



TECHNOLOGY REPORT

ISBANK Subsidiary

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2022

TECHNOLOGY REPORT

Colophone

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Dear Readers,

We are happy to bring you together with the Softtech Technology Report, a product of months of intense and devoted efforts, in 2022 as well. Once again, we tried to keep the pulse of the technology world with the articles written by our valuable writers. We predicted the place of future technology trends on the "radar", supporting our predictions with evaluations and suggestions.

We offer you the four main headings of the 2022 Technology Report:

- > **The Future of Technologies:** Quantum Computers, Blockchain, Wearable Technologies, 5G, Biotechnology, Data Analytics, Low-Code Platforms, Artificial Intelligence, Web3, P2P Distributed Storage Systems, and Digital Identity Applications.
- > **Financial Technologies:** Finance 3.0, Open Banking, Embedded Banking, Next-gen Investment Apps, Crypto Finance, Super Apps, and Multiplayer Fintechs.
- > **Environment, Humans and Digitalization:** Sustainability Technologies, Agritech, Post-Pandemic Business Life, Digitalization in Education, CX-Changing Technologies, Digital Workforce, and Smart Businesses.
- > **Startup Ecosystems:** Ecosystems in the US, China, and Turkey, Startup Funding, Human in The Startup Ecosystem, Digital Transformation, and Social Startups.

Undoubtedly, the effort put forth by all of our writers, enabling this report to emerge and meet with you and provide full support with their valuable contributions, will be rewarded by the interest and appreciation of you, our esteemed readers.

Hoping to meet again in healthy days.



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M. Murat Ertem
Softtech CEO

Preface

While presenting last year's technology report, we believed that the discovery of the COVID-19 vaccine could offer us a new life in 2021. We hoped that a short break might drive change in the mindset of humanity. Although everyone prefers to see dolphins swimming in the Bosphorus, the mucilage in the Marmara Sea indicated that 2021 would be similar to the "following year" in Yaşar Kemal's Binboğalar Efsanesi (The Legend of the Thousand Bulls). Life blatantly made us sure that it would resume from where we left off in March 2020. A two-year period is not a long duration in our private lives. However, we cannot say that it is short, either. Considering the history of humankind, it is still a period we can consider nearly insignificant. Although we think that "these two years has affected us significantly", has life resumed from where we left off and restarted its natural flow? I believe recalling the highlights of 2021 will help us answer this question.

First, we welcomed January with an attack on the US Capitol. While many were discussing how the rise of China had failed the democracy, 2021 brought about a shocking change.

On the day of the attack, Klaus Schwab and Peter Vanham published their joint book titled "Stakeholder Capitalism: A Global Economy that Works for Progress, People and Planet". Similar to many recent books on the same issue, this book also highlights the problems arising from capitalism and the need to change it. Considering 2021 as the year that included the word "sustainability" in all areas of life, Biden returned the US to the Paris Climate Accords right after becoming president. In September, on the other hand, China pledged to stop financing new coal energy plants abroad. However, the UN's August report revealed that the climate crisis had reached a point posing deadly consequences for the world. Meanwhile, the leap in carbon consumption rates even when vaccines eased the effects of the pandemic did not draw an optimistic picture either. Moreover, the global supply network also started to face disruptions. While the US and China were racing against each other to ban companies, diplomats, and products, the US has now reached the point of not sending diplomatic representatives to the 2022 Beijing Olympics. China expanded its military pressure

on Taiwan via warplanes. America answered this move by launching a military alliance between Australia and the UK, covering the Indian Sea and the Pacific Ocean. In short, the polarization with the US has grown directly proportional to China's rise. Despite the efforts shown to make eco-friendly collaborations, concrete results are still yet to come.

On the other hand, considering the technological highlights, we can say that blockchain-based technologies made their mark in 2021. Parallel to all the global fluctuations, cryptocurrencies increased in value significantly. With the ability to be used in diverse areas, particularly in virtual environments, alt-coins provided unimaginable incomes. Decentralized finance (DeFi) products based on blockchain technology, which removes the centralized control, also stood out. By eliminating borders by its very nature, these products provided conveniences, particularly for immigrants, while leading governments to take relevant measures. In September, China banned crypto trading. As 2021 came to a close, we were introduced to upcoming crypto-related regulations in the United States. The investments made by Andreessen Horowitz, a leading venture capital company of Silicon Valley, are particularly notable in this regard. The total value of the company's crypto investments has now surpassed 3 billion USD. It has lastly invested in a DeFi startup named Goldfinch. Goldfinch provides unsecured loan solutions that do not require collateral. Kenya, Nigeria, and Uganda are the top three countries leveraging the most from the loan volume created by the company. Compared to how central governments fail to manage unsteadinesses created by capitalism in the political system, unfair distribution of

income, and the increasing number of immigration and immigrants driven by environmental issues, decentralized blockchain technologies can offer solutions.

Later on, the metaverse was among the foremost technologies in 2021. I believe understanding metaverse is through looking back to the days when computer games first entered our lives. Most of us met with computer games via arcade game centers. The majority without a computer back home had their first computer game experience via the coins purchased. The increasing number of computers in homes allowed us to create our customized characters in games. Spending hours on the computer, we pushed for the next level or tried to earn a valuable game asset. Besides, we shared the virtual assets earned with our friends. Aiming to advance in a game promptly, we bought digital assets using real money or credit card. In time, tokens transformed into coins. On the other hand, the digital assets we spent time and bought turned into assets endeavoured and earned. Those who met in the same world without borders started using cryptocurrencies instead of their credit cards. The fact that our physical workplaces and education moved to the digital environment with the pandemic allowed us to embrace the idea of creating a virtual world that mirrors our physical world. Here enters the metaverse. Moreover, we use NFTs to include our non-monetary physical assets in this virtual world. Thinking about how unmanageable the internet is via a single source, we are now working hard on web 3.0.

Our virtual world strives to overcome the challenges created by capitalism and globalization and go beyond the walls raised to stop post-globalization migration. The most

significant thing is the support given by noteworthy investors to this structure. Instead of making elongate analyses, I believe reading in social science, besides technology, and forming art-related suggestions will allow us to understand better this unsteady period that we all hardly adapt to.

Before highlighting the new books with the newly-introduced stark reality of China's rise, globalization issues, and rapidly-changing dominance center of the world, let's refer to a book that predicted many years ago that we would face these issues: "Long Twentieth Century" by Giovanni Arrighi. The back cover copy of the book best sums up our situation in 2021:

"Following Braudel's approach, Arrighi argues that capitalism, with a new hegemonic power that reconstructs economic and political networks of control, has unfolded as a succession of "long centuries", each of which produced a new world power that secured control over expanding world-economic spaces. In his book, the writer comprehensively analyzes the gradual emergence and rise of hegemonic classes and historical relations among governments' capital, power, and geopolitics, how all of these gain historical significance globally, and how different kinds of ties severely replace them."

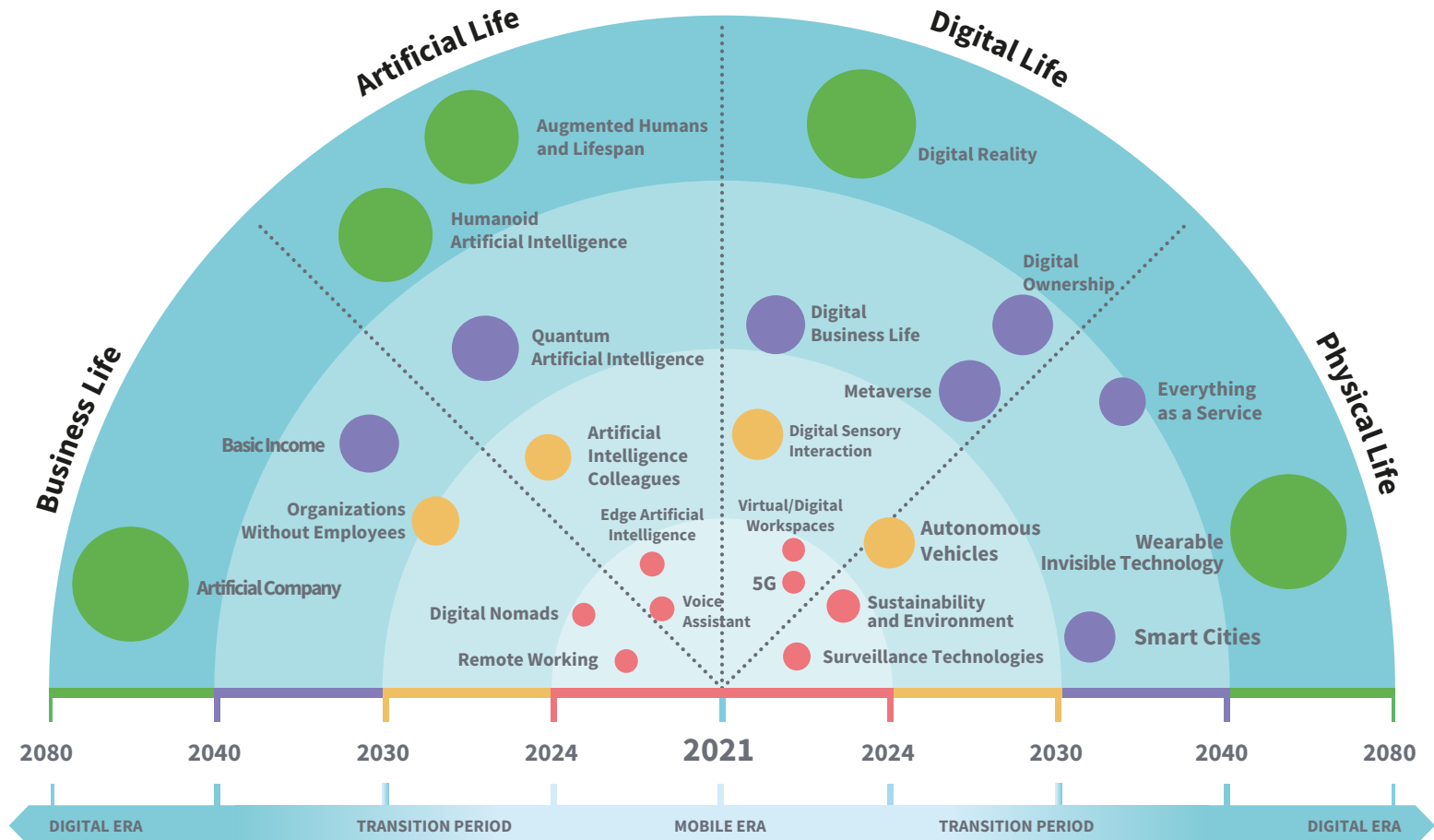
We should also note that Braudel mentioned in the quote was the founder of the Annales school, which was methodically referred to in Tarihçilerin Kutbu (the Pole of Historians) by Halil İnalcık.

Lastly, we should not ignore the space race and the providing the internet over satellites, considering how they are accelerated as technology focuses on decentralized blockchain technologies, the virtual world, and biotechnology due to vaccines in 2021. Broadcast at the end of 2021, Adam McKay's "Don't Look Up" reminded us how small our planet is and the immensity of space, criticizing our world considering our tendency to forget.

I hope 2022 will bring health and peace to all of us...



Future of Technology



Technology Radar

On the Technology Radar in the Technology Report 2021, we included and detailed the topics of Remote Working, Digital Nomads, Voice Assistants, Virtual Workspaces, Digital Reality in Business, AI Colleagues, Always Online Technologies, Edge AI, Smart Cities, Monitoring Technologies, Sustainability and Environment, Autonomous Vehicles, Flying Cars, Instant Pinpoint Delivery, Just-in-time Manufacturing, Quantum AI, Humanoid AI, Basic Income, Artificial Companies, and Augmented Human & Human Life. Since that report, these topics are still important in the past year and have increased their daily effects. Besides these topics, new ones have entered our radar, while some topics included in the previous report increased their impact.

Digital Property

The increase in the number of applications developed via blockchain networks was among the key developments of the past year. However, one of the most sensational news of 2021 was undoubtedly Beeple's artwork sold as a Non-Fungible Token (NFT) for 69 million USD. The popularity of NFTs created with some smart contract standards on Blockchain networks and owning an

NFT adoption by country in 2021

Countries and regions	% Have NFT	% Planning to buy	Forecast adoption
 Philippines	32%	9.5%	41.5%
 Thailand	26.6%	7.9%	34.5%
 Malaysia	23.9%	10.5%	34.4%
 United Arab Emirates	23.4%	11.5%	34.9%
 Vietnam	17.4%	11.62%	29.1%
 Nigeria	13.7%	21.7%	35.4%
 Brazil	12.1%	9.9%	22%
 Hong Kong	10.7%	10.4%	21.1%
 Venezuela	10.6%	13.5%	24.1%
 Peru	9.9%	14.5%	24.4%
 Colombia	8.4%	11.9%	20.3%
 South Africa	8.3%	9.4%	17.7%
 Argentina	7.4%	8.7%	16.1%
 Singapore	6.8%	11%	17.8%
 Canada	5.6%	6.2%	11.8%
 Australia	4.6%	7.1%	11.7%
 Germany	4%	3.4%	7.4%
 United States	2.8%	3.9%	6.7%
 United Kingdom	2.5%	3.3%	5.8%
 Japan	2.2%	2.4%	4.6%

Source: Finder's survey of 20,723 adults was conducted in September 2021

NFT accelerated the introduction of "digital property" in our digital lives, which we will hear more about soon. We are in a period where we are shifting from physical property to digital while digitally-born assets are rising. As a digital asset's ability to prove ownership, validity and exclusivity is recognized by mainstream manufacturers with NFTs, its usage areas and adoption will continue to increase.

With the concept of Digital Property, the methods that will determine the investment transactions made on digital assets, the owner of the original asset, and whether the digital asset is stored as it was first created will also have a legal basis soon.

Moreover, owning a digital asset has also become agentless, marking the beginning of a new era, especially for content creators. Although this ecosystem is in its early stages, it moves the engagement between fan bases and artists to a new level, especially on the side of artworks, allowing us to see the models in various concepts. These models will enable the producer to directly earn more income while providing financial benefits to the consumer who owns the relevant digital asset fully or partially. Industries such as finance, gaming, real estate, music, and sports will face radical changes with digital property.

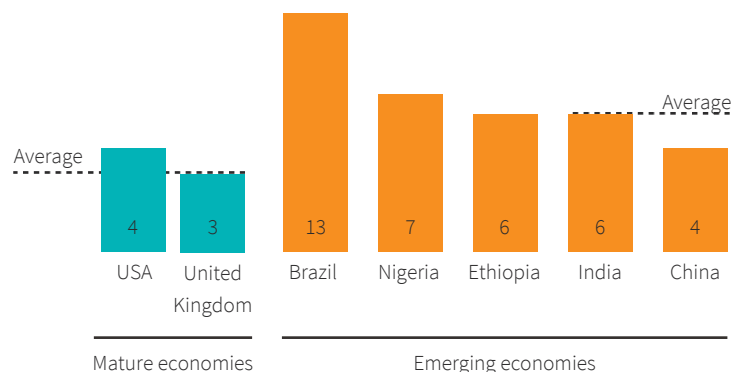
Digital Identity

Digital identity and the need to verify the real person have gained importance, especially with the increasing cyber-attacks during the pandemic. Social networks will expand the processes users

will voluntarily or compulsorily authenticate to prevent criminal networks created via virtual profiles. Besides, sharing economics apps based on the person-to-person service model, which is rapidly becoming widespread, will accelerate the popularity of digital ID use in 2022 and beyond since they are trust-based. Also, the increasing hybrid and remote working trend due to the pandemic has introduced structures where users can connect to corporate networks via their devices, becoming the centre of corporate security risks. Soon, device-independent biometric

Across our focus countries, digital ID could unlock the economic value equivalent of 3-13% of GDP in 2030

Increase in economic value from high levels of digital ID adoption in each country by 2030, % of GDP



65% of potential value could accrue to individuals in emerging economies in our focus group, making it a powerful tool for inclusive growth.

Source: Digital identification: A key to inclusive growth, McKinsey

user authentication-based digital ID apps will be intermediaries in ensuring that employees, external resources, and suppliers work securely on multiple devices and networks.

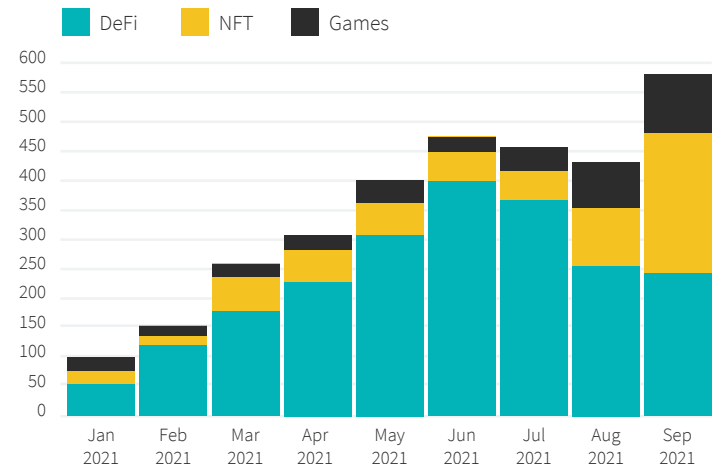
The pandemic has also rapidly changed the perception and adaptation of end-users in sharing digital ID data. As the application of the HES (Hayat Eve Siğar - Life Fits Into Home) code in our country, the ability to verify your health status information by the necessary authorities with a code or app synced to your ID before you travel has globally and significantly changed the opinions and practices on sharing personal data.

How can you verify that you are over 18 without sharing your date of birth? Similar implementations of these apps will become more prevalent in 2022 and beyond with diverse usage scenarios.

Decentralized Applications

Decentralized app (dApp), a concept popularized by distributed ledger technology (DLT) and smart contracts, offers an approach that profoundly changes today's app development architecture run on centralized servers. In 2022, we will hear its name often with web3, in the focus of disintermediation, like many other blockchain-based technology. Each dApp will grow its ecosystem with its token economy and provide new career paths for developers. Moreover, apps in categories such as decentralized finance (DeFi), NFT, virtual universes, and gaming will continue to become widespread. With decentralized apps, the use and popularity of both smart contracts and blockchain networks

New Dapps Launched by Category, 2021



Source: Dapp Industry Report: Q3 2021 Overview, DappRadar

where back-end transactions will be developed and peer-to-peer distributed data storage technologies will also increase.

In a sense, the key step that should be overcome to popularize decentralized apps, a paradigm shift for the internet, will be the user experience. Although decentralized app alternatives are developed for many apps running on central servers that are currently in use and in our lives, the main reason for their unpopularity in today's conditions is some technical competence level requirements that are still expected from the user. The demand for decentralized apps will grow exponentially with more experiences that will streamline the adaptation of end-users.

Digital Sensory Interaction

In 2013, Google published the "Google Nose" search engine and offered a service to find what you are looking for by smell. This content was prepared as an April Fool's joke under the conditions of that day. In time, however, it has turned into a reality and a sincere expectation demanded by users to take our interaction with the internet to the next level.

Beyond screen interaction, our interaction with digital environments today is limited to our senses of hearing and vision with an experience that we interact via Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). However, by the 2030s, we may have a similar experience in the physical world by making sense, smell, and even our thoughts a part of the experience via digital sensory interaction.

Soon, you can have experiences where you can smell the perfume before purchasing it from an eCommerce site, breathe the sea when you are at home, as if you were on a beach, and feel its moisture on your skin. With the development of end-user-friendly versions of equipment such as the "Tasting Device", the prototype developed at Meiji University in Japan in 2020, which allows you to taste different flavours from a device you touch with your tongue, new examples that you can taste before ordering also emerges.

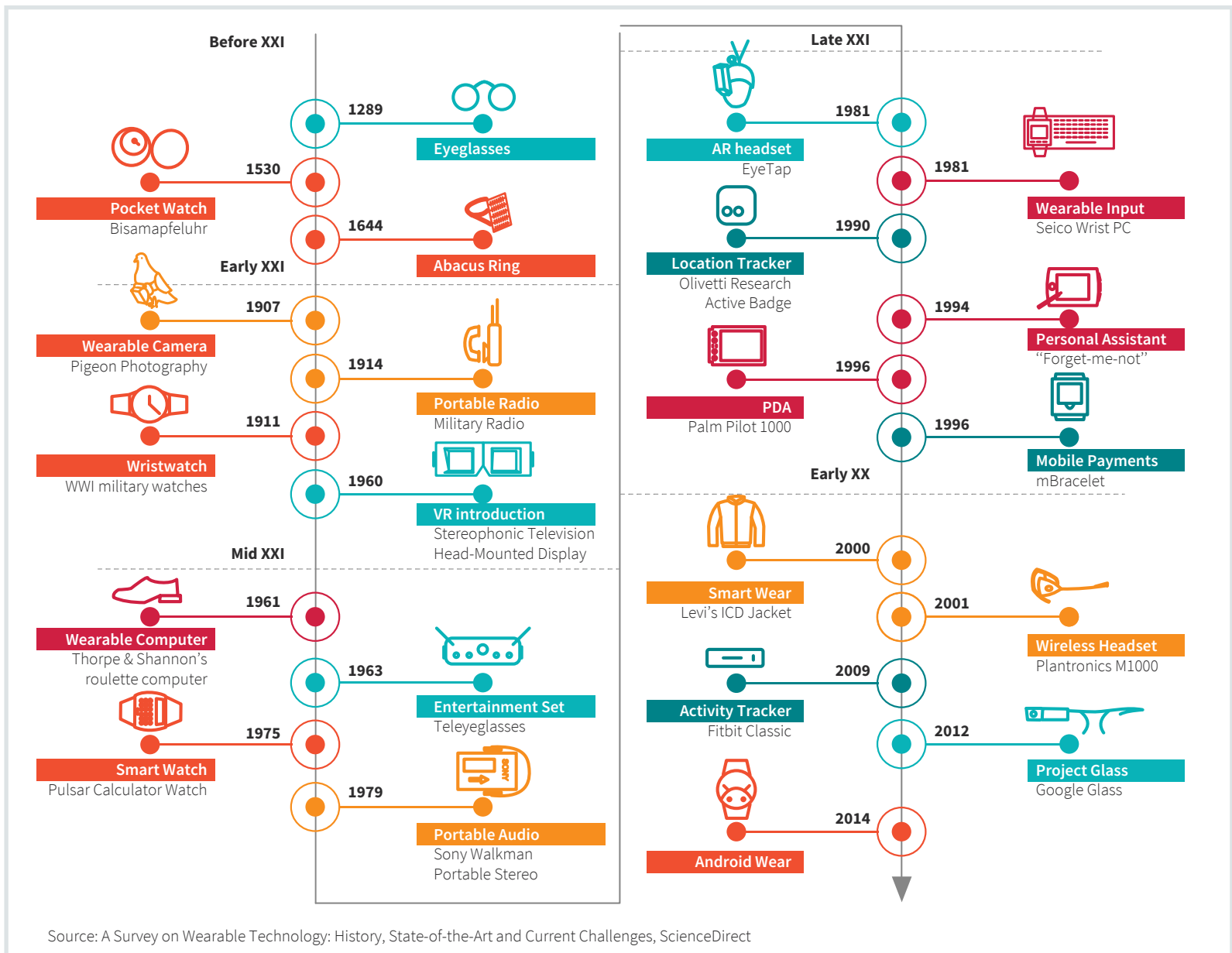
The concept of "Augmented Human" supported by the technology included in last year's report, next-gen sensors and hardware, 5G infrastructure, and Brain-Computer Interfaces applications will develop and cooperate to deliver all these experiences.



Wearable Invisible Technology

Wearable technologies have entered our lives in recent years, including smartwatches, VR headsets, smart headphones, and rings. These accessories already affect many of our behaviours, from our ways of conducting business to determining our sleep patterns. However, we do not consider the experience with all these wearable technologies a part of our body. Thus, they turn into removable devices we interact with. Thus, although the data obtained from wearable technologies turn into valuable information, there are still missing points in making sense of it end-to-end.

Wearable invisible technologies formed by transforming wearable technologies into "invisible" refer to technologies that operate as a part of our body. Investments have been made in this area for a long time, especially in the healthcare industry. With the development of micro-sensors and the emergence of ideal communication



methods and protocols, personal usage areas will also become widespread. For instance, when "Smart Tattoos", which are also known as "Epidermal Electronic Systems" scientifically and have been studied recently, started to enter daily life, you can change the song you are listening to, turn on the coffee machine by touching a personalized tattoo with the design you want, or order bread without needing an external device. Moreover, touchable electronic fabric and smart textile areas are also growing rapidly. Shortly, we will include technological criteria such as chipset and connection capabilities while buying clothes, besides factors such as pattern, size, and colour.

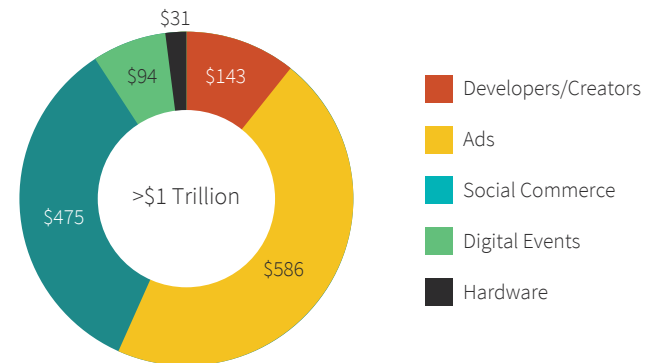
After the 2040s, using an external mobile device to communicate with another person and the ability to communicate from body to body over the Body Area Network, all these invisible wearable technologies will be a part, will be possible.

Virtual Universes

Considering digital property and ID, web3 & decentralized apps, digital sensory interaction, and wearable technologies, is there a place where all they work together? The answer is "yes": Virtual universes, or metaverse, its popular conceptual name.

Many have learned the work on the Metaverse upon Facebook's announcement to change its umbrella company name to Meta in late October 2021. However, it has been advancing with increasing momentum in the last few years. In a podcast he joined in July, Mark Zuckerberg stated that they are working on the Metaverse. He

Metaverse's Potential Total Addressable Market (\$BN)



Note: All verticals based on 2020 estimates except for "Hardware" which uses a 2021 estimate.

Source: The Metaverse Takes Shape as Several Themes Converge, Global X

defined it as the successor of the mobile internet era. He addressed it as an experience where activities such as dancing and fitness, which we cannot do via two-dimensional applications or a web page, can be done with others. The critical point here is whether a single company can develop the concept of the Metaverse. Thus, various working groups and consortia have been established. These groups aim to establish procedures and standards on critical issues such as economic opportunity, privacy, security, equality, inclusion, and communication among virtual universes. Although there are currently virtual universes that operate independently of each other and have their dynamics, these virtual universes, at one point, will be able to communicate with each other, enabling a "Metaverse" where various virtual universes work together.

Blockchain-Based Virtual Economy Segments

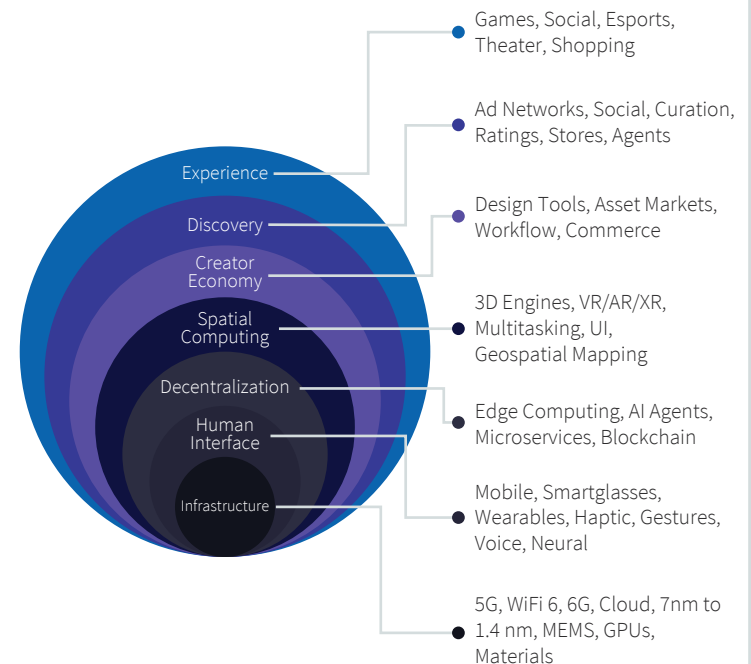
Self Custody & Access – Wallets/Front End Applications				
Agents				
Decentralized Finance (DeFi)	NFTs-Sovereign Virtual Goods	Decentralized Governance	Decentralized Cloud Services	Self-Sovereign Identity
Aggregators	Minting Houses	DAO Frameworks	Storage	DIDs
DeFi Primitives	Marketplaces	Voting Mechanisms	Compute	Verifiable Claims
Oracles	Token Standards	Staking & Slashing	Databases	Creator Coins
Data	Hybrid NFT+FT		Query & APIs	
Marketplaces		Multisignature Wallets		
Units of value – “Internet Money”	Physically Redeemable NFTs	Community Audits		
Programmability Layer				
Transaction Layer				
Peer-to-Peer Networks				

Source: Grayscale Metaverse Report

After making such a global impact, this concept has also affected the investment world. While direct investments to software and hardware manufacturers that create virtual universes and mediate their use have increased, Metaverse-focused investment funds have also been issued. Shortly, we will see new investment products that focus on virtual universes. However, as the use of virtual universes increases, related DeFi products will be in greater demand than traditional methods. Virtual universes are creating their economy and ecosystem rapidly and intensely. There will be

changes in approach within this value chain on many issues such as infrastructure and experience design.

The Seven Layers of the Metaverse



Source: Building the Metaverse, Jon Radoff

However, we need to focus on the concept of "Creative Economy". Those who can produce digital assets and experiences, including a poster design, 3D objects, musical artworks, sound effects, game development, small virtual universe add-ons, and video content, in a model without intermediaries and with decentralized production and consumption, or who invest their time in a game or virtual universe in the "Play to Earn" model receive financial rewards by doing what they want to do. Those who develop tools

and training for content creators will also get a significant share of the pie.

Organizations Without Employees

Although working with individual freelancers, who were not affiliated with a company, was not preferred for many institutions, it has recently become an attractive approach. Increased with the pandemic, the need for agility and the difficulty of financial management in an environment of uncertainty opened up companies to the business model with temporary work teams positioned around a reduced kernel staff. Moreover, digital technologies have allowed small companies to access the vast know-how, talent pool, and financing opportunities that were previously only available to large companies, making them robust against the big ones.

Considering the employees' side, career is now associated with individuals' skill set, experience, and work environment, rather than being a concept defined by companies.

Looking at this figure, we will see that by 2030, zero-employee business models, where freelance teams consisting of talented individuals who are professionals in diverse fields unite and produce value, will be adopted, while the regular employee concept will vanish. Moreover, decentralized autonomous organizations (DAO) and the crypto finance ecosystem will take the types of assets obtained in return for work beyond being merely fees, besides business models that will change profoundly.

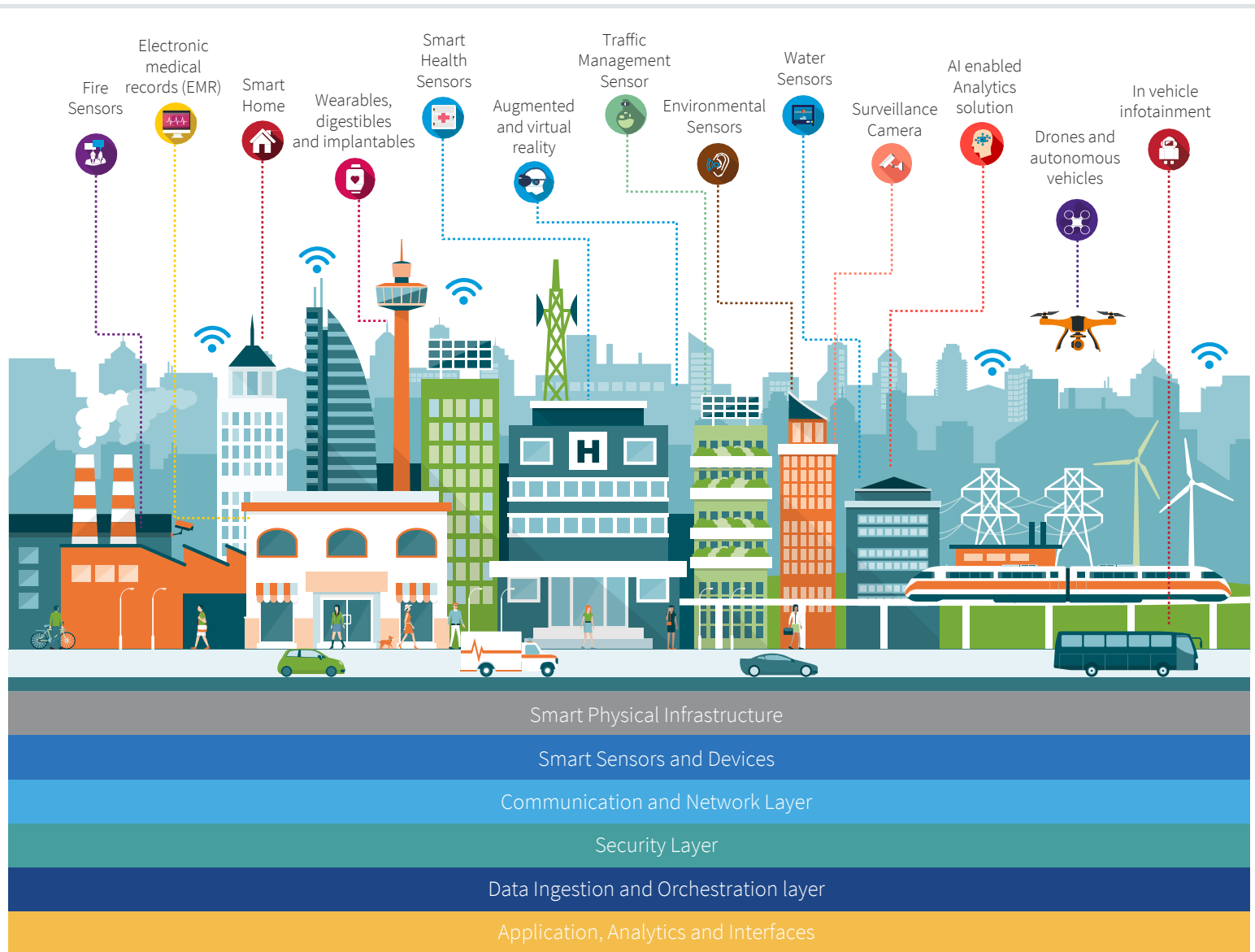
Smart Cities and Businesses

In the future of cities, transforming into smart cities is now moving from a "better-to-do" approach to a "must-do" period. Especially in the post-pandemic period, focusing on the city's inhabitants, inclusivity, creating evidence-based solutions, and putting efforts to increase the life quality will replace prioritizing technology in smart city practices and implementing new technologies with experimental applications with limited gain. In smart city practices, city managers will also focus on revenue-generating service model opportunities via collaborations with smart businesses to overcome the financial difficulties in city budgets. Formed by the city's inhabitants, administrators, and NGOs that make decisions and join cultural, economic, and ecological life together, the "Open City" model will also become widespread in the coming years. However, 5G infrastructure's proliferation is still required to accelerate smart city practices. Data management and analysis,

Centralized organization vs Decentralized organization

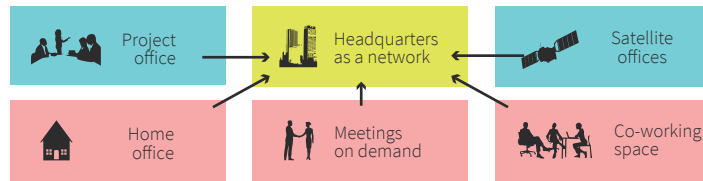
Centralized Organization	Decentralized Organization
Specific members make decisions on the network	Every token holder entitled to take decisions
Employments contracts are legally enforced by the legal system of the respective country	People interact based on a self-imposed contract.
People hierarchy from top level to bottom level	Every user works independently

Source: Decoding Decentralized Autonomous Organizations (DAO), BlockchainSimplified



Source: Road to sustainable smart cities: Challenges, opportunities and emerging trends - KPMG

Headquarters-as-a-network model



Source: A Framework for the Future of Real Estate, World Economic Forum

next-gen sensors to collect this data, AI, privacy, and security will be other prominent issues in future practices.

On the other hand, mobility is the key topic for the inhabitants of cities and smart city practices. Since millions of people in big cities switch locations to work every day, mobility will remain at the top of the priority list. Thus, studies on the optimization and diversification of vehicles will increase.

Besides businesses that support hybrid or remote working models, countries will also launch applications, such as Barbados' remote work visa and Bermuda's digital nomad program, to contribute to the urban economy. Office approaches of businesses will continue to change by focusing on people considering economic conditions, contributing to the emergence of sustainable cities and enterprises.

Sustainability and Environment

While moving from 2020 to 2021, societies wished to leave the pandemic behind and return to "normal" life. However, that didn't happen. While the pandemic continued with variants, natural disasters such as disastrous fires, floods, and earthquakes affected

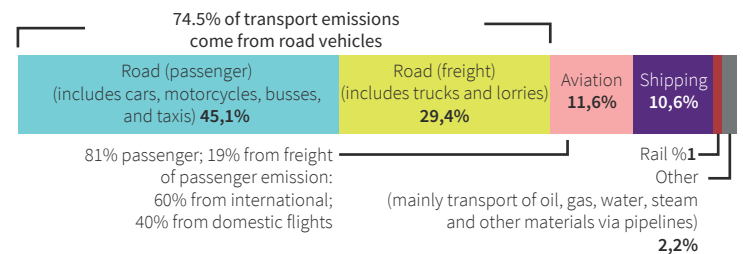
life deeply due to global warming and climate change. In this period of global crises, taking eco-friendly actions for a sustainable future with increasing awareness will be a priority for individuals and institutions in the upcoming years.

Considering the reduced human mobility between locations, changing consumption habits and expectations, and decrease in carbon emissions during the lockdowns in the pandemic period, focusing on how to maintain the gains achieved will be necessary. Adaptation to sustainable environmental requirements will require a significant change in today's habits. Thus, "adaptation" will be the competence that will make a difference for individuals and institutions.

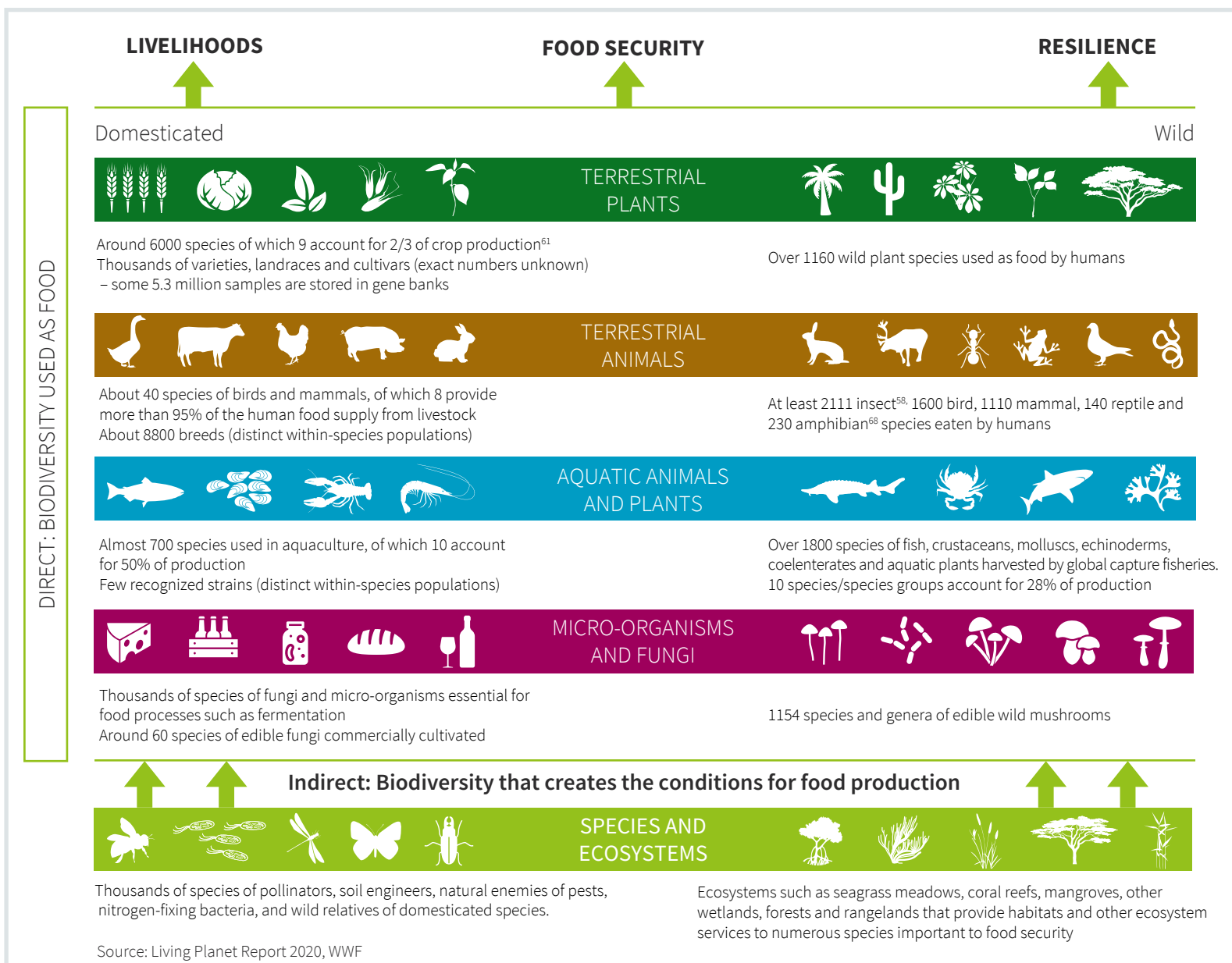
With carbon footprint and water footprint tracking, being carbon-negative will shape institutions' plans and enable sustainable companies to excel in the competition. Moreover, food safety, biodiversity, and waste management will also be on the agenda of the 2022-2030 period considering sustainable environmental practices.

Global CO₂ emissions from transport

This is based on global transport emissions in 2018, which totaled 8 billion tonnes CO₂. Transport accounts for 24% of CO₂ emissions from energy.



Source: Cars, planes, trains: where do CO₂ emissions from transport come from?



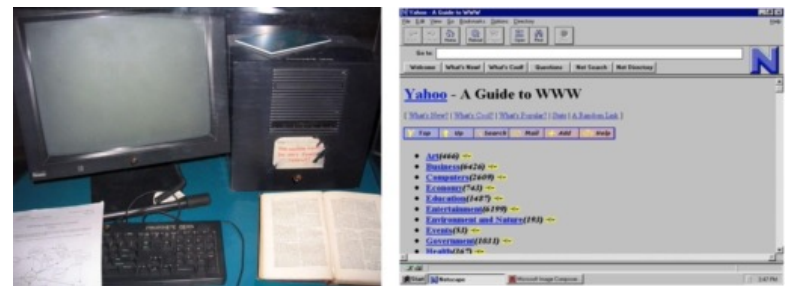


Burak Arık
Maxitech CEO

Who Will Be the Winners of Web3?

When I started to study computer engineering in 1997, we were using Netscape Navigator at our university's laboratory for browsing web pages. Back then, all the web pages combined were like today's Wikipedia. Namely, they were usually HTML pages with static content that we could only read and not interact with. Although Web1.0 provided an open environment, only a few people had sufficient technical know-how to share and create content. While at our homes, there was a world where we could go online via dial-up modems with unique voices, unforgettable for our generation. Connection speeds were incredibly slow as the infrastructure hardly allowed us to go beyond these static pages. Servers consisted of standard computers in a distributed manner, without gathering in specific centres. Back then, warning labels similar to the one, which stated "This machine is a server, please do not turn it off!" on the computer of Tim Berners-Lee, known as the web's inventor, were common. The companies that developed the web page provided the value and content. Thus, they were the

ones earning money. This period between 1990-2005 is referred to as Web1.0, where the Web was read-only.



On the left, Tim Berners-Lee's Web1.0 Server

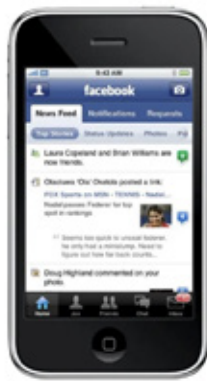
On the right, Yahoo.com on Netscape Navigator

Moving to 2004 and 2005, we entered a new era with the launch of social media, cloud computing, mobile technologies, and increasing connection speeds. With Facebook, which was made available exclusively to Harvard students in 2003 at Harvard University under the name Facemash and then decided to be launched worldwide in 2006, social media met with large masses globally (founded in Turkey in 2003, Yonja had actually stepped into this field before Facebook, very successfully). Then YouTube and Twitter entered our lives, in 2005 and 2006 respectively. With the launch of the iPhone in 2007 and advancements in telecom

infrastructure such as GRPS/EDGE, we have become able to stay online 7/24. Later, the announcement of Apple's App Store in 2008 introduced mobile applications to our lives. With these mobile apps that improve the user experience (UX), the use of the web on mobile devices increasingly accelerated.

Web2.0 - Facebook's mobile app running on iPhone 3GS

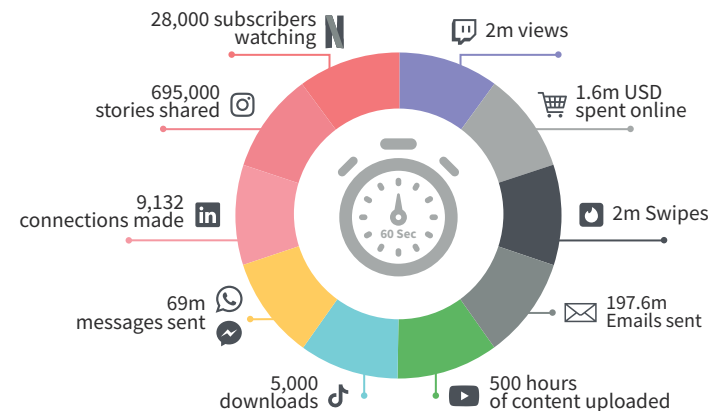
Users could both consume static data on web pages and easily create content without needing technical knowledge. Namely, the read-write structure replaced the Web1.0's read-only. Another transformation was brought by cloud computing. Consisting of regular computers, servers were replaced by specialized, powerful servers located in silos in data centres. The centralized structure displaced the distributed. The term Web2.0 refers to the period between 2005 and today. So what is the problem with Web2.0 that we are now talking about Web3.0? We have mentioned that the companies that developed the web pages created the content and earned the money in Web1.0. In Web2.0, however, the technology giants have the lion's share of the earnings even though the users create the content. Monetizing the content, we create and the personal data we share with them, knowingly or unknowingly, these companies have become the world's largest companies. As of the time of writing the article, Google is the 3rd and Meta (Facebook) is the 7th largest company in terms of their market cap.



Let's think about the personal data we hand over while creating a Google or Facebook account. We provide a lot of information such as our name, age, photos, interests, and friends. Besides these, these companies also collect a lot of information "without our knowledge". For example, Google tracks the history of the sites we navigate on Chrome, the devices and apps we use, and the searches we make on Google.com via cookies or its products and services. While signing up for these websites, we actually allow this by accepting the terms and conditions that we rarely read. According to a 2019 research conducted with Americans, only 22% is the rate of those who say they often read these policies. The same also applies to cookies. Generally, we want to promptly click "accept all" and remove that annoying window.

A Minute on the Internet in 2021

Estimated amount of data created on the internet in one minute



About one-in-five Americans say they always or often read privacy policies before agreeing to them

% of U.S. adults who say they ___ read before agreeing to a company's privacy policy when they are asked to



NET Always or often reads privacy policies: 22%

Note: Those who did not give an answer or who have never been asked to agree to a privacy policy are not shown.

Source: Survey conducted June 3-17, 2019.

"Americans and Privacy: Concerned, Confused and Feeling Lack of Control Over Their Personal Information"

PEW RESEARCH CENTER

As in the Facebook example, the personal data obtained by Web2 companies via various methods creates a unique environment for companies to make targeted advertisements. Those seeking to advertise can utilize 98 different data such as age, gender, location, education level, and language. Considering these data points, is the related person in a long-distance relationship? Did he/she move to a new house? Is he/she expecting a child? What is his/her political view? Where would he/she go on vacation? More detailed information such as these is also included. Besides using this data on their platforms, Web2 companies also share it with their partners. I believe we all remember Cambridge Analytica, which manipulated American voters with targeted Facebook data in the US election.

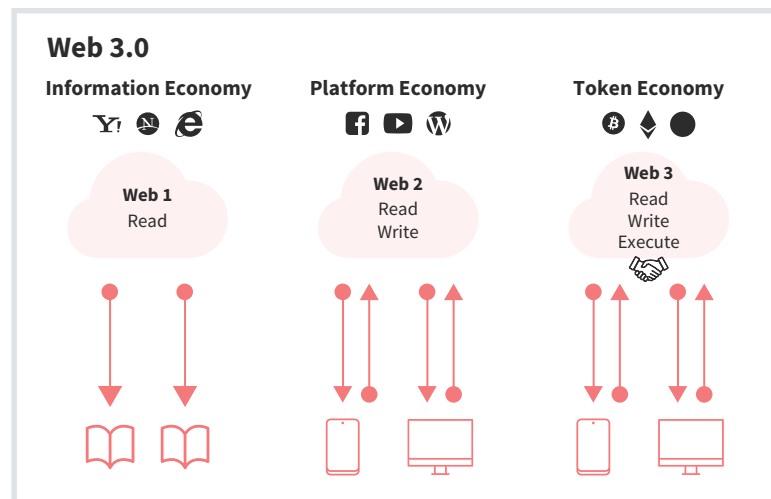
However, it is known that Web2.0 companies have never claimed to be non-profit companies. They all pay salaries to thousands of employees and allocate billions of dollars for their infrastructure. For example, Facebook is expected to spend 34 Billion USD

capex in 2022. Although we, as users, are dissatisfied about our data being used, expecting to receive these services from these companies "for free" is inconsistent with the realities of life. As cliché as it may sound, you are the product if the product is free in Web2. Knowingly or unknowingly, you allow these companies to earn money via the personal data you share.

