers may soon no longer need to use online banking services provided by banks (Gozman et al., 2018). It is anticipated that the banking business will evolve as a result of external forces including cybersecurity threats (Mansfield, 2016) and intense rivalry (He et al., 2020). Because of fintech's rapid growth, the conventional banking system is under increasing pressure to change. Existing and potential competitors in the banking industry might benefit from exploring new avenues of growth.

Even though the foundations and guiding developments of open banking have emerged in the European Union, the world's financial services are undergoing significant transformations. In many nations, open banking research is ongoing or open banking regulations are planned for the near future. There are differences in the emergence and implementation of open banking regulations across nations. These differences are the result of country-specific decisions regarding issues such as which actors are governed by the open banking regime, how standards are determined and which institutions are responsible for governance, which sectors are covered by open banking regulations, who is responsible

for funding and timeliness, and what security mechanisms are in place. Open banking regulations and practices may emerge in response to market demands, or they may be initiated by national regulatory bodies in an effort to foster a culture of innovation and boost competition. Regulatory agencies can be mobilized by the process triggered by the demands and market requirements of financial technology companies. From this perspective, competition institutions, central monetary authorities, or industry associations may be in charge of open banking's orientation and management processes. The scope of open banking regimes may also vary.

1.3. Open Banking in Turkey

Regulations pertaining to open banking in Turkey consist primarily of regulations within the scope of harmonization to be carried out over the course of the next few years in tandem with studies conducted in the European Union. The Law No. 6493 on Payment and Securities Settlement Systems, Payment Services, and Electronic Money Institutions went into effect in 2013 to comply with the PSD1 regulation published in 2007. Numerous mechanisms related to payment systems services were defined and included in the law for the first time. By amending the Law No. 6493 with the 2019 Law No. 7192 on the Amendment of the Law on Payment and Securities Settlement Systems, Payment Services, and Electronic Money Institutions, the responsibilities of the The Banking Supervision and Regulation Agency (BSRA) in the field of payments were transferred to the CBRT. Consequently, the CBRT was designated as the solitary regulatory body.

The Open banking movement in the financial services industry is profoundly altering how industry organizations store, process, and monetizes consumer data, and is accompanied by the larger digitalization trend. As financial services become more and more digital in nature, customer data becomes more crucial. According to studies, the financial services industry is the second most analytical industry, after the technology sector (Davenport and Harris, 2017). Given the intrinsic significance of data in the finance industry, a radical change in the way data is handled, such as open banking, could have a significant effect on organizations in the sector. This is especially true for incumbent banks that can monetize consumer data without the traditional obligation to share the data with third-party competitors. This is currently changing, but the effect of open banking on the organizational models of established institutions is a fascinating and timely topic.

The importance of the open data economy in modern life has grown along with the development of digital technologies. However, this type of exposure is usually seen as risky from the standpoint of a bank, thus more attention should be paid to supervision, regulation, and risk management (Brodsky and Oakes, 2017). In the past (He et al., 2020), only authorized bank personnel had access to customers' financial records. In light of "privacy as a fundamental human right" (Goddard, 2017) and the General Data Protection Regulation's (GDPR) 2016 release, customers are now the exclusive owners of their data. Because of the GDPR, companies have revised their privacy policies. Another major regulatory force is the amended Payment Services Directive (PSD2). It standardized the nuances of data ownership, especially in the financial sector, and made it possible for customers to willingly exchange their banking information with other TTPs using APIs (Brodsky and Oakes, 2017).

1.4. Possible Effects of Open Banking

The use of digital technology is also fundamental to open banking. The financial sector has long been a veteran of the digital age. To better serve their clients, banks have begun offering digital versions of previously in-person services, such as account verification online (Zachariadis and Ozcan, 2017). A change in service or business model may be necessary due to the complexity introduced by digitization, which is the process of turning analog information into a digital format that a computer can store, read, and send (Bloomberg, 2018). The technology that aids digitization has several facets, but APIs are often regarded as having the largest influence on open banking (McKinsey, 2014). To avoid learning the provider's complete system, an API can serve as a "link" between two computers (Jacobson and Woods, 2012).

Bodle (2011) argues for API systems to be both interoperable and modular. These two characteristics can reduce technology costs and accelerate innovation by averting duplication of effort. Instead, APIs allow users to build "on top of" existing systems. The degree to which the API publisher exerts control over the API differentiates private APIs from partner APIs and from open APIs. Banks have been using private APIs for a very long time. Banks use proprietary APIs to lower the cost of building internal IT systems by facilitating communication across departments. The use of standard APIs is very prevalent. Public application programming interfaces (APIs) allow banks to provide these services

without building their own systems (International Banker, 2020), despite the fact that they must associate with other financial institutions such as clearinghouses and brokerages. Given security dangers including malicious third-party providers (TPPs) and other consumer privacy issues, the degree to which open APIs should be available is still controversial (Gozman et al., 2018).

When it comes to luring in new customers, the banking sector continues to benefit greatly from the implementation of PSD2 and APIs. New services like account information service providers' (AISPs) that help customers manage their money across many accounts are becoming increasingly popular. People used to go to each individual bank to handle their finances, but now, with the help of account information sharing providers (AISPs), they can do it all from one place. Consequently, open banking may be characterized as the movement from data obscurity to data transparency (Currie et al., 2017) and the exchange of banking data between two or more parties to improve financial goods and services (Brodsky and Oakes, 2017). It's a fresh start for the banking industry that might spur more breakthroughs by making massive amounts of transaction data accessible for analysis. It is widely agreed that fintech companies are both more innovative and more agile than traditional businesses (Zachariadis and Ozcan, 2017). Customers, especially millennials, want traditional banks to match the quality and ease of fintech businesses (Srinivas et al., 2019).

The advent of Open Banking has had a profound impact on the banking industry, resulting in significant disruptions to traditional banking practices and business models. Prior to CRM, banks could concentrate on sustaining their business model, but now they also possess customer information. The reduction in information asymmetry has also reduced the 'lock-in' effect or 'switching cost' (Zachariadis and Ozcan, 2017). Consequently, a bank's agenda included numerous adjustments, such as new competitors and customer expectations. Depending on perceived characteristics, changes can be perceived as threats or opportunities (Jackson and Dutton, 1988).

RESULTS

Open banking, a transformative concept in the financial sector, has been making waves globally. This innovative approach centers around the sharing of customer data held by traditional banks with third-party service providers, granting them access through

Application Programming Interfaces (APIs). This sharing is made possible with the explicit consent of the customer, enabling these third-party companies to create and offer new financial products and services. By facilitating the exchange of financial data, open banking has created a comprehensive ecosystem for customers to access and manage their financial information and transactions in one place. In this essay, we will delve into the evolution of open banking, its significance on the global stage, and how it is being embraced in Turkey.

