

Agpaytech's Research
15th December, 2022



Web 3.0 Technologies:

How Will It Enhance Open Banking?

Executive Summary

Open banking is an evolving trend in many jurisdictions and authorities have responded by taking a broad range of actions in recent years. Besides, two factors have influenced open banking growth; regulation and market factors. While a key concern of open banking is centered on data constraints, there seems to be data freedom from Web 3.0 applications.

The Web 3.0 application, distinct by the “read-write-own” version of the internet will make user data decentralized and users can effortlessly move their data assets between platforms, allowing different services to display different views for the same assets or data. While this is a breakthrough for open banking and open finance projects, the Web3 tools provide interoperability that is immutable and trustless, enabling powerful new applications for DeFi services.



In this report, we examined how Web 3.0 technologies influence open banking initiatives worldwide. Besides, the study highlighted the impact of Web 3.0 on FinTechs, data access, and challenges in the financial landscape. The report concluded that the concept of open banking and web 3.0 is highly related in terms of data decentralization and mass adoption of both initiatives will disrupt the payment service positively. This study calls for the global adoption of Web3 apps and open banking projects.

Contents

Executive Summary

02

Introduction	04
The Web	05
The Web3 Technologies and Applications	07
Blockchain	08
Smart contracts	08
Decentralized Autonomous Organizations (DAOs)	09

Web3 and the Financial Landscape

10

Web3 App Growth	12
Open Banking	13
Open Banking Players and Requirements	14
Web3 and Open Banking	15
Data ownership	16
Web3 will boost Open banking connectivity	16
Incentives to provide data	17
Enhance users' trust	18



How Web 3.0 Will Boost Fintech Activities

18

Key Concerns on Web3 and Open Data	19
Conclusion	20
References	21

INTRODUCTION

Today, advanced technologies are changing the phase of financial innovations. The traditional model of banking is not meeting the digital needs of consumers. Fintech companies have stepped in to provide a seamless and personalized experience to users. However, one key constraint is the centralized control of consumers' data, being held in the hands of a few. Besides, the majority of web2 content and user data is controlled by a few large tech companies. This has prompted a growing body to break centralized and monopolistic features evenly across the internet and transition to Web3.

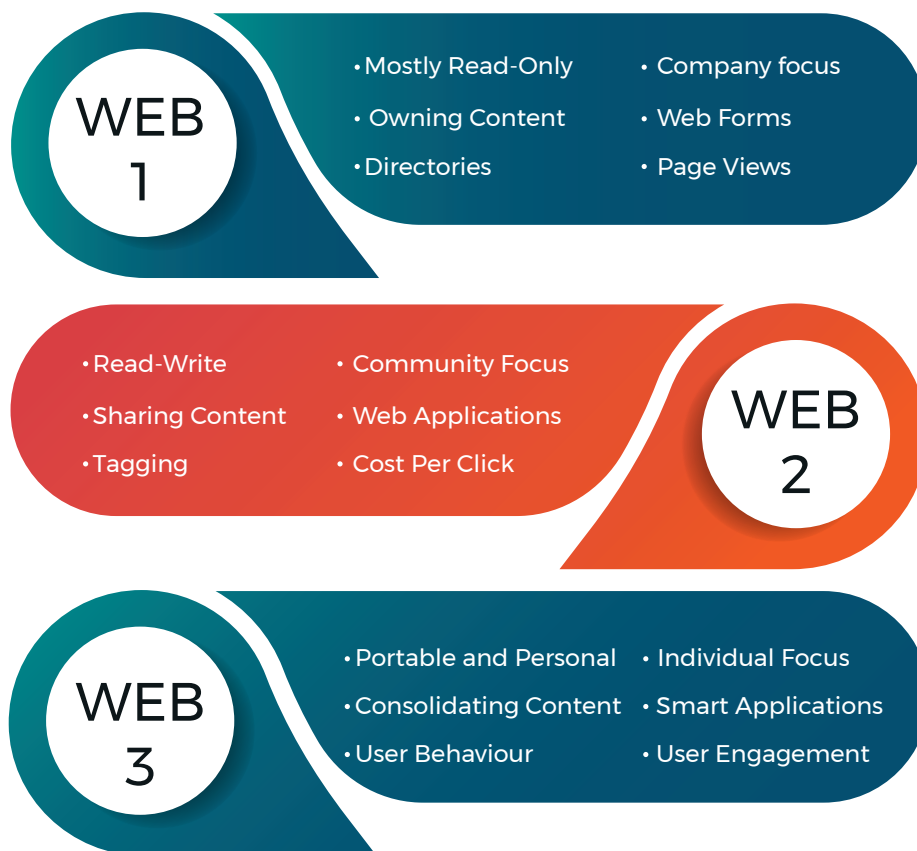
The Web3 technologies which include blockchain technology could influence traditional financial services. Because its foundation layer is blockchain technology, the core of DeFi is immutable, and public and data will be interconnected in a decentralized way. Web3 places much emphasis on developing peer-to-peer networks, blockchains, and distributed storage systems, making data easier to easy to access from both financial and non-financial institutions.