Highlighting its sensitivity to personal data at every opportunity, Apple shook the mobile marketing world by announcing the ATT (App Tracking Transparency) feature with the iOS 14.5 version. For the first time, this version has left the decision to share to users with the "Ask App Not to Track" dialogue box when a newly-installed mobile application wants to access data about other installed apps. Earlier, this setting was automatically assumed to be active without asking permission. The research conducted by Flurry Analytics showed that only 23% of the users who encountered this question provided permission. Many wonder whether Google will introduce a similar feature. We become even more disturbed by ads, incoming spam e-mails, and phone calls each day. Now, it is not surprising to see a product we are interested in on various websites and apps we visit. Moreover, we have started to hear more news that these companies we trust and entrust our data get hacked. In the last year alone, 37 billion user records were leaked due to the 4000+ data breach incidents in the USA. Although Apple's ATT is a right and bold move to address users' demand for data privacy, more remains to be done.

Another significant user demand is to share the profits between the company and the user more equitably. While the creator

economy is increasingly growing, millions now regard this business as a means of living. In 2020, the pandemic led to an explosion in the number of content creators. Continuing in 2021, this growth increased by 48% compared to the previous year. Users have started to demand the fair distribution of the revenue obtained from the data they share and the content they create, rather than giving the most of it to companies. Now, let's consider a system where the real data owners are the users on an open and distributed system and earn money by sitting in the driver's seat in return for the data/content they share with their consent. How does it sound? Welcome to Web3.0!



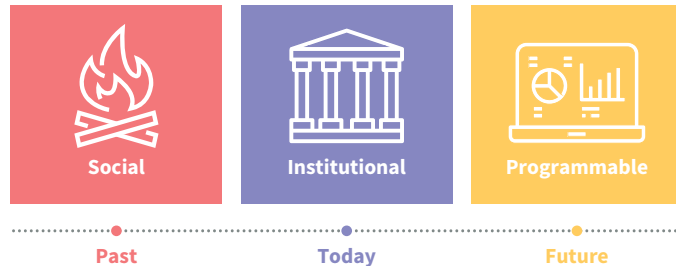
Although we are talking about Web3.0, it does not necessarily mean the end of Web2.0. However, we see that Web3.0 apps are expanding rapidly to large masses. These apps enable the creation of "open", "agentless", "trustless-permissionless" networks. Web3 combines the best aspects of Web2 and Web1, creating a new

web concept. It redefines Web1's distributed structure in a way to be managed by the community while combining it with Web2's modern technologies that provide a rich UX. Well, how did this become possible? Considering the last decade, we have seen dramatic increases in the processing power of the computers we use every day. Offering rich UXs we are used to, applications can now run directly on these devices. This paved the way for Edge Computing and Serverless Computing. I think the words, such as agentless, distributed, open, and serverless, mentioned in the above sentences reveal the most fundamental technology underlying Web3.0. Yes, you are right. We are talking about Blockchain.

Allowing users to interact directly with each other without the need for a server, intermediary, or trust authority, blockchain is a private computer accessible to everyone but owned by no one.

Here, establishing the element of trust is critical. Intermediaries acting as a notary public just for this purpose can be eliminated only by doing this. While the element of trust was previously a social phenomenon that emerged over time, today's institutions are responsible for establishing it. However, blockchain mathematically secures the element of trust on crypto networks via various methods such as proof-of-work and proof-of-stake, although it varies from network to network. Starting from individuals/software, smart contract blockchain networks such as Ethereum establish the element of trust via the "programmable trust" from the bottom up, instead of from top to down, that is, from institutions to individuals. Ethereum is a globally-distributed computer owned and operated by its users.

Establishing the Element of Trust



Establishing the element of trust

However, traditional servers are components managed by third parties that users entrust their data while carrying the risk of breakdown and getting hacked occasionally. Perhaps for the first time in history, Blockchain offers a distributed, consistent, and cross-country experience where applications running on it will never break down. Web3 is the new Internet owned by its users and orchestrated by tokens based on Blockchain technology. Ownership and control in Web3 is distributed. By owning tokens, users can hold parts of Internet services.

Web2 requires us to create a separate user name, password, and profile data for each service we use. However, we are all tired of creating different accounts, finding diverse and complex passwords, filling out similar forms repeatedly. Although we wanted to use the service, sometimes we even changed our way because we did not want to fill out the registration form or were too lazy to do it. Although social login methods such as "Login with Facebook" and

"Login with Google" were introduced, they still needed us to trust a centralized company, increasing our dependence to a single point. Here, that's what Web3 promises to change. Keeping all their data in a "wallet", users can access all the different services via their wallet. What we need is a decentralized, distributed, and secure authentication mechanism that we fully control. Wallets such as MetaMask, WalletConnect, and Coinbase Wallet, which we can generate and easily manage our private keys on the Ethereum Blockchain, now enable access to all Web3 services via a single wallet. MetaMask has increased the number of its users by 420% to 21 million between April 2021-November 2021, revealing the development speed of Web3. Web3 services can always access the single and most up-to-date version of the data in our wallet, as much as the permission we give via our private keys. However, among the problems of the wallet approach is that it is hard to read and share the wallet addresses created due to being too long and complex. However, the ENS project also addresses this issue. If you want to get a .eth domain name for your wallet addresses, you can use the Ethereum Name Service (ENS).

ZKP (zero-knowledge proofs) is among the significant technologies brought by Web3 concerning privacy. In a nutshell, ZKP answers the question, "How can you prove the information you know without providing it to someone else?" ZKP protects privacy by allowing parties in the blockchain network to trust and approve the transaction details without seeing them. Although I will not go into its details in this article, I believe following this subject closely is useful.

Web3's basic principles are briefly:

- The system works in a distributed manner without the need for authorities to control the corners.
- The element of trust is the mathematics in crypto networks, not the individual and institution.
- Management is in the community, not in the control of an individual or company.
- Services can be used on the network without receiving permission.
- No one can block you, censor you, or block your access.
- Payments are made via tokens.
- With smart contract protocols, almost any app can be programmed.
- Revenue goes to the creator. This individual can be an app developer or a content creator.

	Web 1.0	Web 2.0	Web 3.0
Engagement	Read-Only	Read-Write	Read-Write-Execute
Product	Their Product	You Are the Product	Your Product
Infrastructure	Personal Computers	Cloud, Mobile	Blockchain
Control	Distributed	Centralized	Distributed
Organization	Companies	Platforms	Networks

Well, which technology products are launched with these principles? Let's take a look at them:

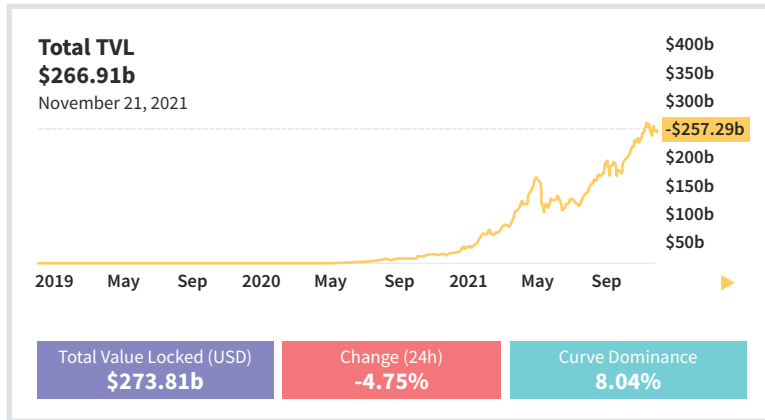
- Digital assets and NFTs
- DeFi (Decentralized Finance)
- Tokens
- Blockchain platforms
- DAO (Decentralized Autonomous Organizations)

Acting as a digital ownership certificate, NFTs (Non-Fungible Tokens) reinforce Web3's claim that "revenue goes to the creator". For example, with NFTs, artists directly earn money for the digital artworks they create. These productions can be artworks or digital assets such as photographs, codes, texts, game objects, and administrative authority. Exceeding simply being unique and collectable, these digital assets can be used in Metaverses. Moreover, the outlook becomes even more interesting when they become working objects. For example, a virtual shop in Decentraland, a Metaverse, was bought for 2.4M USD last month. In Sandbox, another Metaverse, the most "cast-off" real estate price starts at 25K USD. Making a tremendous effect by changing its name to Meta, the world giant Facebook's bold step gives us clues about the world that awaits us in the future.

Non-NFT tokens, that is, interchangeable tokens with standard values, are another player in Web3. For example, you can exchange one gram of gold for another, or 1 Bitcoin is worth the same as another 1 Bitcoin with the ability to be exchanged. Namely, cryptocurrencies are means of payment in Web3.

Another key topic is DeFi. Based on Web3's distributed and agentless principle, the number of DeFi apps that aim to provide financial products and services without banks is increasing rapidly. The widespread use of faster and inexpensive protocols such as Solana, Avalanche, and Cardano instead of the Ethereum smart contract protocol with high transaction costs (gas fee) creates a breakthrough in DeFi. Accordingly, while the total value locked (TVL) hidden in DeFi applications was 1 Billion USD on June 1,

2020, it has increased 270 times to 270 Billion USD as of November 25, 2021.



Another player we should mention related to Web3 is DAOs. We can liken DAOs to digital cooperatives managed by their participants via governance tokens. For example, ConstitutionDAO, among these cooperatives, participated in the auction of the famous auctioneer Sotheby's for the first copy of the American Constitution. Although ConstitutionDAO collected an average of 206 USD per person from over 17,000 participants via \$PEOPLE token, which it uses as a payment tool, it provided clues about how stronger future digital cooperatives can become despite losing the auction.

Let's look closely at unit economics in Web3. We have mentioned that the business models of Web2 companies are based on ad revenues. Similarly, Web2 startups trust ads to acquire new users to grow. However, Web3 here provides a different approach. Instead of the central companies, the revenue is distributed to the users/developers who create the network at the edge. Thus, Web3



ConstitutionDAO (👤, 📁)
@ConstitutionDAO

...

Community: We did not win the bid for the copy of the U.S. constitution.

While this wasn't the outcome we hoped for, we still made history tonight with ConstitutionDAO. This is the largest crowdfund for a physical object that we are aware of—crypto or fiat. We are so incredibly grateful to have done this together with you all and are still in shock that we even got this far.

Sotheby's has never worked with a DAO community before. We broke records for the most money crowdfunded in less than 72 hours. We have educated an entire cohort of people around the world – from museum curators and art directors to our grandmothers asking us what eth is when they read about us in the news – about the possibilities of web3. And, on the flip side, many of you have learned about what it means to steward an asset like the U.S. constitution across museums and collections, or watched an art auction for the first time.

We had 17,437 donors, with a median donation size of \$206.26. A significant percentage of these donations came from wallets that were initialized for the first time.

You will be able to get a refund of your pro rata amount (effectively minus gas fees) through Juicebox. Please expect more details from us about this tomorrow – our team has not slept in the past week, and we are giving people the night to get some rest before we're back at it tomorrow AM.

Every one of you were a part of this. We want to also thank our partners in this work: Alameda Research, Endowment, FTX US, Juicebox, Morning Brew, and SyndicateDAO.

expects users to contribute to the app growth as the real owners, namely, shareholders. Consequently, the dependency on the ads most trusted for growth is reduced. Instead, tokens turn into marketing tools. The owner of the token becomes an advocate for the application by carrying the financial risk of the business. Fair distribution of tokens is a critical issue in Web3. A genuine community can flourish only when property rights are equitably distributed based on the efforts of the individuals creating the network. Bitcoin is among the best examples of this issue. This network is owned mainly by its participants and defended on every platform, reaching a size of trillions accordingly.

Let's try to explain this via some examples. Facebook, Instagram, and TikTok did not share any revenue with content creators as social media platforms. If we call this a take rate, it was 100%. However, Rally, Mirror, and BitCloud, Web3 social platforms, have a take rate of below 10%, namely, 90 of every 100 units of earnings is given to the content creator. Let's give another example from the gaming industry. Although the players create a great value via the network effect by playing games, they do not receive any share from the revenue. As a Web3 gaming platform, Axie Infinity is among those that change this situation. Developed by Vietnamese Sky Mavis studios, this gaming company gets only 4.25% of its revenue, distributing the remaining back to the players. The revenues obtained from the games are used to fund other peer-to-peer players. Based on CNBC's news, it has actually become the primary source of income for many Filipinos. My last example is from the telecom industry. Helium includes its users in the Blockchain network via radio communication over a Hotspot device installed in their houses. Thus, it provides the Internet for IoT devices by eliminating the need for a centralized telecom company while users' revenue is shared. Soon, we will hear more examples like these.

We can adjust the sentence "Your (profit) margin is my opportunity" shared by Jeff Bezos, the founder of Amazon, in 2012, to today as "Web 2's take rate is Web 3's opportunity." We are experiencing highly interesting days to witness and be a part of. Web3 contains significant opportunities for everyone. Thus, we can be the pioneers of transformation in this changing world by developing our skill-set under Web3.



Salih Cemil Çetin

MEX Digital Blockchain & Cryptocurrency Developer

If we were going to unite the system, why did we distribute it in the first place? Blockchain As A Service (BaaS)

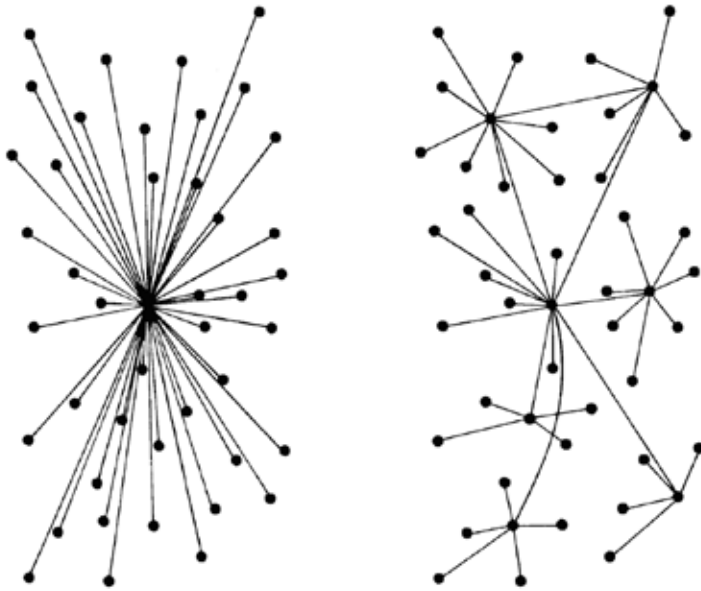
12 years ago, Bitcoin entered our lives with a clear message: A decentralized world is possible. Although decentralizing the end-to-end value transfer was considered to be designed to eliminate the existence of reliable third stakeholders, it was actually an



innovation served to us on a silver platter with the ability to shake the functioning of many industries at their core. So what was behind this Bitcoin-type decentralization? Or what did it bring about? I believe it would be better to touch briefly upon some features, the foundation of the blockchain philosophy, which will be the basis of our article's next part.

Cryptology: Here, the primary concern is the concept of trust. Or distrust. It depends on how we handle the issue. Let's consider this scenario: We ask our friend to send us a photo taken with his/her mobile phone. This photo has no monetary value. Thus, we will both have a copy of the photo once it is sent to us. Now let's consider the same scenario where our friend will send us money via a mobile banking app. After receiving the money, we need to ensure that the money is no longer with our friend. If there isn't any intermediary institution, who is the trust center that will verify the accuracy of this information on the blockchain? Actually, everyone. This leads us to our next discussion topic: the distributed structure.

Distribution: The concept of Distributed Ledger Technologies (DLT) can be shown as a structure that will reveal blockchains more comprehensively. Having all transactions on the network distributed



eliminates potential successful attacks on a single point. In addition to an attack scenario, it will also prevent the system's operation from being disrupted, as in the case of a malfunction, interruption, or error that will occur in a centrally-managed system. Thus, the system will continue to be executed by the distributed mechanism's other units.

Transparency and Anonymity: If we discuss these two concepts individually and combine them even though they are opposite to the nature of the blockchain, we almost obtain the essence of the blockchain philosophy. In an environment where everyone is anonymous, we cannot trust the accuracy of any transaction for sure. However, if we make all the movements of anonymous users

transparent and record everyone in the system as witnesses to this, we can create an environment of trust. Here lies the primary reason why trust and distrust are simultaneously mentioned in the first item of our article. When we release anonymous actors not trusting each other in an environment where equality, distributedness, and transparency are ensured concurrently, the system –with certain theoretical exceptions- becomes invulnerable. A statement expressed in a blog post on Cryptomatic is rather self-explanatory in this regard. The article mentions transactions on the blockchain as follows: While transactions are very secure and essentially tamper-proof, they are also very public (*).

"While transactions are very secure and essentially tamper-proof, they are also very public." *



Besides these, some actors in blockchain networks ensure the continuity of the system operation as well as the accuracy and security of the transactions. Although most of us know these actors as miners, mining is only among the things they do, based on the protocol's technical functioning. So what do these actors do? These actors are responsible for listening to all the transactions broadcast to the network, controlling their ledger records, which store all transactions and balances of users beginning from the

first transaction on the network, confirming them, sealing them irreversibly via a cryptographic mechanism, and announcing them to all users. While doing this job, they also get reward coins accepted as the currency used by the ecosystem and a small transaction fee for each transaction.

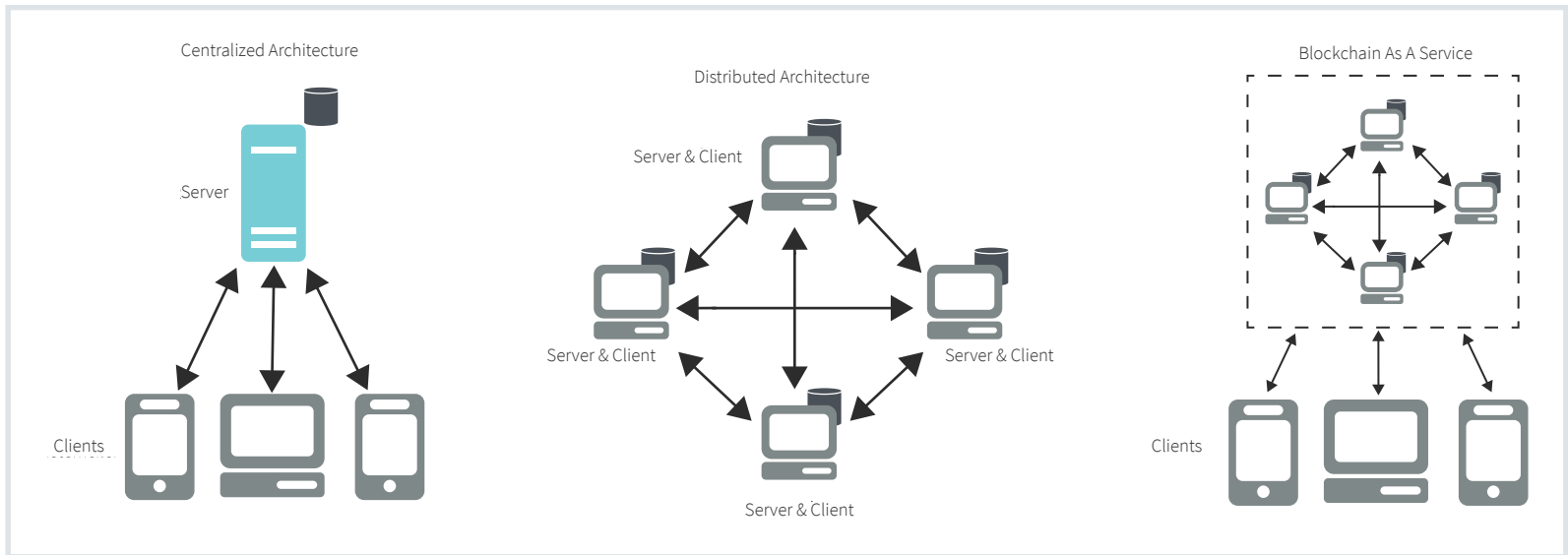
Considering what we have discussed so far, it would be reasonable to think that everything is all roses in blockchain protocols. However, there are also many problems to overcome while sustaining the system. In this article, it would be better to discuss only some of these problems. First, a distributed data structure is brought about by decentralization and the multiplexing of all data. This causes both big and multiple data storage needs. Moreover, the system's ongoing operation causes data to be constantly generated, increasing the need for extending the storage. Today, the shortened node size of Bitcoin alone is 350GB, while hundreds of copies of it are stored distributed. Thus, we always need big data storage areas to maintain the system 24/7.

Similarly, storing private keys to access crypto networks is a delicate issue. Although blockchain protocols are robust against external attacks, storing the private keys of the users, which is under their responsibility, is the Achilles' heel of the entire system. The vast majority of known crypto scams and massive losses are caused by the hacking/losing of devices that store users' private keys, not by hacking blockchain networks. While companies make major investments in this regard, a storage industry, independently of the crypto world, is also emerging even in this field.



The other key issue is the existence of multiple blockchain protocols and their unique features. Like two people trying to reach an agreement while speaking different languages, this situation prevents the project developed on a blockchain network from interacting directly with other blockchain networks. Similar situations, as mentioned above, are among the factors that make it hard to use blockchain protocols, especially in corporate operations. These issues inevitably lead the industry to ask the following questions: Do I have to store all retrospective transaction data in my system? How do I protect keys that need to be protected delicately? Does the project I developed by allocating major investments have to be confined to a single protocol?

Here, a concept rushes to help many companies: Blockchain as a Service, or popularly known as BaaS. On behalf of companies, the BaaS method creates the blockchain environment needed from scratch, including their establishment (integration into an existing network is also possible), generates the relevant actors, provides



the essential security, and offers it as a functioning service. With the ability to be accessed via API and service calls for general use, this service provides access and management with traditional and standard methods. In contrast, the service provider operates a blockchain protocol on behalf of its customer from end to end. Namely, the user continues to use everything in the same way without finding any difference, while the operation conducted proceeds to run in a distributed manner behind the service.

As you can see in the image, there is only one center in the traditional server-client architecture. However, each device functions as a server and a client in a distributed blockchain architecture. The BaaS developed based on this combines these two architectures and includes blockchain's strengths while operating as a single service against the client.

Professionals with a solid grasp of this complex technology establish and operate the blockchain network or integrate it into existing ones. Thus, the doubts and concerns we have just mentioned are considerably eliminated or transferred to professionals.

With this article, I have written while hoping you would find it enjoyable and informative, we have taken a short tour of the blockchain world. Then, let's return to our starting point and ask the question, whose answer you now know, we have asked at the beginning: If we were going to unite the system, why did we distribute it in the first place?

Source

<https://www.cryptomathic.com/news-events/blog/how-digital-signatures-and-blockchains-can-work-together>

**Dr. Oktay Adalier****TÜBİTAK BİLGEM** eID & Blockchain Unit & Program Manager

What Is Needed For the Digital ID Implementation in Turkey?

Among the significant and indispensable building blocks of digital transformation, Digital Identity is now used more often with the development of related technologies. When verifying an individual, Turkish Identification Number, Name and Surname, e-mail address, date of birth, and biometric elements provided to an individual in the electronic (virtual) environment serve the same function as an identity, personnel, and bank card issued by the government institutions in the physical environment. Besides these identity attributes, individual-specific credentials, electronic certificates, mobile identity, virtual identity, and pseudo-identities are also used. Especially the pandemic period significantly increased the use of eCommerce, social networks, remote education, and digital entertainment services. Users from all strata spend most of their daily activities in the electronic environment. These activities include work, entertainment, education, and leisure.

We see that simple authentication methods used in social networks and entertainment-based digital services are now further used in eCommerce and e-finance. The best example of this is the KYC (know your customer) and onboarding regulations issued by the ICTA (Information and Communication Technologies Authority) and the BRSA (Banking Regulation and Supervision Agency) in 2021. The regulations enabled the use of biometric elements for remote authentication in these processes. Identifying customers in live meetings via face recognition and video recording shows the practical advancements in this field.





Today, however, authentication technologies should have been used more considering the rapidly-increasing mobility and services delivered remotely via electronic services. In a life where everything is started and maintained in the virtual environment, people should be able to acquire their identities in the digital environment. Moreover, it should be used in the service flows of all vertical and horizontal industries by prioritizing user-friendliness.

Thus, cooperation and a shared understanding should be formed between the provider of electronic services and its consumer. The service provider in the electronic environment often wants the legislators and rule-makers to intervene in this process to conclude this relationship in favour of both parties with the rules to be set. On the other hand, technology-developing companies should also be able to offer the necessary products to achieve this cooperation. Considering this relationship, ensuring that the

privacy and data of anyone who receives service are well protected is also required.

Turkey should determine its roadmap in the digital development process and be able to establish its rules. Considering this period where everything is transferred to the virtual environment, we should depend minimally on foreign technology and infrastructure providers while providing services in the electronic environment. Especially electronic service delivery platforms, including Google, Meta (Facebook), Yahoo, Yandex, LinkedIn, and such, can be given examples to these providers. Turkey's global political and strategic position is the primary reason for this issue. If we outsource these infrastructures, some may unplug the power source when they want, paralyzing the entire country's electronic and internet infrastructure.

Turkish people are highly open to innovations and new technologies with rapid adaptability. In the financial industry and eCommerce, Turkey shows a more comfortable mobile usage development and adaptation than its European counterparts. The number of services offered in these areas is much higher than in the EU countries. People from all strata somehow learned to use applications in the mobile environment. Especially the social networks.

In the third decade of this century (2020-2030), Turkey, in parallel with its development, can and should go further in the world in terms of developing and using software in an electronic environment by being better in this field, both technologically and

socially. In terms of decentralized digital identity infrastructures, which are usable and secure while providing the necessary privacy and anonymity with technological developments, Turkey should develop and implement them in its ecosystem.

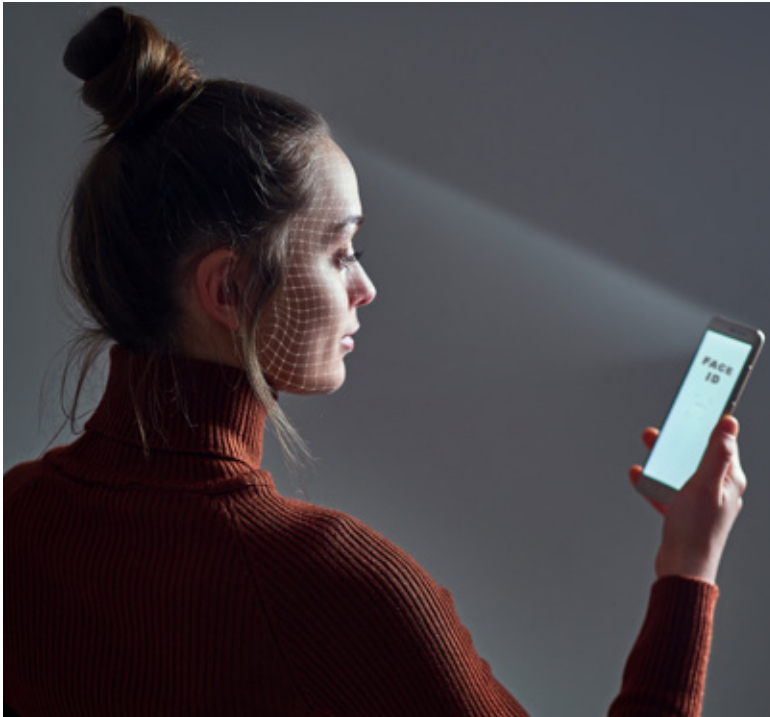
For instance, it should be able to create identities needed in physical and virtual environments safely and readily on mobile devices. Biometric elements used in authentication should not be limited to traditional fingerprint and facial recognition. Since everyone in our society has improved their ability to use digital media, they no longer want to use classical elements such as cards and keypad media. Even entering a password on a computer and

mobile phone to receive service has become too much effort for most people.

With the development of AI methods in signal processing, providing people with high signal processing and learning capabilities by embedding AI and deep learning methods in new chip technologies, even in mobile phones, is a significant achievement. Moreover, mobile phones offer many features such as accelerometer, gyroscope, magnetometer, GPS, proximity sensor, ambient light sensor, barometer, heart rate monitor, fingerprint sensor, and highly-advanced cameras. This infrastructure may also be a platform to implement new digital authentication methods.

Considering the current situation reached in biometric verification today, Authentication and Anomaly Detection apps should be developed based on many behavioural data (behavioural biometrics) besides fingerprints and facial recognition. Thus, the continuous authentication process can be operated.

Another issue to mention is authentication and the need for authentication to be renewed or repeated as service providers change while we are constantly switching between services in the electronic environment, requiring continuous authentication and its elements. However, decentralized structures provide solution to this issue. Leveraging the benefits of blockchain technology, people can create the identities they have acquired throughout their lives in their environment and use them in the system where necessary. In this regard, governments institutions must issue the necessary laws and regulations. They do not need to operate and invest in authentication infrastructures as they do now.



Initiating the implementation of advanced digital authentication technologies available in the SSI, Justice, Health, Education, Economic (treasury), and Finance industries as of 2022 will benefit. People should not be forced to use vein-based authentication, which was suspended during the pandemic period in SSI. When citizens go to polyclinics, they should be able to do authentication automatically, without receiving any help or putting effort, via the credential verification of the digital identity in their mobile wallet in the blockchain through polyclinics' cameras, sensors, and similar media that perform facial recognition via the picture taken from their cameras, identify behaviour from their video and confirm their location via their mobile phones. The same should be implemented in courts, educational institutions, and banks.

In remote e-services, ensuring that the party on the opposite side of the line has the right to receive the service should be decentralized with digital authentication created with the blockchain infrastructure. The digital identity infrastructure to be implemented to use the Turkish Central Bank's Digital Currency in transactions will utilize blockchain technology. A flexible digital identity infrastructure can also be used in remote education and remote working processes. The Digital Transformation Office of the Presidency of Turkey has approved the creation of blockchain-based digital authentication infrastructure by announcing a project to be launched in 2022.

Along with digital identity, personal data and the privacy of identity owners should be extremely protected. Minimal data should be shared with the services. Authentication processes should



be operated anonymously. Therefore, zero-knowledge proof methods should be rapidly implemented in electronic services. Thus, service organizations will not need to store large volumes of personal data. For instance, organizations with high-volume eCommerce store their customers' personal data. A possible attack on information systems results in stolen data of customers. Then, this data is either used for malicious purposes to somehow harass customers.

Consequently, it will be a right move to implement decentralized blockchain and zero-knowledge proof-based Digital Identity creation and authentication technologies by developing them in Turkey with national efforts via SMEs or fintech companies in this 5-year perspective. Thus, lawmakers must work on the required legal and legislative infrastructure as of 2022, conduct essential legislative and executive processes, and enable the implementation of emerging technologies.

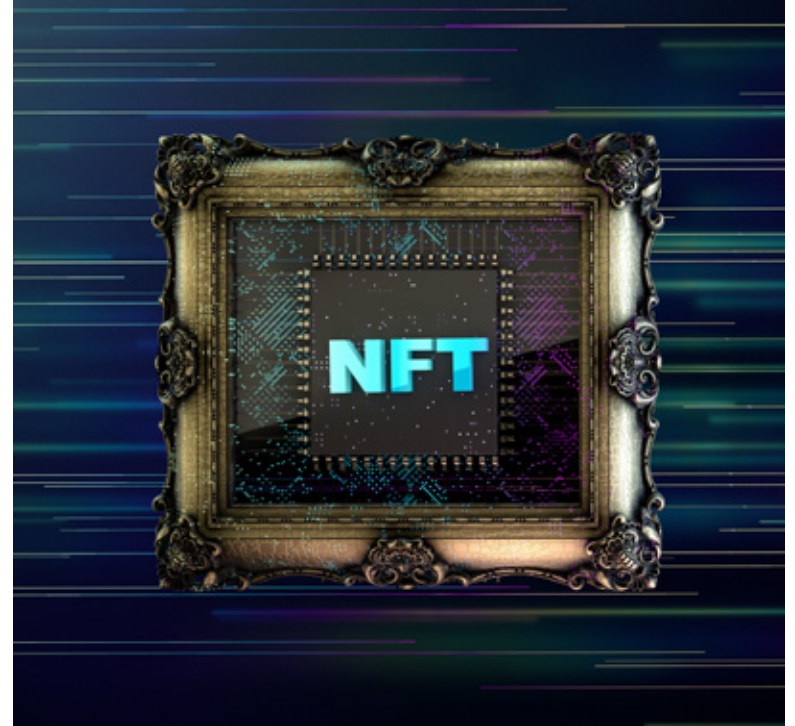


Fatih Günaydın
Softtech Innovation Leader

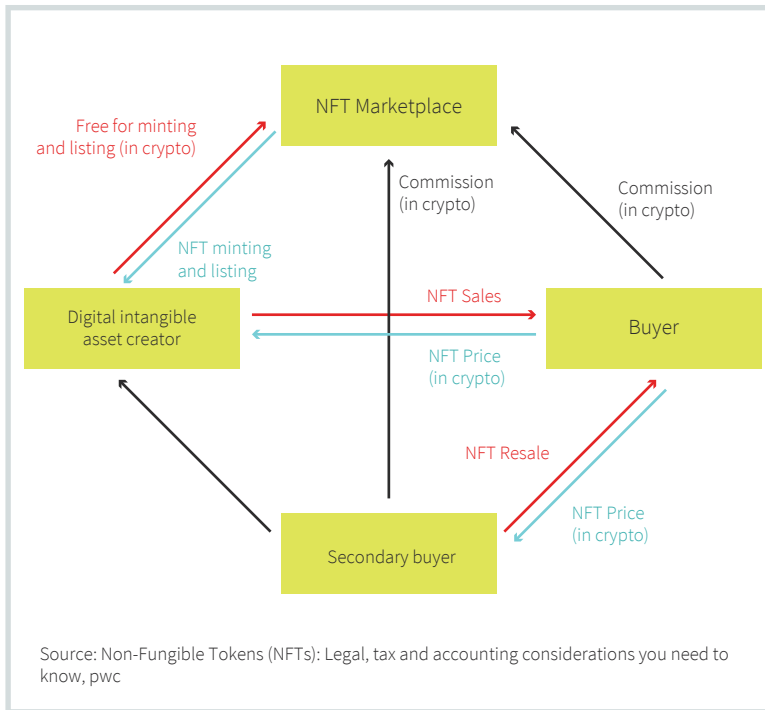
Does Digital Property Mean Physical Dispossession?

Do you think you really own everything you have? How can you prove it? Do you keep the receipt of a shoe you buy and always carry it with you in the physical world? Let's say you visit a crowded house with unfamiliar faces, and someone obtrusively tries to wear your shoes on the way out. How can you prove that they are yours? In the digital world, ensuring a digital asset's scarcity, ownership, and verifiability was challenging before NFTs (Non-Fungible Tokens) entered our lives. Moreover, it could also not be portable and programmable.

Especially in 2021, we woke up with NFT news almost every day. During this period, digital asset ownership was often associated with digital artworks. In 2014, Quantum by Kevin McCoy and Anil Dash was the first NFT artwork. The collection named "CryptoPunks", published on the Ethereum network in 2017, was among the pioneers of this trend. Sold for 69 million USD, Mike



Winkelmann's artwork created a sensation. The NFTs of names like Refik Anadol and Murat Pak had global impact, too. Famous figures such as Cem Yılmaz and Selçuk Erdem also joined this ecosystem with their NFTs.



Besides the visual arts, the music industry is also at the heart of digital ownership. Among the most significant problems, which have been going on since the early years of the Internet, is that an artwork is copied and distributed readily, while its producer cannot get the necessary share. For now, NFT alone does not solve this issue. The intermediary solutions NFTs can offer for this problem, which has recently been regulated somewhat by the streaming platforms, can bring the producer and the consumer directly together, providing both parties with more significant benefits. Models, which allow artists to sell the rights of their songs to fan bases without intermediaries and provide both the artists and fans with income as the songs are listened to, have indeed

started to be used.

Considering NFTs -although it is a significant and influential area- solely art collection would be underestimating what this technology can offer within the framework of digital ownership. Having a vast potential, an NFT can be your car in a game you play, a profile picture you can use on social media, a land in virtual universes, and a stock or a digital receipt confirming the ownership of physical properties. Soon, NFTs will be an indispensable part of digital and physical commerce with the concept of "Metaverse Commerce", where eCommerce will enter virtual universes.

Before changing economic models and daily life, the digital property will continue to show itself mostly in entertaining works. For instance, you can go to virtual reality (VR) racecourse, verify your virtual identity, sit on your seat, a digital property that belongs to you during your subscription period via your combined ticket that you have purchased before, explore the digital magazine left



Top 10 Biggest NFT Marketplaces Comparison (By Total Volume)

Date of Publication: 19-10-2021

										
Name	Opensea	Axie Infinity By Sky Mavis	NBA Top Shot By Dapper Labs	Rarible	Superrare By Superrare Labs	Sorare	Foundation	Aavegotchi By Pixelcraft Studios	Hic Et Nunc By Tezos	Decentraland
Volume (All Time)	\$9,24B	\$2,62B	\$706,87M	\$230,91M	\$157,5M	\$150M*	\$93,44M	\$48,68M	\$43,93M	\$42,09M
Runs On (Blockchain)	Ethereum	Ethereum	Flow Blockchain	Ethereum	Ethereum	Ethereum	Ethereum	Polygon	Tezos	Ethereum
Founding Date	2017	2018	2019	2020	2017	2018	2020	2020	2021	2017
Team Size	~48	~25	?	~50	~50	~50	~25	~4	1	~50
Headquarter	Newark, United States	Ho Chi Minh, Vietnam	Vancouver, Canada	Moscow, Russia	Newark, United States	Paris, France	San Francisco United States	London, England	Brazil	Beijing, China
Traders	563,750	845,189	460,141	81,454	5,046	600,000*	20,054	6,993	39,870	6,320
Buyer Fees	2%	4,25	5,26% +0.30 Flat Fee	2,5%	3%	N/A	N/A	N/A	2.5%	N/A
Seller Fees	2,5%	4,25%	5%	2,5%	3%	N/A	15	N/A	N/A	N/A
Accepted File Formats	GLTF, GLB, WEBM, MP4, M4V, OGV, OGG, MP3, WAV, OGA	N/A	N/A	JPEG, PNG, GIF	JPEG, MP4, WEBM, GLB	N/A	JPEG, MP4	SVG	JPEG, GIF, MP4, MOV, OGV, GLTF, SVG	GLTF
Royalties	ARTIST CHOICE (UP TO 10%)	N/A	N/A	ARTIST CHOICE	10% (ON SECONDARY SALE)	N/A	10% (ON SECONDARY SALE)	N/A	N/A	N/A
Currencies	\$ETH, \$WETH, \$DAI	\$SLP, \$DAI, \$KNC	N/A	\$ETH, \$WETH, \$DAI \$RARI, \$ARTI	\$ETH	\$ETH	\$ETH	\$GHST	\$XTZ	\$MANA \$LAND
Token	N/A	\$AXS	N/A	\$RARI	\$RARE	N/A	N/A	\$GHST	N/A	\$MANA
Total Amount of Funding	\$127M	\$158M	\$636M	\$16M	\$9M	\$737M	\$200K	N/A	N/A	\$24M
Notable Investors	Y Combinator, Founders Fund, Coinbase Ventures, Andreessen Horowitz, Alexis Ohanian, Mark Cuban, CAA Ventures, Coatue Ventures, Ben Silbermann	Mark Cuban, Alexis Ohanian, Libertus Capital	Coatue Ventures, Andreessen Horowitz	Coinbase Ventures, Coinfund, Venrock, 01 Advisors	Samsung, Next, Mark Cuban, Sound Ventures	Gary Vaynerchuk, Consensys Ventures LLC, Accel, Softbank Group	N/A	N/A	N/A	Digital Currency Group, BoostVC, Fabric Ventures, Genesis One Capital

Source: Blockdata

*Estimated amount. Data is not from Dappradar.

on your seat based on your preferences, and read an article where you can find information about the upcoming race. In memory of that day, the photo-finish image of the race can also be gifted on your behalf and stored in your digital wallet. Moreover, you can use your digital ticket to enter a racetrack in the physical world and transfer your right to use it to someone else. The rest depends on imagination.

Technically, NFTs are records stored on blockchain networks and generated via smart contracts created according to specific standards on NFT-supported networks. Two of the most common are ERC-721 and ERC-1155. ERC-721 is the first NFT standard on the Ethereum network. These standards have differences such as gas fees, the ability to combine repeatable and scarce assets.

Today, we store such digital assets in our crypto wallets that support the relevant network. Here, Ethereum excels as the blockchain network with the most NFTs created on it. Ethereum is followed by Polygon and Immutable X, Solana and Ethereum's second layer solutions. Whatever we store in our crypto wallets, whether an audio file, an outfit design, or a digital ticket we can use for contactless entry to the house we rented from Airbnb, will also be used in virtual universes. However, the digital property of an asset in a virtual universe is still stored in your wallet. You cannot transfer it from universe A to universe B. Building bridges between virtual universes and between blockchain networks, setting their standards, and having an entire physical world interaction as in the ticket example is required to build the Metaverse fully.



Virtual universes will combine the assets in the physical and digital world. With real-time data, digital twins of assets in the physical world can join virtual universes via IoT and AI solutions. Namely, our physical properties can also exist digitally. However, we can also consider the opposite. Imagine a house freed of many objects. It does not include a TV, a vase on the table, paintings, or a bookshelf. You can have all these objects with VR equipment and AR applications. Instead of a physical wall clock, you can buy a limited edition digital clock produced by a well-known clock company, acquire its digital ownership, and place it in your home. That's why "adaptation" will be the key concept to determine whether a digital property can surpass a physical one. In this period, with a dizzying speed of change, we will see by experience whether people's adaptation to technology will ensure the spread of technology or those who can adapt to technology will shape the world.



Yücel Karaman

Softtech Blockchain Architect

P2P Distributed Storage Systems

The blockchain world and its technological developments are skyrocketing to 2022. Data storage systems are also among the areas affected by this technology. Since NFT (NonFungible Token; Unique Token) entered our lives, the doors of the virtual world called the metaverse have been opened, putting storage solutions in a more significant position. We need an unchangeable, permanent, always-accessible, and reliable storage space more than ever.

Where Did We Come From? Where Are We Headed?

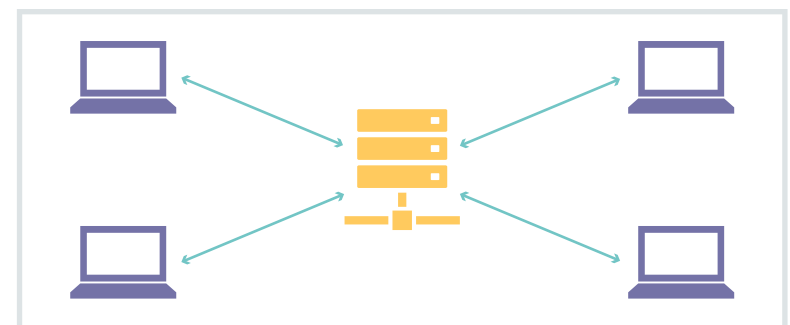
First storage systems solutions were developed in a client-server architecture. We can give Unix-Linux-based NFS (Network File System), Windows-based CIFS (Common Internet File System), and macOS-based AFP (Apple File Protocol) as examples of these systems. While answering the increasing need for storage, the architecture tried to offer a solution by putting servers in groups instead of single servers. ZebraFs and xFs are among the examples.

Then P2P (Peer to Peer) systems entered our lives, including eMule, Lime, and BitTorrent. Discounts on books, movies, music, software, etc., shared among peers were widespread. P2P storage is the latest point we have reached in storage structures based on blockchain technologies. Here, IPFS, FileCoin, Storj, and Swarm can be given as examples.

Why P2P?

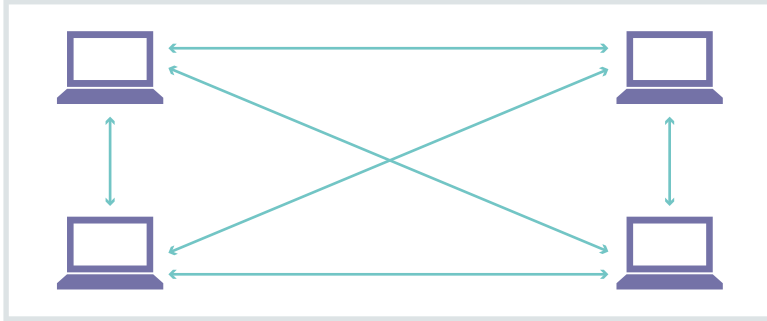
The answer, surely, is trust. Each day, we hear or see that our personal data in a centrally-stored data source is passed from hand to hand.

In classical architecture, data/files are stored physically on a centralized server or server group.



You obtain and copy the data/file from here.

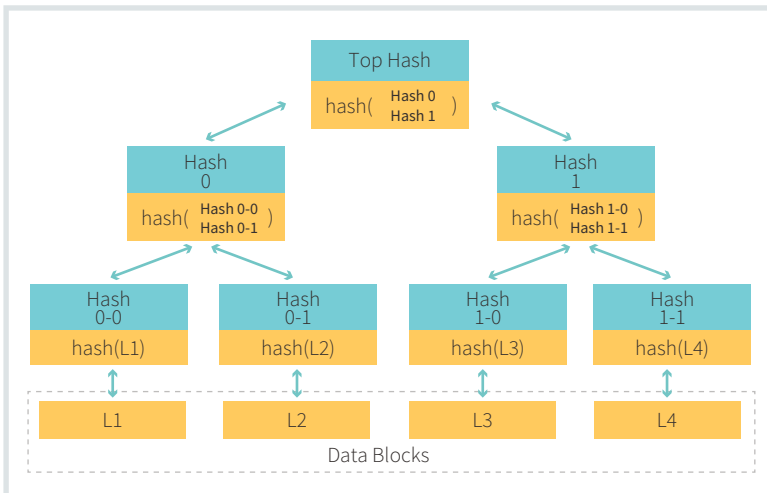
In P2P structure, however, data/file is not stored on a centralized server because it is stored in a distributed manner.



While obtaining the file, the data becomes a file on the requestor's computer with information received from many peers in parts.

IPFS (Interplanetary File System)

Going beyond the earth, the interplanetary file system has also been developed.



Although the information is stored partly among peers, technologies (Hash, Merkle tree, DHT; Distributed Hash Tree, etc.) predominantly in the blockchain also get involved in the process.

The existing problem: Any content is addressed on the internet or our computer as in the examples below, without the possibility of interplanetary access.

https://en.wikipedia.org/wiki/Kara/Users/Ayse/Documents/term_paper.doc
C:\Users\Can\MyDocuments\project_etme_presentation.ppt

IPFS' solution to this problem is CID (Content Identifier), namely, context-dependent identifier. The cryptographic hash of the information to be stored is used as an identifier. Due to the nature of the hash function, it generates an identifier string fixed in character length, regardless of the size of the information, whether it is 1 byte or 1 GB. IPFS uses this context-dependent, unique, fixed-length identifier as a tag that points to pieces of information kept distributed in IPFS. Thus, the information content held in the system has a universal identifier. This identifier (CID) enables access to the content of information.

CID

QmmSSUwWYwt3HBg4ztndsZiipfqedbcyh8e9PGPbQDmfVL

In summary, using the file contents as a tag to access the file, instead of specifying where it is kept, allows us to find the file contents, therefore, the file.

What are they?

First, let us warn you that deleting the data you have saved in P2P systems is not easy. Data particles may not also be cleaned from all peers.



IPFS is a must for applications (DApp: Distributed App) developed on blockchain networks. For example, while creating an NFT, the IPFS address is normally where you will store and address your materials such as pictures and mp4s.



Filecoin is based on IPFS. It was developed as a complementary protocol to IPFS. It is operated with the cryptocurrency known by the same name on the blockchain. IPFS has a structure operating without a revenue model. However, Filecoin offers a revenue model where the peers storing the data earn. Peers store large and long-term data, receiving fees in filecoins in return.



Pinata is based on IPFS. It is an application where you can store and use your data, including pictures and videos, in NFT projects.



Storj DCS (Decentralized Cloud Storage) has a P2P system. It stores the data encrypted in its peers worldwide. While operating the system, it obtains the necessary funding via the memberships.



Swarm is a P2P storage and communication system. We can say that it is similar to Filecoin based on Ethereum Blockchain. Peers storing the data receive incentives in return.

Consequently, P2P distributed storage systems based on blockchain technologies will remain in our lives as storage solutions that increasingly stand out both for security reasons and revenue models.

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Ertan Barut

TOBB Turkey Software Council President

Turkey's AI Strategy

Firstly, I would like to thank the teams and supporters who contributed to preparing the Softtech Technology Report 2022.

“ *The combination of SOFTWARE, an indispensable POWER in every field, with AI has created an unconsolidated SYNERGY.*

As in the world, software in our country has exceeded being only a product or service. Undertaking various roles in the business fields and industries has also been a highly significant and indispensable POWER in "Competition, Growth, Creating Large-Scale Value Chain, and Achieving Success". Including data, today's particularly substantial power, and AI, which can process and transform data into a different value, into the software created an unconsolidated synergy.

As in other developed countries, Turkey's National AI Strategy has been prepared and become valid for our country's benefit and development, achieving this synergy.



As TOBB TURKEY SOFTWARE COUNCIL, we are aware of the responsibility we have undertaken. Established by law under the umbrella of TOBB, we are an Industry Council working with all our stakeholders on firstly supporting our Software Industry more strategically, including software among our country's national policies, domestic and national software production, development and growth of domestic & foreign trade, expansion



of exports, and increasing the future-oriented software workforce and employment.

With our companies in our Software Industry Ecosystem, Council Member Companies, and NGOs, we are working on solutions, regulations, and strategies for the future of our Software Industry by consulting Public Institutions and Organizations, focusing on creating answers to our problems jointly.

Accordingly, we, at TOBB Turkey Software Council, support and continue to contribute to Turkey's "National AI Strategy", which was created according to the practices conducted by the Digital Transformation Office of the Presidency of the Republic of Turkey and the Ministry of Industry and Technology under the Eleventh Development Plan.

By taking evaluations, opinions, and suggestions from our institutions in public and private industry, universities, and NGOs besides our Software Council, Turkey's "National AI Strategy" was

completed in 2021 and included in the 2022 Presidential Program. We believe that this strategy will be a transformation milestone in Turkey's future via the concrete steps to be taken based on the targets.

As a critical technology field, AI will introduce a new process with the R&D and P&D studies to be carried out in this field after being embraced by everyone, ensuring the development of our country while making significant expansions for employment besides industrial advancements.

“We should promptly establish the National and International AI Ecosystem.

Firstly, a solid ecosystem should be promptly established where national and global public institutions, universities, industries, private industries, and NGOs are involved, supported, and assigned while undertaking a role. The necessary opportunities should be offered quickly for this ecosystem to be locked on the target. While ensuring the creation of synergy, platforms that will enable the engagement of ecosystem's each component, such as communication, information sharing, idea sharing, and project production, should also be developed.

To achieve the targets, projects and double, triple, or even quadded partnerships for public-private industry-university-NGO cooperation should be encouraged frequently. Aggregation should also be created, while special, long-term support and incentive programs should be implemented for these partnerships,

including joint ventures in the private industry, including triple-quadded-quintet private industry. These formations should be mainly designed and encouraged to produce worldwide patents.