Open banking has its roots in the changing dynamics of the financial industry, driven by the rapid advancement of technology and a growing demand for more accessible, efficient, and personalized financial services. The central idea is to break down the traditional banking silos and allow customers greater control over their financial data. As customers embrace digital platforms and services, the need for more agile and customer-centric banking solutions has become apparent. Open banking is a natural response to this demand.

This concept has been gaining prominence not only in its country of origin but also in various parts of the world. It empowers consumers by providing them with a more extensive array of options for managing their finances. It encourages competition and innovation within the banking sector, as traditional banks and fintech companies collaborate to create new and improved services. Open banking has the potential to drive down costs, improve transparency, and foster a more inclusive financial environment.

In many developed economies, legal codes and standards have been established to regulate open banking, ensuring the security and privacy of customer data. Countries like the United Kingdom, the European Union, and Australia have taken significant steps in this direction. In the UK, the Competition and Markets Authority (CMA) mandated the creation of Open Banking, an entity responsible for overseeing and promoting open banking initiatives. In the European Union, the Payment Services Directive (PSD) 1 and 2 have had a profound impact on the proliferation of open banking services, particularly among EU member states.

The growth of open banking applications since the introduction of PSD 1 and 2 has been remarkable. This surge in applications underscores the immense potential and demand for open banking solutions, both from a consumer and business perspective. Open banking has proven to be a catalyst for financial innovation and has spurred the creation of numerous financial technology (fintech) organizations that serve as intermediaries between traditional banks and consumers. These fintech companies play a vital role in shaping the future of banking, offering innovative services and improving customer experiences.

In the Turkish context, open banking is also gaining traction. As the financial landscape in Turkey evolves, there is a growing need to adapt to this global trend. The historical development of open banking within the country can be traced, and its progress can be compared to international standards. The time is ripe for Turkish banks to embrace open banking and leverage its benefits for the Turkish financial sector and consumers.

In conclusion, open banking is a pivotal development in the financial industry, fostering competition, innovation, and customer empowerment. Legal frameworks and standards in various countries have paved the way for open banking to thrive. As Turkey seeks to align itself with global financial trends, the proposed bank model designed to offer services in the realms of credit, treasury, banking operations, payment systems, and accounting can be a significant step in this direction. Embracing open banking principles can enhance the financial landscape in Turkey and provide its consumers with more choices, convenience, and control over their financial lives.

DISCUSSION

Although it is claimed that the definition and scope of banking has changed, some basic duties that have not changed since the first banks are still valid. The process begins with adding the customer to the portfolio and converting people into customers, and continues with the collection of deposits and the use of funds. In addition, some reporting activities are carried out in units established due to legal requirements. However, over time, it became possible to establish new units in order to adapt to developing technology. Even though the way services are provided has changed, it has served the same purpose since

day one: meeting the demands of those with excess funds and those in need of funds. On the other hand, as a result of technological developments, new playing fields have been opened for banks. The method or channel of service provision or new activities that can be carried out has also emerged. An example bank organizational chart is given below.

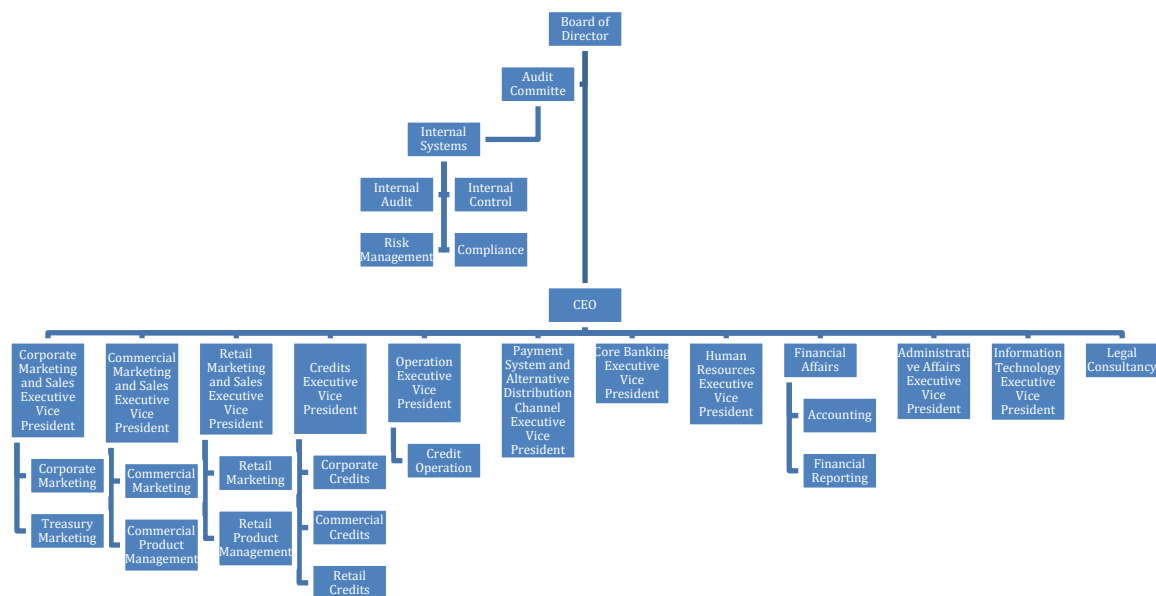


Figure 6: Organization Chart of a Bank

When proceeding through this organizational chart, open banking affects;

- Marketing teams to develop and introduce the new products that will emerge
- Credits teams in terms of loan allocation, operations and follow-up
- Operations teams because of changing the way do their jobs
- HR department in terms of changing of the personnel profile to be recruited by the
- Change of business processes for accounting department
- The developments requested from IT teams should be in a new area
- For digital banking teams, creating a new serving field.

The concept of open banking, which can cause a significant change in the way a bank provides services, will of course affect all units, albeit at different levels. However, while presenting this model proposal, changes in operational processes were taken into focus. For this reason, a model recommendation will be presented based on the units given below. This thesis aims to create a bank model on business families that are expected to be affected

by open banking developments, taking into account all these service areas and the organizational chart of banks that are key players operating in Turkey. In this context, loans, banking operations, treasury, payment systems and accounting units will be designed for the model bank.

