‹softtech

2020
TECHNOLOGY
REPORT

ISBANK Subsidiary | TÜRKİYE İŞ BANKASI

softtech

2020
TECHNOLOGY
REPORT

Colophon

Preamble

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The Technology Report is an annual report prepared by Softtech at the end of the year that includes information on technology trends expected to be on the rise in the coming years.

Various research studies were carried out during the preparation of the report. Analyses are conducted by using data from relevant reports of the major research firms around the world, the Internet literature, relevant academic articles, developments around the world and in Turkey, and according to the results of this research, the technology trend titles to be included in the report are determined. The main purpose of the report is to reveal the impact of technology trends on the banking, finance and financial technology sectors and to evaluate their use. In doing so, we take the advantages and disadvantages of technologies as well as legal constraints, business models and the direction of money into consideration from a versatile perspective. Furthermore, estimations, assessments and recommendations on when the future technology trends will be caught on the radar in the coming years and how great the magnitude of their effects will be are also included in the report. The report presents an approach that prioritizes innovation and entrepreneurship and aims to promote innovation and cooperation by encouraging all of its readers to look at things through this perspective. Softtech Technology Report 2020 has been taken to a different dimension by introducing a significant innovation over its previous versions with the contributions of guest writers who are experts in their fields. The report seeks to create a collective vision in which unity is emphasized by being nurtured by diversity and wealth in the ecosystem. We would like to express our gratitude to everyone who contributed to the preparation of the report, first and foremost, the guest authors, aiming to increase knowledge through sharing.

Quote

"It has become appallingly obvious that our technology has exceeded our humanity."

Albert Einstein

Contents

M. Murat Ertem

Softtech, CEO

Preamble

We present you with the third one of our Technology Report that we started releasing in 2017. If we look at our Technology Radar to see what has changed in three years, we see that smart cities, flying cars and data platforms are caught by our radar, while there are no significant changes in the expected maturation dates of the technologies.

Technology seems to be close to reaching the limit of the available processing power and communication speed in meeting its expectations. The vision of data transfer speeds, created by 5G, gradually brings the next era into view with quantum computers. In other words, technology, which pioneers the change in the world, is close to the limits of its capabilities.

While the developments on the technology side of things are like this, there is also a similar feeling of reaching the limits in the social and political fields, which are deeply affected by technology. Social networks, which make distances betwe-

en people meaningless, especially in the virtual world, are perceived as a threat by the states facing the problems of the era of globalization. The borders removed by technology are becoming more pronounced among states, which is especially apparent by the trade wars between the USA and China. The news about Russia wanting to use domestic software on local mobile devices and computers, and Germany to be bringing the investments higher than 10% in technology companies to the approval of the government, reveals that the situation is far beyond the Chinese-American conflict.

After the fall of the Berlin Wall, technology, the leading force of the growth of the global economy, has turned into something that could be called a "problem" along with the crises of globalization. While the ideas of the future that bloomed in garages came to life walking the lines of the regulations up until today, they could hit the tough walls of sociology and politics during maturation periods. The most optimistic commentary to be made in the near future for efforts that

still maintain their assertion and aim to go beyond the borders and disintermediate with blockchain in this setting is probably that they can flourish within multiple poles that are formed. It looks like we are going to have to say "your blockchain against my blockchain", reminiscent of the cold war era in a way...

So, should we be pessimistic in terms of technology? Frankly, if we look at the new ideas that appear on the radar, we can talk about smart solutions for mega cities thanks to the new possibilities that 5G will offer. While two-dimensional transportation has not been able to solve the so-called traffic problem, we believe that flying cars, which appear to be chaos in three dimensions, can be the solution to transportation. Even though we are not sure yet when we begin to imagine a world where 5G will unite with quantum computers and overcome CPU issues, we are approaching a world where every single data generated is instantly transmitted and interpreted.

Like the era of the first airplanes, there are flying car test runs in many places around the world including Turkey, in this sense our situation looks similar to the end of the 19th century. The situation with quantum computers and 5G, on the other hand, seem to be similar to the times the first computers and the Internet were released, just like the familiar story that began in the 1950s. It seems that we will place the developments that happened in the 19th century, which were thought to have taken a long time, and the 20th century where wars were prominent into a melting pot and go through all of these at once in 25 years. Right at this stage, we must become aware of the fact that the time to talk about

our human resources, which we are trying to accompany with artificial intelligence, has come. We need to concentrate on how our children, who we try to mold with knowledge focusing on the things they know, will gain agility to adapt to change. We think we should have started to see kanban boards on the walls on which school projects are discussed on a daily basis.

In order to get prepared for the new age that is approaching at a head-spinning speed, we believe that we should start off with the experience that the saying "history repeats itself" puts forward. Just like artificial intelligence that detects patterns of human behaviour. But we need to interpret not only rapid cycles but also century-long cycles, perhaps 10-year cycles too, due to the fact that the world is accelerating. With this perspective, we plan to include at least one article on sociology in the 2021 technology report.

In the 2020 technology report, on behalf of our readers, we would like to thank our guest authors who kindly agreed to share their ideas and all our friends who provided content. I am grateful to my editorial colleagues and our design team who made it possible for this report to reach you for 3 years. We would not be able to produce this report if it wasn't for their passion for technology, combined with their courage to prepare a report.

Although it may seem like a dream, we hope that 2020 will give us all the opportunity to make peaceful decisions.

THE FUTURE OF TECHNOLOGIES

ARTIFICIAL INTELLIGENCE

AUGMENTED REALITY

DEMOCRATIZATION

INTERNET OF THINGS

Humanoid Artificial Intelligence

Digital Reality

Quantum Artificial Intelligence

Flying Cars

New

Advanced Voice Assistants

Autonomous Vehicles

5G

Smart Homes

Edge Artificial Intel-ligence

Blockchain

Voice Assistant

New

Data Platforms

Smart Cities

New

API

2048	2028	2023	2021	2018	2021	2023	2028	2048

DIGITAL REALITY PERIOD   TRANSITIONAL PERIOD   MOBILE DEVICE PERIOD   TRANSITIONAL PERIOD   DIGITAL REALITY PERIOD

Based on international partnerships, platform companies, with a strong customer focus, will spread to all sectors.

We estimate that the importance of the applications which prioritise the benefit of the customer and hold a place in the customer's life owing to this fact will increase gradually. In this period that mobile devices are maturing, users are able to spare time for a small number of applications with the ongoing inflation of applications that provide similar functions. For this reason, applications that can directly benefit them and solve their needs in one place are surviving, while others are losing their market rapidly.

The expectations of customers regarding their financial needs do not differ. In the upcoming period, it will be possible to add financial functions to the applications that touch the customer's life with the effects of open banking. In order to provide fast and uninterrupted financial services in the customer's life, many functions will need to be combined in a single experience. This need for speed and focus will bring financial technology platforms to the forefront.

In the longer term, we anticipate that we will move towards the "digital reality" period in the upcoming course of 10 to 15 years, especially with the maturing of biometric recognition, augmented reality, image processing and voice artificial intelligence technologies. With this transition, access channels to the people will become varied and even smart glasses will turn into alternative channels of access. This change will take place in a more and more accelerated manner with the increased use of technology, based on the sector

When this period comes, reaching customers will mean communicating with customers rather than developing applications, and all institutions that are not able to adapt to this structure will have to lose their customers.

We are moving towards a consolidation process within the framework of regulations, whether it is slow or fast, in which companies are spreading globally, active platforms in more than one country are growing stronger, the institutions based on international collaborations with a strong customer focus survive.

Artificial intelligence will gain prominence with productivity-oriented scenarios.

The world is undergoing a major change under the leadership of artificial intelligence. We think that the decrease that happened in 2019 in the artificial intelligence bubble formed in the last 3 or 4 years, especially around humanoid artificial intelligence, will affect artificial intelligence positively. We estimate that artificial intelligence will continue to have an impact, increasing it with solutions that are firmly grounded, focusing on problems, placing productivity at the forefront.

Smart city investments are gaining prominence because of 5G projects.

While efforts on the implementation of 5G technology continue, countries focusing on the usage scenarios of this technology provide support for the practices about smart cities. 5G is fundamentally narrower in signal coverage, however, it stands out as a high-cost investment with significant accuracy in terms of location accuracy, communication speed, and width. Therefore, these practices gain momentum especially in countries that put importance on the megacity structure. It is also supported by smart city practices in cities such as London, Singapore, Hong Kong, Shanghai and Istanbul.

Cyber security and technology are witnessing conflicts at the country level.

The cybersecurity rivalry between the countries continued in 2019 as well. Cybersecurity competition, which is mainly concentrated on smart city technologies, 5G and other communication technologies and cloud services, has gained a new dimension with company-based bans. While Huawei was banned in both the 5G and mobile phone markets in some western countries, Russia signed a bill that prohibited the inclusion of mobile software from other countries in electronic devices when there was an existing domestic technology counterpart.

Data security will come to the forefront as an international strategic issue from the perspective of governments.

We will continue to observe data privacy and its impact in the coming years in the light of the laws on the protection of personal data such as General Data Protection Regulation (GDPR) and Personal Data Protection Law (KVKK) which are advancing around the world. We notice that people attach less importance to the use of their data for a particular benefit, and that sensitivity is more likely to arise from the acquisition and use of such data by governments or political organizations.

Although quantum computers are far from widespread, they can be effective in limited topics.

Since quantum computers are quite different in structure from today's computers, they lead to the need for each scenario to be separately designed. This is a major obstacle to the spread of technology through use in personal computers. However, it is seen that very effective results can be obtained on the basis of scenarios in quantum computers. For example; in an announcement Google

made in October 2019, they stated that they are able to complete a process that would last 10 thousand years on a conventional computer in 200 seconds in an announcement they made in October 2019. In particular, it will be possible to achieve results at a military technology level with the outcomes that can be obtained in terms of encryption and security solutions, genetic and physical calculations. We consider that this type of technology should be closely monitored, as it is a very commonly seen approach to use these technologies in the military for many years and to postpone their commercialization.

Augmented Reality will have a late but strong arrival.

While maintaining our expectations for this trend, we anticipate that augmented reality devices will only develop significantly in 5 to 10 years, especially when we consider that hardware technologies are developing slowly. In the short term, we consider that augmented reality solutions will be developed in the education and entertainment sectors by being used in commercial scenarios rather than individual use.

Autonomous vehicles are coming, led by electric vehicles.

2019 was a year in which the transition to mass production, especially in electric vehicles, accelerated. It is now widely accepted that electric vehicles have acquired a growing share in the market. We expect the speed of data collection for autonomous vehicles to increase as electric vehicles begin to roam the streets. We believe that the developments related to autonomous vehicles will accelerate thanks to this.

Led by China, the Far East has a performance beyond expectations in both technological and financial initiatives.

When China's capabilities to progress rapidly are supported by high-volume investments, China also outperforms expectations. We observe that Chinese enterprises are not only protected by regulations but also understand cultural differences well and ensure fast holding in the market. Led by China and Singapore, we observe the rapid implementation of innovative payment systems. However, we assess that China is progressing into a pioneer in cybersecurity, the Internet of things and image recognition technologies.

Fintechs will be globalized and they will continue to grow in a strong and steady manner.

Especially with the financial crisis that reared its head in the world starting in 2008, the trust in corporate companies has taken a hit. Besides, young generations formed different expectations for better customer experience from companies due to technological changes. Initiatives operating in the field of financial technologies have emerged to meet these expectations and managed to achieve steady growth. In 2019, Fintechs continued to receive investments intensively and confirmed the trend. We interpret that Fintechs, continuing to grow stronger especially in Europe and China, will focus on international expansion through achieving global expansion.

The Open Banking trend continues to mature with the support of regulations.

Corporate companies have started to cooperate with new initiatives in order to improve their services and not lose their customers. The most effective way for initiatives to interact with large companies is possible through financial institutions opening their service interfaces (APIs). To encourage this, governments also have started to support institutions. Turkey started following the direction of the wind that had begun in Europe as well and launched efforts on Open Banking.

We believe that all over the world in the upcoming period, with the open banking system, international payment systems, robo-advisors working on asset management, credit systems based on employer-employee relations, initiatives that help with the cash flow of companies will be under the spotlight and they will gradually develop these services of theirs to serve smaller companies.

With the burst of the cryptocurrency bubble, mature solutions in blockchain technologies that are more firmly grounded will emerge.

In addition to open banking, "democratization" is at the forefront in ecosystem interactions. The development that supports this the most strongly is Blockchain technology. With blockchain, it is possible to establish decentralized but reliable business models.

Although the blockchain technology was not under the spotlight due to the popularity of Bitcoin that emerged, we observed that blockchain attempts aside from cryptocurrency, starting from 2018, increasingly continued. We evaluate that this technology will move in a lot more mature of a direction with consortium-based studies that are firmly grounded, shifting from cryptocurrencies to distributed ledger technologies. We believe that consortium-based studies will not be able to exceed above a certain speed, but will mature and become active over time. Blockchain technologies are candidates for active use in issues such as digital identity, tracking and ownership of all kinds of commodities and assets, management of corporate and interpersonal agreements, international trade and money transfer in particular. Blockchain is also prominent in issues such as the proper implementation of laws like General Data Protection Regulation (GDPR) and Personal Data Protection Law (KVKK) and leaving data privacy to the initiative of the individual.

The transition to more dynamic structures in cooperation models and management of manpower will accelerate.

We are at the beginning of a period in which institutions that make rapid collaborations with Fintech initiatives and invest in decentralized systems will gain prominence. We observe that new generation banking initiatives have received investments by institutions in other countries or they have shifted their activities to other countries through the investments they have obtained, in 2018. It is seen that countries try to be influential in payment systems in other countries through Fintechs, both by purchasing and investment and by partnerships. Investing in initiatives is an important opportunity for those who want to dive into the markets of other countries. Today, the exit strategy of many ventures and funds to back away from investment is to create a company that dominates a certain market in the country and then sell it to a corresponding global company.

It is inevitable for the institutions to go through some changes in the organizational and bureaucratic sense in this whole process. We are moving towards a period where access to talents is becoming increasingly difficult, the importance of engaging in different collaborations through initiatives is rising, and in addition to all of this, efficiency continues to gain importance.

In order to increase their profitability and efficiency, institutions will start to outsource their internal competencies again.

Many companies have tried to enter new markets for decades. One method used for this was to obtain a process or data from a company that has great competence and creates a product as a result of that competence. However, historically, this method has resulted in failure for many. In the age of cloud computing, companies will try this again. The underlying reason for this is the ease of entering new markets and the distribution of cloud services to large masses, provided by cloud computing. Transforming internal capacity into external digital products that generate revenue that can be delivered on a global scale justifies investment becoming a digital business.

ARTIFICIAL INTELLIGENCE
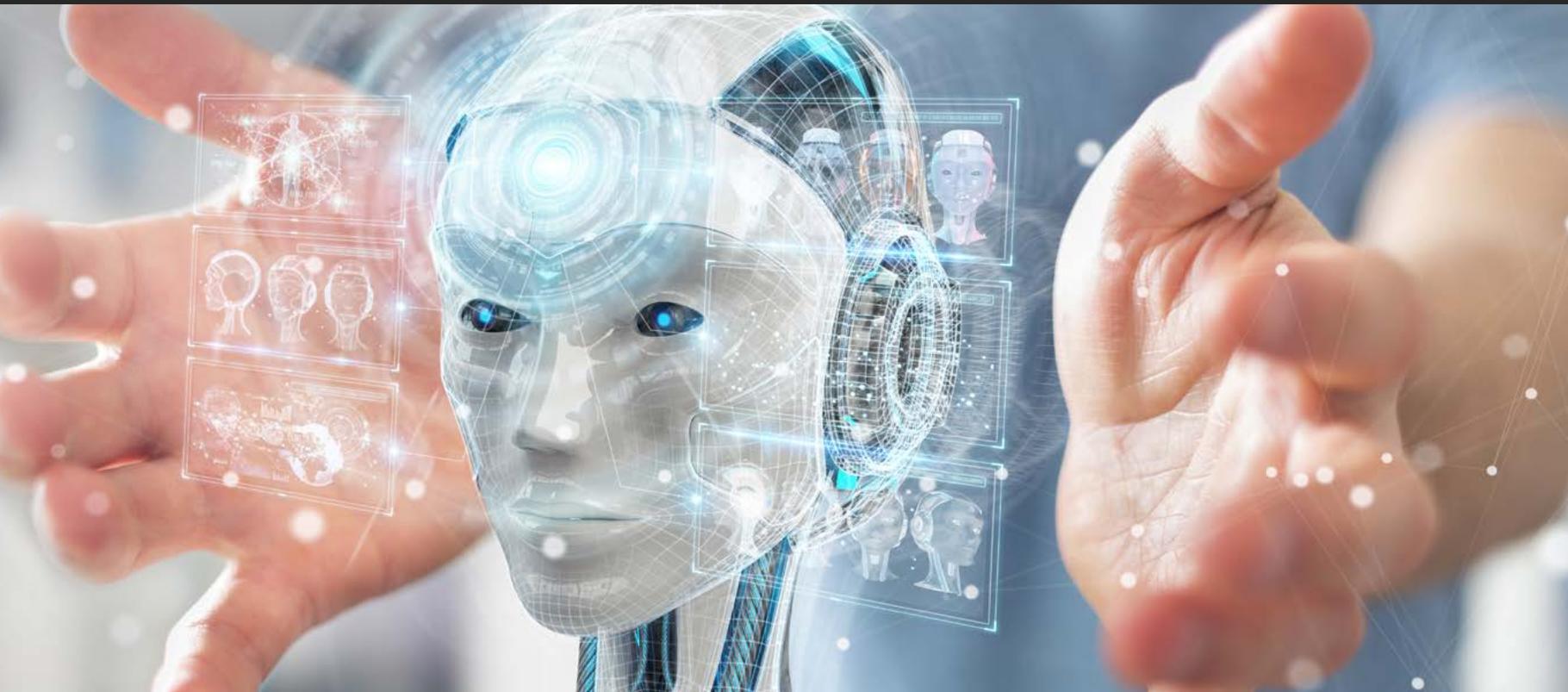
Definitions

Artificial Intelligence (AI): Contrary to the natural intelligence of humans and animals, the discipline of intelligent machines is broad with a goal of creation. In addition to this, it is necessary to capture the long-term passion of the field to build machines that mimic and then transcend the entire cognitive spectrum of humans.

Machine Learning (ML): A subset of Artificial Intelligence that generally uses statistical techniques to enable machines to "learn" from data where instructions on how to do so are not given. This process is known as "training" "a model" using a learning "algorithm" which further enhances the model performance of a given task.

Reinforcement Learning (RL): This is a field of Machine Learning that has received a lot of attention from researchers over the last decade. Goal-oriented behavior relates to software agents that learn through trial and error in an environment that gives rewards or punishments in response to the agent's actions (called "policy") to achieve this goal.

Deep Learning (DL): A field of Machine Learning that tries to mimic activity in layers of neuron in the brain to learn how you recognize complex patterns in data. "Deep" in deep learning refers to a large number of layers of neurons in contemporary Machine Learning models, helping to learn rich data presentation in order to achieve better performance gains.

Algorithm: An exact definition of how to solve a particular problem.

Model: The output of a Machine Learning algorithm after it is trained on the data is known as a model. This model can then be used to make predictions.

Supervised Learning: This is the most common (commercial) type of Machine Learning algorithm of today, where the system is presented with labeled samples that can be learned clearly.

Unsupervised Learning: Unlike supervised learning, this machine learning algorithm reveals the natural structure of data that is not explained by labels.

Transfer Learning: A research area that focuses on storing the information gained in a problem in machine learning and applying it to a different or related problem, thereby reducing the need for additional training data and computation.

Natural Language Processing (NLP): Allows machines to analyze, understand, and manage text data.

Image Processing: Allows machines to analyze, understand and manage images and videos.

Breakdown of Artificial Intelligence Technology and Its Usage

Artificial intelligence is the general term used to describe making machines intelligent and providing the ability to process and make logical decisions. This general concept is subdivided according to the technically targeted purposes.

Machine Learning, in the scope of things such as version space learning or decision tree learning, is the act of machines being provided with learning abilities in the presence of object or process modeling.

Artificial Neural Networks relate to brain modeling, time series forecasting, and classification.

Natural Language Processing is the processing of natural languages in a way that the machine understands.

Expert Systems focus on decision support systems and teaching systems.

Computer Vision & Image Processing consists of object identification, visual data processing, and image interpretation.

Evolutionary Computation involves genetic algorithms, genetic calculations, and programming.

Artificial Intelligence Technologies

Explanatory Technologies

Sensing
- Image Processing
- Voice Processing

Understanding
- Natural Language Processing
- Information Representation

- Machine Learning
- Expert Systems

- Virtual Agents
- Identity Analysis
- Cognitive Robotics
- Speech Analysis
- Referral Systems
- Data Visualization

Source: https://www.guru99.com/artificial-intelligence-tutorial.html

01

Image Processing

- Image Diagnosis (diagnosis of diseases in plants and humans)
- Emotion Analysis
- Behavioral Observation
- Object Understanding
- Threat recognition

02

Voice Assistants

- Natural Language Understanding
- Voice Understanding
- Natural Language Processing
- Natural Language Creation
- Personal Assistants

03

Based Forecasting Systems

- Trend Forecasting (route calculation, workload forecasting, forecasting number of customers)
- Risk Forecasting Systems (fraud, credit score, terrorist relations)
- Suggestion Systems (product suggestion, partner suggestion, financial advisor)

04

Physical Systems

- Autonomous Vehicles
- Robots

Usage Areas of Artificial Intelligence in Banking

Artificial Intelligence Processors

Emotion analysis

Robot advisors

Call center representative pairing

Loss forecasting

Biometric identity verification

Personal financial management

Query forwarding

Service robots

Identity verification

Dialog Artificial Intelligence

Location intelligence

Natural language production

Customer lifetime value modeling

Insurance policy signing

Behavioral biometrics

Giants of technology have purchased a total of 60 Artificial Intelligence initiatives since 2010

Artificial Intelligence Companies

Amazon 7

Facebook 8

Microsoft 9

Google 14

Apple 18
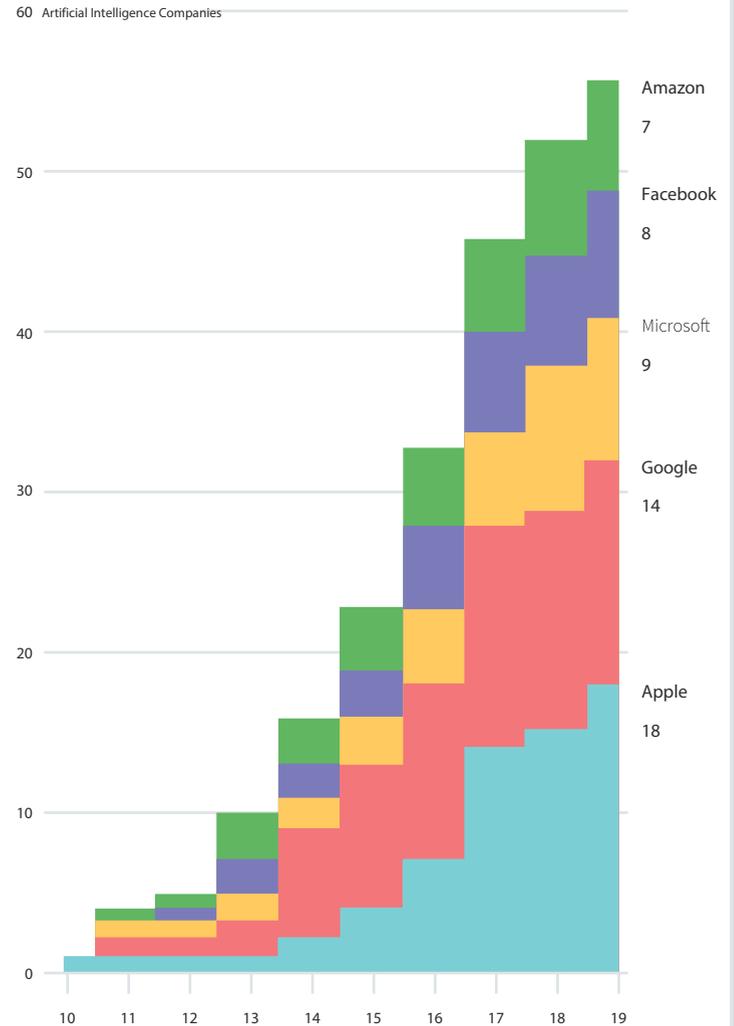
Funding amounts of artificial intelligence startups, Q1 of 2014 - Q2 of 2019
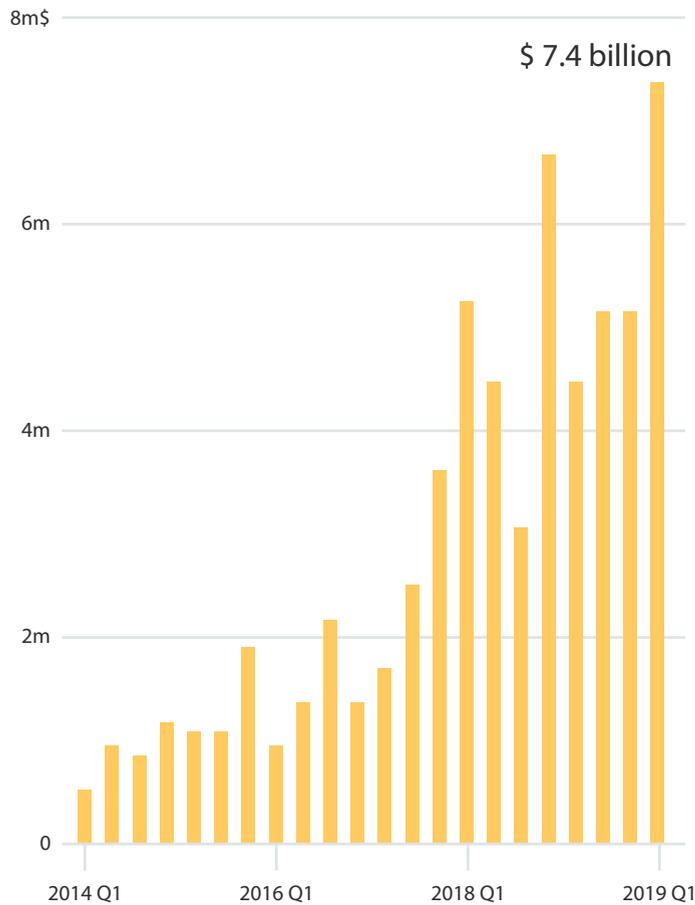
$ 7.4 billion

Number of digital assistants in use worldwide between 2019 and 2023 ($ billion)"
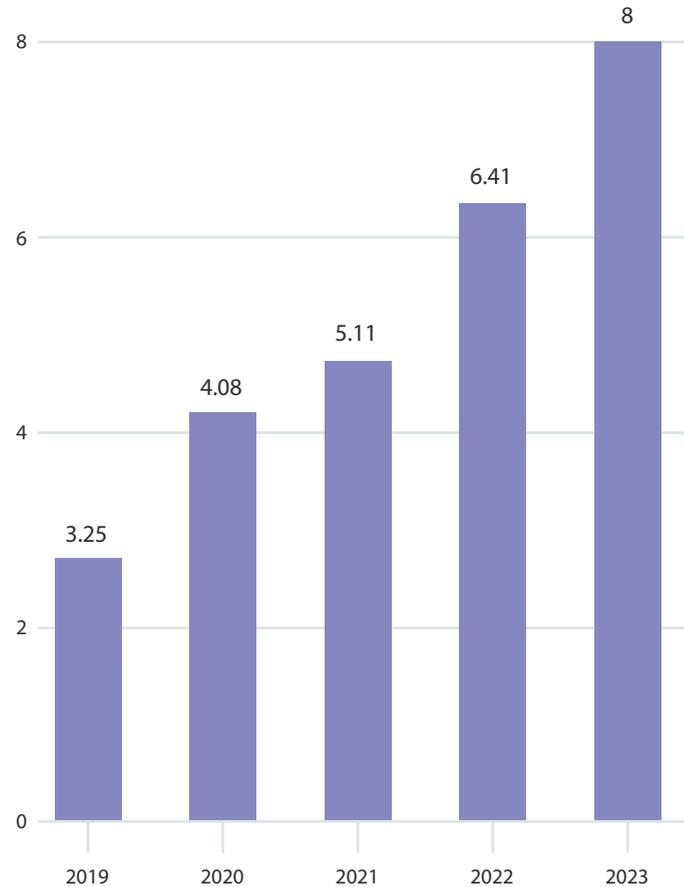
This statistic shows the estimation of the total number of digital assistants used worldwide from 2019 to 2023. It is estimated that the digital voice assistant market will continue to go through the ongoing experience of expansion in the coming years and that the number of audio assistants used in 2019 will rise to approximately 8 billion from 3.25 billion until 2023.
Shanhong Liu, July 18, 2019

01

Prejudiced Artificial Intelligence

02

Data Reliability

03

Legal Liability

04

Transparency of the Decision Mechanism

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Understanding Non-Structural Data

06

Providing Training Data

Fundamental Problems that Artificial Intelligence

Has To Overcome
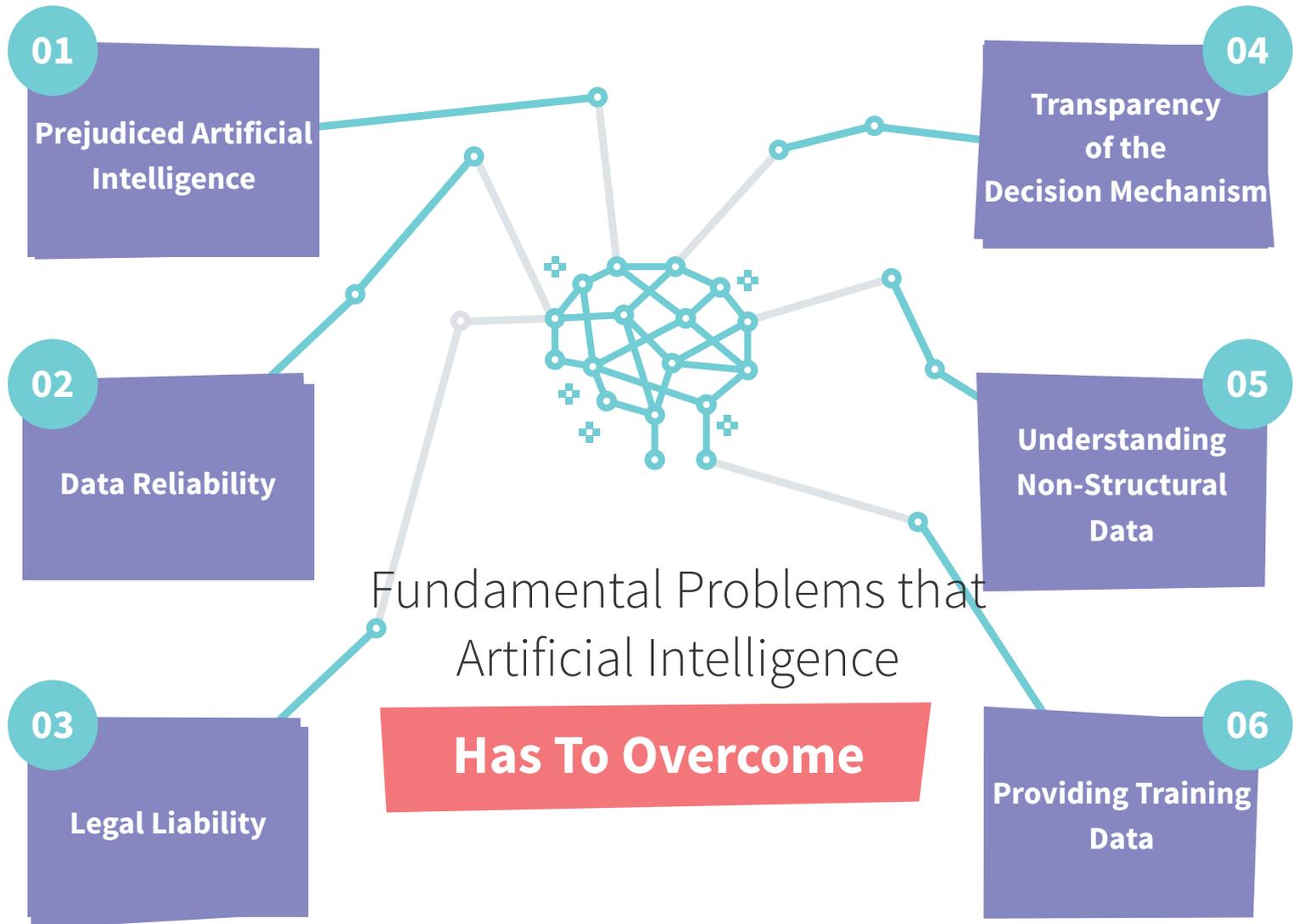
Prejudiced Artificial Intelligence

Computers are trained using an initial data set and training programs are created by people. Often, training sets reveal unacknowledged prejudice that is hidden within us. As our computer systems succeeded in making decisions, we began to find ourselves classified by algorithms into groups that did not make any clear sense to us but might arouse a tremendous reaction.

You or someone you know may get grouped mistakenly due to the algorithm and you may discover that you are not eligible for a loan or a particular drug or renting an apartment for non-transparent or unclear reasons. Since Artificial Intelligence is fed with data, it can discriminate when it is used in cases of suspect identification, credit scoring, etc. due to the existing statistical connections in terms of certain subjects such as gender, origin, occupation.

Data Reliability

As Artificial Intelligence started to be used in critical issues such as security and finance, this has not only begun to increase cybersecurity attacks targeted at artificial intelligence but also increased the visibility of erroneous results although at a low rate. Since artificial intelligence involves an inference based on data rather than coding, the deliberate or erroneous modification of data sets emerged as the most basic method. We will soon reach a point where we cannot tell if the data set has been changed intentionally or accidentally. Artificial Intelligence systems are based on our reliance. If we do not rely on the result, decades of research and technological progress will go to waste.

Legal Liability

Systems that are explored by artificial intelligence and robots on their own, without defined data, in which they are able to reach even better data and variables began to be mentioned. In this aspect, artificial intelligence and robots have started to be scrutinized within the legal dimension, primarily through the concepts of will, consciousness, capacity to have rights and to act, and responsibility. Even in artificial intelligence solutions of a narrower scope, serious legal and ethical issues are brought to attention. The use of artificial intelligence in the diagnosis of cancer patients, in the identification of a terrorist or in autonomous vehicles will directly affect human lives.

Transparency of the Decision Mechanism

Artificial Intelligence systems should be able to explain their decisions, provide more transparency, and be accountable to users of the data. The problem, however, is that when such transparency reveals are presented, the hidden parts of commercial products that are highly profitable are revealed. Another difficulty is that requesting the systems to simultaneously explain decision-making processes can reduce output speed and quality.

Understanding Non-Structural Data

The most crucial disadvantage of artificial intelligence is that it does not have an ability to think which is similar to that of humans and that it does not have integrated sensors like eye and ear. For that reason, many different technologies are used when it comes to understanding videos, photos or printed documents, and their success rate is far from getting close to the level of humans.

Providing Training Data

Artificial intelligence can only be as successful as the data used in its training. Humans undergo education in a multidimensional

way for 16 years to be able to make responsible decisions in legal terms. When teaching data is problematic, people can make wrong decisions as well. In the case of artificial intelligence, there are limits to the size and variety of data that can be fed. Inadequate data as well as missing dimensions can lead to incorrect decisions. Artificial intelligence can create serious illusions, especially when the accuracy of educational data is not clear.

Difficulty Matrix of Needs for Artificial Intelligence

Early Adopters

Leaders

Customer recognition & Money laundering

Personal finance management

Location intelligence

Loss of customers & LVM

Conversation artificial intelligence

Behavioral biometrics

Query forwarding

Call center representative pairing

Robo advisors

Artificial intelligence processors

Emotion analysis

Insurance policy signing

Service robots

Natural language production

Biometric identity verification

Trend-setters

Innovators

Maturity Level of Needs — Established / Developing

Maturity Level of Technology — Established

Source: CBINSIGHTS

Challenges in the governance of Artificial Intelligence

The importance level of the problem (0 = Not important at all, 3 = Very important)

Data privacy

Autonomous weapons

Cyber attacks

Autonomous vehicles

Surveillance

Value congruence

Recruitment bias

Criminal justice bias

US-China arms race

Digital manipulation

Diagnosis of disease

Technological unemployment

Critical system failures of artificial intelligence

Probability of affecting large numbers of people in the US in 10 years

Preventing Artificial Intelligence-assisted surveillance from violating privacy and civil liberties.

Preventing Artificial Intelligence from being used to spread fraudulent and harmful content online.

Prevention of Artificial Intelligence cyber attacks against governments, companies, organizations, and individuals.

Protecting data privacy.

Source: State of AI Report, Nathan Benaich, Ian Hogarth 28 June 2019

Google, while entering 2019, focused on prejudiced artificial intelligence improvements:

Before

After
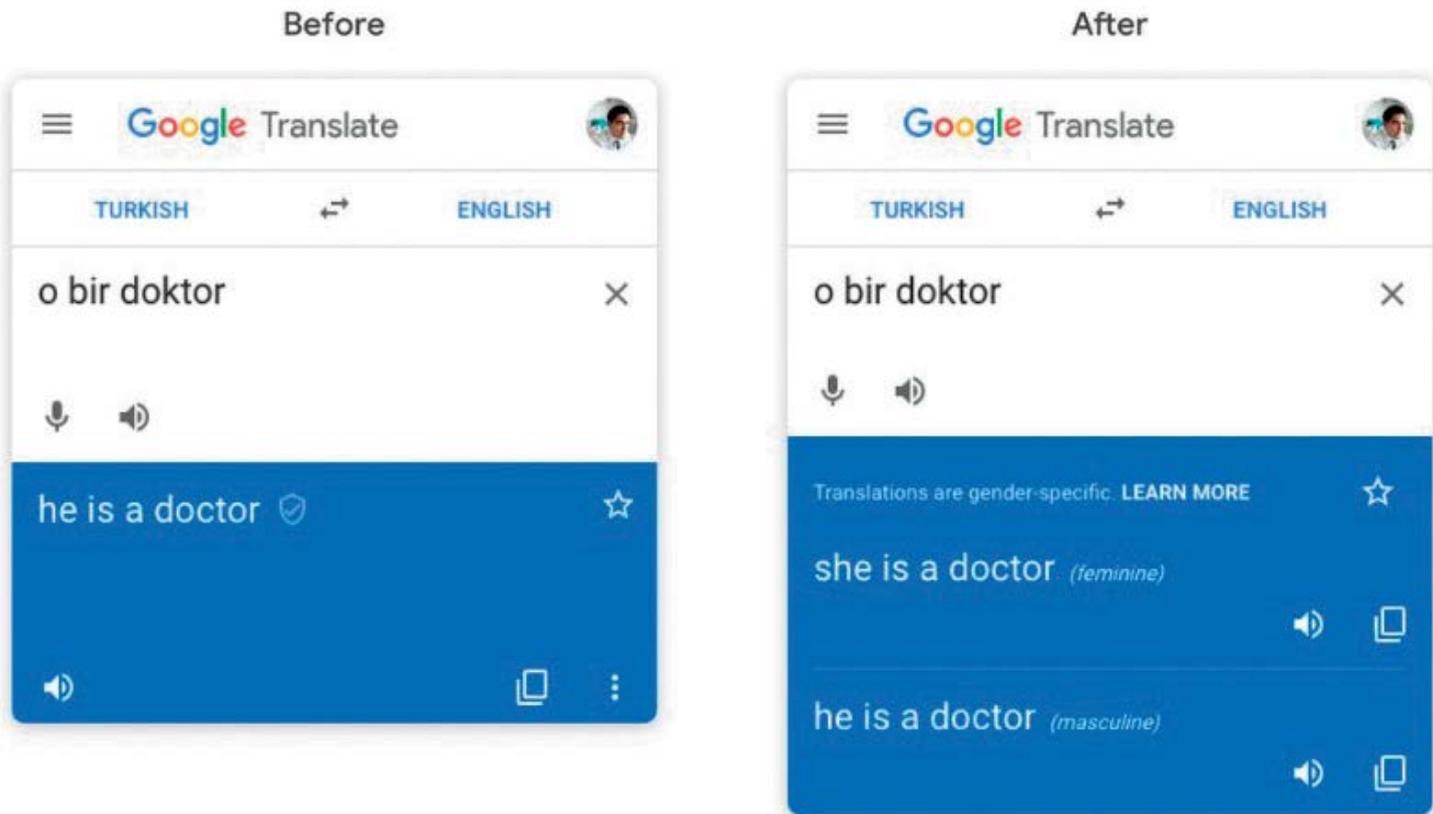
Artificial Intelligence has **5 potential stages**

Artificial Specific Intelligence, Artificial Auxiliary Intelligence, Artificial General Intelligence, Artificial Superintelligence (Artificial Superhuman Intelligence), Artificial Transhuman Intelligence. However, there is no guarantee that we will go through all these stages.

01 Artificial Specific Intelligence

Scope

The ability to perform certain tasks - it cannot move them beyond the dimensions taught, nor can it develop new functionalities on its own.

Effects

It increases the productivity of repetitive jobs that cannot be scaled without human support.

The Affected Group

Blue-Collar Workers

Timing

Today and up to this date

02 Artificial Auxiliary Intelligence

Scope

Artificial intelligence that supports and accelerates people's efforts in their work and daily lives.

Effects

Artificial intelligence increases the efficiency of people in business life and increases the ability to compete with each other and the artificial general intelligence that may arrive in the future.

The Affected Group

Every human

Timing

Today and the next 20 years

03 Artificial General Intelligence

Scope

Performing the more general functions, being able to improve itself by learning in different dimensions.

Effects

Displaying a performance at near-human level in branches such as Art, Law, Mathematics and Science, and competing with people in white-collar jobs without support from people.

The Affected Group

White-Collar Workers

Timing

2045 and later (Computers will be able to reach the processing power of a human brain in 2023 at the earliest, Artificial General Intelligence may come into existence in the next 20 years.)

04 Artificial Superintelligence (Artificial Superhuman Intelligence)

Scope

Artificial intelligence that can develop, learn, and implement decisions it makes, beyond the limits of human perception in terms of speed or outcomes.

Effects

Artificial intelligence that, apart from technical matters, has a say in business life and communication, can communicate with each other and, when necessary, by-pass people and companies that do not use artificial intelligence.

The Affected Group

Managers

Timing

The unforeseeable future

05 Artificial Transhuman Intelligence

Scope

Artificial intelligence is able to create structures that can acquire capital ownership or eliminate the domination of capital ownership.

Effects

Artificial intelligence that can change life as a whole, from business life to international politics.

The Affected Group

Every human

Timing

The unforeseeable future

Artificial Intelligence demand trajectory for the future, change % in Artificial Intelligence expenses over the next 3 years

Outstanding sectors

Financial Services

High Technology and Com-
munication

Transportation and Logistics

Travel and Tourism

Health

Media and Entertainment

Retail

Energy and Resources

Professional Services

Automotive and Assembly

Education

Consumer and
Packaged Goods

Construction Materials and Construction

Sectors lagging behind
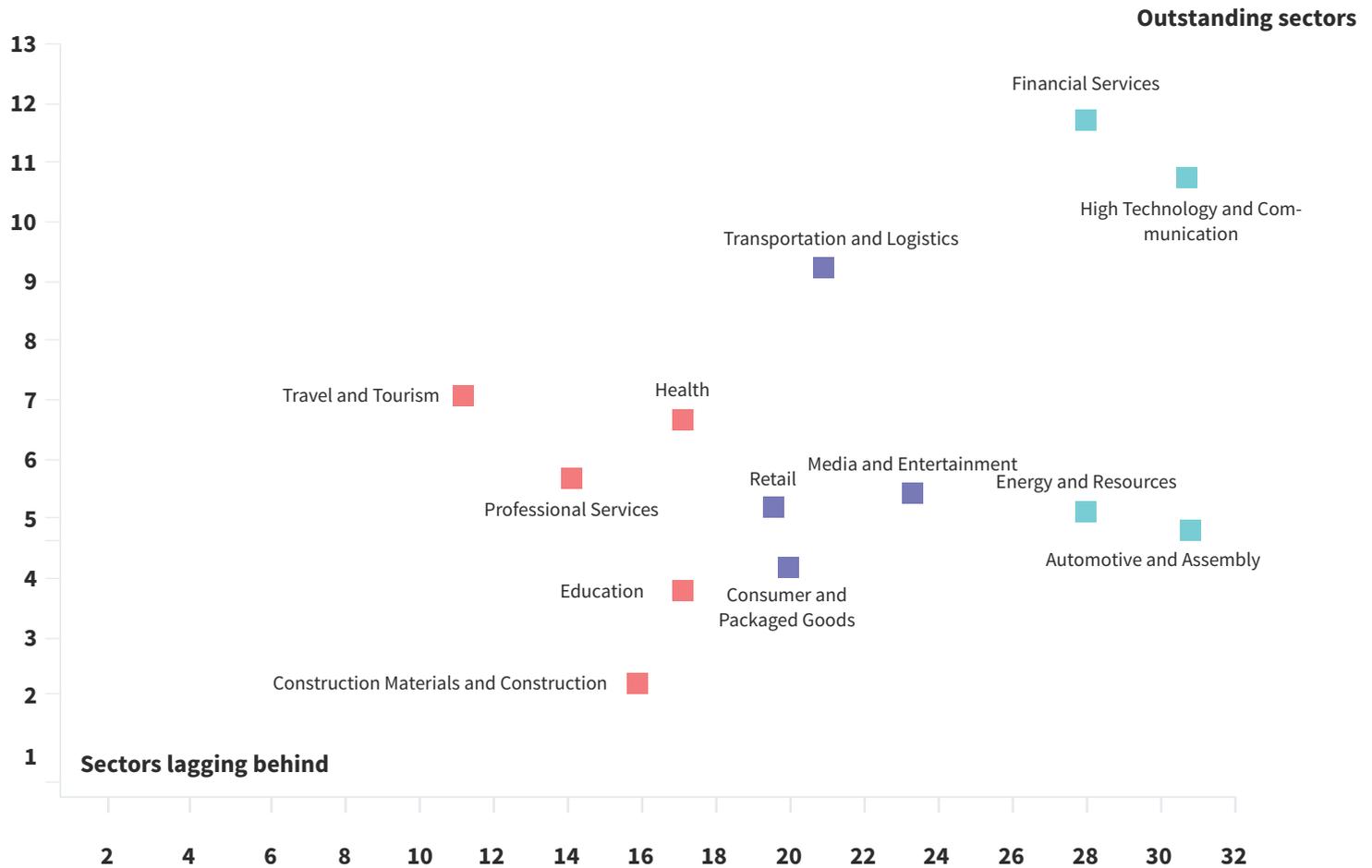
Current Artificial Intelligence adoption rate, % of companies

Source: guru99.com

Opinions on Artificial Intelligence: only 9 years left until high-level machine intelligence arrives

Probability of developing high-level machine intelligence (y-axis): 2.45, 2.50, 2.55, 2.60, 2.65

Years (x-axis): 2020, 2040, 2060, 2080, 2100

- Overall public estimate (within the confidence interval of 95%)
- The overall estimate of participants with a CS/engineering degree (within the confidence interval of 95%)
- Overall public estimate (within the confidence interval of 95%)
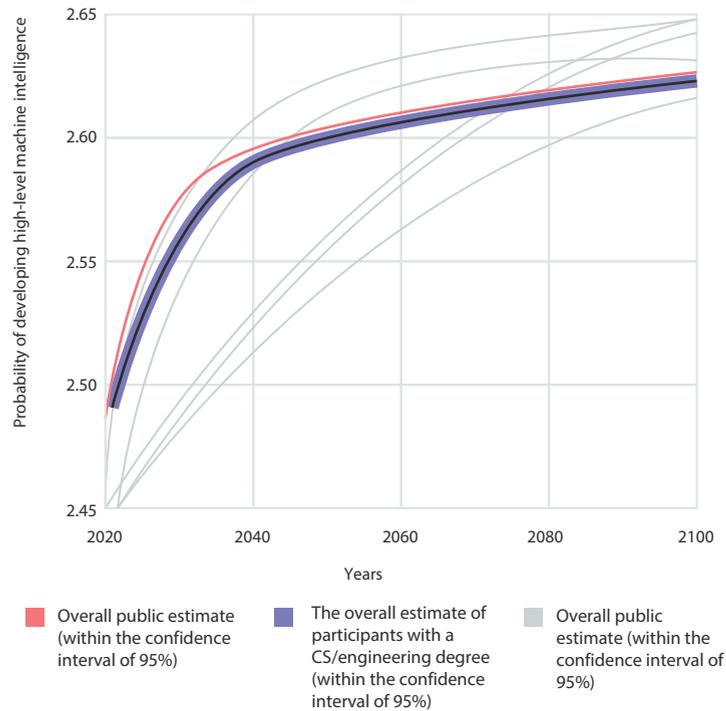
The median of the FHI survey respondents estimates that by 2028, the probability of developing high-level machine intelligence is 54%.

High-level machine intelligence is defined to consist of machines that can do almost all the economically relevant tasks at present, better than any median person (today) in any profession.

These estimates are much earlier than what was estimated by experts in the previous two surveys.

In the FHI research, participants with a CS degree provided a slightly longer period of time, but at the same time showed a significant overlap.
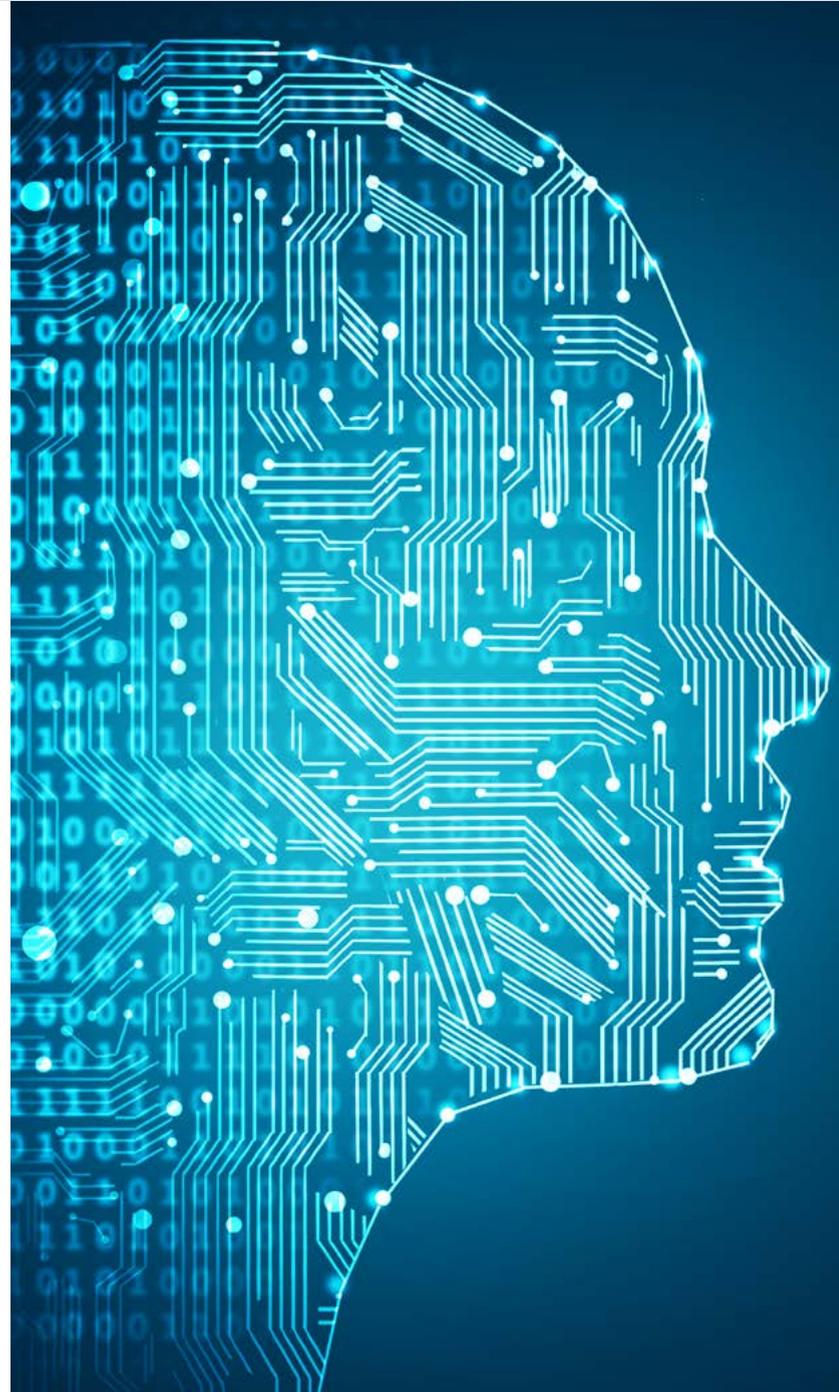
VİDORA

One of the biggest challenges associated with Machine Learning involves data wrangling - this is where data scientists spend upwards of 90% of their time. Data wrangling for machine learning problems typically encompasses a variety of tasks including preprocessing data, cleaning data, and feature engineering. Data wrangling can be thought of as processes which translates raw data into a format which can be used by a machine learning classifier. Feature engineering in particular is unique to machine learning problems and often requires a deep understanding of machine learning technology.

Reducing the time spent data wrangling is one of the most important and impactful areas in facilitating companies to launch machine learning solutions in the market. Vidora's technology helps automate data wrangling tasks and in the process enables businesses to drive more value from their data.