“We should create 5 billion USD funding for AI, R&D, and P&D.

Large-scale resources and funds should be created for AI, R&D, and P&D practices. Meanwhile, financial institutions in Turkey should be encouraged to create startups that provide financial resources to support the efforts of investors in this context. Based on the strategy, these funds and resources should be introduced to partnerships in the ecosystem.

First, our Government should create projects in strategic areas for the needs of public institutions and our country's development. These projects and their undertaking partnerships in the ecosystem should be promoted and supported while ensuring the development of various types of qualified projects by assigning the projects to multiple startups. All these productions will certainly earn a place as a separate value in our country.

Each quarter, project competitions with attractive prizes should be organized by NGOs and public institutions, while various types of sustainable infrastructures should be created to increase entrepreneurial projects and startups. NGOs should be particularly provided with financial resources to be pioneers in encouraging such startups.



“We should also build academies to educate and train AI engineers, ensuring R&D.

We should establish AI Academies and/or Institutes within universities and, if possible, by private initiatives. These academies should conduct R&D practices and implement deep training programs in integrated AI, big data, and sub-specialities aiming to train AI engineers who will produce end-to-end solutions. Meanwhile, AI, R&D, and innovation laboratories should be established, while anonymous access to data should be streamlined by creating national databases.

Infrastructures should be built to support and guide AI practices within technoparks for hierarchical, more focused, and agile AI-based product development. Particularly in strategic and primary industries that contribute to the economy significantly, collaborations should be made with the private industry to give

importance and priority to AI investments. Incentive and training programs should be implemented to create AI units and employ engineers.

“We should establish international partnerships and collaborations while acquiring foreign companies.”

Funding, loans, and financial support should be provided for the acquisition by Turkish entrepreneurs of foreign companies that specialize in AI and will share knowledge, experience, and know-how.

By reaching academicians specialized in AI in global universities, private industry and academic institutions should be encouraged to establish collaborations that will utilize their knowledge, experience, and know-how, besides providing funds and financial support.

While AI Strategy practices are conducted based on our national goals, Turkey's influential and active role in the Committee on Artificial Intelligence (CAHAI) should be further enhanced besides its integration with the world. Moreover, plans on developing opportunities for cooperation and joint projects should also be implemented.

“We must promptly implement our AI Cloud SaaS/PaaS/IaaS Platforms, introducing them to ventures.”

Building infrastructures that allow the development of fast and agile AI solutions and products on cloud technologies should be encouraged.

Besides contributing to AI studies and activities, we, as the Software Council, support all the steps to be taken for the success of our country and hope the strategy will reach the desired goals.





Sri Ambati

H2O.ai CEO and Founder

How AutoML is Democratizing AI?

Artificial intelligence (AI) is increasingly being put to use across organizations, fueling data-driven decisions and pushing decision-making to the edge. Consequently, as technology platforms become more decentralized and commodified, AI companies are co-innovating with customers and partners to build industry-specific AI tailored to a vertical such as the supply chain or telecommunications. Automated machine learning (autoML), machine learning workflows that apply AI and automation to the data science process, or, as we at H2O.ai refer to it, "AI to do AI," is now driving diffusion, specialization and collaboration throughout organizations. Importantly, autoML is driving another critical trend—the democratization of AI. Experts and novices alike can access and employ powerful predictive tools for tasks from the mundane to the extraordinary. Over the next few years, we expect to increasingly see the roles of development, IT operations, data science and business users blur as AI technologies move up the value chain and become cross-functional and more applicable

to various lines of business, opening up even more opportunities for AI to transform organizations and improve our world. This will open up even more opportunities for AI to transform organizations and improve our world.



AutoML more than Automation

The word “automation” can evoke an image of an assembly line moving semi-finished goods from workstation to workstation, however, AutoML is more than simply chaining together a series of steps.

In addition to automating a workflow, autoML, such as our in-memory autoML platform H2O Driverless AI, leverages concurrency by running many experiments simultaneously to find the optimal machine learning (ML) model. In the case of H2O Driverless AI, we spice things up by employing a genetic algorithm that mimics natural selection and, along with other ML techniques, evolves and selects the best-performing models that closely mimic the expertise of a Kaggle Grandmaster. We are working with Softtech to use H2O Driverless AI to discover new ways for Softtech to digitally transform its customers into more AI-driven organizations.

AutoML takes painstaking manual experiments and applies not just different variables, data and code, but also to algorithms (i.e., AI), by themselves or in a variety of combinations, to define experiment settings. The output is a model that is optimized for accuracy, time and interpretability. These often can be run simultaneously or out-of-order with the only constraint being patience for each of the experiments to complete (even AI can manage that for you).

Returning the most evolved and best-performing variables (features) given each of the techniques and combinations, autoML then constructs the best model based on the features and algorithms suited to your use case. Last, it trains and selects the best model(s), letting you choose the one optimized for your business requirements from a leaderboard. Makers love competitions and challenges, so H2O.ai's autoML technologies have leaderboards.

AutoML is critical to democratizing AI because it can deliver expert results without having to have an AI expert involved. With a few lines of code, autoML tools can return results comparable to state-of-the-art, hand-coded models. Likewise, autoML can allow an expert to narrow their search space by revealing gaps in the data, and, like automating anything done by hand, reduce the chance of errors. H2O Driverless AI's ambition is to cater to that entire range of users - from novice to expert - and to extend its accessibility to business users who have the most uses for AI. For example, an H2O.ai customer started using H2O Driverless AI to help increase data scientists' productivity as they grew their AI workforce. As the company grew depth in data science, it began to produce many more models that not only employed more advanced ML methods, but also had different use cases such as fraud, call center analytics, human resources and recruiting.



As H2O Driverless AI use spread throughout the company, a funny thing happened. Even though their workforce grew at a breakneck pace, the appetite for AI models grew beyond the capacity of the data science team. To meet the demand, the data scientists enlisted application developers to build models showing them how easy Driverless AI was to use. Before long, model production well-outpaced demand as app developers found novel uses for their models in applications that started as side projects. Next, business analysts and managers discovered some of these applications and made them work for a particular problem they had in understanding their slice of the business. This process went on, and they now are building their own models for the apps they build, possibly using the H2O Wave software development kit (SDK) or low/no code application development tools. Encouraged by AI applications, the team at all levels can now make crisper and clearer analyses, resulting in more confident and bold decisions. H2O.ai embraces this vision.

However, to get more organizations to this threshold, AI must be trusted by the entire business. To gain this trust, we have to mitigate bias in data and AI models and figure out how to securely use sensitive data without disclosing private information. Fairness and bias detection tools in the AI stack are critical. The H2O AI Cloud delivers a full suite of services that not only offers the widest range of machine learning interpretability tools but also provides services such as H2O AI Feature Store, which captures the most valuable data in your company—engineered features—for reuse across the business. By using interpretability tools to calculate bias metrics and the H2O AI Feature Store to maintain a snapshot

of the lineage of features as related to deployed models, and H2O MLOps to manage and monitor models in production for drift and changes in performance, H2O's Wave SDK makes it easy to build elegant and simple web applications that use AI models. There are already 130 applications built by H2O.ai and our customers available in the H2O AI Cloud Appstore covering strict machine learning applications for NLP, image/video and tabular data, and business user-friendly applications that predict customer churn or demand for supply chain planning, for example. Most importantly, the H2O AI Cloud is the center of gravity for pushing AI into every enterprise and every function. Analysts will gain credibility to provide deep insights, and managers and others close to the ground are able to execute and operate themselves. Decisions are bolder, more accurate, and faster. Conducting such an AI symphony does not happen overnight, but we are seeing this democratization vision come to life.



Table stakes

The democratization of AI already is enabling increasingly higher and higher degrees of agility and autonomy throughout organizations and enterprises. Soon, data scientists should expect to make and operate AI applications, and developers should expect to make and operate AI models that increase the throughput of deployed AI workloads and accelerate feedback loops from business users, thereby increasing their input in the AI lifecycle.

We are seeing ethical and secure AI emerging as requirements for AI deployment. Unsurprisingly, every business will require AI to be built and operated in highly monitored and governed environments. However, this will enable companies to do something they could not do before—empower execution at all levels of their organization. Trusted AI unlocks radical transparency in teams creating a shared understanding at all levels of the business. Trusted AI allows company leaders to delegate decisions with confidence. Bolstered with AI that is widely available, tailored to their industry, easy to use and deploy, and that they can trust, companies can achieve scale and velocity that before was unimaginable.

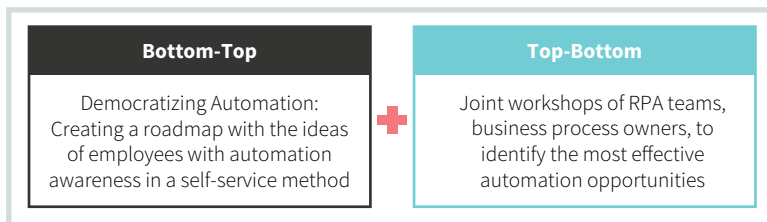


Tuğrul Cora
UiPath Turkey General Manager

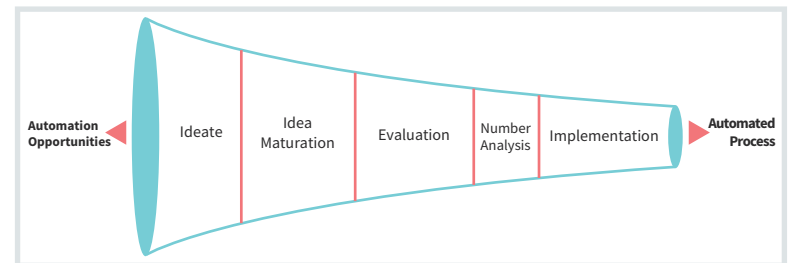
AI-Based Smart Process Discovery Technologies

Robotic Process Automation (RPA) is a software technology that streamlines the creation, deployment, and management of software robots that emulate human actions and interact with digital systems and software. Like humans, software robots can perform activities, including understanding what's on a screen, completing the correct keystrokes, surfing on systems, and extracting data, faster and more consistently than humans.

Traditionally, two main methods are used to identify RPA opportunities.



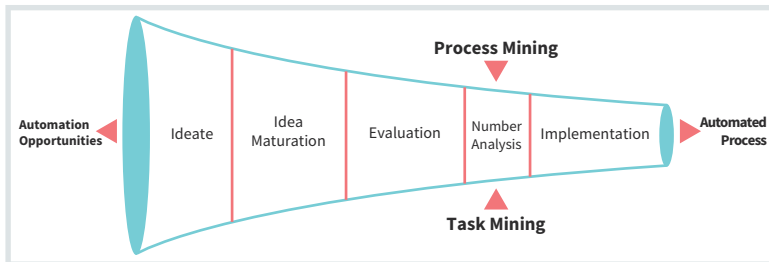
Automation life cycles like below function to elaborate, develop, and implement the potential of the process discovered by both methods.



So far, these two methods have produced successful results, enabling the RPA journey of institutions to reach certain maturity levels and gaining prompt achievements via RPA.

However, ensuring a rapid and widespread automation transformation only via the opportunity extraction methods mentioned above is impossible. The transformation will only be possible by incorporating automation to all business areas, including operations, people, culture, and integration of systems, namely, via institutional proliferation.

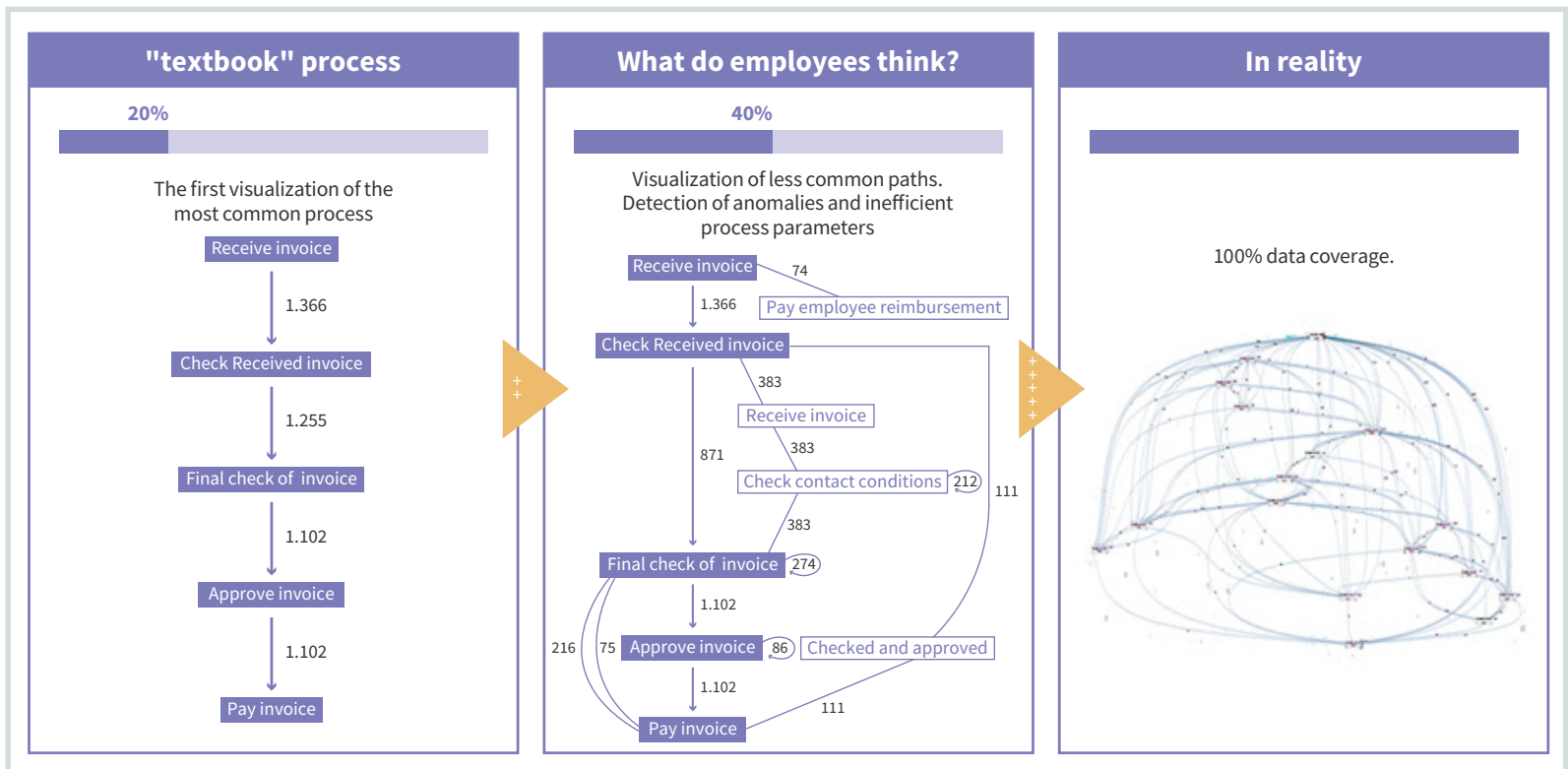
More innovative methods will inevitably feed the automation life cycle to seize automation opportunities in all business areas. These new methods will be enabled by smart technologies ("task mining" and "process mining") that will allow discovering



automation opportunities automatically and getting into unfamiliar business areas.

UiPath, the world leader RPA supplier, continues to accelerate its investments in these two areas.

"UiPath Process Mining" provides process analysis based on data stored in IT systems. With the insights obtained from "UiPath Process Mining", successful automation can be planned, while the automation's business impact can be monitored continuously. By doing this directly based on data, the process can be covered 100% and monitored via a process map with all its exceptions.



With "UiPath Process Mining" technology:

- Unknown potential automation opportunities that exist in business processes can be discovered. By utilizing data from systems such as SAP, Oracle, Salesforce, or in-house developed practices, full transparency is achieved on performing business processes.
- Process slowing issues such as bottlenecks, reprocessing, and inefficiencies can be promptly identified, while the automation of these issues can be understood holistically.
- Processes can continuously be monitored, while actions can be taken proactively via robots. The automation's impact on processes and primary KPIs can be monitored.

IDC's 2022 predictions emphasize that 35% of enterprises that adopt "Process Mining" as a controlling layer for end-to-end business processes by 2023 will be at least 20% more profitable than peers that do not.

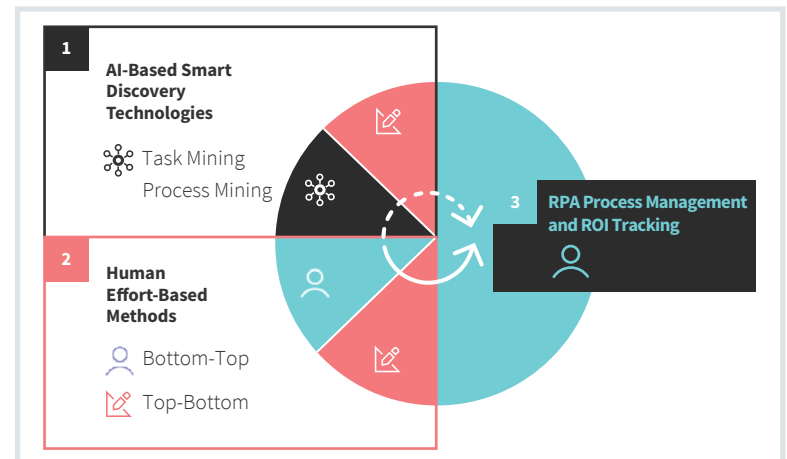
"UiPath Task Mining" technology monitors the desktop activities of employees and utilizes AI to identify repetitive tasks with high automation potential that provide more efficient and productive work. While data in IT systems is obtained via "UiPath Process Mining", activities in desktop apps are captured via "UiPath Task Mining".

With "UiPath Task Mining" technology:

- Employee desktop data can be collected without disrupting work.
- AI is used to identify repetitive tasks and primary task metrics

(e.g. time spent, frequency, etc.).

- A list of automation candidates, frequently-used paths, and deviations can be generated.
 - Robotic processes can be developed via the collected data.
- Utilizing these two technologies, a new roadmap can be created besides the traditional methods, while RPA added value created for the organization can be increased by progressing together.



As seen here, more innovative methods and technologies are now entering our lives to seize automation opportunities in all business areas. These new technologies are projected to accelerate the spread of automation and digital transformation while streamlining the shift to corporate automation by creating added value. We see that pioneer institutions have started to employ these technologies of UiPath both nationally and globally, providing significant benefits. Smart process discovery technologies are expected to become increasingly widespread soon.



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The Future of Quantum Computers

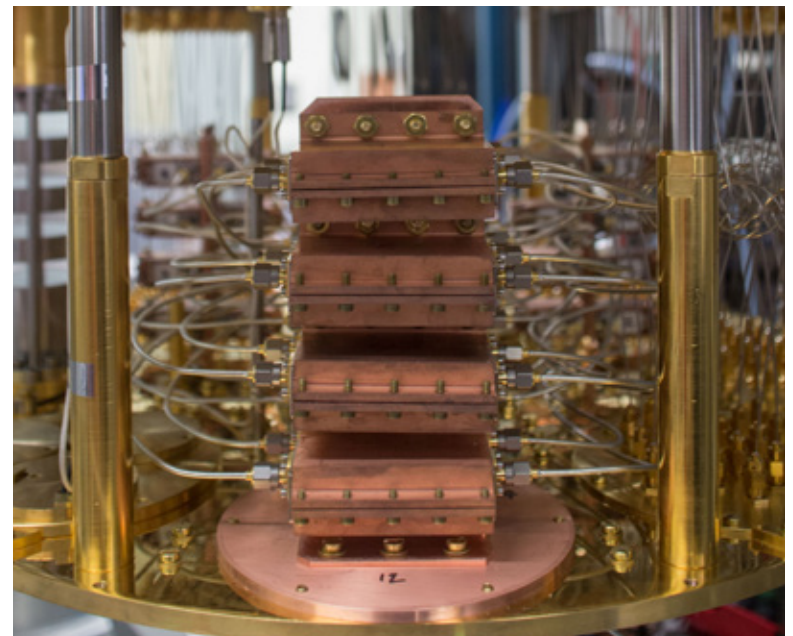
Among the rapidly-developing trends of recent years, the quantum computing field is positively growing every year. In this article, we would like to explore the future of quantum computers, the most prominent quantum technology. A public fund of over 20 billion Euros will be transferred to this field globally until 2030. However, let's briefly recall the background of this technology before discovering its future.

A Brief History of Quantum Computers

This technology is largely based on quantum information theory developed in the 1970s. This theory explores various aspects of the information theory, which is emerged with the development of classical computers and networks, has for quantum systems. It also examines the differences between classical information processing and quantum information processing since the early 1980s. Especially after a conference held at MIT in 1981 and

attended by many notable physicists and computer scientists of the period, the famous physicist Richard Feynman popularized the idea of quantum computers.

The primary reason why quantum computers attracted the attention of physicists at that time lies in their scientific



computational capacity. There is an exponentially increasing memory and processing capacity requirement in a classical-quantum system processing as the system grows. Creating a 'precise' interaction simulation of even a medium-sized molecule requires world-size classical computers. We can now simulate many molecular structures thanks to DFT and similar 'prediction' methods developed in simulation fields. However, the idea that an 'exact' simulation of quantum systems can only be performed via another quantum system started to be widely recognized after the conference in 1981. Thus, physicists and computer scientists initiated their research in this regard.

In 1994, however, interest in quantum computing rose dramatically for the first time when mathematician Peter Shor developed a quantum algorithm, namely, the Shor algorithm, used in prime factorization. After institutions such as DARPA and NSA predicted that the RSA (Rivest-Shamir-Adleman) encryption system based on the easiness of multiplication and the difficulty of factoring could be cracked via the Shor algorithm, they started funding for the development of quantum computers. However, several years of research revealed significant physics and engineering problems to build a quantum computer with the ability to operate this algorithm.

Physics and Engineering of Quantum Computers

The bit, or binary digit, is the primary logical unit of classical computers with transistors commonly used for this purpose.

A qubit or quantum bit is the basic unit of quantum computers. NMR (Nuclear Magnetic Resonance) systems were first predicted in the 1990s for the physical implementation of qubits. These systems aim to use quantum states created via the spinning moments of atomic nuclei as qubits. However, by the early 2000s, it has become clear that these systems are not scalable. Although building a 10-20 qubits system was possible, NMR systems were not suitable for an information processing capacity of 1 million qubits. Alternative technologies then started to be examined.

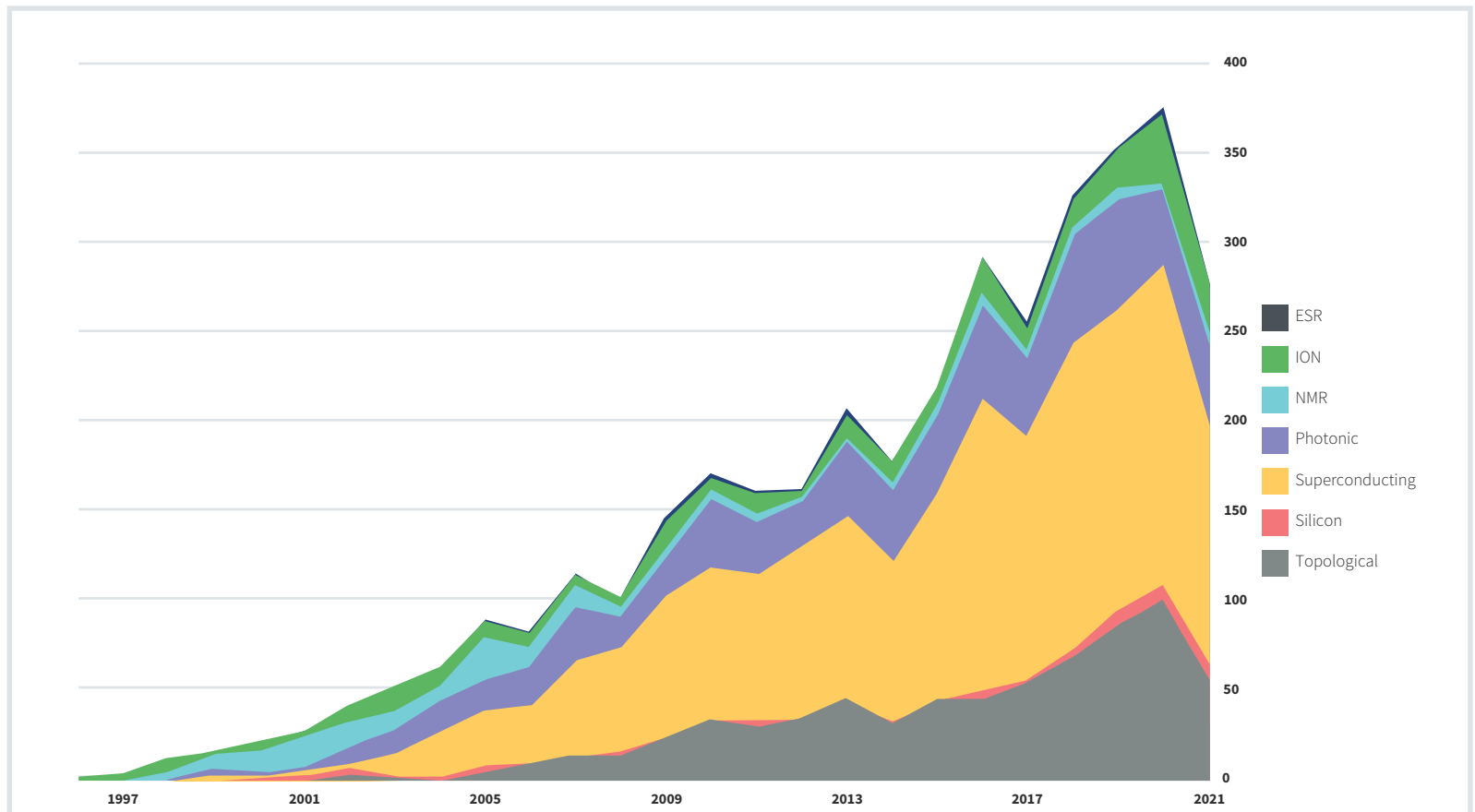
Created in the mid-2000s via superconducting systems, the transmon is currently the most widely-used qubit hardware. These systems are based on utilizing quantum properties obtained in materials reduced to mK-level temperatures as qubits. It should also be noted that the mK level temperature is about 1,000 times lower than empty space. Thus, lowering down to these temperatures and producing electronics operating properly at these temperatures requires tremendous engineering effort. Still, big companies such as IBM and Google combined have invested billions of USDs in this technology and have started to get results. With the development and relatively inexpensiveness of cryogenic systems based on liquid helium-based cooling, over hundreds of experimental and, occasionally, commercial superconducting quantum information processing units are available in the world.

Although everyone recognizes silicon-based transistors as the only method in classical computers, we should remember that the first-gen computers utilized vacuum tubes. Theoretically, any classical computer can also be produced via

any device functioning as a bit. Similarly, any physical system that can be used as a qubit can be turned into a quantum information processing unit. Therefore, although superconducting systems are the most widely used, various schemes including ion traps, photonic structures, ESR (Electron Spin Resonance), silicon, topological qubits are now being evaluated. The table below shows the number of academic publications exploring these

various technologies in qubits by year.

Besides academic studies, investing in diverse physical equipment surely draws global attention as well. For example, PsiQuantum, based in Palo Alto, California, focusing solely on producing photonic quantum information processing units, has landed an almost 700 million USD investment so far. Another American



company, IonQ, which focuses on building trapped-ion quantum computers, has gone public with a valuation of nearly 2 billion USD in recent months. Microsoft has tipped tens of millions of dollars into R&D efforts to develop topological qubits for many years.



Many companies, large and small, spend effort and money to build alternative physical systems to superconducting qubits.

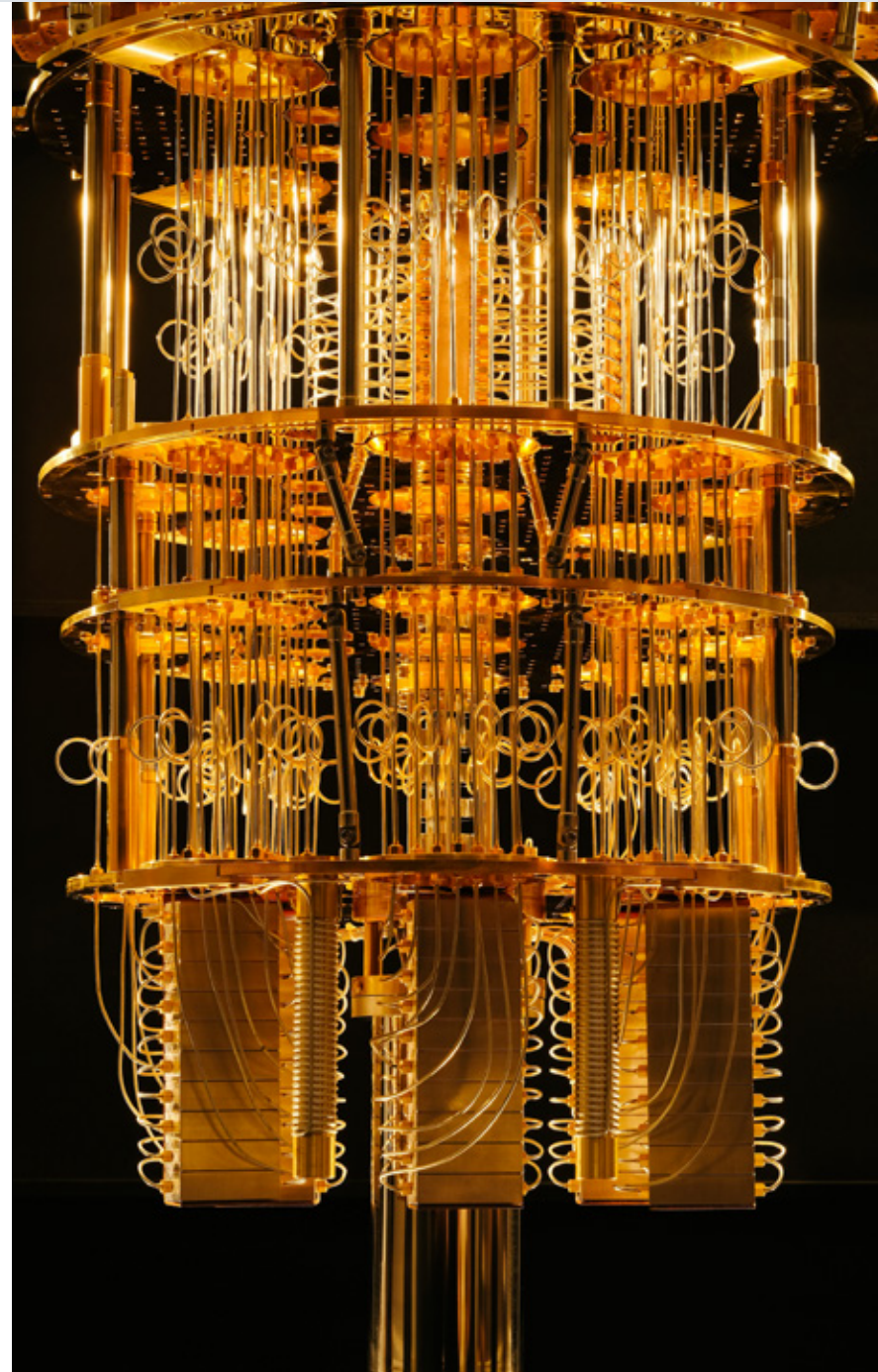
Quantum Computing Models

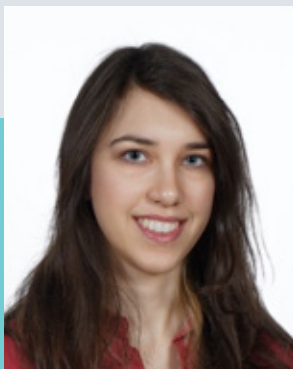
Besides the differences in physical systems, various quantum computing models are also available. Followed by giants such as IBM and Google, this 'logic gate' model is used by traditional computers. We can think of this model as a quantum version of the logic gate-based information processing we know. Alternatively, models including quantum annealing or measurement-based quantum computing are also available. Established in Canada in 1999, D-Wave, the biggest investor and pioneer of the quantum annealing model, has sold the devices it developed to institutions,

including NASA, Lockheed Martin, and Google, for 10 million USD or more for each so far. However, D-Wave has recently announced its transition to a hybrid model combining quantum annealing and logic gate models. Inspired by this computing model, digital annealer systems have also been developed and launched by companies such as Fujitsu. In areas such as finance, their optimization-based usages have already begun.

The Future of Quantum Computers and Computing

Quantum technologies are becoming among the most widely-spoken elements of a global technology race with AI. Notably, China's major investments and successes in this field have led the American Senate to pass the NQIA (National Quantum Initiative Act) and the European Union to launch the Quantum Flagship Program. Emphasizing academy-industry collaboration to technologize and productize quantum science's outputs, both of these programs are initiatives of over 1 billion Euros in size. Especially in Europe, Germany's 2.6 billion Euros and France's 1.6 billion Euros worth extra funding initiatives have demonstrated the national significance of this field for these countries. However, we should also emphasize that this race is still in the early stages and that quantum techs should be considered as a marathon, not a sprint.



**Jale İpekoğlu****Maxitech** Corporate Innovation Specialist

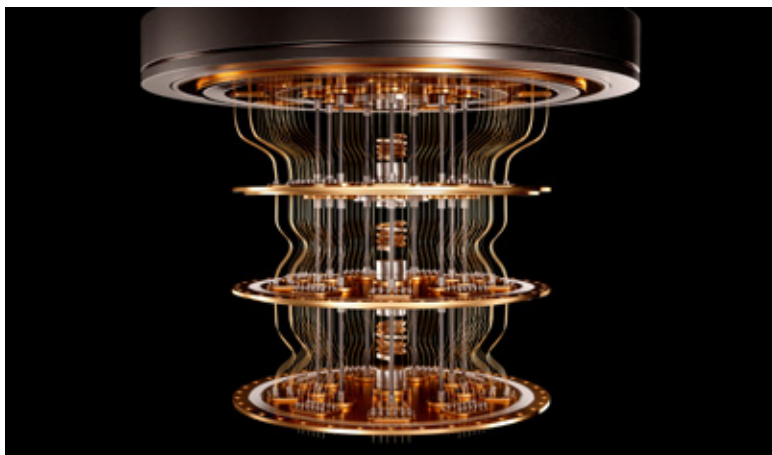
Commercial Application Areas of Quantum Computers

Quantum mechanics emerged at the beginning of the 20th century as a discipline that describes the physical properties of nature at the scale of atoms and subatomic particles. Then, it has paved the way for advancements such as transistors, lasers, and Magnetic Resonance (MR), the basis of many technologies we use in our daily life. By the end of the century, the concept of a quantum computer was developed by laying the foundations of

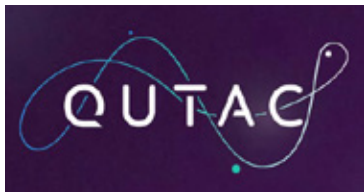
the idea of utilizing the quantum mechanical properties of matter for complex calculations, introducing the movement called the second quantum revolution. Despite the ongoing experimental process of quantum computers, there is a global race to improve their hardware. On the commercial side, companies are moving this technology outside the research labs and exploring ways to utilize it to solve industrial challenges.

Although quantum and classical computers do computations, they use data differently to get answers. Among the most significant points to consider about quantum computers and quantum computing is that this technology will not replace classical computers. However, it is projected to provide the advantage of speed and accuracy in calculations, where classical computers are insufficient, via unique modelling and processing capabilities.

Professionals from various sectors come together with the universities' quantum technology researchers or conduct joint research with numbered enterprises, which offer quantum software services, to ensure the commercial use of quantum computing and solve complex problems that cannot be achieved in acceptable time with today's computing methods.



Next Applications of Quantum Computing (NEASQC) project in Europe brings together companies from diverse industries, such as AstraZeneca, Total, and HSBC, with academic professionals. In June 2021, the Quantum Technology and Application Consortium (QUTAC) was established in Germany by ten major companies, such as BASF, BMW, Boehringer Ingelheim, Bosch, Siemens, and Volkswagen, to ensure the usability of quantum computing in solving industry problems. Also established in 2021, the University of Tokyo-led Quantum Innovation Initiative Consortium was launched with Japan's industry-leading members, including Toyota, Hitachi, Toshiba, and Sony Group, to accelerate quantum computing R&D in Japan.



<NE|AS|QC>

We can list the problems for which today's commercial institutions search for solutions via quantum computers or issues they see as opportunities to improve existing methods used in the industry as follows: Options and derivatives pricing, portfolio optimization in the financial industry; molecular simulation for faster and more efficient drug discovery, simulation of innovative materials for autonomous vehicles and more efficient battery production in the pharmaceutical and chemical industry; route optimization of vehicle fleets, workload optimization in production lines in logistics and automotive; aircraft wing design and fleet management in aviation; drilling optimization in oil exploration in the energy

and oil industry; quantum simulation and large-scale weather forecasting in meteorology.

In these studies, either quantum algorithms or the combination of classical and quantum algorithms are used by utilizing these two technologies in a hybrid way.

Finance

Today, banking customers demand personalized products and services that rapidly anticipate their changing needs and behaviors. However, building models that swiftly and accurately analyze enough behavioural data to determine what products customers need in near real-time is challenging. The same applies to fraud detection as well. The systems used cause banks to be overly cautious in acquiring customers and the processes to take longer. The data modeling capabilities of quantum computers are



expected to prove superiority in the analysis, classification, and estimation of complex data, which is not possible today.

However, in portfolio management, investment portfolios, which follow market trends, are significantly constrained by calculation limitations and transaction costs. The combinatorial optimization capabilities of quantum computing are predicted to respond to market conditions and investor goals in near real-time.

Liquidity management, derivatives pricing, and risk analysis calculations can be complex, challenging the proper management of risk costs in trading. Today, there are promising researches on the development of Monte Carlo simulations, preferred to analyze the effect of risk and uncertainty in financial models via the data processing capabilities of quantum computers, thus testing more results and performing simulations with higher precision.

Considering the practical use of quantum computing in the financial services industry, Goldman Sachs states that quantum computers need to have much more quantum bits than now and that they are still five years away. However, financial institutions continue their research and closely follow technology's development to prepare for the race. The USA-based JPMorgan Chase, Goldman Sachs, Citigroup, and Wells Fargo, the UK-based HSBC and Barclays, Spain-based BBVA, and the Netherlands-based ING are the primary financial institutions interested in this subject.

In September 2021, Goldman Sachs and QC Ware, a Silicon Valley-

based quantum software consulting company, published new research to accelerate Monte Carlo simulations. This research aims to accelerate the Monte Carlo simulation, which is used in finance, telecommunications, robotics, climate science and the development of new drugs and provides more accurate decisions in an environment of uncertainty. They have designed quantum algorithms that can change the way financial markets work if they can work with large-scale data and aims to simulate companies' risk assessment and pricing of various financial instruments at much higher speeds than modern methods. Continuing their research on quantum computer hardware, Maryland also conducted the first trials of these algorithms on small-scale quantum processors developed by the US-based company IonQ.

Specializing in portfolio optimization problems, risk analysis, and market simulation while conducting proof-of-concept studies with international financial institutions in this direction, Spain-based Multiverse Computing and BBVA performed joint research, evaluating and comparing a range of quantum and traditional technologies in finance. This research, which is still in the exploratory stage and expected to maximize the returns on investments, has addressed the dynamic portfolio optimization problem by considering possible constraints such as transaction costs. This research published in June 2020 aims to improve the existing methods used in the industry as a result of this study, which was tested on various hardware platforms using real daily price data of eight years, 52 assets. While the solution they tested using classical algorithms took more than a day, quantum processors completed it in about 3 minutes.

Health and Medicine

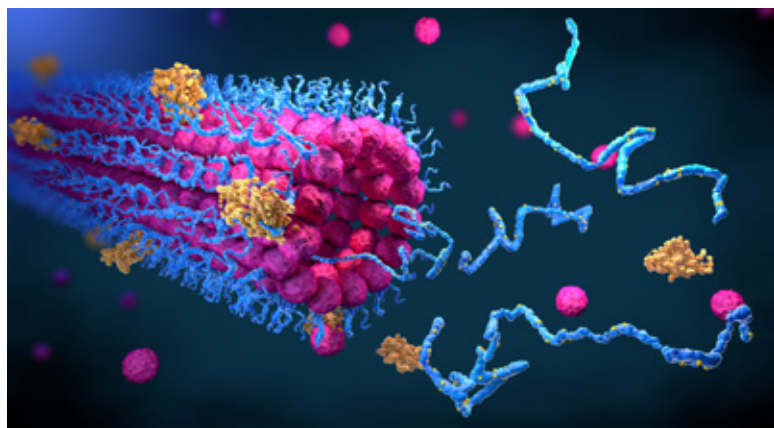
Among the most promising application areas of quantum computers are the simulation of molecules and their chemical behaviour that will enable the more precise and faster development of new drugs. Accordingly, understanding the molecular structures better will ensure the development of more effective drugs. Moreover, neural networks, that is, quantum neural networks, supported by quantum computing advantage with the ability to be used in machine learning, are projected to solve protein folding, an optimization problem that can lead to the early diagnosis or treatment of many diseases.

Swiss-based pharmaceutical company Roche and Cambridge, UK-based quantum computing software company Cambridge Quantum Computing are conducting proof-of-concept studies to simulate chemical interactions at the quantum level to research possible early diagnosis and treatments for Alzheimer's

and produce potential drugs for other diseases. Roche is also continuing research with QC Ware to examine the potential of quantum neural networks to improve the accuracy, efficiency, and reliability of biomedical image analysis. Thus, Roche aims the earlier detection and more accurate diagnosis of diseases.

Today's classical computers may be insufficient in molecular simulations and analyzes that can help determine the mechanisms of disease formation. Since quantum computing offers opportunities for discoveries in pharmacology and treatments for diseases, it can accurately simulate and compare molecules much larger than currently possible. In January 2021, German pharmaceutical company Boehringer Ingelheim signed a three-year agreement with Google to research these possibilities. The company is also the first pharmaceutical company worldwide to join forces with Google.

Besides large institutions, over 15 initiatives worldwide focus solely on quantum chemistry and exploring the potential advantages of quantum computing in drug discovery. These initiatives, mainly in the USA, Canada, England, Switzerland, France, and Singapore, also continue their research to utilize quantum computing for discovering personalized treatments and the accurate prediction of chemical reactions and molecular properties for drug discovery research.



Energy

Power plants and chemical plants responsible for the majority of carbon dioxide emissions have been making investments in carbon capture, use, and storage (CCUS) technologies, which have been on the rise in recent years.

Allocating 10 per cent of its annual R&D investments to this field, France-based Total is partnering with Cambridge Quantum Computing on quantum algorithms that will enable the design of new materials that can capture carbon dioxide more efficiently. With these new algorithms, which are impossible to calculate with today's supercomputers and will simulate all physical and chemical mechanisms, Total aims to accelerate the development of technologies required for reaching its carbon-neutral target. For the same purpose, UK-based BP cooperates with IBM, and Netherlands-based Shell partners with Leiden and Amsterdam Vrije Universities, to work on the accurate modeling of many complex chemical processes on an industrial scale.

The American oil and gas company ExxonMobil believes that quantum computing will improve the production and efficient distribution of energy, joining forces with IBM to research effective methods of delivering liquefied natural gas. In 2021 alone, over 500 gas vessels completed over 1,000 travels to meet the supply. For the efficient distribution, considering the location of each ship and the natural gas requirements of each delivery location, it becomes a complex optimization problem where billions of combinations must be considered, for even a few dozen ships.



Today, such a problem cannot be fully resolved via classical computational methods. ExxonMobil continues to explore combining classical and quantum computing techniques to solve complex and pressing global problems in modelling accurate inventory management and distribution routes.

Predicting the advantages quantum computing will provide for the optimization problems, another research topic is the optimization of the drilling routes by considering the geophysical properties and the limitations of the drilling angles.

Automotive, Logistics and Aviation

The automotive industry is predicted to utilize quantum computing in applications, including the production and synthesis of new materials and the management of vehicular traffic and autonomous vehicles.

Volkswagen joined forces with D-Wave, a Canadian quantum computer company, and Google to discover the use of quantum computing to reduce traffic congestion. After collecting the traffic

data via smartphones and transmitters inside the vehicles, the data is processed via classical algorithms to analyze the traffic density in a particular area and determine the number of people who need a vehicle. A quantum algorithm can then process the results to optimize the number of vehicles available by considering the number of people who need vehicles. Thus, traffic optimization is achieved using classical and quantum algorithms, directing taxis or public transport service providers to a suitable place. This effect of quantum computing can also be applied to autonomous vehicles avoiding heavy traffic situations and deploying them properly. The Japanese automotive company Toyota also continues its autonomous vehicle vision research.

Partnering with Google, the German automotive company Daimler also works on developing new materials to increase the efficiency of batteries used in electric vehicles, aiming to use autonomous vehicles to adapt to heavy traffic conditions and enable Daimler's production lines to become more efficient based on many parameters.

Joining forces with Amazon, the German automotive company BMW organized a competition in 2021 to solve the problems in the automotive industry via quantum computing. The last problem solved by the group during the competition's final tackles the optimization of the number of sensors in the vehicles that will gain more importance with the widespread use of autonomous driving. This scenario aims to utilize quantum computing techniques to optimize the locations of the sensors, thereby providing maximum coverage with minimum costs.



The aviation and space industry has complex computational fluid dynamics, aerodynamics, and flight mechanics requirements. Aerospace company Airbus explores the use of quantum computers in computational fluid dynamics to reduce the computational resources required to analyze airflow around aircraft, a key factor in aircraft design. In 2020, Airbus also organized a competition to optimise take-offs and landings, saving fuel and time, improving wing designs by evaluating various parameters, and utilizing quantum computing to reduce fuel usage and operating costs by using load capacity suitably. Airbus is also a partner and investor of Ware, a quantum software consultancy company.

Besides the experiments on the commercial side, the government also research possible uses of quantum computers. The German Aerospace Center announced in February 2021 that they are experimenting with a quantum computer to simulate the electrochemical processes of new materials to build better battery models. In April 2021, the U.S. Air Force Research Laboratory also

announced that it would explore the potential use of quantum ML in drone research with QC Ware. In April 2021, the Government of New South Wales, Australia, started a partnership with Australia-based Q-CTRL, which also provides quantum software solutions, on creating a more flexible transport network via quantum computing. With this research project, they aim to achieve the instant optimization of public transport systems by creating real-time maps of the movements of crowded communities.

Conclusion

Since quantum computing is an interdisciplinary field, it requires the collaborative work of physicists, who are professionals in quantum computing and researchers at the doctoral level,

and industry professionals to identify relevant problems in the commercial field. Thus, companies that research to identify the application areas of quantum computing conduct these investigations together with companies that provide quantum software consultancy.

While identifying problems, companies evaluate problems inefficient to solve via classical methods and that overconsume resources instead of problems that are impossible to solve with today's classical computers and not classically optimized by data science teams, or that involve manual decision making. These studies explore the benefits of quantum computers based on the results obtained via classical methods.



This investment does not provide any short-term return for companies that foresee generating income commercially via quantum computers. However, it should be considered an R&D investment and approached as a "quantum transformation plan" similar to the digital transformation plan. Today, companies investing in quantum computing research are expanding their capabilities in unique technologies that will disrupt the future. Meanwhile, they join the production of technologies expected to be widely used worldwide, leading this emerging technology based on their needs.

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Low-Code Platforms

Today, the success of an institution/company depends on how fast they launch their new products to the market and with which innovations and methods they can outrun the competition. In today's rapidly developing technology, a growing number of companies do not work with 'traditional' package software that offers the same features to all users but instead prefer applications that are developed explicitly for corporate needs and can differentiate them from the competition.

Namely, managers want to transform their businesses from reactive to proactive via the new solutions, which provide an advantage to their institution, they will offer to the market. This is exactly what low-code application development offers.

Low-code/No-code (LCNC)

LCNC platforms help both technical and non-technical employees develop apps according to business needs while allowing organizations to be more productive and promptly adapt to dynamic changes in the modern business environment to grow. Low-code application development is a software development

approach with little or no coding need to create applications or processes. Instead of using complex programming languages, it utilizes visual interfaces with drag-and-drop features.

On the other hand, No-code application development allows non-technical users to develop applications only via drag-and-drop interfaces, without any coding know-how and writing codes.

We can summarize the differences between low-code and no-code Platforms in the table below.

	Low Code	No Code
Who is it for?	Developers	Non-technical users
Main objective	Speed of development	Ease of Use
Coding requirements	Low	No coding
Customization	Complete customization	Customizable pre-built templates
Platform lock-in	Freedom to switch platforms	Locked in to the same platform
End-to-end development	All platforms provide end-to-end development	Same platforms provide limited capabilities
Purpose	Next-gen rapid app development tool for developers	Self-service apps for business users
App Complexity	Can create complex applications	Can create simple apps

Source: axcelbeck.com/low-code-no-code-technology-the-key-to-revolutionizing-insurance/

Benefits of Low-code Application Development

Although digital transformation has been a high-priority issue for years, the COVID-19 has taken its significance to a higher level. Today, companies want to develop new applications to digitalize their business processes rapidly.

Using low-code platforms to meet this intense demand for application development help organizations in many ways.

Rapid Application Development

The low-code platform enables rapid application development by creating screens, business processes, and data models readily with the drag-and-drop feature using pre-built component sets and modules.

Thus, you do not need to spend extra effort to monitor and analyze the performance of developed apps and other apps with which they interact. These services are pre-built within Low-code platforms.

Forrester analyst John Rymer (1) says Low-code platforms "enable software development as much as ten times faster than traditional methods."

Cost-Effective

Reducing costs affects the profitability of institutions directly.

Using a low-code platform help organizations reduce their costs in various ways.

It reduces the need for costly professional developers by allowing users with zero or low coding experience to develop applications.

Rapid application development shortens the time for institutions to introduce their products to market, thus allowing them to see the return on their investments faster.

Pretested components and modules on low-code platforms remove the possibility of incompatibility, thus reducing maintenance costs compared to the traditional application development method.

Operational Efficiency

While automated manual processes reduce errors and increase quality, most low-code platforms offer users visual user interfaces via their business process automation tools, allowing them to create their processes.