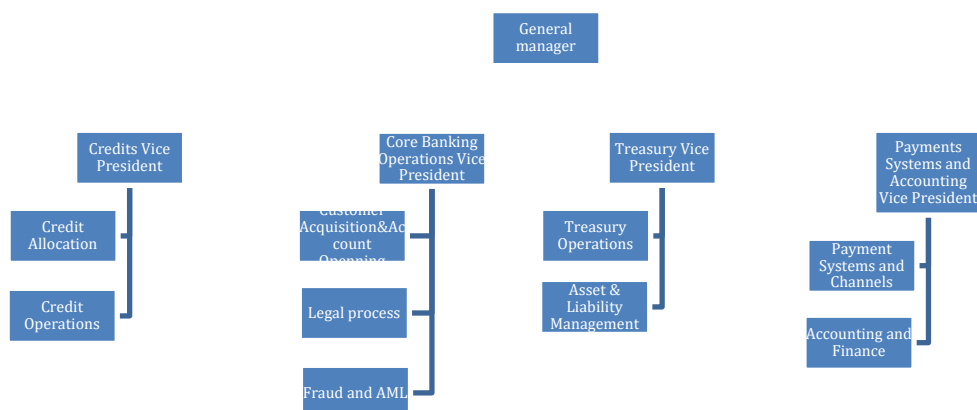


Figure 7: Organization Chart of Model Bank

5.1. Credits

5.1.1. Credit Administration

In this era of advanced technology, the application process for loans is also quite archaic. It is necessary to acquire all the necessary documents from consumers to demonstrate their eligibility for the loan. It requires a significant amount of time to compile the recent financial history, salary information, documents demonstrating the securities and real estate possessed, and many other details. Nonetheless, a summary of monthly quantities of income and expenses, as well as their categories (rent, loan, wage, allowance, etc.), residual income, debt-to-income ratio, whether there is a seizure of funds in direct bank accounts, availability of wage advances, and total amount of debt should be provided. Open banking enables the collection of a variety of data, including the number and total amount of payment events such as debt refusal, the number and total amount of last credit limit withdrawals, indicators related to overdraft such as the maximum overdraft account, and documents displaying the securities and real estate owned. By eradicating the need for applicants and lenders to manually compile, submit, and verify this information and documentation, applications and lending decisions can be made more quickly and

efficiently. In addition, it permits the cross-comparison of information received from various institutions. Thus, it will not be provided with deceptive information.

5.1.2. Credit Assignments

A bank has only one requirement when extending a loan: repayment of the loan. The answer to the query of who can repay the loan is therefore extremely valuable to banks. The development of statistical decision-making models to assess the creditworthiness of institutions and reduce the risk of default dates back to the 1950s. It was determined that statistical scoring models were significantly more effective at distinguishing good risk profiles from poor ones than a model based solely on the opinions of credit institution employees. This increased the proportion of "good loans." Over time, models have become more complex, but the underlying principle has remained largely unchanged. They continue to rely on a combination of demographic, socio-professional, and financial data, and the default risk and resultant non-performing loan ratio have yet to converge on zero. This is due in part to the fact that the relevant models are not fed entirely precise data. It is extremely challenging to obtain live or at least daily updated data in abundance. Today, the only method to accomplish this is to acquire the necessary data from those who directly or indirectly influence the financial market. Even if the relevant data can be collected separately, the consolidation of these inputs is a time-consuming task. With open banking, it is possible to eradicate this fragmentation. The risk of loan default will be significantly decreased by incorporating fragmented data from a variety of information sources, such as a customer's payment performance at another bank, bill payment habits, public loans, and joined services, into decision-making modules in a clear and usable manner.

Additionally, with the speeding up of digital enrollment procedures, there are now more customers in the portfolio who have access to alternative distribution channels. These customers anticipate being able to retrieve their money right away without going to a bank. However, banks frequently contend with legacy infrastructure and inadequate data management across silos, which lengthen the lead time for data-driven decisions. This can be costly for both consumers and banks as approval processes may be impeded by potential delays, affecting credit risk assessment.

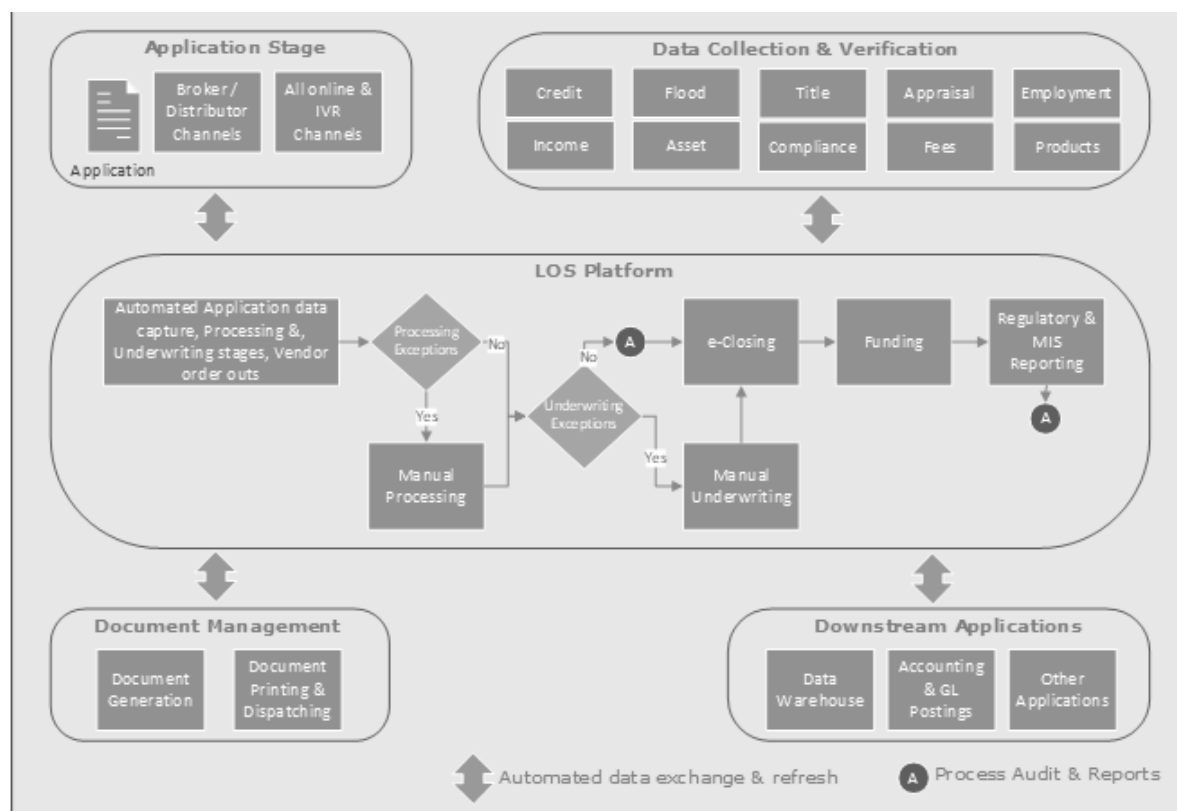


Figure 8: Process of Loan

<https://www.wipro.com/banking/gallagher/resources/blogs/sridhar-sathyanarayan/how-lenders-can-reduce-loan-processing-time-from-weeks-to-days/>