As an example consider behavioral data from an ecommerce company which might include behavioral activity like purchasing an item online, selecting a category of items, adding an item to a shopping cart, clicking on an email, etc. In order to leverage this raw event information for machine learning, the raw event data must first be organized and processed per user, cleaned, and finally feature engineering must be applied to create more complex features. Vidora automates many of these tasks within a simple interface thereby enabling business users to build out complex machine learning models like predicting who will purchase in the next 5 days, how much inventory will be available in the next two weeks, etc.

T. Metin Sezgin

Koç University, Associate Professor

Biography

He completed his master's degree and doctoral studies in the Artificial Intelligence Laboratory of the Massachusetts Institute of Technology on artificial intelligence applications. He completed his post-doctoral research at Cambridge University on automatic analysis of facial expressions and joined Koç University in 2009. In addition to having been a visiting fellow at Harvard University and Yale University, Dr. Sezgin was awarded the Outstanding Young Scientist Award by the Turkish Academy of Sciences. He continues his research on artificial intelligence applications, machine learning, computer vision, and intelligent human-computer interfaces, and he is also an artificial intelligence advisor for industrial projects.

Contact Information

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https://iui.ku.edu.tr/people/

Explainable Artificial Intelligence

Artificial intelligence technologies have recently become the focus of interest that we have not seen before. Not too long ago, 5 or 6 years back, the concept of artificial intelligence was a mysterious one that was associated with science fiction films and in need of an explanation. Today, successful applications of artificial intelligence in many areas ranging from voice assistants to autonomous vehicles have become a fixture of newsletters.

The increase in the awareness of artificial intelligence is based on two main reasons. As a result of the Big Data and GPU processor craze, which started about 10 years ago, the cost of accessing and processing big data decreased. Innovative machine learning methods that make good use of these advantages have demonstrated unprecedented performance improvements. For example, the most successful system's error percentage has decreased from about 30% to less than 5% in the object recognition problem, which was considered a very difficult problem in 2015. So the machines equaled the performance of people who were very successful in solving the object recognition problem and then moved the bar far beyond.

ImageNet Classification Error (Best 5)
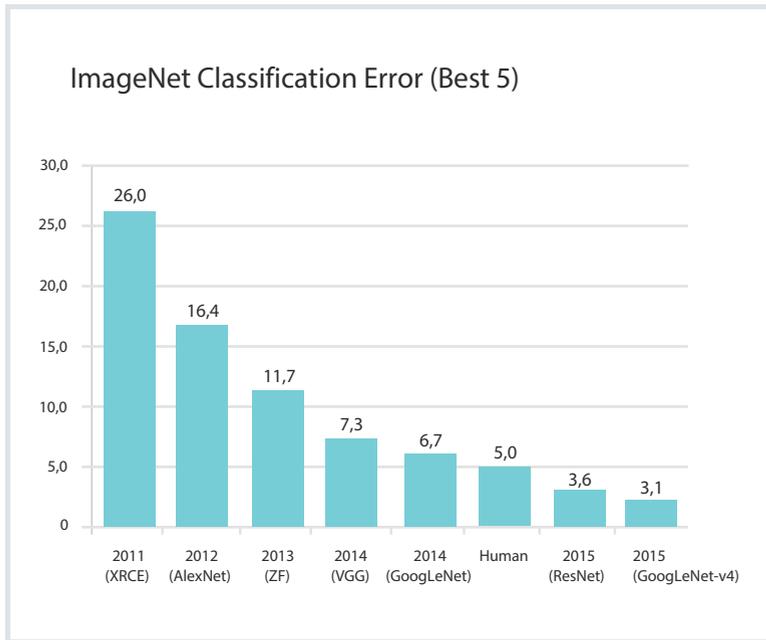
The display of best object recognition performance for the ImageNet database according to years. In 2015, the best system exhibits a performance below the human error rate.

The second factor that brought artificial intelligence to the agenda was the successful PR studies carried out by huge companies such as Facebook, Amazon, and Google who realized the potential of artificial intelligence as a result of the successes mentioned above in the academic field. These companies have already been using artificial intelligence in their products for a long time. When the brand value of the technology was understood, they started to promote their works in the field and their products with intensive media and PR support. With the awareness raised by this huge PR wave, many companies today are racing to add artificial intelligence solutions to their products and processes.

A mistake in the industry (and in academia although in a lesser amount) in this fierce competition is that machine learning algorithms are seen as magic wands that translate labeled data into intelligent models, and the resulting models are treated as black boxes making intelligent decisions. However, it carries a great risk to use complex artificial intelligence models without understanding how they work, how they reach a decision, in which situations they can make mistakes, and the weak points, as they can sometimes be a part of vital systems and trained with big data. The studies conducted under the title of "Explainable Artificial Intelligence" aim to define these risks, to take precautions against these risks and to make the smart models transparent.

Let's discuss artificial intelligence systems that assess loan requests for a bank or perform biopsy evaluations for an oncology clinic. In both cases, the system receives the data at hand and produces a simple result (rejection/approval, benign/malignant). However, although the result is simple, in both cases how it is achieved and the reasons for the decision are of great importance. The making the relevant decision being a fair process, the decision being compliant with the law and corporate policies is critical for the bank customer, and for the oncology clinic, compliance with the accepted medical criteria is critical. Therefore, artificial intelligence systems should be able to express their decisions and operations in a simple language understandable to people.

The above example covers the explainability of decisions made on an individual basis or a singular example basis. Another type of explainability involves the holistic understanding and mapping of the decision-making mechanism of an artificial intelligence model. What is intended to be achieved here is not a description of how a decision is made for a single input, but a description of how the system works as a whole, what kind of a process led to the decision on what grounds and measures.

Very few of the existing artificial intelligence systems support explainability. We shouldn't look at this feature as a useful but optional feature. This is because the European Parliament's 2016 GDPR regulations pave the way for people to demand to know the reasons for the decisions, with restrictions on automatic algorithms that make decisions that will affect people with their private data.

Explainability is one of the most interesting and most difficult issues in the field of artificial intelligence. Finally, let us address the difficulty of producing explainable systems. To understand the difficulty of this, it is necessary to appreciate the complexity of the
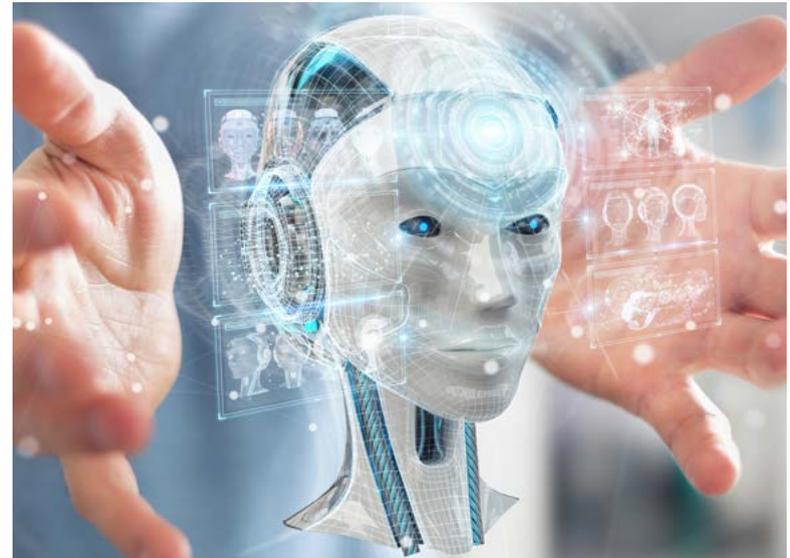
black box underlying a typical artificial intelligence system. A typical model used for detecting objects from images in autonomous vehicles includes over 100 million parameters that have been precisely tuned (learned) with training data. Recognizing objects such as pedestrians and cars in a photograph, using this model, requires more than 10 billion multiplication and collection processes. The seemingly very simple artificial intelligence black box, in fact, merges the billions of small decisions taken inside, somehow linking them to a single conclusion. Trying to summarize billions of operations in a few words or a few sentences with the simplicity that a person can understand is just one aspect of the technical difficulties of this task. How a good explanation should be, and how the concept of "explanation" should be defined from a philosophical, practical and legal point of view constitutes the aspect of this that relies on humanities and social sciences.
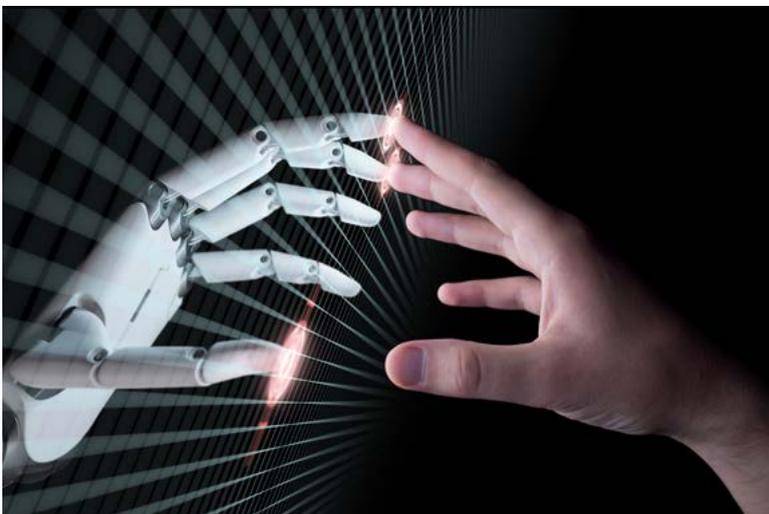
RECOGNITION TECHNOLOGIES

1. Voice Recognition

Your voice is unique due to the shape of your voice cavity and the way you move your mouth as you speak. To register in a voice recognition system, you either say the exact words or phrases the system asks for, or you provide a broad sample of your speech for the computer to be able to identify you regardless of the topic you are speaking of.

2. Face Recognition

Our faces have started to turn into a key for us to be able to access our money and devices. Contrary to fingerprints, the face being scannable from afar and humans being electronically identifiable as they are passing from in front of a camera are the distinguishing features of this technology. Face recognition systems produce a code that is unique to the person, called facial traces, by measuring the distance between points, such as the width of a person's nose. A security camera can be used to recognize faces from a certain distance. A complex system that searches for, reroutes, warps and stretches faces is used in these cameras.

3. Gesture Recognition

If you have seen movies such as "The Matrix" and "Iron Man", you must have wondered what it is like to be able to control the TV, computer and other devices at your home by just waving your hand. These science fiction dreams are rapidly turning into reality as the gesture/motion recognition technologies mature.

Image Processing Usage Scenarios

(Computer Vision)

Biometrics and
Face Recognition

Emotion
Analysis

Image Diagnosis
(diagnosis of diseases in plants and humans)

Behavioral
Monitoring

Object
Understanding

Security and
Video Tracking

The general definition of gesture recognition is the ability of a computer to understand gestures and execute commands based on these gestures. Most consumers recognize this concept from games for Wii Fit, X-box and PlayStation, such as "Just Dance "and "Kinect Sports".

4. Emotion Recognition

Emotion recognition can be used to measure abnormal concentrations of emotions such as anxiety and fear in the environment, especially in security scenarios. It also has a place in measuring customer experience and automating the satisfaction survey.

Behavioral Monitoring
Behavioral monitoring is a technology developed especially for security monitoring but it can also be used in a wide range of fields such as the shop and exit model that Amazon is utilizing or the measurement of user behavior in stores and branches, due to the object recognition feature it has.

Object Understanding
Object understanding technologies become meaningful when combined with other image processing technologies. There are also scenarios with narrower uses, such as finding out the genus of a plant.

Image Diagnosis
Machine learning algorithms can compare a medical image to that of millions of other patients, revealing the nuances that the human eye will miss. It can complete examinations that would take hours for a human to complete, within a second.

Security and Video Tracking
These solutions are generally used for security purposes in detecting and monitoring suspicious persons, combined with face and emotion recognition from the camera, however, they could also be used for finding missing people or improving customer experience by understanding customer behavior. To be used outside the context of security, data must be recorded and monitored anonymously, within the scope of personal data security.
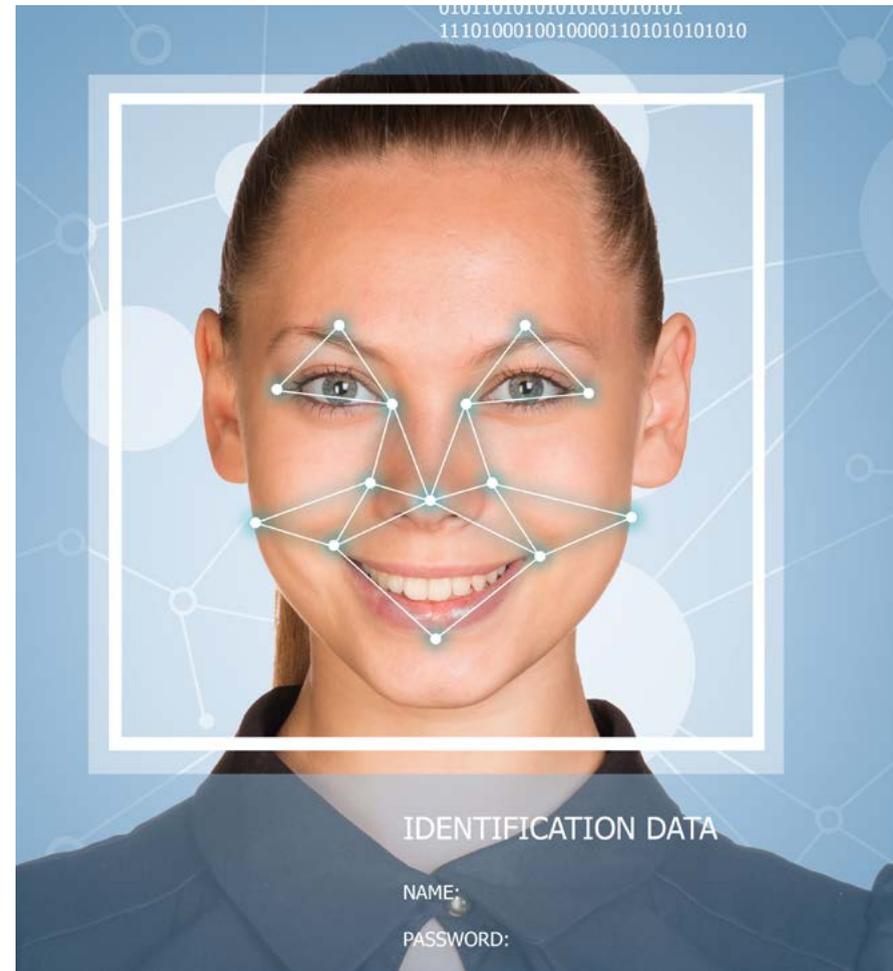
Face Recognition

Usage Areas of Face Recognition

The error rates in face recognition can be as low as 0.8 percent, but in practice, we can misidentify, for example, a murder suspect, at a rate that represents eight out of a thousand scans in practice. In a case reported to Intercept, it turned out that the security footage of a bank robber was matched through face recognition with a man named Steven Talley, who was able to prove that he was not in the bank during the robbery.

Some of the places that recognition systems are used or can be used

Airports

Railway stations

Banks and financial institutions

Stadiums

Public transportation

Public offices

Commercial institutions

Global Face Recognition Market on the Basis of Application

Internal security, having a predominant position in 2015, will continue to be in a pioneering position throughout the forecasting period.
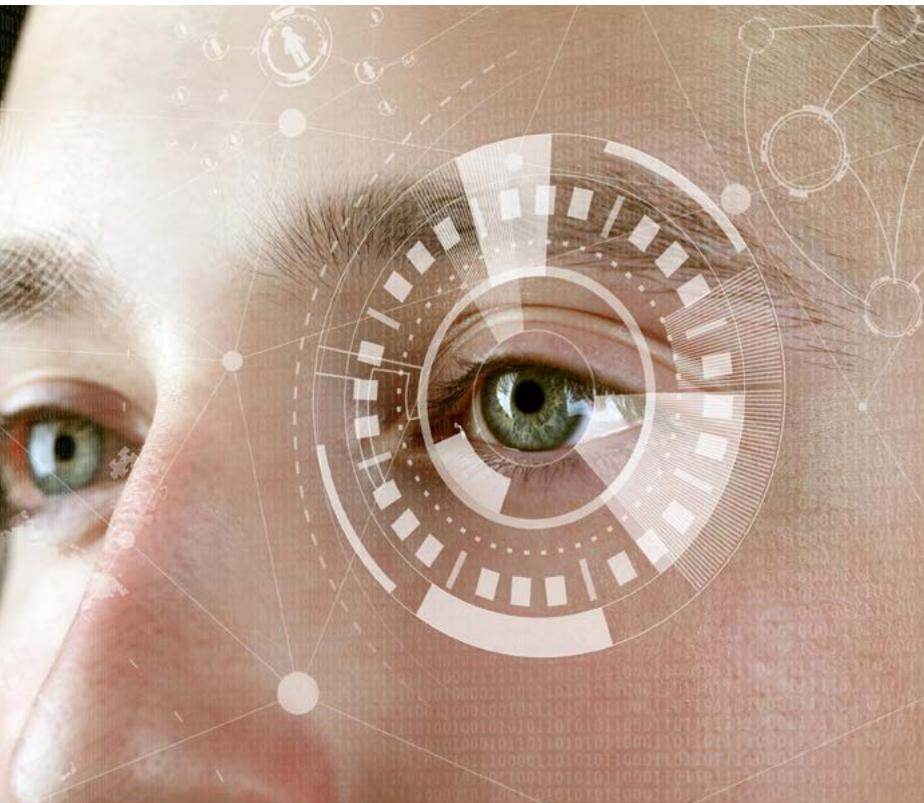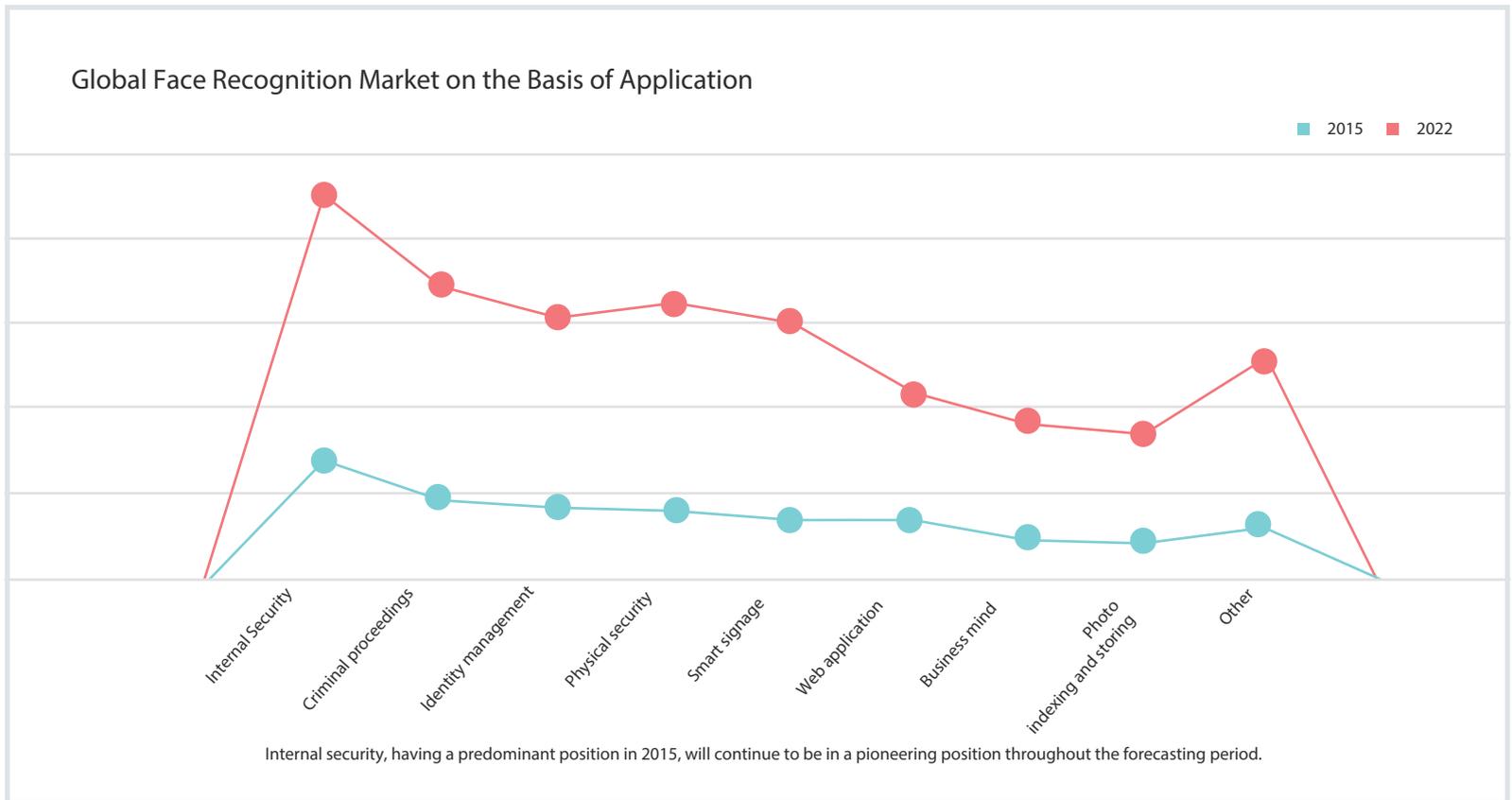
Face Recognition Market

In recent years, face recognition software has become very powerful, user-friendly and less costly. Furthermore, handheld face recognition devices provided easy access to this technology for government officers..

Global revenue by region in facial biometrics ($M)

Forecast

Middle East and Africa

Latin America

Asia Pacific

Europe

North America

| | | | | | |
|2015|16|17|18|19|20|
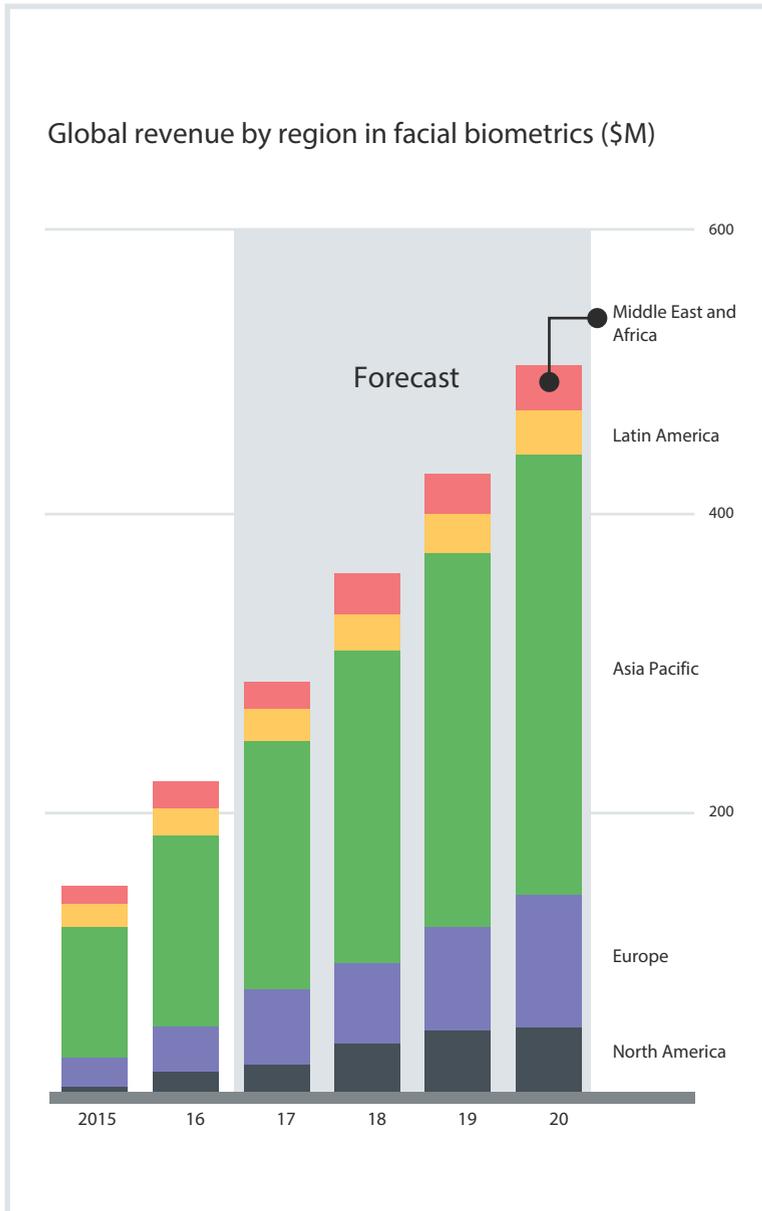
SenseTime

SenseTime is an artificial intelligence company that focuses on innovative image processing and deep learning technologies. The company works on a face recognition technology that can be used in bank card verification and security systems and can be applied to payment and picture analyses. SenseTime is currently offering its face recognition technology to more than 300 companies including China Mobile Communications Corporation, China Union-Pay, Huawei Technologies Co., Xiaomi, and JD.com.

Founded in 2014, SenseTime says its face recognition technology has an error rate of less than one in 100,000. It also provides text, vehicle and image recognition to mobile internet companies, financial services, and security companies.

At a Glance

Location
China, Beijing

Website
www.sensetime.com/

Establishment year
October 2014

Category
Artificial Intelligence,
Image Processing,
Face Recognition

Investment Received
$ 2.6 billion

Voice Recognition

Usage Areas of Voice Recognition

Some companies use voice recognition features to allow people to access their information or grant authorization without being physically present. Thus, instead of taking a step towards an iris scanner or a hand geometry reader, authorization can be made by making a phone call.

Voice Recognition Usage Scenarios

Communication Eavesdropping and Intelligence
Sound traces can be used to detect criminals, kidnappers and terrorists from phone calls. The police can detect suspects in real-time by comparing the suspect's speech with the sound traces stored in a database.

Call Center Efficiency
Call center applications, credit card application procedures, banks, and ATMs can take advantage of voice recognition. Call centers are able to use Voice ID to verify the identity of users before allowing the transfer of funds and stock information on the phone.

Feature	Fingerprint	Palm print	Retina	Iris	Face	Vein	Sound Trace
Ease of Use	High	High	Low	Medium	Medium	Medium	**High**
Accuracy	High	High	High	High	High	High	**High**
Cost	High	Very High	Very High	Very High	High	Very High	**Low**
Usage Acceptance	Medium	Medium	Medium	Medium	Medium	Medium	**High**
Remote Control Verification	Available	Available	Available	Available	Available	Available	**Yes**
Mobile Phones	Partially Available	Yes	Available	Available	Yes	Available	**Yes**

Voice ID

Another application is the use of voice recognition to solve the problem of credit card fraud. Existing systems cannot answer the following questions: "Is the person using the credit card the same person whose name is written on the front of the card?" or "Is the person who activated the credit card the true owner of the card?" With voice recognition, these questions can be answered quickly and easily.

Voice ID allows only authorized personnel to access your records and does not require the use of confidential PIN numbers - instead, users say a password for direct and secure access.

Security Vulnerability
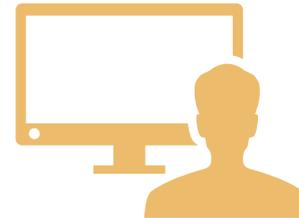
To protect **25** web accounts,
an average person uses **6.5** passwords.
Each one is shared on **3.9** websites.

password

More than two-thirds of consumers believe that it is acceptable for a trusted organization to use biometrics to verify their identity.

Some participants said that this is only acceptable if the biometric data is not accessible by the institution.

Preferred Biometric Methods

Method	Percentage
Voice Recognition	83 %
Face Scanning	70 %
Hand Geometry	57 %
Fingerprint	56 %
Eye Scanning	50 %
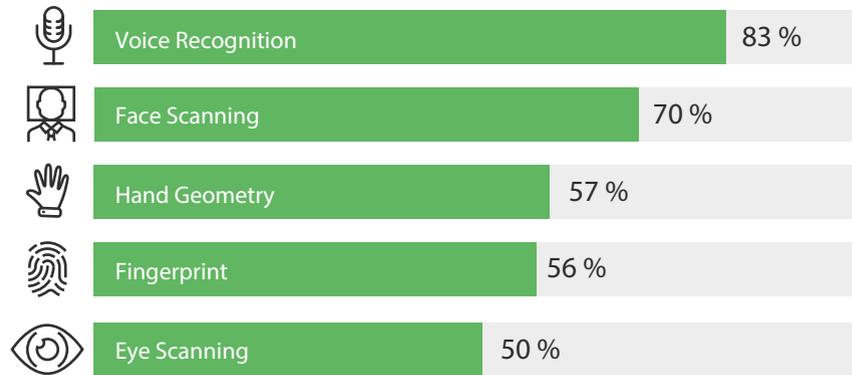
Iflytek (Keda Xunfei)

Anhui USTC iFLYTEK Science and Technology Co., Ltd. is a software company that focuses on researching smart speech and language technologies, developing software and chip products, providing speech information services, and e-government integration. USTC iFLYTEK, a major supplier of smart speech technologies, has long-term research experience in the field of smart speech technologies and has proven its worth in a variety of technologies such as speech synthesis, speech recognition and spoken language assessment.

At a Glance

Location
China

Establishment Year
1999

Investment Received
3.1 billion Chinese yuan,
~ $ 447 million

Website
www.iflytek.com

Category
Artificial Intelligence,
Speech Recognition

Gesture Recognition

Examples of Gesture Recognition

Intel

Intel prepared a Specification Booklet (White Paper) on touch-operated multi-factor authentication (MFA) to reduce the safety risks of health institutions and improve clinician productivity.

Microsoft

Microsoft has a project to explore camera-based gesture detection in surgical environments. This allows a surgeon to view and manipulate a patient's X-rays or laboratory reports while adhering to the hygiene standards.

Tobii Rex

The Swedish company Tobii Rex is creating an eye-tracking device based on infrared light beams, which allows people with disabilities to interact with the computer using their eyes..

Leap Motion

The American company Leap Motion has designed a sensor that senses hand and finger movements as input. This sensor not only allows you to control your computer but also allows you to perform hand-tracking in virtual reality.

Global Gesture Recognition Market Size and Forecast, 2015-2024 (Billion Dollars)

Compound Annual Growth Rate 16.2% (2016 - 2024)

2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
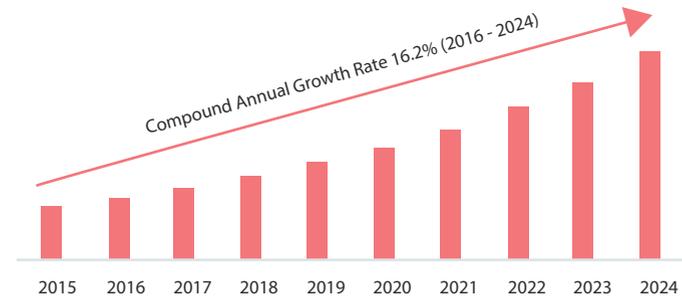
USens

Located in Silicon Valley, USens produces hardware and software that allows the user to interact with a digital interface such as a smart TV by detecting finger gestures and hand gestures.

Limix

Limix, an Italian startup, uses a gesture/motion recognition feature to record hand gestures of deaf people in sign language. It translates the gestures into words vocalized by a voice synthesizer on a smartphone.

Seeper

Seeper, a London-based startup, created a technology called Seemove that goes beyond image and gesture recognition. Seeper believes that their systems will be able to allow people to manage their personal media such as photos or files and even initiate online payments using gestures.

Gestigon

Gestigon started using 3D depth data in augmented reality for automotive industry companies such as Audi, Renault, and Volkswagen. The company also works on consumer electronics and smart home appliances, as well as on AR/VR headphones.

Automotive Gesture Recognition Market

Touch-based automotive gesture recognition industry Compound Annual Growth Rate (2018-24): **43%**

Hand/fingerprint automotive gesture recognition market share until 2024: **> $ 8.60 billion**

Sunroof application Compound Annual Growth Rate **(2018-24): >41%**
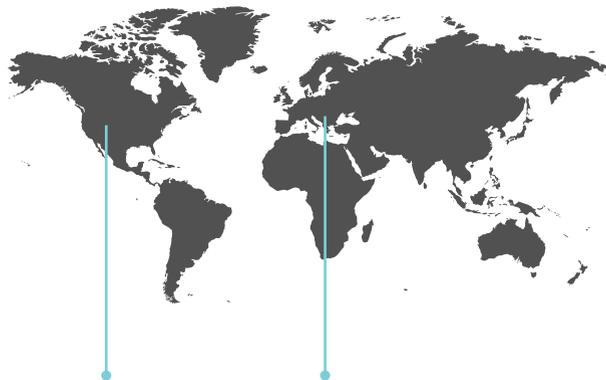
North America Compound Annual Growth Rate **(2018-24): >40%**

European Industry Market Share **>43%**

Compound Annual Growth Rate (2018-24): >42%

$ 1,142.90 million

$ 13 billion

| 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
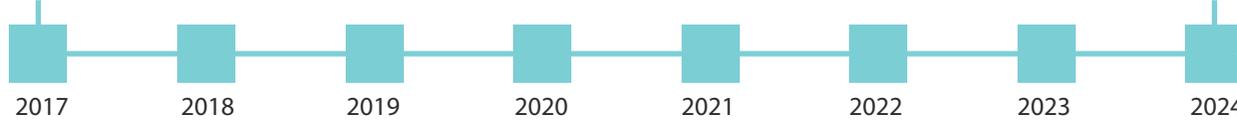
Since 2016, BMW 7 Series cars have a gesture/motion recognition feature that allows the drivers to turn the sound on or off, accept or reject a phone call, and change the angle of the multi-camera image There is even a two-finger gesture/motion feature that you can program as you like and customize it from "go home" to "let's get a pizza".

Emotion Recognition

Emotion recognition is a method for software to "examine" emotions on the human face using complex image distribution. Companies are testing what a video or image of a person's face tells us about how that person feels, with image processing applications that were developed in the last ten years and by combining advanced formulas.

Emotion recognition is also compatible with other face recognition technologies and biometric image recognition. These two types of technology can be used in many security situations. For example; authorities can use emotion recognition software to conduct further research about someone at some point in an interview or in-terrogation. Emotion detection continues to progress in the same way as other innovations, such as natural language processing, and this progression is often possible with the blending of more powerful processors, the scientific growth of complex algorithms, and the integration of other relevant technologies.

Usage Areas of Emotion Recognition in the Industry

Emotion recognition is already widely used by different companies to understand the mood of the consumer depending on products or brands. The opportunities offered by this technology are more advanced than market research and digital advertising.

Emotion recognition in health services:
If an industry uses this technology, this means it has Artificial Intelligence-assisted recognition software that helps patients decide when to use medication or help physicians determine who to see first.

Automotive industry and emotion recognition:
The automotive industry is applying emotion recognition technology because car manufacturers around the world are increasingly

Joy
30.32%

Surprise
8.24%

Attention
99,81%

Dislike
1.47%
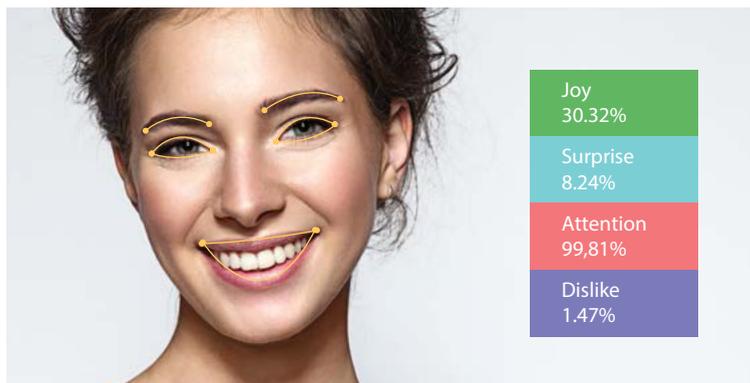
focusing on making cars more personal and safe. In their quest to build smarter automotive features, it is inevitable for car manufacturers to use Artificial Intelligence to help them understand human emotions. For example; by using the emotion detection feature, smart cars can alert the driver when the driver feels sleepy.

Emotion recognition in video game testing:
Video games are designed with a specific audience in mind and they aim to awaken a particular behavior and the users' emotions. During the testing phase, users are asked to play the game for a certain period of time and their feedback is received to obtain the final product. Using the emotion recognition feature helps to understand what emotions a user experiences in real-time during playback without manually analyzing the entire video.

Affectiva

Affectiva, part of the MIT Media Laboratory, is a pioneer in Emotion AI, the next frontier of artificial intelligence. Affectiva Emotion as a Service analyzes human emotional expressions in a simple and cost-effective way. Affectiva's mission is to bring emotional intelligence to the digital world with emotion recognition technology that senses and analyzes facial expressions and emotions. Its patented software is built on an Artificial Intelligence science platform that uses image processing, in-depth learning, and more than 4 million faces, in other words the world's largest emotion data repository, analyzed from 75 countries, reaching over 50 billion emotional data points. Affectiva is used by more than 1,400

brands to gather insight and analytics about the emotional commitment of consumers.

At a Glance

Location
USA, Boston

Website
www.affectiva.com

Establishment Year
2009

Category
Analytics
Artificial Intelligence

Investment Received
60,3 million dollars

Emotion Detection and Recognition Market

~ $ 65 billion

Market Size (billion dollars)

Compound Annual Growth Rate ~ 39%

2016   2017   2018   2019   2020   2021   2022   2023
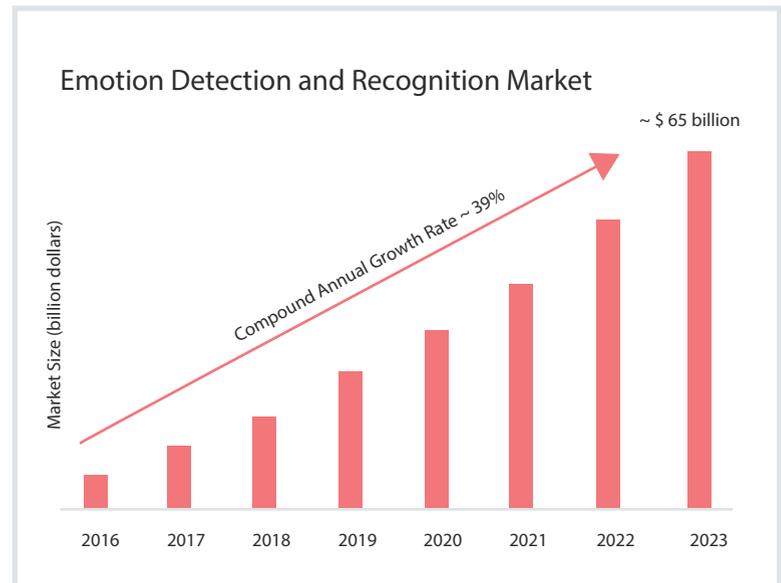
AUGMENTED REALITY
VIRTUAL REALITY
MIXED REALITY

What is Virtual Reality?

Virtual Reality (VR) is a computer technology that simulates a medium/an environment to its user. In VR, the user is placed in the world he/she wants to experience and vision, hearing and sometimes touch is used to form an interaction between the user and the system. VR usually requires **virtual reality goggles** (head-mounted display, HMD). It can also use headphones and sensors that simulate sound and movement to give the environments you want to experience a deeper and more realistic feel.

What is Augmented Reality?

Augmented reality (AR) enables us to perceive the physical environment in the real world, live and in real-time, with sensory inputs (audio, video, graphics, and GPS data) generated by the computer.

Cameras of **mobile phones** or **augmented reality glasses** (AR smart glasses) are commonly used in order to present an enriched environment to the user. 4 years ago, the application Pokemon Go made AR popular, and in this application, the user could scan the environment with the camera of his/her phone to detect Pokemon and could capture the Pokemon that he/she observed on the screen by targeting its location in the physical world.

What is Mixed Reality?

Mixed Reality (MR) combines virtual and physical environments into a single reality, covering all the features of Virtual Reality (VR) and Augmented Reality (AR) technologies with the help of wearable computers. The AR experience requires a hand-held or head-mounted device to be able to see and interact with the simulation that is to be created in the real world. However, MR provides an environment where hands can be easily used without having to be

bound to a screen, to be able to give the user a more immersive experience. This is achieved with Hololens or other mixed reality glasses. Using body movements, the user can interact with the simulation in parallel to the real world. The user can get a reaction when he/she attempts to move the virtual content he/she thinks he/she sees in the glasses, in the real world. The talks about MR have gained momentum with the launch of Microsoft's commercial product HoloLens and the introduction of the Windows Mixed Reality universe.

The Widespread Use of Applications

While the development platforms created are strengthened by investments, mobile applications continue to make it possible for these technologies to reach more users with new features in AR and VR fields.

Snapchat

Snapchat allows the users to create their own AR filters through Lens Studio Editor which was created in order to increase the usage rate and profitability of the application. All users can access these filters with the built-in Lens Explorer embedded in the application. In addition, Snapchat started to incorporate certified filter manufacturers into its structure through the **Lens Creative Partner Program** launched. With the program for creating sponsored AR filters for brands, filter creators can form contact with companies that want to advertise.

Google Maps

Google continues to carry out AR efforts in its applications delivered to the end user. One of them is the AR navigation feature, which is integrated into the walking mode in **Google Maps.** This feature directs users to the destination they want to reach, with the arrows that appear on the camera.

Google Search

Another application for which AR-related works continue to be made is the Google search application. Google now began to offer its users the 3-dimensional AR model of the object/thing they made a search for. This will allow the user to see the searched object in real life. With Google Lens, objects that are shown to the camera can be detected and the AR contents can be displayed on the object. This work by Google seems like it will increase the current use of AR technology in e-commerce.

AR SketchWalk

Morpholio, the company which set out to make life easier for designers and architects, launched a mobile device named **AR SketchWalk**. The tool comes into play mostly in the process of the sketches created by the architects at the beginning of the project

receiving approval from the client and it contributes to the negotiation process between the client and the designer as a time saver.
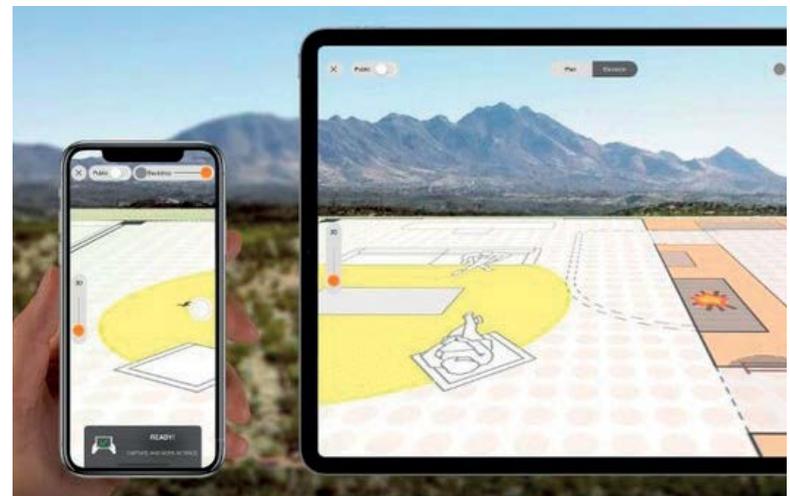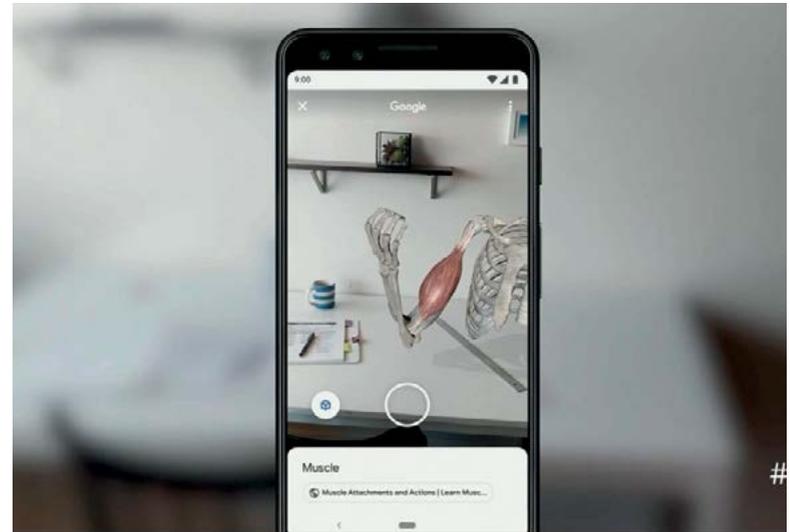
60%

Of consumers say that AR/VR usage will be widely adopted.

But this still depends on who you ask:

Which of the following uses will be the first widely accepted use for AR/VR?

- **34%**
- **64%**

Business/ Corporate Use

Consumer Use

- **70%**
- **30%**

Companies with a plan

Companies without a plan
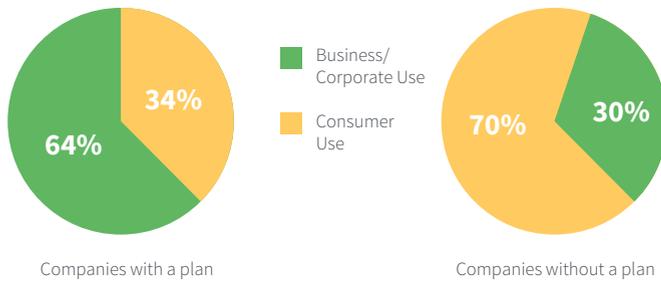
First 3 industries to be affected by AR/VR

Business Use

Medical   Manufacturing   Military

Consumer Use

Gaming   Cinema&TV   Medical

Areas and Industries of Use

One of the main reasons for the AR and VR technologies becoming widespread is the fact that wearable smart glasses and headsets aside from mobile devices gradually started to become widespread in the consumer electronics market. In parallel with that, there is a noticeable growth in the industries where these technologies will have a place. You can find the industries that these technologies will be actively used in the following 5 to 10 years under the following categories.

Online Shopping: Brands use AR for their mobile applications not only to be influential in terms of marketing and PR but also because that is a method with proven effects for

increasing sales. The biggest benefit of it from the perspective of consumers is that, before making the purchase, they can view a product with all its features in their current location and this allows them to make the right decision.

Retail: Imagine that you are walking through a virtual clothing store where you can try all the jackets, shirts or shoes on sale with endless shelf volume. At Lowe's Home Improvement store in the United States, customers can design the bathroom or kitchen they want and then walk around in the finished room using VR.

Industry 4.0 and Industry: The commercial launch of HoloLens has helped many companies implement AR applications, particularly in production plants and factories (Boeing, General Electric, Bosch). Employees, who can quickly find and learn the solutions of complex technical problems in the Augmented Reality (AR) mode during production and maintenance stages, can achieve much faster results than traditional methods thanks to that.

Training: Many companies prefer to have VR training as they see the benefits and potential of a three-dimensional experience. To prepare for the crowds on Black Friday, Walmart trains its employees using VR in customer service training programs or training programs on how to deal with emergencies in a store. Similarly, UPS uses VR in training programs such as ones that teach how to use cargo vehicles, package delivery and the basics of driver safety. Training Center of Air Conditioning and Heating in Houston offers students a VR experience in their training in ventilation and heating. Pitt Meadows Plumbing, located in Maple Ridge, British

Quote

"Technical drawings are not insignificant, but we realized that seeing a three-dimensional representation of what they want to create makes it possible for students to learn faster."

Steve Robinson, owner of Plumbing

Columbia, uses AR technology to advance its new employees in training one step further in education and in the work environment.

Does VR/AR mark the end of traditional classroom education? The answer to this question will probably be "no" because it is almost impossible to replace education that is given by a person to another person. Nevertheless, training programs using VR/AR will come up as a powerful and effective training tool that we will become even more familiar with in the future.

Gaming and Entertainment: Mobile AR games and applications are the most common area of use for this technology especially due to the widespread use of mobile devices. Many games to be released are designed according to game mechanics that incorporate an AR experience, while some games build their content on AR mode viewing.

Real Estate and Construction: VR allows real estate agents to show the location of the property and the neighborhood to their potential owners in a realistic way. AR allows architects to make digital modeling and to place life-size furniture and fixtures inside these models and check up on how they look.

Tourism Advertising: The user can have a three-dimensional experience by being moved to any place or beyond in the world with the VR headset. "Destination BC" has developed the VR experience "Wild Within" in order to promote tourism in British Columbia. The audience can travel through a rain forest or even climb a mountain.

Advertising: Brands turn to AR advertisements to attract consumer interest. A well known fast-food company placed its logo on the competing company's logo when the printed advertising of the competing company was scanned in an AR campaign, and this gathered a lot of attention. Thanks to the AR filters of Facebook, Snapchat, and Instagram, brands found a whole new method of publicity for themselves. Owing to the AR filters and lenses they publish within these platforms, they can offer AR advertising content to consumers without them having to download any applications and they are able to promote the products in a fun way.

Design: Today, many architects can model their designs using three-dimensional programs. Thanks to VR systems, designers can walk around inside these models and are able to manipulate the world created by virtual reality with gloves or similar devices in real-time. These interactive VR applications are also used by industrial designers, helping architects create more human-scale projects through direct experiences.

Event: Oculus Venue is an application that allows participation in events by making people feel all the sounds, lights, and energy in a place. Supported by the Oculus Go headset and Samsung's Gear VR platform, the app gives users the opportunity to access events happening at the moment such as concerts and sports matches from their homes.

Media: The New York Times has begun VR-assisted storytelling and often publishes new visual stories through its new NYTVR application.

Defense Industry: Military research, which has an important role in reaching the current level of AR technologies, has pioneered the integration of data obtained from satellites into AR systems. It is used for the purpose of assisting soldiers in finding directions and targets, increasing communication opportunities and training soldiers on duty.

Problems

Lack of immersive experience

Today, we have to compromise with augmented and virtual reality devices. None of the existing systems offer users a complete and immersive experience. Most systems do not have a natural and wide field of view. They suffer from screen resolution, low brightness, short battery life issues and lack 3D detection abilities.

Field of view FOV issues

The biggest problem with AR/VR devices currently on the market is about the field of view (FOV). Today, these devices should have 190 degrees horizontal and 120 degrees vertical features for normal human vision. However, FOV support is currently available up to 90 degrees. These devices need to capture the FOV as much as possible in order to create the immersive experiences they aim for.

In a survey conducted on 11 markets around the world, the participants said they would be interested in using VR to test a range of products before buying:

71% Travelling
Checking out holiday resorts or hotels

59 % Entertainment
Watching movies from an immersive perspective

58 % Retail
Try on clothes or makeup

49 % Automotive
Test driving

48 % Gaming
Becoming a certain character in a virtual game

What kind of challenges need to be overcome in terms of TECHNOLOGY for AR/VR to become mainstream?

Challenge	Percentage
Manufacturing costs	56%
Technological limitations related to AR/VR-specific devices	51%
Consumer technology limitations (smartphones, smartwatches, tablets)	47%
The form factor for integration into everyday life	40%
Mobile connection	32%
Application ecosystem	28%
Other	2%
No challenges exist for AR/VR devices	1%
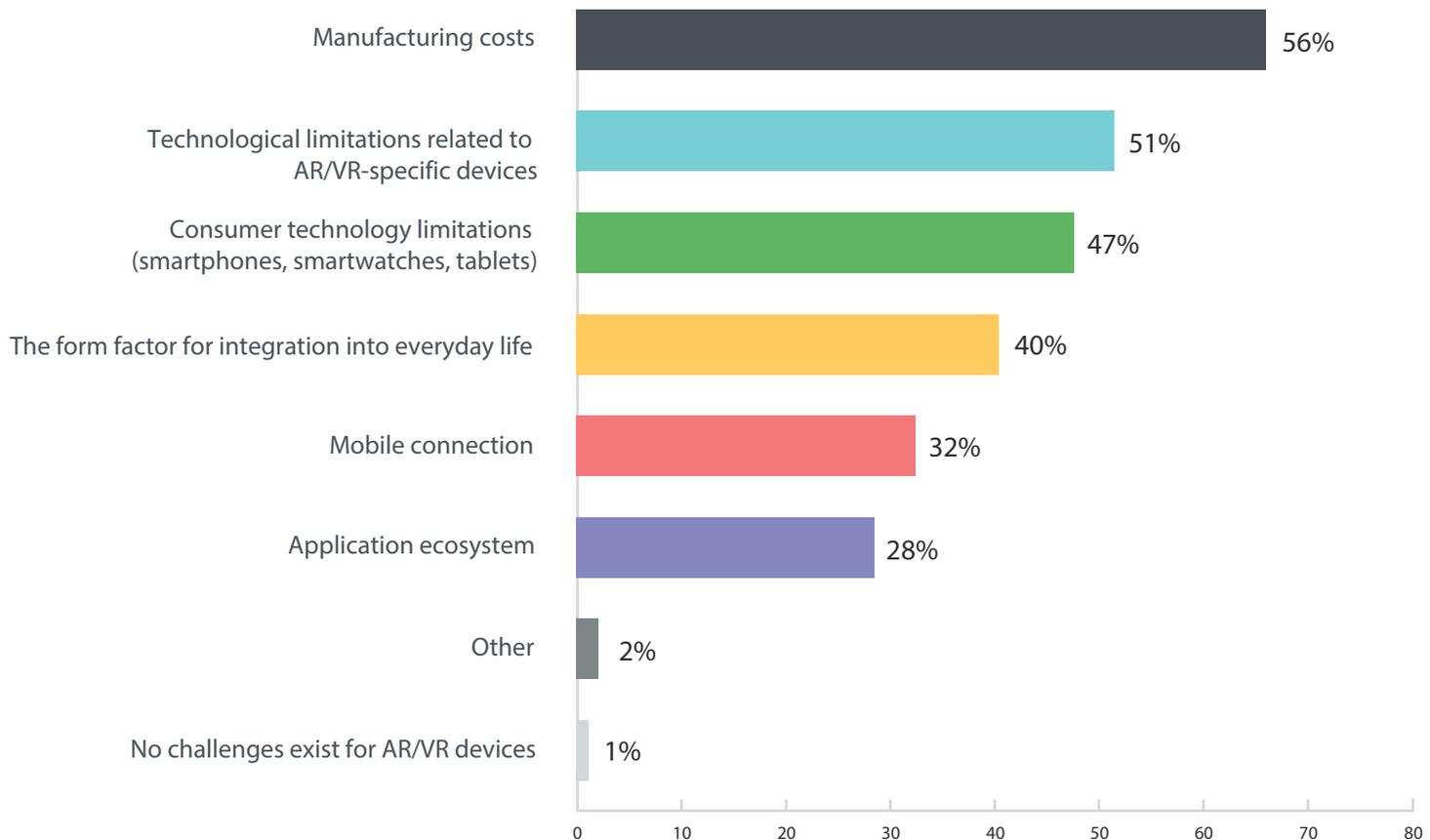
Device limitations

The dimensions of these devices in their current state make long periods of use impossible. AR/VR device limitations including weight, brightness, image quality, FOV, latency and finally the user experience need to be worked on through the ongoing research. It is predicted that these problems will be overcomed in the next 5 to 10 years.