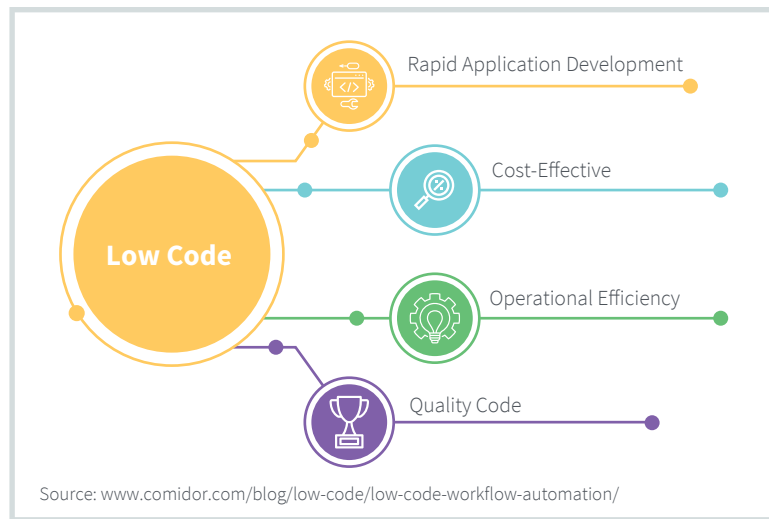
Applications developed on low-code platforms make workflows and processes traceable.

Moreover, they enable the integration of business processes with other applications and third-party systems via APIs and pre-built integration options.

Code Quality

Low-code platforms allow you to control and monitor the quality of new apps.

These platforms take the task of eliminating the dependence of the app quality on whether the developers comply with the coding guidelines and standards. Generating the source code based on the same structure provides controlled and reusable components.



Low-code Use

In the digitalized world, low-code platforms are now a technology preferred by many institutions due to the growing demand for application development and modernization.

Gartner estimates that "by 2024, low-code application development will be responsible for over 65% of application development activity and that 75% of large enterprises will be using at least four low-code development tools."

Moreover, Forrester expects the low-code market to represent 21B USD in spending by 2022.

According to the State of Low-Code 2021 report of Mendix;

- 77% of institutions have started using low-code to close the talent gap.
- While increasing its usage, low-code solutions are used by 33% to build mission-critical apps.
- Software developers acknowledge its flexibility, stating that 51% of their everyday development work could be done on a low-code platform.
- According to the industry-based analysis of low-code usage in the "Low-Code Development Platform Market-Global Forecast to 2025" report of Markets&Markets.
- The primary industries that use low-code application development platforms are Banking/Finance/Insurance (BFSI), manufacturing, automotive, retail, IT, media and entertainment, energy, government, and education.
- Institutions in all industries want to boost their sales and marketing capabilities to increase their total revenue, thus, considering low-code application development.
- Compared to other industries, Banking/Finance/Insurance (BFSI) has the largest share in low-code, with an annual growth calculated as 29.6%.

In the research, industry-based market sizes are predicted as in the table below.

	2018	2019	2020-e	2025-p	CAGR (2020-2025)
Banking/Finance/Insurance	1.509	2.284	3.305	12.094	29,6%
Retail and eCommerce	578	852	1.208	4.219	28,4%
Public and Defense	880	1.290	1.821	6.276	28,1%
Healthcare	770	1.123	1.578	5.388	27,8%
IT	1.193	1.744	2.455	8.417	27,9%
Energy	421	623	885	3.103	28,5%
Manufacturing	422	602	832	2.717	26,7%
Other	608	836	1.118	3.330	24,4%

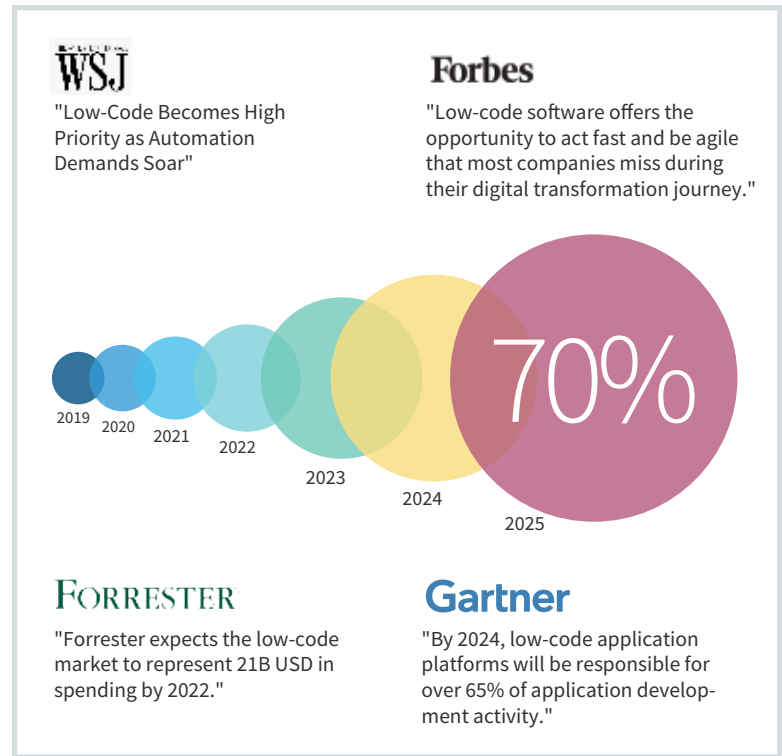
Most applications will be developed and managed via low-code platforms in the coming years. These platforms provide organizations with tremendous benefits in efficiency, effectiveness, costs, and effort to digitalize and automate their applications and business processes.

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Çetin Yalçın Güleç
Softtech Data Analytics Team Leader

Central Nervous Systems of Institutions

You must have heard the adage, “data is the new oil” often. It’s been more than 15 years since data science entrepreneur Clive Humby first uttered this in 2006. It has become more meaningful by the day during these years, and the data economy is now worth tens of billions of dollars.

Data creates enormous value as it is processed, combined with data from different sources, and pushes organizations to make decisions and take action. It’s a lot like oil, right? Today, digital transformation is advancing indisputably. Individuals, corporations and states are becoming digital a little more every day. Although digitalization started long before the pandemic that made its mark in 2020, it has clearly accelerated exponentially in this period. This process has increased the number of methods for producing value from data and the added value created from data.

Data analytics is defined as the processing of data for drawing a

conclusion. Institutions evolve into a brand new culture and a business method by supporting their decision-making processes with data analytics. Today, it’s clear that the corporations that support their processes and decisions with data outperform their competitors by far. For this reason, corporations now need a nervous system that supports their decision mechanisms (their brains) and is responsible for making sense of and containing the data in the external world and within the corporation. There are many technological building blocks that make up this nervous system. In this article, we will introduce these concepts which seem to continue growing in 2022.



Data Analytics Technology Ladder



User

- Citizen data scientist
- Data democratization
- Decision intelligence



Data Presentation

- Self-service BI
- AutoML
- MLORs
- ModelOps
- Data-centric AI
- Explainable AI



Data Storage

- Data fabric
- Data lakehouse
- DataOps (data operations)
- Data product management



Hardware and Network

- Multicloud
- 5G

decision intelligence means corporations do not act without getting data analytics support in their decision processes.

The steps below the user step are responsible for forming the corporational central nervous system. Let's start at the bottom to define them. The infrastructure level, which is at the bottom of the ladder, involves technologies at the hardware and network level. The emerging trends on this step are multi-cloud and 5G. Multi-cloud technology represents the data work spreading across multiple cloud providers with the proliferation of cloud-native systems. This includes the systems installed on site. Data management and analytics applications will broadly support cloud-native infrastructures in the upcoming years. 5G is already known as a new generation wireless data transmission technology. The amount of data produced with this technology will be multiplied, thus increasing the potential to generate value from data in different business areas such as industry.

Let's compare the data analytics to a ladder that takes us to the goal by climbing over the steps. There is "value" in the target. In order to reach this value, there are concepts at the user step that we will continue to hear about frequently in 2022: Citizen data scientist, data democratization and decision intelligence. The user step involves the perspectives necessary to transform the messages received from the corporate nervous system into action. Citizen data scientist means non-statistician business experts have the tools to analyze and democratize data efficiently, and decision-makers access the data easily; on the other hand,



The data step stands above the infrastructure step. The trend concepts in this step include data fabric, data lakehouse, DataOps (data operations) and data product management. Today, data is accepted a first-class asset. Therefore, the operations and planning in the period from the production of the data to the creation of various added values are also first-class works. Inspired by the concept of DevOps, DataOps aims to automate data management operations and make corporate memory more accessible and independent from individuals. DataOps is one of the most critical concepts of the upcoming years. On the other hand, data product management represents the introduction of the product perspective at many points, from creating data to creating value. Meaning, there will be new responsibilities in the corporations for the product perspective and product management, which profoundly affect the software organizations, to be done in a data-specific manner. Data fabric and data lakehouse are technologies offered to connect the data created in corporations to each other. Data is made more discoverable, consolidated and understandable in the data lakehouse. Data fabric is a data management architecture that involves standards and services that enable data orchestration in multi-cloud infrastructures. The concepts we introduce in this step are technology and managerial perspectives that will ensure the data are ready before they're submitted to data analytics processes.

The data is presented to the user on the application step. The critical concepts on the application level that we'll come across in the upcoming period are self-service BI, AutoML, MLOps, ModelOps, Data-Centric AI, and Explainable AI. The trends on the

application step are the methods and tools designed to increase the efficiency of citizen data scientists and data scientists. Self-service BI, which has become more prevalent in recent years, will be on the agenda of corporations in the upcoming period. This concept involves tools that enable business professionals to meet their own analytical demands and is vital in terms of democratizing data. AutoML enables analytical processes run via machine learning to be automated and implemented by stakeholders that don't have the technical know-how. It is anticipated that this step will grow significantly over the next ten years and transform the world of data analytics. MLOps involves automating machine learning processes such as experiment tracking, going live, etc.; meanwhile, ModelOps consists of automatizing model development processes such as model tracking and updating. These methodological concepts are supported by various tools and significantly increase the efficiency of data science teams. As told by Google engineers in 2015, the unseen technical load of machine learning applications is the operation, and it's the most challenging task for data science teams. So much so that; only 10% of machine learning systems are about model development, and the remaining 90% is about putting the model into production and managing it there. MLOps and ModelOps automate these tasks, allowing data science teams to focus on modelling. In data-centric AI, which will be an essential trend in the upcoming period, ModelOps at the application step and DataOps at the data step work in an integrated manner. Until now, data were kept constant in model development processes, and analytical systems were developed by adjusting models and their parameters. With data-centric AI, it is accepted that better data is brought in to get better



models. In order to support this point of view, data collection, cleaning, merging, etc., of model development processes must be integrated with data management processes. Concepts such as MLOps, ModelOps, DataOps and Data-centric AI are surrounded by Data Governance, Model Governance and AI Governance. Organizations that have included data, models, and AI governance in their processes abstract the know-how necessary to develop data analytics models from individuals and make the process visible. The last concept in the application step that will continue to be popular in the upcoming period is explainable AI. As decision support systems increase, the detection and prevention of discriminatory models have gained value due to legal regulations and ethical concerns. In this direction, it will be expected from the models realized with future regulations in many business areas, especially finance, to be explainable.

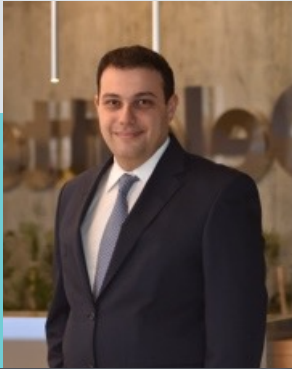
According to the status report published by McKinsey & Company on data analytics in 2021, the most value-generating use cases are; service operation optimization, contact centre automation, product feature optimization, service and response estimation, customer service analytics, customer segmentation, risk modelling,

and plagiarism detection respectively. The costs were reduced in more than 68% of the use cases, and profits were increased by more than 54%. 64% of the successful organizations use the cloud, 45% use AI governance, and 38% use data governance. According to this report, those who make a difference can invest in data analytics technologies more effectively than their competitors by applying the best practices such as MLOps and working over the cloud.

In the light of this information, we can say that data analytics will continue to grow in 2022 and value generation will accelerate within the framework of the technology and methods we introduced. What must be accepted at this point is that corporations are now centring data-driven decision mechanisms on getting ahead of their competitors. The way to do this is to integrate the building blocks on the data analytics ladder within the organization. The corporational nervous system will be built with these building blocks, and high value-added outputs will be acquired with the messages produced by this system.

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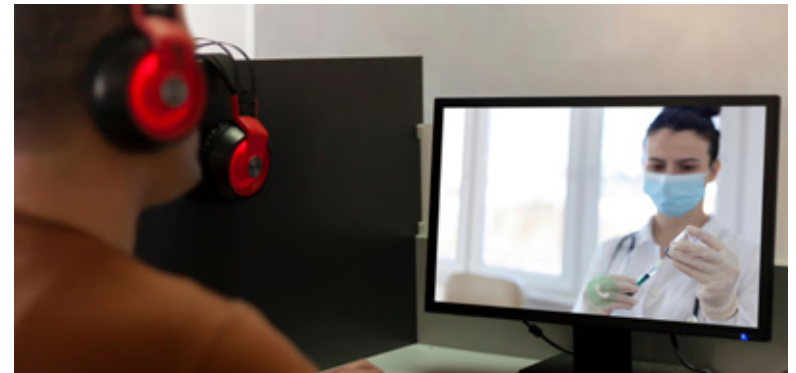
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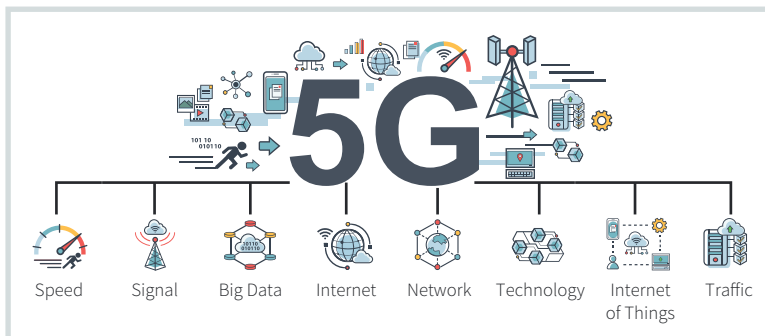
5G: Post-Pandemic New Life

We are reopening doors to a new future. Technology will continue to allow humans to do things they could not even imagine before. We can define 5G as next-gen mobile network technology and an era change in speed and capacity. 5G will surely provide more business opportunities from an economic and societal perspective. Both physically and digitally, it will connect people, devices, businesses, and utilities for people influenced by the poor connectivity brought by the lack of investment.

Especially the Covid-19 outbreak demonstrated how important digital connection is. Many businesses had to discover new ways to collaborate remotely and successfully manage this. Without communication infrastructure, the Covid pandemic would probably bring the world economy to its knees.



5G's every benefit will not come from launching new products, approaches, and services. The most fundamental change, in fact, derives from the advanced speed capability that only 5G can offer. Private 5G networks provided by mobile network operators offer potentially significant benefits in the workplace. Thousands of 5G compatible devices will be alternatively introduced to traditional



wired local area networks (LAN). As the IoT becomes a norm while workplaces have more interconnected sensors and devices, establishing and managing an ever-expanding network of wires will become nearly impossible. The 5G private network offered by a mobile network operator will be the solution in this regard.

5G will bring many innovations into our lives:

- 5G will offer excellent opportunities in power lines, gas pipelines, and remote control of heavy machinery.
- Soon, the world's best surgeons will be able to operate on patients, regardless of location, via 5G compatible devices.
- Utilizing 5G technology, autonomous vehicles will connect with traffic signals, pedestrians, road infrastructure, and each other in real-time. Since possible delays will be reduced via traffic



and density data, traffic jams will be diminished, providing faster transportation. 5G infrastructure will help prevent accidents and optimize traffic, thereby increasing efficiency and, thus, road safety, reducing traffic congestion. Therefore, we will be able to leave a more sustainable world to our children.

- Emergency vehicles may become digital hubs. Providing data before the patient arrives at the hospital and sharing biomedical data and results of diagnostic tests via imaging equipment, 5G technology will ensure that the treatment is provided without delay.
- 5G will help retailers and consumers by providing a virtual “try before you buy” experience. Moreover, the widespread use of smart shelves and advanced inventory will transform supply chain management as technology develops.



Today, we are on our way to a life where being unreachable is almost impossible. Now, we can turn geographical disadvantages into advantages and challenges into opportunities. For the welfare of our country, we should be pioneers who adopt these technologies, striving to support our institutions to contribute to their development.





Erdem Çolak

Livewell Deputy General Manager

The Near Future of Wearable Technologies

Wearable technologies are a new concept introduced in our lives within the last 10-15 years. Although we do not first think of it as wearable, this technology accelerates with the smartphones we always carry with us, becoming an essential part of our lives via smartwatches, bracelets, rings, glasses, wearable headbands, textiles products, sports equipment, and many new devices.

Based on various perspectives, many definitions are available for wearable technologies. However, "human-interactive clothing or interfaces" can be considered the simplest and broadest definition of wearable technology. Today, there are several approaches regarding wearable technologies: The fashion and textile approach, technology approach, wellness and medical approach.

Although fashion and textile are not among the first industries that come to mind, they are still intertwined with technology. Fashion and textile need to utilize technology potently to weave a



fabric, cut and design it with complex machines, and turn it into a favourite clothing item, ensuring that those who wear it can express themselves in changing conditions and environments. Today's fashion and textile do not use technology only for aesthetics. Electronic circuits can be embroidered on textiles, while circuit components can be connected via weaving with conductive threads, embroidery methods, or conductive dyes. Moreover, innovation in fashion and textile is beyond electronics, chemistry, and materials sciences. For example, significant steps are being taken to reduce carbon emissions and increase the sustainability of the textile industry with customized clothing items produced by completely biological methods, such as British fashion artist Suzanne Lee's BioCouture project.

The technology approach focuses on delivering the experience of the same things in various environments brought by digitalization and creating virtual worlds, metaverses, and AR. Experiencing day-to-day life in virtual environments and creating various worlds is a previously-known idea. However, the fact that more people started working and studying remotely due to the COVID-19 pandemic has increased the demand for online interaction to become more realistic.

Epic Games' Fortnite can be a great example of experiencing the same thing in diverse environments. Popular with youngsters, this game can be played on Xbox, Play Station, tablet, smartphone, and PC environments. Moreover, the posts about games can also be followed on social media accounts such as Instagram and Facebook, while its playlists can be subscribed to and listened to on Spotify. Epic Games recently held a virtual concert in the Fortnite universe. What is brand-new in the idea of virtual universes, which gamers are especially familiar with, is that multimedia has begun to enter every area of our lives while being intertwined with the physical world with the accelerating and widespread internet.

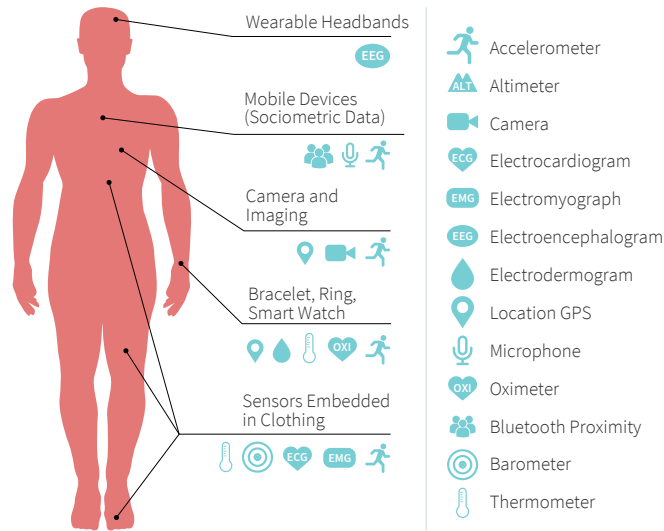
But how do we exist in virtual universes? How will we interact with people, other entities, and the environment? This is where wearable technologies come in. With augmented reality (AR), virtual reality (VR), mixed reality (MR), extended reality (XR), and other wearable technologies, we will be able to reach meta-universes. Technologists hope that virtual reality headbands will not be needed to access meta-universes in the future. However, these headbands are currently the most successful way to access meta-

universes. These developments are why companies like Facebook are making massive VR investments. Processing data from sensors such as movement, pressure, and position embedded in clothes simultaneously, the virtual reality world promises to offer a real-life experience to users by combining this data in a VR headband. With the rapid development of 5G, VR technology is expected to be significantly faster, while more data can be processed.



*One of the movies that describes the metaverse concept best:
Ready Player One, by Steven Spielberg, 2018*

Available Recipients, Recordable Measurements



Source: PLOS Medicine

Considering wearable technologies in terms of wellness and medical science, the idea that we are on the threshold of a new era stands out. Regina E. Dugan, the former head of DARPA, stated, "COVID-19 can introduce the health age just as Sputnik triggered the space age", which many people agreed.

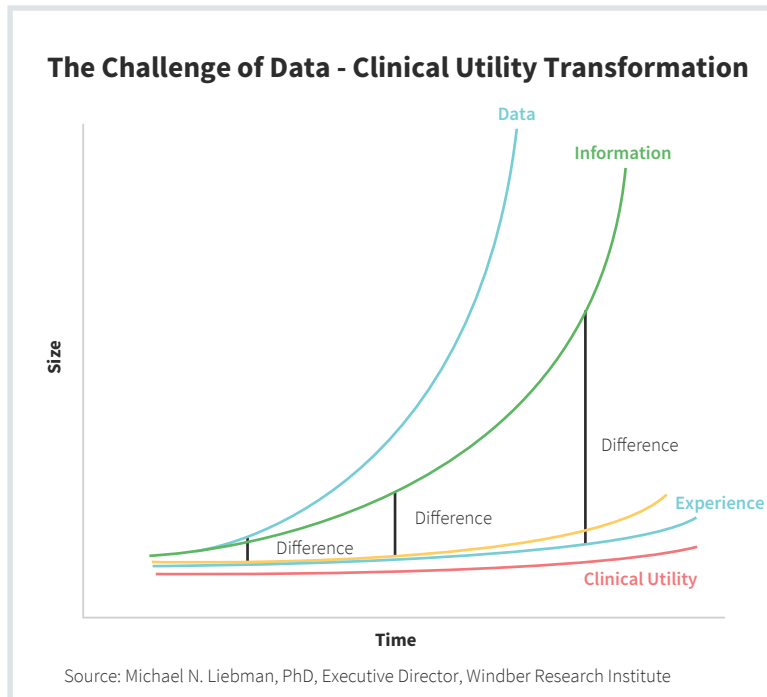
With athlete health devices or smartwatches, we can currently get EKGs, monitor heart rate, measure blood pressure with a certain margin of error without a cuff, evaluate the overall exercise, and observe the effects of environmental factors, such as noise, on our bodies. Soon, wearable devices with the ability to measure

the concentration of molecules, including proteins, enzymes, and hormones related to the diagnosis of diseases, in body fluids such as blood, saliva, and sweat, with non-invasive or minimally invasive methods, are expected to be launched in the market. Various blogs speculate that Apple will soon add blood glucose and alcohol monitor to an upcoming smartwatch. Mobile devices, which the patient can readily use during virtual doctor visits via telehealth apps, and medical devices such as stethoscopes, ultrasound, thermography, electrocardiographs, and customized medical laboratory kits suitable for home use are rapidly becoming widespread.

Accordingly, monitoring people's health data via new medical devices suitable for home use with various sensors embedded on textiles, watches, bracelets, rings, glasses, headbands, on the skin, and under the skin caused great controversy becomes possible.

Considering significant advancements in devices and sensors, the next challenge to overcome is generating and storing biodata incompatible with each other and increasing exponentially. Eliminating the gap between biodata and medical benefit is through transforming data into know-how and experience while using it safely and effectively in public health and healthcare services. However, the massive increase in data sizes and the number of data sources exceed the comprehension and processing capacity of the human mind. This is where artificial intelligence (AI) practices start to come in. AI can scan radiology reports to diagnose COVID-19, helping a gastroenterologist who performs an endoscopy identify small lesions that may be missed.

AI can be actively involved in discovering and developing new antivirals and antibiotics. Considered a threat by healthcare professionals, AI is not expected to replace human relations or empathy. However, physicians and healthcare systems leveraging AI are projected to become successful and continue to exist. Thus, the prevention of diseases, early diagnosis, personalized treatment, and lifestyle improvements are predicted to become more manageable, budget-friendly, and more accessible via AI in the future.



1. Flexible belt that inflates with air and applies pressure



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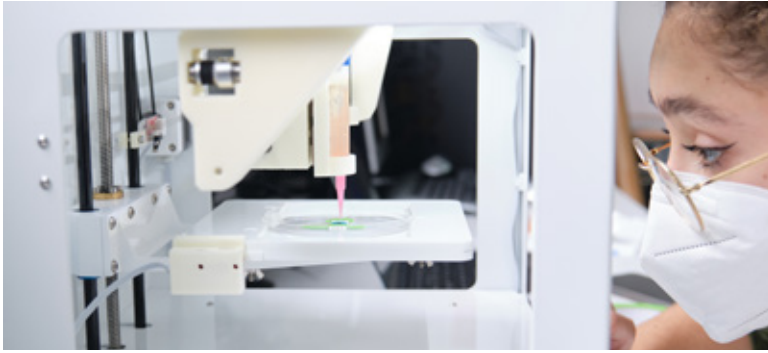
Where Is Biotechnology Heading To?



The COVID-19 pandemic process we are experiencing has shown us again the biotechnology's significance in the global health industry. Consequently, vaccine and drug studies have

accelerated nationally and globally, with many newly-established bio-initiatives in the In Vitro Diagnostics (IVD) industry. As different pandemics are expected to happen in the coming years and decades, these developments will certainly provide great long-term benefits to the global population. However, considering the urgency of this process, the greatest benefit may be the consolidation of the culture of working together towards a common goal among academics, startups, and large-scale industrial corporations in the life sciences. These biotechnology collaborations are projected to increase in the next years. The pandemic's other significant contribution will be the acceleration





of RNA therapeutics, which progress highly slowly, thanks to mRNA vaccines under the spotlight.

Surely, health is only one aspect of biotechnology. Due to many years of climate change, energy security, and similar barriers, both in Europe and worldwide, investments in biotechnology have already been increasing within the scope of renewable resources, bio-based products, bio-economy, and sustainability. Although these investments are expected to continue in the next period increasingly, we can say that among the biggest obstacles to the biotechnological production methods' widespread use is the need for infrastructure with a high-cost investment and the high risk of biotechnology's R&D practices. Developing renewable inputs and cyclical processes and planning how to use both land and sea most efficiently in terms of biomass is necessary to ensure the sustainability of raw materials. The feeding and energy needs of the increasing world are serious challenges. Again, biotechnology will provide solutions to the food demand of the increasing world population with alternative organisms such as micro-algae or insects, synthetic food solutions including lab-grown meats, and

approaches such as plant-based proteins and functional foods. Big data studies, the internet of things (IoT), and analytical solutions are projected to be used commonly both in the field of health and for better agricultural feed, products, and livestock. Thus, smart agritech will inevitably become widespread. Another progress that accelerated the transformation of biotechnology into a product was synthetic biology with various newly-established synthetic biology startups of the past years. While some offer plant-based cell-independent protein synthesis solutions, some operate in the biodiesel industry or quite diverse fields such as microbiota-based live biosensors. During the COVID-19, synthetic biology startups operating in drug and vaccine production have established.

Surely, having well-designed local and global policies for the success, popularity, and market availability of all these strategies



is highly critical. Considering biotechnology advancement as solely purchasing infrastructure and raising buildings will eventually cause failure in the race. For maintaining the sustainability of the established facilities, it would be convenient to create a well-designed workforce, identify pricing policies by considering the investment cost of the goods produced, evaluate the biotechnology industry or startups together for raw material needs and/or waste management in terms of sustainability, and design legislation in this regard.

Besides the suitable policies, investment is also required. In fact, venture capital has potently turned to bio-entrepreneurs with the pandemic, while partnerships, mergers, and acquisitions in biotechnology have accelerated. Among the best-known examples of this field is the rapid production and introduction of mRNA vaccine with the partnership of Pfizer-BioNTech. The collaboration between Astra Zeneca and Oxford University is also another example. Investments not related to COVID-19 have also increased. While Novartis purchased a bioinitiative operating in ocular gene therapy for 280 million USD, Eli Lilly invested 2.7 billion USD in a company developing a genome editing platform. The total investments made in the first half of 2020, even to startups in synthetic biology alone, reached 3 billion USD. While biotechnology investments, which were 3.9 billion USD in the third quarter of 2020, have hit 6 billion USD in the third quarter of 2021 only in biotechnological drugs and treatments (such as mRNA vaccines, RNA therapeutics, anti-aging treatments, T cell therapies), they are also expected to increase gradually in the coming years. However, biotechnology investors should be extremely careful not to face new Theranos cases during this process.

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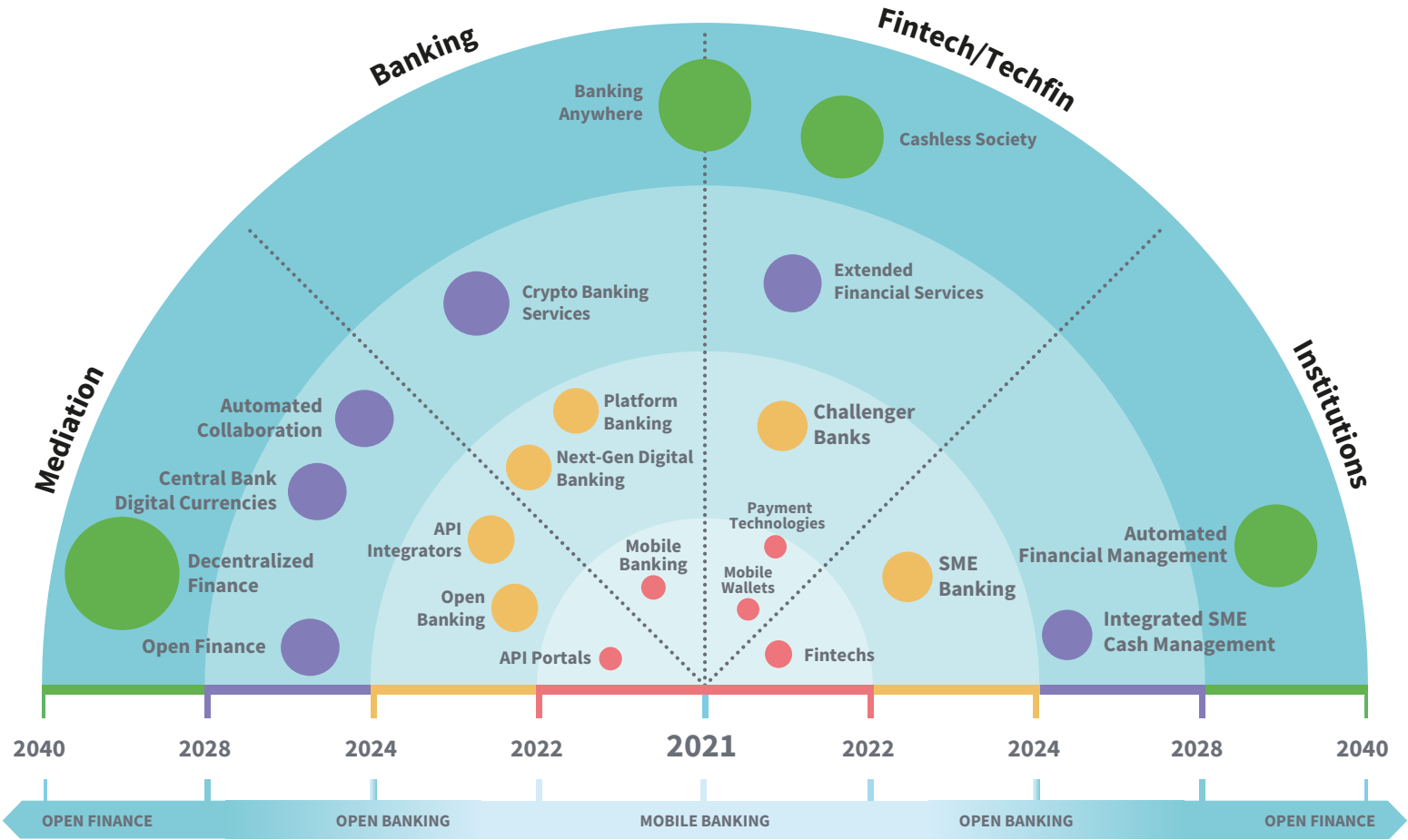
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Financial Technologies



Fintech Radar

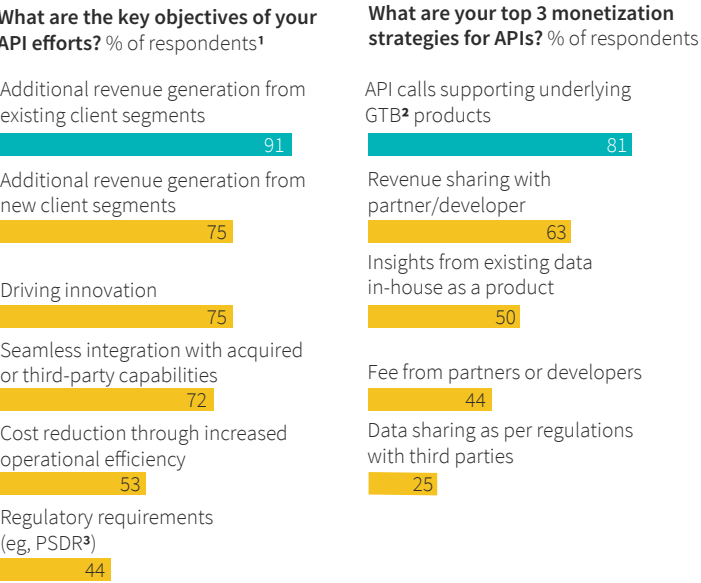
On Fintech Radar in Technology Report 2021, we included the topics of Payment Technologies - Mobile Wallets, Mobile Banking, API Portals, Fintechs, Challenger Banks, Next-Gen Digital Banking, Open Banking, SME Banking, Integrated Cash Management, API Integrators, Open Finance, Extended Financial Services, Automated Cooperation, Automated Financial Management, Platform Banking, Banking Everywhere, Central Bank Digital Currencies, and Decentralized Finance. Although the evaluations and predictions on these issues are still valid, new topics have excelled and been added to the radar while increasing their impact since the last year.

Invisible Banking

The next three years will be a period when banking grows its invisibility in most of our daily activities. Voice-based banking transactions, all kinds of objects equipped with IoT features, personal finance management / financial health applications, and any application with a payment-related flow will include invisible banking features.

With some examples today and the spread of open banking services and service model banking, receiving the optimum financial services of all kinds in the same environment will be

The top objectives and monetization strategies of surveyed banks emphasize revenue generation.



¹Respondents were asked to rate the importance of objectives on a scale of 1 to 5, with 1 being the lowest importance and 5 being the highest. The percentages are for respondents rating an objective 4 or 5; n = 40.

²Global transaction banking.

³Payment Services Directive 2 is a European regulation for electronic-payment services. It seeks to make payments more secure in Europe, boost innovation, foster competition, and help banking services adapt to new technologies.

Source: McKinsey State of APIs in Global Transaction Banking Survey

possible while using a shopping app, just as navigation apps offer us the most convenient way while transporting between two locations.

Crypto Banking Services

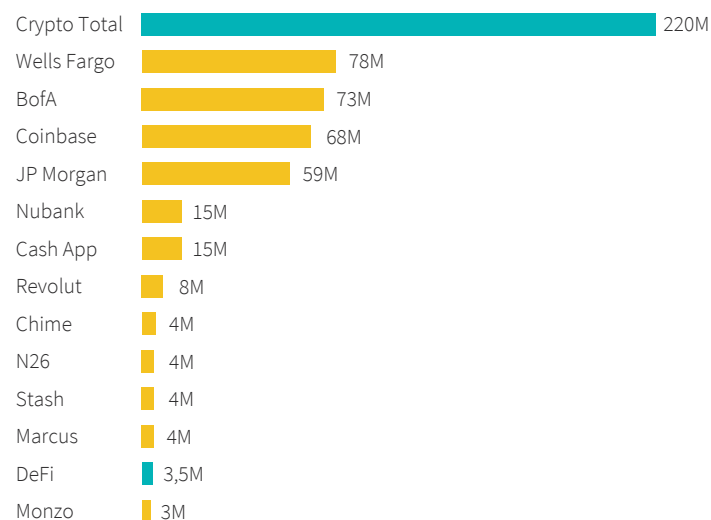
Today, many financial instruments used in the banking and investment industry have found a place also in the crypto-asset ecosystem. The service alternatives in this field and the high return potential despite the risk appeal to many users. Globally, there is an increasing trend for users who are not customers of any bank to have their first financial experience in this ecosystem. Moreover, collaborations between institutions providing new-gen crypto banking services and traditional financial institutions will act as a bridge between two different user profiles. That's because among the biggest obstacles for traditional users are the user experience and the difficulty in accessing crypto banking services. Countries are working on regulatory and technical requirements to use Central Bank Digital Currencies (CBDC), stable coins, and other crypto-assets. Ensuring the establishment of necessary infrastructures will provide traditional banking customers with access to crypto banking services such as storing crypto-assets, cryptocurrency trading, staking, and crypto cards via their familiar corporate structure, increasing demand for service diversity in this regard.

Decentralized Finance

Decentralized Finance (DeFi), another significant issue of the crypto-asset ecosystem, stands in a highly critical place considering that traditional financial instruments continue to be

developed as products adapted to the crypto-asset ecosystem. Although making many transactions such as secured/unsecured loans, crowd-funding, yield farming, and bonds, these alternatives will continue to increase with new products fit for DeFi's nature. Besides all these, the DeFi 2.0 concept, which focuses on areas such as smart contract insurance, KYC, and AML for both user experience and risk management that are hard to access by end-users or prevent spreading to large masses, will become more popular.

Number of Users Across Select Financial Offerings



Source: DeFi - Internet Banking Beyond Borders, Grayscale

Cashless Society

While the pandemic changed consumer habits rapidly, many behavioural patterns considered to be temporary became

Internet Use and Online Purchases, 2020

(% of individuals aged 16 to 75)

	Proportion of individuals who:	
	Used internet within the last 12 months	Purchased online within the last 12 months
EU (1)	89	65
Belgium	92	73
Bulgaria	74	31
Czechia	89	72
Denmark	99	89
Germany	95	83
Estonia	90	68
Ireland	92	74
Greece	79	46
Spain	93	63
France (2)	91	70
Croatia	80	55
Italy	81	44
Cyprus	91	47
Latvia	90	56
Lithuania	84	54
Luxembourg	99	79
Hungary	86	60
Malta	87	63
Netherlands	95	87
Austria	89	66
Poland	85	61
Portugal	79	45
Romania	85	38
Slovenia	88	63
Slovakia	91	62
Finland	97	76
Sweden	97	84
Iceland	99	83
Norway	98	85
Switzerland (2)	97	80
Montenegro	79	23
North Macedonia	84	34
Serbia	79	38
Turkey	78	33
Bosnia and Herzegovina	74	28
Kosovo*	97	46

* estimates 2019

Source: Eurostat (online data codes: isoc_ci_ifp_iu and isoc_ec_ib20)

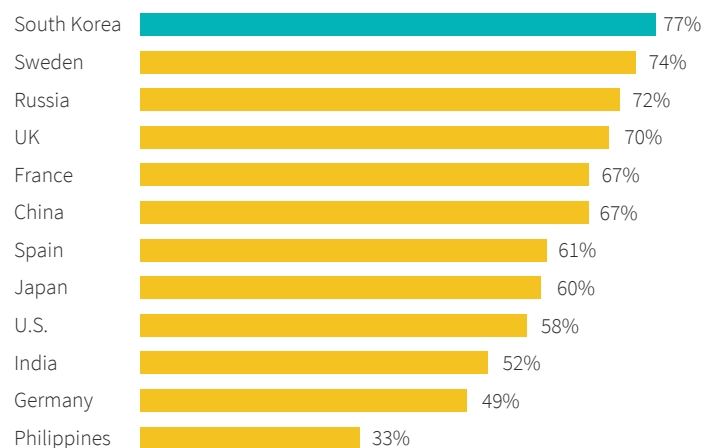
permanent. Decrease in cash usage is one of them. With the big increase in eCommerce usage, especially with the pandemic, the popularity of digital wallet applications, the need for contactless shopping, and mobile payment alternatives, allowed this habit to become permanent.

Considering where the cashless society concept emerged, Asia and Europe are pioneers in this regard. Especially China, Sweden, Finland, and India are still working on this issue. Sweden aims to transition to a fully cashless society by 2023.

By 2040, the use of cash will be the rare, unpreferred, or unaccepted method globally.

Card Over Cash?

Share of respondents who said they preferred to pay without cash in selected countries (2020)



676,000 internet users 16-64 y/o surveyed across 46 markets

Kaynak: Datareportal, Global Web Index



Sabri Gökmenler
İşbank Deputy Chief Executive

The Impact of Developments in the Crypto Finance World On the Future of Banking

Dating back to the years before the Christian era, banking was based on direct exchange in the early periods. However, it became widespread, especially with the invention of money, while the shift to electronic banking began when computers entered our lives. In this process reaching the present day, we have all witnessed the rapid digitalization in banking services via the tremendous contribution of the internet and mobile technologies. Here, we see that significant questions that will light the future await answers: Will technology, which has maintained a vital place in the development of banking until today, cause the creative destruction of banking soon? Are the foundations of a new financial system being built by cryptocurrencies, blockchain, and decentralized finance (DeFi) technologies that are rapidly growing and drawing great attention from the new generation? Using this power, can

banking act as a bridge while managing this change and pioneer the democratization of financial services?

Here, I believe discussing the subject without defining many new concepts (blockchain, crypto-asset, Bitcoin, cold/hot wallet, digital money, CBDC, DeFi, NFT, Metaverse, Web 3.0, etc.) emerged with the developments in the crypto-finance world and analyzing how the future of traditional banking will be shaped would be beneficial.



From Centralization to Decentralization

Today, a monetary transaction must be performed via a central institution or authority that will confirm the relevant information. For example, if a payment transaction is performed via the same bank, the relevant information is confirmed by that bank. However, if it is made between different banks, the relevant central bank confirms the data, while the "swift" network confirms the relevant information for an international transfer. In case of a dispute regarding the transaction or a need for documentation, it is managed via the relevant central structures. Although a central authority or institution exists in the system, serious problems may rarely occur if the systems do not work properly.

With its long history, the traditional banking system has a structure in which legislation and processes are pre-defined down to the smallest detail by national and internationally certified authorities and institutions. Continuing with many crypto money projects after extreme interest, the wave created by Bitcoin (BTC), launched in 2009 to create a payment instrument and is the world's most valuable and first cryptocurrency, seems to have an opposite structure. Offering a decentralized, autonomous, and anonymous system, cryptocurrencies reveal their fundamental differences in this area with their structures that do not accept a single authority. "Blockchain" technology, which has a unique design and will affect the future in many areas, is used to achieve this. We observe that the young generation without a close relationship with the traditional banking system who live with technology easily started to use these new systems that do not need any permission.



We can also observe that among the most important reasons for the rapid increase in the value of crypto assets is the "network" effect. Accordingly, the value of the said assets increases as the interest of the younger generations intensifies. The recent extraordinary expansion of money supply worldwide and the decrease in the value of money with rising inflation have led to an increasing interest in cryptocurrencies, especially in limited supply or created in return for a certain service. This interest was not only limited to the younger generation. With the rapid rise in the value of cryptocurrencies, many professional investors started to show more interest in this field. Compared to the money and commodity markets which are closed at certain times, albeit limited, the ability of the crypto-asset world to make continuous transactions 24/7, including the weekend, stood out as an investment advantage. Following this interest in cryptocurrencies, the studies and evaluations of central banks on digital currencies



(CBDC) working on "blockchain" technology were closely monitored so that they do not adversely affect their rights to print money and "seigniorage" in the future. Many central banks and similar institutions worldwide have started to work intensively on digital currency projects to both understand this new crypto world and maintain their existing privileges.

In the summer of 2021, the El Salvador Government's acceptance of Bitcoin in payments was considered a significant decision by a state authority in favour of the crypto world. However, although Bitcoin first emerged as a means of payment, I do not think it could be widely used, especially in micro-payments. In fact, Bitcoin is considered as an investment tool rather than a payment tool since its supply is limited to 21 million units and provides very high volatility.

In the early years, the real-world benefits of crypto-assets were not fully understood (for which examining the whitepaper of each

crypto-asset project in detail is required). However, they have seen the increased value and interest due to their potential to be used as payment and financial instruments on decentralized finance platforms (DeFi) with lending, credit, return on investment, and insurance opportunities, in the NFT world that has become widespread recently, in Metaverse, which is on the agenda in almost all media these days, and in Web 3.0 environments.

Metaverse Currencies and Art Productions on the Blockchain

While the cartoon characters included in a tiny comic book during our childhood were transferred to the movie scenes where a fantastic world was created, we recently saw these characters meet in 3D on the same stage thanks to technology. Similarly, we played "river raid" or "asteroids" on arcade machines with as many coins as we could get with the money we saved from pocket money. Today, we can watch international game tournaments with great admiration, in which large groups participate via the internet.

This dizzying pace of development gives an idea about the possibility of the realization of many fictions that seem like dreams in the concept of Metaverse based on integrating all the virtual universes we know today, including the real environments we live in, even as in the game "Pokemon GO" that we witnessed for a short time recently, in a common-place. After creating a profile and a wallet, an indispensable part of this world, on "decentraland.org" designed via dynamics similar to the original in a virtual environment, we can meet our friends and



chitchat while visiting many shops in the shopping centre. We can now experience this environment with only our senses of sight and hearing via some specially-designed devices. We see that opening an NFT-based painting exhibition in a suitable location in similar virtual centres or building a platform that can provide decentralized financial services is not difficult.

Having very different dynamics from conventional concepts, these new structures can be analyzed closely and in-depth to evaluate whether they are a potential opportunity or a threat to the traditional finance world. Being as close as possible to these formations, and even within them if possible, is necessary to achieve this. By considering limited losses and performing experimental procedures, discovering the various features of these structures and specializing by constantly learning is important. Otherwise, I think we cannot fully understand the dynamics of these new formations by reading or listening as we did in the past.

New Experiences and Inexperience

While in traditional financial systems based on trusting the institution, many people can transact without any special effort. However, in the new crypto-finance world, relying on protocol and software-based contracts, rather than an institution, directly on the platform to be transacted is required. Since the human intervention is not possible at any stage of this world while technology provides everything, a highly distinct experience and trust mechanism await users. Although these applications run on open-source architectures, we should remember that they carry a very high technology risk. Besides the risks that a software error can cause on the smart contract, the inexperience and old habits of the intermediary platforms allowing us to access these systems or users in this world have also created significant problems.

We know that crypto assets have a distinct energy and an interesting attraction. However, we should also admit that they also carry many risks. Particularly, its different and complex structure compared to conventional concepts, slow performance against centrally designed services, vulnerability to user errors, open architecture allowing fraud, and unestablished regulatory and legal ground by the authorities are important risks in this area. Recently, many incidents occurred due to the misuse or abuse of malicious people and the insufficient knowledge of users. We also know that there are losses due to the inability of the private key, the only proof mechanism for the crypto asset, to be stored healthily in a cold or hot wallet, besides theft or loss. While traditional systems are designed to protect the customer



against mistakes, we should remember that we are alone in this new world and that we can only protect ourselves with knowledge and experience. It seems inevitable that local and global regulatory authorities will introduce the necessary regulations to ensure financial stability, especially to prevent investor abuse and money laundering.

Lastly, I believe that there is no single correct answer to the above questions. Even if we are not in the centre of this world, I think we must be in it, instead of being a spectator, follow the developments closely, and find the most appropriate way to convey what we have learned as past generations to attract and gain the trust of the new generation living intertwined with technology. In contrast, a new future with such different dynamics is being built.



Simla Vardı Aşkın

Softtech Digital Banking Platform Tribe Leader | Multi-Channel Banking Director

Could It Be Finance 3.0 That's Coming Up?

Considering the possible changes and transformations regarding the future of Digital Banking and Financial Services, I realized that touching upon what we may experience in the local industry soon and perhaps what may happen globally soon besides our predictions and discussing these issues with two different approaches is necessary. Thus, I shared my thoughts on both subjects under two sub-headings. For the titles of these two

sub-headings, I also included two internet slangs the Gen-Z loves: "Dreams" for the developments that we assume by interpreting the industry and that we expect to happen with a high probability and "Realities" for what is happening in practice or what seems likely to happen. This part is surely just a summary of futuristic readings.

Where is Digital Banking headed to? (Dreams)

We know that the BRSA will issue licensing within regulation for the popular topic "Next-Gen Banking" with a rapid clustering while existing banks and institutions seeking a license are also preparing for this new formation. Especially e-commerce's powerful players have broken down their preparations for the new setup to the level of teams and launched their HR preparations while preparing their teams in parallel with the developments. However, the Pandemic process, we hope that it will pass for two years, increased the momentum of digitalization in the banking industry more, making it a process and part of the daily agenda of every financial actor. Considering our user data and industry research reports, we can also see that this acceleration is also reflected in the usage rates in all age groups. The expectation of a "Simple", "Fast", and





"Hassle-free" experience we all internalize in our personal lives is the basic satisfaction requirement of all users, regardless of segment.

Today, Open Banking and Digital Banking, as everyone would agree on, are the two main topics that will change the habits of the banking and financial industry in Turkey while transforming them.

Open Banking will seem to enter our lives with its applications in the second half of 2022. Open banking is a system/concept that allows third-party organizations and interbank data communications to access customers' financial information to develop applications or services using this data. Undoubtedly, the greatest contribution of this practice will be provided to the end-users who will utilize the new opportunities offered via diversified services and competition. Moreover, Fintech startups and practices will have a vast playing field with the new ecosystem to be formed. For existing banks, this situation creates an extremely competitive environment. Although the largest asset, client sizes

(for consenting clients), seems to be opening up to a common share, it can also create new revenue models, new channels, and profit centres for banks that created a fintech ecosystem and support this ecosystem sufficiently with technology. This change may also be the first step for banks to transform into platforms.

For Digital Banking, touching upon the growth rates and total sizes of successful implementations worldwide, instead of forecasts and expectations, can allow us to form a thorough idea to understand the scale of the upcoming change and transformation. The pandemic caused a disruption for physical businesses from all industries worldwide, especially with the challenges faced by branch-channel businesses, and accelerated the growth of digital banking. Especially the progression of Nu Bank, a fully digital bank, its valuation of 55 billion USD, its 35 million users in Brazil alone, and its acceptance of users via waiting lists in other countries is the solid proof of the trend of the new-gen for such a service model. Nu Bank also offers limitless money-transferring transactions to its users for free without any annual card or subscription fees and provides more favourable loan interest offerings compared to traditional banks, thus, being preferred by customers. However, only startups seeking to offer all their banking services will not receive a Digital Banking license for sure. Especially e-commerce companies with high user size and commercial volume, which aims to grow their trade via the financial services they will offer to their users, will also be candidates for this license by providing the qualifications. So here, there are both risks and opportunities for existing banks in the market.