Alternatively, both non-cash and cash loans are prevalent in the finance industry. Checks, a form of non-cash loan, are utilized by millions of business owners across the globe, regardless of industry or company size. However, significant advancements have not been made since their inception, and today only a small number of providers, including enterprise platforms, offer an alternative to burdensome and risky paper transactions. Over 92% of businesses still prefer to pay their vendors and suppliers by check, despite the fact that over 70% of businesses are victims of check fraud (Snap Check, 2022). With open banking, checks transferred to the digital environment are initially more cost-effective. By eliminating the need for printing, paper, and postage, the clearance process costs for both customers and institutions will be significantly reduced.

The delay in processing and delivering paper checks also disrupts the market's workflow. It provides transparency for all customer check payment processes in digital checks. Digital checks will ultimately increase consumer satisfaction with checks by combining the

familiarity of conventional commercial checks with the safety, speed, and security of modern payment technology.

Additionally, monitoring traditional checks is cumbersome. It will be necessary to allocate time for a continuous control mechanism and to maintain a constant supply of unanticipated circumstances. The utilization of digital checks has facilitated the ability of customers to engage in commercial transactions without temporal or spatial constraints.

5.2. Treasury

Treasury can be broken down into two categories: customers' treasury transactions and the bank's own cash position management.

First, the successful completion of International Payments has always necessitated a large number of customer-facing documents. However, despite claims that the world has become globalized and that international borders have blurred, countries that impose sanctions against one another will continue to do so in the future. As a result, the use of cryptocurrencies based on block chain technology for both investment and transfer purposes is increasing daily. This new concept in the financial sector, decentralized finance, has issues that the more regulated banking sector must address.

By constructing the necessary infrastructures, banks can incorporate their customers' cryptocurrency purses into the banking system. At this point, the security issues associated with crypto currency applications will be resolved, and the bank will offer a comprehensive service to its clients. By integrating Block chain-based applications and banking infrastructure, money transfers will be more efficient and require fewer documents.

Banks that integrate with multiple crypto-based applications will have access to a vital data source for analyzing market sentiment for each crypto asset. These insights will always be useful for the administration of these foreign actors, whose assets are in some way contributed by their clients.

It enables them to monitor their investment performance and financial transactions in real time, giving them a clear picture of their financial health. Without API connectivity, companies may only be able to access up-to-date information about their cash status once or twice per day, meaning that decisions regarding the company's cash are frequently made based on outdated information. However, APIs can facilitate the transition from intraday statements to real-time cash balance data. This could be a method for businesses to gain

access to a real-time view of their global cash balances – not just for their primary accounts, but for all of their banks and subsidiaries as well. This real-time cash position can then be used as the foundation for real-time cash planning.

Second, it facilitates the transmission of funds between investors' bank accounts and investment accounts. This makes it simpler for investors to make expeditious investment decisions, since they no longer have to consider the time required for funds to clear. APIs provide the real-time connectivity required for businesses to take advantage of real-time payments. It is essential to note, however, that APIs do not inherently guarantee immediate payments, which are instead determined by the applicable scheme and clearance agreement. For instance, a bank may expose its API for payments but continue to process them as BACS or SEPA Credit Transfer payments instead of their immediate payment equivalents (i.e. Faster Payments and SEPA immediate Credit Transfer). Host-to-host connectivity, on the other hand, may not support instant payments per se, but can frequently provide near-real-time payment processing and, thus, make payments rapidly enough to satisfy the requirements of many businesses.

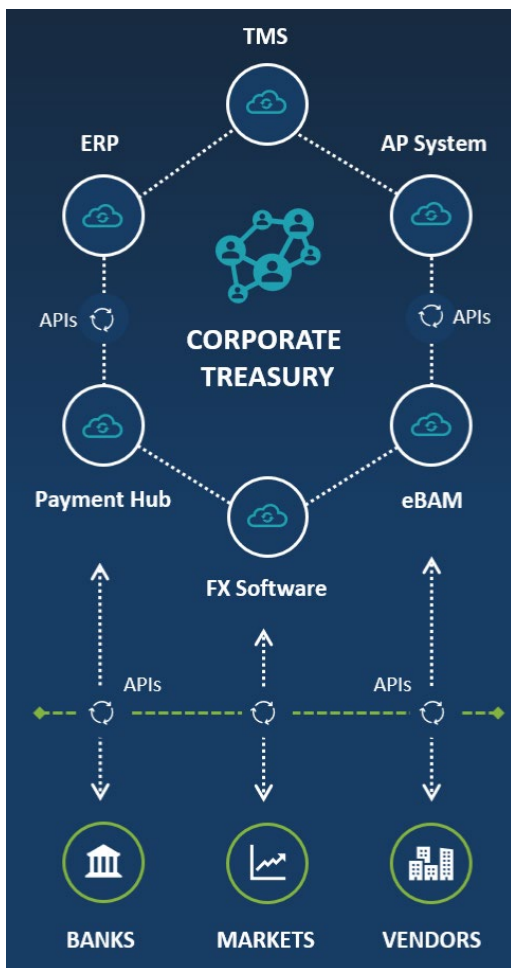
Lastly, there is the issue of increased security. By utilizing secure APIs to access the financial data of users, investment platforms can ensure that user data is protected and kept private. This can provide consumers with the peace of mind that their financial information is secure. Additionally, Open banking can increase the transparency of investment platforms. By displaying all of a user's financial accounts in a single location, they can gain a better understanding of their overall financial health. This can assist users in making more informed investment decisions based on their entire financial picture, as opposed to a single account or asset. Lastly, open banking offers investors more investment opportunities. Using consumer financial data, investment platforms can offer customized investment products based on the investor's risk profile, investment objectives, and financial situation. From the bank's perspective, API-integrated Systems are cross-border currency pooling. Some banks are already investigating the possibility of using APIs to enhance cross-border cash aggregation by leveraging real-time visibility over a company's cash in various countries.

In areas such as forex, where a more dynamic exchange of information between a hedging platform and a company's house banking could provide significant benefits, there could

also be some intriguing use cases. For instance, the company could choose to securely communicate information about upcoming positions with its banks so that the banks can proactively propose methods to hedge future exposures. Open APIs enable the retrieval of historical transaction data, which can then be used to inform underwriting teams about a company's creditworthiness, outstanding balances, and financial health, resulting in more precise credit decisions and efficient risk management.