It looks like it will take us three to five more years to experience unrestricted AR/VR applications. Also within three years, we will see new augmented reality glasses with LTE features that will be an **alternative to smartphones**.

96% **of the people say that there are challenges in terms of both content and technology**

Technological Challenges

Manufacturing costs

Technological limitations of AR/VR devices

Consumer technology limitations

Content Challenges

Cost of content creation

Hardware limitations for content creation

Insufficient software for content making

Investments and Initiatives Continue

Microsoft

With **Hololens, Microsoft** won the **$ 480 million** tender for AR glasses to be used for military purposes, which the US military initiated. It was announced that the US military would use the goggles for decision making purposes on the battlefield or in military training programs. According to this agreement, Microsoft will produce 100.000 of its Hololens in 2 years.

Magic Leap

Having participated in the tender of the American army as a rival to Hololens and lost the tender, **Magic Leap** showed how much it wanted to have a say in this field once again. After acquiring the Belgium based startup Mimesys, which develops hologram software, Magic Leap is now focused on teleconferences. With the Magic Leap One MR glasses, the company makes it possible for the users absent from the meeting to participate in it more effectively.

DigiLens

California based **DigiLens**, producing AR displays, ended the Series C funding round with **$ 50 million**. Prior to this, Niantic received investments of a total of $ 22 million from Foxconn, Sony and Panasonic in 2017 and the company increased its total funding to $ 85 million with the investment from Samsung. DigiLens, wanting to be active in the automotive manufacturing market, will produce displays for corporate companies, automotive manufacturers and military use with these investments.

Phiar

Based in Silicon Valley, AR navigation app Phiar received an investment of $ 3 million in 2018. The founders of the company are Dr. Chen-Ping Yu, previously a postdoctoral fellow at Harvard University, and deep learning expert Ivy Li, and they have designed the application on Artificial Intelligence and Deep Learning. The company brings Microsoft, Apple, Shutterstock and VMWare software together in software optimization, deep learning, 3D reconstruction and AR design. Different from GPS applications, Phiar enhances the driver's real-world environment in a traceable way.

Advancements in Platform Developments

The most important contribution in the development process of AR and VR are made by "development platforms" and "investments" in these areas. Especially since 2017, as Apple and Google have offered AR software technology infrastructure and developer packages, the previously problematic Augmented Reality development processes have suddenly become very easy for many mobile application developers. The SLAM, or Simultaneous Mapping and Localization, algorithms used caused the objects to be displayed as AR in the applications to be set smoothly on real grounds and the AR image to not be distorted even when the user changed the direction of the camera.

Amazon

Amazon announced the **Sumerian plat-form** in 2017 and launched it for all developers to use in 2018. The most important feature of this platform is that it allows its users to develop AR, VR and MR applications without graphics and programming knowledge. Sumerian, offering this to its users with its web-based editor, also enables the creation of rich, natural interactions supported by AWS services such as Amazon Lex, Polly, AWS Lambda, AWS IoT and Amazon DynamoDB. Supporting platforms such as WebGL, WebVR, iOS, Android, Oculus Rift and HTC Vive, and augmented/virtual reality glasses, Amazon Sumerian can work in an integrated way with Amazon Lex for the language and artificial intelligence uses.
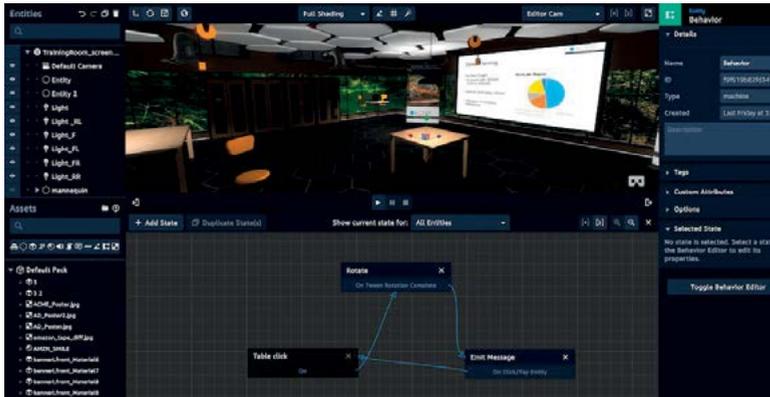
Unity

This year, Unity released the iOS framework and the Android AAR file to be used in native iOS and Android applications to increase its AR market share. Thus, mobile developers have become able to use Unity components with this library that they can add to their applications. The library is currently only able to be used with the full-screen rendering feature.

Google

Google launched its new Augmented Faces API for use with **ARCore 1.7** that it released this year. With the new API, developers can add 3D effects to users' faces with the possibility of modeling up to 468 dots.

Apple

This year, at WWDC, **Apple** announced **ARKit 3** which has new features. The People Occlusion feature included in the kit offers the opportunity to add virtual objects in real time in front of and behind people. With another feature, Motion Capture, movements of people can now be included in the application. The RealityKit feature that comes with ARKit 3 makes it possible for realistic models to be presented and stands out with its environment reflection feature. This feature also supports extra noise and blur effects. With Multiple Face Tracking, it can capture expressions up to 3 faces at the same time using front and rear cameras.anılarak 3 adet yüze kadar ifadeyi aynı anda yakalayabilmektedir.

Where Are the Glasses Heading to?

The potential in this industry has become even more evident from the fact that 271 of the 800 exhibitions held at the Consumer Electronics Show in Las Vegas in 2017 being related to the VR/AR industry. Along with companies such as Google, Facebook, Samsung, and Sony, which offer headsets, applications, and gaming consoles, the computer gaming industry is still a large part of these industries. Oculus Rift, one of the oldest leaders in VR technology, was purchased by Facebook in 2014 for $ 2 billion. Samsung has sold more than 5 million of its Gear VR mobile headsets to date, and the industry insiders predict that the VR headset market volume will reach 52 million by 2020.

Hololens 2

Microsoft launched **Hololens 2** at the Mobile World Congress that was held this year. Thanks to the microelectromechanical system (MEMS), the new glasses are powered by the Qualcomm Snapdragon 850 Calculation Platform, offering a resolution of 2K per eye and 47 pixels per viewing angle. The biggest difference of this platform from the smartphone processors is that it includes an external Holographic Processing Unit (HPU). Featuring a 5-channel microphone input, the mixed reality set is able to offer

an auditory three-dimensional space thanks to the built-in spatial audio hardware. The ToF sensor with artificial intelligence support allows users to interact with the hologram contents using their hands. However, users can also interact with the content through eye-tracking and voice commands if they wish.

Oculus Quest

Facebook launched its new wireless headset **Oculus Quest** this year, offering a virtual reality experience that is on par with PC levels in terms of quality. With 6DOF or 6 degrees of freedom tracking technology, the user is allowed to be able to move freely in virtual reality. Oculus Guardian technology, on the other hand, is used to define the boundaries of the virtual world and in object detection. The goggles, which do not use any sensors on the outside, benefit from Insight technology. The 4 wide-angle sensors integrated into the interior monitors the user and controllers using visual intelligence algorithms. It instantly reflects this data to the digital world and shows the user where he/she is.

Google Glass

Google has commercially released Google Glass Enterprise Edition 2, a device supported by the Qualcomm Snapdragon XR1 platform. The glasses have a new artificial intelligence engine and a multi-core processor. Google announced that it has partnered with Smith Optics to build safety frames that are compatible with Glass for demanding work environments such as manufacturing plants and maintenance facilities. Designed for business use, the device is used by companies such as H.B. Fuller, Sutter Health, Deutsche Post DHL Group and AGCO in the logistics, manufacturing and field services industries.

Apple

Apple is expected to release the AR glasses it is working on in the first quarter of 2021. The glasses are expected to receive location and display information via iPhone, and they will be wireless, same as the working logic of Apple Watch.

Top 5 forecasts for VR/AR start-ups (2019-2024)

69% of the people expect AR/VR to become mainstream in the next five years

Currently mainstream	1-3 years	4-5 years	6-10 years	More than 10 years	Never
6%	29%	34%	22%	8%	1%
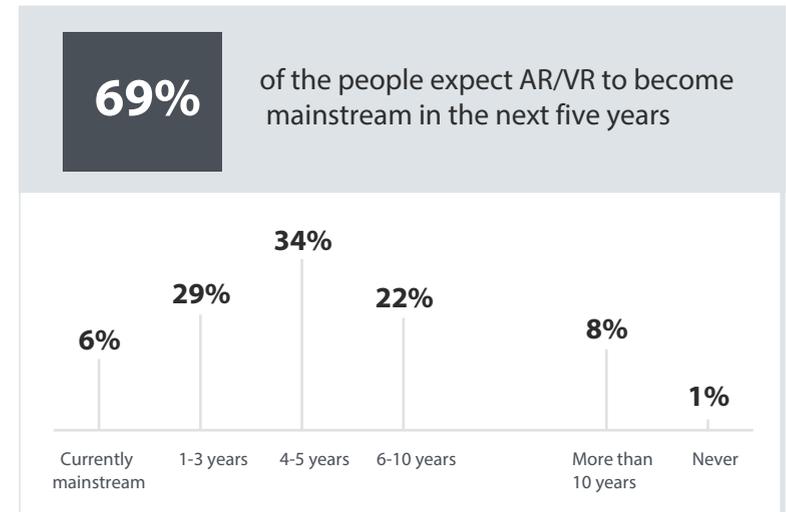
1- The switch from PC-based devices to standalone mobile VR devices

VR devices often used PC connections with cables and bulky hardware that limited a user's range of motion. However, we are about to witness the rapid rise of an independent and highly dynamic VR experience economy. New devices either require only mobile applications or can connect directly to WiFi. Freeing headphones from heavy hardware limitations will cause VR and AR to be continuously interactive and portable, regardless of the time and place.

2- AR displays with wide field of view

Microsoft's HoloLens 2 pioneered the AR industry in terms of headphone comfort and display quality. The most important problem with its previous versions was the limited rectangular field of view. The device, creating a microelectromechanical system (MEMS) display with laser technology, placed the waveguides, guided by mirrors, in front of the users' eyes. New devices that expand the field of vision will also thoroughly expand the usage field of this technology.

3- Mapping of the real world to activate the persistent AR "Mirror World"

The concept of Mirror World is known as the digital reflection of the real world. This can be explained as the virtualization of the whole environment of the real world with MR. Pokémon Go as an application served as an introduction means, combining the concept of the mirror world with real actions of people. In the next five years, with the rapid increase in the scanning accuracy of devices, a more detailed Mirror World model is expected to form. This will lead to new applications getting involved in our lives that will provide users with a virtual copy of the world. To sum it up, we will be able to get away from our normal lives and experience new things awaiting us in this mirror world.

4- 5G mobile devices will lower delays to imperceivable levels

The existing network infrastructure leads to a delay in data transfer, which leads to lowered realism in two users' face-to-face conversation experience with the device. In short, the AR and VR devices require a network infrastructure that can work without interruptions. Verizon started to use the 5G technology that will make this happen, in Chicago and Minneapolis with Moto Z3. Thus, the growing network and mobile devices with 5G support will increase the quality of the real-time connection and affect the communication methods of tomorrow.

5- Improvement of eye tracking and facial expressions for a fully natural communication

In order to improve human communication through AR and VR, it is necessary to reflect eye movements and micro-expressions very well. To better reflect the user's emotions and wishes, companies such as Pupil Labs and Tobii have integrated eye-tracking hardware plug-ins and softwares into their VR / AR headphones. These kinds of software can focus on the people's facial expressions alone, by reducing the peripheral environment resolution. By combining VR/AR devices and AI (Artificial Intelligence) software, Affectiva has transcended physical boundaries and even language barriers between any two individuals and has succeeded in creating meaningful interactions.

Onur Koç

Microsoft Turkey, CTO and Author

Biography

He worked at Microsoft for 19 years, in 5 different positions across 3 continents. Prior to his time in Turkey, he worked as a product development director for the HPC, Azure, and Xbox One teams at Microsoft's Seattle headquarters. He has been actively managing projects on Artificial Intelligence for more than 10 years. He is the author of the book "Artificial Intelligence for a Better World", all of the revenue of which was donated to Darüşşafaka.

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How Do Artificial Intelligence and Mixed Reality Change Industries?

Examples from Turkey

Artificial intelligence and mixed reality technologies are beginning to be a part of our lives. We feel their effects not only in our private lives but also in our business lives and the society we live in. Now, if you please, let us elaborate on some of the topics of how we can produce domestic solutions that we can sell to the world by using these technologies, which industries can be examples for our country and how we can create the necessary labor force.

Truly Domestic Software Solutions

It is important to create solutions that we can sell to the world that are developed by Turkish engineers, having originated in Turkey. It is very difficult to consider a solution truly domestic if we cannot sell it outside of the country. When developing horizontal and vertical solutions using new technologies, we must think globally and think about the opportunities in the market on a global scale. We should prioritize Turkish companies that are likely to sell their solutions abroad, both in the private sectors and public support. In this sense, cloud platforms are a channel for domestic solutions to reach the world. Let's not forget that the business centers of the future are being built on cloud systems.

3 Fundamental Axes of Artificial Intelligence Based Innovationi

1. Axis Data: The raw material of artificial intelligence and mixed reality solutions is data. The raw material analogy is correct, because data, like other raw materials, gain enormous value when processed. The raw materials of the agricultural age were fields and seeds. The raw materials of the first industrial age were iron and steel. Today, the raw material of our world, where every company, every experience is digital, is data.

2. Axis Cloud: Cloud computing platforms have removed important obstacles to the development of artificial intelligence technologies. Every company and every developer now has the ability to store unlimited amounts of data, process data and deliver solutions to the entire world thanks to cloud technologies.

3. Axis Intelligence: Through machine learning, deep neural networks and its cognitive services it is possible to create smart applications that analyze different data types (text, image, video, sensor… etc.) through algorithms to learn, make forecasts and communicate and offer brand new experiences..

Solutions from Turkey and Example Sectors

Health: Health is a field where a lot of investments are made in our country and where data is produced in an incredible amount in the world. Thanks to artificial intelligence-based health solutions, hospitals or even the toothbrushes, blood pressure monitors, devices that measure insulin levels that diabetic patients use, taps and toilets we use at home have turned into smart things. Artificial intelligence and mixed reality technologies are transforming medical education as well. What students of medicine need the most and lack the most is case experience. What should be done in different situations, when receiving complaints from patients, and what kind of questions should they ask? What should be the right chain of decision? A Turkish startup (Founder: Mürsel Haspolat, a pediatric surgeon) that I know well in this field wants to transform medical education. Imagine a medical student, who can experience different scenarios in the mixed reality environment, with the help of artificial intelligence. In each scenario, how should he/she examine the patient's condition, what kind of questions should he/she ask, what tests should be requested for the patient, how should he/she interpret those tests and make the correct diagnosis? The student can experience the results of each scenario in a simulation and increase his/her actual case information. Mürsel's aim is to save lives.

Manufacturing: The manufacturing sector is one of the sectors that we need to place importance on the most. Not only the factories but also the products produced by factories are becoming smart nowadays. We started to see this change in manufacturing companies we have worked with closely in Turkey. Products such as smart trucks, smart wind turbines, smart home appliances now have dozens or hundreds of sensors. Engineers continuously analyze the raw material/data from these sensors, analyze the produc-

tion, consumption, and performance of the truck or wind turbine, can detect potential problems beforehand, ensure the communication of the home appliances with each other, and so on. In this way, manufacturing companies are transforming into companies that sell not only their products but also value-added services.

Agriculture and Husbandry: It is very important for us to be a self-sufficient country and agriculture has changed a lot in the last 100 years. In the near future drones will cultivate and manage the fields that used to be cultivated by ploughs pulled by a horse or ox. It will be possible to make healthier and more efficient production happen with artificial intelligence and mixed reality technologies. Smart self-driving tractors and harvesters will know when and how to handle hectares of fields. Smart irrigation systems will carry out watering according to the weather and the needs of the soil and the crop. The product collection tools will automatically collect and pack products that have reached the correct ripeness level. Sensors and artificial intelligence-based solutions were introduced in animal husbandry as well. How much did an animal walk around, is it sick, was it stolen? All of this can be understood from the activity of animals. We can end world hunger soon.

Finance: Finance, like the health sector, is a sector where an incredible amount of data is created. From shopping to transportation, to the times we go to the restaurant and have a meal, the times we get gifts for our loved ones... Behind all these activities is a financial institution. Even now, credit card risk analyses and investment portfolio simulations are performed using artificial intelligence technologies. Banks that have a lot of data about their customers can offer customized personal finance packages to their customers, knowing that you change vehicles every 4-5 years, before you start researching for a new vehicle, they prepare special, attractive payment opportunities, knowing that it is time for

your child to start going to school, they can guess which schools you could send your child to in advance and they suggest customized education loans Turkish financial technology companies, such as Softtech and Intertech, which sell their solutions to the world, are very important in this respect.

Note: Of course there are many other industries that I can give examples of solutions to, but I limit this to 4 industries for this article.

Skilled and Creative Workforce

The sample solutions from some sectors that I have presented above are not only created by technologists. In the creation of these sector-specific solutions, we will need to bring the people with deep industrial knowledge and technologists together. On the other hand, since the raw material of Artificial Intelligence and Mixed reality solutions is data, we need generations that are skilled at data-based research and decision-making. During the time our children and young ones spend from elementary school to university, then to business life, we must instill in them the ability to understand data, solve problems with data, and make decisions.

Source
"Artificial Intelligence for a Better World", Author: Onur Koç. You can use this book as a resource for more detailed project examples from different sectors, also for matters such as ethics, features that distinguish people from programs, quantum computing and artificial intelligence that I haven't been able to mention in this article.

Note: We donate all of the royalties to Darüşşafaka.

5G AND THE INTERNET OF THINGS

The fifth-generation mobile technology promises high speed, very low latency and the capacity to carry multiple connections at the same time. With the approaching arrival of 5G, the excitement for its use in both industry and everyday life is increasing.

The fifth-generation mobile technology promises high speed, very low latency and the capacity to carry multiple connections at the same time. With the approaching arrival of 5G, the excitement for its use in both industry and everyday life is increasing.

With a wide range of innovative features, your smartphone will now begin to offer a closer experience to a laptop computer. Thanks to the Ultra-Broadband Internet connection, a much more realistic virtual reality experience, games, wider multimedia options, ubiquitous connectivity, zero latency, faster response time and higher quality sound become possible. In addition, HD video and audio can be transferred to other mobile phones without compromising quality.

Definitions

5G: The fifth-generation mobile network that follows 4G which is the fastest connection currently available. It is sometimes called "5th generation mobile networks" or "5th generation wireless systems".

Gbps: Displays the number of "Gigabits per second". It is a unit of measurement of data rate. 5G allows data transfer at multiple gigabits per second.

GHz: It means "gigahertz". It is based on the intense GHz frequencies of 5G.

GSMA: It is the abbreviation for "Groupe Speciale Mobile Association". GSMA speaks for the interests of mobile operators worldwide and brings together more than 250 companies and about 800 operators in the wider mobile ecosystem

IoT: It means "Internet of things" and refers to connected devices other than smartphones and computers.These devices help to connect many "things" such as lights, roads, cars.

Standards for 5G were not fully defined until the 2019 GSMA Conference, but progress was made rapidly after the consortia were formed and standards were agreed upon. The low-band and mid-band 5G, which are mainly focused on the spectrum below 6 gigahertz, and the high-band 5G in the spectrum above 6 gigahertz, will provide high speed and low latency with high energy efficiency, especially in millimeter-wave bands. In addition, these spectra will be used to strengthen and develop existing LTE networks instead of replacing them.

100 times more devices	Technological Features of 5G	Near zero latency
Faster response time		Speed up to 10 Gbit
Very high capacity		Wide range of applications
More software options to upgrade		Connection anywhere
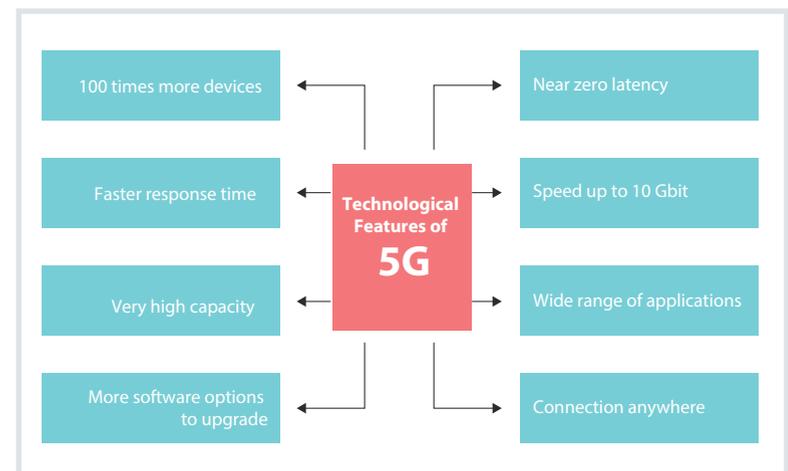
Areas of Use and Challenges of 5G

Enhanced Mobile Broadband
Higher speed, lower latency and higher capacity, high-capacity communication on the move, ultra-high-definition video, virtual reality and other advanced applications will be possible with 5G. However, wireless data prices are declining, and growth of demand can be met by other means (e.g., extending LTE networks and Wi-Fi offload-ing) instead of 5G. Another obstacle is that the fixed and stable connection is severely limiting for high-band 5G due to propagation losses at high frequencies.

Internet of Things
With the explosive growth in the number of connected devices, existing networks are struggling to keep up. The emergence of 5G will provide more connections at a time (up to one million per square kilometer) with very low power, revealing the potential of the Internet of Things (IoT). 5G has to compete against other technologies such as Wi-Fi and Zigbee.

Task Critical Control
As connected devices become increasingly centralized in applications requiring absolute reliability (e.g. medical devices and vehicle safety systems), latency times come to the forefront as an important factor. Since 5G has the potential to provide significantly lower latency (up to about one millisecond), it will be used in health care, public services and other time-critical jobs. However, just like IoT, existing systems are also showing improvements in this matter

Fixed Wireless Access
Fixed wireless access (FWA) has been used for years mainly in areas where there is no suitable wired broadband. 5G is capable of delivering speeds of more than 100 Mbps to the home, especially in the millimeter-wave spectrum, and is becoming a suitable alternative for wired broadband in many markets, especially in places without fiber.
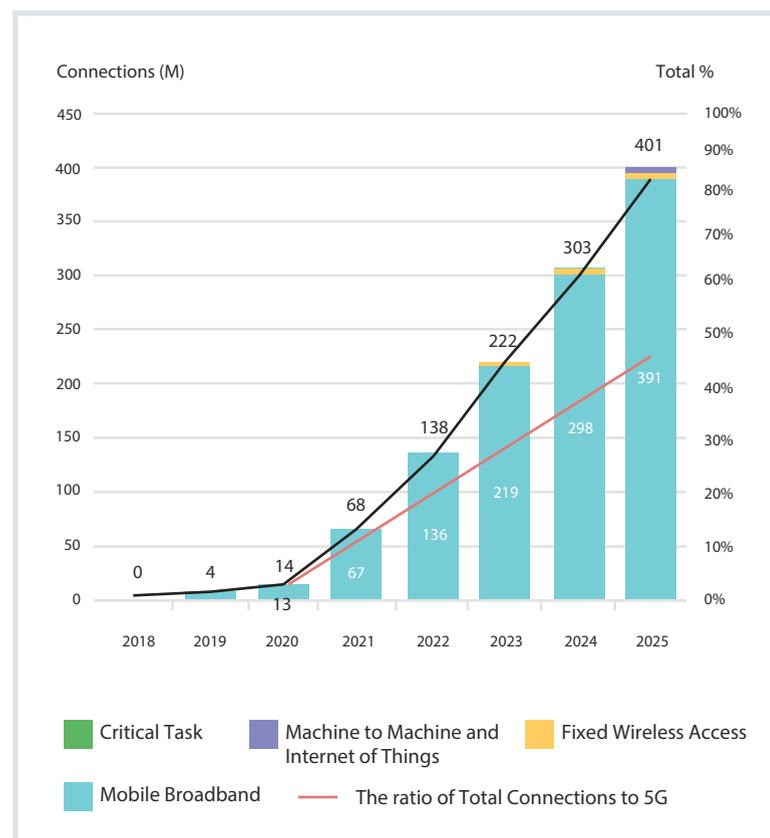
5G Growth Projection

> By the end of 2024, enhanced mobile broadband is expected to have 1.9 billion 5G subscriptions. This amount will constitute more than 20 percent of all mobile subscriptions at that time. LTE subscriptions will reach their peak with approximately 5.3 billion subscriptions and are expected to decline slowly afterward.

> In 2024, 5G networks will carry 35 percent of mobile data traffic globally.

> It is predicted that 5G will be able to cover 65 percent of the world's population in 2024.

> NB-IoT and Cat-M technologies will account for nearly 45 percent of cellular IoT connections in 2024.

> By the end of 2024, approximately 35 percent of cellular IoT connections will be broadband IoT, the majority of which will be 4G based. However, 5G connections will be available for more advanced use cases.

> Despite challenging 5G timelines, device suppliers are expected to be ready throughout 2019 on different devices with different band and architecture support.

> Chipsets for spectrum sharing are currently being developed and are expected to be available in 5G commercial devices by the end of 2019.

> VoLTE will be the foundation for activating voice and communication services on 5G devices. Subscriptions are expected to reach 2.1 billion by the end of 2019 and are expected to reach 5.9 billion by the end of 2024.

Global mobile data traffic (EB per month)

Ericsson Mobility Report June 2019

Worldwide Smartphone Forecast According to Production - 2019 1st Quarter
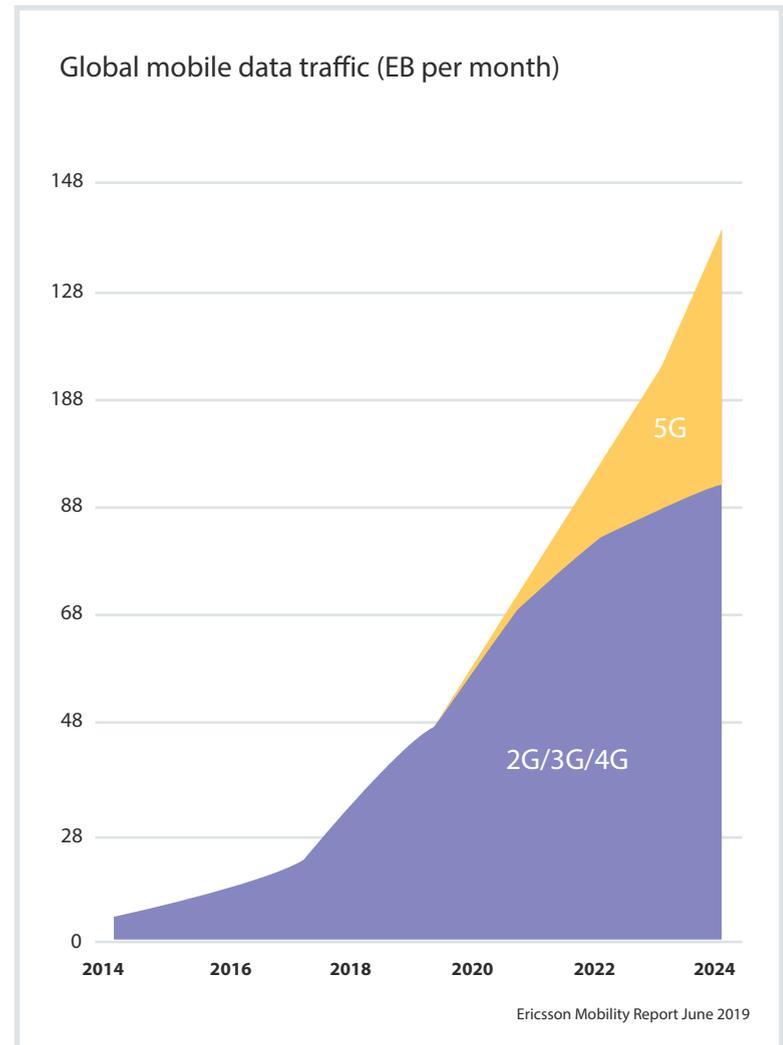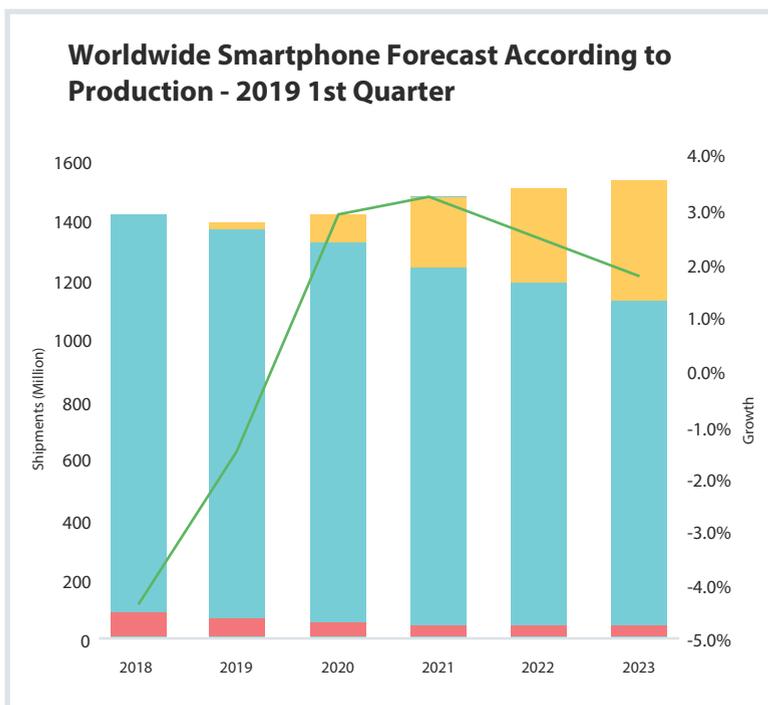
Regional 5G Projections

> In North America, service providers have launched commercial 5G services for both fixed wireless access and mobile devices. By the end of 2024, approximately 270 million 5G subscriptions are expected in the region, accounting for more than 60 percent of mobile subscriptions.

> The acceleration for 5G in Western Europe was highlighted by the first commercial launch in April. By the end of 2024, 5G is expected to account for about 40 percent of mobile subscriptions.

> The first 5G subscription in Central and Eastern Europe is expected to happen in 2019 and is predicted to account for 15 percent of subscriptions in 2024.

> It is estimated that 5G subscription penetration in North-East Asia will reach 47 percent by the end of 2024.

> In India, 5G subscriptions are expected to be available in 2022 and are expected to account for 6 percent of mobile subscriptions by the end of 2024.

> In the Middle East and North Africa, commercial 5G deployments via leading communication service providers in 2019 and significant volumes in 2021 are predicted. At the end of 2024, approximately 60 million 5G subscriptions are expected, representing 3 percent of total mobile subscriptions.

> In the first half of 2019, the first 5G commercial devices are expected to be installed in Southeast Asia and Oceania region. By the end of 2024, it is estimated that approximately 12 percent of subscriptions in the region will be used for 5G.

> In Latin America, the first 5G deployments at 3.5GHz will be possible in 2019. In Argentina, Brazil, Chile, Colombia and Mexico, the number of subscribers is expected to be higher than the number of subscribers in the countries of the region using 5G for the first time. By the end of 2024, 5G mobile subscriptions in this region are expected to account for 7 percent of the total.

Global 5G Adaptation

Estimated 5G smartphone subscriptions by region

Legend:
- Asia-Pacific
- Europe
- Latin America
- North America
- Central Asia and Africa

Chart values by year:
- 2019: 11M
- 2020: 72M
- 2021: 220M
- 2022: 627M
- 2023: 1,220M
- 2024: 1,793M
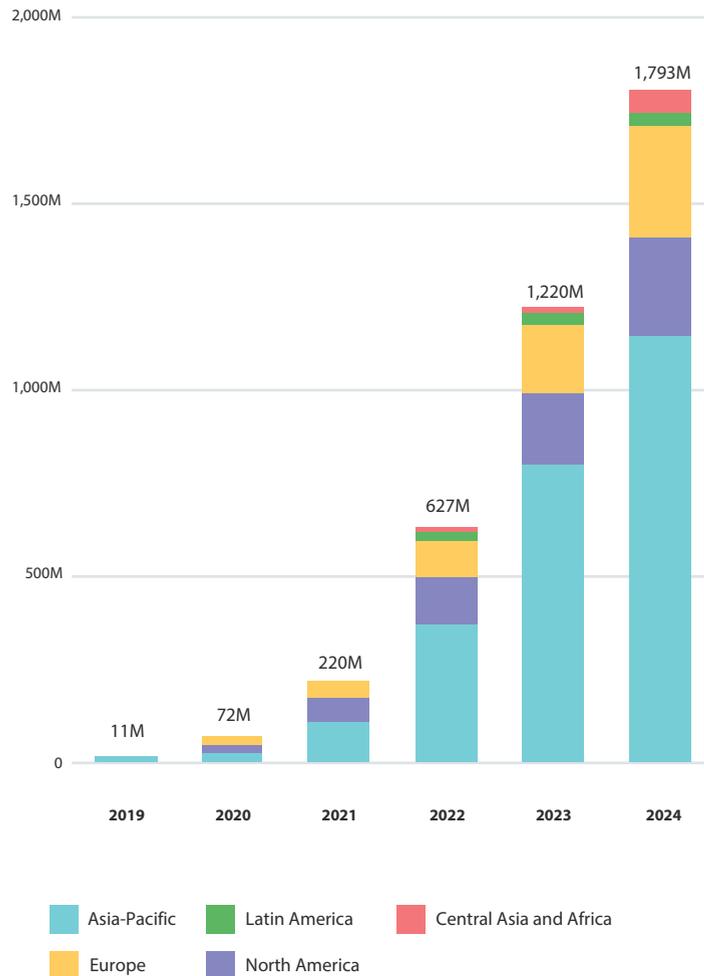
Internet of Things

The Internet of Things (IoT) is a network of devices that collects, accumulates and transmits data over the Internet without any human intervention.

How Does It Work?

Stage 1 Sensors, Actuators, Devices, etc.

Stage 2 Data Collection Systems

Stage 3 Preprocessing, Endpoint Analytics

Stage 4 Cloud Analytics
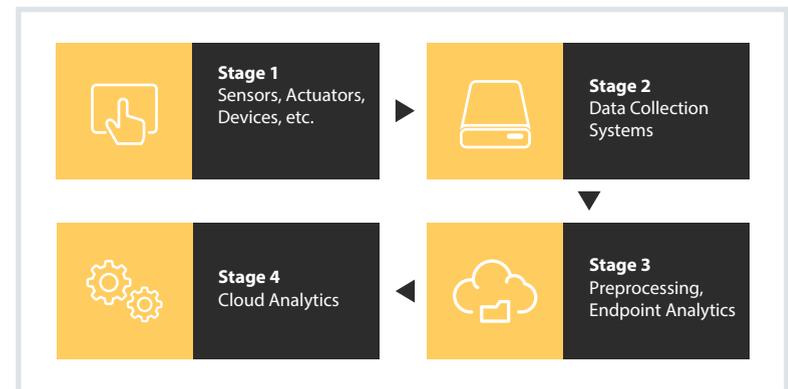
Step 1 (Sensors/Actuators)

A device must be equipped with a variety of sensors and actuators that allow it to collect data in order for it to be able to get integrated into the world of the Internet of Things.

Step 2 (Data Collection Systems)

The data from the sensors is in analog form and must be converted to be transferred to the digital world. Data collection systems perform these data acquisition and analog-to-digital conversion processes.

Step 3 (Endpoint Analytics)

Once the IoT data has been collected and digitalized, the data may

need more processing before entering the data center. This need is met by Endpoint Analytics.

Step 4 (Cloud Analytics)

Data may need further processing or may need to be forwarded to another platform. Cloud-based systems are needed to meet these requirements

Usage Areas of Internet of Things

10 Usage Scenarios to Drive the Growth of IoT by 2020

Related Industries

- Discrete manufacturing
- Transportation and logistics
- Public services
- Retail
- Healthcare services
- Process industry
- Energy and natural resources

Source: BCG IoT buyer survey, IDC, expert opinions, BCG analyses
Note: The sizes of the circles indicate the relative amount of expenditure
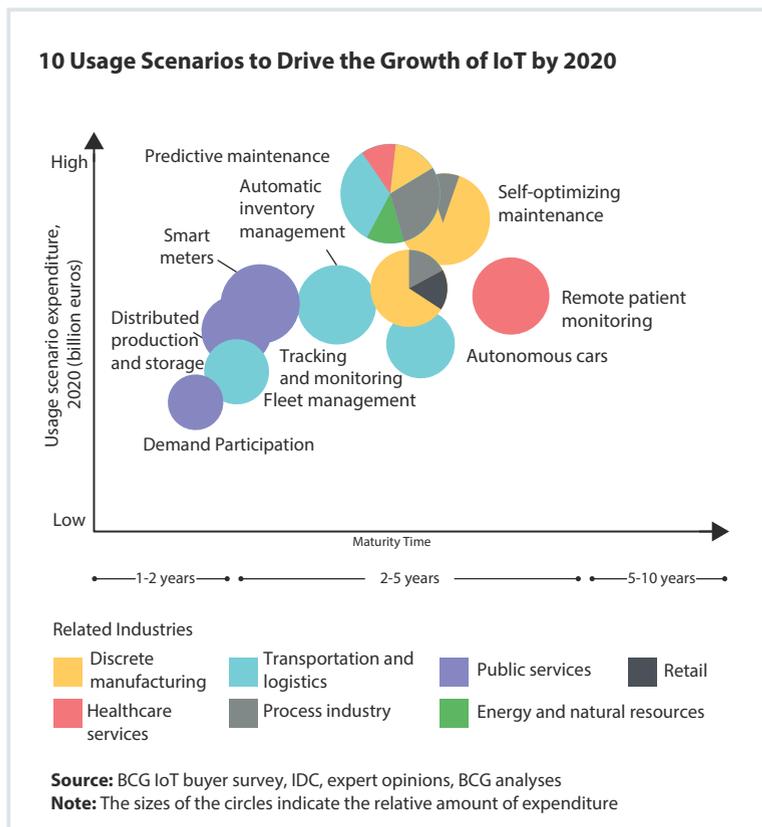
Myriota

In 2018, **Myriota**, together with Space X Falcon 9, launched its microsatellite into space. This satellite provides an IoT connection with very low power consumption. The satellite is located in the Low Earth Orbit and it is possible to perform processes such as viewing sensor data in the field, remote real-time location tracking, and instant status monitoring.

At a Glance

Headquarters
Adelaide, Australia

Website
www.iguazio.com

Establishment year
2018

Category
Telecommunications/ IoT

Investment Received
$ 15 million

Smart Cities

Description

A city is considered "smart" when it collects and analyzes large amounts of data from a wide range of sectors, from city planning to garbage collection. In a smart city, a complex network of interconnected sensors, devices and software must be established and maintained. This creates a more sustainable and efficient environment for the city's inhabitants.

Technologies that Make
Smart Cities Possible

01 Information and communication technology (ICT)

02 Physical devices connected using the Internet of Things (IoT) network

03 Geographical information systems (GIS)

04 Collecting and interpreting a huge amount of data that can be used to improve components and systems, each operating in a city

Smart traffic signals reduce travel and pollution

Personal time saved (in hours) per person according to the maturity level of traffic reduction

The average annual fuel saved per person

9.7

3.3 gallons

4.7

1.9 gallons

2.0

0.6 gallons

Traffic management maturity stage

■ Leading　■ Transitioning　■ Beginning
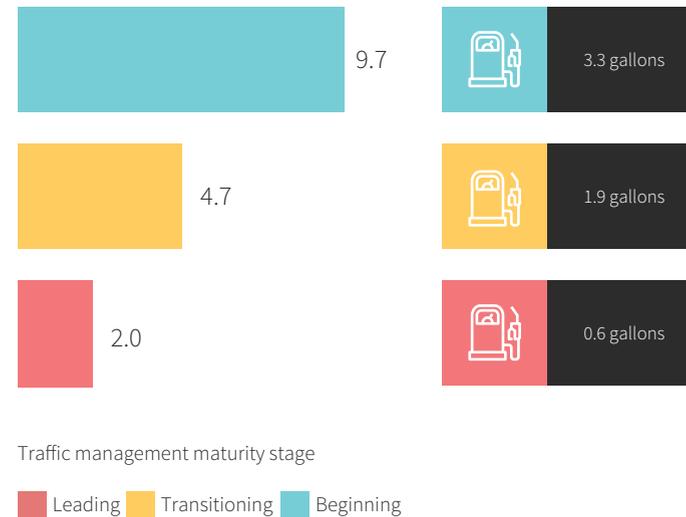
It has been shown that smart traffic lights reduce the total travel time from 43% to 25%, not only offering relief for those who go to work but also for the city as a whole. Reducing congestion can reduce pollution, increase efficiency and ensure citizen satisfaction as well as cutting down on time, fuel and difficulties for drivers. The cities that haven't installed smart traffic lights yet can have the largest gain potentially in terms of time saved per person when they do. Potential savings are lower for more mature cities that have progressed further in smart traffic lights.

Cities need to build a path that is open to smart city transformation

Roadmap for smarter cities

Utilize the concerns of the stakeholders: Adapt to the priorities of the stakeholders and give them input to gain their participation.

Remove obstacles: Cities often face difficulties due to political difficulties, cybersecurity concerns, inertia or uncertain return on investment.

Leverage data: Ensure that you are collecting a variety of data, analyzing and combining them, and offering access to them for the stakeholders.

Deploy IT infrastructure: Set up the broadband, shared architecture and scalable systems as well as processes and standards needed to support smart initiatives.

Keep up with digital innovations: Make sure you don't fall behind basic technologies like cloud, biometrics and mobile applications, or behind emerging technologies like Artificial Intelligence, the Internet of Things, beacons and chatbots.

Do not leave cyber security for later: Most cities, especially those starting their smart city transition recently, are not ready for cyber attacks. As cities become smarter, the risks increase.

Invest wisely: Cities being compared spare approximately 15% of their operating budgets and 17% of their capital budgets to smart city programs.

Use digital ecosystems: Cities can partner with technology providers and universities, or provide services for external resource development and implementation.

Dragos

This startup passively defines all assets and communications, detects industrial cyber security threats through behavioral analytics, and directs them to security teams and provides a guided investigation environment.

At a Glance

Motto
Industrial cyber security

Website
www.dragos.com

Location
USA

Category
Cyber security

Establishment year
2016

Investment Received
$ 48.2 billion

Quote

"The ICS threat landscape is largely unknown. For that reason we must take an intelligence-driven approach, gain visibility into our environments, and codify knowledge of our teams to scale the response instead of simply watching for anomalies."

Robert M. Lee, CEO of Dragos, Inc.
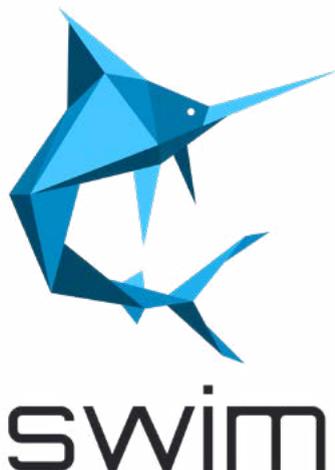
SWIM

The IoT software landscape is in the midst of a major transition, and the industry is trending away from centralized architectures in favor of decentralized models. For example, monolithic architectures have already evolved into composable pipeline architectures. As we continue on a path towards the total decentralization of data processing, the ability to efficiently perform streaming analytics using edge computing and AI/ML techniques will become mission critical.

Enterprise application environments have become increasingly heterogeneous and distributed, with ample local compute and storage resources. Meanwhile, demand for real-time applications, analytics, and automation is growing rapidly. In order to optimize the usage of local resources and ensure

reliable real-time performance, it's necessary to create an application mesh which unifies edge and cloud resources.

There's plenty of buzz around service meshes, data fabrics, and IoT platforms and it can be difficult to discern whether a specific solution is a good fit or an unnecessary layer of complexity without a real benefit. Market leaders like Microsoft and AWS provide solutions to streamline deployment and management of IoT and edge applications, but few solutions address developers needs to building efficient, performant applications for edge environments.

One of the most significant challenges for application developers is state management. Today, there are several stateful processing solutions available in the open source sphere. For example, Flink, Spark Streaming, Pulsar, Akka, and Kafka Streams all support stateful use cases. However, these solutions only support isolated stateful services and ultimately rely on stateless RESTful APIs for external state management. As IoT applications become more sophisticated, demand will grow for holistically stateful application platforms, such as swimOS, which provide a universal model staterful computation built around the notion of eventual state consistency.

Stateful application architectures are ideal for real-time use cases. I see direct applicability for swimOS and other like technologies to become enablers of distributed real-time use cases such as AR/VR, autonomous vehicles, smart cities, connected infrastructure and massively multiplayer gaming.

CLOUD TECHNOLOGIES

Today, information and data can be stored on physical or virtual servers operated and controlled by cloud computing providers such as Amazon AWS products. As a personal or corporate information processor, you can access your stored information via your internet connection through the "cloud".

Cloud Computing is a type of computing based on shared information processing resources, instead of having local servers or personal devices to run applications. In the simplest terms, cloud information services (cloud services) carry these needs beyond an organization's firewall.

Carrying out development on the cloud allows users to quickly launch their own applications to the market. It does not cause data loss due to hardware failures and network connection backups. Cloud computing also uses edge resources and reduces server and other equipment costs for organizations.

In-company

9%
Software Licenses
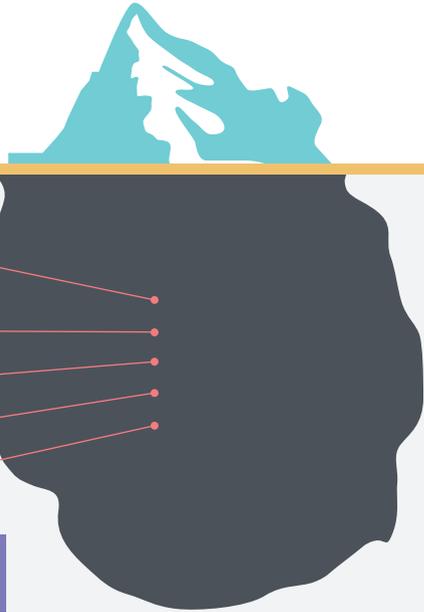
Customization and
Application

Hardware

IT Staff

Maintenance

Training

Current Costs

> Fixes, patches, upgrades
> Interruption
> Performance tuning
> Customizations
> Integrations
> Upgrading dependent applications
> Ongoing load on IT
> Hardware maintenance/upgrades
> Network maintenance/upgrades
> Security maintenance/upgrades
> Database maintenance/upgrades

Cloud Computing

68%
Subscription Fee
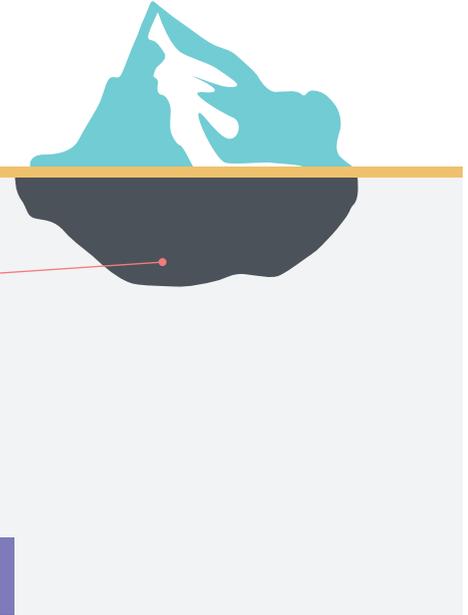
Application,
customization and
education

Current Costs

> Subscription Fees

Public Cloud

Public clouds belong to third-party cloud service providers that provide information technology resources such as servers and storage over the Internet. Microsoft Azure is an example of a public cloud. With a public cloud, all hardware, software, and other supporting infrastructures are owned and managed by the cloud provider. You can access these services and manage your account using a web browser.

Private Cloud

A private cloud refers to cloud information technology resources used by only one business or organization. In other words, it is a cloud where services and infrastructure are kept on a private network. A private cloud can be physically located in the company's data center. Some companies also pay third-party service providers to host their own private cloud.

Hybrid Cloud

Hybrid clouds combine public and private clouds, bringing them together with the technology that makes it possible to share data and applications between those. By allowing data and applications to move between private and public clouds, a hybrid cloud gives your business more flexibility, more distribution options, and helps you to improve your existing infrastructure, security, and legal compliance.

Adoption of cloud services

94% of companies use cloud services to some extent.

Private cloud only — 5%

Advantages
More control/ customizability
Greater flexibility and reliability
Enhanced security
High scalability

Disadvantages
Higher initial investment requires IT expertise

Mostly used for
Confidential, critical business operations

Public cloud only — 22%

Advantages
Low cost / no pre-investment
Pay-per-use model
No maintenance
Unlimited scalability

Disadvantages
Default security concerns
Surprise costs
Reliability

Mostly used for
Non-sensitive, public operations and unpredictable traffic

Hybrid — 67%

Advantages
Control
Flexibility
Cost-effectiveness
Ease of use

Disadvantages
Infrastructure management becomes more complex. It can be more expensive than using public cloud-only

Mostly used for
A mix of each

Source: RightScale

6 **advantages** and **benefits** of cloud computing

Allocate commercial capital for variable costs

Instead of investing heavily in data centers and servers, you can pay only when you spend and depending on how much you consume.

Take advantage of large scale economies

By using cloud computing, you can achieve a lower variable cost than what you can afford on your own. Since the usage of hundreds of thousands of customers is gathered in the cloud, providers such as Amazon Web Services can achieve larger scale economies with their prices getting increasingly lower.

Capacity estimation comes to an end

Eliminate estimations for your infrastructure capacity needs. When you make a capacity decision before rolling out an application, you often continue to deal with either expensive idle resources or limited capacity. These problems disappear with cloud computing. You can access as much or as little information as you need and scale up and down within just a few minutes of notification.

Increase speed and agility

In a cloud computing environment, new IT resources are just a click away, reducing the time it takes to make resources available to your developers from weeks to minutes. This leads to a dramatic increase in agility for the organization because the time and cost required to experiment and develop are significantly lower.

Stop spending money on running and maintaining data centers

Instead of changing your infrastructure, focus on projects that change your business. Cloud computing helps you focus on your own customers instead of focusing on storage and reinforcement servers

Go global within minutes

Easily distribute your application across the globe with just a few clicks. This means that you can provide lower latency and a better experience for your customers in a simple way and with minimal cost.