Where is Digital Banking headed to? (Realities)

What are the other developments outside the limits of financial regulations but seriously affect the financial industries? Should we not consider them until they are regulated? Tokenomics, the economy of cryptocurrencies, is a concept, which we think of as the distant future but is alive today, where financial industries are at least an investment instrument with deep relations due to the overall market size.

Bitcoin's market share alone has reached silver's world market share size, among the oldest commodities in human history. The total crypto market is about to nearly double silver's market share. In a market where such a large amount of money enters the world, financial services are needed, as might be expected. Users only believe and trust in services' decentralized power



on platforms exempt from any financial regulation. DeFi (Decentralized Finance) is among the most popular concepts in the cryptocurrency ecosystem. Today, the greatest interest for users of these limited applications exempt from regulation and without being associated with taxes seems to be interest benefits. Still, reaching an agreement with lawmakers worldwide, determining the limits, and taxing the income is necessary to eliminate the shortcomings in application diversity and ensure daily use. However, when these conditions are provided, today's financial industry actors must have completed their preparations for the next deep wave. For example, an annual interest rate of up to 12% in USD seems to be a standardized offer for DeFi platforms. A standard offer far above what today's financial industry can offer!

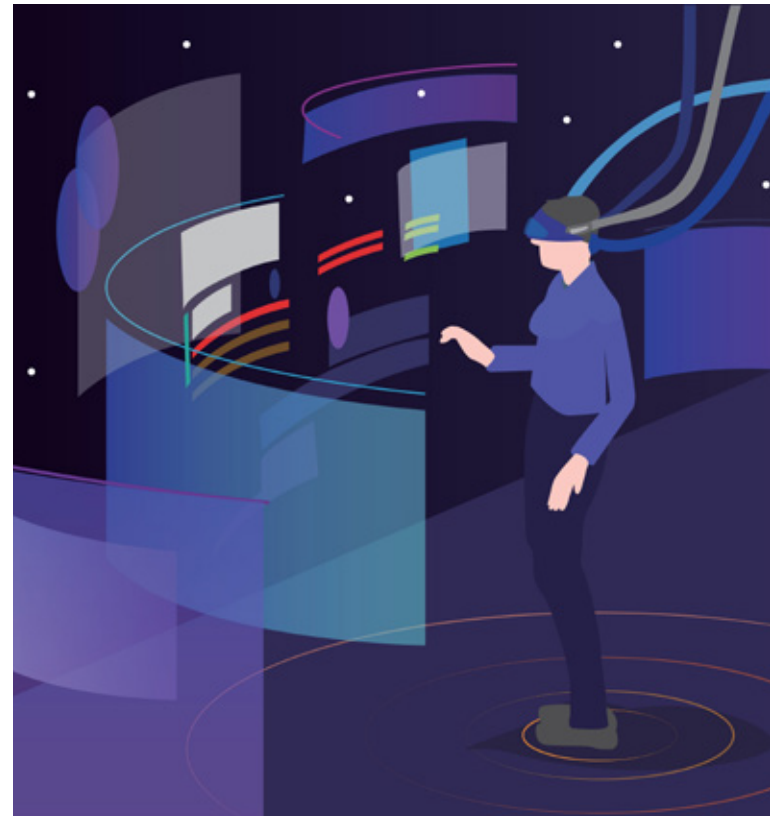
Besides these, I would also like to discuss the Anonymization and Metaverse duo briefly. Blockchain offers traceable addresses/contracts to users, failing to provide complete privacy. Namely, each transaction of the users leaves a contract trace they can track in case of a problem. Taking this one step further, token/coin projects and applications offer complete anonymity, thus rapidly emerging. Here, only the system's decentralized auditors can monitor the record system. Sounding highly complex until now, this definition serves a situation such as this: Person A wants to transfer an asset to person B. Person A who sends the asset via the project, which offers anonymity on the blockchain, confirms all acceptances regarding the transaction's realization.

Meanwhile, the system approves the transaction's realization through the verification centres on the blockchain in a decentralized way via the algorithm developed. Briefly, only the sender and the recipient know the amount, reason, and date of the asset A transaction sent to B. Keep this information at the back of your mind. Now, let's add a virtual world experience, namely Metaverse, in Anonymity. It is a new type of experience where users can share their information at their own discretion and have various experiences.

Brands operating in various industries worldwide have already started planning to offer products and services in the Metaverse universe. The blockchain universe is also intertwined with the Metaverse. Now, let's think about the financial aspect of the relationship between users A and B that met on Metaverse. Two anonymous people without any idea of the other's physical

appearance, and maybe even located at the farthest or the closest two places in the world. One transfers anonymized money for any product or service via the blockchain. It's like a highly complicated and confusing brain exercise...

So, where will each player in today's financial industry position themselves in this transaction?





Umut Esen

Softtech Ventures Managing Director

Multiplayer Fintech

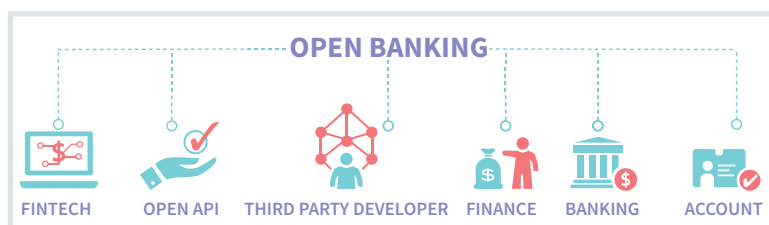
Today, everyone knows that the road for customers to takeover their financial data is paved via the regulations introduced with open banking and expected to expand with open finance. This shift creates two new consequences: While banking is now transforming into a platform and marketplace business model, all companies are increasing their efforts to become fintech. While continuous customer benefit stands out with this increasing competition, technology and e-commerce marketplace companies aim to grow their market shares via discounts and broad product ranges, strengthening the competition with their closed-circuit approach. Focusing on multiple players in the same industry while combining financial and industry-specific data, the Multiplayer Fintech Business Model combines can soon provide "co-ompetition" with the marketplaces via an approach that

can benefit all stakeholders in the industry with more customer experience-oriented approaches.

Open banking and open finance give the control of people's financial data back to them.

As everyone knows, open banking regulations launched in Europe in 2015 are also accelerating in our country via the efforts initiated to implement them. There are fundamentally two primary motivations of open banking.

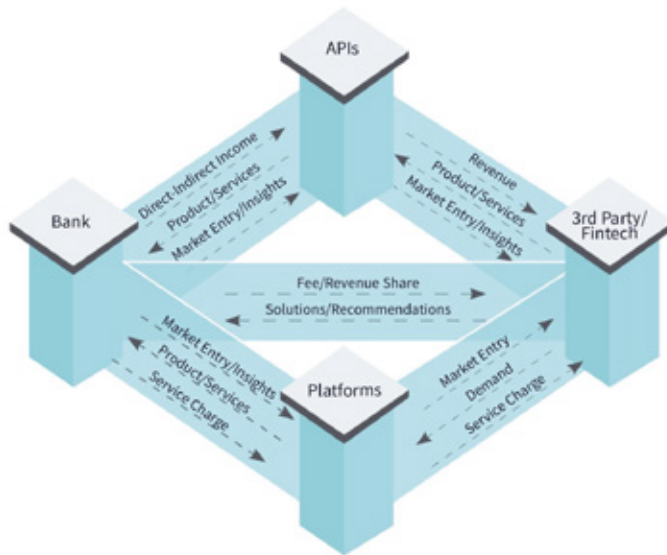
- The first is to empower non-bank fintech players to compete with non-European payment and financial solutions, especially GAFA's.
- Its second motivation is to define financial data as a valuable asset owned by the user, enable end-users to possess their data and allow third parties to access it in a controlled manner with GDPR, thus promoting competition and innovation.



With the FCA's (Financial Conduct Authority) 2020 call to collect input for Open Finance and European Commission's report "Digital Finance Strategy for the EU", 24 September 2020, Europe launched open finance practices by expanding its open financial data set to include data such as insurance, investment, and mortgage.

Thus, Marketplace and Platform Banking Models are readily projected to stand out with open finance applications. You can find the details of this model in my article "Softtech Technology Report 2021 The Future of Open Banking".

Marketplace Banking and Platform Model Basic View



The digitalization accelerated by the COVID-19 and open finance regulations requires every company, especially technology and eCommerce companies, to turn into a fintech company.

Increasing digital spending with the pandemic reinforces industry players and encourages them to offer financial services to end-

users besides others. Each company, especially eCommerce and technology companies, started asking the following three questions regarding the services they offer to their customers:

- Can we include a financial service in the experience we provide to our customers? Would it be meaningful?
- Will providing a financial benefit to the customer, such as payment and loan, to help stay ahead of the competitors?
- How much does the additional income I can generate by intermediating financial services contribute to my business compared to my primary service income?

Similarly, financial institutions and FinTech companies aim to respond to this competition by creating industry-oriented business models and collaborations that offer their customers more integrated and seamless experiences under strategies such as embedded banking, invisible banking, invisible insurance.



"Multiplayer Fintech Business Model": A new industry-focused business model to deliver excellent, seamless experiences throughout the customer's life-cycle

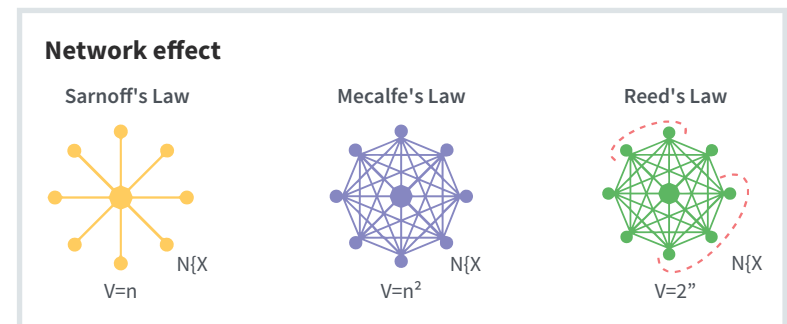
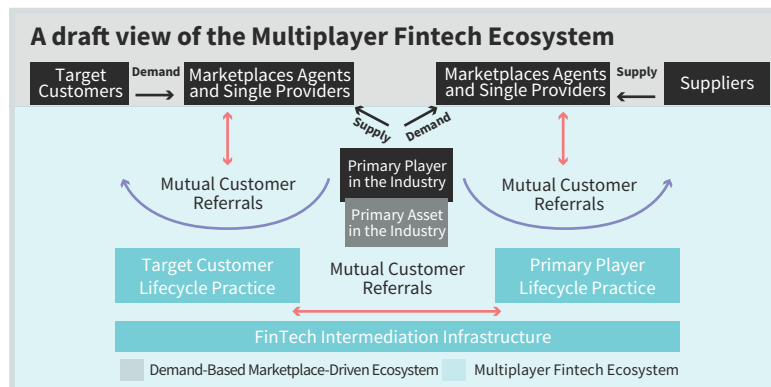
Multiplayer Fintech is a new concept that has stepped forward via industry-specific and multi-personal targeting apps such as TripActions. TripActions is an app that helps employees plan their business trips, it allowing companies' finance departments to integrate and make their expenses under control. Although this concept may seem new, various tech companies, especially platform-oriented companies, have established startups similar to this business model via similar approaches.

The Multiplayer Fintech Business Model can be defined as a business model that aims to provide end-to-end and seamless service to multiple players in the same industry, focuses on delivering benefits to its customers, combines financial, technological, and business services in an open ecosystem, and aims to create added value via the data produced. This article will explore and enrich this new concept, providing more definitions.

In the Multiplayer Fintech Business Model, various platforms, which focus on the industry's primary players, also create synergy among themselves, providing further advantages over platform business models.

Today, platform business models have stood out, reaching scaling that classical centralized structures cannot provide. Everyone now accepts how difficult it is for a centralized business model to create the power of the network effect generated by business models like "Airbnb".

While many platform companies multiply this model via the platforms they established between buyers and sellers, creating a more significant network effect by enabling homogeneous platforms to interact with each other may also become possible. In the Multiplayer Fintech Business Model, strengthening the network effect by establishing connections among various platform apps will create a more robust network effect while obtaining rich multidimensional data on the industry and its assets.



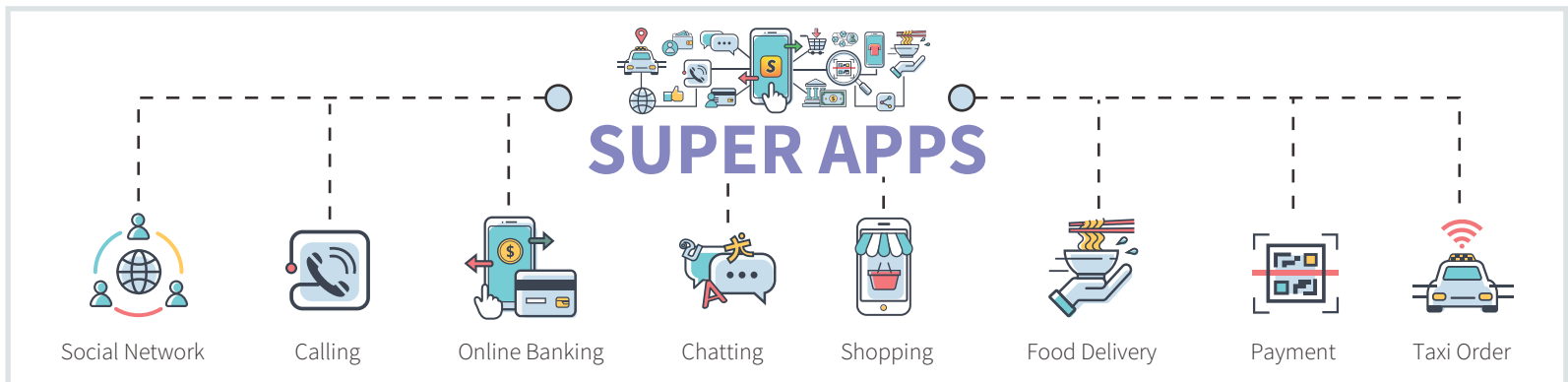
Offering all possible product and service alternatives to its customers, the Multiplayer Fintech Business Model should address its customers by making customer benefit a top priority.

Customers can have seamless, end-to-end experiences only when customer benefit is considered. Thus, technology, business services, and financial services should be offered under the most favourable conditions via an open ecosystem. Although these services can be provided via marketplace integrations and/or partnerships with individual intermediaries, new services based on data and technology that are considered to provide additional benefit to the customer can also be created. While services can be received from single suppliers that meet quality standards, multiple alternatives can also be offered based on price advantage. The main goal in the first stage should be providing benefits to the customer rather than profitability.

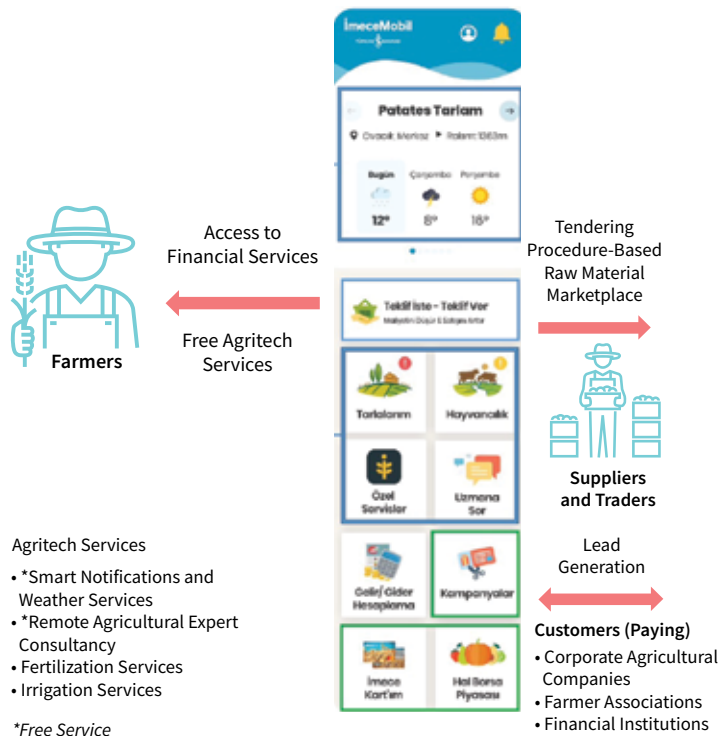
In the Multiplayer Fintech Business Model, seamless continuous experiences should provide advantages compared to marketplace applications and super apps.

Marketplace apps and super apps focus on promoting customer benefit via discounts and approaches such as delivery services. They combine buyers and sellers to focus on multiple products, aiming to increase the network effect and the volume created. However, their relationship with the customer is based on identifying their demand and enabling them to engage with these apps beyond a seamless experience. They try to maintain this fragile link with serious marketing expenses via advertisements, various reminders, and search engines to create awareness and ensure customer continuity.

In the Multiplayer Fintech Business Model, industry and segment-specific, data and service-oriented experiences embedded in the user's life uninterruptedly and ensuring customer continuity marketplaces cannot achieve. Having a permanent place in the customer life cycle is only possible by using the industry know-how to provide both products and all kinds of technology and business services at the time and point needed instantly.



ImeceMobil Business Model

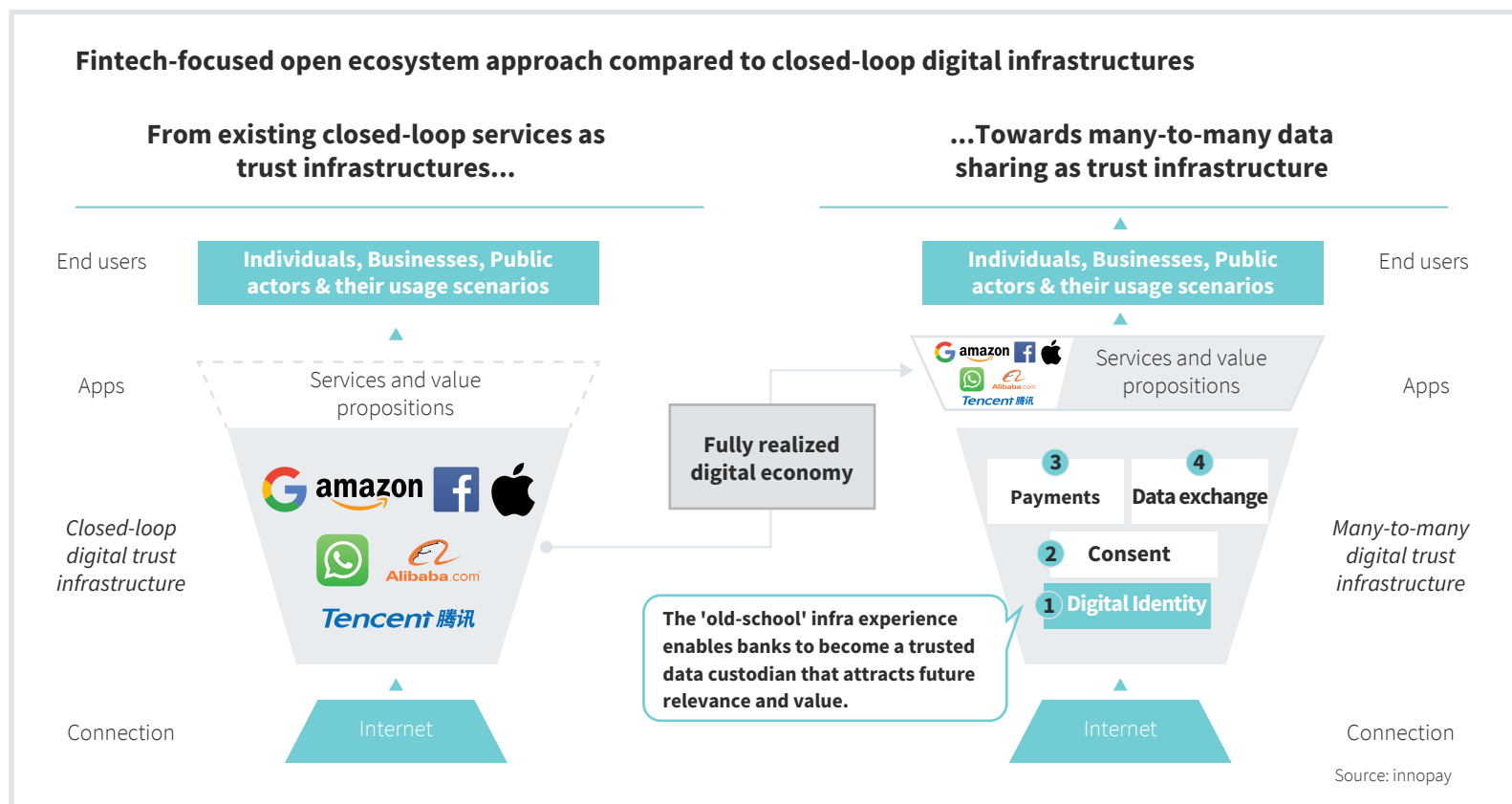


For instance, ImeceMobil provides technology-oriented satellite-assisted alert and information services and expert services, such as irrigation and fertilization, to farmers free of charge. Its Bazar feature can also allow farmers to buy products from contracted suppliers at affordable prices. ImeceMobil turns all these into income with financial benefits such as buy now and pay at harvest or agricultural loans, standing out as a successful multiplayer fintech business model.

Similar to agriculture, the goal of the Maydanoz Initiative, which aims to digitalize the real estate industry that fell behind in digitalization in our country, is to increase efficiency in the industry and expand it by creating an ecosystem based on trust and cooperation, focusing on benefiting real estate consultants.

In the Multiplayer Fintech Business Model, a Financial Technology Intermediation Infrastructure should be established based on multiple data sharing and containing singularized services.

In this period when all companies are trying to transform into a FinTech company, financial services and data will be indispensable both to benefit customers via financial services and create extra income by intermediating them. While access to industrial data can be used in risk calculations of financial services, providing business-oriented benefits by better understanding the needs of customers with the financial data obtained will also enabled. Therefore, performing analyzes, creating insights from common data, and turning this into a benefit with business partners will increasingly stand out soon. Introduced as an open banking app focused on account merging services, Tekcep aims to allow customers to utilize all their financial data, creating an ecosystem based on open collaborations while becoming a multiplayer fintech infrastructure.



Accordingly, the Multiplayer Fintech Business Model stands out as a platform and ecosystem-based business model, alternative to marketplaces, super-apps, and closed-loop tech giants.

The implementation of Multiplayer Fintech Business Models requires competencies such as B2B and B2C-focused business experience and the ability to create a sustainable, trust-based collaboration network. This Business Model also requires the combination of technical competencies such as cloud-based API, providing mobile technology, productivity-oriented back-office

software, data analytics, AI, and FinTech know-how.

As Softtech Ventures, we believe that in our world where industries are progressing into disintermediation, "co-ompetition" based open ecosystems, such as the Multiplayer Fintech Business Model, should be created instead of closed-loop ecosystems. We digitalize industries via our technological competencies and trust-based extensive business network, aiming to develop initiatives that will add value to society.



Çiğdem Kılıç

Softtech Next Generation Technologies Middleware Applications Group Manager

Invisible Banking

With the dizzying speed of technology, the banking industry is also transforming into a fully automated model via various platforms, becoming a model available anywhere, anytime.

In China, the banking pioneer in the digital world, WeBank gives loans to individuals upon request during their shopping on WeChat. With blockchain, the loan amount directed to several banks can transform into a loan based on the customer's needs via APIs.

When we purchase an application on our mobile phone, we can readily confirm the payment by scanning our fingerprints. Moreover, we have internalized this process so much, considering it a step to download the application. Payment processes for services such as Uber, Netflix, and Spotify have also become invisible.

We are heading towards a world where banking, not banks, is available when needed for service for any industry, confirming the

prediction of "Banking is necessary, but banks are not" expressed by Bill Gates 27 years ago.

It's almost time for us to switch from the traditional banking model, where we fulfil our financing needs by issuing a credit card to purchase a product, to banking that enables purchasing that product right at the time of need following an integrated process.

Opening his book Bank 4.0 with the words "Banking everywhere, never at a bank", Bretty King also explains that banking will be



different with digitalization and bring us together with models that will be available anywhere where needs are met.

Compared to 2008, the total number of bank branches decreased by 31%, or almost 75,000, reflecting the rapid increase in the use of online and mobile banking services recently. We can readily predict that these numbers will decrease rapidly with invisible banking.

What Is Embedded/Invisible Banking?

In Turkish sources, the translation of this concept carries the same meaning. However, let's define it formally first: Embedded Banking is the process of integrating financial solutions with a business's platform or app using APIs. Payment is a concept including various types of financial services, such as lending, wearable devices, contactless payments, wire transfers, and cards. Namely, embedded banking is the integration of banking tools into non-financial platforms.

Customers can easily interact with, buy, sell, and trade in their favourite non-financial apps via a bank's platform, while banks can reach customers wherever they are. Thus, the essential services of banks are primarily offered to customers online and often via mobile.

For instance, the Starbucks app is a leading example of embedded banking with deposit and loan products provided by JPMorgan Chase. Launched in 2011, the app allows customers to keep cash at Starbucks and earn rewards for purchases. The store's 25% of

all the US transactions are now conducted via the app, while the retailer keeps cash on its app and cards as much as some banks hold. Accordingly, we can say that this coffee chain has one of the most popular financial apps on the market.



It is also a successful example of embedded banking when customers shopping for eCommerce feel they receive the loan from the eCommerce website instead of the bank.



Embedded Banking Technology

In the technology age we live in, platforms form the basis. The platform economy highlights economic models that help buyers and sellers interact in the digital environment.

Digital money replaces physical money and intertwines payment systems with digital money. While exports and imports are done via platforms, supply chain and contracts can also be made without central authorities with blockchain. Also, banks are transforming by operating and managing these systems instead of disrupting them. They even integrate their products into these platforms.

Besides API, Embedded Banking also uses emerging technologies such as Artificial Intelligence (AI), Machine Learning (ML), Robotics, voice-based banking, Virtual Reality (VR), Augmented Reality (AR), Blockchain, and edge computing.

With the banking as a service (BaaS) approach, customers can access financial products via non-banking applications and online platforms.

A banking API is required to connect apps to the banking system. An API or app programming interface is software that functions as an intermediary among the software's other components.

A BaaS platform provides an always up-to-date, modern API that integrates deeply with the non-financial app. Because an API without full integration or well-protection can cause issues,

disrupting the end-user experience.

What are its benefits?

Embedded banking provides benefits for businesses, banks, and customers in its ecosystem.

For businesses:

- Ability to meet customer expectations
- Increased user number
- Offering customers new, customized rewards
- More affordable prices with reduced transaction fees
- Ability to improve brand image via innovation
- Increased customer loyalty
- Ability to gain more data about the customer

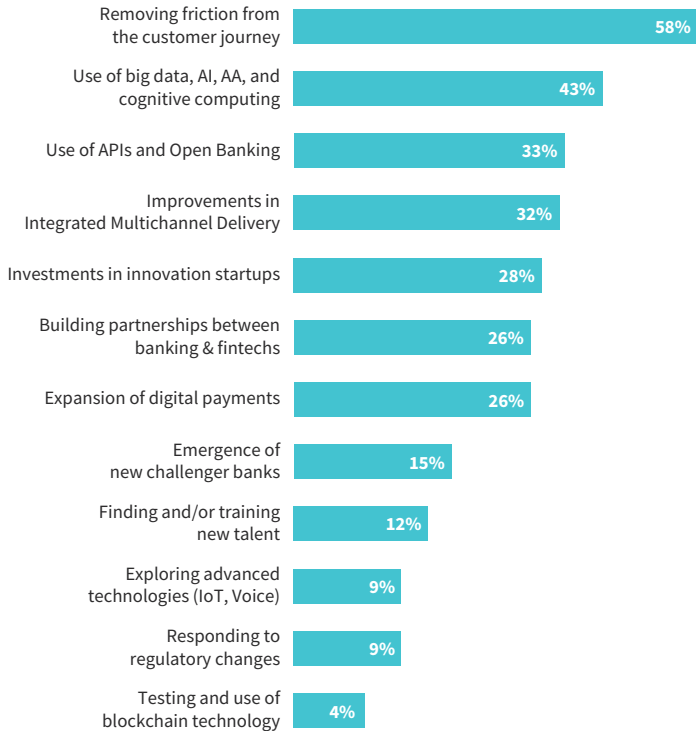
For customers:

- Ability to gain more value from the products and services of businesses
- Customized experience and rewards
- Ability to access to the financial products of reliable brands
- Ability to perform frictionless transactions

According to the research conducted in 2020, 58% of the respondents highlighted the frictionless customer journey, the basis of invisible banking, as the first of the top 3 retail banking trends.

Top Ten Trends For the Retail Banking Industry 2020

What do you think will be the (3) three most important trends for the retail banking industry in 2020?



Source: Digital Banking Report Research, January 2020 The Financial Brand

For banks:

- New customers acquisition
- Ability to reduce customer abandonment rates
- Increased competitiveness against fintechs

In summary, embedded banking goes beyond saving time/

resources and offers a seamless customer experience, providing a mutual benefit for banks and business partners.

Predictions

The future of financial services is beyond the distribution of traditional products and services.

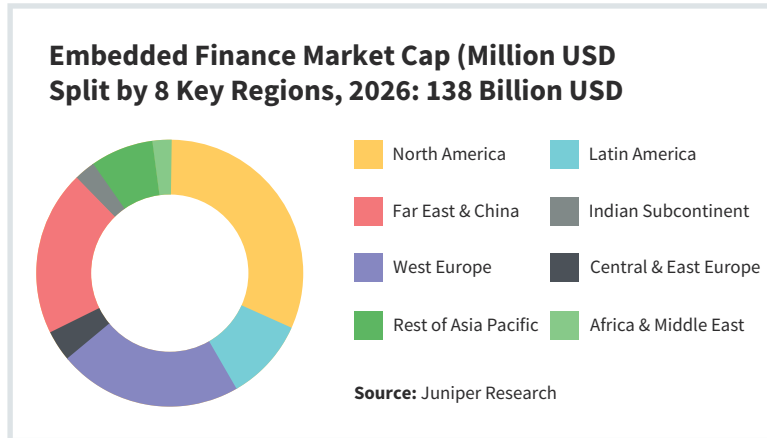
Banking is transforming to remove the need for consumers and small businesses to turn to traditional providers to meet their financial needs. We are moving from a model where we provide original signatures and perform transactions at branches to another where we make all transactions online and provide the financing by being a part of another app without even logging in to any digital banking app.

While banking becomes invisible, we will hear this concept more in the next five years.

As in China, the pioneer in this field, we will often see banking experience in successful applications in areas such as messaging and eCommerce in Turkey.



According to the study of Juniper Research, Embedded Finance, including Embedded Banking, is estimated to triple by 2026, reaching 138 billion USD.



According to OpenPayd's December 2021 report, 96% of European companies surveyed said they were planning to offer embedded payments to customers in the next five years or are seriously considering doing so, while 94% reported the same interest in an embedded banking product.

According to KPMG's report titled "Meet EVA - Your Enlightened Virtual Assistant and the Future Face of the Invisible Bank", invisible banks will replace video calls and manless branches.

Defined as EVA by KPMG, personal assistants will access bank accounts and remind us of payments, offering the ability to provide all services without the need to go to the bank. Moreover, we will be able to synchronize EVA with our social media accounts. Thus,

it will access our agendas and offer suggestions about our private lives based on the characteristics it will collect via these accounts. For instance, it will be able to provide services such as purchasing a plane ticket and car rental service by integrating with invisible banking upon request.

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Tuğba Kasapbaşı
Softtech Product Manager

The Reflections of the History of Open Banking on Turkey

The concept of Open Banking introduced a new turn in Turkey with the regulation on Payment Services and Electronic Money Issuance and Payment Service Providers put forth by the Central Bank on December 1, 2021.

As of this date, Financial Technology companies will start applying for licenses to become Authorized Payment Service Providers (YÖS). Banks have already started their infrastructure preparations, and the first ten banks are expected to have account transactions and payment API-Application Programming Interfaces ready by the end of 2022.

So what does this mean for us account holders? How will open banking reflect on our daily lives?



In fact, we've seen its reflections in the lives of commercial enterprises for a while. For example; Is Bank pioneered with its TekCep and TekPOS products allowing the customers to access their data accounts and POS transactions held at other banks through Is Bank channels.

According to a survey held by Capital in 2008; Companies in Turkey were working with an average of 9 banks. From our one-to-one meetings with finance and accounting employees, we can understand that this number hasn't changed much today. It's a huge waste of time for a company manager or a finance employee

to log in to the internet banking system of 9 different banks and perform checks one by one just to track account activity. Open banking will eliminate such a waste of time and pioneer many new products to make your life easier.

If these products have already started to exist, then why is the regulation of the Central Bank important?

To understand this, it's necessary to look at how open banking has progressed from its past to the present. Let's take Europe as an example;

The EUR currency, which officially entered the lives of European Union member countries in 2002, brought many standardization projects that would have to be implemented later on. Although the EUR was the common currency, each country still had its currency, payment infrastructure, and different payment value dates. Sending money from one European Union member country to another was still considered an international transaction. During this period, when digitalization began to accelerate, the infrastructures established by banks many years ago couldn't transform easily and adapt quickly to the users' needs.

Payment service provider companies that could act faster in this environment started to easily create a market for themselves with new payment solutions. For example, Klarna, which has now reached 46 billion USD in value, was founded in 2005.

In light of these developments, the European Commission

enacted the PSD1 (Payment Services Directive) Payment Services Law in 2007. The first aim of this law was to establish a shared payment infrastructure in the European Union member countries. In addition, it was aimed to control the functioning of payment service providers. In this context, the steps have been taken in the following subjects with PSD1;

- Single Euro Payments Area (SEPA) standards were set. The processing of payments made within the European Union under a single payment infrastructure like a single country was accelerated, making transactions faster and more affordable.
- Payment Service providers became officially recognized and were then able to provide controlled payment services.
- Transparency obligations on users regarding commissions and value dates applied by banks and payment service providers.
- The security standards of online payments were strengthened.



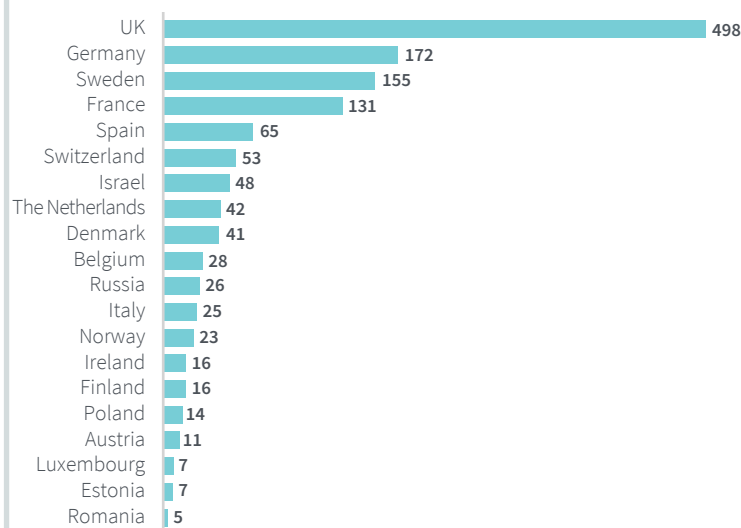
After the PSD was put into force, as the digitalization of payments deepened further, it became clear that the set provisions didn't exactly serve the needs, and that there were areas they were lacking in. Fintech companies taking their place in the market and offering very innovative products have increased the necessity of setting new standards and enacting them into law. As a result; PSD2 provisions were announced in 2015;

- Additional regulations were put in place for different applications of PSD in European Union member countries.
- Standards were introduced regarding brokerage fees in payments, collections and card payments.
- New market players, Fintechs, were also included in the law.
- Strong authentication standards were set.
- The competitive environment was strengthened by imposing banks the obligation to share information with payment companies and fintechs with the consent of the customers.

The implementation of these provisions of the law was set for 2018. During this period, banks and fintechs adapted their infrastructure to the law.

Since then, the creation of fintechs in Europe has accelerated. Some have been very successful, and some haven't been able to continue. But strikingly, the UK has pioneered open banking applications and fintech investments. In the number of company funds that received investments between 2017-2020, the UK has surpassed Germany by a landslide of 326 cycles.

Top 20 Countries By Number of Fintech Funding Cycles (2017 – 2020 1. Half)



As of mid-2021, more than 2.5 million individual and commercial customers in the UK use open banking products, and there are around 300,000 active fintechs.

How did the UK manage to progress faster than other European countries? When the underlying factors are analyzed, the main reasons that stand out are that the UK didn't settle with PSD2, they allowed processes to continue without stopping the product development processes with a pre-licensing agency mechanism for account service and payment service providers, they made the legal infrastructure that will give the end-user confidence reliable and straightforward. Most importantly, they set the API standards



transformation after the end of 2022, when banks will complete their adaptation. The days when we will be able to see our account balances and movements throughout all banks, make payments through a chosen bank account, see the loan terms of all banks and apply to any bank we want, access every information about our cash flow and even get investment guidance all over a single application aren't too far away.

for the parties that will be integrated for the use of the products and appointed an organization that will control the infrastructure configurations from a single centre.

In the light of all this information, let's go back to our original question; Why is the Regulation of the Central Bank of the Republic of Turkey important?

When we analyze the regulation, we see that; The Central Bank has determined the details of the regulation by evaluating the practices in the world, the experiences the European Union had since taking the road to open banking in 2007 and its results in-depth. It has set detailed API standards to make the application easy to use and keep it under control, just like in the UK. Central Bank has also authorized the Interbank Card Center for its control. This is a massive advantage for a financial system like Turkey, which has always been ahead in terms of banking technologies. It can be seen as a precursor of rapid acceleration in the open banking



Soner Canko

Softtech Ventures Board Member

Mobile World's New Business Model: Super Apps

Recent studies show that the average time spent on smartphone apps has increased by 30% to 45% over the past two years. Moreover, another data shows that we spend an average of over 4 hours a day worldwide using our smartphone apps. This unprecedented change means that millions of new users utilize

digital tools and access various transactions via mobile devices, including public services and banking.

Every day, we browse dozens of apps via our smartphones. Sometimes we scroll through social media for minutes, transfer money from our banks, and text messages to our friends. These services, which we use via our smartphones for various needs and interactions that can last a moment or minutes, are now offered in a single app.



We call this type of apps, which provides multiple functions in one, SuperApp.

The logic of super apps is based on delivering interconnected and sometimes disconnected products and services to end-users via a single app. Thus, we can log into many apps via a single ID, utilize various products and services, and make payments using a single wallet within the same app. Namely, our experiences on mobile screens are now faster, easier, and simpler.

Leading Country of Super Apps: China

Utilizing touchless technology, QR codes, and digital wallets, super apps offer a near-perfect customer experience with just a touch via options including one-touch payment, food delivery, reservations, and ride-hailing. Considering super apps, China is undoubtedly the first coming to our minds. Two-thirds of smartphone users in China now use QR codes. Transactions made via mobile wallets are projected to reach nearly 1,9 trillion USD by 2025.

Among the reasons super apps became popular in China first is that they have the most prominent app in this regard. In 2011, the first version of WeChat, perhaps installed on every smartphone now, was introduced to consumers as a messaging app. With over 1 billion users, the app today stands out as a multi-purpose social media, communication, gaming app, and payment tool besides messaging. Besides these extensive features, it also offers other social media content, becoming a complete super app.

Both Alipay and WeChat dominate the super app market, nearly with a combined market share of almost 90%. In the last decade, nearly 257 billion USD was invested by China in super apps, compared to just 43 billion USD by its Southeast Asian counterparts. These investment rates show us that China will pursue its super app leadership. Offering similar experiences, super apps that modeled WeChat's success story have been launched one by one. Alipay, Grab, and Gojek are other popular apps in this category.



While western countries are still discussing super apps, Asian users plan their mobile lives via super apps.

Although Asia is still the most used geography for these apps, it is undeniable that they are the rising trend around the world.



Competition Increases in Turkey

As Turkish users, we always are eager to be early adopters of new technologies. We are among the most popular countries when a new computer model or smartphone is launched. Considering our past experiences, I can say that our adaptability to new techs and payment methods has always been higher compared to others.

Our country's finance, telecom, and retail industries have always been open-minded to utilize state-of-the-art technologies to stay a step ahead of industrial competition. Introducing technological

innovations much earlier than their counterparts in developed countries, these industries are always prepared for the interest and acceptance provided by consumers.

Today, we hear the footsteps of apps that expand the coverage of their mobile apps with extra features and are on their way to becoming super apps to meet their users' expectations.

Thanks to the competition of well-established institutions from any industry with next-gen digital players, super apps will shortly become a rapidly-growing business model in our country. However, instead of the fastest, largest, and most famous brands, those that offer a speedy, easy, and simple experience to their users in the safest way will succeed in this regard.



**Kenan Ayvaci****IS Investment** Assistant General Manager

Next-Gen Investment Applications

The "spirit of the times" does not forget the investment world as well. The experience and knowledge accumulated up to a few previous generations and all the presuppositions, paradigms, and assumptions are consistently eroded. We witness an industry undergoing a radical change in terms of background technology and user experience and its revenue generation structure based on the business model referred to as "monetization".

Everyone knows that most of the most preferred global investment instruments are thousands of years old in the "traditional" category (Boston Consulting Group – Global Wealth 2021). However, what has fundamentally changed is how we access and trade these thousands of years old investment instruments.

With the digital competencies achieved and the legal regulations adapted to them, becoming a remote customer and concluding a contract without being physically dependent on a newly-established or well-established organization is now possible.

NFC (Near Field Communication)-enabled phones and chips in IDs are replacing contracts and ID photocopies with a weekly magazine's thickness. Thanks to this process called Digital Onboarding, the customer acquisition steps and paradigms of the past are destroyed instantly. Undoubtedly, companies with a simple, fast Digital Onboarding process have and will have the lion's share in new customer acquisition.



There are hundreds of investment tools and value propositions in the marketplace that you encounter once you become a customer. Active investors strive to invest and multiply their savings against constantly-changing prices and an intense news flow. Investors with relatively few transactions generally prefer fixed-income investment instruments or mutual funds. Regardless of the investor type, there are hundreds of investment alternatives. Applications that offer free instant market data to their users could significantly differentiate until recently. Here, the fundamental divergence of next-gen investment practices reveals itself. Today, platforms that offer smart decision support tools such as simple risk management techniques via conditionally activated orders, analytical return comparison tools, simple graphical visuals, and components that measure risk perception via gamification besides free instant

market data stand out and differentiate. Besides investment transactions, offering payment/money transfer services via self-service on the same platform makes the application unique. Moreover, an application that can offer all these should also not experience any performance problems.

Considering investment practices, almost all investment institutions are now in fierce competition to offer these features together. Having a solid, scalable, and simple infrastructure architecture besides the UX and front-end design is necessary to offer all these features together. Including programming language, database preference, method-level flow monitoring tools, and ensuring business continuity, many significant decision parameters are decisive in the outcome.



Even when you replace a traditional investment application with a next-gen investment application, the user himself does not change. Considering the subject in terms of behavioral finance, many psychological factors, including prejudices, illusions, and conditionings, accompany you in every application and platform. Behavioral finance strikingly shows with numerous examples that individuals do not always act as rationally as assumed. Here, we see the development of investment applications that are likely to emerge in the next step: Creating and implementing personalized algorithms (execution). For example, let's assume that a multiple investment idea (containing multiple aspects in multiple investment instruments) that you build on your data estimate is automatically converted into an order within the framework of take-profit / stop-loss principles and perfectly implemented



before a significant economic data is announced. An investment idea that you create on the effect of the price of a commodity traded abroad on industry would be another example. By applying investment ideas like this individually, you probably create a new observation that can be the subject of behavioural finance. Also, your algorithms, which always stay dedicated to the main idea, always keep their rational ground. We can say that positively differentiating applications will soon emerge from those with large and adaptable algorithm pools.

Without a place in investment applications, crypto assets, today's most popular asset group, are traded only via its applications. The encryption and distributed ledger technology crypto assets based on are introduced as a solid hypothesis where a system

can be reliable despite being decentralized and unmediated. Regardless of the accuracy of the hypothesis, many individuals and companies position themselves in platforms and assets, the products of these technologies. This hypothesis has not yet been convincingly refuted, excluding simple fraud cases and operative errors. With the changing demographic structure and the increasing technological acceleration, the need to confirm this hypothesis is getting weaker, creating a global "de facto situation", which can almost be called madness. Challenging all known rules with 24/7 trading and arbitrage opportunities between platforms, these structures have unique front-end and various transfer and custody experiences. Hence, investment applications strive to enter this new world via derivative instruments based on crypto assets and traded in organized markets.

Thus, the crypto world will evolve into a multi-centred structure instead of decentralization after a sufficient period for the madness to end and the large-scale losses caused by the risk of storing crypto assets. Only in this way it will ensure its permanence. It seems that crypto-assets may position themselves in next-gen investment applications after conscious and healthy steps are taken to store assets.

Another development that impacted the recent period is commission-free applications or platforms that have seemingly taken the form of "investor-friendly". Since investment applications function as brokerages, their income models are also widely based on brokerage commissions. However, some applications do not receive a brokerage commission. So how do these apps exist? Let's give an example to explain this situation better. Let's assume that there is a street market, and you take the local people to this street market via your large vehicle, free of charge. There is only one condition to travel for free: You have to chat with the driver about which fruits/vegetables in what quantity and the maximum price you are willing to pay. For example, one passenger says they want to buy 1 kg apples and are willing to pay 5 TRY per kg. You instantly convey this information obtained via the driver to your business partner in the street market. Your business partner buys from a seller who sells apples for 3.5 TRY in the market. Then, the vehicle drops the passenger at a point away from that seller. Your business partner, who sells apples for 4.5 TRY, is waiting for the passenger who gets out of the vehicle. Your business partner pays you a share of the 1 TRY they earn in return for the early information service you provide. Considering the example, the passenger

thinks that they have an advantage of 0.50 TRY. If the passenger had reached the market by themselves, the probability of buying the same apple for 3.5 TRY, namely 1.5 TRY cheaper than the price they were willing to pay, would have been high. In summary, the implicit cost of the seemingly free travel to the passenger is 1 TRY (4.5 – 3.5 TRY). The income you get via this situation, which I have outlined, is called Payment for Order Flow in the application. The aggregation of the orders of many individual investors with the emphasis on "commission-free transaction" and earning a profit by selling these orders to a third party before their transmission to an organized market is becoming widespread on a global scale. We can say that we are lucky because our national regulations contain provisions that strictly prohibit and penalize such transactions. We should remember once again a phrase we hear a lot these days: "Be careful if you do not pay for a product or service, the product or service could be you!"





Environment, Humans and Digitalization



Hakan Aran
İşbank Chief Executive Officer

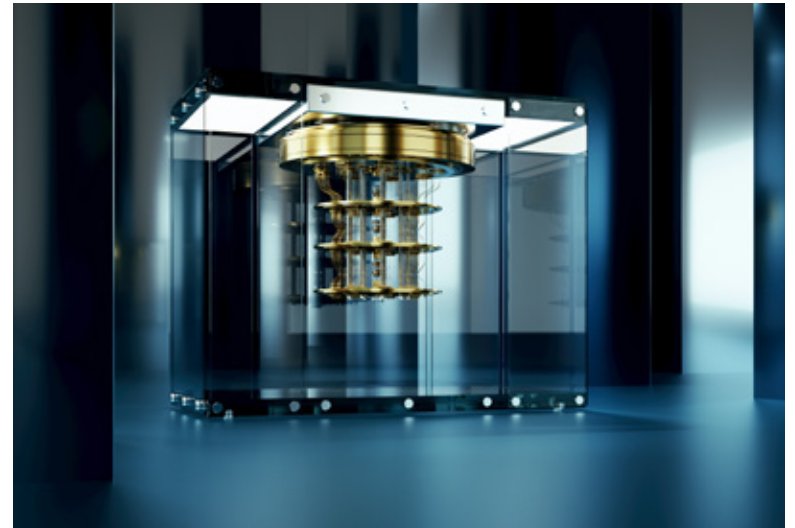
Technologies That Can Transform Our Lives

The technology's development has reached such head-spinning speed in all areas of life that no one can keep up with it anymore. While some try to inject ads into our dreams, others try to transfer the reality of this world to the digital with the Metaverse concept. Let's take a short journey and look at these transformative technologies.

When humanity's never-ending sense of curiosity and development, good financial support, the guidance of expert professors, and the enormous, unsolved capacity of our brains combine, head-spinning technologies emerge. I believe Quantum computing, which will invalidate today's all communication and encryption security and allow us to factor a number into prime numbers, is at the top of the list of projects that will transform the world. Quantum computers to be produced with this technology

will solve many of today's unsolvable problems while bypassing firewalls considered unpassable.

For now, quantum computers similar to computers we comprehend have reached 50-60 qubit capacities. Considering that 100,000 qubit capacity is required to solve existing encryption algorithms, we have at least five years to discover the destructive effect of these computers (Aselsan Tech Blog, 2021).





Looking at the artificial organs produced with 3D printers besides buildings and bridges constructed overnight, we can see that 3D printing technology can radically change how almost everything is built and play a transformative role in healthcare, manufacturing, and defence. Although we do not understand the importance of this invention sufficiently in our single-planet, under-robotized life today, we will once life in space begins. This is actually the reason for the interest and excitement aroused by the concept of a 3D-printed house buildable and liveable on the surface of Mars. Besides, the possible innovations the 3D-printed rib cage will bring in medicine and the production of humanoid robots are within the limits of our imagination. Thus, 3D printer technology, which radically changes the future production methods, earns its place as the second on our list.

While Software Professionals and app developers consider which jobs will be taken from whom and when via AI, GPT-3 (Generative Pre-trained Transformer), developed by OpenAI and continuing its

development silently, has the potential ability to take over their job. Although I place this AI technology, which can write poetry or program if you want, at third place on the list, I hear you say it should be on the top. Called "low-code" or "no code", the GPT-3 technology, which enables application development without writing any code, represents the latest point reached by today's AI.

Considering VR and AR, we are now faced with a reality that pushes the limits with the Metaverse. Leaving the questions of 'Is our experience a dream or a reality?' and 'Are we physically in this world or the virtual world?' unanswered, this new technology has the potential to beautify our lives and bring what is far-away closer. Promoted by Facebook and ranked fourth due to its early days, Metaverse must have either been inspired by the Avatar movie or inspired it. That's because Metaverse promises the same experience in this movie by playing with our senses and brains.



Blockchain technology will be the last technology I am going to include in my list. At the core of cryptocurrencies and decentralized finance, blockchain technology has also enabled the digitalization of cash. While the Lydians first invented physical money, Satoshi Nakamoto invented digital money. We would be lucky to find him.