Web3 brings an empowering set of technologies that has the potential to completely reshape many different fields, especially the financial landscape and digital technologies. As Web3 gains more attention globally it activates new paradigms to engage, govern, create, iterate, and implement around new payment ecosystems such as open banking, open finance, and smart data.

THE WEB

Every technology goes through generational cycles, including the internet. When a critical threshold of upgrades is crossed, it marks the beginning of a new generation. This moment, and its significance for the marketplace, can prove confusing. Web3 is the third, and latest major paradigm shift of the Internet, and it has two preceding phases in the form of Web1 and Web2. Web3 is gaining increased attention traction as it evolves and Web3 development becomes more accessible. They have unique defining characteristics. Web1 was static, Web2 was dynamic, and Web3 is decentralized. A basic understanding of the concept of Web3 can be gained through comparison to its Web1 and Web2 predecessors.

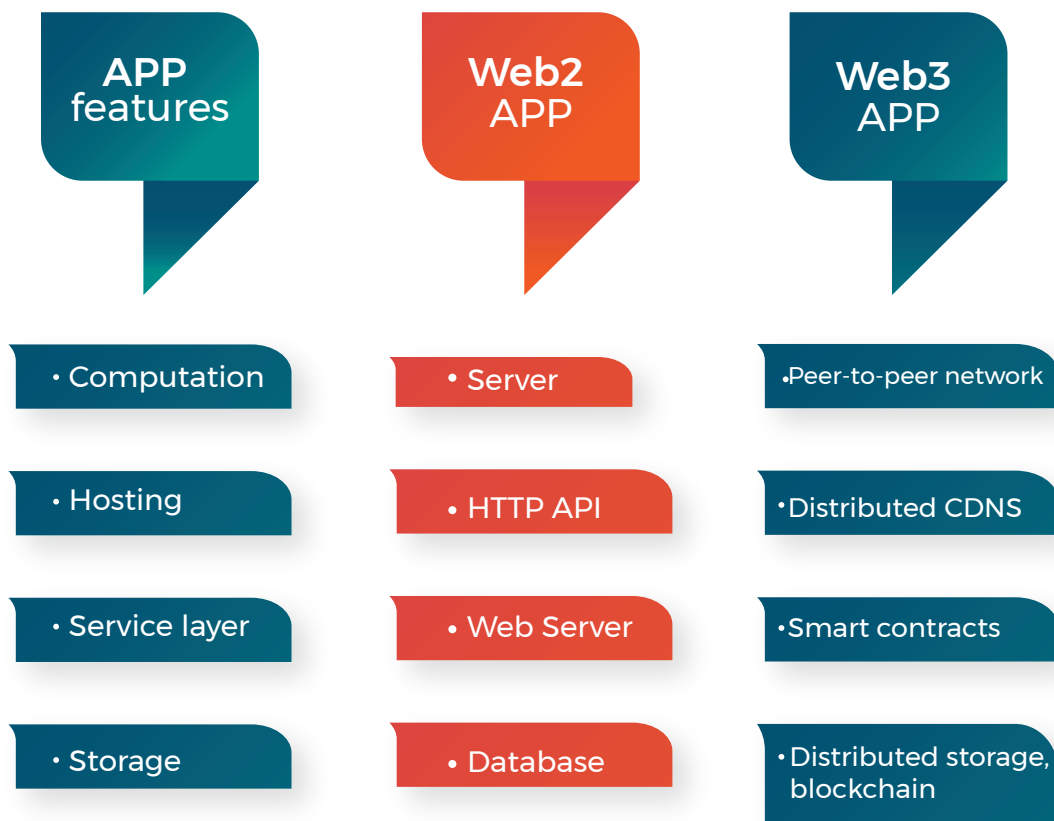
Figure 1: Comparison of Web 1, 2 & 3



Source: Agpaytech

According to Filipčić (2022), the hallmark of Web1 was "read-only", meaning that only technology enthusiasts and technology companies could create the content then users consumed. Web2 introduced the "read-write Web" also referred to as the participatory social Web, allowing users to create shared content by utilizing server-side scripting to allow online services and proliferate. With Web2 we saw the rise in popularity of centralized social platforms and global websites emphasizing user-generated content and usability for end users. This leads us to the Web3 "read-write-own" version of the Internet, where user data is in the decentralized platforms and users can more easily move their data assets between platforms, allowing different services to display different views for the same assets or data. Web3 tools provide interoperability that is immutable and trustless, enabling powerful new applications for every corner of society (Filipčić, 2022). Web3 will put power in the hands of communities rather than corporations.

Figure 2: Comparison between Web 2.0 and Web 3.0 Apps



Source: Agpaytech

The Web3 Technologies and Applications

The Web3 technology application is spearhead on the concept of blockchain technology, decentralized control of the Internet, data security and privacy solutions, trusted intermediaries, and smart contract solutions. Simply put, blockchain, DAOs, and smart contracts are key technologies for the web3 framework. These technologies are set to de-monopolize the controlled feature of web2 internet. Web3 is a decentralized web based on blockchain technology. The fundamental idea behind Web3 is to create a decentralized version of the Internet by removing the dominance of the centralized power of web2 giants and giving control back to users.