Source: Amazon

The current and planned use of public cloud platform services that operate worldwide as of 2019

	Working applications	Trials	Planning to use
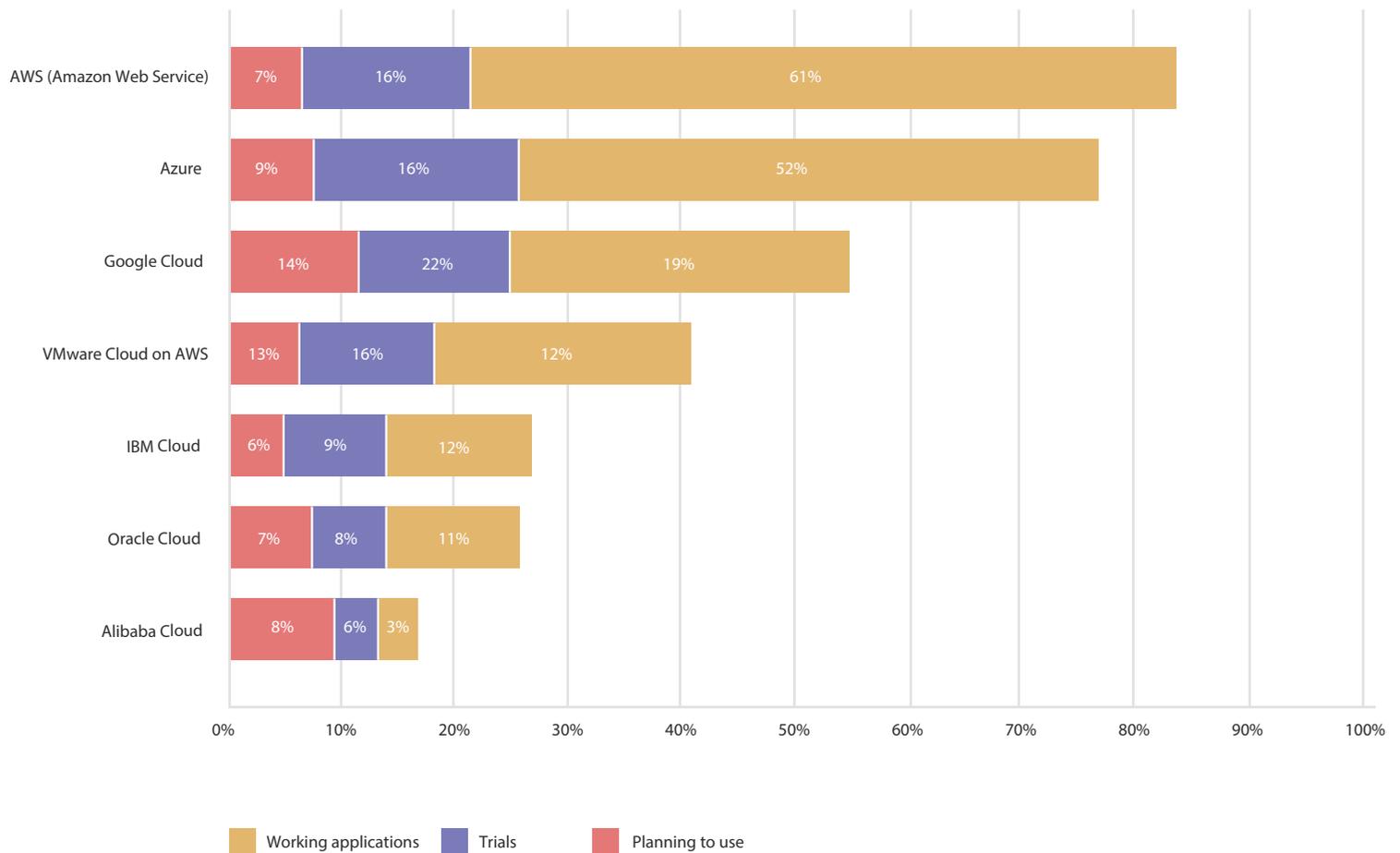
Three Types of Cloud Services

Software as a Service

SaaS (Software as a Service) is the most commonly used cloud service. With SaaS, companies pay on a subscription basis. Almost any software you can think of can be used as a service or will probably be used as a service soon.

Infrastructure as a Service

IaaS (Infrastructure as a Service) allows customers to find resources without actually buying hardware. This approach has the potential to eliminate capital expenditures. The IaaS markets have matured rapidly and dozens of providers have begun to offer dozens of provider services to meet your demands about all the services you need.

Platform as a Service

PaaS (Platform as a Service) can be used by organizations that want to develop new software applications without having to acquire and install the hardware and operating system. It also provides access to different, new and innovative services such as face recognition, the Internet of Things and Artificial Intelligence.

Global cloud data center IP traffic between 2015 and 2021 (exabyte per year)

Cloud data center traffic (exabyte)

Year	Value
2015	3 851
2016	5 991
2017	8 190
2018*	10 606
2019*	13 127
2020*	16 086
2021*	19 509
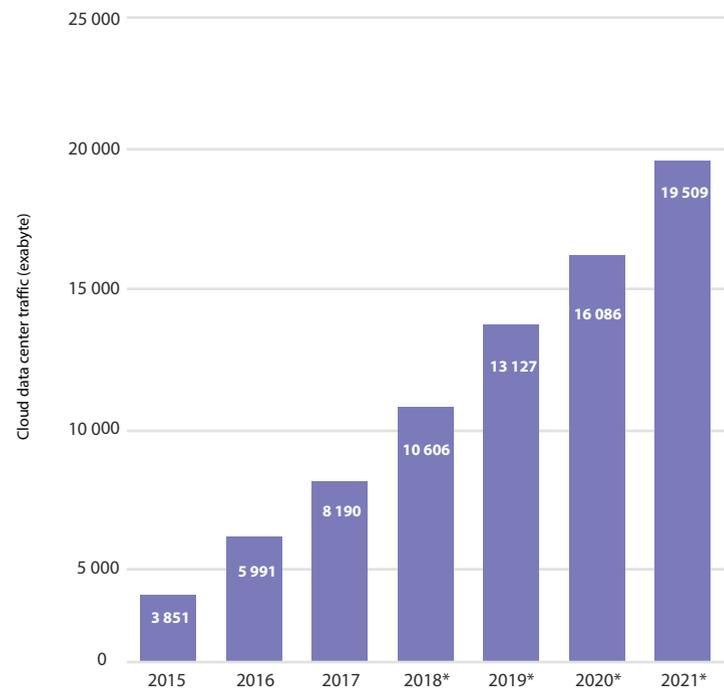
Financial Use Scenarios

Multi-Layer Biometric Identity Authentication and Payment Systems

Biometry is the general name given to the sum of the qualities that allow us to differentiate individuals from each other by measuring the individual characteristics of a person's physique or behavior.

Today, biometrics have started to be used in various fields. There are biometric practices that we currently use such as the Republic of Turkey Identity Card or identity authentication systems used in hospitals.

With the expansion of IoT-supported devices with 5G and the infrastructure supporting real-time access to a large number of devices, these devices will be able to collect the behavioral data of individuals and the biometry information produced will be able to be used in verification systems and be integrated with payment systems. For example, Amazon Alexa now provides services such as information acquisition, purchasing, credit inquiry, with voice command systems.

Real-Time and High-Speed Trading

It is expected that there will be revolutionary changes in the stock market transactions with the delay times around 50 milliseconds with 4G turning into delay times of 1 millisecond and finally turning into real-time processes with 5G. Today, brokerage companies conduct their buying and selling transactions through app-

lications automatically. With the low latency that 5G is aiming to offer, these transactions can be processed almost in real-time, and the stock trading transactions can be realized much faster, where even seconds make differences of millions of liras.

Personal Assistant Service

Today, when accessing the internet through Web and Mobile channels, the personal data of users is collected through applications and used by service providers for purposes such as user experience and targeted marketing.

With the reliable infrastructure and high processing power of 5G, it will be possible to develop new financial products by combining usage information like application data (such as files, pictures, documents), the user's geographical location, information coming from payment systems, with personal information. For example; using this kind of information, Financial Institutions will be able to determine the daily spending limits of the users and more efficient portfolio management and more efficient use of investment tools will be possible.

Personalized Insurance Systems

Today, although health sensors are not very commonly used, this is expected to change as wearable technologies start to develop and 5G starts to become more widespread. For example; devices that detect smoking will inform the insurer while alerting the insured, which will affect the insurance policy costs.

Insurance companies will be able to accelerate the insurance pro-

cess through mobile devices, for example, when offering life insurance to a client, by completing the client's blood tests remotely with mobile devices without the client having to physically see a doctor. This will make the processes easier for both the insured and the insurer.

Real-Time Audio / Video Communication in the Context of Applications

Within the scope of Financial Advisor and Customer Services, making payments from our mobile devices, checking our accounts, withdrawing money from ATMs and depositing are now standard services. We now have very few reasons for visiting bank branches. Research also shows that after each visit to a bank, the rates of a

customer leaving angry or upset due to an unpleasant experience are rising. Besides, the rate of customers who carry out their banking procedures on mobile apps changing the bank they work with is 40% lower.

The period in which mobile platforms evolve into a central hub position instead of a channel for the financial world will be complemented by the benefits of 5G technology.

The effective speeds that 5G will bring will make it possible to make video calls with customer representatives and personal financial advisors and to implement financial recommendations simultaneously.

Order	Service	2018	2019	Growth
1	Serverless	24%	36%	50%
1	Flow Processing	20%	30%	50%
2	Machine Learning	18%	26%	44%
3	Container as a Service	26%	37%	42%
4	Internet of Things	15%	21%	40%
5	Data Warehouse	29%	40%	38%
5	Collective Processing	26%	36%	38%

General Cloud Computing Services Market Size from 2009 to 2022
(Billion USD)

Year	Value
2009	58.6
2010	76.94
2011	92.97
2012	110.27
2013	130.7
2014	154
2015	175
2016	219.6
2017	145.3
2018	182.4
2019*	214.3
2020*	249.8
2021*	289.1
2022*	331.2
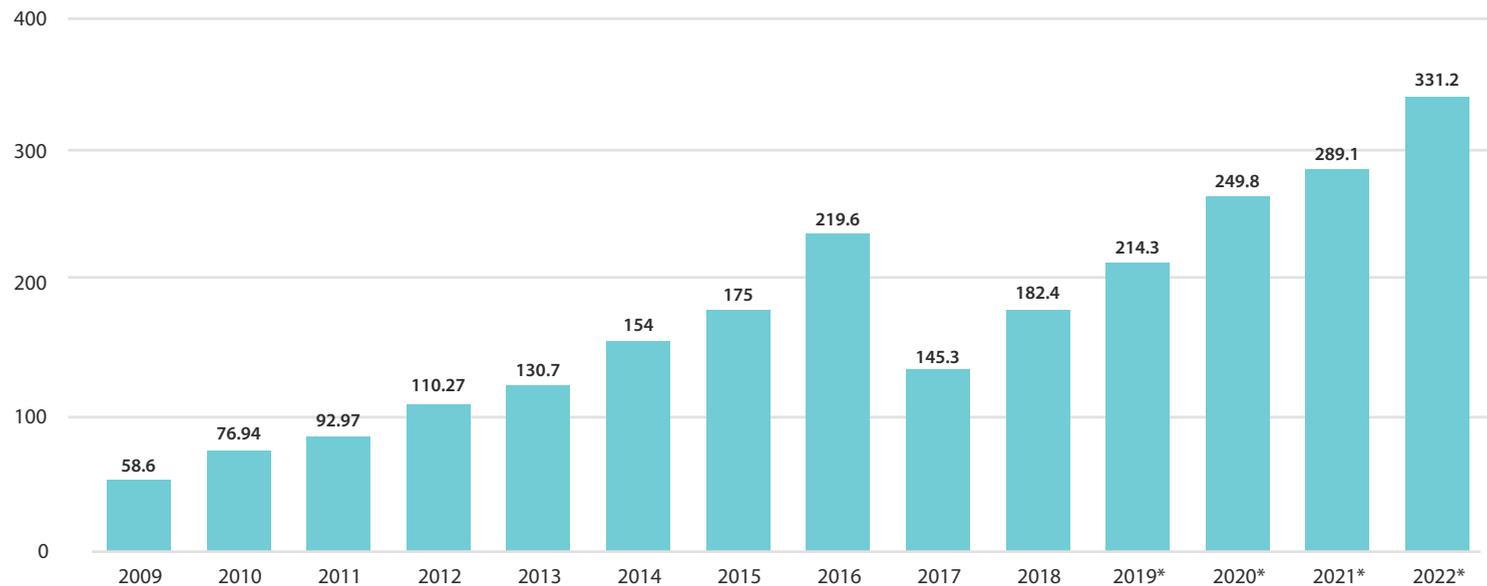
News

$ 15.7 Billion Deal from Salesforce to Tableau

Salesforce, a cloud-based software company, announced that it signed a $ 15.7 billion deal to increase business analytics offerings in June by acquiring Tableau, a leading developer in business intelligence and data visualization software.

Both companies said the acquisition would place Salesforce in a better position to compete in the digital transformation market. The news of the deal arrived four days after Google announced it had purchased the business analytics company Looker Data Sciences for $ 2.6 billion..

Snowflake Coming to Google Cloud

Snowflake brings its cloud-based data warehouse and analytics service to Google's cloud platform. A new Data Transfer will also allow users to access data sets from various providers.

Snowflake's data warehousing service already exists in Amazon's AWS and Microsoft's Azure cloud, and users will soon be able to access the Google Cloud Platform as well. This will provide users with the ability to easily access the three major public cloud providers. A preview version will be available in autumn and the full version is expected to be available in early 2020.

Microsoft Azure and Oracle Cloud Partnership

The two giants in the enterprise cloud industry, Microsoft Azure and Oracle Cloud, have announced a partnership that will allow the two cloud systems to work together and enable users to handle critical tasks together.

Thanks to a partnership between Microsoft and Oracle, businesses will now be able to seamlessly connect Azure services such as Analytics and AI to Oracle Cloud services such as Autonomous Database. Customers will be able to run one part of a workload in Azure and the other part in Oracle Cloud, and as a result of this partnership they will have the best cloud experience

.

Snowflake

Snowflake provides data warehouse as a service. The software of Snowflake that runs on AWS and Azure enables users to store and query data in their preferred cloud repository in order to examine the trends in data. The saved data can be used by many different applications allowing users to work efficiently on small or large data segments.

At a Glance

Motto
Data Warehouse for the Cloud

Location
USA

Establishment year
2012

Investment Received
$ 928 million

Website
www.snowflake.com

Category
Data analytics, cloud data services, SaaS

Volkan Sözmen

IBM Turkey, Country General Manager

Biography

Volkan Sözmen joined IBM in 2003 and assumed various roles within the company related to the public, telecommunications, banking and finance, and the insurance industry. Sözmen was appointed as the Country General Manager of IBM Turkey in January 2019 and he has functioned as IBM Turkey's Executive Vice President responsible for Enterprise Sales.

Prior to his career at IBM, having assumed various sales responsibilities in the IT sector, Sözmen graduated from the Department of Chemical Engineering at Middle East Technical University (METU). Sözmen also holds a Master's degree in Polymer Science and Technology and an Executive MBA degree, from METU.

Digital transformation is reformed with a hybrid cloud strategy

For around ten years, we have been intensively engaged in consumer-oriented technologies. Mobile applications using cloud and artificial intelligence technologies have almost become the centerpiece of our lives. Thanks to that, our daily lives have become easier and faster than ever. Through this, the positive effects of cloud and artificial intelligence technologies on today's business processes and end consumers have been tested and proven. Of course, there are ongoing developments in this world equipped with consumer-oriented technologies. However, enterprise technologies play a leading role in digital transformation.

We will be witnessing a new period in which cloud and artificial intelligence solutions are used on a sectoral basis and on a large scale, where business needs are a priority. Because the sectors such as finance, banking, insurance, telecommunication, retail and health, which are the spine of the economy, have increasing needs. These needs can be listed as follows:

01	Diversification of products and services
02	Improving efficiency
03	Regulatory compliance needs

Enterprise technologies are also the biggest supporters of the business world in these fields. We will see that cloud technologies are used more intensively in order to provide better and more diverse services to their customers and pave the way for new applications. This means that we will not use cloud technologies solely for personal needs such as checking our bank account balance and accessing our data via our smartphones. We have already begun to witness serious steps taken in the integration of technologies such as artificial intelligence applications, blockchain and the Internet of Things into business processes around the world. At the top of these investments is a strong hybrid cloud infrastructure. In the first period, what dominated the cloud were "user applications". In the new period, what will dominate the cloud will be "critical workloads". 80 percent of these critical workloads are still kept in the company using traditional methods. These data consist of data that will guide the future of our investments and that must be moved or connected to the cloud.

In the next 10 years, the interest in multi-cloud management will increase

In the hybrid cloud market, which points to a $ 1 trillion opportunity in 2020, companies need to be able to manage their data and business processes by moving them between multiple clouds. This brings multiple cloud management to the table. Today, companies around the world are working with 5 to 16 cloud technology providers at the same time. The synchronization of these with each other and the reliability of the journey of data are also among the most important elements to be considered in this new period.

When we meet with our customers, we see an increasing awareness in terms of presenting and managing a hybrid cloud strategy. Today, almost every company is using a combination of general, private and internal capabilities. This is what a hybrid cloud strategy truly is like. According to IBM's predictions, the number of large businesses that adopt the hybrid cloud strategy and benefit from multiple clouds will increase over the next 10 years. This will make a new digital transformation strategy compulsory for all businesses within the new rules on competition.

> *The number of large businesses that adopt the hybrid cloud strategy and benefit from multiple clouds will increase over the next 10 years. This will make a new digital transformation strategy compulsory for all businesses within the new competition rules.*

IBM

An integrated investment model is needed for security

Two of the top priorities gaining prominence for businesses in this new cloud journey are security and flexibility. They demand data to be moved easily and fast. Data breach in general is one of the major concerns. According to research conducted this year by the IBM Security Business Unit and Ponemon Institute, the cost of data breaches in the world has increased by 12 percent over the last five years, reaching an average of $ 3.92 million. The cost of data breaches in Turkey increased by 18.5 percent over the previous year and rose to 11.15 million. Moreover, 45 percent of data breaches consist of malicious or criminal attacks.

The two best ways to be protected against cyber security threats are to use encryption on a large scale and to be prepared to intervene in cyber events. IBM's security approach is also apparent in

the new IBM z15 mainframe designed to protect the most sensitive data of companies in secure and large-scale hybrid multi-cloud environments. The Z15 performs encryption at an unprecedented level of security, ensuring security not only in one place, but also in open hybrid multi-cloud and supply chains.

In terms of the information technology industry, this new era also points to a period where projects on a larger scale than ever are managed, requiring knowledge and experience focused on the needs of institutions. As IBM, we position ourselves as the "Hybrid Cloud and Enterprise Artificial Intelligence Technologies" company in this new era with our century-long know-how and investments in the field of enterprise technologies. With our investments, we further strengthen our position in the market. Aiming to become the number one company in the Hybrid Cloud market with the acquisition of Red Hat, we accompany our customers from the very beginning to the end of their cloud journey. We will continue to support the technological advancement of our country and our sectors with our history that goes beyond 80 years in Turkey.

BLOCKCHAIN

What Is It?

Blockchain is a distributed database system that provides data management in encrypted form. In this database, the way data is stored is distributed into different parts, in blocks and encrypted. Blockchain technology can also be thought of as a bookkeeping system that keeps track of the processes. Each process group made on a blockchain can be referred to as a block.

Then, each block is linked chronologically to form a chain Each block in the chain contains an encrypted hash of the previous block, a timestamp, and batch processes. The cryptographic hash included in a block consolidates the integrity of the previous block, thus making the blockchain architecture highly secure.

History

The History and Evolution of the Blockchain Technology

The concept of distributed computing has existed since 1990.

Cryptocurrency was started to be distributed in cash-related applications.

The use of the blockchain technology in the financial markets and blooming of it in applications beyond cash transactions

Permissioned blockchain network solutions

Origin

Processes

Contracts

Application

| 1990s | 2009 | 2011 - 2012 | 2012 - 2013 | 2013 - 2014 | 2014 - 2015 | 2015 - 2016 | 2016 - 2017 |

Bitcoin was created by Satoshi Nakamoto. Later, the concept of blockchain was introduced to create a decentralized book maintained by anonymous consensus.

Currency transfers and digital payment systems

The development of smart contracts using the blockchain technology

Development of the Market, sub development and expansion among the industries

How Does It Work?

Blocks are files in which data related to processes are saved permanently. Each block contains its own data as well as its own hash value and the hash value of the previous block. A data unit stored in a block can represent any value (money, a company share, voting information used during the election, digital property file, or any other value) depending on the type of blockchain.

Once a block has been created, a hash is automatically calculated. Changing something inside the block causes the hash value to change. Therefore, a hash value also indicates changes made to a block.

Data

Hash

**Hash of
Previous Block**
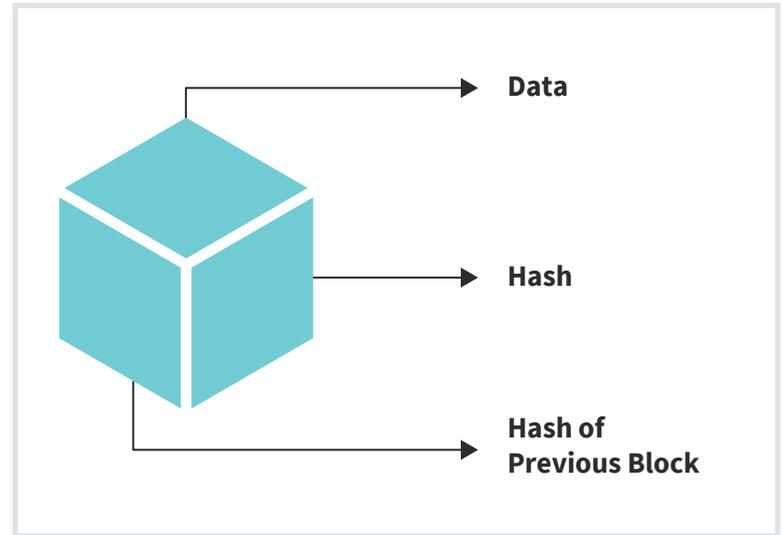
To explain it shortly using a transaction;

The transaction is started.

Verification: Nodes validate the transaction and the user's status using known algorithms
The requested transaction is broadcast to a peer-to-peer network of nodes.

A verified transaction may include an encrypted currency and other digital markers, records or other information.

The transaction is completed.

The new block is then added to the existing blockchain permanently and irreversibly.

Once verified, the transaction is combined with other transactions to form a new block of data for the ledger.

Blockchain Types

Public
(Public)

Private
(Private)

Hybrid
(Hybrid/Consortium)

Public:

It has no access restrictions. Anyone with an Internet connection can issue transactions as well as validate transactions.

Usually, such chains use PoS or PoW algorithms.

Some of the largest and most well known public blockchain networks are Bitcoin and Etherium.

Private:

In order to read the stored data, you must log in with permission from the network itself.

Such networks can be considered as the transition interlayer for companies interested in blockchain technology.

In these networks, companies often try to incorporate technology into the accounting and bookkeeping process.

These can be considered as procedures of presenting data to the public Internet without compromising autonomy and without carrying risks.

Hybrid:

A consortium blockchain is often defined as semi-localized. One single organization that controls the network and other organizations, each of them being a node, exist on the hybrid network.

Administrators of a consortium chain restrict users' read rights as they see fit and give permission to only a limited number of trusted nodes.

> "We believe executives should no longer ask a single question about blockchain but, rather, a broad set of questions reflecting the role blockchain can play within their organizations."
>
> Linda Pawczuk,
> Deloitte Consulting LLP
> Principle & Deloitte Consulting Leader for
> Blockchain and Cryptocurrency

Consensus Models

Since blockchains do not have a "leader" or they are networks that are decentralized, a consensus must be reached using "consensus mechanisms" for blocks that prevent decision-making. In simple terms, consensus is a dynamic way of reaching agreement in a group.

The purpose of a consensus mechanism is to verify that the information added to the ledger is valid, in other words, that the network is in agreement. This ensures that the next block to be added represents the most up-to-date transactions on the network, preventing double-spending and other invalid data from being added to the blockchain network.

Consensus can be made in different ways. Some consensus models are:

Proof of Work (PoW)
It is used when nodes compete to solve mathematical problems and decide which block is real.

Proof of Stake (PoS)
It is used when nodes risk their own capital to reach consensus.

Delegated Proof of Stake (DPoS)
Delegated proof of stake (DPoS) system works in the same way as

PoS with the exception of selecting a general asset to represent the individuals' shares in the systemr.

Practical Byzantine Fault Tolerance (PBFT)
Under this consensus mechanism, each node distributes a public key. Messages received along the node are determined by the node to validate the relevant organization.

Federated Byzantine Agreement (FBA)
FBA permits consensus among multiple nodes that do not know each other individually and in situations where even the total number of participants is unknown.

Most Popular Usage Scenarios

Cryptocurrency
Sending money internationally using available payment methods can be both expensive, due to fees charged by intermediaries, and time consuming. Especially in developing countries, there are a significant number of people who do not have access to banking services. Blockchain can be used as a foundation for building cryptocurrencies to solve these problems. Cryptocurrencies can be considered, in simple terms, as a digital currency that acts as a means of exchange in the purchase and sale of various goods and services. Making cross-border payments can be both fast and inexpensive with these digital currencies.

Supply Chain Management

As a product moves along the supply chain, deficiencies arise in terms of traceability. There may be product authenticity problems in supply chain management due to the fact that consumers often might purchase counterfeit goods. A supply chain is a network between a business and its suppliers and it promises to solve these problems found in supply chains through the blockchain technology. With this method, according to the claims, that will be provided by the ability of the blockchain to enable the digitization of assets, the products can be labeled and stored on an unchangeable blockchain.

Digital Identity

Digital identity can be thought of as a body of information that represents individuals, organizations, etc. that exist online. The blockchain can potentially solve problems related to digital identity by giving back control to the user called a "self-sovereign identity". Instead of giving broad approval to various applications and service providers when it comes to obtaining the person's digital identity, individuals can have an encrypted digital center where digital identity data can be stored. More importantly, individuals can check who has access to this center and revoke access if necessary.

Voting

Voting is an activity that needs to be done online, especially in our society that is becoming increasingly interconnected. However, online voting carries concerns of security and fraud. The blockchain is capable of eliminating voter fraud concerns by providing a clear record of the votes cast..

Smart Contracts

Self-managing smart contracts that operate within the blockchain infrastructure, with predefined rules, make agreements between various parties easier without the need for intermediaries.
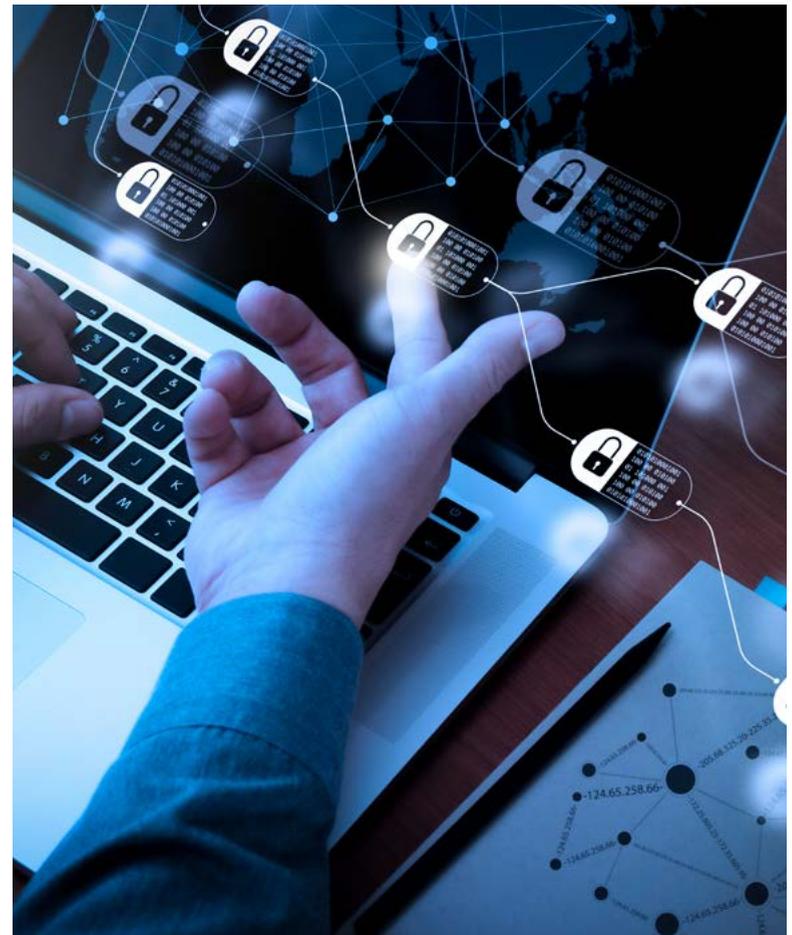
Adoption of Blockchain on the Basis of Sectors

Inapplicable   Limited   Low   Medium   High

	Revenue	Cost	Capital	Social
Agriculture	Medium	High	Inapplicable	High
Art and Recreation	Low	Limited	Inapplicable	Low
Automotive	High	Low	Inapplicable	Low
Finance	Medium	High	Low	Medium
Health	High	High	Inapplicable	Medium
Insurance	Low	High	Inapplicable	High
Manufacturing	Inapplicable	Low	Inapplicable	Inapplicable
Mining	Inapplicable	Low	Inapplicable	Limited
Real Estate	High	High	Inapplicable	Low
Public Sector	High	High	Inapplicable	High
Retail	Low	Low	Low	High
Technology, Media and Communication	Medium	Low	Inapplicable	Low
Transportation and Logistics	Limited	Medium	Inapplicable	Low
Public Services (Electricity, water, etc.)	Medium	High	Low	High

The Changing World

Location-Based Google Search Statistics on Blockchain for the Last 5 Years

China | 100
Ghana | 42
Saint Helena | 38
Malta | 33
Nigeria | 30

July 20, 2015   January 17, 2016   July 16, 2017   January 17, 2018
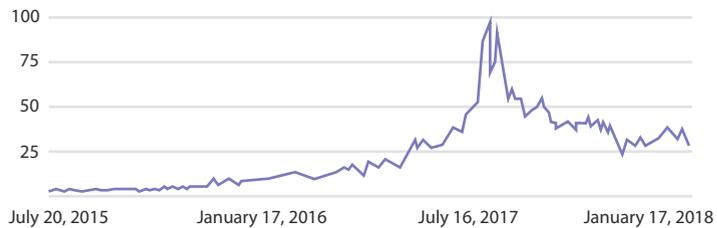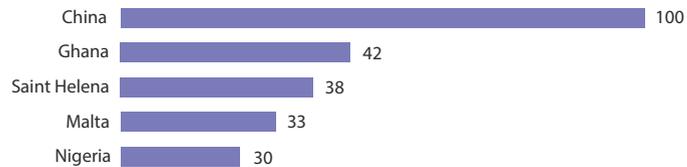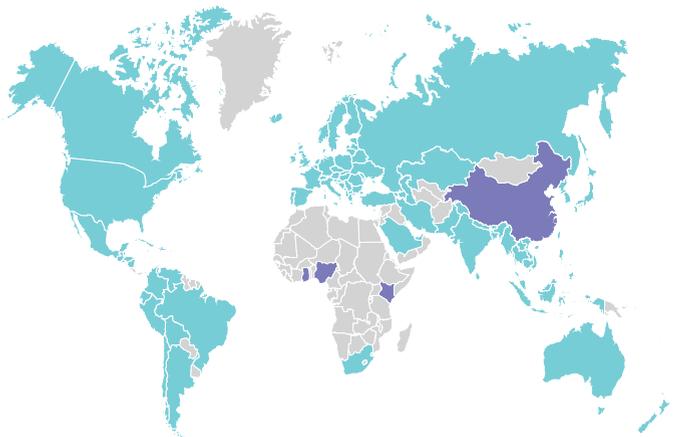
Quote

"The old question 'Is it in the database?' will be replaced by 'Is it on the blockchain?'"

William Mougayar,
Author, Investor, Analyst,
Block Chain Theorist and Strategist

Change in Interest in Blockchain Technology Between 2018 - 2019

Views of blockchain's relevance within organizations (2019 vs. 2018)

It has critical importance in our top five strategic priorities

- 53%
- 43%

It will be important but not in the top five strategic priorities

- 27%
- 29%

It will be relevant but not a strategic priority

- 14%
- 21%

Not sure/we haven't reached a conclusion

- 3%
- 4%

Not interested

- 3%
- 4%

■ 2019 ■ 2018
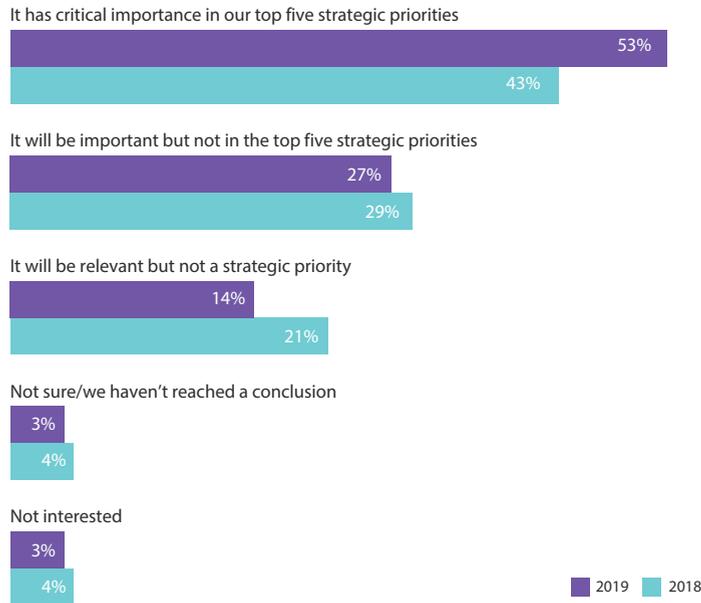
Source: Deloitte's Global Blockchain Survey, 2018 and 2019.

Most respondents see blockchain as one of the top five strategic priorities with a jump of 10 points compared to 2018.

Survey question: Which of the following best describes how you currently view the relevance of blockchain to your organization or project in the coming 24 months?

Forecasts

Worldwide Spending on Blockchain Technology Solutions (billion dollars)

2017	0,95 $	
2018	2,10 $	
2021	9,70 $	
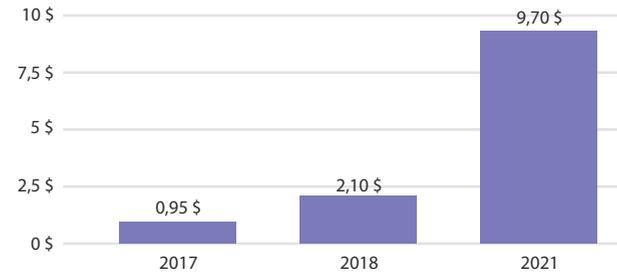
According to International Data Corporation (IDC), the amount spent on blockchain technology solutions worldwide is estimated to be more than twice the amount of the total of $ 2.1 billion spent in 2018 and $ 945 million spent in 2017.

IDC expects blockchain technology to grow solidly during the 2016-2021 forecast period, with a total spending of $ 9.7 billion in 2021 and the five-year compound annual growth rate (CAGR) of 81,2%.

Source: IDC

Top 3 Sectors by Blockchain Spendings in 2018

Finance

Manufacturing and Resources

Distribution and Services

Top 3 Usage Examples On Blockchain in 2018

Cross-Border Payments and Agreements

Trade Finance and Post-Trade / Transaction Agreements

Legal Compliance

Top 3 Sectors by Blockchain Spendings in 2021

Public Sector

Finance

Distribution and Services

Cross-Border Payments and Agreements

Assets / Property Management

Identity Management

Blockchain Adoption Cycle

Legend: Business Value ▪ | Growth Rate —

Left axis: Blockchain's Operational Value (billion dollars) — 0, 500, 1000, 1500, 2000, 2500, 3000, 3500

Right axis: Growth Rate in Business Value — 0%, 20%, 40%, 60%, 80%, 100%, 120%, 140%

X-axis: 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030

Callouts: 128%, 72%, 104%, $176B, $3.1T

Impact on consultancies

Expansion: Customer demand leads to rapid growth in consultancy

Rationalization: Challenges in implementation force less consultancy from the market

Growth: Business adoption promotes organic growth in the remaining consultancies

Note: Blockchain forecast data "Forecast: Blockchain Business Value, Worldwide, 2017-2013."

Top 10 Blockchain Start-Up List of 2019

BiKi

Founded in June 2018 and headquartered in Singapore, BiKi.com carries out digital asset exchange activities in the global market. BiKi.com, which reached 1.1 million registered users and 100.000 active users in a year, is supported by Du Jun, the co-founder of Huobi. BiKi.com focuses on the global market with the mission of bringing digital assets into the mainstream.

Advanced Blockchain AG

The Berlin-based publicly listed company Advanced Blockchain AG (ABAG) was founded by Robert Küfner, founder of peaq.io and the German crypto pioneer. The company produces DLT solutions for the largest automotive manufacturers in the world. ABAG has recently been selected by German Accelerator to be sent to the US market Silicon Valley.

YottaChain

YottaChain is a unique economic model and governance structure for linking global information technologies and storage resources together, as well as a public blockchain that uses a proprietary technology. In 2018, the company was among the top 20 finalists in the "Founder World Championship" competition in Silicon Valley.

HeroToken

Barcelona-based HeroToken is committed to continuing PawnHero's success story. Co-founder David Margendorff, together with a team of technology experts, works to provide solutions a customer portfolio of billions without bank accounts worldwide and to provide a transparent credit market.

Bitconch

With a global development team of former engineers from Google, IBM, Huawei and GE, Bitconch is working on a blockchain platform that enables the beta network to reach 100.000 transactions per second using the PoR consensus algorithm. Bitconch has created an open node pool with PoW (proof of work) + PoS (proof of stake) + PoA (proof of authority) algorithms and a three-dimensional smart node system that contributes to centralization. The company has recently partnered with Cryptic Labs.

BREACH

BREACH was established to insure your digital assets. With the support of PJC, a leading Boston-based early-stage venture capital firm, BREACH partners with global insurance companies, cyber security experts, and exchanges, to provide products to protect user investments.

KaratGold

KaratGold Coin, a subsidiary of Karatbars International GmbH in Germany, aims to create a strong gold-based ecosystem by offering cross-border blockchain solutions. Currently, KaratGold allows consumers to purchase gold at more than 500.000 acceptance points worldwide.

BISS

Supported by Matrix Partners, ZhenFund and Metropolis VC, BISS offers crypto exchange services to its members through a membership-based platform. The platform also provides its users with a secure crypto trading exchange for securities, minimizing the imbalance in cryptocurrency. BISS has earned 300,000 monthly users in just four months.

LiteLink Technologies Inc.

LiteLink is a public company that develops enterprise platforms and digital wallets that use blockchain to solve problems in the logistics and payment industry. The company operates through its platform called 1SHIFT-logistics, which provide real-time and transparent tracking for brokers, shippers and carriers to make it possible to track and pay for shipments.

MetaHash

MetaHash is a self-sufficient network that works with the vision of creating a new Internet for DApps and digital assets. Offering a range of tools for developers and a variety of solutions for businesses, MetaHash supports more than 50,000 transactions per second with a three-second confirmation time with its protocol based on advanced data synchronization, and solves the blockchain industry's key performance problem. With hundreds of community-run servers, MetaHash is rapidly approaching its goal of becoming the fastest and fully decentralized blockchain.

LIBRA

Global Currency and Financial Infrastructure

> Libra is an open-source blockchain platform that is planned to be released worldwide in the near future.

> The purpose of its consortium is to establish a financial platform infrastructure with the leading players of the sector and to produce cryptocurrencies with real value and to ensure that the financial transactions are presented in a low-cost and fast way through a system open to everyone with the concept of "the Internet of money".

Payments

Technology and Marketplaces

Telecommunications

Blockchain

Venture Capital

Non-Profit and Multilateral Organizations, Academic Institutions

> Founding members of the platform consist of payment systems, network technologies, marketplace platforms, venture capital firms and academic institutions.

> When the founding members are examined it can be seen that all possible substructural stakeholders based on the blockchain are located in the consortium. The presence of institutions that manage cash flow in the area of payment systems, in particular, indicates that "the creation of a new digital financial ecosystem in the changing world" is aimed for, as stated in Libra's foundation argument.

> Libra is defined as an interesting compromise between a decentralized blockchain network and a central banking system.

> The Libra currency is fixed to existing assets such as the Dollar or Euro and is positioned as a "stable coin" in order to remain stable unlike many crypto currencies.

> Libra is considered worthy of attention by experts as it may have the potential to destroy existing financial infrastructures - particularly established systems such as SWIFT. At the same time, the Facebook company, which pioneered the realization of the platform, has suspicious confidentiality practices that took place in its history, and experts expressed concerns about the confidentiality of data and the underlying ideology of the crypto currency due to this. In order to resolve these concerns, Facebook announced that financial data and social data would not be kept in the same environment and financial data would never be used for advertising purposes.

> Market experts emphasize that if Facebook succeeds with this initiative and makes money for Libra, the founding members of the Libra consortium can earn a large amount of interest, and if there is an increase in fast purchases through Facebook with Libra money, advertisement spendings will increase.

> "Libra White Paper" was prepared and signed by 53 blockchain experts. Signatories include Stanford University PhD students, computer science professors and software developers in the field of artificial intelligence.

> When Facebook first announced that it was working on Libra, The United States House Committee on Financial Services asked Facebook to stop working on this project immediately. They thought that this step taken by Facebook would further increase the lack of regulation in the current cryptocurrency world. The Committee listened to the details of Libra at a session in July 2019 from Facebook. In addition, France is also continuing to work on having cryptocurrency regulations managed by central banks. It is opposed to the widespread use of the Libra, especially as it may increase cases of money laundering.

> Libra is expected to be released in the first half of 2020.

Ahmet Usta

BCTR, Editor in Chief and Technology Writer

Biography

He graduated from Istanbul Technical University, Department of Aeronautical Engineering in 2001 and from the MBA program of Yıldız Technical University in 2007.

Usta started his career in 1999 by writing articles on game technologies in game magazines. Since 2002, he has served as Information Technologies manager in different institutions. In 2017, he founded his own company, Mercek Tech.

He translated 'The Startup Owner's Manual' and 'Identity is the New Money' into Turkish. He is the co-author of Blockchain 101, the first book written on blockchain technology in Turkish, and he carries out presentations and lectures on blockchain in addition to offering consultancy.

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Blockchain Turkey Platform (BCTR)

There are rare ideas that add important milestones and initiate subsequent periods in the advancement of humanity. The blockchain thought structure expresses such an idea revolution. Turkey is trying to be a part of this revolution with the ecosystem of competition it developed.

In 600 BC, which is approximately 2,600 years before today, one of the most important developments in the history of mankind took place in the Didim region, which is located within the borders of Aydın province. Anaximander who lived in Miletus, an important trade, science and cultural center at the time, revealed that the earth was not flat like a plate and that it acted like a stone surrounded by skies instead.

This information, which seems quite simple for today, was a rebellion to the process of the scientific acceptances being transferred from the teachers to the students. Thus, instead of maintaining the authority of the central will and the power that protects it, the doors were opened to scientific criticism and the choice of the best criticism among them. The Anatolian peninsula had silently witnessed what was possibly the most important development of the history of humanity. His decentralized thinking destroyed authority and gave birth to a culture of consultation.

'Bitcoin: A Peer-to-Peer Electronic Cash System' by Satoshi Naka-moto, published in 2008, which continues to retain its mystery, has ignited the sparks of an idea revolution that is similar to the one of Anaximander of Miletus. The Bitcoin article may be understood as a mathematical analysis of a decentralized electronic cash system for the first-time reader, but the message it conveys is hidden between the lines: "Humanity! You no longer need centralized systems to make reliable data recordings between each other."

Blockchain Turkey Platform Is Founded

"Daha Yeni Başlıyor" (This is Only the Beginning), the book authored by one of the most important businesspeople in Turkey, Faruk Eczacıbaşı, tackles the topic of the importance of flexibility in the world of the future, convergence and network topology. One of the areas Faruk Eczacıbaşı has shown special interest in within this period, in which he combines his personal experiences with his vision of informatics of the future, is blockchain technology.

Quote

"Blockchain technology is under the sun and the applications of this technology have not even set sail yet... We can say that it is taking baby steps. In the majority of societies, this technology is accepted as cryptocurrency, but we should know that blockchain redefines one of the most basic concepts of law: the 'contract.'"

Faruk Eczacıbaşı, the Chairman of Turkey Informatics Foundation and the Chairman of the Steering Committee of BCTR

One of the founding members of BCTR, the CEO of Interbank Card Center of Turkey and the member of the steering committee of BCTR, Dr. Soner Canko said, "The limits of our field of activity as a company are set. The potential of blockchain technology required an approach that encompassed all sectors extending beyond these boundaries, and we wanted to build a larger platform and turn it into an ecosystem. Meeting with Mr. Eczacıbaşı and seeing that we had ideas in common made us inexplicably happy" in his speech.

The ideas that meet on a common ground are shaped in a short time. Under the leadership of Faruk Eczacıbaşı, with the aim of turning Turkey into a society of information, Blockchain Turkey Platform (BCTR) was found in 1995 as an initiative of Turkey Informatics Foundation (TBV). The official announcement of the foundation of BCTR was announced to the public at a press conference on June 8, 2018.

The point BCTR has reached today presents a rare example not only in the context of Turkey, but also in the context of the world. The platform not only provides global and local news flow to its members and all its followers, it also strives to increase the knowledge level of the ecosystem through the events and training programs that are held. However, the largest output of the BCTR comes from Working Groups. Four different Working Groups, formed with the participation of BCTR members, have published five reports to date and work is ongoing for the new ones.

The Relations of the Public and Blockchain in Turkey

By its very nature, the blockchain claims to be an alternative solution to the function of central structures. On the other hand, this claim will strengthen the central structures instead of directly threatening them and raise their reliability, in addition to the possibility of being able to perform a function that will serve to improve the quality of them. In this case, the interest in the blockchain technology of public institutions in Turkey is continuing to progress in parallel to the development of the ecosystem in Turkey.

We have witnessed the foundation of Blockchain Research Laboratory (BZLab) in 2017 by Informatics and Information Security Research Center (BİLGEM) which is a part of the Scientific and Technological Research Council of Turkey (TÜBİTAK). This laboratory, which includes professional cryptology experts who have been working for many years in the institution, has been working on developing unique algorithms and solutions since its inception. While TÜBİTAK BİLGEM continues to do work on this, it joined BCTR's collaborations in 2018. In 2018, the Institution held the first National Blockchain Workshop event in Ankara with international participation, and this year continues to work on making the second event happen in Istanbul on September 25-26, aiming for even wider participation.

The Ministry of Trade is strengthening its strategical plans about blockchain technology with the collaboration agreement signed by the Minister of Trade Ruhsar Pekcan and the Chairman of the Executive Committee of Turkish Informatics Foundation (TBV) Faruk Eczacıbaşı, as a part of the "Blockchain in Public Conference" that was held on January 10, 2019 under the auspices of the Ministry of Trade of the Republic of Turkey. Again, Minister of Trade, Ruhsar Pekcan, states that they have established the "Behavioral

Public Policy Unit" within the ministry with these words: "Today, we are taking the first steps towards a new initiative. As the Ministry of Trade, we are taking on a very important task on blockchain and we are becoming one of the pioneers in this field. We have completed our works and we have officially established our first unit on this in the presence of all the ministries."

Blockchain is in the Development Plan of the Republic of Turkey

With the transition to the Presidential Government System, the 11th Development Plan, the development plan that covers the years from 2019 to 2023, was unveiled as the first development plan of the new system in July with the approval of President Recep Tayyip Erdoğan. What makes this plan interesting in terms of blockchain technology is the statement "Blockchain based digital central bank currency will be introduced". Thus, the blockchain ecosystem that is rapidly growing in Turkey and the financial solutions that take place among the most important applications of this technology were added to the roadmap by the highest authorities of the country in a planned manner. With this step, Turkey managed to attract the attention of many technology companies, starts up and the related entities of the other countries in the global arena.

Initiatives and Other Works

Undoubtedly, the ecosystem that is rapidly growing in Turkey under the name of blockchain technology is not only composed of the attention of BCTR and public institutions. We are witnessing that the academic world, initiatives and the private sector are actively paying attention to this field in Turkey.

The rapidly growing number of academic articles and the training and curriculum efforts about blockchain and cryptocurrencies in different universities are gathering attention. On the other hand, new initiatives are added to the existing initiatives in our country each day. While global cryptocurrencies spend effort to enter into the market due to Turkey being a field of activity for blockchain technology, similar structures operating in Turkey are still continuing their works on expanding to the global arena.

As the strategical process is continuing for making Istanbul turn into a financial center, Turkey is one of the pioneering countries that adopt the blockchain technology and idea with its young and dynamic population, technological infrastructure and opportunities, and its healthily growing ecosystem structure.

References: "This section was shortened from the article that was written for The Turkish Perspective, titled the same"

BCTR has reached a total of 75 members in its first year on its journey to create a healthy and sustainable blockchain ecosystem in Turkey.

BCTR, having members that have global impact and are from a variety of main sectors such as finance, banking, law, logistics, manufacturing, transportation, technology, among which are Türkiye İş Bankası and Softtech, has also collaborated with a variety of NGOs and academic organizations, most importantly with the Ministry of Trade. Shortly thereafter, four Working Groups were established under the roof of BCTR

With the joint work of BCTR members and the representatives of the collaborators who participated in these working groups, important reports were published on 6 different topics within a year. These reports are on:

Digital Identity

Blockchain Technology Terminology Work Report

Finance, Banking and Insurance

Blockchain Regulations in the World

Law, Regulations and Public Relations

Vendor Recognition Platform

Manufacturing, Logistics and Transportation

Conceptual Architecture for Blockchain

Technology, Education and Events

Open Data

The publications are available free of charge on the BCTR website https://bctr.org.

DATA SECURITY AND CYBER SECURITY

Data security is the process of protecting your most critical business assets (data) against unauthorized or unwanted use.

This includes not only deploying the right data security products but also integrating people and processes with the technology you choose to protect data throughout its lifecycle. Enterprise data protection is a team sport.

Data Security Risks

According to IBM's Cybersecurity And Privacy Research 2018 survey, 75 percent of consumers do not buy the products of compa-

The most important concerns about a variety of security threats

Spoofing attacks via email	**85%**
Phishing via email	**82%**
Web browser spoofing attacks	**65%**
Ransomware	**64%**
Insider data theft	**47%**
Phishing via social media	**45%**
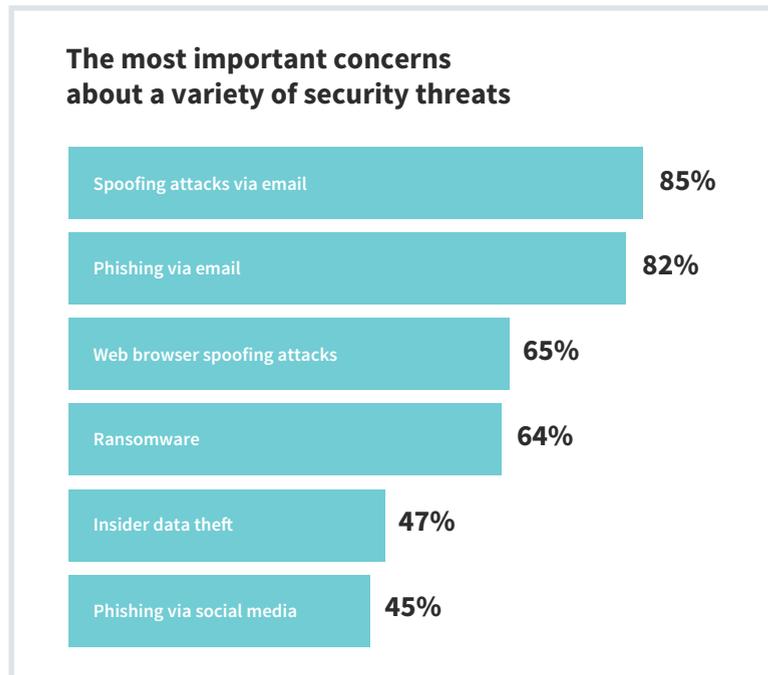
nies that they do not trust with the protection of their own data. For this reason, data and data security have become very important for company revenue and expenses.

Problems

There are many difficulties in ensuring the security of data. These are briefly; data growth, new privacy regulations, operational complexity and lack of cybersecurity skills.

Rapid growth of data
The data is growing at an exponential rate. Keeping up with new data sources in multiple environments creates new complexities on an unprecedented scale.

Continuous change of privacy regulations
General Data Protection Regulation (GDPR), California Consumer Privacy Act (CCPA), Lei Geral de Proteção de Dados (LGPD) in Brazil and more.

Operational complexity
The transition to the cloud, big data technologies and the different tools provided by multiple vendors increase the complexity.

Cyber security skills
Organizations are already facing a lack of skilled security experts, and this gap is expected to increase just in the next few years.