Treasury transactions are traditionally settled at the end of the day via the SWIFT system. The instantaneous flow of information provided to the bank's consumers can also be utilized by the bank's treasurers to make speedier decisions regarding liquidity management and investments. Thus, the instantaneous visibility of the company's financial position ensures that its account balances are minimized. Moreover, balance and transaction reporting in real time enables the treasurer to effectively monitor the movement of cash. Daily account reconciliation helps to reduce the possibility of fraud. Real-time reporting will also facilitate the treasury team's month-end reconciliations.

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TMS: Treasury Management System

eBAM: Bank Account Management through software

ERP: Enterprise resource planning

AP System: accounts payable system

Figure 9: Process of Treasury API

Source: <https://tispayments.com/wp-content/uploads/APIs-Blog-Graphic-2.png>

5.3. Payments Systems and Accounting

The present study aims to investigate the capacity and resources required for effectively managing all payment flows utilizing the most cost-efficient technology. By doing so, individuals can enhance their budgeting skills, identify the most suitable deals, and explore the best products and services for accessing their accounts. The study posits that a regulated price comparison website can offer valuable insights into actual spending patterns, thereby facilitating the development of frugal habits.

A payment to a merchant or corporation will be initiated through their mobile banking software or online banking web portal. The transaction will function similarly to a bank transfer. The funds will then be transferred promptly to the merchant using real-time banking channels. Receiving funds in real-time enables the user to promptly credit funds

to their customer's account, thereby enhancing the customer experience. If a refund is necessary, it can be issued in real-time, thereby enhancing the consumer experience. Using APIs can also reduce reconciliation costs compared to bank transfers. Checkout without data entry decreases shopping cart abandonment Increase conversion rates by facilitating mobile payments for customers.

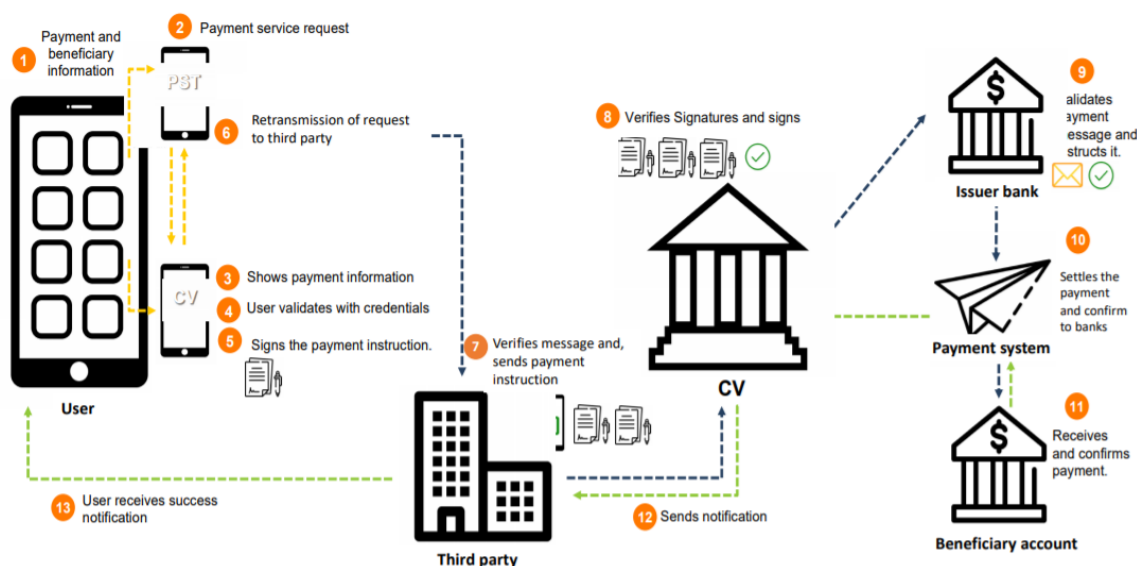


Figure 10: Process of Payment System API

Source: <https://www.bcn.cl/laborparlamentaria/documento?id=697591a>

There are four API-based payment categories. These:

- a) Business-to-Business (B2B) - B2B payments consist of businesses paying their suppliers or vendors. They are typically denominated in crores, indicating their high value.
- b) Business to Consumer (B2C) - B2C payments are business-to-consumer transactions. Included are reimbursements, legal payments, insurance claims, and contingent employee earnings. These are remittances of moderate to high value.
- c) Consumer to Business (C2B) - C2B payments consist of consumer payments to businesses. C2B payments include bill payments, hospital co-payments, and payments made at the point of sale (POS). These payments are typically regarded as having a medium to low value.

- d) Domestic Peer-to-Peer (P2P) - Domestic P2P transactions involve two parties. Local P2P payments include transactions between acquaintances and relatives. These are remittances of medium to low value.

Customers' accounting software can also be incorporated into the banking application. In this manner, they will initiate collections from their creditors by submitting a request to the bank, and it will be possible to advance all previous processes from the bank application, via open banking and APIs. Customers can create a mutual collection record and payment assignment by transmitting, via their own bank, the follow-up of their receivables and payables and, if necessary, the invoice forwarding transactions to the bank of the party to whom they are credited. Thus, mutual payments will be made in a secure and convenient environment.

Through APIs, it is also possible to add products subject to customers' commercial invoicing to their inventories. By perusing the product/service information engraved on the invoice issued to the customer by the vendor and adding it to the required inventory records, a further operational procedure can be performed through the banking application.