Blockchain

A blockchain is a distributed database that is updated and shared across a network of computers. Data and state are kept in “blocks”, which are collections of data and state (Goel et al., 2020). Blockchains allow the Internet to achieve a distributed state of the network by allowing ‘trust’ to be shared across the connecting networks. This ‘trust’ gives the notion of a web of trust between nodes in the Blockchain (Zarrin et al., 2015). To transmit ETH to someone else, it is first necessary to add the transaction data to a block. The data in a block cannot be changed without affecting all following blocks, which would necessitate network unanimity (Fillipic, 2020). Web3 is providing a solution to data security, and privacy problems were removing the trusted intermediaries for sharing services.

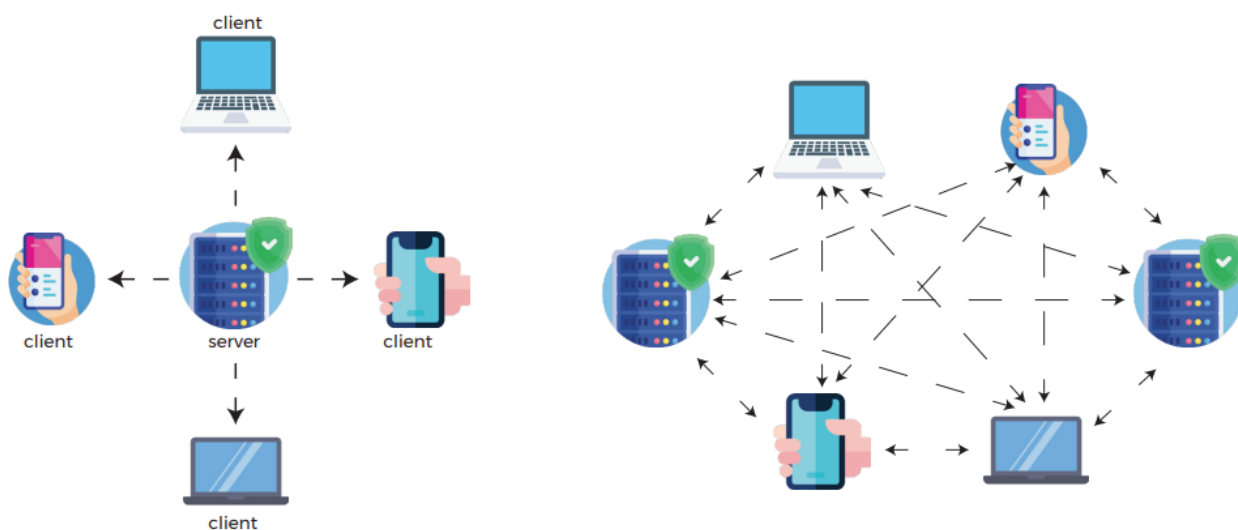
Smart contracts

Another fundamental component of Web3 is smart contracts. A smart contract is a computer program that resides on a decentralized network, rather than a single computer. Smart contracts are codified agreements between two parties. As such, the point of a smart contract remains the same as traditional contracts. However, the main difference is that code on a blockchain establishes the terms and conditions. Goel et al. (2020) asserted that smart contracts allow several parties to reach a shared outcome in an accurate, timely, and tamper-proof way, by execution on a decentralized blockchain rather than a centralized server on a blockchain network. In a Web3 context, most smart contracts run on the Ethereum blockchain.

Decentralized Autonomous Organizations (DAOs)

Central to this theme of Web3 is an understanding of a DAO framework. DAOs are decentralized, autonomous organizations governed by a community and smart contracts. Decentralization means that the database does not depend on a particular organization or administrator but is distributed among all peers (Tran, 2019). Such technological advancement could bring positive change to systems facing trust issues and skepticism about who keeps the data. They enable people to coordinate and govern themselves through self-enforcing rules encoded in a software infrastructure on a public blockchain. In the DAOs, rules cannot be altered by a single individual, and decisions are implemented based on approved logic written into a smart contract and comprises of all entities that coordinate activity among a distributed community of stakeholders.

Figure 3: Centralized vs Decentralized Network



Source: Agpaytech

According to the analytics service DeepDAO, in 2021 the total value of DAO treasuries surged fortyfold, from \$400 million to \$16 billion, and the number of DAO participants increased by 130 times from 13,000 to 1.6 million. As DAO innovation has largely been led by the private sector and DAOs are being developed for an increasingly wide variety of purposes (IMF, 2022).