Total Records Stolen through Data Violations **Between 2018-2023**

$ 146 billion

Legend:
- North America
- Latin America
- Central and Eastern Europe
- Far East and China
- Indian Region
- Asia Pacific
- Africa and the Middle East
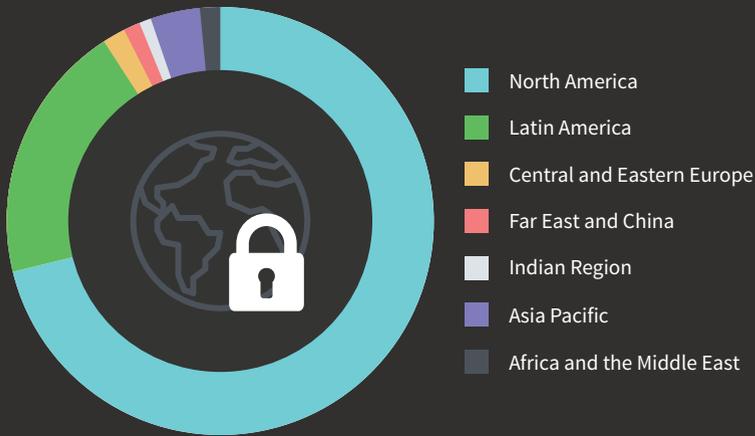
33 billion

Records to be stolen through cybercrime in 2023

%55 of all Data Violations **will target the US in 2023**

Source: Juniper Research

Data at Risk

Category	Percentage
Finance	46%
Contact Information	40%
Retail	40%
Insurance	38%
Health	38%
Electronics	33%
Education	33%
Entertainment	30%
Law	27%
Accounting	27%
Public	23%
Information Technology Services	22%
Service	20%
Real Estate	13%
Logistics	12%
Engineering	9%
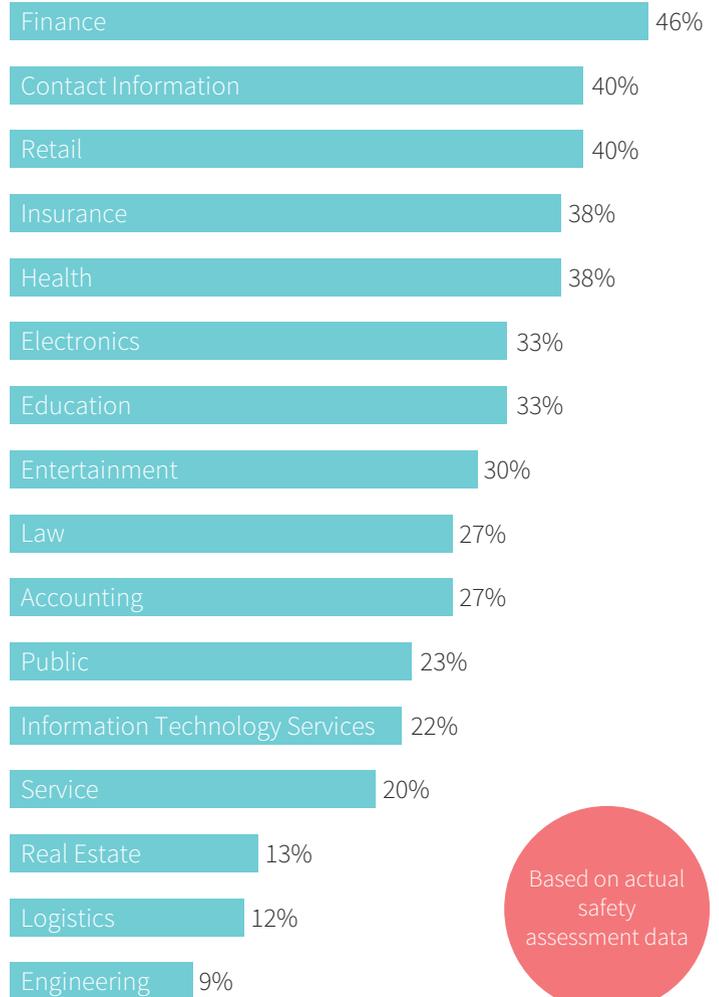
Based on actual safety assessment data

Breakdowns of Cyber Security Startups

Purchasings and Public Offerings by Category in Security Technology

■ Public Offering   ■ Purchasing
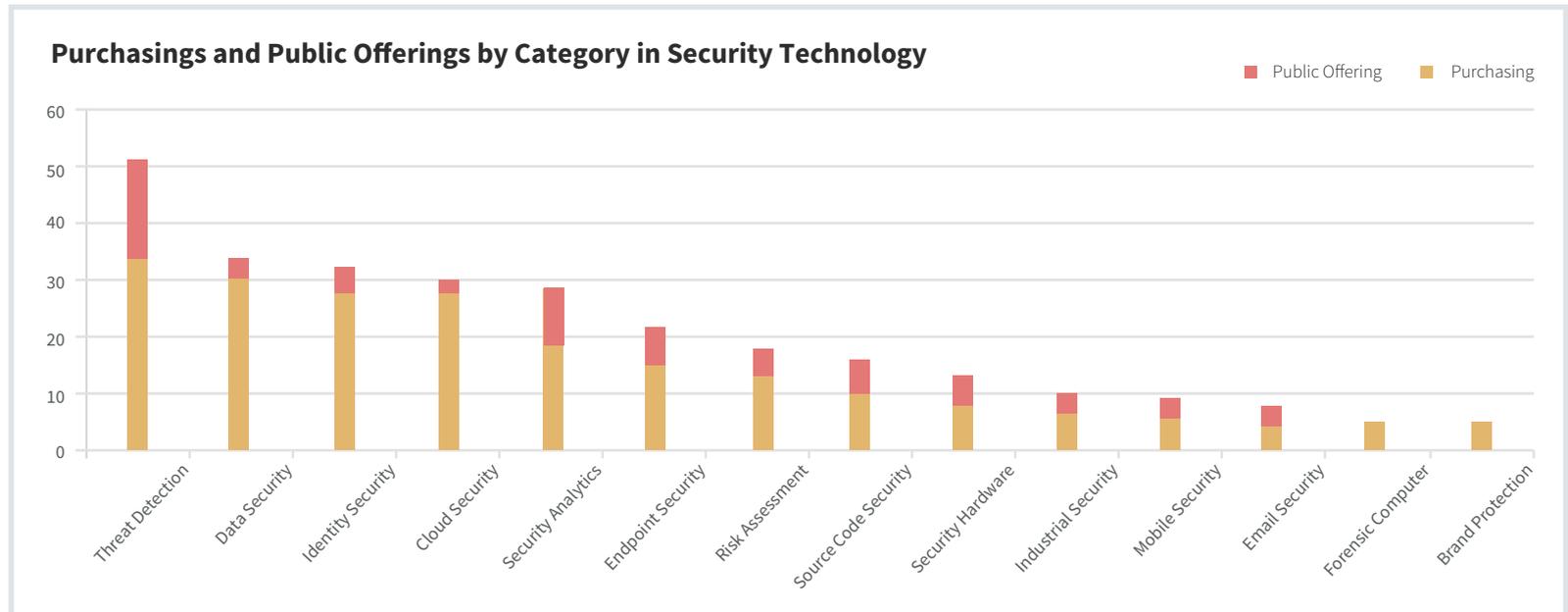
Some Data Security Strategies

Data security technology can take many forms and protects data from an increasing number of threats. While most of these threats come from external sources, companies should focus on their efforts to protect their data from the inside as well. The first measures to be taken in data security are:

Data encryption: In data encryption, a code is applied to each piece of data, and access to the encrypted data cannot be achieved unless an authorized key is issued.

Data masking: Masking specific data fields can protect data from external harmful sources as well as from being exposed to internal personnel who may potentially use the data. For example, the first 12 digits of a credit card number can be masked in a database.

Data deletion: There are times when data that is no longer active or unused should be deleted from all systems. For example, if a customer requests that their name be removed from a mailing list, the information must be permanently deleted.

Data flexibility: Making backup copies of data can recover data from accidental deletion or being stolen during a possible data breach.

Data security standards

NERC - Critical Infrastructure Protection

China's Personal Information Security Specification

PCI Security Standards

Regulatory compliance requirements

Personally Identifiable Information (PII)

Protected Health Information (PHI, HIPAA)

Credit card information

Cybersecurity mistakes made the most by enterprises

Not having information about personal data storage and processing laws

Most governments try to protect the safety of their citizens and pass bills on this matter. There are laws such as the General Data Protection Regulation (GDPR) in Europe and the Law on the Protection of Personal Data (KVKK) in Turkey.

Violation of these laws, failure to comply with them, may result in large fines and sanctions for businesses. Even worse, businesses may have to suspend their operations until they comply with the law.

Inadequate protection of all resources

Most Startups use Amazon Webservices (AWS) or Google Cloud services to develop their products. And many think that they are safe due to this situation. Cloud services are of course also secure, but an easy password to your account could cost you a lot. At the same time, safety measures must be considered in addition to the services used.

Being caught unprepared for DDoS attacks

DDoS is an efficient way to download resources from the Internet. This method is highly preferred to hide advanced attacks because it is less costly.

In 2016, the cryptocurrency e-wallet startup called Coinkite had to be shut down after many DDoS attacks. Therefore, it is necessary to not be caught unprepared for such attacks.

Employees not being conscious enough

While it is very important for entrepreneurs to be aware of data security in startups, it is also necessary to raise the awareness of their employees. As the attackers are well aware of the weakness of the engineers working in startups, they organize attacks directed at the employees. We call these attacks social engineering tricks. For this reason, it is very important to motivate and direct all employees to take a security-oriented attitude.

BİZNET

Since its establishment in 2000, Biznet has been carrying out projects in the field of data security and providing consultancy and audit services. In 2011, through FVD İleri Teknoloji Yatırımları A.Ş. has invested in Biznet and acquired the majority of the shares. One hundred percent of the shares of the company were acquired by Faruk Eczacıbaşı in May 2018.

Biznet made it to the Deloitte Technology Fast 50 Turkey list four times. The company has undertaken many large-scale cyber security projects.

At a Glance

Location
Ankara

Establishment year
2000

Website
www.biznet.com.tr

Category
Data Security,
Network Security,
Mobile Security

Cybersecurity

Data security and service continuity have become more important than ever before, as the services become increasingly virtual. In addition to membership-based services, the rapid growth of physical transactions in the virtual environment, as well as the emphasis on the sensitivity of personal data stored in the virtual environment following the European regulations, created the need for small-scale enterprises and institutions to increase cybersecurity measures.

Major Leaks in the Recent Years

One of the biggest data leaks in 2019 took place in March and resulted in the theft of personal data from 100 million Americans along with 6 million Canadians. The leak, which is expected to cost Capital One about $ 150M, was carried out by exploiting a vulnerability in the firewalls of the cloud IT company the company

M. Emre Aydın

PCI Checklist, CTO and Co-Founder

Biography

He is an author continuing his doctoral studies in Astronomy and Space Sciences and held lectures on high-performance scientific computing algorithms. He worked on POS and TSM software development in the data center, high accessibility services and PCI-DSS compliant infrastructure architecture designs for 7 years. He is one of the founders of the PCI Checklist, one of the 4th-semester graduates of Workup, and he functions as the CTO.

Contact Information

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was receiving services from.

Similarly, one of the most controversial leaks of the year occurred in Adobe's cloud computing infrastructure. The necessary measures for the leak that was detected in October were taken on the same day, but this did not prevent the publication of the personal information of 7.5 million users on the Internet.

One of the most important data leaks of the year originated from Bulgaria in July. In the event where the personal data of approximately 5 million Bulgarian citizens were stolen, the leakers shared the data with Bulgarian media companies. It is stated that the data of almost all Bulgarian citizens exist in 57 files shared.

In particular, leaks coming from the companies working in the IT sector can lead to criticism in the sector. For example, one of the leaks in 2019 came from the forums of Comodo, the SSL Certificate provider. Information and encrypted passwords of 170,000 Como-

do Forum users were detected on a website.

2019 also brought about the shocking news of the hacking of VPN service providers. NordVPN's name has been mentioned frequently due to its aggressive advertising policies in recent years, shared that between January 2018 and March 2018, a server of theirs had a potential security vulnerability but that it was exploited only once in March according to what they could detect. The vulnerability was the result of the installation of an unsafe remote access system on the server by the data center NordVPN receives service from, and according to what the company shared, NordVPN had no idea of the installation of this software. Although the leak occurred in 2018, the company announced it in 2019 and said, as a justification, that they wanted to make sure that the researches were completed and that the attackers could not access the different servers. 3 TLS keys were stolen as a result of the leak. Although NordVPN initially announced that the stolen keys had expired, in fact this was true when the leak was disclosed, not when the leak occurred. In short, the keys that expired in December 2018 reveal that the traffic of NordVPN users between March 2018 and December 2018 can, in fact, be deciphered by intruders.

Market Size

All these events confirm the predictions that the cybersecurity sector will grow. In 2017, the investment in the cybersecurity sector was 4.4 billion dollars and in 2018 this amount increased to the level of 5.3 billion dollars. With more than $ 1 billion in capital investment in 2018, Israel continued to maintain its position as the largest cybersecurity investor after the US.

Apart from the investments made, cybersecurity spendings are showing that the increase continues globally as well. While the cybersecurity market size was 3.5 billion dollars in 2004, it grew by 12.4% in 2018 compared to the previous year and reached 114 billion dollars. This figure is expected to reach 170.4 billion dollars in 2022 and 300 billion dollars in 2024.

Of course, the expenses are always below the losses resulted from data leakage or service interruption. Cybersecurity Ventures shared in its 2016 report that the cost of cybercrime worldwide was $ 3 trillion, which is expected to reach $ 6 trillion by 2021.

In addition to new investments, investments of large companies in cyber security are also increasing. Satya Nadella, the CEO of Microsoft, shared that in the near future, the company's cybersecurity spendings will reach $ 1 billion annually. Alphabet, Google's parent company, announced a cloud-based cyber security telemetry service called Backstory. Unlike conventional SIEM (security in-

formation and event management) applications, this service will have a model of licensing according to the number of employees a company has. It also announced a cloud-based DDoS protection solution similar to Akamai, and CloudFlare. Thus, companies will be able to directly benefit from the DDoS protection technology Google uses in its services such as Gmail, and the search engine, YouTube.

California-based company Palo Alto Networks announced that it has purchased Zingbox for $ 75 million in cash. Thus, it will expand its cyber security services in the field of IoT. HP, another company from California, announced the acquisition of Bromium for an undisclosed amount, especially in order to ensure security of software on hardware terminals. California-based virtualization technologies giant VMware announced that they have acquired Carbon Black for $ 2.1 billion. The company said that they would protect their cloud-based systems with big data, behavioral analysis, and artificial intelligence.

In recent years, one of the types of attacks that have been particularly painful for small businesses has been the so-called ransomware or crypto locker, which encrypts the sensitive data of the enterprises and provides access to data in exchange for ransom. While the worldwide cost of ransomware in 2015 was $ 325 million, it rose to $ 5 billion in 2017 and $ 11.5 billion in 2019. This cost is expected to be 20 billion dollars by 2021.

Sources of Leak

The impact of third parties on data leaks is increasing. According

to the report from New Forrester, 17% of the leaks were a result of third parties in 2017 and this rate rose to 21% in 2018. According to the Opus & Ponemon Institute, this rate went up to around 59% in 2018 On the other hand, the popularity of risk assessment instruments has started to increase.

The use of third-party services is on the rise with Internet services that are getting more complex. According to Gartner, the third-party network of companies using third-party services in 2019 increased 71% compared to the previous year. It is seen that 60% of companies received more than 1000 third party services.

One example that indirectly affected third-party services was the Docker Hub leak in 2019. The information of 190,000 accounts that had access to the containers on Docker has been stolen and integrations such as GitHub and BitBucket were put under risk. Although this number corresponds to a small proportion that is 5% of Docker Hub users, the fact that a Docker image has been tampered with makes it possible that the vulnerable image has been moved to many systems.

In particular, an investigation on the leakage of personal data shows that 60% of the leaks were caused by human error and that the health sector suffered the most from this. When 4856 events were examined in the research published by Egress, it was noted that 43% of them were a result of the spreading of incorrect information. It was revealed that 18% of this resulted from e-mailing sensitive information to the wrong people or making errors in Bcc use, 20% was a result of sharing information with the wrong peo-

ple by fax or similar methods and 5% of it was due to data sharing as a result of phishing attacks.

The majority of these data leaks are related to small and medium-sized enterprises. The vast majority of data is either stolen from small businesses, or the small-scale third-party businesses,

Who are the victims of the breaches?

16% Breaches of public sector enterprises

15% Breaches relating to health institutions

10% Breaches of the financial sector

43% Breaches involving small business victims
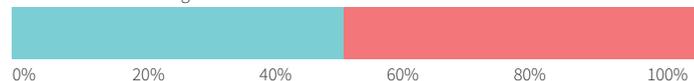
Breaches

that large companies receive services from, have a share in the leak. According to the Verizon 2019 Data Breach report, 43% of the leaks are associated with small and medium-sized enterprises.

We Do Not Learn From the Mistakes
Unfortunately, what has happened to different companies in the

Quote

"By 2022, cyber-security ratings will become as important as credit ratings when assessing the risk of business relationships."

Gartner
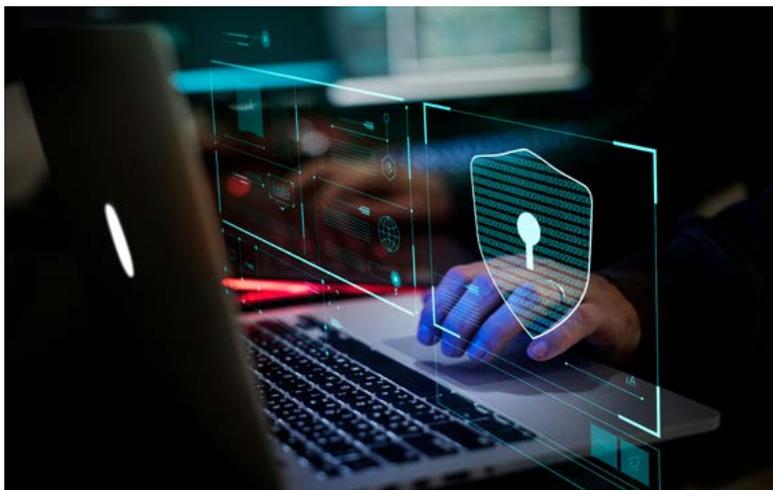
past did not teach a lesson, although these leaks are popular and widely seen on media. For example, PCI Checklist's research on 1200 websites shows that 12% of websites still have the vulnerability that led to the Equifax leaks and 46% of websites have the vulnerability that started the British Airways leak. Although 2 years have passed since these leaks and they are closely monitored by the media, the fact that small and medium-sized sites have not yet taken the necessary measures shows that cyber security monitoring tools have not reached a sufficient level of affordability and usability, and that awareness of these tools are not sufficiently established in the sector.

Both the increase in the use of third-party services in the IT sector and the increasingly difficult cyber security adaptations of small and medium-sized companies indicate that cyber security assessment tools will be needed more in the near future.

QUANTUM COMPUTERS

Quantum Computers

Quantum computer is a technology based on the concepts of superposition and entanglement in quantum mechanics, which enables us to solve the NP-hard problems that classical computers cannot solve or can only solve in long periods of time, by parallel calculations.

The concept of bit, which is used as a memory unit in classical computers, is replaced by the quantum bit, qubit in short, in quantum computers. In addition to being able to display the values of 0 or 1 like the conventional bit, qubits can also end up in the state called superposition and have the values of 0 and 1 at the same time. The superposition state may exist until its value is measured with an observer. This is best observed in Thomas Young's experiment (double-slit experiment), which visualizes the idea that matter has both wave and particle properties. It is observed that the pattern the atoms sent individually from two parallel slits in a plate leave on the opposing wall exhibits wave behavior when no observer is present, that is, a single atom can pass through two cuts at the same time and leave a pattern that is similar to that of colliding waves neutralizing one another; while the pattern when the observer starts to participate in the experiment is similar to the behavior of the particle, and it is seen that it passes through only one cut at a time. This state corresponds to the state where the qubit units in quantum computers display both 0 and 1 behavior at the same time until their value is observed. There is only one probability in the measurements since the value of the qubit

cannot be known without disturbing the quantum property. For example, in the experiments done on the IBM Q Experience platform that IBM made available for the users, it is seen that when circuits formed with qubits are measured, the results are 0 at a certain rate and 1 at a certain rate. This feature allows quantum computers to solve the algorithms in parallel that conventional computers solve in sequence. Thus, it can solve a problem that a conventional computer can solve in a few centuries in a matter of seconds.

To base this on a real-life analogy, it is certain that the value of a coin thrown into the air will either be heads or tails when it falls. If we think about this in terms of conventional bit behavior; tails would correspond to 0 and 1 would correspond to heads. When the coin is spinned on the table, it cannot be known for certain whether it is tails or heads until it is stopped and its value is obser-

ved. In other words, it can be both tails and heads when spinning, which corresponds to the fact that qubits display both 0 and 1 behavior in superposition. In fact, just like the example of a spinning coin, this is called a "spin" in quantum mechanics as well. This allows qubits to conclude the calculations made by normal bits in sequence, in parallel.

This different behavior also means that quantum computers cannot be programmed like conventional computers. In other words, when programming quantum computers that will be advantageous in solving certain special problems only, quantum algorithm equivalents for the classical algorithms need to be present. Beginning to form quantum algorithms already and testing them with small amounts of data on quantum computers that are produced on a scale of the first output stage will mean having quantum ad-

vantages one step ahead of others when quantum computers that larger amounts of data will be able to be used in are produced.

The importance placed on quantum computers worldwide has been on the rise since the early 2010s, with investments from the United Kingdom, Europe, America and China exceeding billions of dollars. On the basis of manufacturing companies, Canada-based D-Wave systems has been working on quantum technology since 1999. They have partnerships with Google, Nasa and Lockheed Martin, one of the largest American defense companies. The difference of D-Wave from other manufacturers of quantum hardware is that the system, which is part of quantum mechanics, uses the lowest energy orientation. The general name of this method is "quantum annealing". D-Wave, having produced its latest system of 2000 qubits (D-Wave 2000Q), has a total investment of more than $ 200 million, with the Canadian government having contributed 10 million dollars. In this system, rather than measuring individual qubits, the general behavior of the system is observed when proceeding and optimization problems are, first and foremost, one of the problems this system can solve. Some of these are stated to be problems of which flight should be carried out through which gate at the airport, optimization of which assignment is to be handed to which robot in the factories, and portfolio optimization in finance. Founded in 2013, Berkeley, California-based startup Rigetti Computing is working on quantum computers based on the logic gate, which is the basis of conventional computers (superconducting). With the support of major investment companies such as Andreessen Horowitz and Y Combinator, it has approached a total investment of $ 120 million. Among the larger companies, Google
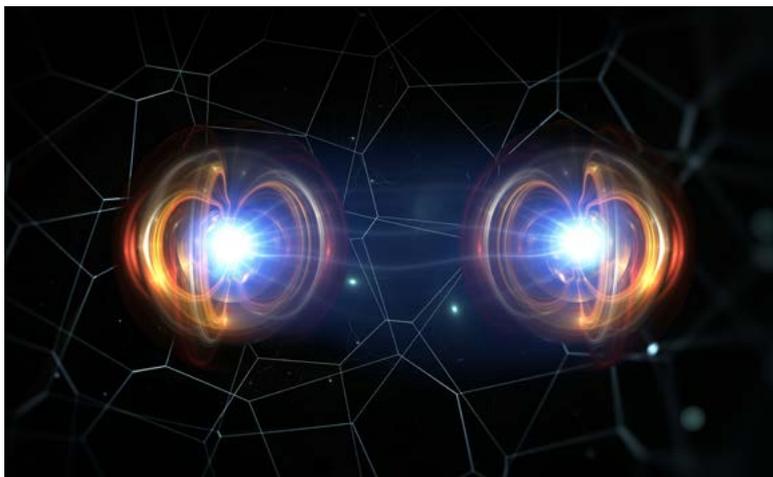
has produced a quantum computer of 72 qubits, IBM of 53 qubits, and Intel of 49 qubits. Unlike D-Wave, it is difficult to make the qubit system bigger because the concepts such as control of the communication between the qubits and error correction are introduced in the systems produced by such companies.

The aim is to benefit from the efficiency of quantum computers in many different fields such as data security, weather forecasting, finance, and especially chemistry. In banks such as Barclays and JP Morgan Chase, teams working on algorithms to solve such problems on quantum computers were formed and partnerships were established with companies that offer quantum software services in order to make use of the speed advantage of quantum computers, especially in terms of finance, in making investment optimizations, risk analysis, and portfolio optimization happen in real-time.

Softtech's USA office, Maxitech, has also begun contacting the most active companies in quantum software consulting. Among the first companies that were contacted are California-based QC Ware and Canada-based 1QBit. As a result of our research, we have observed that the main objective of both companies is to provide both the senior management and technical staff of the companies with awareness on the topic of quantum, to identify the problems that quantum advantage can be used for by establishing working groups and preparing the quantum algorithms beforehand for when the computers that real banking data can be processed in begin to be produced.

Quantum computers that can compute using customer-oriented large-scale data or banking data like conventional computers have not been produced yet but are expected to start to be manufactured within 5 years. In addition, conventional bits are still needed to measure the values of the qubits at the end of the processing. In other words, even though the process is performed with qubits, conventional bits make it possible to see the results. Therefore, quantum computers should not be considered as a substitute for conventional computers. However, in addition to this, they will have the power to reduce the time algorithms that would take to be solved by using only the conventional computers down from years to seconds.

ROBOTIC PROCESS AUTOMATION

MANUAL

Processes

RPA

Robotic Process Automation

What Is It?

Robotic Process Automation (RPA) is a technology that continues to be in development. They are the automated scripts, that perform tasks that are repeatable, predefined, and certainty-demanding in a variety of environments, of robot software that adopt approaches called workflow automation and screen scraping.

What can be done with it?

With RPA, you can check e-mails, make calculations, and connections with allowed applications and APIs, and even make invoice payment verification and billing.

RPA enables the automation of various flows and processes in areas such as financial services, accounting, human resources, supply chain management, and customer service, and can reduce the operational burdens on your organization by carrying out processes such as creating and sending invoices, revealing fraud findings, card activations, service order management, and reporting.

Which industries can RPA be used in?

Industry and Manufacturing

E-Commerce

Banking and Finance

Telecommunications

Insurance

Energy and Public

What are the advantages?

> It helps you get fast and consistent results.

> It reduces the error and risk rate to zero.

> It provides the opportunity to use human resources more efficiently.

> It can complete routine procedures by having a 24/7 working schedule.

> It reduces operational burdens.

RPA and the Future

Interest shown over time
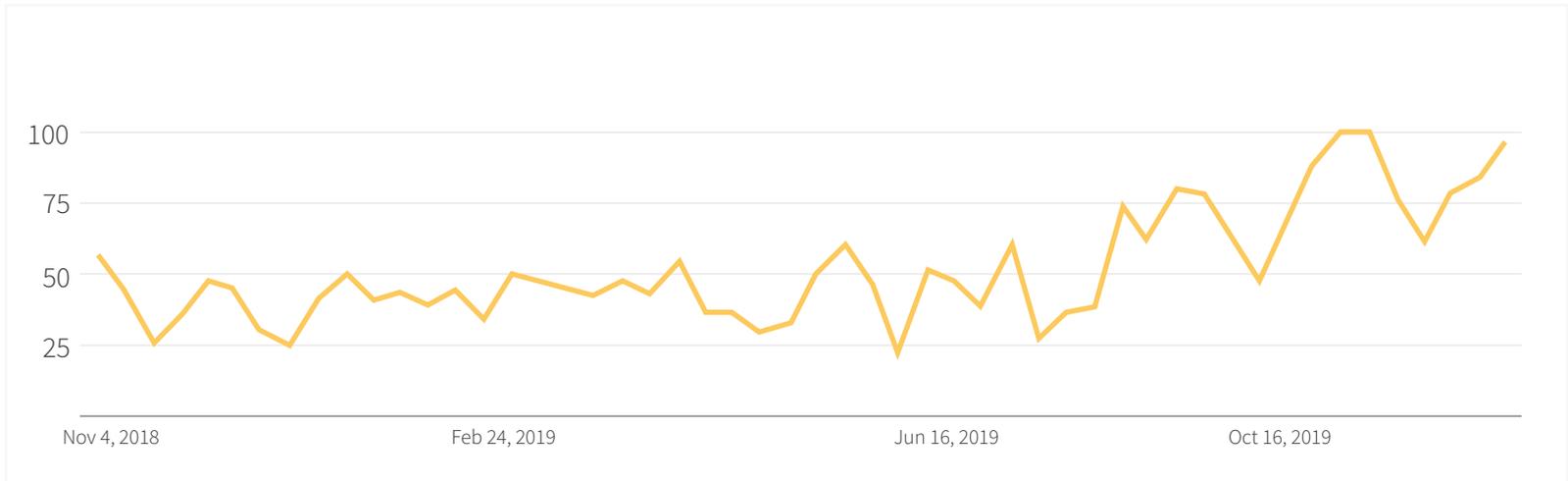
Source: Google Trends

Since the 1990s, a growing number of companies have sought to reduce operating costs by sourcing some of the white-collar jobs from developing countries with low-cost labor, such as China and India. However, the increasing trend in labor costs in developing countries in recent years has made it more difficult to reduce costs by taking advantage of labor cost differences. It is anticipated that RPA tools, which are positioned to solve the automation challenges faced by modern enterprises, will be increasingly strengthened by technologies that are developing and becoming more widespread such as Artificial Intelligence (AI), Cognitive Computing and Internet of Things (IoT). However, there are two major challenges that await the world of RPA.

Namely the requirements for the integration of the software, which are:

Design and Development

Maintenance

Future Challenges in the World of RPA

1. Simplification of RPA Programming: NoCode RPA

Simplification of RPA programming will help democratize and expand the use of RPA systems. Currently, most of the automation with RPA is carried out by programming, which is one of the biggest costs of RPA implementation. In addition, the need for developers with RPA knowledge to develop relevant software is a limiting factor. As long as we do not adopt the no-code RPA solutions, a long programming process and dependence on third-party companies will pose serious risks.

2. Automation of Modeling: Self Learning RPA

Before programming, RPA developers need to understand the process they are going to be programming. However, most companies do not have accessible process information. The process information that is automatically extracted from videos and recordings is one of the most important priorities for RPA companies. Unless you work for the government, even constantly repeating processes rarely have manuals or current diagrams. Companies try to create these process diagrams. The current solution requires extensive pilot stages in order to conduct interviews to understand the process on a high level, cross-check logs for outliers, and ensure that the process is modeled correctly, which is a manual and time-consuming process. For this reason, the world of RPA is in search of methods and techniques to facilitate modeling.

3. Smarter RPA Systems: Cognitive Automation

It is anticipated that the scope of the processes that can be automated by Cognitive Automation and RPA software can be extended with Artificial Intelligence and Machine Learning.

Aims   **What Is RPA and how does it affect?**   Effects

Accounting & Finance
Invoice processing • Processing of expenses
• Creating a cash flow statement

Payroll & Fringe Benefits
• Processing of personnel data
• End-of-year tax regulation

Job application procedures
• Filling in application forms
• Lack of data control

Sales processes & Operations
• Recording of customer information
• Name specification processes

Automation of routine office work

Improvement of quality
Elimination of human errors

Speed
Increasing the process speed by a hundred

Increase in efficiency
30-75%

Increased functionality
Focus on working with more added value

RPA

- Computer coded software

- Programs that change humans performing tasks based on repeating rules

- Cross-functional and cross-application macros

Not RPA

- Walking, talking, automatic bots

- Physically present paper processing machines

- Artificial intelligence or voice recognition and response software

What can be done?

- Opening an email and its attachments
- Logging into enterprise web applications
- Moving files and folders
- Copying and pasting
- Filling forms
- Reading and writing on databases

- Scraping data from the web
- Connecting to the system API
- Making calculations
- Extracting structural data from documents
- Collecting social media statistics
- Following the "if/then" decisions/rules

RPA Example: Automation of debt receivables operation

Automaker B applied its business operation in the global service center on RPA by automating its receivable process.

Humans perform a series of activities manually.

Read invoice information	
Understand the content and record the information	
Verify reliable data	
Send to general accounting	

ERP system is active, but there is no automation.

Robot performs the recording, verification, and sending of invoice information.

Read invoice information	
RPA provides recording of information	
RPA verifies data	
RPA transfers data	

The time spent on routine office tasks is reduced by approximately 65-75%. Improvement in task performance quality. (error reduction)

Realization of quick gains

Minimum pre-investment

No interruption in subsystems

Business unit leadership with IT support

Highly scalable, adapts to the changing work environment

RPA Positioning

- Other/Access to sourcing decisions
- Core RPA capabilities
- Front Office
- BPM
- ERP
- Productivity tools

Tansu Yeğen

UiPath, Vice President of EECIS Region

Biography

In 1989, he graduated from the Department of Electronics Engineering at Boğaziçi University. He holds a master's degree in Business Administration from Marmara University.

He began his working life in 1991 at Digital Equipment and continued advancing his career in 1994 as Sales and Marketing Director at Hewlett Packard Turkey. He joined Microsoft Turkey in 1998 as Manager for Marketing, and he continued to carry out his duty as Assistant General Manager in 1999 in the same company.

Then, he took the role of General Manager at Apple, Turkcell Ukraine, Turkcell Europe and IBM respectively, and he was appointed as vice president of Samsung Turkey in 2013. As of August 2018, he is the Vice President of EECIS Region at UiPath, responsible for 30 countries.

Cooperation between Humans and Robots

Founded in Romania by two computer engineers Daniel Dines and Marius Tirca in 2015, UiPath is the world leader in the Robotics Process Automation (RPA) market. Since it was established, UiPath has been committed to using the RPA Platform, which runs on artificial intelligence, to save employees from continuously repeating manual work, thus improving efficiency, productivity, customer experience, and employee satisfaction. Headquartered in New York, UiPath has more than 50 offices and more than 3,000 employees in Europe, the United States, the Middle East, and Asia. It supports the automation of more than 5,000 customers worldwide, including global companies and government agencies, and the digital transformation of corporations, with the vision of "A Robot for Every Employee". UiPath is titled the fastest growing software company in the history of enterprise software.

We introduced the office in Turkey in October 2018 and from that date on, we have formed a strong ecosystem with the business partners which covers the banking, e-commerce, telecommunications, insurance, retail, manufacturing, and technology industries. We helped more than 100 companies convert their business processes into robotic process automation including some of the biggest institutions of Turkey.

The Impact of RPA

To briefly describe Robotic Process Automation, we can say that they are rule-based software that can do repetitive manual jobs. It is a so-called 'ROBOT' software technology that uses digital systems and applications to complete a rule-based process and task, imitating humans thoroughly, and performing things that humans do using their hands and eyes, quickly and accurately instead. RPA software is not a part of an organization's information technology structure, on the contrary, it enables efficient and rapid use of technology without any changes in the infrastructure. Therefore, it does not impose an additional burden on the data processing departments.

In 2013, McKinsey predicted that automation technologies such as RPA would rise rapidly. In 2014, RPA attracted the attention of corporations in automating business processes and in 2016 it started to be actively used.

According to UiPath's recent survey with 502 executives in 8 countries with the Economist, 90.8% of the institutions reported that they use automation for their reporting processes, while 50.6% of them said that they use it comprehensively. Today, RPA has become a fundamental technology and strategic priority for companies around the world. Research shows that the adoption and scaling of RPA is accelerating all over the world. When we look at the spendings made by companies, it is seen that the investment in RPA increases every year. Forrester predicts that the RPA market will reach $ 23 billion by 2023. Gartner predicts that, by 2022, 85%

of the companies with annual revenue of more than $ 1 billion will be using RPA. RPA is also a very important technology that acts as a bridge on the road to Intelligent Automation (IA) supported by 'Artificial Intelligence' (AI) and 'Machine Learning' (ML). In line with the strategies of the companies operating in this field, software robots are predicted to be completely artificial intelligence robots within 2 years. Owing to this, robots will have the ability to continuously learn from people, make predictions, answer questions that are asked to them, or issue warnings in advance, and the areas of use of RPA will expand.

A Robot for Every Employee

Now we have automated 3 to 7% of the enterprise processes with robots, but this ratio is quite high in volume and has made major contributions to the company in terms of efficiency, speed, and accuracy. With the vision of Daniel Dines, founder and CEO of UiPath,

A Robot for Everyone

Volume

Robots for personal needs

Robots as assistants of employees

Happy and productive employees

3-7% of the processes · More than 40% of processes · Processes
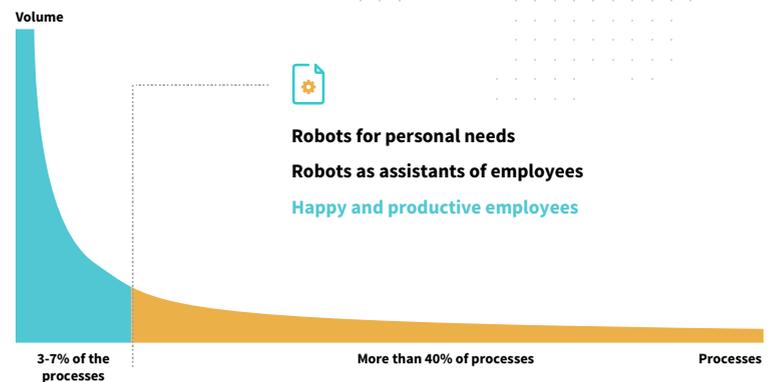
"A Robot for Every Employee", we are moving onto a very different area in the coming period. As of 2019, we have taken important

We need to develop new competencies

Professional Competency Categories	2002-2016	2016-2030
Physical + Manual Competencies	▲ 3%	▼ 11%
Basic Cognitive Competencies	▲ 1%	▼ 14%
Higher Cognitive Competencies	▲ 9%	▼ 9%
Social + Emotional Competencies	▲ 13%	▼ 26%
Technological Competencies	▲ 27%	▼ 60%

McKinsey Global Institution: Competency automation and the future of workforce, May 2018

steps in the development of this vision, however, 2020 will be the year that signals a brand new era where robots and humans truly collaborate. With the vision of "A Robot for Every Employee", we aim to transfer more than 40% of the processes in the company to robots and therefore help employees engage in more value-added tasks. At UiPath we work hard to inform organizations about RPA and artificial intelligence. We work together with many universities to educate both students and alumni on topics such as artificial intelligence, machine learning, and deep learning because we have to prepare both our youth and our employees for the future. Towards 2025, there will be 130 million new jobs in the world, 70 million of which will be handled by robots, while the remaining 60 million will be done by humans. Around 50% of these people will have to receive training again in order to be able to perform these new jobs. We all have to gain new competence. According to the

report McKinsey released last year: by 2030, the need for the physical and manual competencies of the employees of an institution will decrease by 11% and the need for the technological competencies of them will increase by 60%.

Automation First

I and my colleagues, having worked in large corporations for many years, know very well that in today's business world, the profit rates of companies are gradually shrinking, so twentieth-century solutions are no longer sufficient to survive. We can only regain the efficiency, accuracy, and speed needed to succeed in a data-driven world by automating processes and handing over repetitive boring jobs to robots. At the moment, RPA has become a fundamental tactic and priority for all countries of the world. Considering their strategic goals, 84% of the managers in India and 73.2% of the managers in the USA prioritized the use of RPA technology.

In our experience, the first companies to reap the benefits of automation will not be the companies who used RPA the first, but it will be the companies that develop the mindset of "Automation First". The Automation First mindset means examining the work your team is doing and determining which tasks are human jobs and which tasks can be performed by robots. Your automation team should look at key processes and determine which ones are the most time consuming and have the most volume. After that, all we have to do is transfer those tasks to the robots and help our employees reach their true potential.

FINANCIAL TECHNOLOGIES

With the growth of Fintechs or the use of technological innovations, designing and providing financial services has been one of the most important developments in the financial sector in the last decade. Fintech has the potential to play a major role in increasing access to financing worldwide.

Factors driving the growth of Fintechs

> Technological evolution: The rapid pace of technological advances was combined with a reduction in the cost of technology. Mobile phones are transforming finance. Millions of people around the world have phones, but don't have banks. These non-bank markets, led by the countries of Asia and Africa, have inspired fintech innovations that use the existing technology in the developed world.

> Developing customer expectations: Customers are now demanding digital services and experiences similar to those of other industries. Fintechs are viewed as ecosystems organized by large technology companies that offer financial services to monetize existing user data or relationships, as well as existing platforms (for example, AliPay, which supports Alibaba's e-commerce offer). The fact that these technology platforms have a very high relationship with their users often provides a huge advantage over other companies in terms of customer acquisition costs.

> Financing and capital availability: Financing for Fintechs has increased significantly over the last few years. The biggest obstacle for the existing financial institutions is about organization and

skills as much as investing in technology. In the beginning, it is never easy to change traditional mindsets and operating models in order to offer digital journeys rapidly. Financial institutions either invest in fintech startups or collaborate through strategic partnerships.

> Support from governments and regulators: Both governments and regulators accepted fintech as the evolution of financial services and proactively supported them. Governments and supervisory authorities are developing various methods to protect their financial systems. Europe focuses on fintech startups that are approved of in a controlled manner by regulatory institutions, while China provides flexibility in granting financial characteristics to technology firms located in the country that already have reached a large number of users. On the other hand, with a more hybrid structure, the US supports both technology companies and financial technology companies in terms of global expansion. The main objective of each country is to ensure that their countries adapt quickly to the upcoming financial evolution.

Fintech Categories and Their Importance

Categories	Services
Money transfers and payments	Online foreign currency transactions
	International money order
	Branchless digital banking
	Interpersonal payments and non-bank money transfers
	Mobile payment in-store
	Cryptocurrency e-wallet
Budget and financial planning	Online budget and financial planning tools
	Online retirement management tools
Savings and investment	Interpersonal borrowing platforms
	Investment through crowdfunding
	Online investment advice and management
	Online stock broking
	Online betting with odds
Borrowing	Online-only loan providers
	Online markets and aggregators for loans
	Online loan brokers and websites
Insurance	Insurance premium comparison sites
	Smart devices with insurance connection
	Insurance through the application only

▬ Areas destroyed by FinTechs   ▬ Areas invented by FinTechs

The comparison of FinTech categories according to their acceptance rates (2017-2019)

	2017	2018	2019	Order
Money transfer and payments	18%	50%	75%	1
Savings and investment	17%	24%	48%	2
Budget and financial planning	8%	20%	34%	4
Insurance	8%	10%	29%	4
Borrowing	6%	10%	27%	5
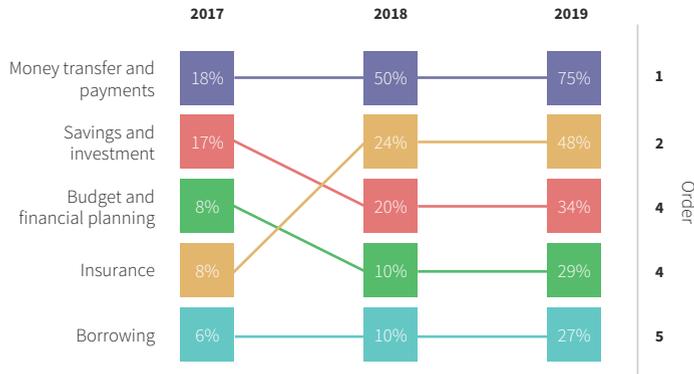
Fintechs Offering Services to SMEs

As seen among consumers, SMEs are participating more and more in FinTech ecosystems, which combine different service offerings provided by established financial institutions and, in some cases, non-financial service companies. Such ecosystems provide SMEs with efficiency and security through interoperability and the ability to connect different business functions.

SME FinTech services	Services
Banking and payments	Online foreign currency transactions
	Branchless digital banking
	Online payments
	Mobile POS payment machines and scanners
Financial management	Online invoice management tools
	Online cash flow and liquidity management tools
	Online bookkeeping and payroll tools
Financing	Online lending platforms
	Online markets, aggregators and intermediaries
	Online capital and borrowing promissory notes
	Online invoice financing and dynamic discounting
Insurance	Insurance premium comparison sites

Success consists of three basic points of focus for Fintechs:

01	User Experience
02	Regulation
03	Technology

Regulation

It continues to be important that regulations are flexible enough to create innovations in the global market on a level that is competitive and they are realized in a controlled manner enough to be able to maintain locality. Together with the focus on globalization, we could say that the importance of developing structures that can be compatible with local regulations will increase.

Technology

The most successful fintechs are those that quickly offer innovative products. Fast-growing startups usually succeed without using brand new technology. When their data-driven approaches are combined with early and continuous user testing, startups that can quickly test the market and the customer stand out. Although the latest technology is exciting, it can sometimes be complicated and in this case, validating the business model increases the time things take.

Therefore, despite its allure, artificial intelligence applications are rather complementary to fintech startups. It is becoming more and more important to move faster and increase the amount of data. The importance of data-driven marketing and personalization will gradually increase. Because of the speed and low initial cost, Fintech startups using cloud technology are becoming more prominent.

Reasons for using FinTech Challengers (2017-2019)

■ 2017   ■ 2019

	More attractive prices or fees	Easier to set up an account	Access to different and more innovative products and services	Better experience, better product features and service quality
2019	13%	30%	24%	16%
2017	27%	20%	18%	12%
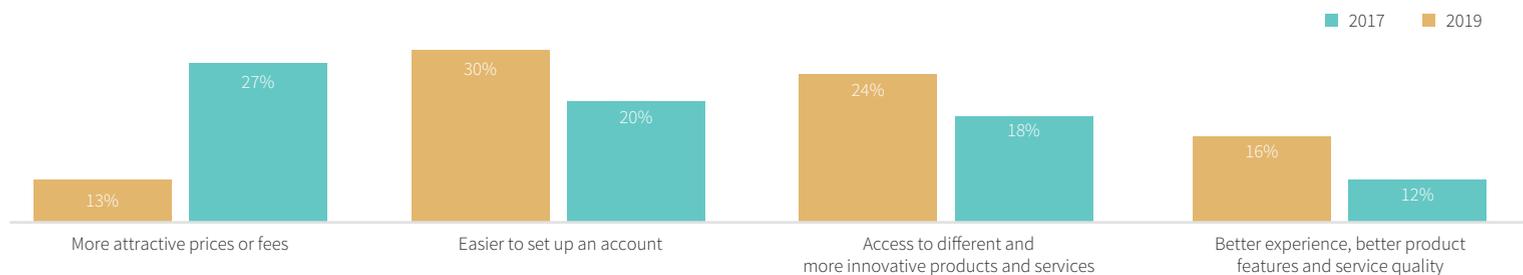
Global FinTech Adoption Index 2019 -EY

User Experience

Especially due to the non-mobile websites of many banks abroad, fintechs have progressed quite fast. It was easy for fintechs to gain customers by creating a semi-valuable application with excellent user experience (UX).

Today, most financial institutions have changed the retail user experience, offering full mobile functionality with best-in-class design principles. Nowadays good user experience has become a norm. While it is impossible for poor user experience to find a place for itself in the market, the increase in good experience also brings price competition back under the spotlight.

Competition in Financial Technologies

Competition in financial technologies takes place mainly between three types of institutions.

01 **Institutions which are Technology Companies and want to offer Financial Services (tech-fin)**

02 **Financial Technology Companies (fin-tech)**

03 **Traditional Financial Institutions**

Fintechs are now beginning to provide their user experience by differentiating their products as well.

Differentiation in consumer banking products and services:

Hybrid checking account

Debt rewards

Early access to salary checks

Loan offer for customers without credit history

Customer loyalty rewards

Leading Chinese fintechs are often part of an internet giant's ecosystem that spans the entire fintech spectrum.

	Europe and America	China				
	Numerous successful, focused fintechs	Larger fintechs that are usually a part of the broader ecosystem				Relatively few niche, independent fintechs
		Ant Financial	Tencent	Ping An	JD.com	
Payments	PayPal Stripe	Alipay	Tenpay	E-wallet	JD Pay	99Bill Lakala Ping ++
Asset management	Betterment Wealthfront	Yu'e Bao	Li Cai Tong	LU.com	JD Finance JD Expert	CreditEase Suishouji Golden Axe Wacai
Financing	LendingClub SoFi	Ant Check Later	Weilidai	Ping An Orange	JD Finance	Qudian.com Rong360 ppda.com Yirendai Dianrong.com
Insurance	Oscar Metromile	Zhong An Insurance	WeSure Zhong An Insurance	Ping An Insurance Zhong An Insurance		
Banking	Atom	MYBank	We Bank	Ping An Orange		
Credit scoring	Credit Karma	Zhima Credit	Tencent Credit	LU.com	JD Credit	

Source: Press research; McKinsey interviews

1. Institutions that are Technology Companies that want to offer Financial Services (tech-fin)

Techfins are technology companies that often find a better way of providing financial products within a wider range of services.
Examples of Techfin companies include Google, Amazon, Facebook, and Apple (GAFA) in the US, and Baidu, Alibaba, and Tencent (BAT) in China.
A few years ago, Jack Ma, the technology visionary, co-founder and executive chairman of the Alibaba Group, explained the difference between Fintech and Techfin.

Google, Amazon and Apple launched their own payment systems (Google Pay, Amazon Pay, Apple Pay), but some have recently decided to go a step further with more advanced payment solutions.

Apple announced a credit card that will be released next summer. To create this card, Apple partnered with Goldman Sachs. This card will be associated with the Apple Pay and Wallet on your iPhone.

Apple Wallet is a solution that not only gives users many details about their account balances but also collects data from all the other cards (store cards, credit cards, student ID cards, debit cards…). People can see their spendings and manage it in real time.

Facebook's new cryptocurrency solution, Libra, has also made a big impact this year.

Quote

"There are two big opportunities in future financial industry. One is online banking, all the financial institutions go online; the other one is internet finance, which is purely led by outsiders."

Jack Ma

Wallet and payments network	amazon pay	Amazon Pay is a wallet for users and a payment network for both online and conventional traders. There are 33M + users of this service as a mobile wallet.
Cash	amazoncash	Amazon Cash connects offline and online commerce by enabling users to accumulate digital accounts (cash) at partner retailers.
SME loans	amazonlending	Amazon Lending offers Amazon dealers loans ranging from $ 1K to $ 750K (for a year). The program has given loans surpassing $ 3B in total since 2011.
Membership rewards	reload	To minimize Amazon's exchange fees, Amazon Reload encourages Prime users when they use their digital Amazon debit card by refunding 2% of the money.
Insurance	amazonprotect	Amazon Protect, in partnership with The Warranty Group's London General Insurance Company, offers accident and theft insurance in select EU countries.
Credit Cards	amazon.com STORE CARD	Amazon offers its Store Card and Prime Store Card in partnership with Synchrony Bank. The card can be used on certain websites and in retail stores.
	prime VISA	A consumer credit card offered through Chase provides a 3% discount on Amazon.com and Whole Foods. Chase and Amazon are also reportedly in talks to offer SME commercial cards.

According to Bain, "Many of the tech giants possess the ingredients of success: digital prowess, large customer bases, organizations well versed in improving the customer experience, and ample leeway to extend their corporate brands into banking".

As a result, an increasing percentage of consumers are eager to use the financial products offered by these unconventional companies, especially when their level of experience is higher than those offered by older organizations.

2. Financial Technology Companies (fin-tech)

In the last few years with the Fintech boom, investors have become more selective after many high and low-level fluctuations. While general funding remains on historically high levels, technology investors on a global scale are increasingly investing in companies that have proven their worth and are advanced in achieving significant scales and profits.

**Despite the discount agreements,
funding for VC-backed fintech companies
went up by 24% in Q2 2019**

$4,971	$6,496	$2,321	$5,517	$8,456 / $4,500	$2,974	$2,671	$3,316	$5,840	$4,913	$4,700	$6,186	$20,640 / $14,000	$6,206	$7,450	$6,739	$8,344
Q2'15	Q3'15	Q4'15	Q1'16	Q2'16	Q3'16	Q4'16	Q1'17	Q2'17	Q3'17	Q4'17	Q1'18	Q2'18	Q3'18	Q4'18	Q1'19	Q2'19
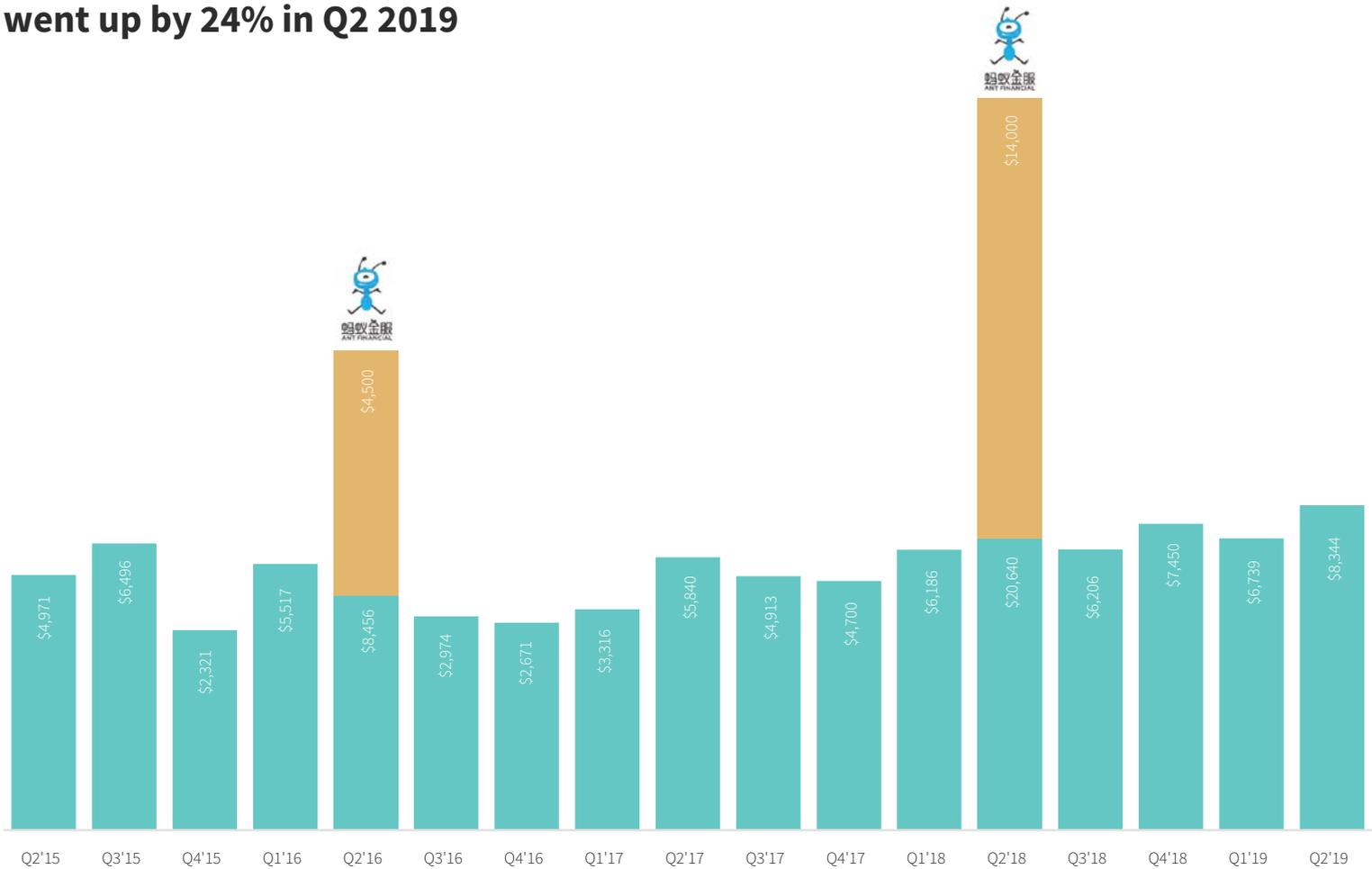
In 2019, 7 fintech unicorns were born in the 2nd Quarter and 2 new fintech unicorns were born in the 3rd Quarter

North America

USA

stripe Worth $ 22,5B	**MARQETA** $2B
coinbase $8B	**robinhood** $7.6B
carta $1.7B	**credit karma** $4B
affirm $2.9B	**avidxchange** $1.24B
SoFi $4.8B	**Kabbage** $1B
oscar $3.2B	**Clover** $1.2B
BREX $2.6B	**chime** $1.5B
Lemonade $2B	**Hippo** $1B (Q3'19)
CIRCLE $3B	**SYMPHONY** $1.4B
PLAID $2.7B	**TRADESHIFT** $1.1B
Dataminr $1.6B	**AVANT** $1.9B
Bill.com $1B	**DevotedHealth** $1.8B
gusto $3.8B	**zenefits** $2.1B (Q2'15)
ROOT $1B	**toast** $2.7B

Europe

England

TransferWise $3.5B	**Revolut** $1.7B	**monzo** $2.55B	**Greensill** $3.5B
checkout.com $2B	**ivalua** $1.1B	**OakNorth** $2.8B	

Germany
N26 $3.5B

Sweden
Klarna. $5.5B

Asia

China

LU.com $39.4B
$1.5B
$1.4B
$1B

Japan
Liquid $1B

South Korea
Toss $2.2B

India
policybazaar $1B

Paytm one97 $10B

South America

Brazil
Nubank Worth $ 10B

Australia

Australia

Airwallex $1B	**judo bank** $1.4B (Q3'19)

3. Conventional Financial Institutions and Collaborations

In general, incumbent financial institutions have been slow to respond directly to fintech attackers, perhaps because of the fear of the disappearance of strong conventional franchises. Many began experimenting with digital offers in non-core businesses or in geographic areas, where they could take more risks. Retail banks were responsible for developing digital experiences that would match fintech in their core experience.