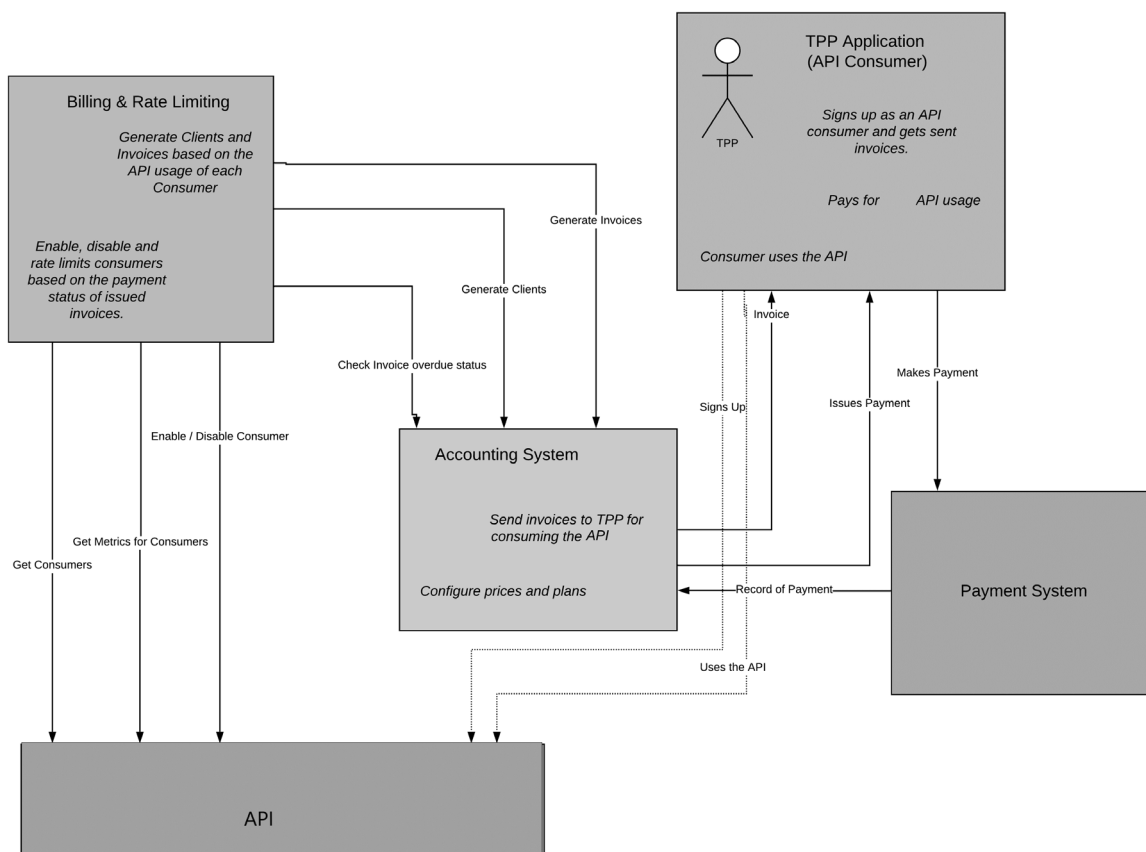


Figure 11: Process of Accounting API

Source: <https://github.com/OpenBankProject/OBP-Billing>

5.4. Banking Operations

5.4.1. Fraud and AML:

Financial crime, specifically anti-money laundering (AML) and counter-terrorist financing measures, remain at the top of the agenda for regulators. In an increasingly digital world, global tensions and instability, anti-money laundering, and counter-terrorist financing measures have become central to the risk management of financial institutions, and firms must prepare and defend themselves against these risks. Know Your Customer (KYC) is a legal requirement designed to protect institutions from fraud and money laundering. Simply stated, the KYC process is the verification of consumers' identities before or during their use of financial services. The objective is to exclude "bad players" and hazardous individuals from financial markets.

The prior, conventional procedure consisted of numerous sequential stages that an individual or group must complete. The collection of data, compilation of client profiles, and creation of audit traces have been manual processes. Each stage would require countless hours of manual labor, and a client could be off-boarded for any number of risk-related reasons. This procedure is obligatory, and labor costs can impact the bottom line, reducing returns on investment. Historically, these time-consuming processes have been costly, including the loss of many consumers during the initial phases of the application procedure.

The open banking system, on the other hand, is predicated on the notion that a person has the right to use their financial data to their own advantage. Simultaneously, financial institutions capture and analyze raw consumer data using their own algorithms and analytics. Today, financial institutions develop derived data to provide additional value or insight to the consumer, and fintech firms have made it simpler for businesses and banks to conduct KYC without human intervention. Many of them provide trustworthy KYC solutions via sophisticated APIs. Through KYC APIs, a few fundamental details such as name, date of birth, address, gender, mobile number, and photo identification are instantaneously accessible and dependable.

Advanced APIs that communicate with one another are excellent time savers and offer KYC at a low cost. The integration of these APIs can facilitate and expedite the background screening process. With no time squandered on manual data entry, documentation, or attestation, operations can be streamlined and customer/user onboarding can be accomplished immediately.

There are numerous advantages for institutions and enterprises that utilize KYC APIs.

- a) No human intervention: KYC APIs eliminate the need for human intervention at every stage. This API integration decreases the possibility of errors at every stage.
- b) KYC APIs provide real-time insights, such as customer risk analysis, credit score, and numerous other parameters, so that businesses can make the best decisions for each customer.
- c) Zero risks of manual errors: KYC APIs deliver the correct data at the right time and location, eradicating the possibility of clerical errors. The integration of KYC APIs into the operational workflow of an enterprise is poised to yield significant benefits in terms of temporal and financial efficiencies. Instead of enduring a time-consuming and laborious verification process, businesses can streamline and automate the KYC flow to create a frictionless onboarding process. This frictionless experience leads to a seamless induction procedure and, as a result, increased retention.
- d) KYC APIs expedite the process of businesses' expansion into novel markets.

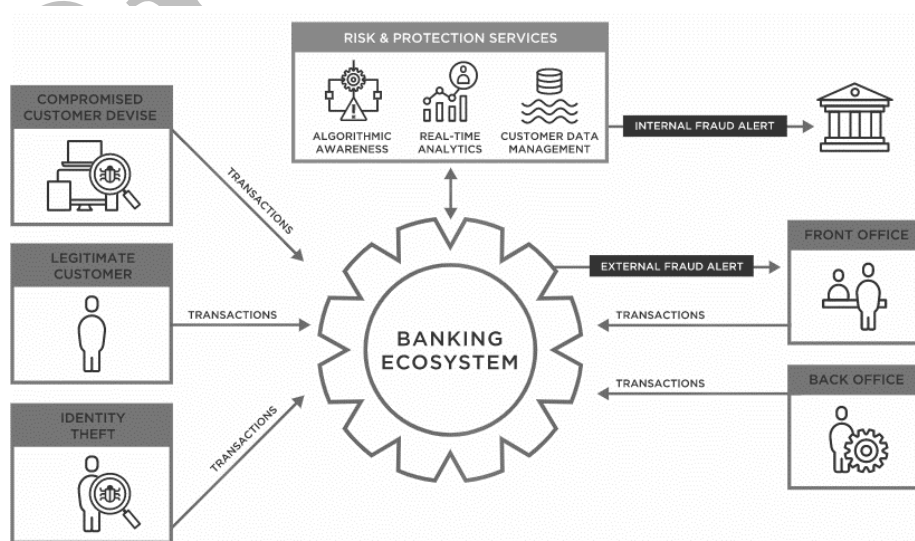


Figure 12: Process of KYC API

Source: <https://www.tibco.com/reference-center/how-to-detect-banking-fraud-in-a-constantly-evolving-cyberspace>

5.4.2. Onboarding and Account Management

Numerous businesses in regulated industries have protracted and difficult onboarding procedures for new customers. According to new research commissioned by TrueLayer and conducted by YouGov and released, four out of ten individuals begin the process of creating an online account for a service but do not complete registration. When requested to submit information in response to a verification request, 46% of individuals abandon the signup process, and 75% of consumers are only willing to spend 10 minutes or less before giving up. To prevent this churn, onboarding APIs offer a secure, dependable, and fast method for onboarding new customers.