Table 1: DAO Taxonomy

Taxonomy	Generative	Associative	Ad hoc
Activity	Functional	Governance	Task
	Power a network or application	On-chain management of a community	Pursue a specific communal objective
Value transfer	Investment	Philanthropic	Special purpose acquisition DAO
	Facilitate participant investment activity	Fund public good	Buy a unique item or other companies
Social	Production	Community	Flashmob
	Compensate people for work they do	Networking and coordination	People come together at a place and/or time

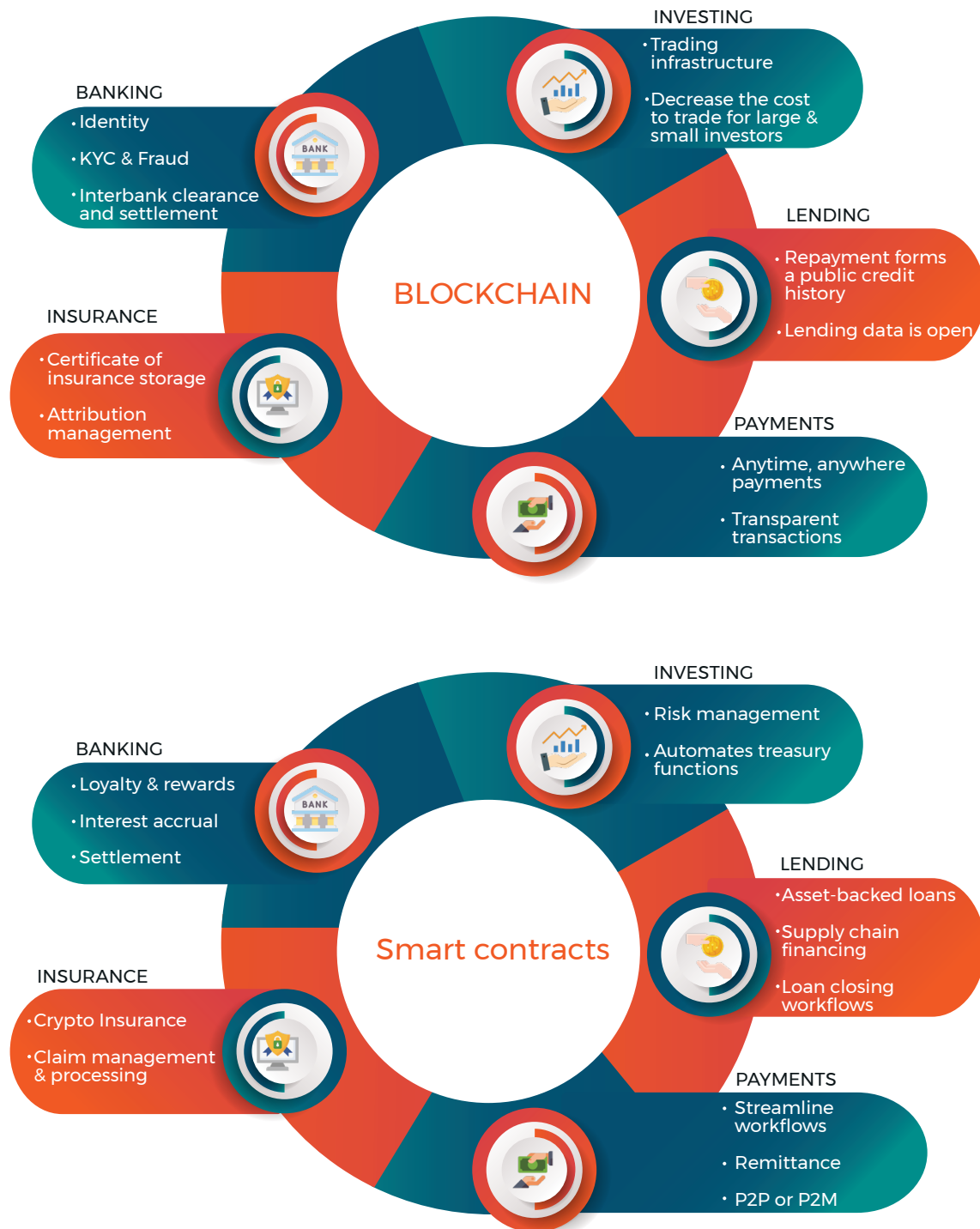
Source: IMF, 2022.