An increasing number of established and fintech companies realize the benefits of combining strengths in partnership models. When they reach saturation in local digital marketing channels, many fintech start actively seeking partnerships to grow their business. Larger ecosystem firms also bring a broad and loyal customer base from core internet businesses.

The incumbent financial institutions are more cautious, especially in terms of partnership on basic checking account and mortgage products. However, large customer data sets collected over a long period of time are very attractive properties for fintechs. In addition, the compliance and regulatory competences of the officials may be invaluable to newer, smaller participants. As a result, we expect both partnerships and acquisitions to increase.

Approximately 88% of the global financial service providers believe that they might lose a significant market share to fintechs. In response to this competitive pressure, 56% of them had to change their main strategies. They are looking for ways to invest in or cooperate with fintech companies, which expect to expand their partnerships in the next few years.

These collaborations enabled financial technology firms to create specialized multi-part products with a specific focus.

Previously, fintech startups focused on separating banks by focusing on attacking border margins and customer needs.

Today, some fintechs have combined these solutions to compete with established financial institutions.

Banks of the Future
Product offers by top financial services

Company	Credit Products				Payments				Asset management				Financial Establishment Type
	Staff/ Client	Housing Loan	Business	Student	Credit Card	Debit Card	Person-to-Person	Processing / Gateway	Brokering	Robo Advisor	Deposit	Crypto	Entry Point (first product)
CHASE	✓	✓	✓		✓	✓	✓	✓	✓	●	✓		Bank
Bank of America	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		Bank
US Bank	✓		✓		✓	✓		✓			✓		Bank
Marcus BY GOLDMAN SACHS	✓										✓		Bank
amazon			✓		✓	✓							Technology Platform
SoFi	✓	✓		✓	✓	✓			✓	✓	✓	●	Alternative Loans
LendingClub	✓		✓						✓				Alternative Loans
Square	✓		✓			✓	✓	✓				✓	POS Payments
robinhood					●				✓		●	✓	Brokering
coinbase									✓			✓	Crypto Brokering
affirm	✓					✓		✓			●		POS Loans
Klarna.	✓					●		✓					International POS Loans
Betterment	✓									✓	✓		Robo advisors
wealthfront	✓									✓	●		Robo advisors
PayPal	✓		✓		✓	✓	✓	✓					Payments
acorns						●				✓			Micro-investment
STASH	✓					●			✓				Investment
chime	✓					✓					✓		Digital Banking
TransferWise						●	✓						International Money Transfer Fintechs
Revolut						✓	✓			●		✓	International Digital Banking
monzo	✓					✓	✓						International Digital Banking
N26						✓	✓			✓	✓		International Digital Banking
stripe			✓			✓		✓					Payments
Kabbage			✓			✓		✓					Commercial Financing
BREX			✓		✓								Commercial Financing

✓ Currently available   ● To be announced

Fintech Investments

Europe maintains leadership over Asia in fintech financing in the first quarter of 2019

Global VC-backed fintech fund, 2018 2nd Quarter - 2019 2nd Quarter ($ Million)

	Q2'18	Q3'18	Q4'18	Q1'19	Q2'19
South America	$33.9	$23	$216.1	$47.6	$348.9
Australia	$25.4	$204.7	$72	$130.6	$10.6
Africa	$61.3	$30.3	$11.2	$76.9	$6.9
Europe	$943	$832.7	$886.6	$1,715.8	$1,550.6
Asia	$2,065.0	$1,967.3	$2,612	$959.5	$1,094.4
North America	$3,510.8	$3,148.5	$3,651.8	$3,808.4	$5,332.8

■ North America ■ Asia ■ Europe ■ Africa ■ Australia ■ South America
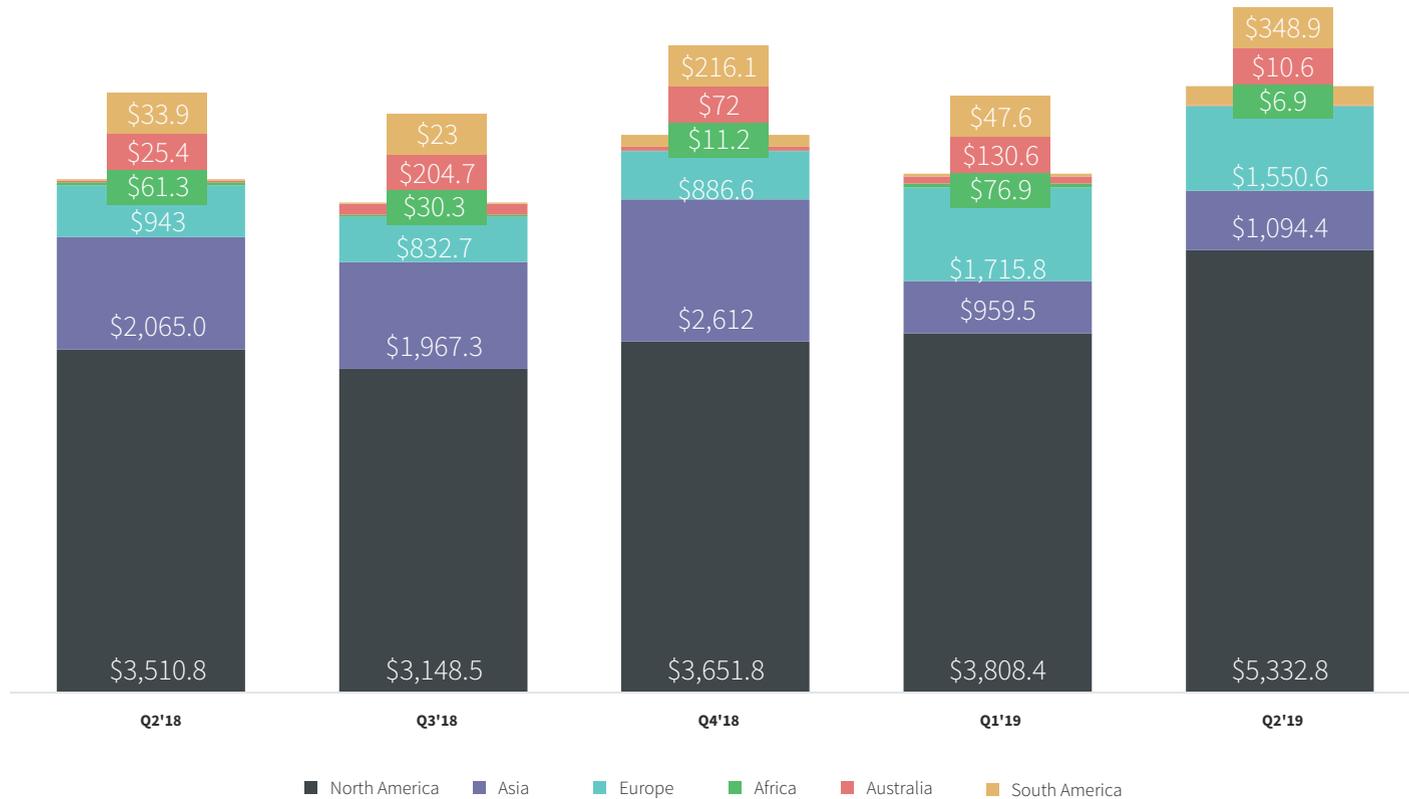
Serkan Uğraş Kaygalak

Türkiye İş Bankası, Deputy General Manager

Biography

He was born in 1975 in Bingöl. He graduated from Middle East Technical University / Faculty of Economics and Administrative Sciences, Department of Business Administration. On the same year as his graduation, Kaygalak began his career in Türkiye İş Bankası A.Ş. as an Assistant Inspector Intern on the Board of Inspectors and served as an Assistant Manager in the Treasury Department in 2006. During this period, he served in the units of derivative transactions, money markets, deposit pricing, and operations. In 2008, Kaygalak worked as the Manager of the Tarsus Branch and in 2010 as the Vice President responsible for information systems audit at the Board of Inspectors, and he was appointed as the Card Payment Systems Division Head in 2013.

Kaygalak completed the Advanced Management Program at Harvard Business School in 2018 and was promoted to Deputy Chief Executive on 26/08/2019.

Kaygalak has the title of Cambist, and he speaks Level 2 English. He is married and has one child.

The Relationship Between Platform Business Model and Technology

With the commercialization of the Internet a quarter of a century ago, our lives and the world went through a radical process of change. With the spread of new technologies that have led to productivity and scalability being redefined, countries, sectors and business people have had to face an increasingly complex world.

As the point technology reached and habits change, the screen time spent by people on their mobile devices exceeds 3 hours per day (1) and As the point technology reached and habits change, the screen time spent by people on their mobile devices exceeds 3 hours per day (1) and the time they devote to e-commerce in front of the screen is approaching nearly half an hour (2). While individuals want to make use of this time period with good user experience in the most efficient way, companies try to gain the highest possible commercial return within this period of time.

cts/services to customers at the appropriate time by developing a new trade approach with ecosystem business model/strategy, are increasing.

In particular, it is observed that global players create new business branches in different industries by creating an ecosystem and leveraging customer base and products/services. The ecosystem Alibaba group from China has which spans from e-commerce to financial services, ING Bank's B2B and DanskeBank's B2C marketplace companies along with Yandex marketplace that is the collaborative startup of the search engine Yandex with Sberbank can be shown as leading examples on this matter.

In line with this process, we see that the masses come together with the opportunity to access multiple services in a comparable way, fast and with low cost and that digital platforms referred to as platforms are formed. With increasing screen time and changing living conditions due to the impact of technology, platforms are becoming increasingly important to consumers in their daily lives. We are seeing these platforms transform into structures called "ecosystems" where different players come together, with the desire of players from different industries to offer their own services to the clients.

Unexpected collaborations taking place with the emergence of ecosystems, the loss of clarity of the industry's boundaries, the increase in the ownership of the channel owners, and the loss of the importance of superiority in the long-established competition among the competitors, lead to permanent changes in the business world. In this new world, we are able to see that while success and the right decisions may have great rewards, the punishment for not keeping up and being idle can be much heavier than before.

The number of examples in which the financial institutions owned by service providers such as banks, insurance companies or platform companies that possess competencies such as access to big data, benefiting from economies of scale and providing produ-

From Global Platforms to Local Payment Systems

In the platform economies, the emergence of a global landscape such as the fact that a Turkish company selling products to the

German consumer through a China-based marketplace application entrusts its products to an American-based logistics company for transportation is becoming an ordinary example. In this sense, it will be easy to say that concepts such as online sales or e-export have become a global multinational phenomenon.

In terms of payments, we can say that the resulting picture is actually focused on localization rather than being global. When we look at the target regions in the world, in terms of payment methods, we see that different local payment methods other than international card brands we all know are gaining prominence. It would not be wrong to say that they are born according to the economic and social conditions of the region concerned and in this sense are accepted as the most preferred method of payment by the local economy rather than the international card schemes. The payment system we are accustomed to in regard to Turkey is the credit card, while this method can be Sofort which has more of a money order structure, iDEAL in the Netherlands or Alipay or WeChat Pay on the Chinese front.

These are the methods preferred the most by consumers in the relevant markets when making payments.

When an enterprise that will make international sales through an e-commerce channel offers these different methods at the time of payment, it actually gives the customer an experience that makes the customer feel at home.

There is also the sense of reliability side of things.

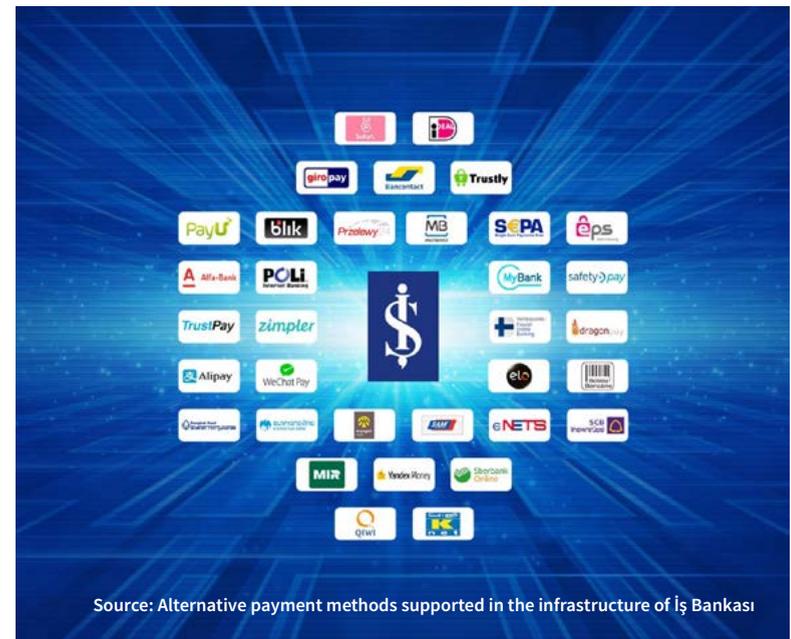We see that customers may not want to enter card information and this reduces the likelihood of the customer completing the

Shares of International Payment Methods

Source: Edgar, Dunn and Company, 2018

purchase if they wish to make purchases from abroad, especially from a site that has not yet reached sufficient size and recogniti-

Source: Alternative payment methods supported in the infrastructure of İş Bankası

on. On the other hand, when a customer who sees the button for payment methods such as Sofort or iDEAL, which the customer uses for payments when shopping on e-commerce sites in his/her own country, we see that the probability of the shopping transaction turning into sales is quite high when the customer knows that he/she will enter his/her information through the interface of his/her bank. As can be seen in the image below, only 23% of global e-commerce is carried out through international cards, while different methods such as local cards, bank transfers, and electronic wallets stand out in the remaining part.

With this need in mind, we have offered an extensive local variety where around 40 alternative payment methods and 26 currencies are able to be accepted along with the 8 big international card schemes to İş Bankası's virtual POS infrastructure since 2016.

Payment Systems Technology

Thanks to the technology-based dynamic structure of the world of payment systems, which enables different stakeholders to work together, we have implemented a solution in which payments that can be made not only by card but also by different methods can be delivered to customers through a single infrastructure. In fact, such a service expansion has made our Bank a payment platform operator that can support different payment methods rather than a conventional payment provider. These systems, each of which operate on different technical infrastructure and with different flows, are possible to be made available to member businesses on a single system thanks to a technology-based platform. Once

this infrastructure has been implemented, the introduction of new methods into the platform can now be achieved through an operation on a plug-in level.

It would not be wrong to say that it is an art to operate that many products and services, beyond just development, in the right way and to keep them up and going without interruptions.

We consider payment systems technologies as another point that we differentiate from the industry along with product diversity, innovation, and our pioneering position. Nevertheless, we are fully confident that we will continue to be at the forefront of the ever-changing business world as well as the changing technological environment, with our aim to always improve and better ourselves which is a constant part of our culture.

(1)   Screen time stats 2019: Here's how much you use your phone during the workday, March 21, 2019 Jory Mckey
(2)   Statistica 02/2018: Monthly time spent on online shopping by users in US as of December 2017

PAYMENT TECHNOLOGIES

Payment Methods

Cash Payments

Are we heading for a cashless society? Research based on a general view of the world of cash in commerce shows that cash is still the most important payment method at the cash register, with all the innovations to facilitate digital payments.

Money Transfer Payments

EFT and money order based payments made through money transfer through banks are included in this scope. Third parties combining mobile experiences with these kinds of payment along with open banking will increase the rate of use of this method.

Card Payment Methods

A payment processor (Card Network) acts as a mediator between the member business and financial institutions and manages credit card transactions. The payment processor may allow transactions and make payments to vendors on time, facilitating the transfer of funds. The receiving bank is the financial institution that holds a seller's account to accept credit cards. The receiver processes the card transactions for a member business. Someti-

mes the payment processor and receiver are the same.
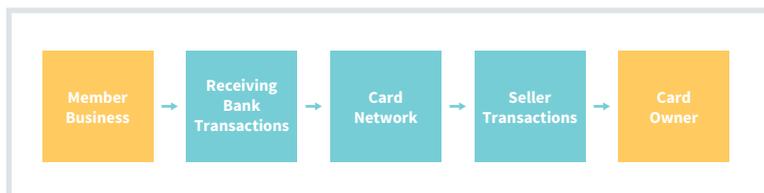
The card issuing bank is the bank of the card owner responsible for making payments to the recipient (and then the seller) for approved card transactions and collecting payments from the card owners.

Electronic Wallet Based Payment Method

In this method, since the intermediary card network is disabled, it
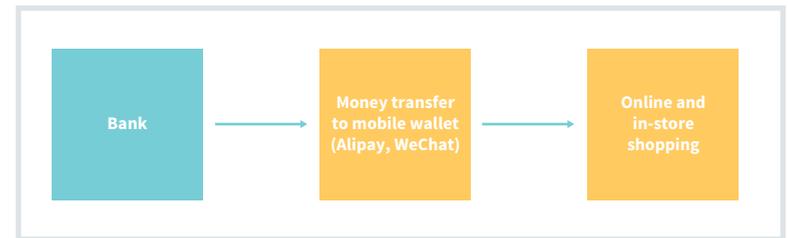
is possible to transfer money directly through person-to-person or from bank-to-bank models. The e-wallet ecosystem is constantly expanding worldwide, especially in China, such as Alipay and WeChat Pay.

Automatic Payment

This is perhaps one of the most frictionless payment methods. It is used for recurring payments of consumers in the case of subscriptions and bills. Instead of contacting a Bank or Direct Debit office, they can partner with a lender and connect to an automatic payment plan via an API. Direct debit is a common method, especially in Europe.

Payment Methods 2019

	Between Partners	Revenue	POS
Today	Better user experience	Technical debt - salary day	Static POS
Tomorrow	Payments ecosystems	End-of-shift payments	Flexible POS
Future	New infrastructure	Single account	No POS

Source CB Insights

How Are Payments Changing?

Fintechs are advancing in payment technologies by partnering with existing card networks. They are offering solutions integrated with Visa Direct and MasterCard Send. For example; Revolut offers both Visa and MasterCard options.

It is seen as only a matter of time for companies that provide solutions to vendors such as Square and Apple to eliminate the intermediaries and build closed-loop systems.

In particular, cards focusing on physical shopping cannot meet the demand with the shift of payments to e-commerce. Entering card information is laborious and does not provide security. All methods such as the virtual card and 3D Secure improve security, although disrupt the smooth flow of the process.
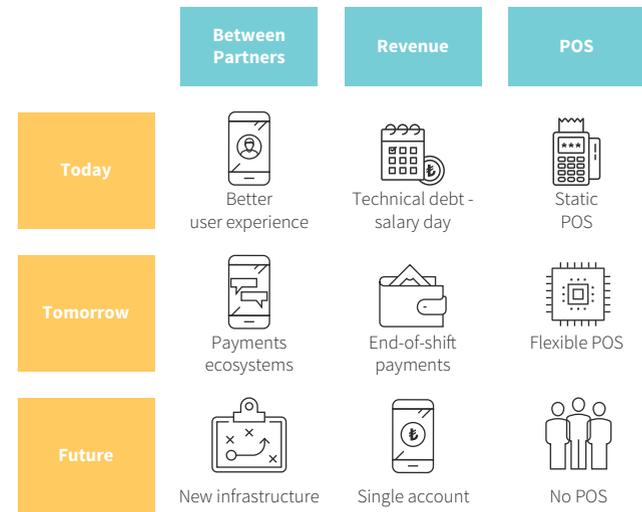
The world of payments is shifting from a world with POS devices, to a world without POS thanks to mobile POS and even biometric technologies. Cards are replaced by IoT devices and biometric technologies, while POS devices are replaced by mobile phones. Card networks that mediate payments are gradually decreasing and money transfer-based payments are increasing.

INTERNATIONAL MONEY TRANSFERS

Dr. Soner Canko

Interbank Card Center, CEO

Biography

Dr. Soner Canko graduated from Istanbul University, Faculty of Political Sciences in 1990 and holds master's and doctoral degrees from the same university, Faculty of Economics. He has taken roles in organizations such as Procter&Gamble, Citibank, Hewlett-Packard, and Ziraat Bankası in his professional career and he has been working as the CEO of Interbank Card Center (BKM) since July 2011. Blockchain Turkey Platform's Steering Committee Member Dr. Soner Canko continues to contribute to the digitalization of the finance sector with his experiences.

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Rules Are Being Rewritten for International Money Transfers

With the influence of Fintechs and open banking solutions, a new era in finance and banking is approaching in the world. While digitalization and the interest of new generation digital banks and technology giants in finance accelerate the introduction of innovative and value-added products into our lives, they also encourage conventional players to revise their strategies, to give more importance to digitalization and innovation.

International money transfers are among the leading areas of high-level competition among financial services.

Which Countries Stand Out?

The money people who work in different countries send to their families has a large share in international money transfers. The fact that India is the country where the most of the money is sent, followed by China, Mexico, and the Philippines, supports this argument. Unfortunately, the number of people who leave their country due to war has been increasing recently. This unpleasant reality also creates a new segment of users that make international money transfers.

Countries with the Most International Money Transfers
(2018, billion dollars)

Country	Value
India	79
China	67
Mexico	36
Philippines	34
Egypt	29
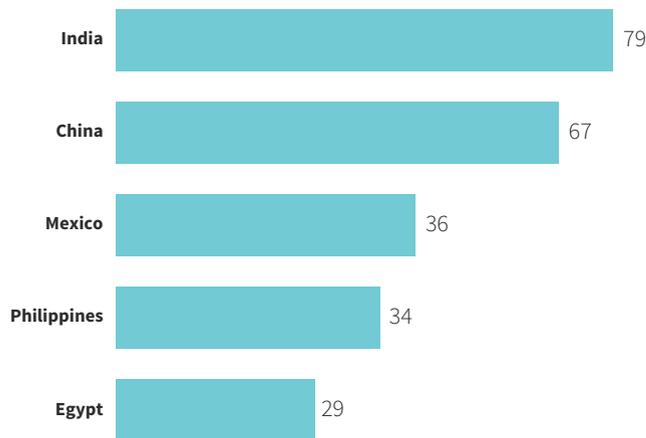
Source: World Bank

Development of the Amount of International Money Transfer and the Share of Digital Transactions

Legend:
- The Amount of International Money Transfer ($ Billion)
- The Share of Digital Operations (Right Axis)
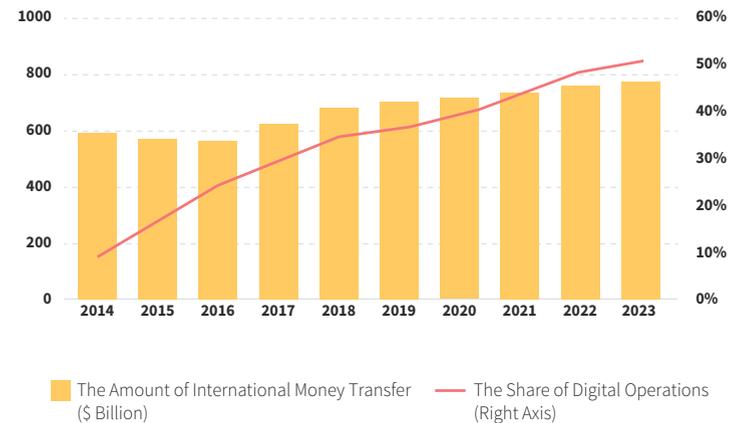
Source: World Bank, Business Insider Intelligence

Aside from individuals, international trade organizations also seem to be a target audience for the players offering services in this field.

A Slow Growing but Rapidly Digitalizing Market

Although significant amounts are in question, it is not possible to mention high rates of growth in money transfers to countries abroad compared to the growth in e-commerce, contactless or mobile payments. According to the data from the World Bank, international money transfers, which approached 600 billion dollars in 2014, decreased in the following two years. In 2017, the number of transactions, which rose to 633 billion dollars, approached 690 billion dollars in 2018. Due to being a mature market, digital will be the driving force of international money transfers, where growth rates remain in single digits. The share of digital, which is 10% in money transfers made in 2014, is expected to exceed 50% in 2023.

Need: "Fast, Cheap, Easy, Secure" - Solution: "Digital"

So, what is the reason behind the transition to digital? Since conventional players have a widespread network, nowadays a person can easily go to a contracted service location and make money transfers. However, the high cost of these transactions and the time the money takes to reach the other party are important problems that the users are faced with.

According to the World Bank, sending 200 dollars abroad costs an average of 7.5% of the money sent, that is, 15 dollars. This rate is approaching 10% in Southern Africa.

Digitalization also allowed us to design a better user experience while producing solutions to these problems. The increase in smartphone ownership and digital literacy eliminated the need to have thousands of branches to become an important player in international money transfer. We can now perform many operations with an application installed on our mobile phones. Transferring money abroad is also included in this set of operations. The fact that 31% of the adult population in the world does not have financial access and that it is possible to reach these people with only one mobile application shows us the great potential of digital solutions in international money transfers.

Dynamics are Changing with New Players and New Technologies

It is no longer possible to say that conventional players are alone in the market. **Fintechs** that produce digital solutions that meet

Number of Countries Served by Major Players

Player	Number of Countries that Money Can Be Sent to	Number of Countries that Money Can Be Received from
WESTERN UNION	200	200
MoneyGram	200	200
worldremit	52	151
XOOM a PayPal Service	1	130
TransferWise	20	48
Remitly	15	47

■ Number of Countries that Money Can Be Sent to   ■ Number of Countries that Money Can Be Received from

Source: World Bank, Business Insider Intelligence

the expectations have breathed a new life into the market. In this sense, WorldRemit, TransferWise, Remitly, InstaRem, TransferGo and Xoom which is a PayPal service started to become widespread as a result of their successful strategies and became important players used by millions today. Some of them, however, joined the unicorns club.

The technology that has increased the competition in the field of international money transfers has been the **blockchain**. Bitcoin, the existence of which many of us became aware of at the begin-

ning of the 2010s, has proven that it is possible to send an asset much faster and at a lower cost than traditional methods, wherever the receiver is located around the world. Cryptocurrencies such as ether, litecoin, XRP followed Bitcoin. However, the fact that there were too many question marks surrounding cryptocurrencies, excessive fluctuation of prices, and the fact that regulatory authorities kept their distance from these currencies, had a braking effect on their spreading. It was simply impossible not to be inspired by this trend.

Blockchain came into our lives as the technology behind Bitcoin and it took a place in the roadmaps of many institutions, however, the player that gained prominence with the solution it developed has been Ripple. Ripple, wanting to increase efficiency with a distributed structure, is working with more than 200 organizations in more than 40 countries as of the 3rd Quarter of 2019.

Central banks, on the other hand, have included blockchain-based digital currencies in their agenda. For example, the People's Bank of China reiterated that it has been working on digital currencies since 2014 and has made positive progress, and has recently announced that the name of its digital currency is Digital Currency Electronic Payment (DCEP). The developments in the world are closely monitored in our country, furthermore, according to the 11th Development Plan covering the period of 2019-2023, it is stated that a blockchain-based, digital Central Bank money will be implemented.

Undoubtedly, one of the biggest contributors to digital currencies

becoming a main topic of conversation was Facebook. Developed under the lead of Facebook and announced in June, the blockchain-based digital currency, Libra, is planned to be managed by an independent consortium called the Libra Association. Although most of the institutions that were to support the project initially, during the first announcement, have withdrawn their support later, it is stated that Libra will be launched in 2020 with the vision of becoming a global cryptocurrency. The Libra Association, which will primarily target 1.7 billion people without financial access, is implementing this initiative with the idea that financial services should be cheaper, faster and easier. If Libra succeeds, it will not be a surprise if it becomes one of the major players in international money transfers.

Another important development is Swiss Financial Market Super-

visory Authority - FINMA giving approval to Seba and Syngum and awarding them licenses to work on crypto banking. With this approval, banks will be able to buy, sell and manage cryptocurrencies and digital assets, and this is another important development for international money transfer.

Instant Payments Will Be a Winning Tool for Conventional Players

International money transfers will be one of the important areas of use of instant payments, also known as real-time payments, which is one of the most prominent concepts as of late in the finance world. This trend, which is the result of the steps taken with the vision of making national money transfers possible 24/7, has started to be used in payments between countries today. The most

successful solution for instant payments in the international arena was implemented in Europe. In the European Union, which adopts a single market policy, important steps have been taken especially in the last three years regarding instant payment structures. The SCT Inst (SEPA Instant Credit Transfer) scheme and the TIPS (TARGET Instant Payment Settlement) service enable money transfers between countries in Europe to take place within seconds. These solutions, which will initially include countries in the eurozone, will also support different currencies. Sweden, which uses the krona as its currency, has recently announced that it will join the TIPS, signaling that the support in question could first come for transactions in krona.

The Real Competition Begins Now

The international money transfer area, dominated by a small number of players, is at a completely different point, accompanied by the opportunities of digitalization today. The prominent concepts in this new era are fintech, cryptocurrency, digital currency, central bank digital currencies, blockchain, and instant payments. All of these concepts serve one purpose: to make international money transfers more accessible, inexpensive, fast, easy and safe... Players who best melt these four components in a pot, or even those who can create disruptive business models with new collaborations, will outrun their competitors in the future.

Major Players in the International Money Transfer Area

Card System Players — VISA, Mastercard

Cryptocurrencies — Bitcoin, Ethereum, XRP, Litecoin, BitGo, BitPesa, coins.ph

Digital Currencies — libra

Central Banks

Conventional Players — SWIFT, WESTERN UNION WU, MoneyGram

Fintechs — TransferWise, worldremit, XOOM (PayPal Service), Airwallex, paga, Remitly

Technology and Concepts — ripple, Blockchain, Instant Payments

Source: World Bank, Business Insider Intelligence

INSURANCE TECHNOLOGIES

Insurance and Financial Technologies

Prof. Dr. Selim YAZICI

Istanbul University Faculty Member and Co-Founder of FinTech Istanbul

Biography

Prof. Dr. Selim Yazıcı is the co-founder of FinTech Istanbul Platform and a faculty member at Istanbul University, Faculty of Political Sciences, Department of Business Administration. As a visiting professor at various universities, he holds lectures on FinTech and InsurTech as well as Entrepreneurship, Project Management, Business Continuity Management, Business Management, International Business, and Organizational Behavior.

He has co-authored the book "Electronic Insurance" (Elektronik Sigortacılık) (2002). His research interests include FinTech and InsurTech. In this context, he mentors startups in various environments.

It has helped shape the "FinTech 101 Training Program" which was brought about for the first time in Turkey by FinTech Istanbul, covering all the fields that entrepreneurs need in terms of financial technologies.

In the face of changing customer expectations after the 2008 financial crisis, the rapid transformation wave that happened in the financial world began to affect the insurance industry after the banking industry. FinTech startups that simplify life in the financial services industry with the software they developed; started to follow InsurTech startups, which operate in a perpendicular way in terms of insurance and are under the observation of the global giants that are insurance and reinsurance companies. Start-ups that offer telematics software services that compare, advise, track the damage process and shape insurance premiums through wearable technologies as online brokers in insurance and the services that are offered through their software have started to be used as indispensables of daily life nowadays.

The insurance industry, which is worth $ 4 trillion on a global scale and is a few centuries old, is one of the sectors that will benefit most from technology in the field of financial services. According to data from CB Insights, Global FinTech investments went up to 40.5 billion dollars in total in 2018. The InsurTech field, which ended the year 2018 with an investment of 4.15 billion dollars, managed to attract approximately 3 billion dollars of investment in the first two quarters of 2019. Today, it is possible to see InsurTech star-

tups such as Oscar ($ 3.2Bn), Lemonade ($ 2Bn), Clover ($ 1.2Bn), PolicyBazaar ($ 1Bn), Zhong An ($ 11Bn) in the Unicorn startups (startups valued at more than 1 billion USD) list.

In this article, we will evaluate the technologies used in the insurance industry, the new generation of startups using these technologies and their effects on the industry.

The Relationship between Insurance and Technology

Due to its structure, insurance can offer products and services that cover the management of risks on an individual's entire life (such as life, property, and liability). In fact, if we extend the definition further, it is possible to use an insurance product in all processes that begin before birth and continue after death. Therefore, insurance products and services can touch people's lives more than

other financial services. This situation allows technology to be involved in the relationship between insurance and people more intensely. Insurance is also closely related to culture and lifestyle.

Nowadays, data is replacing money. Having data, processing it correctly, evaluating it, turning it into meaningful products and services and storing it safely, has become almost more important than protecting the money in your hands. In this case, using the customer data to provide the customer with the desired product or service, perhaps without the customer needing it yet, at the right time, at the right place and with the right pricing, is becoming the most important issue that insurers are focusing on today. Technology comes into play here and provides the tools that can accurately analyze the customer, the customer's current situation and his/her future expectations.

New Insurance Industry Players: InsurTech Startups

The insurance industry is quite open to disruptive approaches. Research shows that the insurance industry has a weaker resistance to disruptive technologies than the banking sector and thus will be the most affected sector. Therefore, every aspect of the insurance value chain has now faced these technological innovations and has to confront the business models of the creative, new generation startups.

It is possible to assess the contribution of InsurTech startups to insurance in multiple dimensions:

1. Advanced Technology Use: InsurTech startups prove their presence with the use of the power of mobile, social media tools, data collection, artificial intelligence, analytics, and other innovative software and hardware.

2. Creative Business Models and Working Methods: Since Startups focus on customers and problems, they aim to produce products and services that can solve these problems in a simple and agile manner and with disruptive business models.

3. Being Close to the Customer: MThey aim to understand customers' wishes, needs, and expectations and link those with the cultural features they are present in, providing them with different user experience in a fun and uninterrupted process (on the same platform from product design to sale) with cheaper and flexible possibilities. Due to the reasons mentioned above, InsurTech startups are able to offer the products and services that fit exactly the

needs of the customer in a timely manner, at the desired place and with a pricing model that is appropriate to the customer's conditions compared to conventional insurance companies, so that they can obtain important pieces from the value chain of the insurance companies.

Technologies That Can Be Used in Insurance

In terms of technology use, the insurance industry is more advantageous than other financial service providers. This is due to the fact that insurance products can touch all areas of life, as we have already mentioned, and the fact that products and services integrated with other financial services can be produced.

Mobile Technologies

The most important tool that can be used here is the ease of data collection provided by mobile technologies. Collecting, processing, interpreting, using and then storing customer data in a legal and ethical manner is among the priorities of all organizations today. The position information, speed and acceleration (over-acceleration and deceleration) information provided by sensors on mobile vehicles is the basis for many applications today. For example, thanks to this data, "Good Customer" applications developed especially in the field of automobile insurance around the world can easily operate. Thanks to the data collected from the mobile device, the driving characteristics of the driver can be evaluated, scored, information can be given to the driver, warnings can be sent and depending on the continuity of the behavior,

changes to the premium pricing based on rewards can be made. Many insurance companies use such practices in our country as well.

Big Data and Artificial Intelligence

The essence of it all is based on "Big Data" (In fact, "Law of Large Numbers" has been used in actuarial calculations in insurance for several centuries). Data has always been there. However, nowadays, advanced analytical methods (Advanced Analytics) were needed to make sense of this rapidly accumulating data. The analytical methods developed today have brought about many improvements in the data processing. As a result of applications such as Artificial Intelligence and Machine Learning, Intelligent Automation systems and Chatbots that can communicate with customers have emerged to be used by companies.

Artificial intelligence has been known in the financial services industry for almost 20 years. It was mainly used in loan decision processes and credit scoring. It was also used to automate repetitive jobs that operate under specific rules (RPA- Robotic Process Automation), such as Anti Money Laundering (AML) and Fraud Detection. Today, Artificial Intelligence is trying to evolve into structures that have the cognitive capacity, can feel, understand, learn and work with an emotional sensitivity that can mimic human beings. Nowadays, virtual assistants such as Alexa, Google Assistant, Siri, and Bixby have entered our lives as Cobots (Collaborative Robots) and are used by many players in the industry. One of the best examples of this is İş Bankası's personal assistant "Maxi".

Understanding and correlating the underlying causes of individuals' risk orientations and financial decisions, that is, understanding customer behavior, is one of the issues that finance experts have been working on for a long time. Many of the technological innovations mentioned above have begun to reach the capacity to be able to solve this problem. One of the most typical examples of this is Robo Advisory software that helps you with your financial decisions. There are many applications that can help people with difficult to understand and complex products such as Pension Funds. Or there are many Robo Advisory software that tracks your spending and credit card information, guide you, motivate you, and compare you to similar users to achieve a financial goal (with the purpose of saving or using) that you set. In particular, as a result of the Open Banking applications that emerged within the scope of PSD2 regulation in Europe, FinTech startups that can give more meaningful recommendations to people have started to emerge as a result of evaluating the data of individuals in many financial institutions with the financial institutions opening their APIs.

Automatic Participation, which has emerged in our country in the area of private pension, has made it necessary for companies to reach a large number of customers in a short time that they were not prepared for before. This is not a situation that can be managed with conventional methods in terms of time, resources and cost. This is where private pension companies respond to the situation with technologies such as artificial intelligence robots, chatbots, and roboadvisory.

Internet of Things (IoT), Telematics and Wearable Devices

Perhaps the most important technologies that can be used in insurance, especially in the elementary and health industries, are the developments emerging with the Internet of Things (IoT). The "instant" data collection from the user and the location of the device via the Internet and the devices connected to each other has brought about an important development for the insurers: Being able to conduct a personal risk assessment, product development, and pricing.

Telematics applications can be seen as the simplest implementation of this. The data set, which can be installed in vehicles and which results from the combination of location data, weather, and road condition data and usage statistics, has provided solutions in many areas, including theft, vehicle wear and tear, and detection of fraudulent and incorrect use. Moreover, with the advanced telematics systems that are installed as standard by many vehicle manufacturers, vehicles coming from opposite directions can communicate with each other and communicate the weather and road conditions ahead and advise the driver to either use alternative routes or take necessary measures. This situation is considered as a development that will lead to the emergence of a different field such as the development of "protective and preventive approaches" in insurance and to the decrease of public expenditures of both insurance companies, consumers and the government.

Wearable devices are the technologies that can be used in daily life such as watches, bracelets, rings, shoes, and clothes, which are getting cheaper and spreading day by day, collecting data about your health and transferring them to the insurance company and providing product and service development in the field of health insurance with "good consumer" logic. Thanks to that, it is possible to have instant access to simple health data, as well as to provide applications that can measure what the person is doing to stay healthy and improve the insurance premium, thus contributing positively to the person's life in terms of both health and cost.

Virtual Reality (VR) and Augmented Reality (AR)

At first glance, these two concepts, which seem to have little to do with insurance and are rather perceived as visualization, can be used frequently in insurance technologies. The first one of these is to provide training and information on the risks to which the person or the person's property (facility) may be exposed. The second one is to show the person what he or she can do or be incapable of in the event of any damage that may occur, as a result of this information, and ultimately bring it to the stage of persuasion of the sales process. Therefore, the rich simulations created in such environments enable the individual to easily perceive the dimensions of risk through visual and auditory means.

Drone Technology

Drones are used in many fields today. Drones offer the possibility of precise imaging, metering and 3D modeling with the help of GPS from the desired height with a high-resolution camera. In insurance, drones are often used in reconnaissance to determine risk in hard-to-reach areas, in very large or dangerous facilities (such as chemical and nuclear plant fires), and in the assessment of the damage after catastrophic natural phenomena and the rea-

lization of expertise services. From this point of view, it is possible to be used in the pricing stage and post-damage detection.

Blockchain

Perhaps the technology that will have the most profound impact on insurance will be Blockchain technology. It is possible to see Blockchain technology in a position to provide the "trust" environment wherever transactions, records, identities, contracts, and money are mentioned. Blockchain creates a world in which contracts are reduced to digital codes and stored in a transparent and shared database. In this way, a digital record and signature of each contract, process, task, and payment can be created, defined, validated, stored and shared. This eliminates the intermediaries. Individuals, institutions, machines, and algorithms can easily interact with each other. The greatest potential, Blockchain promises, lies in that.

Smart Contracts held through Blockchain have the potential to cause a great change in the industry. In the event that the terms of the contract are met, the contract that is triggered and activated automatically carries out the damage payment automatically. By bringing together all parties in the insurance value chain, the damage processes are accelerated, forms and communication processes are reduced, manual controls are reduced, and consensus processes are accelerated and fraud is reduced.

In the event of an airplane delay, which is one of the things that everyone complains about today, an InsurTech startup from France named Axa, with Fizzy, has presented an insurance policy with blockchain technology that comes into play in case of more than 2 hours of delay which they turned into a "smart contract". Thus, in case of delay, the payment is made directly to the customer's account without any report being prepared.

Conclusion

In the field of financial services, the insurance industry is perhaps the most likely to benefit from technology. Thanks to this, it is possible to better understand the customer and to offer personalized products and services at special prices just when they are needed. Customers are now digitalized and do not want insurance companies to be "the usual insurance companies", but to be advisors who live with them and are part of their daily lives. With the opportunities offered by the technology, it is possible to understand the customer better, to be closer to the customer and thus to increase customer loyalty. What is important here is to determine how to

do it and to develop an appropriate business model. Of course, this requires a strategic approach to digitalization.

Insurance is actually a need that is at the center of a person's life within the scope of the risks that an individual has. How this need will be adopted and managed with technology will become clear through solutions that will be produced through the strategic outlook of all parties in the insurance ecosystem, and in a creative way.

Today, many startups working in the insurance industry develop new business models with creative solutions and challenge big companies by doing the work they cannot do and therefore get a share from the insurance cake. In the field of insurance, startups that enter the customers' lives by facilitating the customer experience are growing by receiving investments on a global scale.

Many insurance and reinsurance companies on a global scale establish their laboratories to test their own creative and innovative applications, try to create ecosystems that will improve their cooperation and investment opportunities with startups working in this field, and even use the Internal Corporate Entrepreneurship applications that can put the creative capacities of the employees of a company to use and arrange idea marathons called hackathons or ideathons to help the young entrepreneurs try out their ideas. In addition, there are acceleration programs in the InsurTech field, VCs making investments in this field, and insurance and reinsurance companies (CVC), which set up their own investment funds and seek investment opportunities for InsurTech startups.

Today, companies like Google are supporting and investing in many startups to help people lead better lives with life expectancy getting increased. The increase of life expectancy brings many risks and opportunities for the insurance sector. Concepts that include innovative approaches such as smart cities, self-driving vehicles, sharing economics, platforms, and cyber-insurance are being discussed as things shaping the future of insurance.

Therefore, whether you are prepared or not, the "future" will bring a new era for all players in the insurance industry.

ASSET MANAGEMENT

Wealthtech agreements and funds, lowest of the 5 quarters having 35 agreements worth $ 421 million

Venture capital-backed global wealthtech agreements and financing trends, Q2 2018 - Q2 2019 ($ Million)

	57	53	45	56	35
	$ 970.7	$ 589.3	$ 494.1	$ 768.2	$ 421.1
	2018 2nd Quarter	**2018 3rd Quarter**	**2018 4th Quarter**	**2019 1st Quarter**	**2019 2nd Quarter**
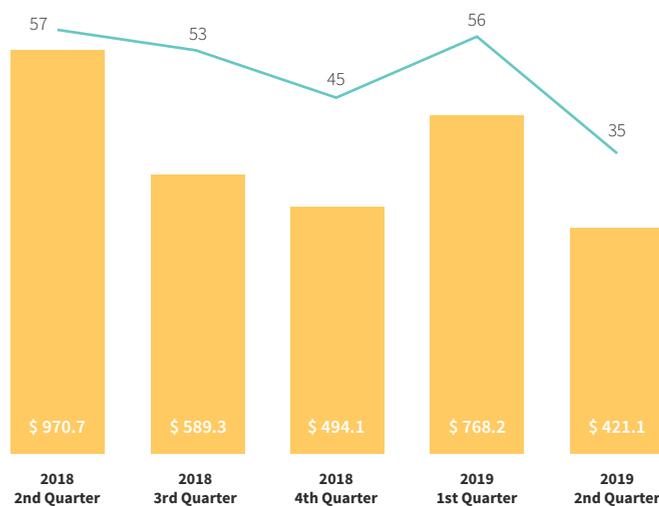
Soruce CB Insights

WealthTech

Wealthtech is a new type of financial technology company that produces digital solutions, gradually transforming the investment management industry. It includes both the end investors and the companies that serve them. It covers a wide range of operations and channels, from business-to-consumer (B2C) robo-advisors and micro-investment platforms to intermediary institutions and business-to-business (B2B) technology providers that provide software for asset managers and advisors. Wealthtech refers to the use of the most advanced technologies such as artificial intelligence and big data to provide an alternative to conventional asset management companies.

Sales and Trade

Probably nowhere does the combination of post-financial crisis regulations and technological destruction have more impact than they have on the sales and trade segments of investment banks.

Today, banks earn money only by requesting a commission for each transaction made from their customers. Before the financial crisis, however, investment banks could use their own money to implement their own trading strategies and protect their profits. In 2009, JP Morgan, Citigroup, Bank of America, Goldman Sachs and Morgan Stanley earned nearly $ 100 billion from transactions alone.

The Volcker Rule, which went into effect in 2014, prohibited investment banks from conducting commercial transactions and betting with their own capital.

At the same time as the issuing of the Volcker Rule, various financial regulators around the world increased their investment requirements, forcing investment banks to keep their capital rate higher rather than making transactions.

The result was the commodification and resumption of the world of trade from the largest investment banks to quantitatively-driven funds and other companies where investors could take more risks, benefit from a less-seized regulatory environment and generate higher returns. Investment banks responded in the same way, investing in technology to automate the parts of the buying and selling functions and keep hold of profit margins as much as possible.

Robo-Advisors

Robo-consultants are an important breakthrough for retail investors looking for cheap advice. These platforms make advice more accessible and less costly and they make use of technology to create scale economies that lower the account minimums and advisory prices. They provide democratic access to asset management, giving an opportunity to those who cannot benefit from tried and tested, corporate-grade, asset management techniques of financial management.

These platforms tend to use standardized surveys to gather customers into a range of age, income, risk profiles and return targets. They can also provide 24/7 automated support, tax-efficient rebalancing and in some cases access to advisors. Although it is said that very few match the regulatory definition of "advice" and it

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Advisor tech startups aim at financial planning with customizable UI / UX product package

Jacobi	trizic	Vestwell
2019 2nd Quarter funding: $ 7.5 million, Series A	**2019 2nd Quarter funding:** $ 7.96 million, Series B	**2019 2nd Quarter funding:** $ 30 million, Series B
Focus Multiple-asset portfolio design and analytics with a range of self-service tools	**Focus** White-label asset management package for banks, credit unions and advisors	**Focus** Pension investments and planning for RIAs and implementers with various integrations
Investors Illuminate Ventures, 8VC, CreditEase, Fintech Fund	**Investors** Operative Capital, Sorenson Ventures	**Investors** Primary Venture Partners, BNY Mellon, FinTech Collective, Point72 Ventures, Nationwide Ventures, Allianz Life Ventures, Franklin Resources, Goldman Sachs PSI

Source CB Insights

won't reach full automation for a while, these platforms still have an optional control over the investor funds.

Robo-Retirement

Unlike robo-advisors, robo-retirement includes asset management services that target retirement savings accounts. The aim is to help individuals, as well as small and medium-sized enterprises, better manage their savings plans.

Micro-investment

Micro-investment platforms allow users to deposit small amounts of money on a regular basis without having to pay commissions. The idea is to make huge savings over the years by making regular investments that do not require monetary sacrifice.

Social Investment

A popular method of digital mediation is social network investment, which lets you see the investments of people you are following in your trade network just the way you follow people on Facebook.

M&As (Mergers and Acquisitions)

The new technological capabilities built to help both companies and banks complete their mergers and acquisitions show us the reason large and small companies are increasingly moving towards the "DIY" (Do It Yourself) method.

Axial Networks, referred to as "Tinder for M&A" by Bloomberg, is a platform bringing startups together with potential buyers. The company said, in 2018, that it has facilitated deals of a total of $ 25 billion since its launch in 2010.

This tool offers two main advantages:

1 A larger pool of potential buyers, not limited to a bank's network

2 It is much cheaper.

Stocks Research

According to the European Commission's Markets in Financial Instruments Directive II (MiFID II), which came into force in 2018, it is almost impossible for large investment banks to restore this conventional function of theirs. MiFID II forced investment banks to price and sell their research as a separate product, and forbade the merger of research on how trade is performed. This triggered the questioning of the value of the relevant research among the clients of investment banks in the world again, which led to many of them deciding that they could go without it.

In addition, new technologies such as natural language processing, which help computers analyze human communication, offer more effective tools to automate the writing of research reports. Some of these technologies have been developed by the accountable persons or have white labels, but are also used by small companies that offer another opportunity to further reduce the historical functions of investment banks.

LENDING TECHNOLOGIES
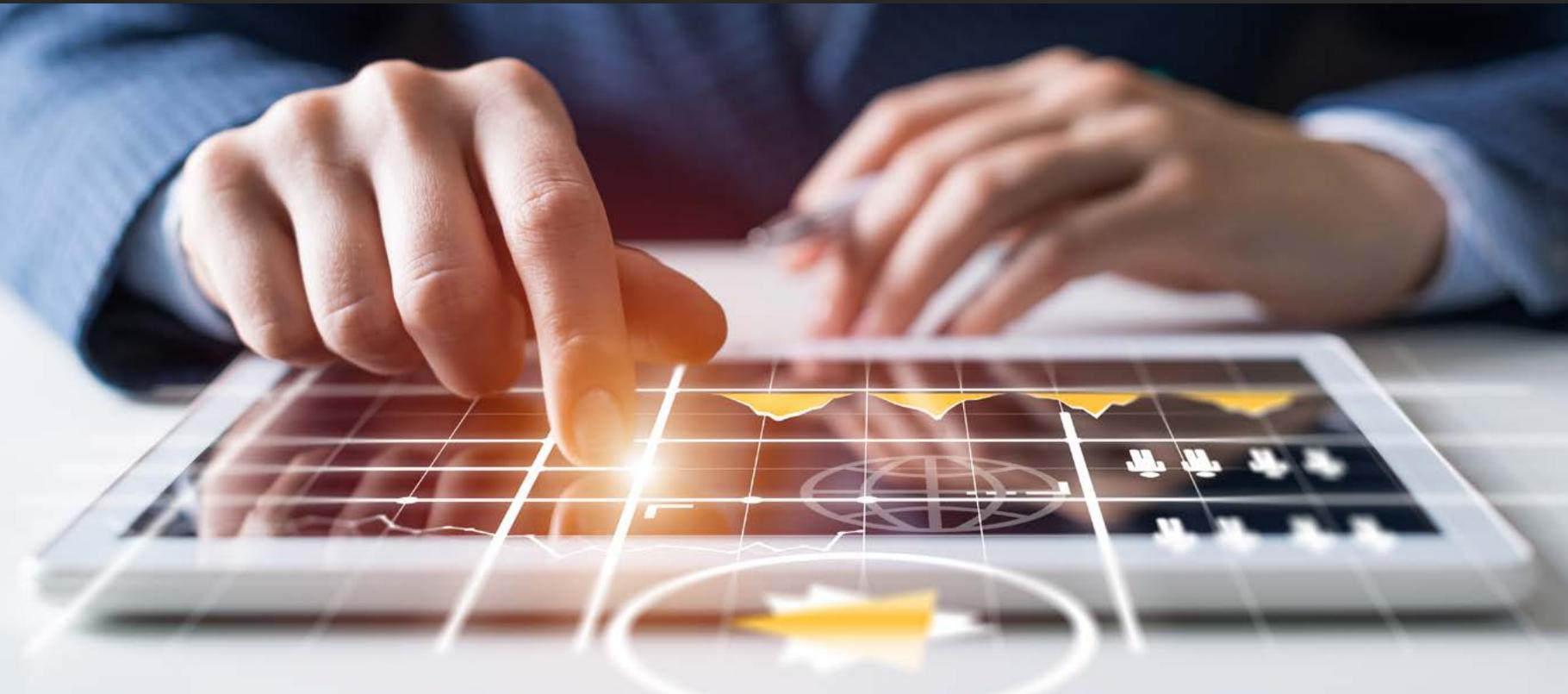
Lendtech

Lending companies primarily use machine learning technologies and algorithms to evaluate lendings. This area includes peer-to-peer (P2P) lending platforms as well as insurance and loan platforms. New leasing solutions are also within the Lendtech area.