In the past, the onboarding procedure frequently entailed manual, time-consuming duties such as collecting and verifying personal information, conducting identity checks, and establishing proof of address. By obtaining customer data from their bank APIs, banks and their consumers will save time and resources during the enrollment process. This will enhance the overall user experience and increase the conversion rate of new customers by eliminating the need for them to enter their personal information manually.

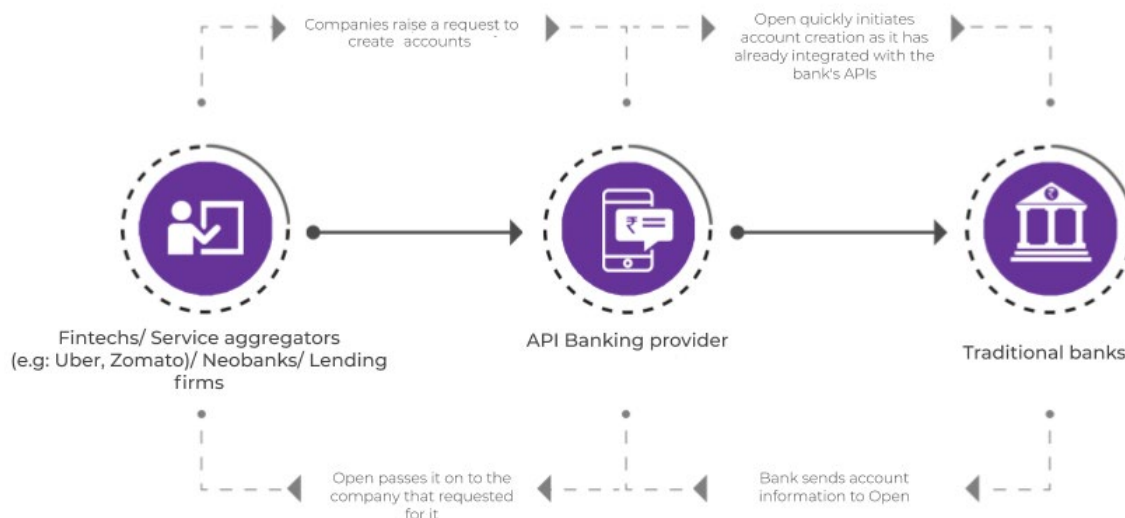


Figure 13: Process of Onboarding API

Source: <https://open.money/banking/core-banking-api>

With the advent of open banking, consumers will now have the convenience of being able to access and view all of their bank accounts through a single interface. Open banking relies heavily on the use of APIs to enable the safe and efficient exchange of data between different entities. These APIs play a crucial role in ensuring that information is shared securely and seamlessly between parties involved in open banking transactions. Data sharing is defined as the act of a data bearer or data provider providing data to a third party or data consumer with the consent of the data proprietor. The exchange of digital information between individuals and organizations is a crucial aspect of open banking initiatives. This process is supported by a range of practices, technologies, architecture, cultural elements, and legal frameworks that work together to form one of the primary pillars of open banking. The introduction of explicit data sharing models offers several advantages. The promotion of transparency, competition, and market entry can be a significant contributor to the reciprocity and cooperation within the financial ecosystem. The act of combining data from different sources has the potential to increase the effectiveness and worth of services.

In conclusion, this technology has the potential to enhance decision-making processes, elevate the quality of products, and grant individuals' greater control over their own data. In the world of technology, there exists a powerful tool known as account aggregators. These infrastructures are designed to efficiently manage and transfer data transactions between two key players: data providers and data consumers. As we delve into the world of data exchange, we come to understand the significance of Account aggregators. They serve as a crucial mechanism for the implementation of this process. One of the responsibilities of the participants is to ensure interoperability among themselves. Although Account aggregators play a crucial role in data management, they are merely intermediaries and lack the ability to store or redirect information to unauthorized individuals or entities. One notable aspect of account aggregators is their approach to devising mechanisms for obtaining consent from end-users regarding data flows.

In the realm of open banking, the presence of account aggregators is of utmost importance for effective execution of data-sharing. In the world of information management, an account centralizer or aggregator serves as a focal point for the collection and organization of data that has been properly standardized and regulated. Data sharing is advantageous in

many ways. It facilitates the sharing of information in the digital sphere, fosters collaboration and mutual benefit in the financial system, and enables the integration of data from several sources to improve service quality. It also allows people to make more informed choices, speeds up innovation, and gives them more control over their personal information.

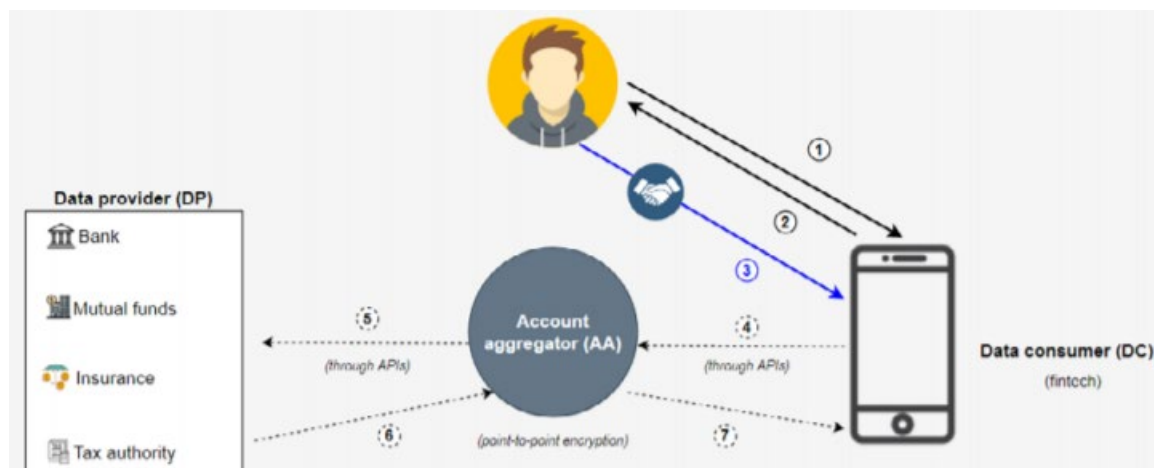


Figure 14: Process of Account Aggregation

Source: <https://www.bis.org/publ/othp56.pdf>

5.4.3. Official transactions

After the financial crisis, banks have become one of the industries with the strictest legal requirements worldwide. However, it maintains contact with numerous official institutions. When their consumers are parties to a public receivable, the relevant legal authorities send information to the institutions. What is referred to as information in this context is essentially a data payload. The relevant data bundle is transmitted to all institutions, and the customer's account balance up to the specified amount is blocked. However, since this data package is simultaneously sent to all institutions and their systems are not integrated, quantities in excess of the debt amount may be blocked. With the incorporation of APIs into the collection of public receivables, individuals will be able to be blocked only to the extent of their debt. When the amount in a bank account and the amount that has been blocked are shared with other banks, other banks will not block.