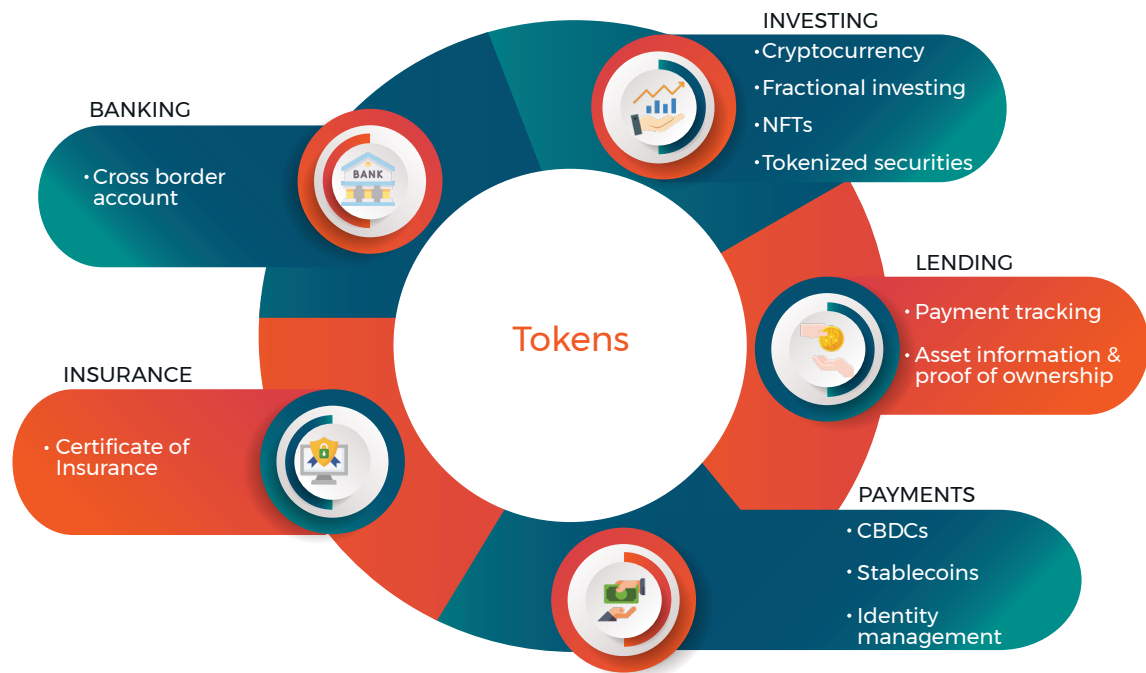
Web3 and the Financial Landscape

The concept of DeFi in Web 3.0 will have a major influence on the way financial services operate. Two key aspects of Web 3.0 will be the integration of the internet and digital payments infrastructure using different technology stacks and achieving a seamless user experience (Chia-Hung, 2022) Distributed ledgers can further help in micropayments with the service provision APIs. In the traditional payments infrastructure, micropayments failed to take off due to the poor integration of the web and the relatively high cost of the transactions.

Much of the financial services industry is built upon a trusted third party brokering an arrangement between two parties. Web3 provides a construct for the broker to be removed. According to Filipčić (2022), the potential impact of Web3 technologies (e.g., blockchain) is endless in transforming finance (DeFi), law (data privacy), research (data sharing), as well as new forms of ownership (NFTs).

Figure 4: Financial services & Web3 technologies





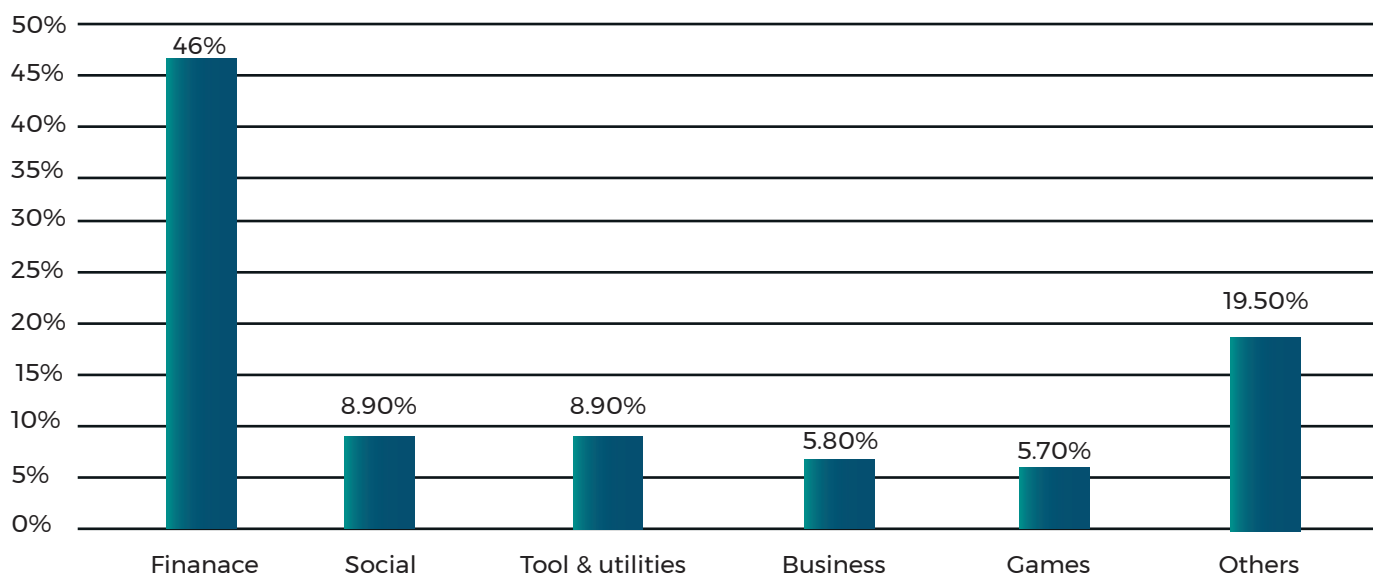
Source: Money Web3 Report (2022)

Web3 App Growth

As of May 2022, approximately 46 percent of all mobile apps that used the keyword "Web3" to define themselves were finance apps. Around nine percent of social apps, as well as tools and utility apps, used Web3 in their description or title.

Additionally, less than six in ten mobile gaming apps were reported using the keyword as of May 2022. Distribution of mobile apps describing themselves as Web3 apps as of May 2022, by category (Statista.com).