Scoring models of many banks are not suitable for specific produ-

cts or segments, and more importantly, these models are primarily designed for and focused on retail / private industries. Desired markets such as students and micro, small and medium-sized enterprises (SMEs) are excluded. In addition, many banks have to incorporate adaptive technologies such as machine learning into their credit ratings. In contrast, many fintechs have developed comprehensive scoring algorithms that can be filed, based on big data, artificial intelligence and unusual information (e.g. network

Fintech Companies Are Solving the Salary Issues of the Employees to Ease and Prevent Their Debts

B2C payday advance practices appear as an alternative to payday loans or subject to overtime pay
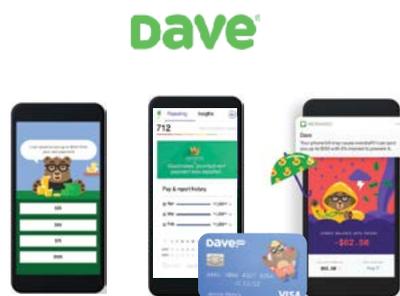
2019 2nd Quarter funding:
$ 110 million, Debt-II

Investors
Victory Park Capital, NYCA JP Morgan Partners, CreditEase Fintech

Business model
Receives a fee of $ 1 per month to receive $ 100 per salary payment without interest.

Customer base
3.5 million users, more than 1 million downloads on Google Play

2019 2nd Quarter funding
Not Announced Series A

Valuation:
$ 150 million

Investors
Lightspeed, NYCA Partners, Canaan Partners, DCM Venturest

Business model
There is a monthly fee of US $ 10 to receive $ 250 at a time in the form of a credit check or without interest.

Customer base
More than 300,000 members, more than 100,000 downloads on Google Play

2019 2nd Quarter funding
$ 10.5 million, Series A

Investors
Canvas Ventures, Unlock Venture Partners

Business model
The rates range from $ 100 to $ 500 at rates starting from 15%.

Customer base
More than 50,000 loans, more than 100,000 downloads on Google Play

Source CB Insights

quality), to assess reliability and process information on continuous risk.

Lending and investment: Fintech solutions have the potential to transform the lending field. One way of doing this is through crowdfunding, which requires increasing external financing from a large group of investors. Investors can interact with investments and see their ideas on the crowdfunding platform. Financing can be received in the form of rewards or donations, debts or equity. Lending crowdfunding is close to peer-to-peer lending. Peer-to-peer lending has the potential to improve access to financing for small and medium-sized enterprises with credit reduction from banks. It is a type of debt financing that enables individuals as well as businesses to borrow online from their peers without a balance sheet-based mediation by a financial institution.

Trade Financing: Invoice trading is the emerging field of fintech applications. It helps SMEs that are often struggling with operational capital and cash flow due to delayed payments. Recently emerging fintech companies provide such SMEs with platforms to sell their invoices or other receivables with operational capital discounts.

Employee loans: A credit ecosystem, especially around salary payments, has recently been created. The main reason for this is that employees are given lendings by their own employers, leaving the risk of unemployment to the employer's initiative, supported

only by supplementary data such as basic credit intelligence and social score, it helps a group with lower credibility to reach a loan of money fast and conveniently.

Prepayment

Another method in loans is the loans given based on access to cash flow data. In the life cycle of the client, the ventures that are by their side can follow the payments and transactions of the enterprises and it could be said that they open credit in a way, by giving the cash that they have access to beforehand.

REGULATORY TECHNOLOGIES

RegTech

Regulatory technology, also known as "RegTech", is a new field in the financial services industry that uses information technology to improve regulatory processes. This field places particular emphasis on regulatory monitoring, reporting, and compliance and it benefits from the financial industry.

RegTech's aim is to increase transparency as well as consistency and standardize regulatory processes, provide robust interpretations of uncertain regulations, and thus provide higher levels of quality at a lower cost.

Regulatory Sandboxes

Regulatory sandboxes have been widely accepted as an innovative regulatory initiative. On a fundamental level, they are formal programs that test financial services and business models with real customers, subject to specific services and supervision.
Special units have been launched, including thematic sandboxes, that promote market development with the aim of improving financial participation. Sandboxes may help regulators better understand FinTech and develop evidence-based regulations that support inclusive FinTech.

The FCA in the UK and the regulators in many different countries followed the sandbox approach. However, countries such as Germany and France consider that giving a chance only to selected startups with the sandbox is not compatible with the principle of equal opportunity. In broader discussions on FinTechs, BaFin rejected the idea of a legal sandbox, regardless of how popular the concept is in other fields of jurisdiction. Although BaFin's approach is surprising, it is important to understand the difference in the configuration of the German regulator, unlike other authorities, such as the FCA. From a legal point of view, this is, at the same time, consistent. Bafin is not authorized to make exceptions to the mandatory requirements of the financial regulation law. Furthermore, the introduction of individual initiatives was not permitted by the legislative power.

Functions of Regtech

RegTechs include the use of technology to match structured or unstructured data with information organizers to automate compliance or surveillance processes or match them with decision rules that are meaningful to both regulators and their regulations.

1. Capital and liquidity reporting, means the collection of high-quality structured data, that is the sum of risk data which is necessary for RRP and stress test, from the financial group. It contains descriptive problems and involves complications with the use of incompatible and outdated IT systems.

2. Due to the wide range of risks, scenarios, variables and methodological diversity that need to be included in the **modeling, scenario analysis, and forecasting** as needed for stress testing

Examples of regulatory sandbox initiatives by jurisdiction
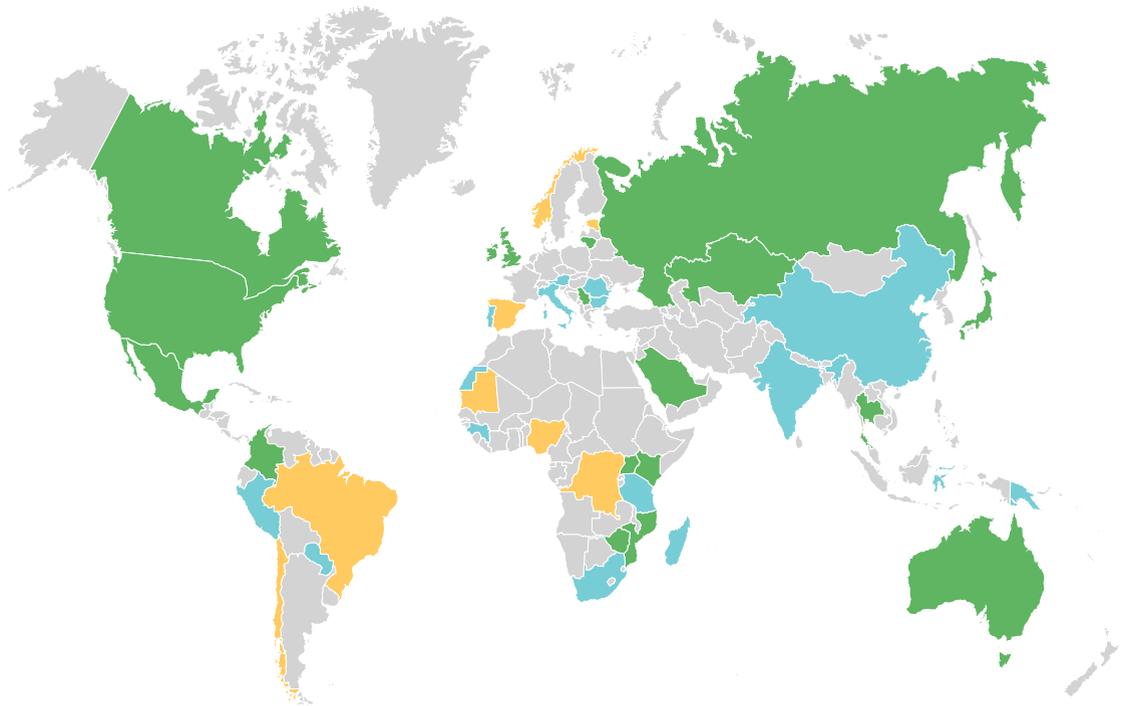
Sandboxes in operation as of June 2019:

Abu Dhabi, Australia, Bahrain, Brunei, Canada, Colombia, Ireland, Isle of Man, Japan, Jersey, Kazakhstan, Kenya, Kuwait, Lithuania, Malaysia, Mexico, Mozambique, Serbia, Russia, Saudi Arabia, South Korea, Taiwan, Thailand, Uganda, United Kingdom, United States of America, Vanuatu, Zimbabwe

Forthcoming sandboxes:

Austria, Brazil, Chile, Congo, Estonia, Fiji, Malta, Mauritania, Nigeria, Norway, Qatar, Tajikistan, Romania, Spain

Proposed sandboxes:

Bulgaria, China, Guinea, India, Italy, Madagascar, Morocco, Papua New Guinea, Paraguay, Peru, Portugal, Rwanda, Samoa, South Africa, Tanzania, Trinidad, and Tobago

A Sandbox is considered "Forthcoming" if the decision to operate it has already been made but is not yet operational. If an official decision has not yet been formally announced, its status is "Proposed".

Source The Global RegTech Industry Benchmark Report - Cambridge Center for Alternative Finance

and risk management, it is increasingly getting more complicated in terms of calculating power, effort, and intellectual capacity.

3. In tracking payment transactions, the bottleneck (especially in real-time) is caused by the transaction metadata introduced by payment systems being of low quality and having a great mismatch. This makes it difficult to automatically interpret transaction metadata to recognize money laundering and terrorist financing.

4. In the identification of your customers and legal entities, the use of automatic identification solutions such as fingerprint and iris scanning or blockchain identity as required by regulations related to your customer may make things more efficient.

5. Monitoring the internal culture and behavior of a financial institution and following customer protection procedures often require the analysis of qualitative information that conveys behavior, such as e-mails and verbal expressions. The automatic interpretation of these resources will provide major breakthroughs in the efficiency of trade.

6. Buying and selling in financial markets involve a series of regulatory tasks, such as calculating the margins of participants, choosing a location for buying and selling, selecting a central counterparty, and assessing the impact of a transaction on its institutions. Automating these tasks will ensure compliance and increase trade speed and efficiency.

7. To determine the new regulations applied to a financial institution, to interpret the results of this and to allocate the different compliance obligations to the liable units throughout the organization is currently a labor intensive and complex process that can be improved by automatic interpretation of regulations.

Why is RegTech gaining importance?

The cost of compliance (or non-compliance) is firmly determined in the financial industry: It is reported that companies spend approximately 4% of their revenue on compliance with regulations (Duff and Phelps 2018). Forecasts in the economy are more difficult to compile, but the United States Council of Economic Advisers has estimated the direct and indirect costs of the regulation to be 12%. In 2012, the GDP of the US, cost estimates of the regulatory stock in the United Kingdom historically exceeded 10% of the GDP.

Regulators need to develop regulatory mechanisms to help support new business models and to influence a functional perspective of financial regulation. Since these are early stages of innovation, regulators should focus on documenting and understanding market failures and carefully evaluating potential regulatory responses, rather than full-fledged regulations.

Capabilities and solutions of additional regulation technologies

Based on the EY Horizon Scanner (a global database of over 16,000 FinTech firms), 1,300+ companies identified themselves as RegTech. The field is continuously evolving, rapidly changing and will continue to evolve over the next few years. Below are examples of various RegTech solutions across regulatory compliance capabilities.

Cyber / Enterprise Information Security

Capabilities: IS program management - IS security metrics - Threat and vulnerability management/assessments

Solutions: RiskIQ - RADAR

Anti-money laundering / know your customer

Capabilities: Verify identity of clients/employees - Continuous monitoring for financial crime - Store, protect and provision ID information

Solutions: Safe Banking Systems - RSA Archer GRC - Digital Reasoning

Vendor risk management

Capabilities: Vendor risk management governance program - Proofing/risk assessments - Vendor issues management

Solutions: Prevalent - ProcessUnity

Business continuity / resilience

Capabilities: Business impact analysis/assessments - Business continuity/disaster recovery plan management - Crisis management

Solutions: RSA Archer GRC

Market / credit / liquidity risk

Capabilities: Capital allocation - Capital transparency - Quantitative modeling - Stress testing - Cash flow projections - Country risk - Risk assessments

Solutions: AYASDI - FINCAD

Reconciliations and controls

Capabilities: GL to subledger reconciliations - Account reconciliations - Journal entry management

Solutions: BlackLine

Capabilities of Regulatory Technologies

Enterprise / operational / IT risk management

Capabilities: Board reporting - Enterprise risk and control assessments - Operational risk quantification

Solutions: QRM - IBM OpenPages

Reporting and data analytics

Capabilities: Report automation tools - Web-based streamlining for financial reporting - Analytics validation and modeling software - AI-enabled analytics tools

Solutions: Moody's Analytics – SAS – AxiomSL- Wolters Kluwer

Compliance / SOX

Capabilities: Internal control management to address Sarbanes-Oxley - Govern and track regulatory requirements - Facilitate compliance activities

Solutions: ComplyGlobal - MetricStream

Regulatory inventory, policies and standards management

Capabilities: Legal and regulatory requirements - Policy, standards, and procedures monitoring and management - Policy management metrics

Solutions: MetricStream - AQMetrics

Information and asset management

Capabilities: Information and asset inventory - Information and asset classification and profiling - Information and asset monitoring

Solutions: Moody's Analytics - ServiceNow

IT operations

Capabilities: Configuration management - Incident and problem management - IS operations - Application security

Solutions: Oracle - ServiceNow

Source EY regulatory technology (RegTech) brief 2019

Main Barriers to the Implementation of Regtech and for Development of the Regtech Market

Legal restrictions on the use of data and new technologies

A lack of data standardization

Regulatory deadlines for implementing new IT solutions in FIs

Outdated reporting portals and methods used by some regulators

Uncertainty due to still unfinished regulatory agenda

The preliminary stage of the Regtech market
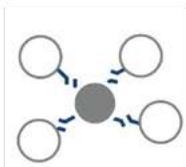
Lack of networks bringing together regulatory experts, software developers and FIs

Source Institiute of International Finance - regtech in financial services

Distribution of Regtech Startups by Country

Country	% headquartered	% active
UK	25%	63%
USA	17%	46%
LUXEMBOURG	8%	12%
SWITZERLAND	7%	18%
IRELAND	6%	11%
AUSTRALIA	5%	23%
SINGAPORE	4%	23%
JAPAN	4%	9%
GERMANY	3%	16%
FRANCE	2%	17%

■ % of sample headquartered in jurisdiction
■ % of sample that is active in jurisdiction
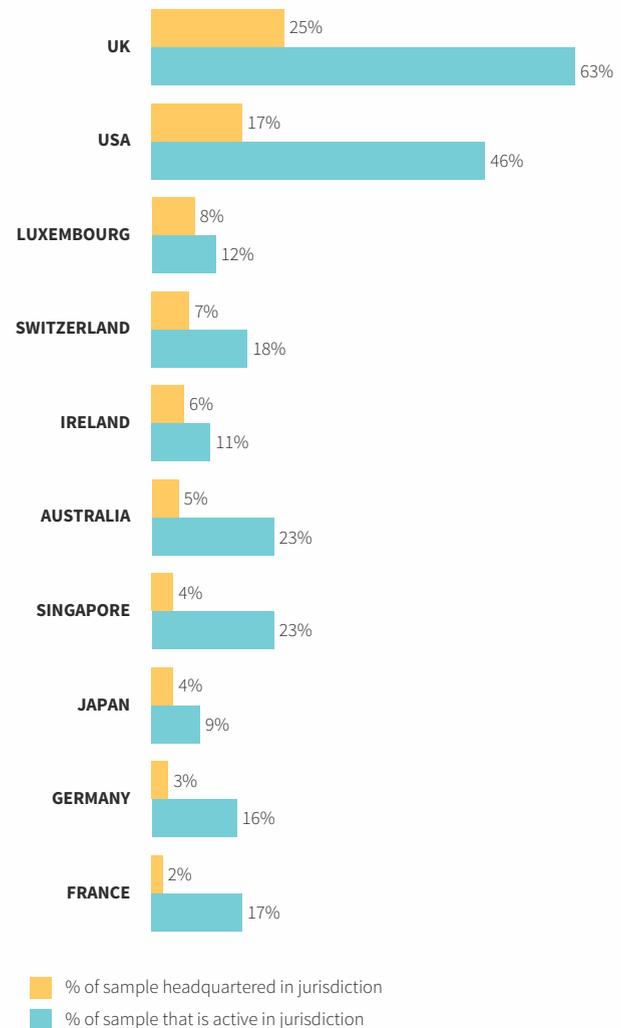
Source CCAF Global RegTech Industry Benchmark Survey 2019

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Biography

Yaşar K. Canpolat, Esq. works in the fields of financial technologies, information technologies, and intellectual property law. Canpolat, having started his career in the field of intellectual property law, has managed the brand portfolios of global brands and later worked in Interbank Card Center on Protection of Personal Data, financial technologies, and disruptive technologies, and recently he established Canpolat Legal.

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Open Banking and Compliance Efforts with the other Developments in the Turkish Fintech Industry

Within the scope of the 11th Development Plan, which was approved in July 2019, the aim was to implement important policies and measures aimed at catching up with Open Banking and other trends in the Fintech industry. Among these objectives were:

> Harmonization of legislation with the European Union Payment Services Directive 2 in order to strengthen the open banking legal infrastructure,

> Reviewing the methods and mechanisms for the sharing of digital data in the hands of economic actors on the widest scale possible within the framework of trade secrets and confidentiality principles, and developing recommendations for this,

> To introduce modern and new generation financing models to our country's capital markets, such as crowdfunding for financing innovative projects,

> Making the necessary legislative arrangements in order to facilitate the use of Digital Identity and Customer Identification processes,
> Establishment of Payment Services and Electronic Currency Institutions Association, and,
> Establishment of a roadmap for the development of the Fintech ecosystem in our country and coordination relating to the implementation being provided by a single public institution.

The law amendment addressing many of these policy measures, and involving major structural changes particularly in the payment area has been passed quickly in November 2019 and gave the signal of a dynamic year to come in 2020 in terms of the Turkish fintech industry. The innovations introduced with this amendment, which foresees the amendment of some other regulations, especially the Law No. 6493 on Payment and Security Settlement Systems, Payment Services and Electronic Money Institutions, will be effective as of 01.01.2020. Therefore, in 2020, it is possible to say that

> Serious structural changes are awaiting the Turkish fintech industry,
> The product variety will increase in terms of payment systems and therefore new business models will be created and this will lead to new players entering the fintech market,
> Banks and fintech organizations will cooperate more than before,
> The agile structure of Fintech organizations will bring dynamism to the payments industry.

The final result of all these developments will be the increase in competition in the electronic payments industry and thus creating an advantage in terms of diversity of financial services and cost to end consumers.

It is possible to summarize the amendments to be enacted in January 2020 within the framework of the amendment of the law as follows:

Central Bank of the Republic of Turkey being the Only Regulatory and Supervisory Authority in the Field of Payments
With the amendment of the Law, the regulatory and supervisory authority over payment service providers and electronic money institutions, including the supervisory authority on the external service providers of these organizations, will be transferred to the Central Bank of the Republic of Turkey ("CBRT") from the Banking Regulation and Supervision Agency ("BRSA"). In addition, clearing

and offsetting activities related to debit and credit cards have been completely excluded from the BRSA's range of jurisdiction and the CBRT has become the only regulatory and supervisory authority in the field of payments.

Definition of Open Banking Products Compliant with Payment Services Directive 2 (PSD2)

"The Payment Initiation Service Provider" (PISP) and "Account Information Service Provider" (AISP) services, which are Open Banking products and also included in PSD2, are defined as Payment Services under the title of "Payment Services with Special Features". It is expected that these services, which do not hold funds at any time but are predicted to have practical results such as personal finance management, offering the ability to shop online to those who do not have a credit card, will provide different user experiences and added value in favor of the user with fintechs

providing them. Although there are no regulations made on the technical requirements (API, webservice, etc.) and the obligations yet in order for these services to be provided by the banks and payment institutions, CBRT has been authorized on the regulation of these details. Therefore, the regulations to be adopted by the CBRT in the upcoming period will be determinative in turning Open Banking into a necessity instead of an initiative.

It should be noted that the institutions that are currently providing the newly defined open banking services will have to obtain the necessary activity licenses for the provision of services within one year from the regulations to be issued by the CBRT.

Extending the Scope of Payment Services to Cover Marketplaces and Closed-Loop Systems

With the Law Amendment, the way was paved for transactions and services reaching the level to be determined by the CBRT in terms of total size or area of influence in the field of payments, to be included within the scope of Payment Systems. In this context, it has been specifically regulated that the transactions related to closed-loop payment devices such as food cards or transportation cards that benefit from the limited network exception and the payments carried out by marketplaces benefiting from the commercial agent exception can be defined as payment services when they reach certain criteria in terms of total size and area of influence.

Therefore, new business models or marketplaces that do not currently require any license may need to receive a license when organizations offering closed-loop payment transactions exceed the levels set by the CBRT, or they may have to benefit from solutions

offered by existing payment service providers.

Establishment of the Turkish Payment and Electronic Money Institutions Association

In order to meet the needs in common between the payment and electronic money institutions, to have the profession develop in accordance with the general activities and to materialize the position of the Fintechs in the payment industries, it was decided to establish the Turkish Payment and Electronic Money Institutions Association ("the Association") as a public professional organization.

All payment and electronic money institutions must be members of the Association, which is also authorized to impose administrative fines on its members.

Regulations on the Business Methods of Payment and Electronic Money Institutions

Along with the amendment of the law, a number of important changes have been introduced that will affect the business processes and models of payment and electronic money institutions. Although the details of most of them will be determined by secondary legislation to be issued by the CBRT, it is possible to list the main changes as follows:

> The CBRT has been authorized to determine the characteristics, amount and rate of fees, charges, and commissions and other benefits payment institutions receive from the parties to the transaction in return for the services provided,

> The CBRT has been authorized to impose obligations on payment and electronic money institutions to have collateral,

> The obligation to block the funds invested by electronic money institutions to the banks has been abolished,

> Although the Payment Institutions are prohibited from issuing loans, the CBRT has been authorized to issue regulations regarding whether the activities carried out in relation to payment services are within the scope of lending activities,

> The CBRT has been authorized to determine the procedures and principles to be complied with in the legal relations that the payment service providers are a party to and to establish a working committee in this field if it determines that there are situations and practices that may adversely affect the development of the field of payments.

OPEN BANKING

APIs

An Application Program Interface (API) is a code that enables software programs to communicate with each other. When APIs are used to extract data, it creates an effective way to share data in a usable format. Being a platform-agnostic, they can facilitate real-time information exchange. It is a scalable and standard way of sharing information with the existing security because only the information that the API is open to can be shared. APIs can be of different types.

API Types

> Private APIs: They are used within only one organization to share information and functionality between programs.

> Partner APIs: Partner APIs are published only to business partners under certain conditions.

> Open APIs: APIs that anyone can use to extract data from or push data to or for functionality. For example; open web APIs allow the exchange of information with a website for all developers.

PSD (Payment Services Directive)

PSD has been implemented with the aim of defining new players and roles, facilitating access to services by improving competition in the payment services sector, supporting innovation and protecting consumer rights and data in line with all these developments. Since its publication in 2007, the Payment Services Directive (PSD) has led to fundamental changes in the field of payment services and the emergence of new business models, primarily in the European Union countries, but generally on a worldwide scale.

Closed Banking

Bank   Customers

Open Banking

Customers   3rd party providers

Bank

Price comparison sites   **Source** Deloitte analyses
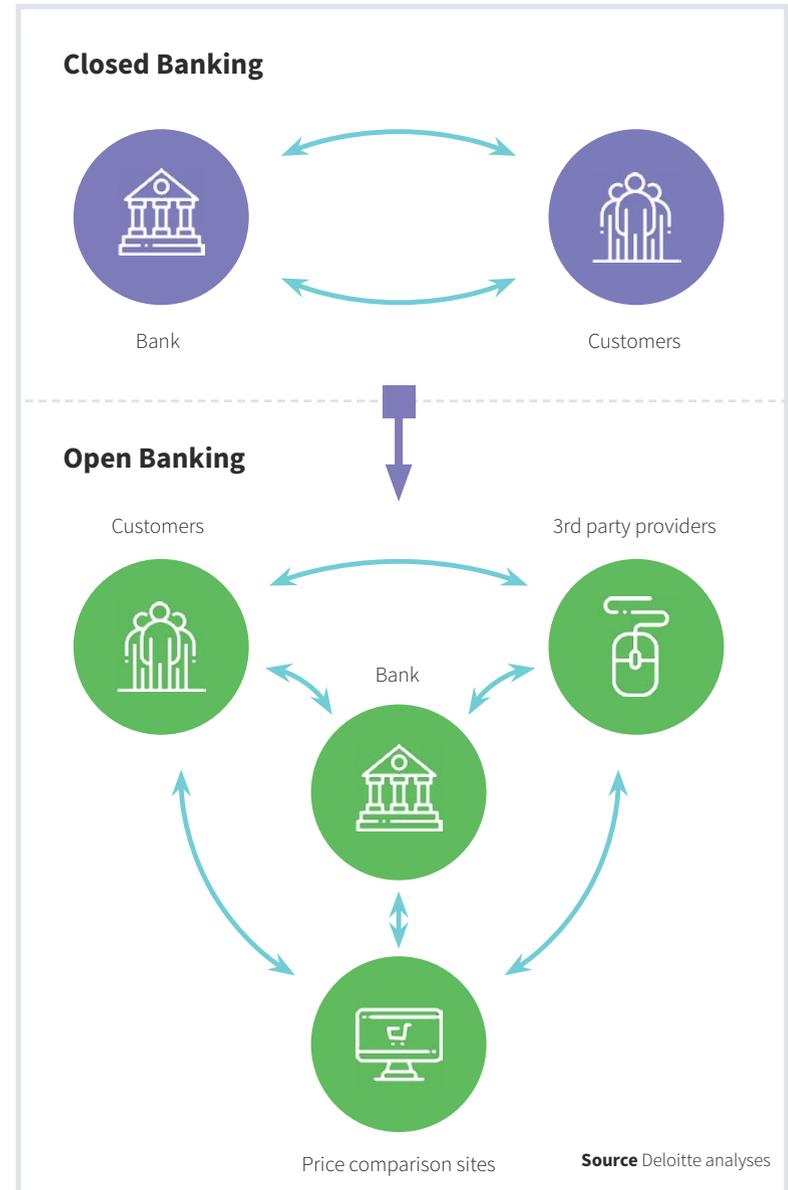
In our country, the importance of payment systems in the economic field is increasing day by day and the use of them in our daily lives and commercial activities is getting more widespread, and with new players, a vital threshold has been passed for the industry as the need for a holistic legal structure which would provide a more stable, competitive, secure and efficient working environment was met by Law No. 6493. (Source: ÖDED)

PSD2 (EU Payment Services Directive 2)

Open Banking allows bank customers to use third-party service providers to manage their finances. At the customer's request, it allows banks to access the customer's data through the selected third-party's APIs. PSD2 / Open Banking began as an initiative of the Financial Conduct Authority and the Competition and Markets Authority (CMA) of the UK and the European Banking Authority (EBA) in the EU region.

On 12 November 2019, Law No. 6493 was harmonized with PSD2 and the way for the introduction of PSD2 into our country was paved. Although the law is not yet compulsory for banks, it introduces important regulations.

Open Banking

Open Banking was designed to bring more competition and innovation to financial services. It was established by the Competition and Markets Authority on behalf of the UK Government. In summary, Open Banking is the definition of open target regulation that the UK advances in line with PSD2.

Open Banking forces the biggest nine banks of the UK, which are HSBC, Barclays, RBS, Santander, Bank of Ireland, Allied Irish Bank, Danske, Lloyds, and Nationwide, to publish their data between the online authorized organizations in a secure and standard way and makes data possible to be shared more easily.

Payment and Electronic Money Association (ÖDED)

Payment and Electronic Money Association, in accordance with Law No. 6493, was established in October 2015 to undertake the representation of companies offering payment and electronic money services in Turkey and companies that have the status of being payment and electronic money organizations and to provide the opportunity to all of the payment and electronic money organizations to join the association.

TPP (Third Party Provider)

Any external legal entity that is not a part of the supervised banking institution. Third parties may be supervised institutions (e.g. banks or other regulated financial firms) or unsupervised institutions (e.g. financial technology firms, data collectors, business partners, vendors, other non-financial payment firms).

AISP (Account Information Service Provider)

AISPs are methods that consumers and companies can use to achieve a financial 360-degree view (a PFM Application for all financial accounts). PSD2 provides a framework for how these organizations can access customer transaction history and account details.

An updated payment model, including a payment initiation service provider (PISP)

Client

Merchant

PISP

Receiving Bank/Processor

Card Network

Sending Bank

Current Flow   Future Flow

An updated interaction model, including an account information service provider (AISP)

Client

AISP

Customer's Bank A   Customer's Bank B   Customer's Bank C

Current Flow   Future Flow
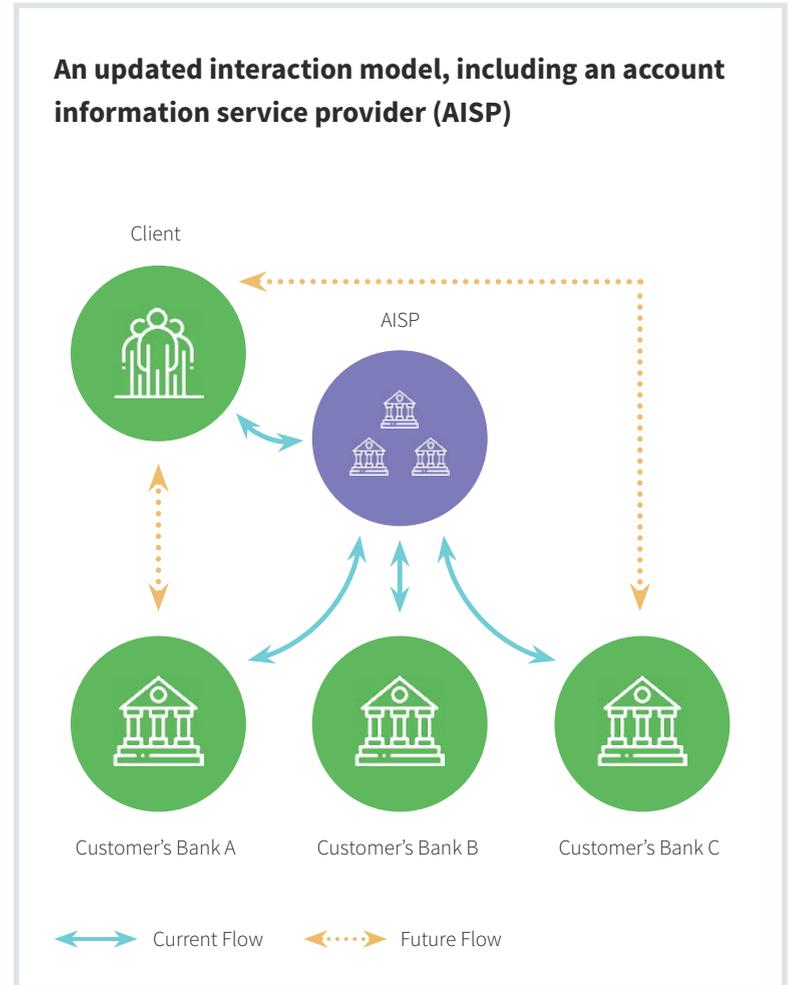
PISP (Payment Initiation Service Provider)

PISP is an organization that offers companies, retailers and merchants an online solution for accepting electronic payments.
It typically uses the software as a service (SaaS) model that connects the vendor or the vendor's Web page to the payer's bank's online banking platform, so that a money transfer can be realized.

Current Basic Customer Scenarios

Account Gathering: View all your accounts in one place.

Startup examples based on scenarios

Personal Finance Management	Account Collection	Payments
FONDY STRANDS tink YOLT	EVRY BANKIFI STRANDS volt tink Worldline YOLT	FONDY EVRY BANKIFI token Trustly volt tink Worldline YOLT

Source Paypers

Payment Initiation: Initiation of money transfer, invoice and enterprise payment services, using the money in the bank account.

Personal Finance Management or Cash Flow Management: Shows where your money is spent on and where it comes from. Usually, these tools show where you can save money from, for example, cutting down on food or clothing expenses, etc.

Debt Management: Tools that help you choose lower interest rates or lower withdrawal fees, giving notifications and advice for better products.

Asset Management: Advising asset management products to customers with free cash flow in their accounts based on the customer's risk profile.

Other cross-product offerings: Offering various cross-products when needed, such as offering overseas holiday insurance to someone who goes abroad.

Umut Esen

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Biography

He started his career as a software engineer and then founded his own software house. Later, he moved to Financial Technology by working at HSBC Digital Channels. At Softtech, he worked as a Solutions Architect in İş Bankası's Customer-Oriented Transformation, Fundamental Banking Transformation, and Digital Transformation programs, and then carried out the establishment of an innovation team as the Director of Innovation and made innovative projects happen. He was a mentor in the Workup Entrepreneurship Program, bang.Prix Platform, he performed as a jury member at ITU Big Bang 2018 and provided technical review services for Maxis Venture Capital. In recent years, he has focused on financial technologies, platform models and the European Ecosystem, and has been working as a consultant on collaboration, investment and acquisition with a focus on venture and technology firms.

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The Future of Open Banking

In order to interpret the future of Open Banking, it is necessary to go down to the root of it.

There are fundamentally two motivations of open banking.

To be able to compete with payment solutions from outside Europe, especially those that come from GAFA.

PSD2 regulations are a method developed by Europe to produce solutions that can compete against payment services such as Paypal or ApplePay. Regulatory institutions, which saw that banks could not compete fast enough, introduced PSD2 regulations, which forced banks to cooperate and initiated programs to support startups such as regulatory sandboxes. European governments believe in financial startups rather than banks when it comes to financial service competition. They are trying to create financial products that can compete in the market by producing more customer-oriented and faster financial solutions by breaking the dominance of banks and creating a competitive environment within. This approach aims to encourage both competition and joint action between banks and financial technology companies.

There are fundamentally two approaches to financial competition that governments follow.

> The first is to restrict access to the local market through regulatory constraints and licensing methods, a more defensive approach that prioritizes prevention.

> The second method is to adopt a more aggressive and expansion-based approach that prioritizes liberality and reduces regulations.

Countries position themselves between these two approaches in accordance with strategies and competencies.

Being able to control the use of data by defining it as a valuable asset

Through open banking, regulators aim to promote competition and innovation by opening customer data to third parties. The GDPR, on the other hand, defines limitations and controls for the use of personal data. GDPR is trying to serve the same purpose by trying to define the freedoms of payments with PSD2 while providing limitations. Ensuring that end-users are the owners of their data.

PSD2 is, on a fundamental level, an update of the regulation prepared to let payment services be provided by institutions other than banks, organized under the name of PSD. The European Union evaluates the issued regulations every 5 years and makes arrangements if additional regulations are needed. For the possible PSD3 approach, it is, therefore, necessary to focus on industry orientations and regulatory needs.

Open Banking in Turkey

Open Banking activities started in Europe in 2015 for the first time. The tradition of adopting financial regulations in Europe after 5 to 6 years in Turkey continued and with an amendment covered by Law No. 6493, Open Banking was published in the Official Gazette on 22/11/2019. The law amendment submitted to the Parliamentary Commission on 17/10/2019 came into effect quite quickly and became effective as of 1/1/2020. Within the scope of the legislation, the authority of the BRSA is transferred to a union to be established by the CBRT, enabling third-party enterprises outside of banking to merge accounts in more than one bank and initiate money transfers from banks. The law does not impose any obligation on banks to open APIs at this stage.

"

"Open Banking is a secure way to give providers access to your financial information."

http://openbanking.co.uk/

Open Banking Is Spreading to Turkey and Outside of Europe

		UK	EU	AUS	HK	SP	NZ	JP	MX	IN	US
Pioneer	CA: Competition Authority	CA	CA	CA							
	MA: Central Money Authority	MA		MA				MA	MA	MA	
	IE: Industrial Enterprise					IE	IE	IE			IE
Other cross-product offers	Large banks	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	All (including small) banks	✓	✓	→		✓	→	✓	✓	✓	
	All financial institutions			→							
	Cross-industry			→							
Standardization	Organized by market (M) or regulator (R)	R	M	R	R	R	M	-	R	R	-
	Standardization level	Hi	Md	Hi	Md	Md	Md	Lo	Hi	Md	Lo
Scope of services	Product information				✓	✓	✓	✓	✓	✓	✓
	Account information	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Payment initiation	✓	✓		✓	✓	✓	✓	✓	✓	
	Other				✓	✓	✓	✓	✓		✓
	Retail	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Business activities	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
Timeline	Readiness	Hi	Hi	Md	Md	Hi	Lo	Md	Md	Md	Lo
Commercial Model	Limited fees	✓	✓	✓	✓	-	?	?	✓	-	?
Security	Routing (R) or embedded model (E)	R	R	R	E	-	?	?	?	?	?
TPP license	Accreditation system and conformable institution	✓	✓	✓	Ma	Ma	✓	Ma	?	-	-

✓ Yes   - No   → Planned   ? Unspecified / Unknown   **Lo** Low   **Md** Medium   **Hi** High   **Ma** Mutual agreements   **Source** INNOPAY

Stages of Open Banking

Banking of Today

1 - Conventional Bank

> The bank dominates all channels

> The bank provides all financial solutions

> The bank has the ownership of technical infrastructure and products

> Technology firms provide basic tools

2- Collaborating Bank

> Startups provide some of the banking services

> Guidance and services are provided through collaborations between banks and startups

> The bank has the ownership of the customers' data

> Limited exchange of data between startups and banks

Open Banking Transition

3 - PSD2

> Payments are regulated by market demand or regulations

> Startups can use these transactions without any agreement

> Account balances, transactions are shared with startups

> Banks that fail to provide an adequate customer experience lose market

4- Open Banking Beyond Regulations

> APIs that are not limited by regulations are provided

> Functionalities expand with Open API and Partner APIs

> Data ownership is shared between the bank and the startup

> Bank generates revenue from services and data through APIs

> Banks losing their customer channel become subcontractors

Beyond Open Banking

5- Marketplace and Platform Banking

> Financial transactions take place in the customer's life cycle
> Solutions that are solely finance-oriented lose customer reach
> Collaborations required for fast end-to-end experiences
> Solutions that cannot form collaborations enter the market late
> Solutions that cannot form collaborations cannot focus on quality
> Institutions that fail to make fast and open collaboration happen to end up lagging behind
> Customer data is scattered between collaborations
> Ownership and authorization of data passes to the customer
> Institutions that are unable to adapt to the new model are losing income

Basic Outline of Marketplace Banking and Platform Model
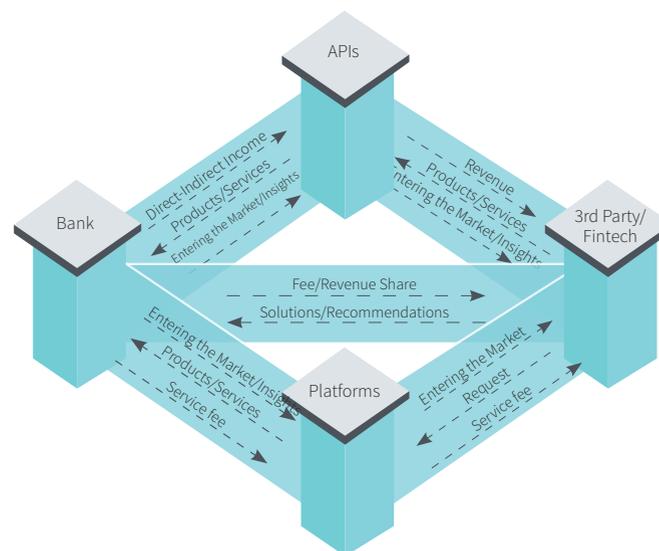
Developments that may be subject to PSD3

APIs are expected to exert pressure on the banks' profitability.

Banks are expected to accelerate the opening of their APIs for revenue with PSD2. It is thought that the banks that have a small share in the market will accelerate this process by opening a large number of services and trying to grab the market share of the large banks. Increased API-based services, spread of access to these APIs, are expected to create significant price pressure on API providers. A similar process has been realized in the rapidly digitalizing tourism industry. Companies such as Expedia that reach customers dire-

ctly lead to a decrease in prices by making the hotels and rental companies, APIs of which they have access to in the background, compete more strongly. A similar process can be expected to be seen in commissions and interest rates in financial services.

For data-driven revenue models, there is a need for a clearer definition between GDPR and PSD2.

Financial institutions wishing to reach new revenue models should create new revenue models based on data that fit well with the platform model. In particular, GDPR compliance is expected to gain prominence in the scope of this. There is a need for regulations to

provide and clarify the coordination between GDPR and PSD2.

PSD2 only makes it difficult to access to cash accounts.
With the spread of PSD2, the sharing of all accounts such as loan, credit card, investment accounts, etc. will also be on the agenda and there will be a need for standardization related to these structures. PSD focuses on access to financial data, while regulations in other industries are advancing with GDPR restrictions.

Payments are managed independently of the PSD2 definition.
PSD2 addresses the payment initiation process but does not cover the entire payment process. At this stage, PSD2 initiates the transfer of money from the account, allowing payment to be made, and paves the way for eliminating the need for intermediaries such as Visa and Master. However, existing payment systems, especially integrated with card systems, operate via virtual pos and money transfer is not used as a common payment method. It is expected that efforts on matters such as a transfer-based payment that IATA plans to carry out in the aviation ticketing will increase over time. The fact that such payment solutions operate as separate initiatives lead to the prolongation of the process.

There is no complete concordance between PSD2 and SEPA.
In Europe, the process of initiating a SEPA transfer may also take place with PSD2, but is not included in the definition of PSD2. Since SEPA is an asynchronous payment method, it is not possible to realize the end-to-end single transaction immediately and this disrupts the instant payment experience. With SCT Inst (SEPA Ins-

tant Credit Transfer Scheme) becoming more widespread in Europe, money transfering across Europe will be made possible in less than 10 seconds, and scenarios for making payments via money transfer abroad might be introduced.

Differences in the technical standards used in the implementation of PSD2 slow down the transition process.
Especially in non-UK applications, APIs do not provide standard data and security models. The key performance indicators that APIs must provide are not clear. This creates a significant cost of integration for third-party providers.

The SCA (Strong Customer Verification) in PSD2 makes it difficult to complete the processes in a smooth way.
In the payment world where one-touch payment comes to the forefront, strict access controls and user password requirements decrease the seamlessness of the process. Further progress is needed in practice with respect to biometric solutions and their compliance with SCA.

PSD3 Forecasts

In view of all the above problems, it can be interpreted that PSD3 will focus on three main points:
> Commonization of API and security standards
> Establishment of a money transfer-based payment method all over Europe with regulations on payments and instant money transfer.
> Arrangements to resolve issues such as data diversity, owners-

hip, processing, and revenue generation in accordance with GDPR, or harmonization efforts.

New Models for Banks and All Financial Institutions

Regulated by PSD3 or not, API Banking is expected to push all financial institutions into new business and revenue models.

The platform model is well established and developed in industries such as tourism, digital media, and advertising where regulations are more flexible. I believe that the resilience in the regulations introduced by Open Banking will also lead to evolution into a similar structure in financial products. Within this new structure, startups and financial institutions can focus on one or more roles according to their competencies, resources, and strategies. One organization may focus entirely on being a channel, while the other may choose to remain a provider in the background. Since the fragmentation of financial services is expected to increase in this process, institutions can be expected to customize these strategies on a product basis. Therefore, the importance of platform and ecosystem banking will increase gradually. New models will require new perspectives in addition to the technologies that provide.

The transition to the Financial Platform model is progressing very rapidly. Many players have started to offer these services widely as

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Developing an ecosystem business model requires a new strategic approach

Conventional business strategy

- What we do?
- Who are our customers?
- Through which channels can we reach our customers?
- Which stakeholders can help us reach through these channels?
- How can integration improve value chain efficiency?

APIs are primarily a way of encouraging the execution of a bank's market entry strategy.

Ecosystem business strategy

- Which capabilities (assets) are we uniquely good at?
- Which ecosystems can benefit from our assets/capabilities?
- Which ecosystems will allow us to enter these ecosystems?
- Which connections do we get linked to with which skills?
- How do we continuously optimize connections in order to gain customers, serve them and keep them?

APIs activate the fundamental assets and capabilities of the banks in order to create new businesses within the ecosystem of partners, communities, customers, etc.

of now.

Especially since the developments in data ownership and data platform are advancing very slowly with the effect of KVKK, GDPR, and other regulations, it is seen that these startups are early-stage startups. It is expected that sooner or later regulators will be able to produce safe and flexible solutions for the customers by making changes to these parts. Many early-stage startups, especially those based on distributed ledger blockchain technology, try to focus on this issue. Since the studies are at an early stage and related to regulations, it can be assumed that the formation of such a structure may take 3-5 years and that it reaching a certain level of prevalence may take up to 10 years. Fundamentally, the solution of four problems is expected to accelerate the matters:

> Sharing, processing and, as needed, anonymization of data when it is being used.

> Ensuring that data can be stored centrally in a regulatory institution or in a blockchain-based distributed structure, and ensuring and securing which data can be viewed by whom and for how long.

> Recording all data access and purpose of access, and monitoring of those only by authorized individuals within clear security restrictions.

> Providing the customer the right to be forgotten.

> Creating a model where all parties, namely the owner of the data (the person whose data is formed), the data receiver (customer channel), the data holder (service provider), processor (data specialist companies), user (marketing channel) and intermediary (data platform), are both controlled and able to earn revenue.

Forecasts for financial institutions

Customer experience will continue to be important.

It will be necessary to produce fast and effective solutions by using external services in problems that concern all institutions like security, KYC, GDPR, AML.

Solutions that serve enterprise customers and SMEs will also come to the forefront with the wave of digitalization.

Account merging services will no longer be an additional feature but will become a necessity.

API and developer portals will gain importance with their ease of use, service richness and platform features.

API integration solutions running on APIs of different organizations will gain prominence.

It is expected that there will be structures in which international money transfer practices evolve into payment services. Card mediation is expected to change with this model over time.

Platform models will become more and more prominent as they will allow you to combine a large number of functions in a customized way in a short period of time.

The process of global institutions expanding into markets in different countries, by acquiring local licensed institutions or making partnerships, is expected to accelerate.

New Roles to be Formed in Marketplace and Platform Models

Sales Channel (TPP)	Marketplace / Platform	Manufacturer (API Provider)

| White-Labeling | Customer Journey | Customer Experience |
| | Multi-Channel Management | Insight Provider |

Experience

Customer Data Permission	Data Merging	Data Provisioning
Providing Advantages	Data Association	Data Anonymization
	Data Processing Mediation	
	Data Marketplace	

Data

Sales of Sales Opportunity	Service Marketplace	Product Provider	
	Service Adapter	Service Provider	License Provider
		Infrastructure and Service Provider	Technology Competence Provider

Function

White-Labeling: Products that are realized only through the branding of an application that is ready. The most superior solution is the speed of expanding into a market. It is a suitable model especially for companies with a large existing market, high brand value, strong digital marketing and power of receiving or making large investments.

Customer Journey Design: With the use of technologies such as the Internet of Things and Augmented Reality in addition to financial technologies, the importance of uninterrupted customer experience will become increasingly important in the new generation banking. Although the experience in the customer's life is a completely independent journey, such as playing games or planning a vacation, it may involve the presentation of one or more financial products. Fintechs such as Simple and 11:FS are particularly focused on customer experience. 11:FS, for example, provides this competence as a service as well and provides insight into market experiences with a product called 11:FS Pulse.

Multi-channel Management: In parallel with customer journey design, multi-channel experience solutions are expected to continue to be offered under digitalization solutions by being adapted to new technologies. Mobile banking infrastructures working on BaaS platforms can also be evaluated within this scope.

Customer Experience Insight Provider: Even though customers do not have access to any of their data, clickstream solutions that provide insights only from the actions taken during the customer journey, they will need to reach different data beyond the clicks of

the users in time, with the enrichment of experience.

Providing Advantages for Customer Data Permission: There are loyalty and campaign solutions spread across various industries that obtain data usage permission over the membership system and increase membership satisfaction by providing membership advantages. GDPR and KVKK impose limitations on these models. Providing clearer and, in terms of money, measurable advantages in order to obtain explicit permission from the customer will make it easier to be under the spotlight. For example, applications that combine both payment and loyalty are being tried by companies, such as Starbucks. For such applications to be successful, it is important to reach a sufficient number of customers and to provide a good technical infrastructure in accordance with regulations. I do not expect most of these endeavors carried out by each company independently to succeed. Over time, these applications will need to be consolidated and cooperate with products that are already available to the customer.

Data Merging: Financial information of customers is available in many different systems. With PSD2, bank account balances and transactions can be displayed by AISPs on a single screen.
With the continuation of regulations post-PSD2, it is expected that it will be possible to collect all financial information from multiple sources and shown together. It is considered that a rapid integration capability with different technological systems is critical for this service.

Data Association: It is expected that institutions that bring toget-

Data collection startups make up the core layer of financial innovation:

PLAID

Investment	Valuation
$ 309.8 million	$ 2.4 - $ 2.6 billion

Investors
Andreessen Horowitz, Goldman Sachs Investment Partners, New Enterprise Associates

Region
USA (No open banking)

Plaid is an API provider that powers financial services applications and helps users connect to their bank accounts.
Plaid is more valuable than international competitors; because this startup collects data in an unrestricted environment.

TRUELAYER

Investment	Valuation
$ 11.8 million	$ 38.55 million

Investors
Anthemis Group, Connect Ventures

Region
United Kingdom (Open Banking)

TrueLayer is an API platform that enables developers to access the bank data they need to build financial applications and services.

TrueLayer currently operates in the UK, is in beta in Germany and soon will arrive in France, Italy and Spain.

tink

Investment	Valuation
$ 309.8 million	$ 273 million

Investors
Sunstone Capital

Region
European Union (Open Banking)

Tink offers APIs as building blocks for creating banking services.

Tink said the plan was to reach 20 markets by the end of 2019, targeting a range of customers from large banks to individual developers.

Source CB Insights

her different data types and form compositions from them, especially those that can develop insights by combining financial information and non-financial information, are expected to come to the forefront. In this model, the main aim is to evaluate the relationships between multiple data with technologies such as artificial intelligence and scoring, in order to make them possible to be used in decision-making mechanisms. Companies such as Experian, which produce credit scores, are mainly focused on this service.

Data Processing and Intermediation: Due to the richness of customer data and there being a lot of possible scenarios in which insights can be used, the need for data processing will reach dimensions that cannot be met by the institutions that provide the data and reach the customer. Platform providers are also expected

to offer the possibility of anonymous data processing to the companies that are experts in data processing. It is expected that business models that are only about data processing and mediating data processing will be formed.

Data Marketplace: It is needed to provide the necessary infrastructure for regulations and cooperations for a common platform for all services, such as data providers, channels that want to use data, data handlers, and data merging services. Startups such as Dawex, iDatastreamx offer such a model. Similar models may be expected to focus on anonymized private data.

Data Provisioning: VInstitutions with lower data processing capabilities are expected to generate revenue by sharing raw data.

Infrastructure players commodify consumer data and become the source of more fintech formations

2019 Q2 opportunities and fintech partnerships

TRUELAYER		token		tink		YAPILY	
Lending	**Banking**	**Student Housing**	**Rentals**	**Payments**	**Incumbent Firm**	**Payments**	**Incumbent Firm**
ZOPA	monzo / Revolut	StuRents	mashroom	PayPal	SDC / NatWest	GOCARDLESS	Moneycado
Credit scoring		**Incumbent Firm**		**Banking**			
ClearScore		TURKISHBANK		lunar way			

2019 2nd quarter financing
$ 16.5 million, Series B, USA & UK

Licenses
AISP and PISP

Investors
Tencent Holdings, Anthemis, Temasek Holdings

2019 2nd quarter financing
$ 35 million, Series C, UK

Licenses
AISP and PISP

Investors
Octopus Ventures, Opera Tech Ventures, EQT Ventures, BNP Paribas

2019 2nd quarter financing
$ 11 million, Series D-II, Sweden

Licenses
AISP and PISP

Investors
Insight Venture Partners, SEB Ventures, ABN AMRO

2019 2nd quarter financing
$ 5.4 million, Seed, UK

Licenses
AISP and PISP

Investors
Holtzbrinck Ventures, LocalGlobe

Before the data can be exported, it must be extracted from the personalized data scope by creating summary data, or approval must be obtained from all persons for which the data is transferred. With the settling of KVKK and GDPR over time, it can be expected that some rules within this scope will be clarified.