Today, we are indeed witnessing the transformation of cash into digital money. The struggle on the seigniorage rights being lost to the cryptocurrency world by the digital money experiments of the Central Banks will intensify each day. Injustice in income distribution, poverty, central banks without any money printing limits, and restrictions and sanctions imposed on money transactions make cryptocurrencies superior every day. In terms of technology and digitalization, they continue to develop under the realities of the digital world. When all these factors are combined, we can see the potential of decentralized finance, the method of accessing financial services, products, and most importantly, digital money, and the blockchain technology that created this concept to change and transform the future of finance.



Therefore, whether we are aware of it or not, everything, including our business manners, products and production methods, money, and experience, is changing and transforming rapidly. As I briefly mentioned in the introduction, even our dreams are about to get their share from this change. Companies try to make us see a particular product or service in our dreams by offering stimulants that evoke our brain before or during sleep, aiming to affect the content of our dreams. Moreover, their first experiments have already begun. On top of VR and AR, dreams are also getting on the stage now, opening the doors of a fictional world like in the movie *The Matrix*.

We are busy developing the technologies we will need while shifting from a single planetary life form to a new multi-planetary life form in space. A sustainability concept without space exploration would be highly incomplete. One way to ensure the sustainability of our planet is also to move our environmentally damaging activities, especially mining, to space promptly. I wish you a great 2022 year while looking forward to meeting again to discuss sustainability and space technologies in our following technology report.



İhsan Erbil Bayçöl
Enerjisa Üretim CEO

Sustainable Energy

When the world's resources are becoming more limited every day, the sustainability of all concepts gains even more importance. Starting from this undeniable reality, discussing the concept of "sustainability" first is necessary. We sometimes see that sustainability is limited by concepts such as "continuity" or just "not damaging the environment".

Although the sustainability upper identity includes these concepts, it is a greater concept than their sum. Underlining this concept within the limits of our available knowledge, abilities, and thinking is a must. With these definitions, we are actually trying to do that. However, doing "what we know and think about today" is not enough to achieve real sustainability. Because we don't know how tomorrow's needs will be met and handled differently than today. What we do today may be insufficient and meaningless for tomorrow.

Therefore, a popular short definition of sustainable energy summarizes what we and society should expect and do: "Energy is sustainable only if it meets the current needs without

compromising the ability of future generations to meet their needs."

When we extract energy from the beginning of the definition and add any other concept, this definition remains valid. Sustainability should be internalized as awareness and considered in everything we do today. First, we should act not by thinking about sustainability or listing it as a task to be completed, but by incorporating it into every work we plan, do, will be doing, and evaluate its effects.



Thus, we can create a sustainability concept meaningful for future generations.

The most significant step we can take for sustainable energy is increasing the investment in renewable energy resources and prioritizing these technologies. Here, I find it useful to look at the definition and concept in detail. Renewable energy is energy collected from renewable sources that naturally regenerate on a "human-time scale". Here, the concept of "human-time scale" secretly accepted by everyone but not included in their definitions is critical. Today, we add water, wind, solar, bio, and geothermal while counting the list of renewable energy sources. Although carbon-based resources are also naturally produced, they are not renewable on the human-time scale. This is among the main reasons for our exclusion. The other, of course, is its potential damage to the environment. This contradicts the condition "without compromising the ability of future generations to meet their needs" in sustainability's definition.

The need for energy is increasing each day in today's world for sure. Among the main reasons people use electricity-based infrastructures in their daily lives is the advancement of technology. Considering this situation, we should ask ourselves another question: "Will electricity production be sustainable enough to meet the requirements of the definition of sustainability?" Actually, the answer is "no" as we all observe.

Conscious production is a must. However, it does not provide us with sufficient conditions. Conscious consumption, minimizing



our footprint, cancelling out its creation if possible, and taking it further by clearing our retrospective footprints. These are our responsibilities towards the society we live in, the environment, and future generations.

Gartner's April 2021 research [1] titled "Leading Sustainability Ambition, Goals and Technology in the 2020s" defines the stages to reach the sustainability goal in three steps: Compliance, optimization, and transformation. The level of compliance can be accepted as a baseline as many countries already require it. In a nutshell, the optimization is to start to take actions for sustainability, consider the ways of doing business in the business line we are in, and research what we can contribute by doing better.



are at the optimization level say they are in the first steps after compliance. In comparison, 37% state that they have started to run an optimization program supported by senior management in a planned and strategic way. Moreover, 36% of institutions at the transformation level state that they are in the first transformation steps while transforming their business conduct and internal value chain. Only 16% work on a total transformation plan with their stakeholders to create a greater impact.

Regardless of their levels, the reactions of the institutions show us that the issue is now at an undeniable point on the world agenda. One last striking example from the same research reveals how trendy the subject is: Compared to 2017, the increase in sustainability investments among all institutions is at the level of 92%. Although none of the institutions stated that they have severely or seriously reduced their investments in this area, only 8% say that they have not changed or that they have decreased slightly.

We can say that we reach the "transformation" step as an organization if we internalize the concept of sustainability and plan to transform our industry, the way we conduct business, our contractors, and infrastructures in our sphere of influence, besides doing good work.

According to these results in the same research, 48% of the 183 global companies participating in the survey are currently positioning themselves in the optimization step, while 52% are in the transformation. Also, 11% of the institutions stating that they

Everyone has taken or is taking action for our environment and heritage. So what can we do as institutions that have embarked on this journey or are preparing to do so? First, we need to accurately analyze our ways of doing business and examine our optimization level steps. In Edgepoint's article [2], which summarizes what the world's giant institutions are doing in this field, a great outline explains what institutions in many industries, such as technology, finance, production, and health, have done and promised to do. While a toy manufacturer mentions optimizations in areas including production methods and packaging standards,

a technology company is committed to using clean energy throughout its production. Although what we can do will depend on our specialization and business area, there are many examples from which we can draw inspiration.

As Enerjisa Üretim, our mission is to generate energy for a better future by respecting life. Sustainability is a concept in our DNA, and we act with this awareness in every step we take. In our 2020 Sustainability Report [3], we compiled what we do and what we want to do under the headings of "we have a culture", "we have a responsibility", "we have a world", and "we have a dream". We put sustainability on our agenda and work on it both in terms of environmental sustainability and in many areas, including our people, technology, and equality principles.

Life gives us a reward to live with all its beauties, work, struggle, enjoy, and succeed together. We are obliged to act responsibly under the upper identity of sustainability, be respectful while producing and consuming, and achieve this with an internalized awareness for future generations to offer the same beauties and live in a self-sufficient world. Although we also have individual responsibilities, those will be insufficient to make a radical impact. Therefore, we should remember the importance of bringing the business world in our areas of responsibility to the same awareness. For sustainability, we must continue to do everything we do, develop, grow, take inspiration, and encourage. We should remember that our individual efforts are inadequate. It is not enough for us to be institutions that work and make an effort separately. We must act together, independently of the industry,

as a whole, set our priorities, and fulfill our responsibility to future generations.

I wish everyone a world where sustainability is not just a concept but our ways of living and doing business are indissoluble, inseparable, and unnoticed.

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Ömer Barbaros Yiş

LC Waikiki E-Commerce General Manager

What Awaits Us in the E-commerce World in 2022?

We started to talk about the e-commerce industry with the pandemic like we never did before. The goals that would take three years to achieve were achieved within a year after mobility restrictions were put in place to control the pandemic. Although this dynamism that started in 2020 slowed down a bit when the restrictions were removed entirely in June 2021, the e-commerce business lines' double-digit growth momentum continued at full speed. As a result of the significant increase in demand, technology investments gained momentum both on the platform side and in the logistics processes in order to raise the digital experience to a higher level.

Talent acquisition and management on the human resources side have perhaps never been more critical. While all companies were competing to provide the best experience in Quality, Pleasure, Convenience, and Customization axes, they also kept seeking



answers to how to be the fastest, both in the shopping experience within the platform at the post-shopping delivery point.

Efforts will continue at full speed in 2022 to make this growth sustainable. 2022 will be a year where those who put their customers at the centre will win. Brands that can empathize with the customers, worry about their problems and seek quick



answers, and the brands that won't let their customers have any bad experiences will always be one step ahead in the competition. Brands that care about their customers wholeheartedly and make them feel like they're a part of the brand, and the brands that are able to reflect this approach with their actions rather than words will also win the customers' hearts.

Price advantage will be sought after more by our customers without sacrificing quality. But the most important thing is that those who can relay this advantage transparently with real discounts, as our late mentor Doğan Cüceloğlu said, will be able to find a place for themselves in the highest level of reliability. Integrity should be at the top of the list of things that should never be compromised, and whatever we're talking about in the 2050s, it should always remain on this list.

We will hear the concept of the Metaverse very often. Stores will begin to take their place rapidly in the Metaverse universe. In the

Metaverse universe, retail experience will be redesigned from scratch. Many of the obstacles we encounter in the physical world will no longer be an issue in the Metaverse universe. We used to say, "Sky is the limit", never to stop dreaming. In 2022 we will begin to say, "Metaverse is the limit". NFT collections will continue to proliferate. We will start to see NFT corners frequently on e-commerce sites. We see that the NFTs areas of use are also getting richer by the day. It's already being used in many areas as a gift, an entrance ticket to the Metaverse universe, and a way to gain status in loyalty programs.

Sustainability concept will continue to be in our agendas. The climate crisis is a more serious threat than the pandemic. The only difference is that we are not seeing the results right now, but it is essential to raise this awareness together so as not to find ourselves in the movie "Don't Look Up". We mustn't forget that we must consider its impact on the environment in every action we take.





The sharing economy is perhaps one of the most positive results of the pandemic. We started to give place to sharing, the concept of co-opetition rather than competition, and thinking about who's in need. Hopefully, keeping the social benefit on the main axis will be an ongoing practice in 2022 and beyond. I believe that seeing the companies that compete with each other in corporate social responsibility projects work together and watching them co-opete for kindness will make us look to the future with even more hope.

We will need the power of technology more and more by the day to realize our dreams. Digital transformation will continue at full speed. The success of the transformation will depend entirely on how much we can transform. For the success of this transformation, gaining the competencies required by the new world, implementing the most efficient working methods, creating the right organizational structures and, most importantly, believing wholeheartedly in the necessity of change will become an essential part of our lives.



Ahu Büyükkuşoğlu Serter
Fark Labs Founder

Transforming into Sustainable Cities with Micro-Mobility

Considering the automotive industry, we see that our future is in connected, autonomous, shared, and electric vehicles. When it comes to electric vehicles, we should think beyond electric cars because we can include all macro and micro-vehicles that operate with electrical energy and move in the air, on the land, underground.

Before getting to the bottom of micro-mobility, an indispensable part of our lives, especially recently, we need to define the future of our post-pandemic city lives. Here, examining the 15-Minute City Model introduced by Prof. Carlos Moreno, Faculty Member at Panthéon Sorbonne University, and combining it with future trends will provide various and innovative solutions.

Based on the question of "What would it be like if we could spend

our time together in cleaner and more peaceful cities instead of today's traffic chaos that takes up most of our time?", this model offers significant suggestions for redesigning cities.

Containing many suggestions, such as turning schools into neighbourhood and activity centres in the evenings, that will contribute to our lives, this model can provide practical solutions for today's problems. For instance, considering the hours-long search for a parking space in Rome's city centre, the traffic jam on highways while travelling in Frankfurt, crowded main streets in New York due to minor road repairs, or the developing rail transport network in Istanbul, we still have to use vehicles while travelling from point A to point B due to the long distances.

Micro-Mobility as a Concept

As a part of every aspect of our lives on the land, in the air, at sea, and even in the space above-below ground, mobility can be provided in various dimensions via different vehicles and purposes. Roughly, the maturation of the mobility structure based on a narrow and small scale in size, vehicle, and purpose can be called micro-mobility, as we will emphasize in this article.

Considering another approach, the concept of "mobility", the movement from one point to another, combines with the word "micro", which means small and narrow, to form the concept of "micro-mobility".

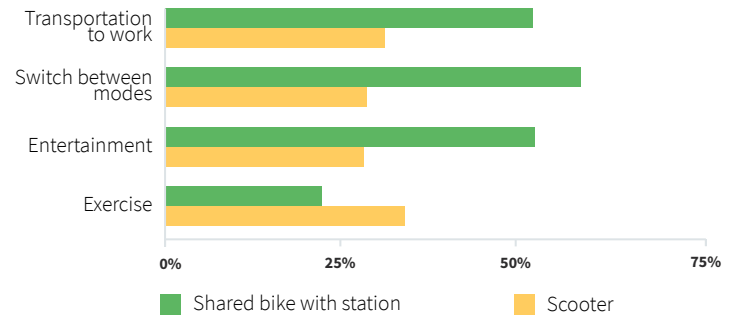
According to the Institute for Transportation & Development Policy, micro-mobility refers to a range of small, lightweight vehicles operating at speeds typically below 25km/h and mainly used for trips up to 10km. However, Micromobility America interprets micro-mobility via different concepts: "moving a human being... its purpose is thus to offer maximum freedom of mobility while leaving no trace of itself and asking the least for itself."



Use of Micro-Mobility

Micro-mobility vehicles provide a great advantage to users via their practical use and easy-to-park features. Meanwhile, they are also preferred by many people with their ability to provide fast and eco-friendly transportation on short-distance trips.

Reasons to Use



According to NACTO's research, bicycles and scooters, among the most preferred micro-mobility vehicles, are primarily used for commute trips and connect to transits between vehicles. As in various cities worldwide, the use of these vehicles with public transportation has also increased significantly in Istanbul. These vehicles used to connect various transportation methods such as metro stations and bus stops also provide easy access from home to public transportation to the targeted destination.

Micro-Mobility for Livable Cities

In a sense, micro-mobility facilitates the lives of living beings via integrated technology's advantages. Streamlining our lives via technology, these tools also create an infrastructure for the smart and livable cities of the future.

A United Nations study shows that although more than half of today's world population lives in urban areas, this number is expected to reach over two-thirds of the global population by 2050. Smart cities and micro-mobility will play a key role in managing the increasing population and mobility in the best way.

Micro-Mobility Regulations in European Urban Life

While it is planned not to allow vehicles to enter the city centres to create a sustainable living space in livable cities, some European cities are also working to provide transportation here only via micro-mobility vehicles. We can give the Municipality of Milan's introduction of new 35 km micro-mobility lanes to support and encourage the use of bicycles, scooters, and other micro-mobility

vehicles via the "Strade Aperte" (Open Streets) or the fact that the number of cyclists using bike lanes in Paris increased by 67% in August 2019 compared to the same period in 2018 as examples for these efforts.

Again, the mayor of Paris, Anne Hidalgo, stated that a total of 50 kilometres of lanes usually used by cars would be reserved for bicycles. This reveals both the increase in the number of bicycles and a need for establishing a new economy accordingly. Sustainable cities will also be equipped with smarter solutions and products.

At Fark Labs Transformation and Innovation Hub, we can summarize our primary expectations for sustainable cities as follows:

- The suitability of a city's infrastructure for micro-mobility vehicles for the safe use of micro-mobility,
- Having roads allocated only for these vehicles and unusable by pedestrians and other vehicles,
- Building parking areas near transportation stations,
- Making special sections to transport these vehicles available in trains, subways, and buses,
- Establishing charging stations at specific points in the integration of cities and training conscious users with local and national administrations will provide support.



Micro-mobility vehicles will drive the world into a sustainable future!

With the increase in the use of these vehicles, which provide eco-friendly transportation by operating with clean energy without emitting CO₂, urban traffic and carbon emissions are expected to decrease. Moreover, considering that 70% of the carbon emissions that cause the climate crisis are generated by cities, we can see why micro-mobility creates a sustainable transportation model for cities.

We need a sustainable ecosystem to change the existing chaotic structure. As a transformation hub focussing on the verticals of "Mobility", "Life Sciences", and "Sustainable Lifestyle", we, at Fark Labs, which we established based on these needs with the power of Farplas with 50 years of industry experience, continue to build tomorrow's technologies for a better future and a sustainable world via a collaborative intelligence consisting of entrepreneurs, investors, and business partners.

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Gülben Gündüz

Softtech Human Resources Director

The New World and the Dominoes

"Every earthquake reshapes the earth, and topples the dominos. Then the nature or man tries to put them back. Because the world keeps turning."

Pandemic: The general name given to epidemic diseases that spread and affect a vast area such as a continent or even the entire world.

Pandemic: The teaching of life that came into our lives in March 2020 radically changing our faith and way of life.

Welcome to the new world.

The "End" of the Working Period as We Know It

The first case in Turkey was confirmed on March 11, 2020. We thought that the "work from home" practice that was put in place

as a precaution would be reverted shortly once the vaccine was discovered. However, for nearly two years, our way of life has irreversibly changed, and thus we've reached the "end" of the working period as we know it.

This pandemic, which was effective on a global scale, affected business life worldwide. For this reason, in his latest book on the pandemic, Zizek (2020) refers to the famous quote of Martin Luther King, "We're in the same boat now."

We are all in the same boat, and now coming to the end of a working period, we have already entered a new one.



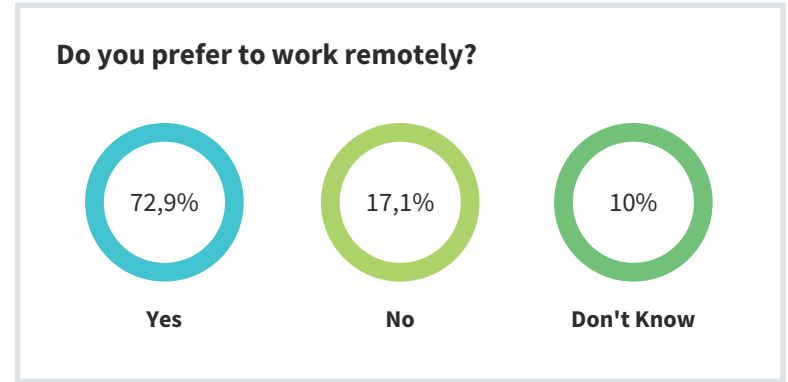
Redefined "Ordinaries"

Although the remote working practice provided great comfort at first, the situation turned into something else after a certain period. Long working hours turned the work and life balance upside down, and the employees started feeling more burnt out.

Two-thirds of the participants of Microsoft's survey held among 31.000 full-time employees in 31 business lines revealed that they're looking forward to being in contact with people and their teams. 37% of the participants said their managers demanded more from them because they were out of the office, 54% said they felt overworked, and 39% said they were exhausted. Burnout is a chronic stress syndrome that cannot be managed well in the workplace, and the World Health Organization accepted it as a health problem only in 2019 (Acar Baltaş / Pandemi Sonrası Çalışma Hayatı "Working Life After The Pandemic").

On the other hand, with the remote working practice, employees got to know what it's like to choose where they want to live, have flexibility in their working hours, and balance their life. The "Future Forum" survey held among 4,700 information workers revealed that the majority never want to go back to the old ways. Only 12% stated that they would like to return to a full-time office job, while 72% said that they prefer the remote working model.

Deloitte's survey in Turkey resulted in a similar way:



This change in the business world is also reflected in our way of life. Our shopping, entertainment, celebrating, and others have replaced learning habits.

The changes that made us happy at the beginning of the pandemic made us feel the opposite as time went by. From this point of view, we've experienced change within change. We placed the dominos back, watched them get toppled again, and then placed them back all over...

During this time, we were using our power of adaptation to its limits; we've clearly seen that anything that remains the same, that is stagnant, cannot survive.

What about now...

The primary matter of all these changes in the business world is digital transformation. Technology has stood out as a necessary factor to cope with the short-term effects of the crisis and adapt to the new normal in the long run.

The survey by Ernst and Young showed that 59% of employers are considering changing the technologies and tools their employees are currently using.

The professions that can adapt to this transformation began to be preferred more in the business world and these preferences quickly became the new trend. The need for jobs that develop the knowledge and technical skills more has increased rapidly. This brought a new concept to our agenda along with the shift in the needed professions: “Talent Development”.

Many firms felt the need to change their working methods, seek new competent resources, and invest in resources to help realize this transformation. This shifted the supply-demand balance towards “technical positions”.

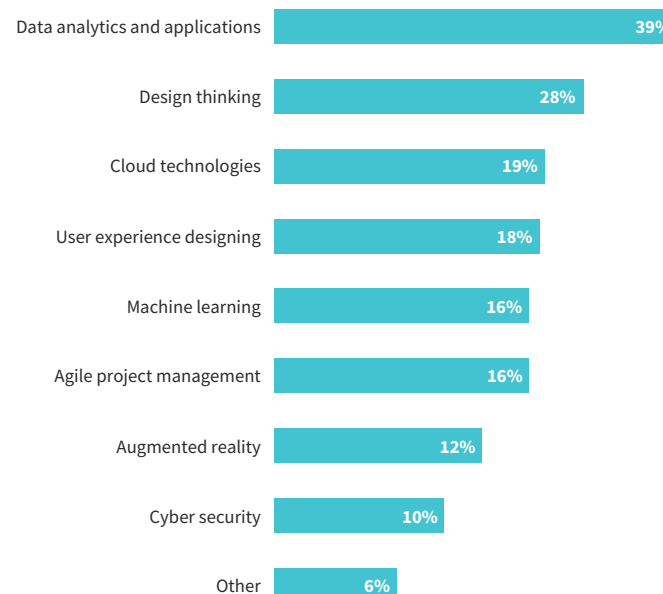
The boundaries of the physical working space disappearing made it possible for the resources sought for or invested in to be acquired from different geographies. The opportunities for finding workforce resources increased, while the employers' competition conditions have grown considerably.

The limited resources in the market and the time and importance of the needs have caused the talent development issue to be approached more carefully. Limited resources caused institutions to focus on "training" policies, and universities were one of the first places to look for solutions in this field. It's because the next new concept after digital transformation was “digital nomadism”.

According to the results of the “Future of the Working World” survey by E&Y, digital competencies such as data analytics and applications (39%), design thinking (28%), and cloud technologies (19%) are the top competencies that students want to acquire in order to invest in the future.

This caused training action plans to become a significant matter in the investment plans and strategy of institutions.

What competencies do you aim to have in the future? (Students)



Says...

Everything about yesterday has gone with yesterday.

Today, it is needed to say new things.

Rumi

From now on...

Each institution reevaluated its working conditions and methods to ensure the business's sustainability within the framework of its own needs. This changed the order of importance of the concepts in our lives; some of these concepts were considered for the first time.



Working Conditions – Redesigning

We have gradually accepted that the pandemic will be in our lives for much longer. While we're going towards a permanent remote working life, socializing and the advantage of working in a physical work environment are among the issues that we feel the lack of. All of these are pushing us to redesign our working order.

- Defining and implementing working models according to needs (remote, hybrid, etc.).
- Employees self-determining their working hours and place = freedom of choice.
- Adjusting the office working order according to the new conditions (hygiene, seating arrangement, technological infrastructure).

- Using digital tools such as artificial intelligence and data analytics in business processes prevalently. Increasing efficiency by making processes shorter and easier.
- Expanding cyber security measures as the popularity of working in the digital environment grows.
- Developing early warning systems to prevent risks.
- Structuring fringe benefits that will support the new working order (flexible fringe benefits practices, premium systems).



Talent Development and Leadership – Next Generation Approaches

The style of communication, management and leadership also transformed when the new order brought distance to our lives. New generation approaches have begun to be adopted in performance management, promotion and talent development.

Certain topics became more significant here as well:

- Improving leader communication to ensure loyalty and promotion in the new work order.
- Improving leadership competencies in matters such as crisis management, combating uncertainty, adaptability and resilience, future business models and strategic decision making.

- Adopting a leadership style that acts as a "role model" and is inclusive to keep the corporate culture alive.
- Restructuring the recruitment, talent and performance management, training and development processes with digital methods.
- Defining the existing and anticipated competencies according to the changing conditions and business needs, and creating an appropriate development policy.
- Adopting a management philosophy that will support the balance between work and private life, and supporting it with appropriate processes and tools.

New Organization Models – Agile and Flexible Organization

Instead of the replications of the known structures for organizational sustainability, models that are flexible and shaped according to needs became a condition for sustainability. Certain principles emerged for this:

- Redefining business processes and organizational structures to support flexible and remote working.
- Adopting the “employee-centred” unifying management philosophy and transferring it to the entire organization.



- Designing business models and processes that will quickly solve problems in environments of crisis or uncertainty.
- Establishing and popularizing evaluation mechanisms that take the opinions and feedbacks of all stakeholders into account for continuous development and improvement.

Plans, predictions, controls, strategies, alternative plans... Until today, these were the main pillars that ensured sustainability in a person's business life, maybe even in their daily life. However, we woke up one morning to an uncertain world where all these weren't enough, and new ones were always needed. Instead of the plans that we tightly held on to, we added new ones that we weren't sure of and had to change constantly; we're still continuing to add.

Meanwhile, we became aware of 2 main strengths that allow us to stay alive: "Adaptation" and "Flexibility". This way, we sought new ways to adapt to all these new conditions, and tried to place the dominos back.

Perhaps they will be toppled again; who knows? And once again, we will try to place them back in the new order we have adapted to...



Says...

*In the carriages of the past
you can't go anywhere.*

Maksim Gorki



**Cavit Yantaç****Microsoft Turkey** Customer Success Lead

Technologies That Change Employee and Customer Experience

Affecting the whole world, the COVID19 pandemic has included digital technologies among the basic needs. Just like the absence of food, beverages, and security, we now cannot shop, socialize, or work without the internet. Many companies worldwide have transformed most of their operations to the online model, connecting their employees to the office via online training and meeting tools and completely digitalizing their supply and value chains. With hundreds of millions of users worldwide, Microsoft Teams has allowed Turkish institutions to engage with over 350,000 employees and schools with over 850,000 students. This statistic alone may be enough to demonstrate the way digital technologies entered our lives. However, since COVID-19 is now somewhat controllable with vaccines and drugs with the ability of people to travel again and return to their normal-like habits, the future of our business life and our interactions with our employees

and customers has started to raise questions. Although answering these questions is not easy, the recent technological developments have strengthened our hand in this regard.

Employee Experience Trends:

The "Microsoft Work Trend Index", a worldwide review by Microsoft in early 2021, provides an insight into future business life. This review shows that 46% of employees consider moving to another city/location thanks to their ability to work remotely. The five times increase in remote work job postings on LinkedIn during the pandemic, the over doubled (148%) number and duration of weekly meetings held among white-collar employees between February 2020-2021, and over 40 billion emails sent between February-March 2020 can show us how our work life has changed.

Again, research shows that too much time online may not be a good idea: Evaluations conducted by the Microsoft Human Factors Lab using EEG (electroencephalogram) on a large number of people who attend online meetings show clear differences in brain functions between people who constantly have online meetings and those who take a 10-minute break every hour. During these 10-minute breaks, the effects of practices conducted



via meditation apps, such as Headspace, on the brain were also evaluated. It is observed that people who regularly have meetings have a decrease in their attention levels and brain functions over time, while people who take a break or even meditate experience noticeable improvements in attention and stress levels. This gives us significant tips to overcome online meeting (or training) fatigue.

Besides constantly working online, a key difference compared to the past has been socialization. Individuals who could come together and socialize with their colleagues in an office, between office desks, in the kitchen, or the cafeteria can no longer experience this coincidental social happiness in the "meeting" model. No matter how many "online coffee event" is organized, the lack of continuous and high-speed internet in individuals' homes, and the lack of images or high image quality in most of these social gatherings caused continuous online situations to

become less comfortable. People whose rooms are messy in their home while living in a shared space with their family members attended the meeting / socializing without video. However, this alienated us from socializing in an office environment.

Accordingly, the need for applications that streamline employees' lives and aim to offer psychological support has started to increase. With the ability to observe employees in an office and provide the support they need, managers have begun to have difficulties in conducting these remotely in the new world. Such as Microsoft Viva, compiling the communication between teams and the individuals they are consist of, the information they have, the resources they access, the training they have received, and the insights they have regardless of their location while supporting their personal growth become possible. Thus, managers can have opportunities to assign training to their employees, receive reporting on training, and boost employee engagement. Research such as the Microsoft Work Trend Index shows that such practices are expected to become significant while enhancing the EX and adapting to the hybrid work environment.

Customer Experience Trends:

Like the office environment, companies are also transforming by renewing their processes, including digital competencies to their products, or engaging with their customers with brand new possibilities. As an example of this transformation, the number of computer engineers worldwide in the 2020 automotive industry surpassed the number of mechanical engineers. We have witnessed digital transformation's another effect on the

same industry with the chip crisis. 2021 global chip shortage influenced the automotive market besides the computer market. Many companies had to reduce production due to the inability to access enough electronic circuits and chips. Namely, digital transformation affects both employees and each industry and product differently. The pandemic is also accelerating this effect.

Among the questions in this environment is will institutions be able to make their employees more effective via tools such as Microsoft Teams and Viva while engaging with their customers via similar innovations? Let's answer this question with a few examples from the entertainment industry. Considering that over 60% of the world's internet traffic is used by platforms such as Netflix, Youtube, XBOX, and Playstation, we can see how significant interactive tools have become. Going beyond just reading static texts, the internet has become a world where we live and share experiences. This allowed CX to reach points unimaginable in the physical world. Here, Fortnite stands out as a highly striking example.

With over 350 million active players, Fortnite means much more than a game for its players. DJs or musicians like Marshmello give concerts to hundreds of millions of players. Moreover, players can also watch a movie via Fortnite instead of going to the cinema. Well, how is Fortnite attracting so many youngsters? Similarly, how does Minecraft, which is used by over 100 million students worldwide, become a centre of attraction for its players (including teachers and students in cases of training given on it)? What tips can companies learn from Fortnite's successes? What steps can they take for the future?



Let's look at the standard features of games like Fortnite and Minecraft: These environments (games) are always active – they live 24/7. Participants (players) can go live and socialize with other players anytime they want, with their desired costume or skin ("avatar"). These players may also be their real-life friends or people they don't know or only meet digitally. They can both "train" in these environments and resurrect in case of mistakes and deaths. Thus, they are unafraid of making mistakes. These environments also do not limit the number of participants (however, some Fortnite or Minecraft rooms can only be accessed by designated people, allowing privacy). They have an internal economy (Although Fortnite is a free game, players can exchange real money for "Fortnite money" to buy costumes or participate in events).

Still, these environments have some limitations. For example, they still have an economy within themselves (namely, you cannot use Fortnite's currency or costume in Minecraft, Facebook, or a Microsoft Teams meeting). While you are "present" in Minecraft, the same "state of existing" (i.e. "presence") does not apply to Fortnite. Your identity is not transitive between these platforms. Each platform is managed in its infrastructure (Fortnite runs on Epicgames' infrastructure, while Minecraft on Microsoft's and Instagram or WhatsApp on Facebook's, currently known as Meta.) Namely, you cannot use your Spotify or Netflix subscription in Fortnite or Minecraft as well.

However, considering the overall internet, we see the possibility of eliminating these limitations. Similar to the bank authentication that can be used while using e-government services, institutions can also share users' authentication and instant availability data. Moreover, blockchain-based smart contracts enable data sharing and record-keeping in distributed architectures; economies without banks or money-creating central banks can emerge.

Namely, removing the limitations of entertainment and gaming platforms and the emergence of the metaverse, a trendy topic of today, are highly possible. The metaverse, a universe present in the digital environment as an alternative to (and co-existing with) the physical environment, is now technically possible. Enabling fast internet, designing a unified experience across multiple devices and apps, and planning the shift from centralized to decentralized architectures is required for consumers to be included in this digital universe via various tools such as phones, PCs, AR/VR.

These practices are also the basis of the "metaverse"-themed 2021 announcements made by many companies, including Microsoft, Facebook (now known as Meta), and EpicGames.

Consequently, since almost everything (our meetings, healthcare appointments, entertainment, socializing with family and friends) has moved to digital environments due to the pandemic, we can see that these decentralized structures have recently stood out to overcome the pains of this rapid transition. Soon, we can expect these technologies to influence our experience with employees and customers.





Evrin Kuran

Evrin Kuran Consulting Founder
Universum Turkey Leader

Digital Workforce

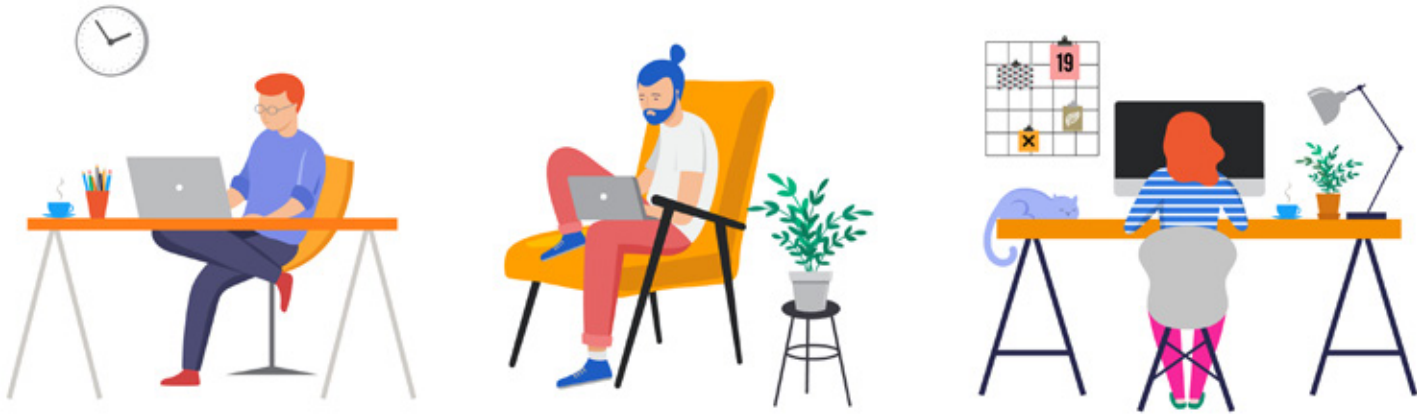
Triggered by the pandemic, digitization, which has had a tremendous acceleration even in the last few decades, has gone beyond a generic theme for all institutions investing in human capital or a subtitle in annual reports. We started to discuss a concept meaning the full or partial integration of the physical environment and infrastructure with the digital environment in the CX or UX besides employee experience: Phygital.



We know that phygital experience is offered at different employee experience touchpoints, including wellness, lifelong learning, talent acquisition, recognition, and appreciation. Moreover, some opportunities provide new concepts in employment models for business sustainability. Institutions now need to consider new workforce models such as freelancers and gig workers, which have stood out with digitalization, with a realistic perspective, excluding any ordinary projections, prejudices, or biases about the future.

2021 Turkey's Most Attractive Employers Research, which we conducted with Universum with 71,584 university students, 20,798 young professionals, and 3,809 experienced professionals from 59 universities, provides remarkable findings on digital workforce expectations. 24% of the students, 21% of the young professionals, and 24% of the experienced professionals prefer to be freelancers or gig workers in the workforce. Similarly, I would like to highlight that 9% of the participant students are currently working as freelancers.

We can read between the lines of Turkish youth who migrate digitally or physically and understand the motivation of gig workers or freelancers who prefer to be involved in various business lines



or projects simultaneously and positioned as a stakeholder rather than an employee in business life.

Considering the motifs that shape the digital migration context, we should remember that to what extent the economy on a macro-scale meets the need for progress in the conventional market on a micro-scale. It is worth reminding that among the significant findings of the Young Perspective on Turkey's Future research, which includes participants under the age of 30 and was published by Istanbul Economy Research in November 2021, is only 13% of youth can live comfortably with their current income.

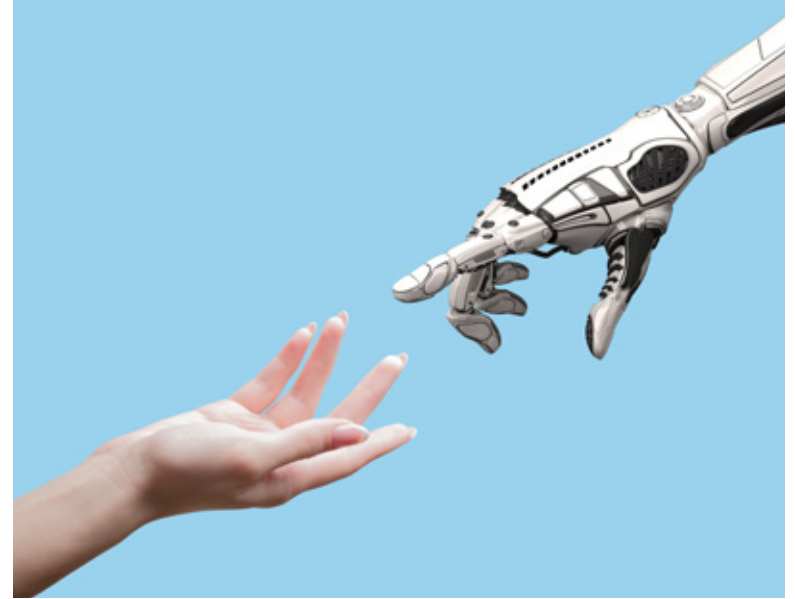
Today, thousands of young Turkish people teach Turkish to foreigners, provide logo design for any brand, or offer article writing,

translation, graphic or animation design, programming, and many more on platforms like Fiverr that serve as a marketplace for freelancers (or candidates). While some jobs require a minimum level of competence, many of these freelancers demonstrate their competence to a great extent, joining various studies and reaching a period that an ordinary white-collar peer would prefer much more than their monthly income. Looking at this platform, you can see that a substantial majority of the hourly and (even) job-based wages demanded by Turkish users is 5 USD. (The lowest fee that can be set on the platform is also 5 USD.)

However, I think that the values and expectations of the individual cannot match with the values and promise of the organization in traditional hierarchical business models, acting as a catalytic

effect for the next-gen employees to create learning opportunities that will maximize their value set, working principles, expectations, and competencies.

Among the unfortunate but opportunistic insights of the employee experience surveys, we conducted with 29,412 employees in reputable institutions between 2017 and 2021 was that 59% of the participants stated that their daily employee experience and company values overlap. Turkey's Most Attractive Employers 2021 research also reveals that only 31% of young professionals trust their company's leaders, while 37% trust their company's vision. These statistics are valuable to understand unique working models built on personal vision, among the primary motivations for entrepreneurship.



Digital migration is inevitable in our country since those seeking to work freelance in the digital workforce cannot access the sufficient resources they need. So as institutions, what are we going to do for these young people who are skeptical of the values of institutions and want to work autonomously without believing in positions and titles?

First, we will reconsider our culture. We will introduce a new perspective to bureaucratic business life, where power is distributed to positions while tasks and resources are widely offered arbitrarily. More than ever, we now need to build a new, transparent, and merit-based culture that applies innovation to everyone in the organization, encourages employees to leave their comfort zone, and motivates them to create value instead



of moving one step further in their careers. We need to build humanocracy, which Gary Hammel argues about maximizing contribution, not control.

While taking all these steps, our method should include listening and understanding the needs. Acting without falling under the curse of knowledge and thinking that our employees know what we know is the first step of empathic interest. Let's remember that technology is for people. It is a tool, not a goal, to build a decent, prosperous life. Technology facilitates getting deep insight into the motivation and behaviour of the people that build the real value of our organizations, meeting the needs. Using technology not only in our work but also in appreciating our employees, the independent members of our organization, and clearing the pebbles in their employee life cycles as well as accomplishing and celebrating together and providing diversity, not only in word but

in substance, makes our companies worthy of the era. Utilizing technology at least to expand our product portfolio, improve our R&D investments, increase our capital while enhancing the people who will move our institution forward makes us real agile institutions.

The pandemic and the accompanying uncertainty have taught us this again: Work is not a place but a mindset. Work is independent of location as long as its outputs transform into meaningful actions. Today, we need to redefine business concepts. It's time to consider that flexible working is not working much longer than working hours, that people build the brand, and that providing initiative and autonomy is a true leadership effect. And more than ever before.



Ahmet Hançer
Enocta CEO

Digitalization of Education and The Future of Learning

Today

The pandemic we are going through, and the fourth industrial revolution and the digital age we are in are interacting with socio-economic and demographic factors, changing business models and workforce market in all sectors, and creating the need for new jobs and skills.

The World Economic Forum's "The Future of Jobs" survey shows the change in the division of labour between machines and humans between 2018 and 2022. For example; looking at the "Information Processing" area, almost half of this type of work (62% in 2022) is done by machines. Looking at the "Complex Technical Works", it is believed that 46% of such works will be done by machines in 2022. It is seen that many professions that seem very valuable today will undergo a change and will be passed on to machines either

partially or entirely. Moreover, this process has been accelerated even more by the pandemic.

Division of Labor with Machinery

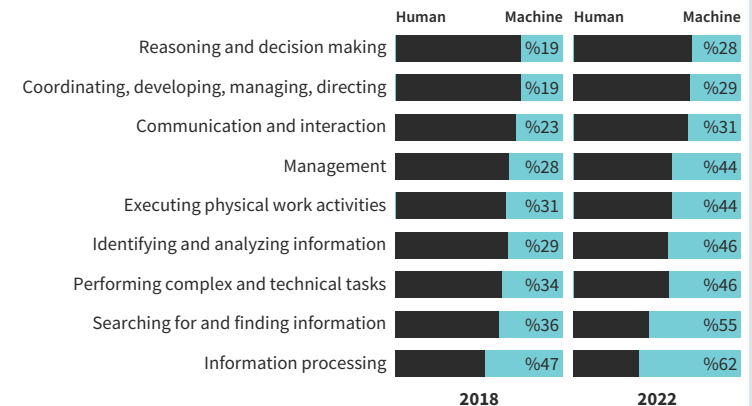
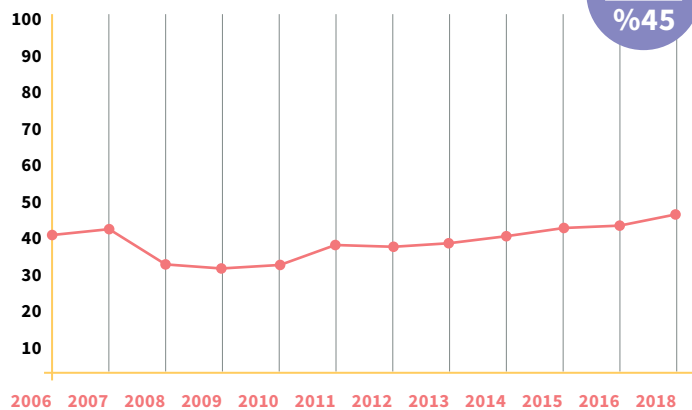


Chart 1: World Economic Forum Future of Jobs Survey, 2018

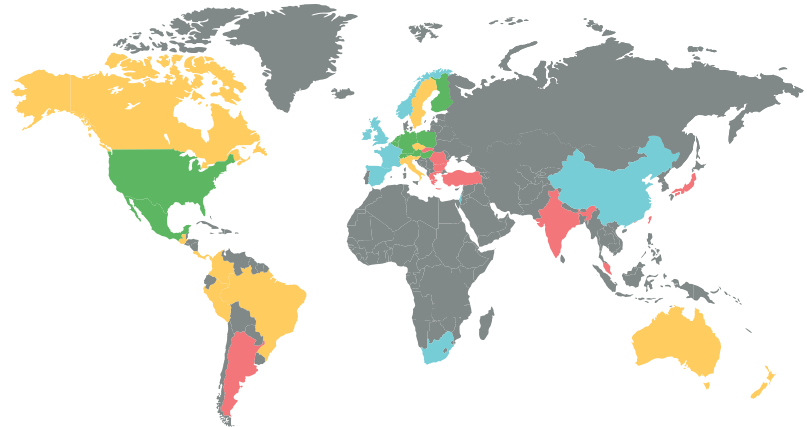
It is as impressive as it is thought-provoking to say that machines can easily do most of the physical work we do today as the human-specific coordinated movement capabilities of robots develop and that almost a third of the work in the field of "reasoning and decision-making" where we have the highest competitive power, will be handed over to machines by 2022.

Talent Shortage

Global talent shortage at its highest within the last 12 years



Manpower Group, Talent Shortage Survey, 2018



Ranking of Countries Having Difficulty Finding New Talents

Having Below-Average Difficulty

Australia	34%
↓ Brazil	34%
Belgium	35%
Costa Rica	35%
Panama	35%
Czech Republic	36%
Italy	37%
Guatemala	38%
Slovenia	40%
Canada	41%
↓ Colombia	42%
Sweden	42%
Peru	43%
New Zealand	44%

Having The Least Difficulty

China	13%
Ireland	18%
UK	19%
Netherlands	24%
Spain	24%
Norway	25%
France	29%
South Africa	32%
↑ Switzerland	33%

Having The Most Difficulty

↓ Argentina	52%
↑ Slovakia	54%
India	56%
Singapore	56%
Greece	61%
Turkey	66%
Bulgaria	68%
Hong Kong	76%
Taiwan	78%
Romania	81%
Japan	89%

Having Above-Average Difficulty

Finland	45%
↑ Austria	46%
USA	46%
↑ Portugal	46%
↓ Israel	49%
↑ Mexico	50%
Germany	51%
↓ Hungary	51%
Poland	51%

Graphic 2: Manpower Group, Talent Gap Research, 2018

Undoubtedly, this picture doesn't mean that there will be no work left for people to do. On the contrary, according to many studies, artificial intelligence will create more jobs than it eliminates. However, as technology advances at such a rapid pace, people, societies and countries need to be able to keep up with it.

As traditional jobs are disappearing and new professions are emerging rapidly, finding and training people to pursue these professions is becoming more complex. The Talent Shortage Survey conducted annually by ManpowerGroup displays this issue clearly.

As shown in Figure 2, in the survey between 100 companies, the global talent shortage is 45%; moreover, this rate has been increasing regularly since 2012. Many sources call this a talent crisis rather than a talent shortage and consider it a global-scale crisis. Turkey is the sixth country with the highest talent shortage by 66%.

At this point, education and learning processes emerge as the key processes. Undoubtedly, the institutions where individuals spend a significant part of their time working have the most prominent role. Upskilling will be a process that takes place mainly within the company to adapt to the changing world. If a profession is to disappear, reskilling will also take place within or with the company's help.

The machine that gets smarter and starts to learn reaches a capacity to support people's learning and development. It will

be beneficial for every educational institution, academia and instructor to examine the next generation learning trends in order to understand this transformation of learning, the learning experiences and learning moments of the future.

Next Generation Learning Trends and Digitalization of Education

“Continuous” Learning and Learning to “Learn”

While the change is accelerating, this competence is not only essential but also fulfils an existentially decisive function. Because every change creates a knowledge or skill gap that needs to be filled, and this gap can be filled quickly only by continuous learning.

Considering the point reached by learning, information and communication technologies, we are in a golden age in terms of continuous learning. With advanced search engines, desired information can be found very quickly. There are virtual schools, each as comprehensive as a university with wonderfully compiled tutorials. It's possible to get in touch with an expert on any subject and get their support.

Auxiliary virtual memory tools unlimitedly increase people's memory capacity, whether in the cloud or as portable devices. New technologies, tools, and resources are emerging every day, making it easier to learn, revise, and remember.



“Micro” and “Mobile” Learning

Microlearning can be defined as the effort to learn only in the length and depth required for a specific, measurable learning goal.

Since microlearning packages are focused on a particular subject, the most appropriate method (video, animation, audio, text or visual) can be easily selected. It's easy to set up customization, adaptation and automation algorithms with domain-focused microlearning packages. It also provides excellent flexibility in designs, as it is easy to develop, store, organize, update, search for, and re-evaluate within other contexts.

Another factor that allows for the rise in microlearning is that it enters the learning fields of mobile devices as a platform. Mobile-friendly, mobile-appropriate micro-learning programs are turning into mobile-first learning platforms designed entirely for the mobile world.

Mobile learning is the number one learning aid for people with disabilities thanks to its technologies such as voice recognition, location tracking and more. Mobile-based microlearning seems to be the only option for employees such as field workers who don't have a stationary desk and computer.

Digital and “Distributed” Learning Networks

Digitalization brings forth new bridges and layers for accessing information. Learning experiences that have never existed before came to be, and thus a process that radically changes traditional education methods has begun.

Digitalization has also led to the emergence of distributed information communication networks. Thanks to these networks, the limits of time and space in learning have mostly disappeared. It's possible to access the desired information at any time. Today, people are demanding an open and flexible learning system.

Everyone or every institution can be a source of information or even an authority on a subject under this complex structure. Again, everyone or every institution can find and benefit from these authorities. This new form of relationship transforms traditional master-apprentice or instructor-student relationships. Anyone who has developed themselves in a subject can be accepted as a "master", regardless of age and location.



Artificial Intelligence and Machine Intelligence

As a result of many years of work, machines have begun to perform functions that are unique to humans, such as learning, reasoning and decision-making. The incredible level of hardware technologies, processor power and learning algorithms have turned artificial intelligence into a destructive actor.

Some of the jobs or professions we have in our companies today will no longer exist tomorrow because of this new workforce. In summary;

- Upskilling of current employees to be successful in the world of machines
- Reskilling of employees who work in extinct professions for them to work in other fields
- Preparation of employees who will take part in newly emerging professions and work areas

On the other hand, the contribution of artificial intelligence in the field of learning will go far beyond this. Here are some of the contributions it will make;

Analyst: Will help identify the developmental needs of the employees.

Designer: Will take part in the automation of learning design processes.

Content Creator: Artificial intelligence that can write scripts or books will also produce educational content.

Mentor: Will guide the learning and development process as a coach or a mentor, and will support development.

Evaluator: Will be able to evaluate the success of the learning process and the extent of development.

Estimator: Will make predictions by analyzing all the data related to the learning process together with other relevant data.

Instructor: Will be teaching just like an actual instructor, either by sound or image or in a humanoid body.

The roles on the list are all roles of instructors. That's why every instructor should closely follow the developments and the researches on artificial intelligence.

Virtual Reality, Augmented Reality and Metaverse

The concept of the Metaverse, which emerged when the physical world and the digital world came together, also contains essential opportunities in education. Before the Metaverse concept came to be virtual and augmented reality had already appeared as

important actors in education. It's probably not unbelievable to expect a break in education with the Metaverse, for the Metaverse will provide the opportunity to learn a job as if you were actually doing it and experiencing it in the real world.

Virtual reality is a technology that provides an experience beyond traditional learning experiences such as watching or listening by immersing the person in the learning situation itself. Just like getting inside of a machine or an engine or travelling through the veins in the human body. In virtual reality, the cognitive load on the learner is reduced compared to what it is the traditional method of listening, watching and understanding.

Virtual reality is about entering a completely virtual world and leaving the real one, whereas, in augmented reality, it's possible to reach additional information in various formats such as audio, video, animation, 3D models, text, etc., without disconnecting from the real world. Therefore, theoretically, augmented reality has the potential to turn any place into a digital visual feast.

According to TEGEP 2020 Corporate Training Survey, approximately 6% of the companies in Turkey are using virtual and augmented reality applications.