Figure 5: Web3 apps as of May 2022, by category.

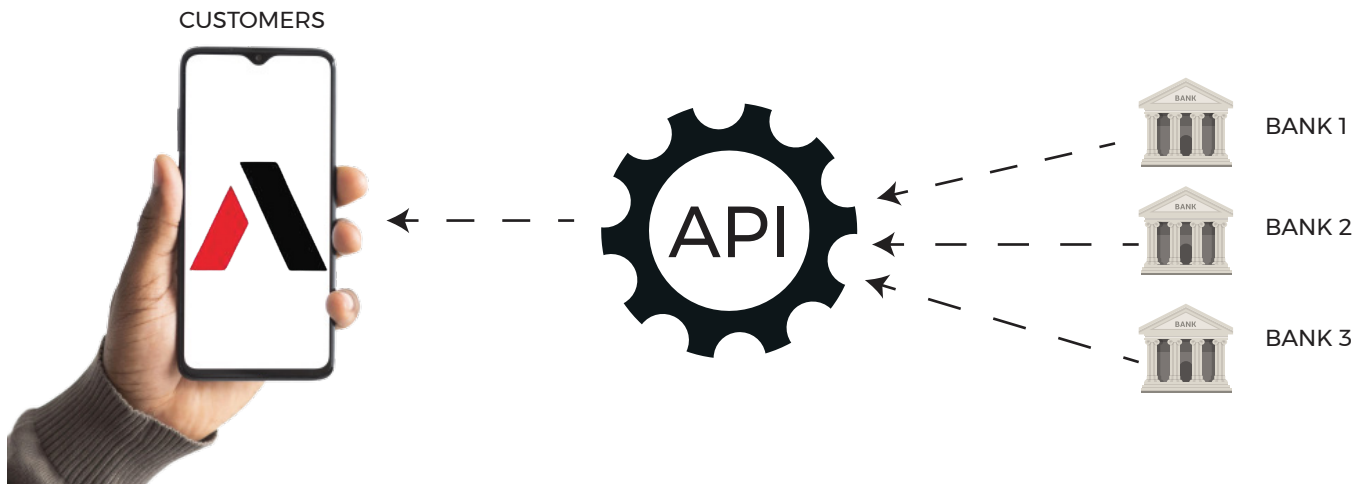


Source: Statista

Open Banking Model

The world where data is controlled and owned by a few central institutions is paving way for decentralization. Technology is reorganizing data control and giving more authority to the users than the institutions. Open Banking (OB) operates in such a way that the banking institutions disclose APIs to third-party service providers (TSPs) for creating new services, analytics, and financial products to improve customer experience. Yeh et al. (2020) argued that OB is not only meeting customer needs but also helping TSPs to create an innovative activity for exploring prospective customers and accelerating financial inclusion. In OB the consumers or users have the right to allow (permission-data) other TSPs to access their account information using open API (Almehrej, 2020). Sharing financial data can bring more diverse financial services to users, and it can also promote innovation and cooperation between banks and TSP.

Figure 6: Open banking model



Source: Agpaytech

Open Banking **Players** and **Requirements**

The OB dream depends on four key forces in the open banking ecosystem; the approved regulations from central banks and monetary unions, third-party providers such as financial technology API developers, financial and non-financial institutions, and bank customers. These four institutions' permission data, and the API technology providers. Each has a unique and sometimes overlapping role to promote financial inclusion in the open banking financial solution.

Table 2: Key partners of open banking

Partner	Requirements
User / Consumers	<ul style="list-style-type: none"> • Only keep one account password. • Decentralized access control. • Right to be forgotten. • Self-sovereign identity and personal data privacy.
Third-party Service Providers	<ul style="list-style-type: none"> • Securely provide novel services. • Provide personalized services to consumers. • Get the customer's consent.
Financial institutions	<ul style="list-style-type: none"> • Confident to share API. • Efficient and effective eKYC. • Contactless online account opening. • User real-name registration, anonymous on-chain.
Regulatory & Data Management	<ul style="list-style-type: none"> • Regulation toward diversity of eKYC with banks. • Oversight data management and histories. • Ensure privacy preserving.

How will Web3 improve the Open Banking concept?

The open banking concept is being driven by either regulatory imposed structures or market-driven factors to provide seamless and personalized services to consumers. The practice allows consumers to permit Fintech access to their information from their traditional banks through API. The concept of open banking and web3 is highly related in terms of data decentralization.

The decentralization of technologies such as blockchains, non-fungible tokens (NFTs) financial data, and new social platforms like the metaverse will enable digital economies to flourish and give greater power to content creators and consumers. The realization of web3 will provide unbounded access to information for all, and will only emerge from a mature data economy where data can be fluid, valued, purchased, and utilized seamlessly for a greater consumer experience. Web3 will influence open banking in the following ways;

Data Ownership

Web3's potential revolves around how users conduct agreements and value exchange. The conception of Web3 was born with the idea to place the control of data back into the hands of individuals. The data ownership will be decentralized, meaning that the database does not depend on a particular organization or administrator but is distributed among all peers. This will reduce data access bureaucracy, transmission challenges, and the cost of data.