In conclusion, banks are subject to rigorous regulations. In addition, it is difficult and labor-intensive to manage the auditors' requests in these audits. Businesses rely on their banks to respond quickly and accurately to requests for audit affirmation, but legacy processes and

high volumes of requests hinder banks' ability to execute effectively. APIs can help banks eradicate these processes and provide customer support teams with a superior user experience and cutting-edge technology.

With the assistance of a centralized API request list, a bank can eradicate the time spent chasing and tracing requests across multiple channels. Multiple communication channels have a detrimental effect on productivity and efficiency. API allows institutions to reduce costs and increase efficiencies. They eliminate the overwhelming number of dispersed queries.

Additionally, API can decrease duties by eliminating manual follow-ups. Error rates and duplicate requests caused by manual processes decreased as a result of the reduction in manual workload. It streamlines workflows to eliminate redundancy, processing errors, and rework.

CONCLUSION

The effects of communication technologies changing at a rapid rate around the world have caused changes in society and culture and made a new generation very different from the ones before it. Organizations that can keep up with today's rapid change, in which technology is at the center of people's lives, have a chance to stay in business. As in every other area, changes in the banking world have led to new rules. The main parts of the players who are already there get lost when new ones come along. When fintechs and big platforms work together on a global scale, they create a synergy that makes it hard for countries to ignore these changes. They are now taking steps to help with the digital finance shift. One important part of all this change is open banking, which will change the rules of the standard banking sector over the next few years.

In 2008, there was a global financial crisis that touched all financial markets and the system as a whole. People lost faith in the banking system and banks because of the crisis. Due to the effects of the crisis, there are now more laws that affect the financial sector, and as a result, technology in this sector is changing quickly.

With the growth of technology, customers can now do many tasks without going to the branch. In traditional banking, face-to-face activities are done in real bank branches. Block chain and digitalization have brought up many new problems, like digital banking and open

banking. Changes in the market and competition are pushing banks to work with fintechs, which are companies that use technology to make financial services. This will help banks do more than just offer services through their own digital outlets. As a result of this change and transformation caused by technology, the banking industry moves away from the old banking system and turns into a digital platform. There is a change toward a time when banking isn't just about money anymore and data banking becomes more important.

Even though there are sometimes concerns about open banking in the banking world, it has become widely accepted in a short time all over the world. Open banking will be the key to an important lock in the process of changing the way money works. Those who don't keep up with this expected change will likely lose in different ways. Even though Turkey is still in the early steps of open banking, it is expected that the system will get better as fintech startups gain more business development experience and as customers become more aware of the environment.

It is possible to say that open banking will radically change the organization of banks from end to end. However, since this thesis aims to create a new structure for operational areas, suggestions have been made for loans, basic banking operations, treasury, payment systems and accounting units.

In the field of loans; open banking's ability to collect information from many sources will be an important breakthrough in the processes of finding good customers and allocating receivable loans. In addition, considering that collecting information and documents and processing them takes a lot of time, it can be said that operational processes will also become easier.

In basic banking activities; Banks are utilizing from APIs to streamline the onboarding process, reducing manual tasks like identity checks and address verification, thereby improving user experience and boosting conversion rates. In addition, financial crime, particularly anti-money laundering and counter-terrorist financing measures, is a top priority for regulators. Know Your Customer (KYC) is a legal requirement to protect institutions from fraud and money laundering. Traditional manual processes are costly and time-consuming. Fintech firms offer sophisticated APIs for KYC, simplifying the process and reducing costs. This integration streamlines operations and allows for immediate onboarding.

As the world becomes more globalized, the use of cryptocurrencies for investment and transfer is increasing. Banks can integrate their customers' cryptocurrency purses into the banking system to address security issues and provide efficient money transfers. APIs can help banks monitor investment performance, facilitate real-time cash balance data, and facilitate fund transmission between investors' bank accounts and investment accounts. Open banking offers increased security, transparency, and investment opportunities. Banks are exploring API integration for cross-border currency pooling, hedging platforms, and forex. Real-time visibility of a company's financial position can help make faster decisions regarding liquidity management and investments. Real-time reporting also facilitates treasury team reconciliations and reduces fraud.

Mobile banking software or online portals enable merchants to initiate payments, similar to bank transfers. Real-time transfers allow users to credit funds to customers' accounts and issue refunds in real-time. APIs can reduce reconciliation costs, decrease shopping cart abandonment, and increase conversion rates by facilitating mobile payments for customers, thereby enhancing the customer experience.

In conclusion, banks shouldn't see the digitalization process as a threat if they change and work with financial technology businesses. They should see this change and cooperation as a way to improve the customer experience, offer new products and services, lower operational costs, give customers access to the financial system, reach more customers, make financial life easier, and get more people involved in the financial system.

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Tables and Figures

Tables

Table 1: Digital Transformation of Banking

Table 2: Comparison of Open Banking and Traditional Banking Open Banking vs. Traditional Banking

Table 3: Methods of Open Banking

Table 4: Open Banking Service Process

Table 5: Types of APIs

Table 6: Comparison of Countries Comparison of Open Banking Frameworks

Table 7: Comparison of Banking as a Service (Baas) and Banking as a Platform (BaaP)

Figures

Figure 1: Number of Open Banking Products Released to the Market by Customer Type Over Time

Figure 2: Open Banking Progresses over the World

Figure 3: Number of Active Digital Banking Customers

Figure 4: Number of Startups Established

Figure 5: Service Areas of Fintech Companies

Figure 6: Organization Chart of a Bank

Figure 7: Organization Chart of Model Bank

Figure 8: Process of Loan

Figure 9: Process of Treasury API

Figure 10: Process of Payment System API

Figure 11: Process of Accounting API

Figure 12: Process of KYC API

Figure 13: Process of Onboarding API

Figure 14: Process of Account Aggregation

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