Big Data Analytics

Big data analytics is exciting for instructors as well. It also holds important opportunities in terms of education and development. Evaluating training data together with other data sets provides



substantial opportunities in measuring the trainings' contribution to the business and the company. Some of these opportunities are as follows;

- First of all, it makes it possible to go beyond the available analysis and metrics to evaluate the effectiveness of training.
- Analyzing the training data and the satisfaction or loyalty data makes it possible to make loyalty estimations based on the training results.
- Evaluating many business data together means a more accurate analysis of the need for training and development. This allows for the creation of the data infrastructure required for the individualization of development.
- On the training solutions side, big data analysis makes it easier to curate better from many different fields in the sea of information and find the most suitable learning solutions for individual needs.

- It becomes possible to make dynamic designs and assignments based on the preferences of past learners.
- Evaluating the development needs of people who follow certain career paths and the training they have received makes it easier to create development plans for the future.
- Especially when the different informal and social learning experience data of those who learned via the xApi (Experience Api or Tin Can) standard are collected, it becomes possible to look at development from a much more holistic perspective.

In summary, big data analytics has the potential to offer important insights to instructors, training managers and human resources planners.

Blockchain Technologies

Blockchain technology offers substantial opportunities in the field of education as well. Some of these are:

Accreditation: Can be used for training, instructor or educational institution accreditation. Institutions that will receive service from these persons or institutions can make the necessary security verifications. Processes such as contracting or reference verification can be expedited.

Portfolio: Similarly, blockchain technology can be used by instructors to share portfolios or trainings.

Diploma/Certificate/Transcript: School diplomas, certificates of all after-school education or transcripts can be shared over the blockchain. For example, institutions can verify this information during onboarding processes.

Badge/Credits/Points: Any badges, credits, or points information

that in some way have become industry standard in relation to educational experiences can be shared.

Learning Records: All learning records of an employee in one organization can be shared with another organization, for example, when the employee changes jobs.

In summary, in education, blockchain is a technology that has been started to be used in many areas such as learning, guidance, process management, accreditation, and certification. It seems that its areas of use will expand further.

New Generations

According to the traditional generation classification, the Generation Z youth born after 1996 started to enter the business world in 2019. This means that Z youth will start to participate in orientation programs and trainings. Knowing the common characteristics of the Gen-Z is critical in understanding the shared values, beliefs and expectations of this generation.

Below are some statistics from surveys done on Gen Z;

- They make up 30% of the world's population (Annie E Casey Foundation, 2018).
- 81% say that money is the common source of stress (Statista, 2018).
- 74% spend 5 hours or more per day online (Spredfast, 2018).
- More than 60% don't use apps and websites that load slowly or are difficult to navigate (Forbes, 2017).
- 92% have a smartphone (Forbes, 2018).

Conclusion

In the digital transformation era, institutions need to develop talents internally and help their employees prepare for the new order so that they don't experience talent shortages and prepare themselves for the future more easily. At this point, forward-thinking education professionals in institutions that want to keep up with the development of technology should work more closely with team leaders and design training programs that cover the new generation learning trends described in this study for the change envisaged by teams in institutions, and align their organizations, processes, technologies and skills in this direction. Organizations that manage to create a 'culture of learning' in which knowledge is actively shared among employees, partners and customers will succeed. Institutions that have the ability to change and develop themselves regularly can overcome their talent shortages and prepare for the future more easily.

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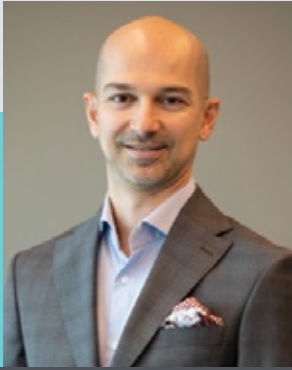
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Erdem Şekeroğlu
SAP Turkey COO

The Way to Think of the Present and Future Together: Being a Smart Business

The Approach for Today and Future: Smart Businesses

Lived in Ephesus between 535-475 BC, the philosopher Heraclitus said, "The only constant in life is change." Yes, change keeps happening. So how and to what extent can humans adapt to the speed of change? 2020 has been quite challenging for everyone. The global economic recession has been this severe for the first time since the 20th century. Simultaneously, the effects of the climate crisis continued to intensify and manifest this year. Global problems, including increasing disasters, pollution of the seas, and plastic waste, threaten our planet's future. With the challenges such as the pandemic and climate change, we have transitioned to a more circular economy where resilience, efficiency, and sustainability are prioritized. Now we need to integrate sustainability into the fabric of how we do business. While transitioning to the circular economy, we must establish new

business models and be more sustainable, resilient, and agile. As Europe prepares to transition to a low carbon economy with the "European Green Deal", this shift will also affect many industries in Turkey. Digital transformation is no longer enough to adapt to this transformation, manage business processes more efficiently, and be minimally affected by new applications such as the European Green Deal. Thus, we need to transform into smart businesses. Because we need to think about the present and future together. Dreaming of where we want to go tomorrow and pave its way today will bring success.

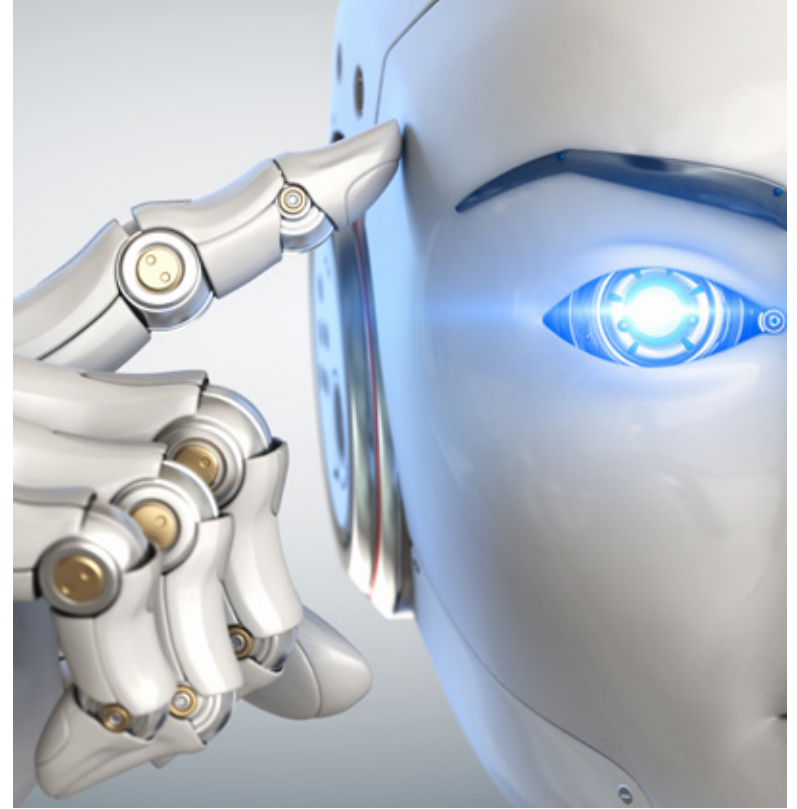


Be Smarter or Get Smaller

Today's world has a simple rule: 'Be smarter or get smaller'. The way to achieve growth potential in digital economies is to rethink and imagine your business and business processes. At SAP, we change the nature of business with end-to-end solutions and applications integrated with smart technologies that we shape with our customers while allowing our customers to enjoy what our 'Smart Business' concept offers.

SAP is a company at the heart of digital transformation. For nearly 50 years, we have been bringing people, processes, and technology together. In Turkey, over 1500 institutions from all industries and scales manage their business processes via SAP software. Therefore, we can see the picture holistically. The formula we recommend to our customers is 'Feel, learn, and act'. Because the available indicators have lost their meaning. While transitioning to the circular economy, we must establish new business models and be sustainable, resilient, and agile. We can achieve these by integrating new technologies such as cloud computing, learning machines, AI, and IoT into our business processes.

Cloud computing fully meets the needs of the business world via its infrastructure and features such as "Pay-As-You-Go" and "Scale Capacity". Among the triggering factors of digitalization are operational excellence, competing better, and being more profitable. The competencies offered by cloud technologies are the only option to achieve these in the fastest and most effective way. Our latest research with IDC strikingly reveals that cloud technologies are now at the top of companies' needs list. According



to the research conducted with the participation of Turkey's top IT directors, business data is kept or evaluated in the cloud by 64% of CIOs for the need for a better scalable environment, while 63% of them for its ability to provide more flexibility. At SAP, we offer our customers over 100 cloud solutions. We announced our new cooperation model, "RISE with SAP", in February 2021 to allow all institutions to experience the convenience provided by the cloud via the connect-use logic.



Connect-Use Convenience: RISE with SAP

In the RISE with SAP cooperation model, which we have prepared for the needs of the business world and offered as a service, we provide all the integration in a single package via our S/4HANA Cloud ERP solution. Today, the RISE with SAP model offers our customers all the resources they need with “connect-use” convenience for a complete smart business transformation. With our fully scalable RISE with SAP collaboration model, we offer organizations the fastest and most efficient way to move business applications to the cloud, providing them with visibility, focus, and agility via end-to-end integrated processes.

Business Process Intelligence is an essential part of the RISE with SAP package. Acquired in the first months of 2021, Signavio, the business process automation, SAP perfectly complements SAP's existing Business Process Intelligence software. The SAP

and Signavio combination gathers standardized process KPIs, broad benchmarking data, user behavior, and CX analytics to offer our customers a 360-degree view of every business process. Combining Signavio with SAP's Business Process Intelligence unit also strengthens SAP's capacity to help companies swiftly understand, improve, transform, and manage their business processes at scale. This combination creates an end-to-end business process transformation package, providing what our customers need to gain a competitive advantage.

In summary, fluctuations in the global economy, issues such as global warming, and the ongoing pandemic cause businesses to have to face the change more swiftly than ever. In this process, we, as SAP, will continue to support companies in their digitalization journeys via the technologies and solutions that we have developed based on changing needs.



Mükremin Seçkin Yeniel

Softtech Platform Based Solutions Product Manager

Will Technology Save Farmers From the Cobweb?

Due to consumption habits, population growth, and income growth, food demand is expected to increase by 50% by 2050. Since access to food is at the core of human existence's sustainability on Earth, it is an everyday issue that needs to be considered. Providing employment and income to 1,1 billion people worldwide, agriculture is among the primary areas of economic activity beyond this fundamental concern.



Central governments, global organizations, and each economic actor operating in the agricultural industry must cooperate to enhance the impact of this change on the environment, climate, and affiliated communities while ensuring better management of limited natural resources.

Here, the main objective should be to meet the anticipated "food deficit" and "limited resources" by utilizing them most efficiently and to improve the "social and environmental" effects.

Agricultural activities, the first link in this entire chain, and the economic sustainability of the farmers performing these activities are issues that need to be resolved within this framework. In Turkey, a significant agricultural country, farmers risk not getting the return of what they produce due to input costs. Due to COVID-19, the contraction probability in global markets was also added to farmers' dilemma of continuing to production or not.

Moreover, employment in the Turkish agricultural industry has contracted in the last decade. According to SSI statistics, the number of registered farmers has decreased by 541,600 since 2008, corresponding to a 48% reduction. The decrease has accelerated, especially since 2011.

According to the data TURKSTAT provided, 7,458,000 people were employed in the agricultural industry in 2002, which decreased to 4,157,000 as of February 2020. This corresponds to 3,301,000 fewer agricultural employees in the last 18 years. Therefore, the number of people employed in the agricultural industry decreased by 44%.

Besides the decrease in agricultural employment, there is also a reduction in the areas of plantation in Turkey. Agricultural land, 26,579,000 hectares in 2002, decreased to 23,136,000 hectares in 2020. Accordingly, agricultural land reduced by 12.9% in 18 years.

The expected increase in food demand with consumer habits worldwide brings about an increase in demand both in quantity and prioritization of better nutritional needs with the diversity and the adoption of various dietary patterns. While the increased demand brought by population growth creates pressure to use limited resources more effectively, changing consumer habits look



for and reward approaches based on best agricultural practices, eco-friendly production, and sustainability.

However, basic agricultural activities are not economically sufficient for farmers. We can observe this via the decrease in the agricultural land and employment in the agriculture industry. Employment in agricultural production and the sustainability of farmers' economic activities stand out as essential issues.

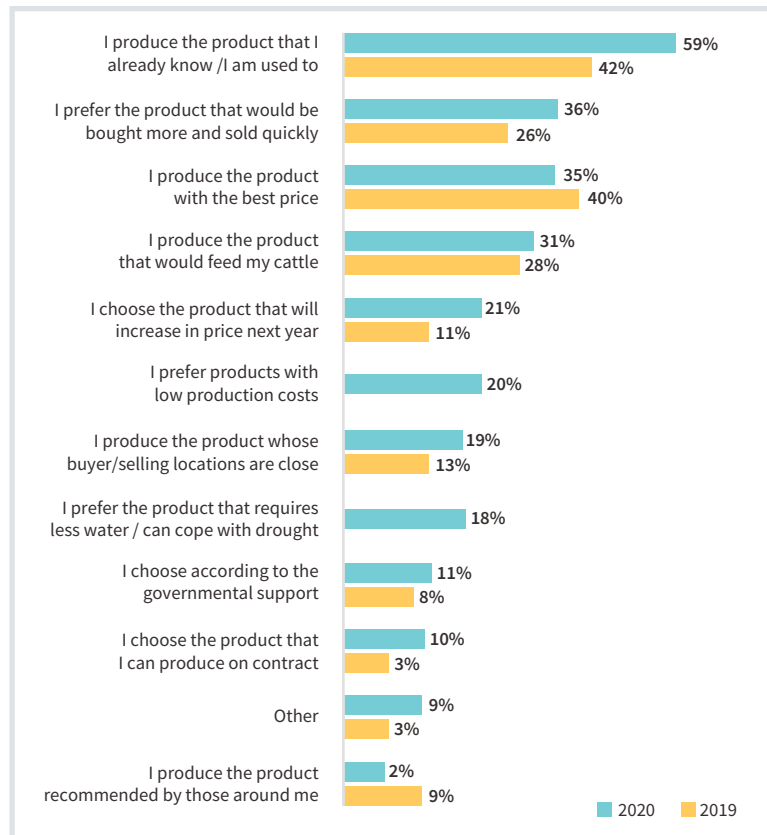
The ability of farmers to exist within the market mechanism just as they can earn sufficient economic income and respond to changing consumer habits can be seen as the summary of the issue they are now facing and will face in the future.

Considering the 2020 Agricultural Outlook field research conducted by KKB (Turkish Credit Bureau), it confirms Nicholas



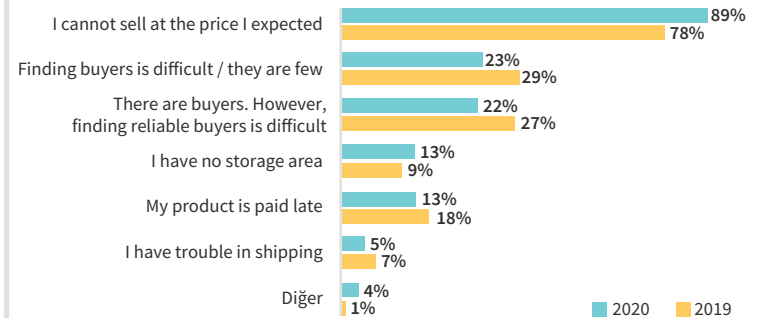
Kaldor's assumption in 1934, which would later be referred to as the cobweb theory, that farmers use the previous year as a basis, especially in the agricultural market.

A small number of farmers act by considering contract production and/or government support before starting production. This table briefly shows that the farmers maintain the classical methods of production.



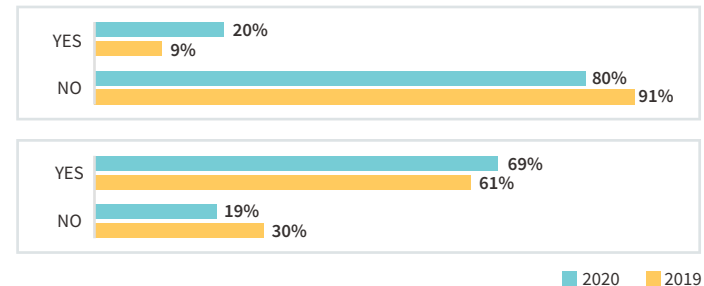
Looking at the distribution of the post-production problems experienced by the farmers, the market price below expectations, the lack of buyers and/or reliable buyers, and cash flow-related issues stand out.

Ratio of Post-Production Issues Experienced by Farmers to Number of Farmers



Without answering all these questions, contract farming can still be a solution to some of the issues raised by farmers. The satisfaction levels of the farmers who have experienced this are incredibly high.

Contract Farmers and Their Satisfaction Levels



The production that starts in the land is the first ring of the entire chain. Strengthening the ties of this first link of the production process with the remaining process, establishing new connections, and shifting from a passive position to a more active role will allow farmers to increase their products' market value and respond to changing demands.

Technology can pave the way for connecting farmers with large agricultural corporations, to which they can sell their products, and industrial producers with large agricultural corporations, from which they supply raw materials and consumers. Thus, they can create new markets and sources of finance for their production via these links.

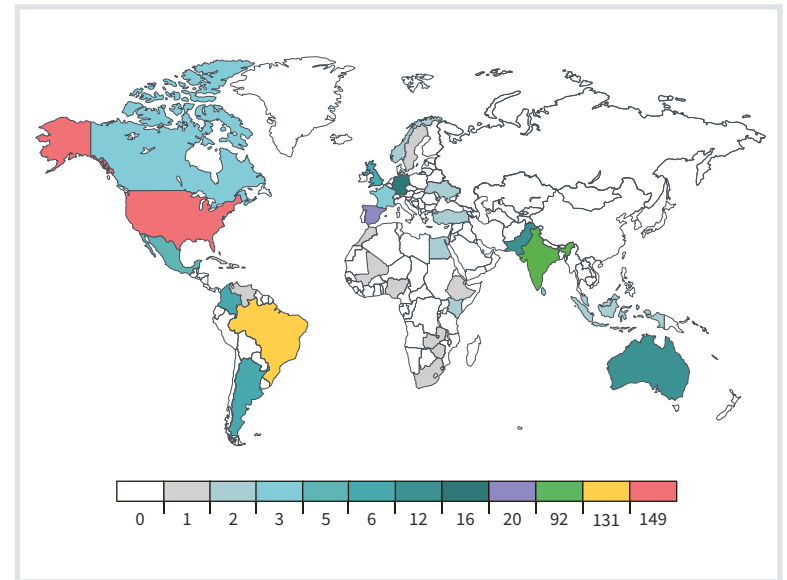
Digitalization can ensure that farmers can establish economic relations with their stakeholders once they make a production decision while monitoring these relations transparently. Enhancing the knowledge that farmers can access during the decision-making process regarding the production, their experiences, or the market price that exceeds the previous year will be the most significant gain.



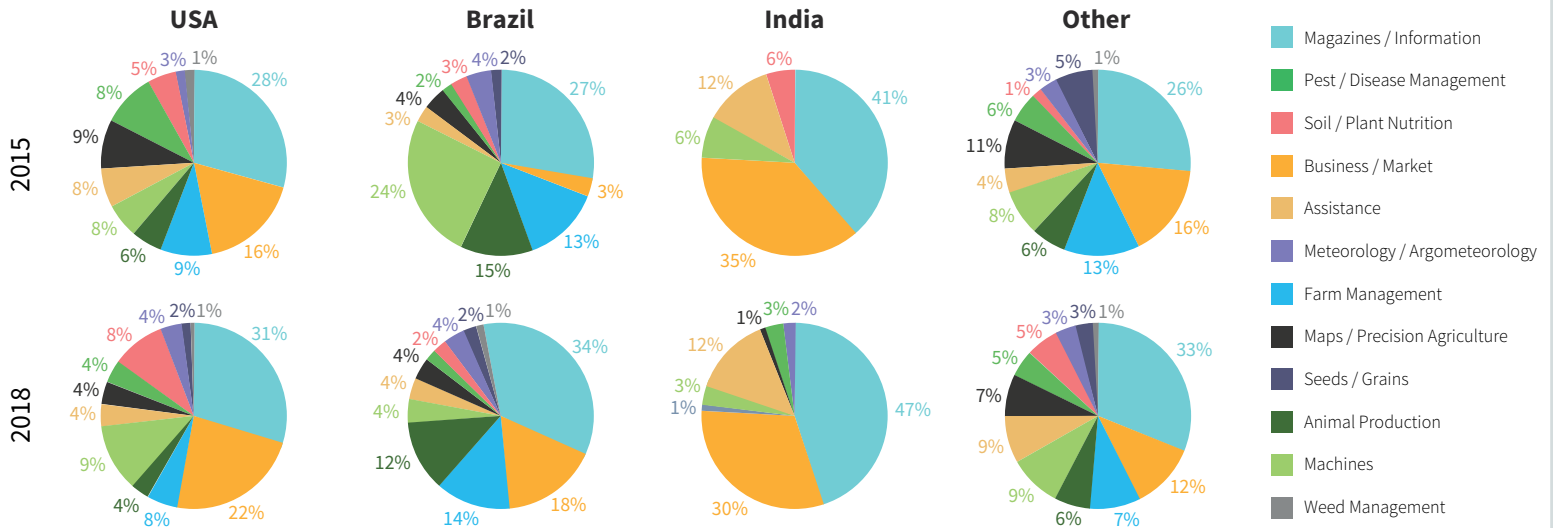
A significant share of Turkish agricultural production is family-owned. The number of businesses operating over 500 decares is 11% of the total. The land size of 48% of the businesses is below 100 decares. In 2014, Law No. 5403 on Soil Preservation and Land Utilization determined the agricultural land size of sufficient income in Turkey as between 150-175 decares.

Since making the entire process, where products are transported from lands to stores and enter our lives via best agricultural practices, transparent is an increasing demand from consumers, large agricultural corporations and industry players invest accordingly.

Meanwhile, the distribution of paid and free agriculture-related applications in 2018 published in the Multi-Science Journal 2020 is as follows.



Percentage of applications per agriculture category between 2015 and 2018 for USA, Brazil, India, and other countries



Statistics on the distribution of these apps based on their subjects are also above. Although most practices are related to periodical publications/journals and market knowledge, we can also observe the widespread use of practices related to farm management, pests and diseases, precision agriculture, and technical assistance.

Farmers' ability to finance the technology that will allow them to make decisions as economic actors in the reality of the market mechanism does not seem very likely. Here, however, the deficiency on a global scale is also an evident fact.

The question is: Who will fill it?

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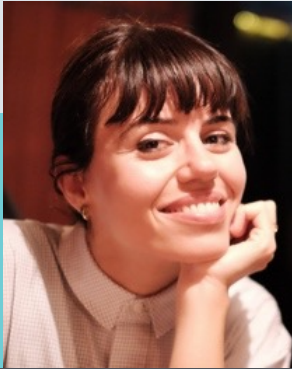
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Nihal Dayioğlu

Softtech Customer Experience Senior Specialist

Experience of the Future

Technological developments are the most influential factor that changes and disrupts our habits in every aspect of our lives. While speaking of technology today, we need to define whether it is AI, AR, or VR to describe its area of influence. Considering the future of customer experience, as in every field, we cannot think of a technology-independent world. However, regardless of the advancements in technology, "engagement between customer and brand" is still at the core of customer experience. Here, technology helps professionals take this engagement to the next

level and create unique experiences for their customers, and it will continue to do so.

Offering unique experiences to their customers is surely a meaningful goal for brands. Until today, companies offering a good experience have interpreted existing customer data, run data end-to-end within the company (by ensuring that up-to-date customer data is used in communication among departments), and diversified engagement channels with customers.

According to Zendesk's report, meeting customers' needs swiftly in the expectation of a good experience will still maintain the first place in the future. Based on the same report, companies managing customer data well meet the needs of their customers 36 times faster than other companies. However, the figures show that the protection and security of personal data will be more significant for customers than ever. According to Futurum's research, 73% of consumers are concerned with how brands use their personal data. Considering these figures, we can say that protecting data and building customers' trust accordingly in the experience of the future will be a prerequisite for a loyal customer-brand relationship.





Saying that more AI will be used in customer relations processes soon or that brands will utilize all technological developments to design a smoother, more comfortable, and easier customer experience is based on the continuation of today's approach, limiting future predictions accordingly. However, the future customer experience should be more personal and memorable for customers. Thus, brands should manage customer data competently and utilize the opportunities offered by technology to achieve this.

Brands that use technology to differentiate, rather than further automate, the experience they offer will create a difference and allow their customers to be a part of their organization, instead of being a consumer of their services, via personalized experiences, without falling into the trap of commodification. To achieve this, they need to design end-to-end whose control they will leave to the customer in the experience (self-service: FAQs, areas where other

users' experiences will be shared, etc.), when chatbot and AI will be involved, and where the customer will engage with an employee. Jason VandeBoom, the founder and CEO of ActiveCampaign, among the pioneers in Customer Experience automation, makes a striking prediction about the use of technology in his article in Forbes: "When AI and similar technologies open the way for engagement instead of being a barrier between your customer and your brand, you will have one thing your competitors cannot buy: Customer advocacy."



For a long time, customers have been providing their expectations from brands, regardless of the industry or the field. If customers are satisfied with their experience with a brand operating in FMCG, they expect to see this experience's positive aspects in their experience with a technology brand as well. While meeting this expectation, brands examine their competitors and good examples in various industries with high customer satisfaction, determining their targets based on these examples.

In this regard, Researcher and Strategist Dr Olaf Herman predicts that the customer's definition as a person who consumes only a product, service, or experience will be replaced with a person who co-owns all processes with the brand. According to Herman, customers become a part of the organization with their feedback, interaction with the employees, joining user communities, etc. Moreover, innovative ideas also emerge via this approach.

In the same article, Don Peppers, co-founder of Peppers & Rogers Group, states: "In the future, customers will expect brands to show their human side more. Brands and advertisers promoting them have always created perfect pictures in the old-fashioned marketing world. However, thanks to social media, mistakes become visible within minutes. Brands that accept their mistakes, take responsibility, and see their customers as their primary asset will be ready for the future."

Sarah Alío and Isabelle Zdatny working in experience management, data analysis, and strategy, argue that the future of CX is not chasing higher metrics but relationship management.

The duo argues that the importance of customer feedback is well-known and that it will be meaningful only if it leads to concrete steps that will result in positive changes for customers.

The article also underlines two types of data that should be considered collectively for efficient relationship management. While one is the experience data (X-data), which measures the customer's feelings and thoughts about the interaction with the brand, the other is the operational data (O-data), where the customer's purchasing or usage habits and preferences can be observed.



According to the authors, if brands combine X- and O-data, continue to listen to customers' voices, and base their activities and developments on this data, they will improve their ability to make predictive decisions. Thus, this will be among the most important values that distinguish a brand from others in the world of experience of the future.

Considering all research, data, and predictions, we can say that brands that include their customers in their processes while designing the future experience will stand out. In the digital age, brands that use technology and its opportunities fully meet the expectations of their customers by keeping all the data they manage safe and enhancing digitalization with human elements in their relationship with their customers seem to be positioning themselves solidly in the future.

As in every significant issue, considering the future of customer experience holistically and utilizing technology to interpret big data and provide predictions for the future, rather than retrospective analysis, without worrying that AI will take our jobs, stand out as issues that will distinguish brands from others.

Brands that see their customers as a part of their organization rather than putting them at the centre will shape the future experience.

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Mehtap Özdemir
Softtech Product Portfolio Manager

Green, Digital, and Purpose-Oriented Startups

Fortunately, GreenTech is now not just considered solar panels and wind turbines. Although the main negative externality of our industrialization and growth-oriented socio-economic reality is based on fossil energy, we still make an impact with every decision we make at any point of the production and consumption chain.

A product, along with its raw material, location, supplier, manufacturing process, production technology, and packaging method, how we evaluate the non-product outputs of the process, where and how we transport it, the product we purchase, and even how we dispose of it determine our negative or positive contribution to global warming, the climate crisis, and the deteriorating economic balance we all talk about a lot.

Based on 17 development goals agreed on by many stakeholders,

leaders, the business world, academia, and NGOs upon the work conducted by the United Nations for many years, technologies developed to change our business models, management, production, and consumption habits are increasingly included in our lives in various areas.

We wanted to share some of these technological and purpose-oriented social startups with you by exploring them based on 17 Sustainable Development Goals.



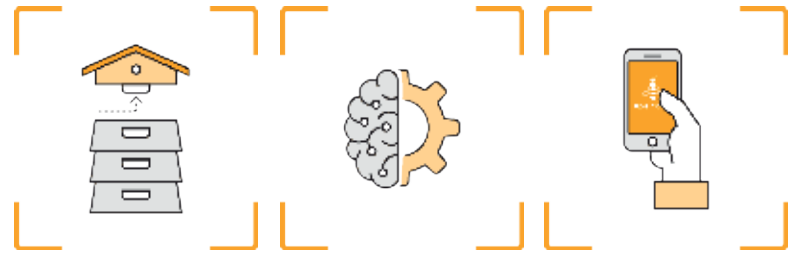
“Bee”-ing Green

Source: <https://turkey.un.org/tr/sdgs>

For many years, we have heard that the decrease in beekeeping and bee population will threaten the continuity of many species and the entire ecosystem in a chain. According to the predictions and data of the Food and Agriculture Organization of the United Nations (FAO), 71% of the most important crops, which provide 90% of food worldwide, are pollinated by bees. In comparison, beekeepers from many countries lose up to 50% of their bee colonies every year.

A significant reason for the losses and concerns regarding this issue is the inability of traditional beekeeping know-how and methods to cope with climate and ecosystem changes, understand the rapidly-changing factors, and analyze how and which of these factors make an impact.

Embarking on a journey thinking she can utilize the Internet of Things (IoT) and Artificial Intelligence (AI) technologies to transform this complex cause-effect relationship into meaningful results, Dr Fiona Edwards founded and launched the Apis Protect startup, of which she is still CEO, in 2017.



Collecting and analyzing data by detecting changes in temperature, humidity, CO₂, sound, and movement with sensors placed in beehives, Apis Protect guides beekeepers to perform proper maintenance for the right hive at the right time via its remotely monitorable application, providing productivity and reducing the risk of losing colonies.

For example, prioritizing the transportation of enduring hives

during the pollination period increases productivity and saves 25% in transportation costs.

Investors such as Finistere Ventures, Atlantic Bridge Capital, Radicle Growth, the Yield Lab, and Enterprise Ireland support ApisProtect, which has received a total of 3.6M USD seed investment until today. Moreover, Dr Fiona Edwards has been rewarded in the Manufacturing and Industry Category – "Creating the products, methods, and materials of tomorrow" in 2021 Forbes Europe's 30 Under 30 list.

With nearly 250 million tons of solid waste generation that can only be measured in cities, China is rather a challenging example of recycling. Based on encouragements and gamification to ensure the participation of consumers in the ideal segregation and waste disposal, this startup had a rough start yet managed to expand in 41 cities with enforcements requiring the mandatory participation of all companies and individuals in 2019.

Located first in the cities with the highest population, each Xiaohuanggou station with six different waste units allows users to provide waste such as paper, textile, metal, plastic, and glass by scanning a QR code. It then calculates the reward points via the weight measurement and material recognition process and instantly uploads the points to users' accounts.

With over 12,000 smart waste segregation and recycling machines, 6 million registered users, and 12 million households, the company offers its registered users features, including ideal segregation

Xiaohuanggou

Modelling the Chinese Population's Waste Management



Source: <https://turkey.un.org/tr/sdgs>

training, accurate location, shopping with points collected, making a donation, and feeding virtual pets in the app, and services such as the collection of wastes that are challenging to transport from the address. The business model also developed a franchising system where advertising revenues are shared for waste collection and transfer from smart machines.



With the help of software-supported systems designed for the reusability and recycling of collected wastes, besides technologies such as IoT, Big Data, and AI, a product that has completed its life is delivered to various users and countries in case wearable textiles. Moreover, the company transforms unusable products and parts into manufacturing inputs, contributing to the circular economy with similar solutions.

Creative campaigns and incentives such as the "Chief Carbon Reduction Officer Challenge", where individuals and institutions can participate, aim to increase adaptation.

Meaning little yellow dog in English, "Xiaohuanggou" was founded in 2017 by Zhongzhi Enterprise Group with an investment of 1.1 Billion Yuan. It is a startup that operates as Xiao Huang Gou Environmental Technology Company and continues to develop innovative features and partnerships in waste management.

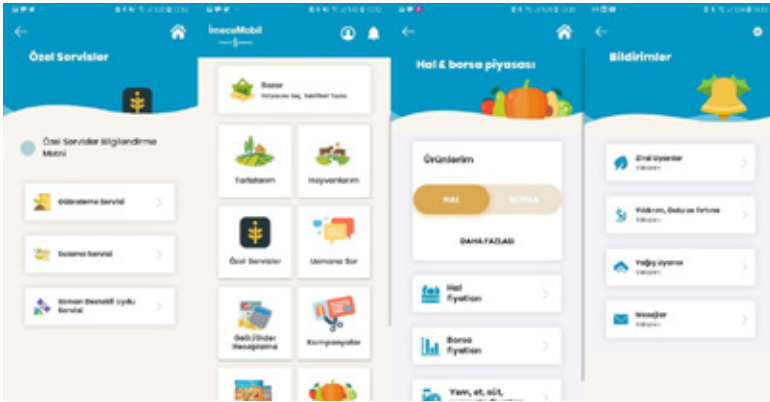
What about Land, Water, and Efficient Agriculture? Is Farmer's Labor Valued As It Deserves?

Imece Mobile Technology Working for the Farmer



Source: <https://turkey.un.org/tr/sdgs>

As in the world, agriculture is Turkey's top priority and most challenging focus area in sustainability. Keeping the soil fertile, vibrant, and healthy, using water ideally, optimum fertilization, planting on time using accurate methods, and coping with the



risks posed by changing climatic conditions create highly complex problems regarding sustainability of the agricultural economy and the entire food chain.

Launched within Softtech in 2019, Imece Mobil is a startup aiming to provide everyone engaged or planning to engage in farming with all the benefits of technology, designing its technology and business model with the vision of applicability in different geographies to carry its mission to a global scale.

With nearly 150,000 users, over 60,000 registered gardens/fields, and almost 9,000 animal production facilities, Imece Mobil readily provide land and product information to farmers, supporting them in numerous areas such as Plant Health (NDVI), Water Stress Tolerance, Infrared Satellite Image, Real Satellite Image, Accumulated Temperature Value, Accumulated Disease Value, and Rating Value Compared To The Other Fields with fertilization, irrigation, weather forecasting, product-specific notifications, and satellite service.

Moreover, Imece Mobil's business model offers farmers many more features, including Imece Bazar, where offers can be obtained from reliable suppliers with price comparison to reduce input costs, accepting payments securely and collection tracking, agricultural notifications, remote agricultural expert consultancy, essential balance calculation, campaigns, agricultural news, commodity prices, Imece Card, and TÜRİB Elüs market information.

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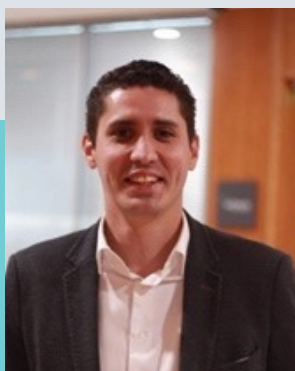
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The background of the slide is a composite image. The top half shows a blurred city skyline at night with warm lights. The bottom half shows a man with a beard and glasses, wearing a white shirt, looking down at a laptop. The text 'Startup Ecosystem' is overlaid on a dark grey rectangular area in the center.

Startup Ecosystem



Onur Yavuz
Softtech China CEO

The Chinese Ecosystem

Introduction

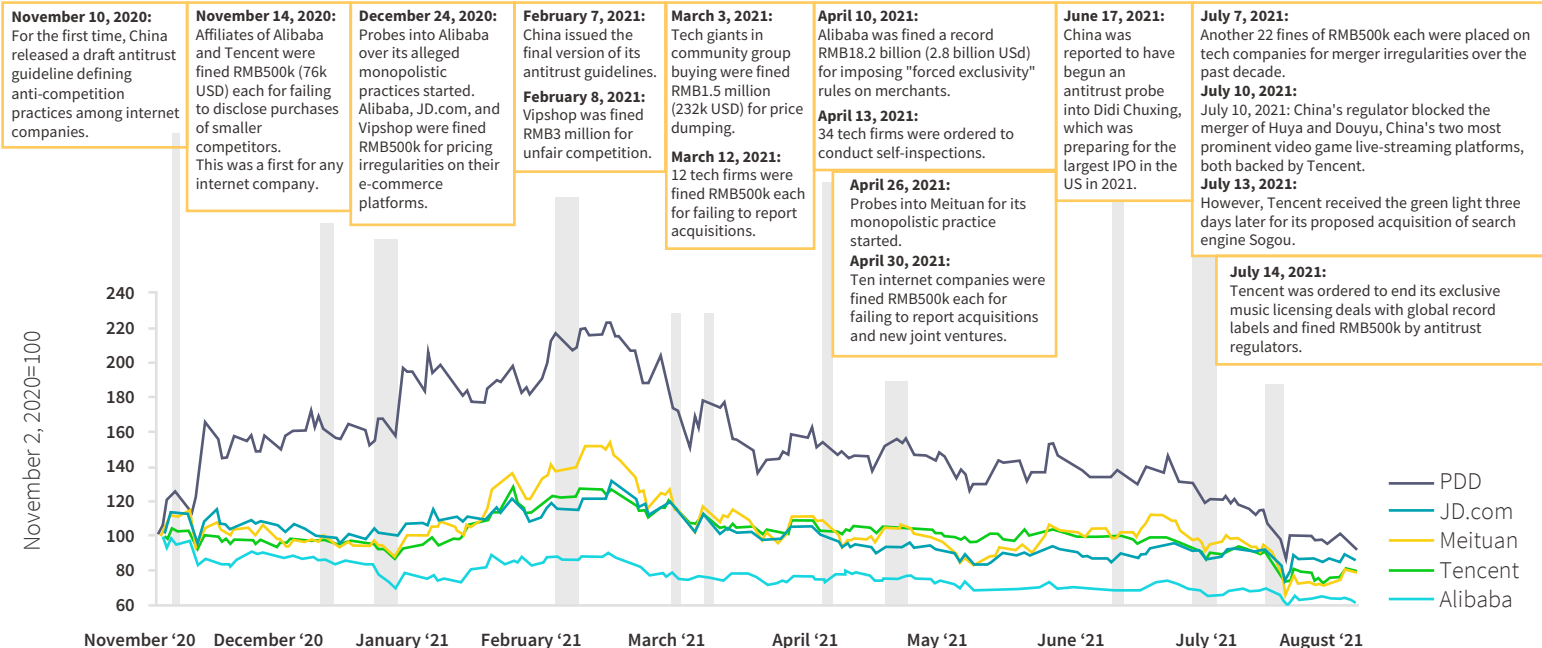
As the starting point of the pandemic, China was the only major economy to close 2020 with growth (+2.3% GDP) despite strict measures within its "zero case policy". Life in China turned back to normal in May 2020, while the rest of the world was still facing the social and economic effects of the Corona virus, while I am writing this article. After surviving the pandemic period successfully, Chinese tech companies had to face a brand-new challenge in 2021 during the post-pandemic period.

The era of innovation and rapid growth of recent years backed by government policies gave its place to the regulations presented within the internet and data protection scope, introducing the new world order with commercial/geopolitical tensions. With this new world order, Chinese tech companies were forced to adapt fast to this new era because they would have to face the threat of being removed from the ecosystem if they did not.

Internet Data Protection and Antitrust Laws

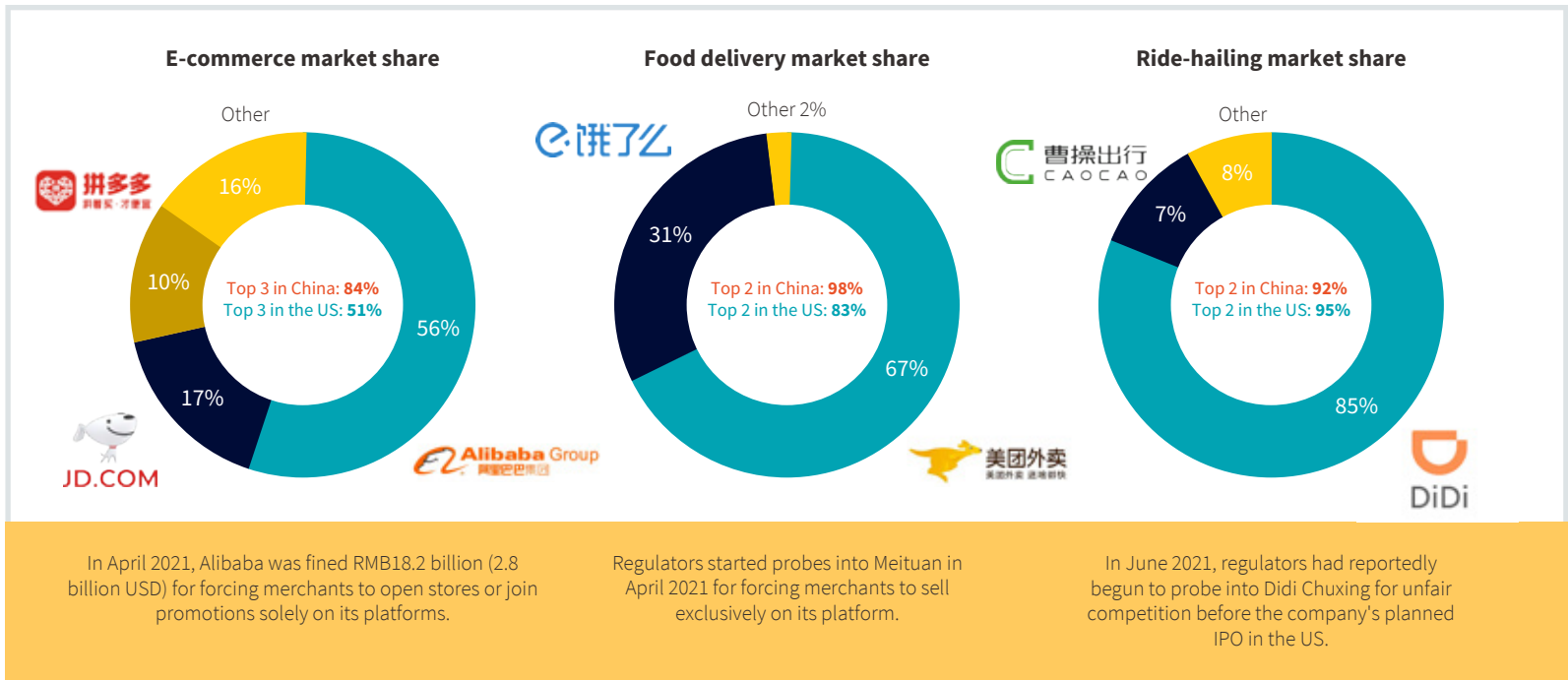
According to 2021 Internet Report data, 989 million internet users in China, while almost all are mobile users, all services from various industries such as finance, retail, education, and healthcare are now offered via digital channels. This means enormous amounts of digital user data. Regarding the threat posed by big data, the Ministry of Industry and Information Technology of China implemented two different regulations on national security and personal data protection for the first time in such a comprehensive manner. As the first of these regulations, the Data Security Law (DSL) entered into force on September 1, 2021, aiming to store sensitive data in data centres within the country to protect national security and transfer data abroad upon Beijing's approval. Taking effect as of November 1, 2021, after the first law, the Personal Information Protection Law (PIPL) introduced some regulations and restrictions regarding storing and processing personal data, similar to the GDPR in the West. How did these laws, which serve the data privacy of China's internet users and national security interests, influence internet companies? China's order to remove Didi Chuxing, the popular taxi and ride-hailing application used by 550 million people in over 400 cities in China, and 25 mobile

Timeline of China's antitrust actions and share price performance of selected Big Tech



apps associated with it from the Chinese application markets can be given as a first example. The country cited violations of rules against collecting personal data, mentioning the data privacy created by the real-time location data related to the user ID data collected by the app. The fact that Didi is a publicly-traded company was among the primary reasons why the data stored and produced by this tech giant was regarded as digital assets causing national security concerns before Beijing. Another tightened regulation was the antitrust move to prevent

"Big Tech" companies from abusing market dominance. With the final versions of antitrust guidelines published in February 2021, the State Administration of Market Regulatory (SAMR) took significant steps to prevent monopoly structures of internet companies. In this context, severe fines and sanctions were imposed on many tech companies, including Alibaba, Tencent, and JD.com. China halted the IPO of Ant Financial, Alibaba's financial technology, and blocked the merger of Tencent-backed game streaming platforms Douyu and Huya. Alibaba, which dominates 56% of the



eCommerce industry, was fined RMB 18.2 billion (2.8 billion USD) for forcing stores on its platform to participate in promotions. Moreover, the antitrust investigation was started into Meituan, which has 76% of the home delivery market, forcing SMEs to use its platform exclusively. Moreover, "walled gardens" approaches, where platforms do not deliberately share links, price differences in the same services these platforms offer to users in different segments, and exclusivity agreements that they force platform partner SMEs to make are replaced by applications that internet companies have used widely until now because they are now subject to investigation and criminal sanctions due to the new regulations.

Cryptocurrency Mining Ban

Although China has illegalized the creation and trading of cryptocurrencies since 2017, the government did not impose any restrictions on national Bitcoin mining until 2021. However, the regulations in May 2021 announced that the mining of cryptocurrencies (especially Bitcoin) would also be blocked. After conducting almost $\frac{3}{4}$ of the Bitcoin mining globally before the regulations, miners in China were forced to leave China after these developments.

The primary reason these regulations prevent cryptocurrency mining is the negative contribution to carbon emissions due to the high amount of computer processing power required for mining and the high energy consumed accordingly. China needs these environmental regulations to achieve its carbon-neutral target by 2060, demonstrating another significant reason why mining is blocked. Among the other reasons are the fragility and speculative nature of the cryptocurrency economy and the potential of these decentralized digital assets to exceed capital controls. Moreover, we know that the Central Bank of the Republic of China has been working on the Chinese Digital Currency for over five years to respond to the decentralized crypto economy and that e-CNY has been conducting pilot schemes in many cities. Therefore, it is not surprising that e-CNY is strongly supported instead of cryptocurrencies in China, while regulations are made accordingly.

New Opportunities in the Chinese Market

Considering tightening regulations and global trade tensions while public offerings are becoming complex, Southeast Asian countries, rather than the Western countries, will be more likely seen in the overseas expansion of Chinese companies. However, Chinese companies, especially next-gen eCommerce startups, that still target the US and European markets try to facilitate their expansion with global branding practices without promoting their Chinese origins to overcome anti-Chinese feelings or the low-quality stereotype associated with "Made in China" products. The newest and best example of this is the online fashion retailer "Shein" application, which succeeded in 2021.



Although the one-child policy was ended in 2015, while the three-child policy was introduced in 2021, China still has an ageing population. However, this situation offers an opportunity to deliver products and services for the increasing population over 60. Representing 11% of 989 million internet users, this segment has been rising compared to previous years. Moreover, this increase will also continue in the coming years. Called "Silver Economy", this group of users over the age of 60 is now the new target of Chinese internet companies. With many innovations such as digital products adapted for older users (such as large fonts and simplified one-click functions), smartphone use courses, and peer "influencers" appealing to this age group, technology companies have started to design their products considering this target audience.

Like the 60+ age economy, female consumers stand out as another rising audience with their increasing education levels, high rates of participation in the workforce and social life, rapidly-increasing financial independence, and evolving consumption habits. Call "Sheconomy", various products and digital services, especially in cosmetics, lifestyle, clothing, and FMCG, are offered to this group by Chinese internet companies. Besides, we should not ignore that women join the ecosystem both as consumers and successful entrepreneurs who launch startups that understand the "Sheconomy" group best and offer the best solutions.

Summary

On its way to being the pioneer of technology globally, China created a three-staged technological roadmap to achieve by 2035. The roadmap aims to develop China's industrial capabilities at the top of the global supply chain with "Made in China 2025", make China the leader of AI with "AI Vision 2030" by 2030, and define China as the standard-bearer of technologies that represent the 21st century with "Chinese Standards 2035". Therefore, AI and 5G investments, R&D studies, and the desire to lead the world will continue based on this vision. Moreover, R&D studies on smart cities and especially electric vehicles are continuing at full speed; the presence of over 300 EV manufacturers in China summarizes the point they have reached in this industry.

Considering the ongoing technological R&D studies besides the pandemic struggle and trade tensions in the rest of the world, we can predict that expanding to foreign markets in China will

be starting from Southeast Asia based on the "dual-circulation" strategy announced by Beijing within its 14th 5-year plan and that the priority will be the growth of the national market. We can also say that Chinese tech companies will respond to new data protection & national security regulations and changing user habits in an agile manner, adapting their products and services accordingly.

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Ali Işıtman

Maxitech Corporate Innovation Specialist

2022 Trends in Silicon Valley

In early 2021, San Francisco was under the shadow of COVID-19. While vaccine research continues for both the development and application of the vaccine, the remote working concept has reached a status that nobody could predict a few years ago. While people started to think that working from home is more comfortable and efficient, companies left behind the illusion, which they had for a long time, that the productivity of their remote employees would decrease. Research showed that people working from home could work visibly more efficiently rather than having a decreased productivity.

After 2020, employees and companies are now used to this new normal created by pandemic conditions. Moreover, various challenges brought by remote working continue to emerge over time, while technological developments are introduced to overcome these difficulties. Generally, these developments focus on boosting and measuring the productivity of remote workers while ensuring solidarity in this period when people are disconnected from each other.



Pandemic conditions have also introduced extensive changes to the business manners of Valley companies. Companies, including Google, Meta (former Facebook), and Twitter, called Big Tech, react differently to this situation. Spending billions of dollars on their campuses, large companies like Google and Apple still use various methods to bring them back to the office, including offering vaccination to employees seeking to return to the office or various additional benefits for office workers. As a pre-pandemic supporter of remote working, Twitter also maintained its perspective during the pandemic conditions. Excluding a few countries, Twitter employees can live and work regardless of location.

Interpreting this situation differently, Meta considers it as an opportunity for people to exist more in the digital environment. Meta's recent launch called Metaverse, which frames digitalization's future, also reflects this approach.



In 2022, we will see the continuation of this digitalization at full speed. We can define the Metaverse concept, the most significant step taken in digitalization recently, as a permanent digital universe, similar to the real world. In this digital universe, we will be able to do real-world activities, including work, entertainment, and socialization, we are used to doing until now. Another significant reflection of the Metaverse is expected to emerge as a visible improvement in simulation. It is easy to predict that the real world can be more accurately and convincingly reflected in the digital environment while possibly introducing more valuable experiences. Providing Virtual Reality equipment to all its employees during the pandemic; Ericsson states that widely-used Virtual Reality devices will become stronger soon by providing other senses besides image and sound and becoming indistinguishable from the real world by 2030.