Web3 will boost Open banking connectivity

Web 3.0 will enable new open banking opportunities as innovative APIs boost connectivity between Web 2.0 and its successor. The Web3 and API3 foundations eliminate the constraints that prevent the blockchain ecosystem from directly accessing off-chain data, including open banking and open finance data (Chiu et al., 2021). Hence, API3 provides decentral governed and quantifiably secure data feeds, originating from first-party providers that are operated by some of the world's premier API providers.

Incentives to provide data

The biggest technical, social and economic advances will not come by simply adopting web-compatible technologies for open data that could have been shared, with other IT technologies. Instead, they will come because a great deal more open data will be available. After all, incentives to provide open data are built-in and those incentives are supported directly by the web technologies used by the providers, brokers, and consumers of the open data (Cohn et al., 2013). Web3 applications will be motivated by the desire for transparency, and data availability through incentives such as government regulations and initiatives for open banking projects. Incentives (not limited to fee-for-data) are foundational to creating the amount of open data on the web that could transform commerce, research, learning, governing and the arts, and the financial landscape.

Enhance users' trust

Most customers are not open to how their financial institutions and oligarchy big-tech use their data. These facets of Web 2.0 left customers feeling exploited, leading to the call for change. One big change with Web 3.0 will be increased demand for transparency about how you use their information. With Web3 and its decentralized distributed ledger, blockchains ensure that no one central figure can own or control the data in its system, and consensus provides security that makes the system harder to manipulate or exploit. Blockchains record immutable transactions with date, time, and location stamps, which provides transparency across the network and creates open-record traceability that can be audited to prove a transaction's origin. Blockchain removes third-party mediation (creating a permissionless network across applications), which creates greater efficiency and speed (International Bankers, 2022; Forbes, 2022).

Web3.0 will boost Open Finance for Fintech

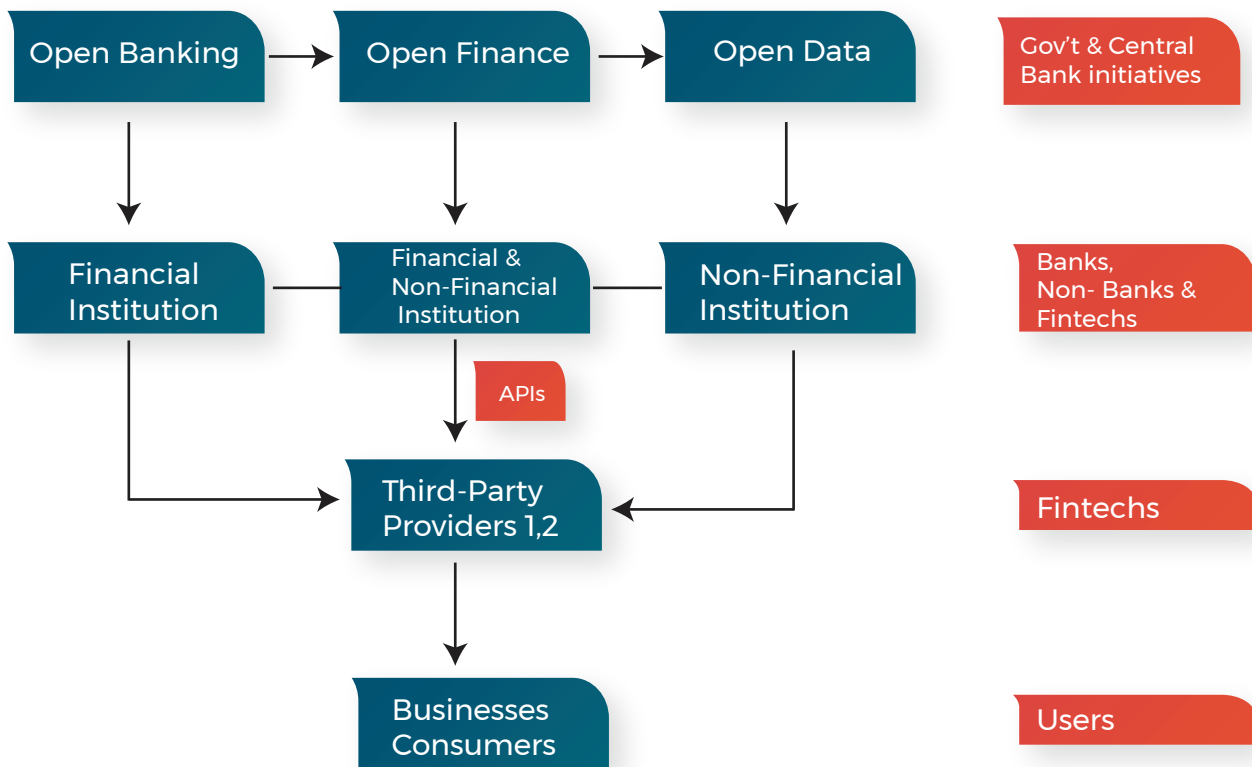
The presence of financial technology companies (Bigtech, Fintech, Regtech) is leading financial innovation and providing unimaginable services beyond traditional block payment models. Besides, with the help of web3 technologies such as machine learning, big data and decentralized ledger technology (DLT), Fintechs can build a more open and interconnected world while retaining the ownership rights of users. Fintech consumers are increasing worldwide and removing data authorization constraints will be disruptive to traditional banks and big gains to businesses and individuals in financial operations, enabling transparent peer-to-peer transactions between users. Open Banking data and capabilities will be directly available to the Web 3.0 ecosystem.

Fintech characteristics in Web3 are a blessing since they will improve the operational



efficiencies in payments, money transfers, loan sanctioning, lending and investment. Furthermore, the open data stream (decentralization) will provide more utility payment opportunities for both financial and non-financial institutions such as insurance companies, money lenders, buy now pay later initiatives, open banking projects, open finance, and open data. Figure 5 illustrates how Web3 can foster new payment models in the financial service landscape. In this scenario, the account information service providers (AISP) allow third-party service providers (through API providers) access information and provide personalized and user-need-based services.

Figure 7: Web3 and open financial service model



Source: Agpaytech

[Note: The web3 and open finance model need to be adopted by central bank and government. At the implementation level, FIs, NFIs and Fintechs collaborate to share data, whereas Fintechs provide TTPs and APIs to serve businesses and consumers personalized needs]

Key Concerns on Web3 and Open Data

The data stream for financial gains and innovative experience is the core praise from the financial perspective on web3, open data, and financial services. While data is decentralized under the web3 concept, financial institutions own and share consumers' data under the traditional open banking model. Moreover, Morris (2011) opined that integration of data is the basic foundation of Web 3.0, and by using metadata embedded in Websites, data can be converted into useful information, and be located, evaluated, stored, or delivered by software programs designed to collect information based on the users' interaction with the Web.



However, less adoption of web3 and open banking is the key problem to service utilization. Currently, the concept of web3 and open banking is not widely adopted globally. Again, most institutions and individuals are not familiar with blockchain technology or the Dapps. Considering the current circumstances, not everyone is familiar with blockchain technology or the decentralized web. Most internet users are unlikely to accept a rapid move. For the decentralized web to become a true revolution, people must first be willing to adapt (Chiu et al., 2021).

Conclusion

Web3 has a huge perspective to leverage a more valuable, user experience and open the Internet for all to grow and develop from. New firms can utilize the decentralized Web 3.0 infrastructure to develop communities centered around their brands and products, which was stressed in the earlier web versions. The existing companies can use the technology to switch to blockchain-supported ecosystems where users gain full ownership over their assets and content. The next era of technological innovation is likely to unlock tremendous opportunities for industrial, financial, economic, and social growth and development through smart data and open banking adoptions.

References

IBM (2022). Open Data on the Web: 3 Principles For Maximum Participation A Position Paper from IBM.

Cohn, J. M., Lawrence, K., & Malaika, S. (2022). Web3, Defi and the atonement of purpose: Is banking ready to answer tomorrow's questions?

Forbes (2022). Ready or Not, Web 3.0 Is Coming. Bold Banks Can Seize the Opportunity.

Goel, A.K.; Bakshi, R.; Agrawal, K.K. (2022). Web 3.0 and Decentralized Applications. Mater. Proc. 2022, 10, 8.

Almehrej, A., Freitas, L., & Modesti, P. (2020). Security Analysis of the Open Banking Account and Transaction API Protocol," arXiv preprint arXiv:2003.12776.

Zarrin, J., Phang, H. W., Saheer, L. B., Zarrin, B. (2022). Blockchain for decentralization of internet: prospects, trends and challenges. Cluster Computing, in press.

Tran, K.C. (2019). What is Web3 <https://decrypt.co/resources/what-is-web-3> (accessed on 8 October 2022).

IMF White paper (2022). Decentralized Autonomous Organizations: Beyond the Hype.

Chia-Hung, L., Xue-Qin, G., Jen-Hao, C., & Shyan-Ming, Y. (2022). Blockchain-based Identity Management and Access Control Framework for Open Banking Ecosystem. SSRN Electronic Journal.

<https://www.openbankproject.com/where-open-banking-meets-decentralized-web>.

About Agpaytech

Agpaytech Ltd. is a company pioneering in the Fintech Space with a focused approach to building robust technologies for eCommerce Card Processing Solutions for Payment Service Providers (PSPs). Additionally, we provide Compliance and Regulatory Umbrella, Remittance-as-a-Service, White-Label solutions, Foreign Exchange, Cross Border Payments, and digital currency technology. We have partnered with multiple banks, non-banking financial institutions, and corporate organizations to create a solid service delivery model for them and their customers to ease their international remittances and payments concerns.

Website: www.agpaytech.com

United Kingdom

AGPAYTECH LTD.

3rd Floor, 86-90 Paul Street

London EC2A 4NE, UK

Email: info@agpaytech.com

United States of America

AGPAYTECH USA LLC

9701 Apollo Dr Suite 100

Largo MD, 20774, USA

Email: usa@agpaytech.com