With the influence of remote working, this trend leads to highly significant developments in decentralization. Decentralized financial products are introduced by the interest in cryptocurrencies, the economy created by them, and the reducing dependence on financial institutions caused by this economy. Decentralized Finance includes structures that people, instead of centralized systems, can manage the familiar financial products based on the internet age. In 2022, more users are expected to start to access these products and prefer these systems over traditional structures.

Against this decentralized structure, banks keep themselves in the background to reach more customers. Banks provide their customers with their products via third institutions with the

structure called Banking-as-a-Service. Providing services such as account opening, lending, and issuing cards, which often require a banking license, to intermediary institutions without a banking license, banks transfer most of their workload to these third institutions, thus indirectly making the customers of these institutions their customers. In return, they disclaim their brand visibility and stay in the background of other products. This structure allows a non-bank company to have extra features, including issuing credit cards, offering loans, opening investment accounts to its employees, and the bank in the background to reach more customers. In 2021, more startups will provide banking services to their customers via this structure, while many companies issue credit cards with their brands and allow their customers to use these loans. In 2022, this structure will increase the variety and quantity of products served to companies.

Banking-as-a-Service constitutes a small part of "as-a-Service" practices. We see various services and products offered to customers via a subscription model. Commented on the 2022 trends via CiscoChat, its periodic publications, in November 2021, Cisco mentioned the rise of Networking-as-a-Service products offered as a solution to the socialization activities that became challenging due to the pandemic. These products allow people to communicate more easily. Various products are expected to be offered to users via different models within the As-a-Service movement.



2021's another significant development in the USA emerged as a movement called "The Great Resignation". Starting with blue-collar workers and later included white-collar workers, this movement causes those unsatisfied with their working conditions in the USA to resign one after another, drop out of their fields of education, and become active in other fields. Companies seeking to fill the positions vacated by these employees have started to try to both change their business manners and offset these deficiencies via technology to improve their working conditions.

Especially innovation studies have reached an even more challenging point with this Great Resignation. Companies without sufficient professionals are heading for self-service solutions, causing many startups to focus on this issue due to this demand. Today, a limited number of companies have to develop their AI



solutions. The market offers lots of ready-made solutions which provide services in various areas. Offering easy implementation shortly, AI solutions are designed for many areas, including HR and project management.

The coding, an extension of this situation, is also required less. Low-code and no-code applications on the market provide product development capabilities without technical know-how. Among the best examples of this situation is OpenAI, whose founder and

investor is Elon Musk. OpenAI's Codex can automatically program a product with features specified via natural language by combining natural language understanding capabilities with a no-code structure. Considering the anticipated increase and continuous development of such technologies in 2022 and including the conveniences provided by the cloud structure in the picture, we see that technical resources and competencies will no longer be an obstacle to product development.

As the conditions change, the technology needs of companies also vary. Besides, each company's technological infrastructure, legal requirements of the country it is located in, and goals it seeks to achieve are also diverse. Not a single startup does a unique job in Silicon Valley. Hundreds of them are striving to solve the same problem via different methods. The good thing about this is finding a startup that produces solutions for any need.

The most efficient method in the digital transformation journey is to offer a solution to specific problems via partners instead of trying to solve each one. Here, the biggest challenge is to identify the right partner. The vast majority of startups offer more than their capabilities to sell their products. Similarly, innovation officers in large companies cannot have expertise in the company's every need.

This is a serious need for companies in this regard. Large companies need access to factual analysis without marketing



language. Consulting companies and their products in today's market provide information mainly via the marketing materials of startups. However, these materials do not always reflect reality and may harm companies in the future.

We see that products that can close this gap will be launched in 2022, streamlining the innovation journey of large companies. These products will offer the information collected from startups

to companies in a readily digestible structure, revealing only facts. Within our innovation consultancy, we guarantee that we will play an active role in this market while assisting our large companies' digital transformation strategies.



Aylin Öztürk

Softtech Innovation Solution Architect

Turkey's Startup Ecosystem

In the 2000s, the Turkish Startup Ecosystem was financed with its resources, without any outside support, due to investor shortage. The 2010s, however, rose a great interest in the ecosystem, increasing the number of startups managed to grow via investment. Angel investors, VCs, and accelerators entered the picture with their first investments. By the 2020s, Turkey's first unicorns were born while the rise in the ecosystem gained momentum.

In the last decade, the Turkish startup ecosystem has developed remarkably. The data on the left, showing the Turkish Startup Ecosystem's growth between 2010 and 2021, strikingly reveals the present situation in Turkey.

While Turkey had 5 acceleration programs in 2010, this figure has increased to 69 by 2021. In the last decade, the startup ecosystem's growth and related demands increased the number of Turkish incubation centers to 82. With technology parks becoming widespread, many leading institutions and universities launch incubation centers, contributing to the ecosystem's growth by supporting startups.

	2010	2021
Number of Acceleration Programs	5	69
Number of Incubation Centers	8	82
Number of Technoparks	27	68
Number of Co-Working Spaces	2	38
Number of Angel Networks	0	18
Number of Unicorns	0	5
Venture Investments	2.0M\$	2.2B\$*

*The first 9 months of 2021



Startup
accelerator



Venture
investment



Investment
fund

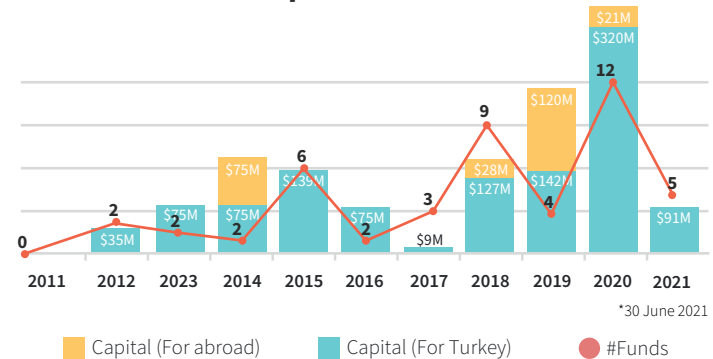


Coworking spaces are also among the key actors in the ecosystem. In recent years, many co-working spaces have been established across the country. Although the pandemic forced many startup teams to work remotely, many are now starting to return to offices. Providing the ability to socialize with many people from various disciplines and events (although they remain online during the pandemic), co-working spaces are today significant startup centers. Co-working spaces allow entrepreneurs to communicate jointly and meet investors and many entrepreneurs at the same location. Thus, they are significant in terms of their contribution to the development of the ecosystem.

Besides all these actors, supportive government policies are essential for the progress of startup ecosystems. Various programs are introduced in our country to establish and grow startups. Beginning in the 2010s, government agencies have enabled and supported the development of entrepreneurship consultants, acceleration programs, angel networks, venture capital funds, and crowdfunding platforms. Institutions such as the Ministry of Treasury and Finance, TÜBİTAK, and Istanbul Development Agency provide venture funds with funding, increasing the reserves. The government-supported angel investor accreditation program provides tax advantages to active angel investors and encourages the official accreditation of angel investors.

However, the growth of the Turkish startup ecosystem and many successful exits led to an increase in new venture fundings. Banks are also showing interest in building locally-based venture funds.

Turkish Venture Capital Investments

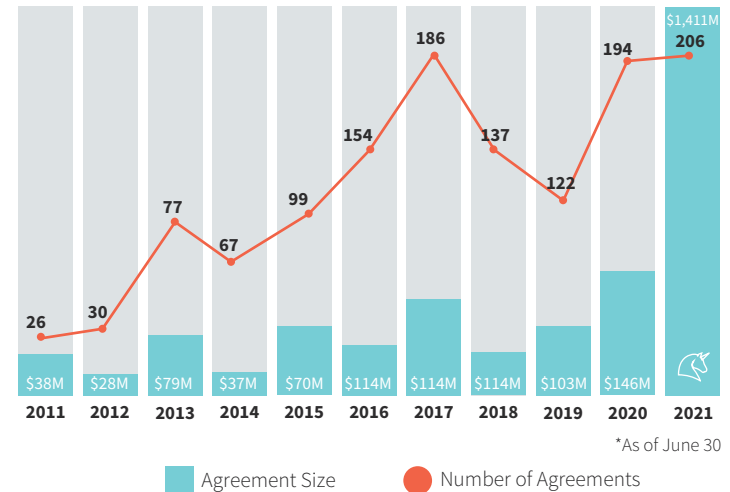




Thus, the Turkish startup ecosystem continues to increase capital.

After some fluctuations, the Turkish Startup Ecosystem entered a new era fueled by a group of passionate entrepreneurs. With recent success stories, investments in Turkey continue to beat records. The development of angel investments and VC (Venture Capital) investment activities is highly exceptional. Turkey's first unicorns have increased investment amounts by over 1,000% from 2020 to 2021.

Annual Angel & VC Agreements



The Covid-19 outbreak has significantly accelerated digital transformation in all industries in the past two years. However, despite the pandemic, 2020 and 2021 were considerably active in terms of investments. Share sales transactions in the gaming industry created a transaction volume of nearly 2 billion USD, making the gaming industry the most invested industry. With the acquisition of Peak Games for 1.8 billion USD in 2020, the first unicorn of the Turkish Startup Ecosystem was born, becoming a milestone for the ecosystem.

In 2021's Turkish ecosystem, the food delivery and gaming industries have stood out by far based on the size of the agreements. Investments received by Getir, Peak Games, and Dream Games had a clear impact on coming this far.



In the first half of 2021, Turkey introduced two different unicorns: Getir and Dream Games. Since there are five Turkish unicorns, the first half of 2021 created a difference in this regard. In the first 9 months of 2021, two major investments have constituted 97% of the total investment volume: Getir, which is close to becoming a decacorn with 550 million USD, and Dream Games, Turkey's third unicorn with an investment of 155 million USD.

Our Billion-Dollar Companies

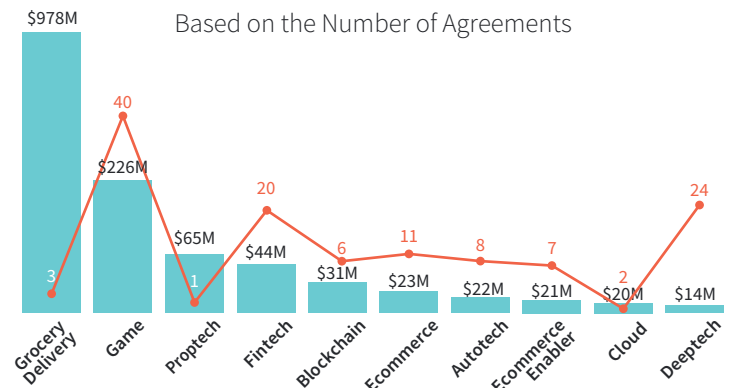


Trendyol also became Turkey's first decacorn. The Turkish Entrepreneurship Ecosystem keeps growing rapidly with its market size, employment numbers, and investment and export share. In the second quarter of 2021, the most striking data ever was reached for the Turkish Entrepreneurship Ecosystem. Venture investments in Turkey increased by 43% compared to the first quarter and hit a transaction volume of 727 million USD with a total of 57 transactions. Considering the first 9 months of 2021, total investments amounted to 2.2 billion USD.

Reviewing Turkish startup ecosystem investments, the KPMG report revealed the industries attracting the most investment in 2021 as delivery, logistics, gaming, media, and fintech, and the fields with the most transactions as gaming, fintech, media, and Saas. Considering the startup.watch data, delivery, games, and proptech verticals are again in the top three.

Top 10 Industries Funded in 2021

Based on the Number of Agreements



Source: startups.watch

Investments of 1,000,000 USD and above in Turkish startups in the first 9 months of 2021 can be seen in the following industries:

Startup	Industry	Capital Raised	Post Investment Valuation
Trendyol	Ecommerce	\$1,500,000,000	\$16,500,000,000
Trendyol	Ecommerce	\$350,000,000	\$9,350,013,135
Dream Games	Game	\$155,000,000	\$1,000,000,000
Dream Games	Game	\$50,000,000	\$198,153,524
BluTV	Video	\$20,000,000	\$57,000,000
Akinon	Ecommerce enabler, Cloud	\$20,000,000	\$130,000,000
Biotrend Energy	Energy, Cleantech	\$20,000,000	
Marti	Mobility, Autotech	\$10,000,000	
Dgpays	Fintech	\$5,000,000	
Ace Games	Game	\$4,921,818	\$24,869,726
Brew Games	Game	\$4,000,000	
Yolcu360	Travel, Autotech	\$3,597,716	\$30,188,376
Ödeal	Fintech, Restaurant, Retailtech	\$3,227,346	\$32,566,860
Fazla Gıda	Restaurant, Cleantech, Social good	\$3,000,000	
TikTak	Autotech	\$3,000,000	
Alotech	IaaS PaaS, Telecom	\$3,000,000	
Büyütech	Image process, Electronics, Autotech	\$2,935,750	
ViraSoft	Healthtech	\$2,500,000	\$13,500,000
Plant Factory	AgriTech	\$2,328,000	\$11,644,000
Fomo Games	Game	\$2,324,534	\$22,314,407
Segmentify	SaaS, Marketingtech, Artificial intelligence	\$2,295,571	\$7,000,000
Vektora	Agency, Business intelligence	\$2,214,019	

Startup	Industry	Capital Raised	Post Investment Valuation
SBS Bilimsel Bio	DeepTech, Biotech	\$2,000,000	
Litum	Location, Internet of things	\$2,000,000	
Trio Mobil	Internet of things, Autotech	\$2,000,000	
Tarabios	Healthtech, DeepTech	\$2,000,000	\$7,000,000
Moltek	Healthtech	\$2,000,000	
PayTR	Fintech	\$2,000,000	
Cerebrum Tech	Agency, Artificial intelligence	\$1,700,000	\$7,000,000
Veloxia	Game	\$1,435,000	\$7,100,000
Tarentum	DeepTech, Artificial intelligence	\$1,400,000	\$8,680,052
Laska Energy	Energy	\$1,400,000	
Marketyo	Grocery delivery	\$1,400,000	\$6,937,644
ArgosAI	DeepTech, Aviatontech , Image process, Artificial intelligence	\$1,309,091	\$12,000,000
HEY Games	Game	\$1,200,000	\$3,600,000
TEA Networks	DeepTech, Artificial intelligence, Telecom	\$1,160,000	
EasyCep	Ecommerce	\$1,103,361	
Hungri Games	Game	\$1,100,000	\$10,000,000
Fuudy	Meal delivery	\$1,100,000	\$7,100,000
Zyrone Dynamics	Aviationtech , Unmanned vehicle	\$1,050,000	
Midas	Fintech	\$1,000,000	\$10,000,000
WorqCompany	Agency	\$1,000,000	
BiSu	On demand mobile	\$1,000,000	\$50,000,000
Paxie Games	Game	\$1,000,000	

The startups raised 1.4 billion USD, with 206 agreements in the first 9 months of 2021. The total number of agreements (206) in 2021 hits a new record. In the first 9 months of 2021, 1 out of every 5 agreements was closed in the gaming industry. Turkey ranks 13th among the countries with the most investments in Europe in the 3rd quarter, 5th in the Middle East, and North Africa in angel and VC investments.

Considering these, investors continue to focus on new business areas despite the ongoing pandemic. Technology and digital services companies among them have risen investor interest significantly.

Gaming, e-commerce, grocery delivery, fintech, and deeptech are still the primary verticals for Turkey.



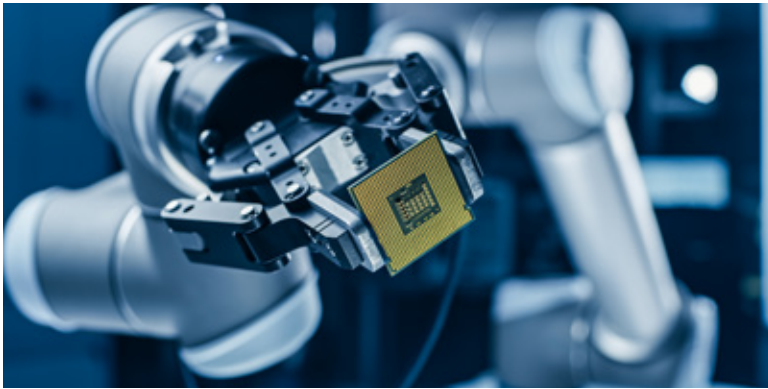
- Based on the data of the Investment Office of the Presidency of the Republic of Turkey, Peak's 1.8 billion USD exit led to the establishment of 213 new game startups in Turkey between 2019 and August 2021. Turkey hosts 445 gaming studios (as of August 2021), becoming one of the most significant gaming centers in Europe.



- Trendyol becoming Turkey's first decacorn, Hepsiburada's valuation of 3.8 billion USD in NASDAQ, and the development of e-commerce platform models allowed the e-commerce vertical to become one of the hottest industries in Turkey.



- Established in 2015, Getir's elevation to global unicorn status and similar "dark store" successes such as Banabi in Turkey also allow new players and startups to emerge in this industry.



> With regulative changes made to support innovation in the industry and the high number of successful exits, Fintech continues to be among Turkey's most significant verticals. Opportunities in open banking and cryptocurrency also lead to an increase in new startups.

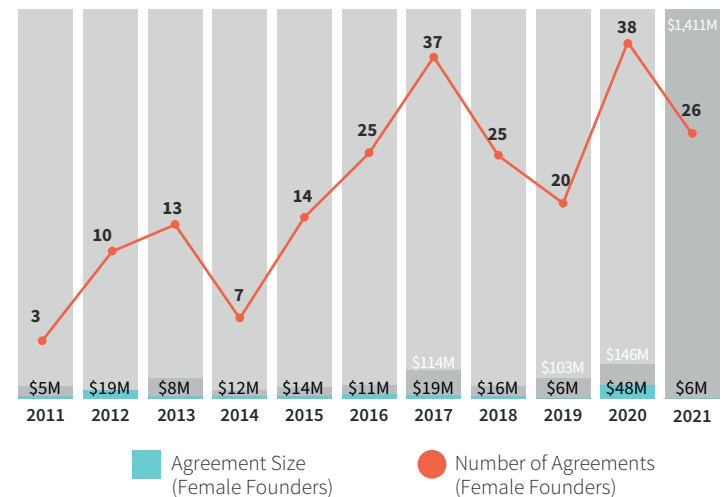


> The establishment of two deeptech-focused VC funds, the launch of deeptech-specific accelerator programs and incubation centers, and the emergence of successful deeptech startups have made deeptech a vertical to watch in Turkey.

Women entrepreneurs have a small share in the big picture.

Considering the ecosystem in terms of women entrepreneurs, startups founded by women have a quite low share among all startups. The rate of female entrepreneurship is only 13% in Turkey, in contrast to 34% worldwide. However, the founder of trendyol, which is on its way to becoming Turkey's first decacorn, is a woman. The rate of women entrepreneurs who raised capital in 2021 fell to its lowest level in the last 5 years (13%). Turkey also has investment platforms and acceleration programs to support women entrepreneurs. The increase in their number and capital size is a significant factor in parallel with the increase in the rate of women entrepreneurs.

Share of Women Entrepreneurs in Annual Angel & VC Agreements



Source: startups.watch

Will the Turkish startup ecosystem continue to attract attention?

Among the startup ecosystems, Turkey has been on its way to becoming an attraction center in recent years. Over the last decade, Turkey's startup ecosystem has constantly been growing. Istanbul has been ranked 15th among Emerging Ecosystems according to The Global Startup Ecosystem 2021 Report that reviews the leading 140 startup ecosystems worldwide. Istanbul has created a total investment value of 4 billion USD in the last 2.5 years.

The Covid-19 pandemic accelerated the digitalization of the offline economy, increasing the significance of tech companies. Therefore, the activities of startup ecosystems today will help determine their position on the global stage tomorrow. Maintaining this momentum will allow Turkey to rise further in the lists of global entrepreneurship ecosystems.

Parring with global players is a test for the ecosystem, while this responsibility belongs to the entire ecosystem (entrepreneurs, VCs, angel investors, accelerators, regulations, and other stakeholders).

Top 20 Emerging Startup Ecosystems

	Ranking	Country	Continent	Performance	Funding	Market Access	Capability
Mumbai	1	India	Asia	10	10	9	10
Copenhagen	2	Denmark	Europe	10	10	10	8
Jakarta	3	Indonesia	Asia	10	10	9	8
Guangzhou	4	China	Asia	10	8	6	10
Barcelona	5	Spain	Europe	9	10	7	10
Estonia	6	Estonia	Europe	6	9	10	1
Wuxi	7	China	Asia	10	5	9	10
Madrid	8	Spain	Europe	9	10	9	10
Zurich	9	Switzerland	Europe	8	10	9	7
Miami	10	United State	North America	10	10	4	10
Dubai	11	United Arab Emirates	MENA	8	10	10	4
Brussels	12	Belgium	Europe	9	9	10	6
Bristol	13	United Kingdom	Europe	9	9	9	9
Manchester-Liverpool	14	United Kingdom	Europe	9	9	5	10
Istanbul	15	Turkey	Europe	7	10	9	9
Detroit	16	United States	North America	10	7	7	8
Lisbon	17	Portugal	Europe	9	6	10	1
Portland	18	United States	North America	10	8	9	5
Houston	19	United States	North America	9	8	6	9
Helsinki	20	Finland	Europe	7	10	3	9



Jason Lau

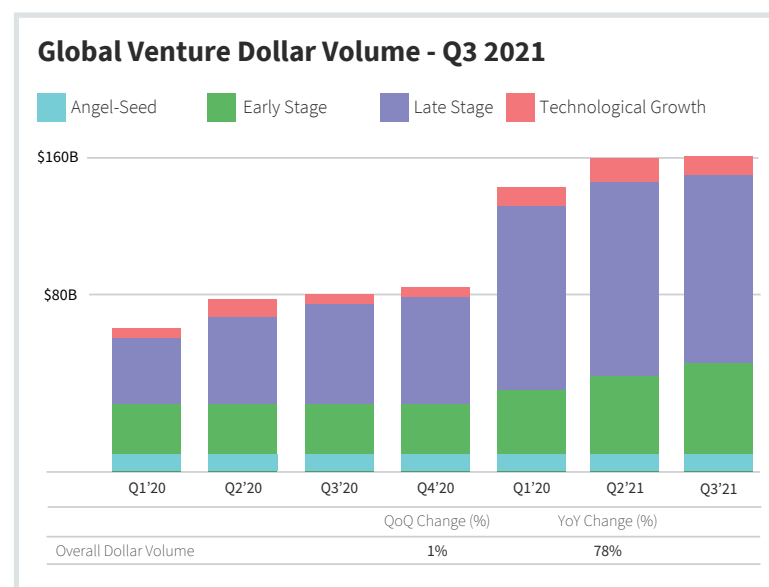
Core Strategy Partner
Özyeğin University Instructor

Funding Startups in The New Normal

The COVID-19 pandemic forced companies to reevaluate their business models and individuals to reconsider their priorities. However, the pandemic has only been a driver for growth in terms of the startup ecosystem.

Sudden and severe social changes create opportunities for those who can swiftly discover solutions and adapt to uncertainty. In 2020 and 2021, startups and investors utilized this atmosphere to introduce new players in existing industries and emerging markets.

In 2020, annual global venture finance hit an all-time high of 300 billion USD despite the first decrease in the immediate aftermath of the global lockdowns. Later in 2021, this figure was exceeded in the first three quarters, peaking at 135 billion USD in the first quarter, 159 billion USD in the second quarter, and 160 billion USD in the last quarter. Besides new market opportunities, this tremendous growth is due to fundamental shifts in how VC (Venture Capital)



fund operations and identify those opportunities. The pandemic has forced VCs globally to be more creative while identifying potential winners and applying technology to disrupt their way of conducting business. We can also say that competition between VCs and growth funds will inflame retail investors via blockchain technology soon, which will change how startups are funded and supported in the future.

The trends listed below play a role in shaping venture capital and investment types of today and near future, presenting a picture we can follow with examples for the future.

Data-Driven VC Investment

Quarantines and social distancing rules, Demo Day, and sales presentations via Zoom meant that investors in coffee shops were no longer allowed to meet by chance. Thus, VCs need to strengthen traditional valuation methods by leveraging data and AI, besides calculations and instincts, to make better investment forecasts.

Social Capital started this trend in 2017 with an "automated" investment platform called capital as a service (CaaS) to quickly identify opportunities regardless of location. CaaS can be defined as the efficient introduction of growth capital when the startup needs it, making investment rounds available automatically as the startup grows.

Next-gen investment companies like EQT Ventures and SignalFire invest in tech companies while hosting their AI platforms to

analyze investment opportunities. Motherbrain, the AI platform at EQT Ventures, has played a role in over 100 million USD of the company's 900 million USD investment since its first fund opened in 2016. Motherbrain includes publicly available data such as investor and LinkedIn data, app store rankings, and financing data, besides private information for rating companies. However, SignalFire allows companies to find resources before investing, perform due diligence, analyze and research the target markets of portfolio companies, and create business strategies via AI. The company can track half a trillion data via over 2 million data sources that help a company describe everything, including how to differentiate and price its product.

AI-driven venture finance has also increased alternative, loan-based financing options. Clearco offers an AI-based and no-equity capital solution for early-stage founders, enabling e-commerce companies and startups to invest from 10 thousand USD to over 10 million USD to replace their data via the "20 Minute Period Chart" and earn money via revenue sharing.

The Blurring Limits on Investment Stages

Funds often focus on a few related phases since each requires different expertise, structure, and resources. However, multi-stage investment is increasingly becoming popular to improve Assets Under Management (AUM) and competitiveness, increasing the chances of holding funds if they are separately managed assets. Managing multiple funds under one brand also creates synergy potential and enables better decisions for subsequent investments.



Funds such as Afore Capital in San Francisco, Wonder Ventures in Los Angeles, and Notation Capital in New York even enter the "pre-seed" stage to contact founders in the idea stage. Pre-product investments used to be the area of angel investors and incubators/accelerators. However, new funds are now being built, while investments are made at lower valuations to take and mitigate this risk.

Social Capital offers an innovation startup at a higher level than any other, via a multi-stage strategy, including seed investment and public market hedge fund. It also created multiple SPACs (Special Purpose Acquisition Companies) to reduce the burden of going public, utilizing them to raise billions of USDs in the stock market across a wide variety of industries. These include space tourism with "Virgin Galactic Holdings" residential real estate with "Opendoor", and online personal finance with "SoFi".

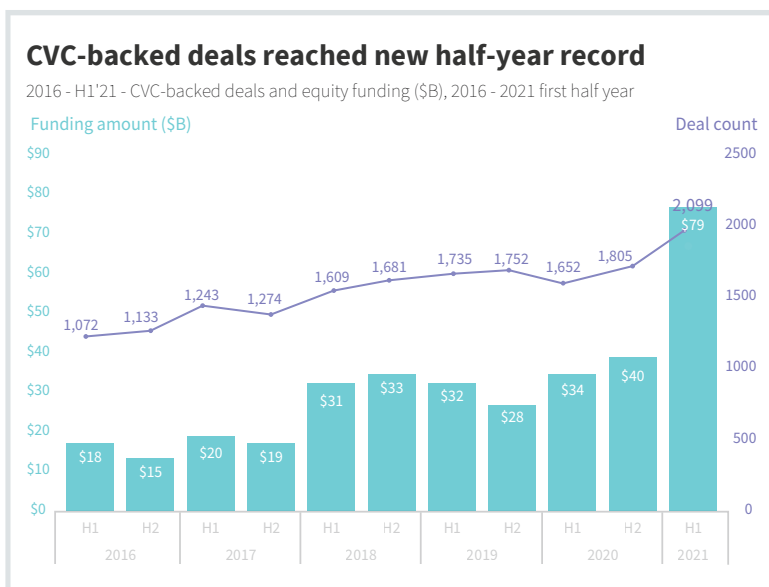
Institutions Double Their CVC Investments

The pandemic forced companies to adapt and innovate into an uncertain future. Thus, companies have had to face the reality that venture investment now is a must. Although past crises were financial and economical, the devastation created by the pandemic has been social and cultural, launching new working and cooperation methods. This has pushed innovation up the CEOs' agenda, forcing companies to consider the future of their workforces and operations.

While innovation becomes a must for companies, CVCs (Corporate Venture Capital) offer a great way to minimize risks to companies. A CVC can invest in 25 different startups, each with a promising idea and a solid entrepreneurial drive with the ability to bring it to commercial applicability. If just two of these ideas come true, the company can double these innovations and leverage early access to create a competitive advantage, better than justifying investment across the portfolio.

Global CVC-backed funding reached 78.7 billion USD in the first half of 2021, up 133% from the previous year, and exceeded 74 billion USD in 2020. CVC-backed contracts rose 27% compared to the first half of 2020, reaching a half-year record of 2,099.





investment threshold is low, reducing the need for large initial investments. This also benefits entrepreneurs by automating and simplifying their funding efforts. It helps them eliminate hundreds of sales presentations and time spent presenting metrics to validate their ideas in front of the super-rich.

Today, numerous ways allow retail investors to access startups and scale before going public. For instance, platforms like EquityZen provide any accredited investor with access to late-stage company shares that may go public soon, such as SpaceX, Rivian, and Klarna. Shares often derive from former employees, creating them a liquidity opportunity.

Retail Investors Joining the Race

Traditionally, venture investments were owned by a group of wealthy individuals, fund managers, and global corporations. However, considering the development of the influence and know-how of retail investors with time and the rise around venture investments, we can say that they will now ask for a share of early-stage investments.

Smart contracts and token generation allow venture capital to be more accessible to all retail investors. Also, adopting cryptocurrencies as a symbol of value and property facilitates the investment process. Considering crypto's accessibility, its





Gizem Eniş

Softtech Ventures Human Resources Manager

"Human" in the Startup Ecosystem

The product I bought from this year's "Black Friday", which has been popular in our country for the last 5-6 years, was the "Harvard Business Review" membership. The article "Considering HR from an Ecosystem Perspective", published in November under the title of HR Management, influenced me greatly. In the article, with the HR research "If the HR ecosystem were to be defined, what would the elements and network of relations in this system look like?", a focus group study was conducted with the participation of 12 senior HR executives working in manufacturing, FMCG, retail, service, automotive, tourism, and insurance industries in Turkey.

In this research, the HR ecosystem was defined with many adjectives such as "dynamic, constantly-moving, timelessness, a vibrant environment, domino effect, adaptability, variable, and complex". Mentioning the significance of "being active on the field" and "staying close to internal and external customers and building a trusting relationship" for the sustainability of the HR ecosystem,



the research also included themes such as "human", "acting with collective consciousness", "relationship of trust and consistency", and "the ability to be on the field".

As an HR professional in the startup ecosystem for the last 6 months, this focus group study showed me many points that intersect on both the entrepreneurship and HR side. How?

Let's explore them together.

An ecosystem is defined as "biological organisms interacting with each other and their environmental conditions". However, entrepreneurship means setting out with a dream and chasing it despite obstacles. Entrepreneurs are those who can turn their dreams into a story with their companions. According to Shine, entrepreneurs are "those who undertake innovations, finance, and business acumen in an effort to transform innovations into economic goods". While promising startups require suitable partnerships, a well-established business idea, and a great work discipline, an ecosystem that allows entrepreneurship is also critical.

Entrepreneurs can create value for individuals and society while responding to economic opportunities. Moreover, they can even initiate a process that introduces sociological changes in the financial system via their innovations. With its many aspects, entrepreneurship acts as a significant part of the wheels operating in the economy.

As the most critical element determining entrepreneurship, the "human factor" is based on employee and teamwork. Startups require teamwork to achieve success. Cohesiveness in a team is crucial since the teammates you will walk together are the ones with whom you will manage success, failure, and risk. In entrepreneurship, you are on the field with your teammates. Your trust and communication with your intra-team and investors build the basis of the communication you will establish with

your customers, demonstrating your consistency in your relationship management and business manners. Together, you act with a collective consciousness both with your customers and teammates. Today, where we can easily access information, cooperation is the most efficient and profitable way of interaction via the synthesis made by creative profiles using data according to needs. The end of this road requires us to act with collective consciousness. Similar to the elements that emerge in the relationships network of the HR ecosystem.

While achieving success, another key feature for entrepreneurship is to work relentlessly and persistently. Although work-life balance is today's highly significant phenomenon, we also need to create



an efficient and productive working dynamic while pursuing our efforts with sacrifice and passion for achieving success. Because entrepreneurship and success are also among the most significant phenomenons. As the popular and indispensable element of recent years, "agility", namely, "agility in change, conclusion, and social and general learning", is a must-have feature of an entrepreneur. I also included Accenture's agility definition in the article titled "Headhunting in Startups" and published it on Softtech Ventures Blog. As for Accenture, agility means "A company's ability to project, perceive, and react to market volatility in the manner that builds up a competitive advantage", namely, "agility = compatibility + speed + operations". I believe the intersection of the HR ecosystem and startups here and in the cooperation with collective consciousness is incredible.

Involving many opportunities and risks, startups also encounter many unexpected obstacles. Here, what is included in an

entrepreneur's approach to obstacles and crises will determine the startup's future. These are competencies such as "leadership", "resilience", "durability", "passion necessary for the startup to have a world-changing impact", and "taking responsibility". In case of a failure, the entrepreneur needs to get up and retry, showing resilience and durability. Resilience is undoubtedly among the most significant competencies of an entrepreneur. Here, however, balance is also essential. It is necessary to accept that the route sometimes needs to be changed. It will be very pleasing to be a part of the wheel while acting with a collective consciousness with the necessity of being active on the field to develop talents and position potentials in the best places in the HR ecosystem.

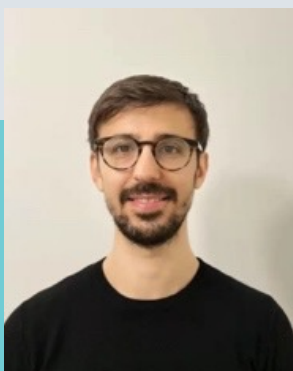
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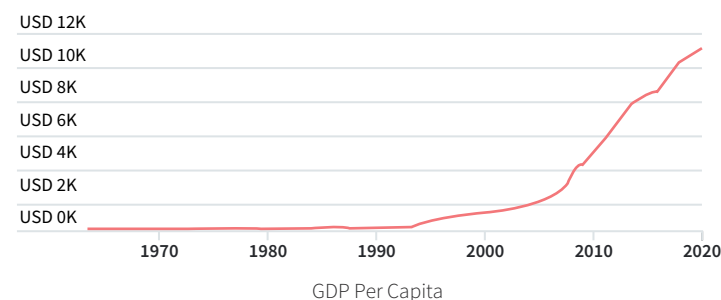
Opportunities In The Chinese Market

Chinese Market Overview

We all know that China has been transforming highly significantly in recent years. The country started to grow its engagement with other countries in the early 2000s, gaining a notable advantage by becoming the world's production centre. While the country's cheap labour force was an influential factor in becoming a production centre, it was known that maintaining this status for many years was unsustainable due to many reasons, including the environment, human health, and living conditions. Evaluating the economic growth and know-how gained as a production centre for the next step, China started to focus on shifting from simple production and cheap workforce to technology, innovation, and qualified HR as of 2015.

China was firstly criticized for copying the Western World during its transition to the technology and innovation model. These

The Gross Domestic Product Per Capita in the Republic of China



Source: datacatalog.worldbank.org

criticisms intensified when the Chinese versions of successful American companies were promptly introduced to users. Chinese versions of giants such as Spotify, Youtube, Netflix, Airbnb, and Uber started to draw attention in many areas, including social media and sharing economics. However, with intense competition among Chinese companies, this trend has transformed into a race to provide the best service to users, enabling the emergence of innovative approaches. For example, the super app model, the pioneer of giant companies such as Alipay and WeChat and known for offering multiple services and products to users under the same umbrella, has started to have a global influence, starting

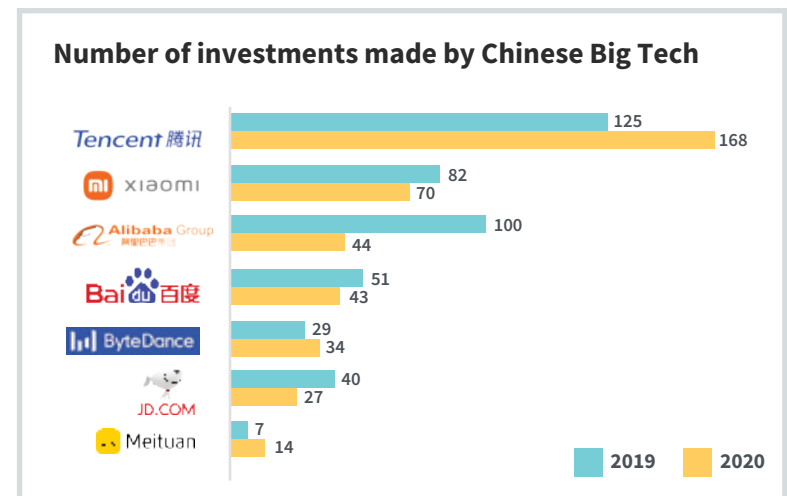
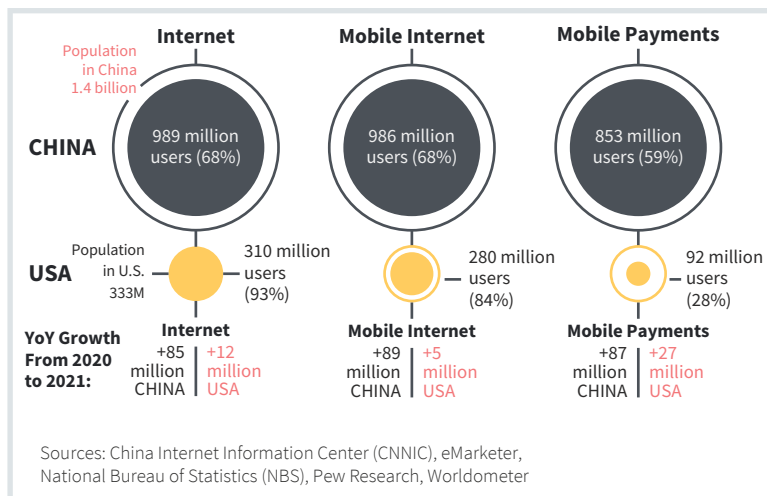
from China. Today, we can observe a super app approach that has become widespread from Southeast Asia to the Americas with examples like Grab, Rappi, and Uber. Similarly, the short video movement under the leadership of TikTok, live broadcasts where millions of products are sold instantly, and e-commerce approaches also affected the whole world, triggered by China.



In 2021, China has stood out with 989 million internet users, 986 million mobile internet users, and 853 million mobile payment users, namely, only 68% of its population. Meanwhile, the USA hosts 310 million internet users, 280 million mobile internet users, and 92 million mobile payment users, 93% of its

population. Comparing mobile payment users between the two countries, China's mobile payment users corresponding to 59% of its 1.4 billion population and the USA's mobile payments users corresponding to only 28% of its population reveal the difference. This difference in technology adaptation is among the most influential factors in the emergence of various Chinese business models and technologies different from other geographies of the world.

Once referred to only as a production centre, China has also started to be recognized as a pioneer technology centre, contributing to expanding technology companies to the ecosystem. Tencent, Xiaomi, and Alibaba, the significant Chinese technology companies, made over 550 investments in 2019 and 2020 alone. Considering the incentives and opportunities provided by the Chinese Government to high-tech areas such as AI, big data, and chip production, however, we can see that the country's growth focus for the coming years is in these areas.





Opportunities for Corporate Non-China-Based Companies

Announced by the Chinese Government in 2015, the Made in China 2025 plan demonstrates the country's goal of leading the world in certain strategic areas. These areas include 10 primary industries such as healthcare and agriculture, covering AI, IoT, green energy, and more. Evaluating the recent developments in the Chinese market by considering this information, China's creation of a large market with over 90 brands for the production of electric vehicles included in the green energy is among the simple examples of successful implementation of the determined strategies. Recently, the American company Tesla has even launched a facility in Shanghai to stay close to the Chinese market and developments. Moreover, highly innovative solutions have also been emerging due to the competition not only in the industries and fields included in the Made in China 2025 plan but also in those which target the end-user, such as retail and mobile games, and constitute a significantly large market with its population and rising middle-class.

It is evident that the Chinese market hosts innovative solutions and technologies while being a difficult location to access information about. Although we can learn the most detailed information about a newly-introduced technology in the USA almost instantly via platforms such as social media, the same, unfortunately, does not apply to China. Factors such as the language difference being a significant barrier and the extremely scattered information even within China make it challenging to monitor this market externally. Moreover, China's prohibition of tools such as Google and Facebook, which we often use in Turkey, may also prevent the easy transfer of information. Besides all these, China also appears to be isolated from the outside world with its strict "zero tolerance" approach to the virus, which decreases visitor/tourist arrivals in China with the pandemic. In the circumstances, non-China-based corporate companies face barriers while following China's dynamic and innovative market developments. Here, Softtech China's Corporate Innovation Services allows you to follow this dynamic market and helps you reach the best technology partner in it.



Opportunities for Startups

Although it does not seem like an attractive market due to the failures of large American companies, the Chinese Market offers outstanding opportunities for B2B technology companies. The foreign technology companies and talents the Chinese government aims to draw are significant factors for the country's goal of becoming a pioneer in developing technology and innovation. Thus, the country provides corporations operating in particular fields, including agriculture, health, and production technologies, with significant incentive mechanisms for market entry.

Specific to the Chinese Market, ensuring that the existing technology infrastructure works smoothly in China is necessary while getting into a new market, besides the research conducted in the first stage, including market research and competitor analysis. Due to the Chinese firewall and restrictions, the technology that operates smoothly outside China may generate problems inside China. Within Soft Landing services, Softtech China provides support in all matters, from market research to technology support, that a startup may need while getting into the Chinese Market.

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Digital Transformation's Effect On Social Startups

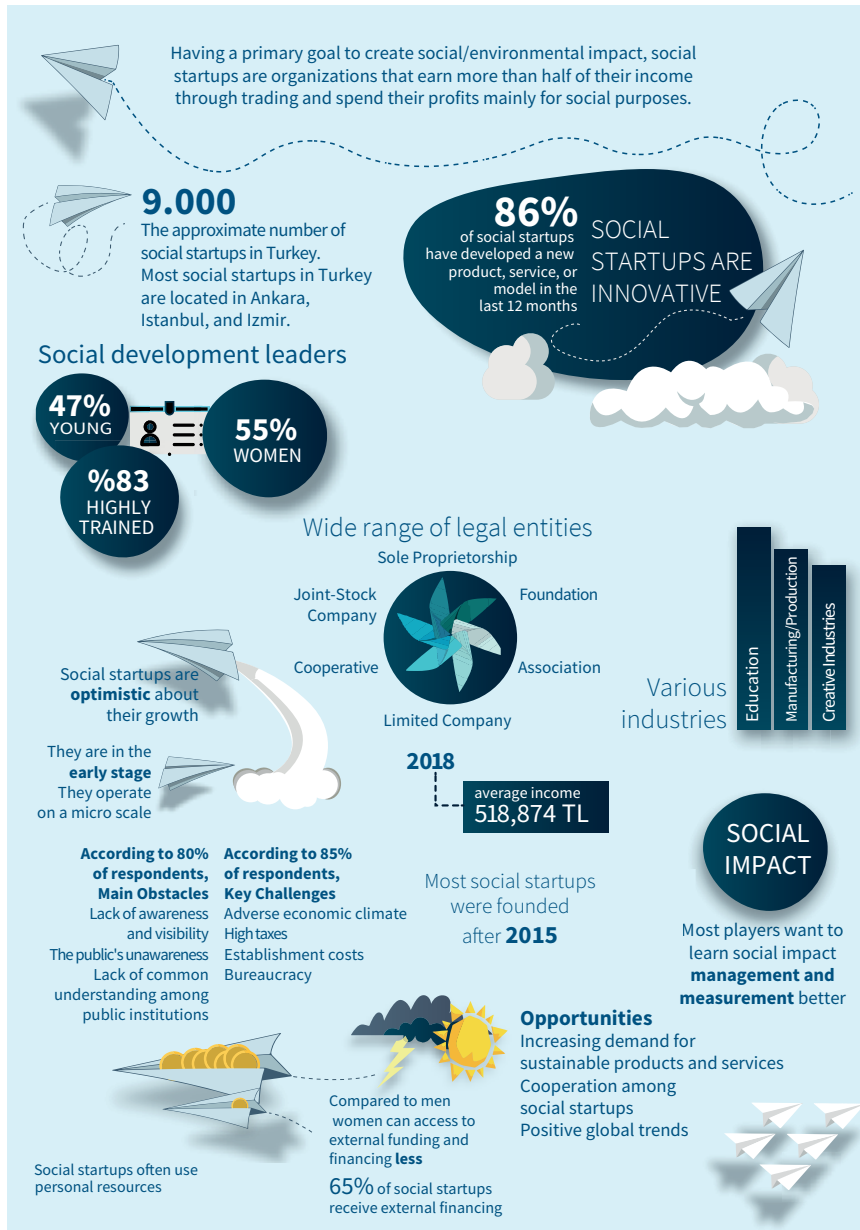
Although social startups and social entrepreneurship have recently become widespread in Turkey, there is still some confusion about them. Thus, before moving on to technological solutions and their contributions, I would like to start by defining them. Social startups aim to solve social and ecological problems by addressing their root causes, changing systems. They develop business models, products, and services to have a sustainable impact. Their difference from traditional startups that create an impact is their founding purpose and motivation, that is, to solve a social or ecological problem. Although they can make a profit, they aim to provide a social and ecological benefit instead of maximizing their profit. Therefore, a maximum of 49% of profits from sales of products, services, or shares are distributed to shareholders. They may also choose not to distribute any profits at all. They reuse profits by investing them in the same startup or a different one

to maximize their impact. Considering their business models and manners, they adopt the principles of "leave no one behind" and "do no harm" in system transformation. Accordingly, they develop fair salary policies and try not to create income inequality among employees.

Big startups such as Uber and Airbnb were first established to solve social problems and strengthen sharing economics. Considering their position in Turkey, we can observe that the industries most popular for social startups are education, manufacturing, and creative industries. Most of them were established after 2015. Moreover, while 55% of their managers or leaders are women, 47.28% are under 35. They are young, dynamic, and open to innovation. Most of them have problems regarding capacity building and scaling. Thus, the ability to utilize digital transformation and technology becomes extremely important. I will try to outline the impact of digital transformation via the example of Adım Adım (Step by Step), which moved its entire operations to digital except running training.

Adım Adım and IPK Platform

When we established Adım Adım in 2007 to popularize the charity runs, be a bridge among individuals, institutions, and NGOs, and drive individuals for social and ecological problems, we were tracking almost our entire operation via Pivot tables and excel files. The runners were sharing the account details of the NGO, from which they wanted to collect donations, with their benefactors, asking them to transfer the money via EFT or wire transfer with the description of "AAORunnerNameBenefactorName". In case of a credit card donation option available on the web page of the selected association or foundation, this information was also included. After receiving donation records, NGOs were transmitting them to us so that we could update them bi-weekly and share them with the runners. However, this operation with a high margin of error was extremely tiring and time-consuming. For example, problems emerged when benefactors mistyped the description, initiating a process involving the bank, the relevant NGO, and Adım Adım. As the number of runners, benefactors, and NGOs increased, we needed a technological solution more than ever and started to search for a partner. At the end of this process, İyilik Peşinde Koş (Run for Goodness Platform) was established with the support of our sponsors as well as the Salesforce Turkey Cloudteam and Yuvarla teams. Let me give a short note for those who believe digital transformation will take some time: It only took us one day to migrate all our data from Excel and Pivot to our digital platform, IPK.



While runners could create their pages and share the IPK link, the manager of the association/foundation was able to send an instant thank-you letter to the benefactor who donated to the runner's campaign via e-mail. NGOs and runners could also instantly monitor the donations made to their campaigns. Convenience and speed were reflected in the number of runners and benefactors shortly, leading to an increase of 400%. The support of Yuvarla helped credit card donations increase from 5% to 70%. After seeing the impact of the IPK, we designed our next social startup, Açık Açık, as a fully digital platform, joining the digital donation and support platforms that have many Turkish examples and that I will discuss below.



Açık Açık, İhtiyaç Haritası (Needs Map), and E-Bursum (My E-Scholarship)

Açık Açık is a platform we established to bring individual and corporate benefactors together with transparent and accountable associations and foundations. It is a social startup that maintains

its sustainability with the platform usage fee and resource development consultancy service fee it receives from the NGOs included in the platform. The income after deducting the expenses is allocated to the operations and communication of the Açık Açık Platform. Everyone can donate, support, and discover volunteering opportunities via the NGO's Açık Açık page.

On the other hand, İhtiyaç Haritası (Needs Map) is a non-profit platform cooperative built to bring those supporters together with those in need. Aiming to popularize online collaborative work, İhtiyaç Haritası collects and confirms needs from individuals, educational institutions, and NGOs, providing support with its map-based technology. Until today, a sharing economics equivalent to 390 million TRY has been created via this map. This system enables the creation of an unlimited number of İH/X maps. For example, those in need and living in Beşiktaş enter their needs, such as rents, invoices, scholarships, and tablets, into the system via Beşiktaş İhtiyaç Haritası Social Assistance Management System. Then, these needs are met within the district. With the map developed for Boğaziçi University Alumni Association (BUMED), alumni, faculty members, students, administrative staff, and craftsmen support each other and contribute to the Boğaziçi's economy by entering and meeting the needs entered into the system.

E-Bursum (My E-Scholarship) is another digital platform that brings those in need together with supporters. The digital platform helps students who need scholarships meet with scholarship-granting foundations, associations, and schools. Until today, E-Bursum has

mediated the distribution of scholarships equivalent to 75,000,000 TRY. In a way, these three examples also address the systemic transformation of digital platforms in the donation and support industry. Individuals and institutions prefer these platforms due to their speed, accountability, transparency, and convenience of impact tracking.

What's Next?

The Covid-19 pandemic has accelerated digital transformation also in the donation and support ecosystem besides all industries. Some social startups considered this an opportunity to increase their social and ecological impact, develop a CRM infrastructure, and scale. On the other hand, others utilized this period in which life slowed down within the principle of "leave no one behind" to adapt assistive technologies to deliver products and services to everyone. However, some entrepreneurs still do not use digital tools and refuse to even try the sales options via the website. While some social entrepreneurs research and use blockchain-based technologies for supply chain tracking, others choose to stay out of the crypto world entirely. While some social cooperatives explore the best examples of platform cooperation, which has been on the rise, especially in Northern Europe and the US, and exchange information to transform their systems, others stick to traditional business manners and methods. Thus, I believe developing and popularizing digitalization programs for social startups with high impact potential by considering that transformation may be intimidating is important. That's why I think "Digital Transformation 101: Why we shouldn't be afraid of technology?" is a good title. What do you think?

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