Data Anonymization: Anonymizing data in order to make the data usable by other institutions will become increasingly im-

portant. For instance, the startups Privitar and BigId identify and anonymize data sets at different points. The InCountry initiative establishes a link between local cloud and global cloud with connection and anonymization techniques, enabling cross-country and hybrid cloud solutions to be realized.

Sales of Sales Opportunities: Channel applications will create opportunities aimed at the sale of financial or non-financial pro-

ducts within the customer experience and generate revenue from these sales opportunities.

Service Marketplace: Platforms focusing on bringing together various functions and services to its customers are being formed. In order to provide fast and high-quality solutions, rapid collaborations come to the forefront. Xero (Market value - $ 11.5 billion - November 27, 2019), providing accounting services for SMEs, intermediates many additional products through the marketplace.

Service Adapter: Institutions that specialize in a single function or service, allowing the selection of these services under the same umbrella according to cost or need. For example, Adyen (Market value - $ 20 billion - November 27, 2019) has focused on being an e-commerce payment provider and has acted as an intermediary in payment infrastructure in dozens of countries.

Product Provider: Organizations that offer software that perform certain functions, both with the SaaS model and the licensing model.

Service Provider: Generally, they offer software that perform certain functions with the SaaS model. They usually focus on non-operational lines of business or offer solutions that help their clients run the operation. It provides personal banking opportunities to all parties through Starling Bank APIs. İş Bankası allows the use of their API which lets e-commerce platforms to carry out credit sales.

Product Provider: Organizations that offer software that perform certain functions, both with the SaaS model and the licensing model.

If data is the new gold,
financial data is the new diamond

Technology companies can interpret exactly why you enter a store when you go there, but they cannot know for sure. They even have to estimate if you bought any products or not, or whether you are a customer or not. You may also be a delivery person that delivers an order or someone working there. Financial data is very clear - which product, how much was it bought for and how often was it bought, is this store more expensive than its competitors? Are there rich people in the neighborhood? In summary, financial data is much more certain.

Open banking took the first step to start digging in this mine and gave its ownership to its source.

The entry to this mine with unlimited resources will never be barren, and in time it will become a marketplace consisting of those who produce, operate, use, trade and those who sell tools to them.

BBVA launches a BaaS platform in the US

Solutions

Identity verification
Make customer authentication easier in one call

Money Transfer
Support a range of payment types from a single endpoint, including custom ACH and bill payment solutions

Account Creation
Create and manage branded consumer and commercial deposit accounts

Card Printing
Design and manage branded customer debit cards

Customers

SIMPLE   azlo   xero   digit

Green Dot will enable small businesses to launch their own banking products

bank OS will enable 'everyone' to offer banking products

1
Providing discounts to athletes due to partnership

2
Sending discount virtual bank cards to the athletes

Sports Equipment Brands

3 Athletes spend money at the store, receive discounts

Youth Sports Organization

4 Sports league earns money from the debit card exchange fees

Source CB Insights

Infrastructure and Service Provider: They provide the entire service end-to-end, not only focusing on software but also undertaking operational tasks if necessary. They focus on operational efficiency by specializing in the field and managing requests from a common pool. For example, The Green-Dot BaaS Platform uses GreenDot Bank in the background.

License Provider: Some organizations will include solutions such as allowing the use of licensing into processes and services they provide. For example, institutions that provide banking services, such as Fidor, also allow the use of their banking licenses.

Due to the possible risks and regulatory controls, this is generally integrated with licensed banking services aside from institutions with no organic or inorganic connections.

Technological Competence Provider: There are providers who can serve all platform steps and are focused on solving common problems there. For example, due to customer recognition, fraud and money laundering prevention, compliance with regulations and data security issues, these things being carried out by institutions that are experts in their field will be more important.

DIGITALIZATION AND SECTORS

COLLABORATION MODELS

Industries and Collaborations

With the developing technology, banks are trying to adapt to technology by adjusting their existing systems to new channels. Instead of entering the emerging industries, they began to hold a place in these new channels with their existing services. For example, the post-Internet banking industry turned to internet banking instead of establishing dominant products or companies in the e-commerce sector.

Today, there is a significant increase in mobile device usage worldwide. Therefore, the current era we live in is called the "mobile internet age". In this era, banks prefer mobile banking applications instead of mobile applications that touch users' lives.

Especially with the maturation of augmented reality products, image processing, and voice transmission intelligence technologies, the transition to the "digital reality" era has begun. With this transition, access channels to people will be diversified and even smart glasses will become alternative access channels. In this new era, it is thought that products that are not integrated into people's lives will be used less and less. At this stage, it is believed that it will be even more important for the banks to change their previous approaches in order to reach their customers and to produce products with priority on customer experience.

The definition of a digital workplace involves a very different con-
cept than the execution of work through mobile or different digital channels. For example, with e-commerce, the companies that digitalized and changed all their processes according to e-commerce gained more importance rather than the companies that transferred their current model to e-commerce. We observe that the institutions that prioritize the customer's experience, plan and design the entire process, from marketing to order, from warehouse management to delivery, are more successful. There is a similar transformation in this field in the world as the regulations in banking also gain flexibility. The institutions that prioritize customer experience come to the forefront in terms of cost, speed and customer satisfaction.

With the advances in technology in the upcoming period, banking will gradually integrate smoothly into human life. For example,

today people still go to the bank to take a loan when buying a house and they have to go through a complicated and exhausting process. In the future, customers will move towards an integrated process in which they prioritize payment conditions in their purchasing preferences.

Two main alternatives stand out for the integrated process. Either the banks will pay more attention to the functions critical to the lives of their customers, regardless of whether they are enterprise or individual, or non-financial industrial initiatives or technology companies that focus on the customers' lifecycle will pay attention to the financial needs of their customers.

In both cases, it is important to have knowledge of different industries and to collaborate quickly with different industries in or-

der to provide integrated services. Partnerships are, by their very nature, can and should help create scale economies to which the other businesses can contribute a lot along with many small enterprises that can't create this on their own effectively. From a global perspective, international partnerships and communication can help businesses reduce their R&D costs. Cost-effective and time-efficient R&D is an important part of innovation and increasing output.

In a recent study by Finextra, 81% of the bank executives taking part in the survey stated that collaboration with partners is the best strategy to achieve digital transformation.

The majority of banks are not suitable for partnerships. Larger institutions may have the resources to identify and form partnerships; however, their size and organizational complexity make it difficult to operationalize and scale partnerships.

Small institutions often lack the resources or skills to identify, examine, and form a meaningful number of relationships. Making partnerships operational often requires integration into core applications, which can be difficult for smaller organizations.

Therefore, in order to achieve successful collaborations, both the adaptation of the internal environment and competencies as well as the types of cooperation models and their suitability to the organization become important.

People and Organization

Basic Problems

Rigid business methods and a culture that is not open to change

The business processes having been shared by being separated into different silos

Multi-level hierarchy and chains of approval

Performance criteria focusing more on the short term

Risk-taking not being rewarded, success being the center of the focus

A culture that refuses transparency, emphasizing having all of the slices of the cake rather than helping make the cake bigger

Suggestions

Build a dedicated team that serves the focus of the collaboration

Ensuring that the established team is a team with all four competencies in this table required for collaboration

Ensuring the established collaboration team has its own areas of decision

Having the established teamwork in harmony with and immersed in the ecosystem

Making collaboration a part of the strategy and reducing it to tactical plans

Organizing training programs to increase the collaboration competencies of all employees

Financial Awareness and Feasibility

Basic Problems

Lack of a dedicated budget, subject-based budgeting work

Implementing a single risk profile throughout the company

Short-term financial KPIs getting ahead of long-term financial KPIs

Threshold of profitability: No trial of alternative areas due to profitability of the main business line of the company

Solutions

According to the company's risk perception, profitability and desire to reach out to alternative business branches, allocating a certain part of the budget to projects containing collaborations.

Placing importance on customer-focused KPIs based on feasibility in the short term and Financial KPIs more in the long term

Providing flexibility for experimental collaborations in line with the main strategy

Internalizing business models such as revenue sharing model and leasing model

Business Information and Law

Basic Problems

Lack of expertise in the industry of collaboration

Lack of knowledge of the advantages and disadvantages of collaboration models

Lack of knowledge about law and regulations

Upper management support

Having high expectations while ignoring the risk factors

Solutions

Working with legal, contract and regulation consultants who are specialized in collaborations

Working with internal/external consultants who have knowledge of the industry where the collaboration happens

Providing sponsor support from upper management

Involving all leaders in the process

Avoiding practices that may undermine trust in the execution of contracts and legal processes

Building an experienced team in product and company procurement options

Generating the necessary knowledge and organization for financial and strategic investment

Providing flexibility that enables rapid corporatization for spin-offs.

Technology and Digitalization

Basic Problems

Technological infrastructure that is not suitable for collaboration

Strict security practices

Weak API and Cloud support

Failure to prioritize resources required for integrations

Solutions

Ensuring that the product and infrastructure are arranged in accordance with the requirements of collaboration without waiting for a collaboration to happen

Ensuring the formation of a rich API infrastructure

Dedicated security, integration, testing, and design team focused on carrying out the collaboration

Collaboration Models

01

Application Programming Interfaces/Sandbox

02

Internal Hackathon/Innovation Contest

03

Open Innovation

04

Startup Acceleration Program

05

Startup Product Integration

06

Startup Product Partnership

07

Startup/Startup Product Acquisition

08

In-House Entrepreneur/Startup Laboratory

09

Joint Venture

10

Capital Investment in Startups

11

Startup Acquisition

12

Hybrid Models

If we see innovation as the use of new market-leading techno-logies to make the lives of the consumers and the operations of the enterprises more efficient, cost-effective, and safe, the best way to do this is to develop partnership models.

Partnerships can and should help create economies of scale in which many small firms, by their very nature, cannot effectively create by themselves, but can contribute greatly along with other businesses.

From a global perspective, international partnerships and com-munication can help businesses reduce their R&D costs. Cost-ef-fective and time-efficient R&D is an important part of innovation and increasing output.

For this reason, it can be ensured that information transfer is im-proved, a wide range of best practices are achieved and through partnerships, the size of the network around the world can be inc-reased.

All over the world, particularly in Europe, the risk and revenue sha-ring continues to improve in the Bank-FinTech collaboration as the current revenue risk rate is a negative situation for banks and needs to be addressed for long-term sustainability. While banks cover the largest part of the risk in any collaboration, the revenue share can be divided equally between banks and FinTechs.

Application Programming Interfaces / Sandbox

Contract-Based API

Banking APIs (application programming interface) enables third parties to develop new products and services and to increase cus-tomer experience to higher levels. This enables closer collaborati-on between conventional financial institutions and Fintechs, and therefore APIs are seen as the most sought-after topic for banks, especially for Fintechs.

Financial institutions are starting their works on API by opening their APIs with more conventional methods due to security con-cerns.For this reason, they prefer to move forward by clarifying who will use the API and how it will be used, through mutual busi-ness agreements and mutual security infrastructures.

Commentary

> As it is a controlled operation, the bank can take the initiative to limit the company's loss of the channel to the customer.

> Both the scope of cooperation and the provision of technical infrastructure are costly, complex and time-consuming.

> Fintechs that start small but grow fast may be noticed late, and partnership opportunities with them will be lost to other com-panies.

> Since the work that is carried out usually includes one Fintech

or sometimes a limited number of Fintechs, the success of these Fintechs also affects the results.

> Since the main purpose of APIs is to provide acceleration and multiple quick collaborations, this structure will have a limited ability to achieve the desired effect.

> It is possible to benefit from the growth of Fintech indirectly and loss of income may occur as a result of the integration of Fintech with other institutions in the future as this indirect benefit is directed to other places.

Open API / SandBox

In this model, firms allow FinTechs to have limited access to some of their infrastructure or services through publicly available APIs and virtual development environments or anonymized samples of customer data.For the company, this represents a relatively closed approach to innovation, where FinTechs can produce and test

new products and services without affecting the company.

Especially in Europe, Open APIs are becoming more common in financial services. In fact, the introduction of the Revised Payment Services Directive (PSD2) of the EU in 2018 will help banking customers manage the financial situation of third parties without leaving their existing banks. An API or sandbox model typically does not include a commercial agreement about how a product is used or who owns it.

Commentary

> It is possible for some APIs to be paid and some APIs to be free.

> Services such as ATM List and Branch List will increase the orientation to the banks and tend to be free and open for everyone.

> Some APIs may be subject to approval and charges. Fast commercial and technical collaborations can be achieved by having those happen in a digital environment with fixed packages.

> Having APIs open will allow the customer channel to start to be shared with startups .

> Opening the first APIs and enabling them to be used in many places may increase banking revenues.

> In an environment where all banks open their APIs, this will cause the channel to be shared with startups. In the current situation, with pioneering banks, pricing based on efficiency and competition will cause a loss of revenue.

> Failure to open an API with the same flexibility in an environment where all Banks open their APIs can result in serious market and revenue losses.

> When the game theory is evaluated, it seems inevitable that APIs will become widespread.

> Data security and regulation issues need to be carefully monitored.

Internal Hackathon/Innovation Contest

Hackathons are time-limited development events where organizations present a business or technology problem and invite Fin-Techs to find a solution often with a team specifically created for the project. Hackathons, which have become popular in recent years, focus on rapid innovation and rapid prototyping to test early-stage concepts rather than producing an attractive product.

Idea contests are usually held in digital environments and spread over a certain period of time. In idea competitions, mutual evaluation in the digital environment and the support of internal mentors

ensure that ideas advance further. The main objective in this kind of work is to create a product, however, the expectations should not actually head in this direction. In-house employees should not be expected to have all the necessary competencies to be able to finalize the work due to the fact that they have existing tasks and they are not able to act independently.

Commentary

> Due to their time-limited structure, Hackathons have positive results more in terms of determination of software, technology, presentation, and marketing competencies.

> Idea contests, on the other hand, are highly effective in developing competencies such as the creation, evaluation, enrichment and field testing of innovative ideas.

> Sufficient competence in both the creation and the realization of the idea may not be fully present in the team in completely inward-oriented practices.

> These activities are very useful in terms of widening the horizons of the people who have a different main focus, although the high expectations for success lead to disappointment in both the participants and the management.

Open Innovation

In this model, all or part of the team is from outside the company. Both hackathons and idea contests can be held within this scope. Teams participating in the project are given access to internal expertise and resources by the organization, questions may be asked about intellectual property rights, and solutions are created during these activities in particular. Organizations should determine how their existing intellectual property can be used during the hackathon and FinTechs or resident entrepreneurs who develop the products or services should ultimately ensure that they have the rights to them.

Commentary

> Hackathons and idea contests that are open to participants outside the company can be effective at attracting and recruiting talents from elsewhere.

> These events being open to the external participants can lead to the creation of many different ideas, including those outside the industry.

> The possibility of getting results is increased as people whose very own aim is entrepreneurship might also participate in such formations. However, the success rate is low as the participants are not yet at a startup level.

Startup Acceleration Program

This model often directs many FinTechs to organizations for support on the new products or services they are currently developing. The organization can identify and benefit from the most promising innovations by selecting a small group of applicants. Selected Fintechs get access to expertise, support, and a customer base. There are fundamentally two models used here. In the first model, no investment and share are received, while in the second model, the shares are received from the startups in return for the benefits provided.

Enterprise Acceleration programs can work with equity agreements rather than a simple collaboration, with organizations often receiving a share of the FinTechs they choose. This means that FinTechs must ensure that they are open and comfortable with the amount of shares they offer and the conditions under which they are issued.

Since shareholders will expect a higher level of control, management rights and exclusivity from trading partners, FinTechs and corporations will require early-stage legal agreements to prevent them from operating under different business models. Each party should be aware of the rights of the other within the scope of such arrangements and ensure that it is documented in advance if necessary.

Commentary

> It stands out as a good model for enhancing and experiencing interaction with the entrepreneurship ecosystem. It provides startups with the opportunity to obtain detailed information about working models.

> Intellectual property rights are wholly reserved by startups. The network effect of the benefits provided to the startups should be focused on rather than the benefits to the company.

> Issues such as exclusivity in partnerships are important.

> In this model, since there is no direct investment in startups or their employees, the cost is low. However, the return of this cost as revenue is also low.

Startup Product Integration

In this model, the product or service is already completed and ready for the market. The organization will select a specific product developed by a FinTech company to test limited portions of its customer base as a white-label or co-branded product. If this is successful, the organization then scales the use of the product. This allows the organization to easily test new propositions and products without wasting its own capital and development time. This is a commerce model where each side shares risk and growth opportunities equally. However, issues may revolve around intellectual property rights and exclusivity. As settling an agreement with an organization in order for its product to be used together with the organization will prevent FinTechs from selling the product to other companies, the agreements should be sorted out in advance.

This concern of exclusivity can also affect the organization. It will need to assess whether it can be bound to a single provider and whether it can rely on a single product to take the associated operational risks. As with most of these models, there is debate about the legal ownership and control of the intellectual property.

Commentary

> The revenue-sharing model is applied in the work that is mainly carried out through the use of API. In some cases, API-based operation may be inadequate as the product must be installed and used internally.

> In such a structure, pricing is usually done with licensing fees or Service pricing models, and all revenue is collected by the institution.

> Since the startup isn't focused on revenue, how much the company will earn in revenue from the product might not be the main focus of it.

> The institution reserves the risks relating to all potential revenue or the inability to generate revenue.

> Since there is usually no exclusivity in this model, the competencies gained by the product in this process can give advantage to other companies and this advantage cannot be turned into money.

> Especially in solutions that require high data and screen integration, integration time and costs may increase due to regulations, and the features that the startup can provide very quickly in cloud environments externally may not be obtained at the desired quality, speed, and cost.

Startup Product Partnership

In this model, companies can partner with startups on a specific product they have, through franchise or joint development models. They may use an intermediary technology company or an intermediary company to make this happen. The sales, development and marketing costs of the product that is created are covered jointly. It can be used where the currently needed product might be a global player to address a significant need in the market. The product can also be developed jointly starting from the initial development stage.

Commentary

> Since products containing technical information (credit scoring, fraud detection, etc.) are also used with this method, revenue may be generated beyond the benefits of the product.

> Since the ownership of the product is shared, the product can gain more efficient features thanks to the joint work.

> In the case of partnerships on a product-only basis, the focus of the initiative may shift to other products, and investment, sales, and revenue sharing should be very clear and result-oriented for both parties.

Startup/Startup Product Acquisition

In this model, rather than integrating an already developed product or forming partnerships based on it, the more common approach includes buying out the startup and obtaining the product that way. In such a structure, the arrangement is that the employees stay in the company for a certain period of time. It can be used especially in cases where the institution purchasing the startup will make a great contribution to the startup and there will be less need for the startup to grow the business.

Commentary
> In particular, it is an effective method to gain a certain technological competence or to reach a specific customer portfolio.

> It is difficult to achieve good results in this model if the employees of the startup are needed to continue the success of the business.

> The likelihood of success is rather low when it is not yet clear how to scale the applications, as the startup spirit will disappear in the case of such applications.

> Since a transformation will occur from a structure in the spirit of a startup to an institutional process, this can offer positive results especially for work that can be scaled.

In-House Entrepreneur / Startup Laboratory

Although it is among the possibilities to identify the in-house entrepreneurs through this model, the main target is based on the recruitment of high profile entrepreneurs from all industries on a contract or long-term basis. The entrepreneur works as an entrepreneur separately from other units within the company, while benefiting from opportunities such as innovation, R&D, sales, legal and accounting within the company. The entrepreneur can focus on the product and business model that he/she has adopted, as well as focus on the business models and products formed within the company. Even if the idea of the in-house entrepreneur is proposed by him/her, he/she must obtain approval from units within the company and upper management in order to proceed with the idea. As a result, it is a method in which the in-house entrepreneur works optionally and receives a share of the revenue if success is achieved, and spin-offs can be created in case the business continues to be successful.

Commentary

> This model is one of the most effective methods in terms of enterprise innovation. The matters of copyright and revenue sharing are under the control of the institution.

> It ensures the development of projects in line with the company's strategy and competencies.

> These profiles can be difficult for companies to achieve because they require entrepreneurs whose basic motivation is success, risk perception is lower than that of external entrepreneurs, and those who have internalized the benefits that the corporate advantages can provide to the entrepreneur to the point that he/she can waive the revenue to be earned in the end, those who have strong communication skills.

> Trying a large number of ideas in this model may result in fewer trials compared to the VC (Venture Capital) model due to its control mechanisms and processes.

> Due to corporate processes, the startup can easily access resources and collaborations. On the other hand, again due to corporate processes, things can slow down from time to time.

> When projects are created on common ground for both the in-house entrepreneur and the institution, progress can be made rapidly due to there being no concerns about sharing the revenue.

Joint Venture

In this model, an institution attempts its own startup to address a particular market niche rather than an existing recruitment or acquisition procedure. This company takes place along with the main business channels and can be a separate brand. It establishes that alone in partnership with a FinTech or Venture Builder. This may bring special capabilities and investments to institutions, supported by a common equity capital.

The main legal concern for the joint venture is the ownership and control of the new company. The question of who owns the rights to the new products created and whether this agreement is exclusive or not should be resolved at the start. Stakeholders agreeing on the value to be placed on technical expertise against financial investments also is of vital importance.

Commentary

> `It is an effective way to form a full partnership, especially in cases where the boundaries of collaboration with the enterprise are clear.

> It is a method that can be used when doing business together with larger scale companies besides the startup.

> It is an effective way of collaborating to establish a more independent structure in terms of marketing, branding, legal and regulatory responsibilities, and financial management.

> It may require a very costly process. The partnership ratios and the exit strategy should be clear.

Capital Investment in Startups

This is one of the simplest models. An institution acquires a minority stake in one or more FinTechs to enable internal access to innovations when they gain prominence. As a simple investment, many of the legal aspects here are standard for large businesses. The institution should assess the risk profile of the investment and the stability of FinTech's value. In this context, exclusivity means to determine whether the service under development will be provided only to the investor or not. Since a high amount of investment is required, a joint venture capital fund can be established to distribute the risk to multiple startups.

Commentary

> High amounts of investment are directed to one or more startups at certain rates. The risk will decrease as the amount and number of investments increase.

> It is an effective method when investing in large amounts.

> Share ratios and exit strategies will need to be studied and managed in detail.

> The process may progress more slowly for the acquisitions that are focused, with clear strategies and target startup.
Offering some flexibility in the agreement may not be possible.

Startup Acquisition

They are acquisitions aimed at acquiring a significant amount of shares without absorbing a startup into the company.

This is one of the most complex models, both in practical and legal aspects. Institutions purchase specific FinTechs to ensure access to innovations through acquisitions or to accelerate strategic transitions. On commercial terms, the key item is usually valuation. The institution and FinTech must agree on a valuation. An institution will have uncertain growth expectations by purchasing a FinTech with a ready product. Under these circumstances, there may be a valuation deficit with the value paid only when certain milestones are reached (when gains are obtained). This can also provide a useful incentive to keep the FinTech in a good condition or to sell the FinTech owners to keep the business growing.

Commentary

> It is particularly suitable for established startups and ones that might get competitive in the future, or entry into a new market.

> The legal and financial aspects of this are complex.

> The exit strategy needs to be understood clearly.

Hybrid Models

It is possible for institutions and FinTech to adopt a special partnership framework that could be a hybrid of the above models.

This can provide more flexibility and allow the partnership to have a wider range of benefits. Naturally, contrary to this approach, it can lead to more complexity and more legal issues to consider and address. Over time, some hybrids can be standardized and can be easily duplicated by copying by other companies.

Hybrid models are more prominent in group companies. One group company may provide the startup with a payment infrastructure while the other may provide technological support.

Funding, on the other hand, may be provided by another institution. Thus, profitability increase can be achieved in the common denominator.

As the FinTech market continues to evolve and advance from the initial disruptive phase to a more mature and diversified market, the creation of new models should be expected. Ensuring that a company's business practices and legal structures are open to future innovations and are flexible can help provide a competitive advantage in this high-growth field.

Other Concerns

There are certain legal issues that need to be addressed when starting a project or partnership. This section summarizes the legal issues that Institutions and FinTechs should consider (and perhaps seek expert advice on) before forming a new partnership.

Intellectual property

Intellectual property is one of the biggest problems for FinTechs. When it comes to working with larger companies, due to legal matters, it is very important to have a thorough understanding of how two businesses will work together and to identify this very clearly:

> Which intellectual property currently exists?

> Who owns the existing intellectual property?

> Under which conditions can the existing intellectual property rights be exercised by each party?

> Who will hold the rights to any new ideas that result from working together?

> How can intellectual property be merged if necessary?

Regulatory Compliance

Institutions are subject to industry-specific regulations that are constantly reviewed and updated. In contrast, there is no specific "Fintech regulatory framework". Instead, there are some regulations that apply. These may also depend on the FinTech's business activities. In response to the growth of the FinTech industry, a number of changes have been made, including special arrangements for lending, crowdfunding, and it is possible to see further changes in the future.

FinTechs often operate at the edge of the financial services industry and may therefore be subject to legal investigation in some way before a product is released to the market. But FinTechs and

their corporate partners are likely to have a complex regulatory understanding and should ensure that legal requirements valid for the FinTech are taken into account. For a FinTech, it is important to understand the possible concerns of the organization, and the organization should be clear about what it wants from FinTech and deal with regulatory concerns early in the relationship. In the context of Mergers and Acquisitions, there may be a need for structuring joint venture arrangements in accordance with regulatory approvals or notifications or rules on outsourcing. Although this is a slow process, it is an integral part of introducing the FinTech's products to the market.

Data Protection and Privacy

Data processing is essential for many FinTechs (and institutions). The special regulations of GDPR and BRSA, published in 2016, are one of the main issues to be considered when it comes to collaboration with startups. As a result, FinTech and institution partnerships should carefully consider data protection issues.

When personal or private data are exchanged between institutions and FinTechs, cybersecurity protocols will also need to be implemented. This not only ensures that data is protected in transit, but also clearly defines how the data will be accessed, processed, and protected throughout the entire life cycle.
The institutions and FinTechs will need to account for what kind of data breaches may occur, how each business will contribute to the

identification and reporting of the breaches and any obligations related to data privacy or any failures in security checks.

Exclusivity

FinTechs are independent businesses that own or develop their own products in addition to a specific project with the institution. Whether FinTech will work with the organization on a single project or on more than one project at the same time should be determined early in a collaboration. Both parties need to determine whether the product created can be sold to other organizations and whether the FinTech can work with other organizations (during or after the period of collaboration) with independent projects.

FinTech operates independently or under the control of the organization, whether the organization requires some oversight, and whether or not both parties have access to proprietary information should be decided.

Exit Mechanism

At the end of the project, there should be an exit process agreed upon. The structure of the exit mechanism will depend on the agreements:

> New and existing intellectual property rights
> Ownership of joint assets
> Which party will be responsible for maintaining compliance

While these are merely a starting point for legal and commercial discussions, clarification and understanding around these key issues at the beginning of collaboration will support a successful relationship between companies in the long run and a smoother exit at any time.

Growth and Risks

Starting a new product or business is inherently risky, but if the project is successful there is also the potential for additional profit and capital increase. Institutions and FinTechs will need to decide how each party will benefit from the increase in value and who will take responsibility for risk exposure.

Costs and Control

The development process for a new product must be considered in advance. The institution and FinTech need to agree on a range of issues, including those responsible for financing research and development costs over the duration of the project. Both companies have to agree on who will manage the day-to-day operations and the more general strategic aspect of the project. Whether the

It is important to see that although all institutions have private law departments, not all FinTechs are at a stage where they have legal representation. Because of the often complex nature of collaboration agreements, we recommend that the FinTech seek appropriate legal representation in the early stages of the discussions.

ENTREPRENEURIAL INSTITUTIONS

İhsan Elgin

Core Strateji, Founder

Biography

İhsan Elgin is the founder of Core Strateji, which manages the entrepreneurial transformation of organizations. He is the co-founder of Startups.Watch and FinTech Istanbul.
He is also a member of the Board of Directors of İş Private Equity and Finberg Yatırım A.Ş. He is the founder of Girişimci Kurumlar Platformu.

In May 2011, Elgin founded the Startup Factory within Özyeğin University and started to work as the director of the Entrepreneurship Center at the university. He has been holding lectures in seminars on master's degree level, especially in Athens and London, on "Creating an entrepreneurial culture within the enterprise", "Lean New Business Development'', "Performance Management in Enterprises'' and "Enterprise-Startup Cooperation'' and "Corporate Innovation''.

He is an angel investor for young entrepreneurs with technology-based initiatives and regularly writes for Business Leaders Startup on the topics of new business development and entrepreneurship issues.

Becoming the Company of the Future through Transformation to Entrepreneurial Institution

The business life, led by large corporations, is undergoing a process of change again with the strengthening of technology companies and new startups. Some of the critical thresholds that created this change are the increased momentum of technological innovation and the talented workforce that pushes the existing business models not preferring to work in large institutions (42% of the young population in America are working freelance and the total volume reached $ 1.28 trillion in 2018), easier access to investment (the entrepreneurship ecosystem received $ 407 Billion in investments in 2018 and there was an increase of 23.3% compared to the previous year). While the business world is undergoing such a transformation, due to the bureaucracy created by the institutionalization and comfort created by the current situation, companies' ability to develop and act quickly has started to weaken, and entrepreneurs as serious players (the number of startups that reached billions worth of valuation reached 413, total valuation is $ 1.291 billion) took their place in the game. Institutions recognized that it was a cultural transformation that was required for them to lead innovation in the business world. Because it had become critical to be agile and fast, to take the customer to the center of any initiative and to develop innovative business models, rather than being large, at this point. In this case, two options emerged for the companies.
We can illustrate this with the version of the technology-human har-

mony graphic that I adapted to institutions from Thomas Friedman's book, **Thank You For Being Late.** The first of the options is to learn quickly and to catch up with the next innovation. It is represented by the line from point A to point A1 in the graph. The second is to immediately adapt to innovation by purchasing competence. It is represented by the line from point B to point A in the graph. This situation led the institutions to entrepreneurship. Because the competence
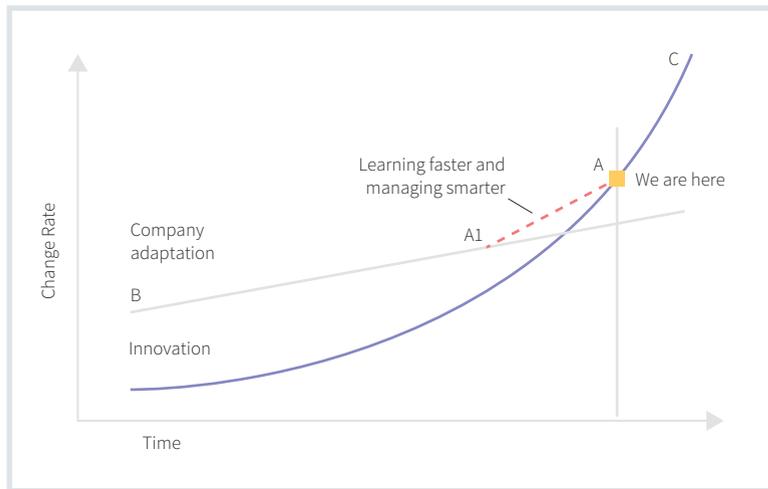
of developing with minimum cost in minimum time, required for realizing the first option, was the entrepreneurs' way of working. The innovation in the second option was, again, in the startups. For this reason, the entrepreneurship activities of the institutions, which we also call the transformation to "Entrepreneur Institution", have started to take their place among the most important trends of today.

Why Is Entrepreneurship Important in Institutions?

Despite the fact that corporate companies were established as startups in the past, with the effect of growth and institutionalization, they have lagged behind new startups in the competition of gene-

rating new ideas and creating innovation. The slowing down of the companies didn't show measurable effects in the beginning, although now we can see that they are behind in the competition and this has an effect on the valuation of the company (Brand Finance 2019: The total value of Turkey's most valuable ten brands is $ 11 billion, the amount paid in only yemeksepeti and iyzico sales total $ 0.8 billion). The search created by this change caused the institutions to be directed to the place where the change began, that is, to the world of entrepreneurship and led to the transformation of large institutions with entrepreneurship. Entrepreneurship activities in institutions starting from 2010 gained momentum in these days when the importance of entrepreneurship increased. As shown by the "Entrepreneurship Transformation Guide for Institutions 6" issued by TÜSİAD, it is noted that 48 of the companies that are members of TÜSİAD in Turkey have corporate entrepreneurship programs. 92% of the managers of these companies think that these activities affect the revenue of the company. 54% of these companies have an innovation unit and 65% of them report on a general manager level and 31% of them report on an assistant general manager level.

Stages of Entrepreneurship Transformation in Institutions

Entrepreneurship studies in institutions are progressing with the experiences gained and increasing their inclusiveness, that is, evolving. When we examine all the institutions in this process, which we will also call the evolution of transformation to this entrepreneurial institution, it consists of four basic stages: Demonstrating Institution, Trying Institution, Adapted Institution, and Entrepreneurial Institution.

1. Demonstrating Institution: The "I can do it, too" approach.

Corporate companies believed that it was enough to gather ideas

The road to the transformation into an entrepreneurial institution 4.0

4.0

Entrepreneurial Institution
The "This is my future" approach

3.0

Adapted Institution
The "This is a part of our business" approach

2.0

Trying Institution
The "I have to understand the opportunity better"

1.0

Demonstrating Institution
The "I can do it, too" approach
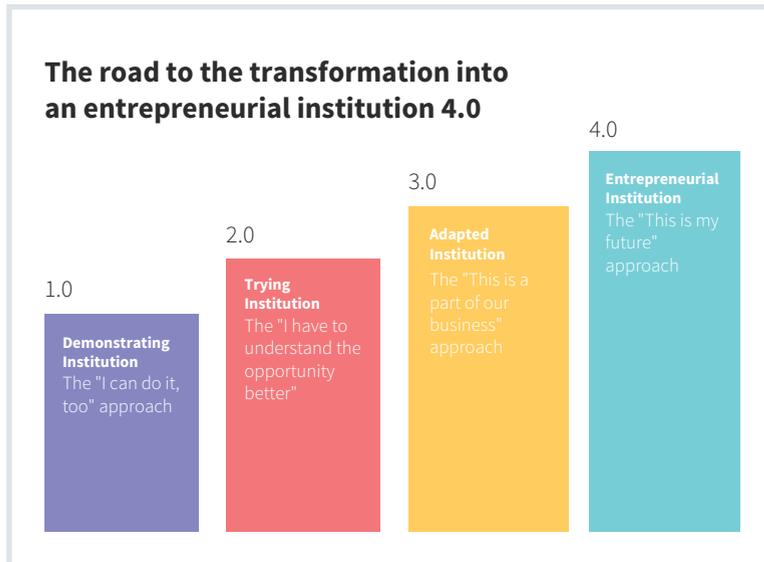
and focus on the inner organization for ideas built on disruptive business models or emerging technologies. Therefore, in the pre-transformation period, they proceeded only with individual suggestion systems arranged within the institution.

As a result of this transformation, the companies moved from the "send your idea and withdraw" types of programs for their employees to the in-house entrepreneurship programs, where the employee proceeded to prove his/her ideas, and the most important goal here was to realize the projects by making maximum experimentation with minimum resources and time. In addition to this, they started to get in touch with the world of entrepreneurship. The first step of externally-oriented practices is to advance by collaborating with incubation centers and acceleration programs that are affiliated to universities or privately operated. These methods did not give the expected results because both the institutions thought that they would get a quick result from the process and the acceleration program managers thought it would be enough for the collaboration to introduce the parties by having a "presentation day". These activities remained at the level of warming up to entrepreneurship, understanding the entrepreneurship ecosystem and providing communication benefits for companies.

2. Trying Institution: The "I have to understand the opportunity better" approach

Companies that were not satisfied with the results of the entrepreneurship 1.0 efforts in institutions and wanted to approach this issue more professionally have changed both in internal practice and collaboration programs. They developed principles and methods for employees' inability to allocate sufficient time from their current job, to receive time from IT, lack of financial resources and rewarding mechanism, which were the main problems in their programs for their employees. On the collaboration side of things, they started to create their own programs. These practices had two main benefits. The first benefit was that the company's employees had the opportunity to closely observe the working methods of entrepreneurs applying to the programs and to take more agile work to innovative projects in their companies by benefiting from the training provided to them. The second benefit is that new technologies and different business models that entrepreneurs are interested in have enabled them to avoid business blindness due to the current situation in the company and the industry. With the influence of these, entrepreneurship studies started to yield results for the first time.

3. Adapted Institution: The "This is a part of our business" approach

Seeing the contribution of entrepreneurship and its positive impact on the company, institutions have progressed into the next step for a greater potential. The main motivation in this step was to generate value together with startups by making investments and to fund its employees by accepting them as internal entrepreneurs and projects as corporate ventures. With this aim in mind, they established entrepreneurship-oriented departments and implemented corporate venture capitals to fund external and internal entrepreneurs who are the main engines of 3.0 (2013 saw 1029 investment procedures while it increased in 2018 by 166% and became 2740, the amounts of investment has increased by 400% and reached $ 53 billion7). The number of corporate venture capitals, which are designed to make a strategic investment for the goals and needs of an institution but which also expect financial revenue just like venture capital, is increasing day by day. The important criterion here is that instead of having an existing manager within the company as the head of these structures, they should be led by people with entrepreneurial ecosystem experience in the department side and people with venture capital experience in the investment side.

When the world is examined overall, the trend of Entrepreneurial Institution is in the 3.0 stage. So what is the new era waiting for us?

Although successful results were achieved in all three stages of entrepreneurship activities in institutions, it was also observed that there were common obstacles in front of more serious successes. The two biggest obstacles were: lack of strategic connections and lack of coordination. Whether it was innovation or entrepreneurship, its place in the company's main strategic plans was not identified and a connection wasn't established. It did not exist in the main performance aims of the company either. This lack of strategic alignment negatively impacted the work being adopted by everyone. On the other hand, the lack of coordination among those who lead the in-house innovation and/or entrepreneurship programs in institutions, those who carry out the out of the company collaboration programs and the business units was leading to inefficiency and slowing down the process of getting the desired results. The main reason for this lack of coordination is due to an integrated organization innovation strategy that encompasses the whole organization for all these efforts not having been established.

4. Entrepreneurial Institution: The "This is my future" approach

Before proceeding with all these efforts for a right strategy, the focal points for the internal and external practices on the current problems of today, the needs of the business units that fit within the near future plans and the areas of innovation that the company wants to test in different areas in the future should be clarified. The most critical point is that the integration with business units and business processes should be designed very clearly. It is also critical that the CEO take the lead and the organization is led by one source. Finally, these studies should definitely have follow-up and performance criteria, and they should be innovation criteria, not financial or project management criteria like what we are used to. The structures that emerge in entrepreneurship transformations in institutions are: Entrepreneurship departments, internal entrepreneurs in institutions, joint ventures and corporate venture capital. The institutions that are able to work in harmony with the business units of those four will become the Entrepreneurial Institution 4.0, which we also call the Ambidextrous Agile Organization.

AGRICULTURAL TECHNOLOGIES

Erdem Erikçi

tarla.io, Founder

Biography

After graduating from Bilkent University, Department of Molecular Biology and Genetics in 2007, he received his master's degree in 2009 from the same place and his Ph.D. degree in biology from Max Planck Institute in Germany in 2014. Immediately after his return to Turkey, he became one of the founding partners for the digital agriculture startup tarla.io / iklim.co and for the startup biftek.co which focuses on research on cell-based clean meat.

Future Agricultural Technologies Good for the World

Today, we obtain the natural resources we need by stealing from the future of the Earth. The agricultural industry, which is under the pressure of climate change threatening our safety, needs to carry out food production with more efficient methods in order to be able to feed the expanding human population. In recent years, enterprises that developed agricultural technologies that received a lot of investments have made promising improvements. There are opportunities for the stakeholders of the agricultural industry as well as the magnitude of the problem to be solved.

Why Do We Need Agricultural Technology?

The support that the planet we live on can provide for the needs of us humans is not infinite. The maximum limit of resources that can be used to ensure social and economic development in a safe way is called "planetary boundaries". Among the limits evaluated under 9 main topics, climate change, reduction of biodiversity, phosphorus and nitrogen use in agriculture and deforestation have been identified as the limits that humanity has already exceeded. All of the over-utilized resources are directly related to agriculture.

Greenhouse gases accumulated in the atmosphere, like the effect of glass or plastic covering a greenhouse, cause the energy reaching from the sun to the earth to be trapped on the earth. The surplus of energy that the world accumulates every day because of greenhouse gases corresponds to the energy emitted by 400,000 of the atomic bomb thrown at Hiroshima. The current amount of carbon dioxide in the atmosphere is 413 ppm. It is said that the accumulation is allowed to reach a maximum of 450 ppm in order to keep the global average temperature rise below 2 ° C, which is considered tolerable. In accordance with this purpose, it should be observed that worldwide greenhouse gas emissions due to agriculture and animal husbandry should are be reaching their peak next year at the latest and a rapid decrease should be realized in the following years.

After 2050, instead of greenhouse gas emissions, a collapse, that is, the removal of it from the atmosphere is needed. Agriculture

and animal husbandry industry had reached the limits of its rights to be able to release greenhouse gases already in 2010. If the business approaches continue unchanged, the greenhouse gas emissions will exceed the quota allocated to it by twice the amount in 2050. Agriculture and animal husbandry's current share in total greenhouse gas emissions is 24%. Electricity generation is responsible for 25% of the emissions while the industry takes 21% of the share, with transportation following that with 14%, heating in buildings taking 6% and the other resources taking 10%. Therefore, it does not seem possible to diminish global warming without finding a remedy for greenhouse gas emissions to be caused by agriculture and animal husbandry in 2050.

Benefits of Agricultural Technology

In order to feed the human population, which is expected to reach 9 billion by 2050, the required increase in food production should be 25% to 70%. In order to achieve the required increase, the only option before us is to obtain more products per unit area. Technological advances in the agricultural industry will be the most important source of help to increase the efficiency of production methods and to obtain more products with fewer resources. For example, it is calculated that the use of high technology will lead to 10% of a decrease in agriculture-related greenhouse gas emissions, 30% of a decrease in land use, 20% of a decrease in water consumption, 25% of a decrease in nitrogen application and 40% of a decrease in phosphorus application. When it comes to high-tech applications, what we are talking about are innovative ideas and practices that can solve the problems in every stage of the food supply chain such as more precise fertilizer applications, efficient water use techniques, more effective use of rainwater, increased

storage capacity, effective tillage, and pest control, development of more efficient and resistant species, improvement of logistics, increasing shelf life, reaching the market.

Investments in Agriculture Startups

Nowadays, there is a dizzying development in the field of agricultural technologies and this rate of development shows parallels with the amount of investments made to the startups. In Europe, the investment in the field of agricultural technologies, which was $ 200 million in 2012, reached the top level of $ 1.8 billion in 2016 and ended up being $ 1.6 billion in 2018. Worldwide, the amount of investment rose steadily to $ 16.9 billion last year, reaching its highest level. In terms of the amount of investment, the US is the leading force with $ 7.9 billion. China ranks second with an invest-

ment amount of $ 3.5 billion and India ranks third with an investment amount of $ 2.4 billion. In Europe, 45% of all investments were obtained by the startups in the UK with a total investment of

$ 388 million and by the ones in France with $ 324 million. They are followed by Spain, Germany, Ireland, Denmark, Switzerland, the Netherlands and Finland in the list. In 2018, 23% of the companies that received investments worldwide developed restaurant food ordering platforms (Yemeksepeti). 21% of them consist of startups working in the field of e-commerce (Migros Virtual Market), 10% are innovative market startups (Amazon Go), 9% of them being agricultural biotechnology, 8% includes methods related to the safety and monitoring of food called "Midstream Technologies", and 6% consists of field management systems, detection, and internet of things.

Expected developments in the upcoming period

The development of agricultural startups revolves around the need and pressure factors. It is a chance for the industry that the needs of producers who are trying to increase their profitability by making more productive agriculture work meet on a middle

ground with the conditions challenged by population growth, climate change, and environmental problems The main topics in the overlapping area of these are:

a) More efficient agriculture with less input: In order for the inputs (seed, fertilizer, medicine, water, energy) to be used in a timely manner and exactly where they need to be used, the fields need to be closely and continuously monitored. To be able to do this kind of monitoring, remote detection and analytical tools are being developed. Aerial or satellite imagery, climate, and soil measuring stations, soil, and plant analyzers, the data from tractor tracking devices are brought together and processed to collect data from the field, and critical conclusions are reached. By collecting this kind of data, enterprises can increase the profitability of their production processes.

b) Different production methods: There is a rapid development going on in terms of changes in the food production methods we have been using for the last 10 thousand years. With the emergence of a new generation of greenhouses, indoor environments can provide very efficient production by multiplying the same unit area through shelves and with just the right level of the water and light that the plant needs. These technologies will be the biggest candidates for solving the food needs on a local level by being established in the vicinity of cities, and even by allocating some floors of multi-story buildings for this purpose. In the next decade, it seems like one of the most interesting developments will be experienced in meat production methods. The concept of "clean meat" aims to completely remove animals from the meat production chain. Clean meat is divided into two branches, namely, plant-based and cell-based. While plant-based clean meat aims to obtain products from the mixture of plants resembling meat in the appearance, texture, and taste, cell-based, or "cultured meat", is a method that produces meat independent of animals by mimicking the events taking place in the muscle tissue of an animal in a laboratory. This method is expected to change the livestock and hence agricultural feed industry significantly.

c) Making the agricultural value chain effective: By linking the actors in the value chain to each other through data, the industry is reorganized in certain areas through the sharing of the existing information in order to make the right decisions, namely food waste, marketing problems, access to finance and insurance, and the effectiveness of contracts. Sales and contract platforms that everyone can trust (blockchain), marketplaces connecting producers and buyers together, parametric insurance products, financing methods operating with crowdfunding are on the agenda of entrepreneurs intensively in the agricultural industry.

d) Biochemistry-genetics: Developments in the fields such as seeds resistant to environmental/climate conditions and in symbiotic relations with microorganisms, environmentally friendly plant protection products, plant breeding are critical in terms of plant and soil health and are highly invested in.

e) Robotics: As a solution to the aging population and loss of labor in agricultural fields, it is believed that the routine tasks on the fields will be taken over by automated tractors in the first stage and later will be taken over by robots that deal with harvesting/pest control/fertilizing. From solutions for optimizing pesticide spraying by distinguishing plants from weeds to robotic arms that understand when fruits are ripe and harvest them, different developments are achieved in many different areas.

Agricultural technology suitable for different conditions

The needs of each country's agricultural stakeholders can vary considerably depending on the circumstances. For example; one of the biggest problems of farmers in Turkey is input costs being too high while the sales prices being too low. Cooperatives can solve this problem, but for various reasons, it is unable to be achieved at the desired level. Solutions that can offer the benefits of cooperatives in an alternative way would most definitely receive attention in a region like Turkey. On the other hand, the European farmers, who have relatively few problems in terms of market access and input costs, but seek to increase production capacities in their existing lands, are eager to use any technology that can improve their yields. In other words, after solving the basic problems, farmers begin to make efforts to get blood from a stone. Therefore, the success of agricultural startups is determined by a good understanding of the local characteristics.

Startups:

onesoil.ai: Provides important statistical data to policymakers through the detection of fields and cultivated plants via satellite.

planet labs: Provides daily high-resolution images through a cube satellite network and provide field tracking for every point in the world.

memphis meat / mosa meat / biftek.co / aleph farms: They work on cell-based meat production in order to meet the need for protein without needing animals, while also managing to not harm the environment.

descartes labs / orbital insights: They perform plant detection and weekly yield estimates with satellite imagery.

Sprout / tarla.in: Uses real-time weather and forecast data as well as satellite imagery to identify climate risks of agricultural

areas and assess damage for insurance companies.

Gamaya, precision hawk, dji: They can produce plant analysis, fertilizer recipes, irrigation decisions through drone images.

Conclusion:

For the time being, the earth we overuse the resources of continues to feed us. But the pressure created by the food demand in the near future seems like it will cause major crises. In order to reduce the impact of the crisis as much as possible, there are many technology startups that know how to turn problems awaiting solutions into opportunities working very hard. We can relieve the pain of the world and provide a safe future for ourselves and other living beings with the right policies and support for the development of technology, determined in accordance with local conditions.

Quote

"We demand more from the Earth than we are entitled to. The Earth cannot approach people forever with the same generosity."

HEALTH TECHNOLOGIES

Prof. Dr. Ata Akın

Acıbadem University, Dean of Faculty of Engineering

Biography

Dr. Ata Akın received his bachelor's degree in 1993 from the Department of Electronics and Communication Engineering at Istanbul Technical University and his master's degree in 1995 from the Biomedical Engineering Program of the same university. He received his Ph.D. in Biomedical Engineering from Drexel University in 1998. After his graduation, he worked at Drexel University, Boğaziçi University, and Bilgi University, and finally, he has been working at Acıbadem University as the Dean of Faculty of Engineering and the Head of Medical Engineering Department. His research focuses on functional brain imaging and medical device design. In 2017, he established the Biodesign Center and is supervising it.

Where Does the Future Lie in the Field of Health Technologies?

There are three basic fields in the world that will always be needed as long as humans exist: Energy, Food and Health. Each of them is in need of the blessings of technology in the face of the increasing population and declining resources. In this article, we would like to introduce the current situation in the field of health, future trends and ecosystem.

Knowing that the reason for the technological developments is the improvement of the quality of life, we can say that all the breakthroughs in the three areas mentioned above arose from necessity. Especially in the field of health, the systems and tools used today have been developed with the great efforts of the health professionals who cared for their patients every day either on their own or the efforts of the engineers they worked with. We have good examples: a stethoscope was developed by a physician in 1816 to be able to listen to the sounds in the chests of the patients better. X-rays were discovered to show the inside of humans by Roentgen in 1895. Within one year, this tool took its place in the field of medicine. It was used to locate bullets on battlefields.

The first stethoscope invented by Rene Laennec, a young French physician

Naturally, the aging world population's need for health services is increasing. According to WHO statistics, in 1995 the average life expectancy was 65, but for the year 2025, this figure is expected to be 73. However, the expectations and needs of the growing population are also increasing. The risk of infectious diseases, especially in developing countries, is expected to rise as well. In addition, the increasing risk of obesity and the emerging risk of diabetes connected to that also is a health problem that threatens the whole world.

The increase in the rate of urbanization will necessitate the planning of health services in these areas. It will not be enough to build large hospitals, but it will be needed to develop various technological innovations in order for those to work efficiently and effectively.

The injustice in income distribution is also expected to increase and in this case, technology should be utilized in order to ensure access to equal health services by the lower economic class.

Albion X-Ray Ambulance used in both World War I and the Turkish War of Independence exhibited in Koç Museum.

Promising Solution Offerings

Innovation in healthcare is defined as changes that help healthcare practitioners focus on the patient, assisting health professionals to work smarter, faster, better, and at a lower cost. It is thought that the Internet of Things can provide quick solutions to most problems. Combined with wearable technologies, it will provide an opportunity to quickly follow the progress of health both on a

personal and societal basis. When smart systems such as Chatbot, which can direct the patient remotely, are added to the equation, it is predicted that unnecessary hospital visits and drug use will be prevented, and the cost and duration of treatment will be reduced through early diagnosis.

In response to the need of the aging population for tissues and organs, there is great hope for tissues to be produced with 3D bioprinters. In the same way, thanks to the smart drug delivery systems that are specially prepared, biotechnological drugs that minimize the side effects of the drugs are among the products we can see in the future.

When the three main groups of innovation in the field of health (Helix Center at Imperial College London, Center for Innovation at Mayo Clinic, and Consortium for Medical Technologies at Massachusetts General Hospital) were examined, it was observed that each of the most fundamental features of each of the three centers were that they positioned interdisciplinary innovation laboratories in hospital settings or nearby; involving stakeholders beyond the clinicians (designers, engineers, business professionals, and patients) at the beginning of the innovation process, and encouraging end users to personalize the solutions according to their needs. The motto of the center at Mayo Clinic is: The needs of the patient come first. They have maintained this approach for nearly 100 years. The approach all of these three centers have in common is to examine improvement aimed at needs and innovation processes.

A2 Says:

Healthcare service is a process consisting of procedures. The successive steps that must be meticulously carried out, just like the production of cars on a production line, define these processes. If there is a skip at some point in this process or a mistake, the process stops. Therefore, the greatest contribution that, we engineers, can make to health services is to follow these processes very closely and to identify the points that may lead to improvement with all stakeholders. Then solutions will already reveal themselves. For the time being, it is unlikely that a disruptive technology in health will emerge and redefine the entire health system. Neither healthcare workers nor hospitals and insurance companies can handle such a disruption. Therefore, unlike other fields, all innovations in health undergo a very long trial and acceptance process. I believe that we, as designers, should be aware of these processes and learn to work with healthcare professionals with respect to their great diligence and care for their patients.

SME AND SAAS

Efecan Erdur

Kolay IK, Founder

Biography

After completing his bachelor's degree in İTÜ and 4 years of career in the field of software, in 2015 he established the HR and human resources management system Kolay İK. Having users both in Turkey and abroad, Kolay İK is a startup supported by investors such as Maxis, Monkfish Equity, 500 Startups, and Galata Business Angels.

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Internalization of SaaS Products by SMEs

In a very short time, cloud-based technologies became an indispensable part of our business life. You may not even remember the times when some tools did not exist, especially if you work in companies that care about technology. Unfortunately, this is not the same in SMEs that make up 99% of companies in Turkey. The companies that have not been introduced to cloud-based technologies yet, especially SaaS (software as a service), make up the majority. But this is changing, in fact, the change in question started a long time ago and it is continuing to accelerate.

At Kolay İK, the entire company is constantly working on how we can accelerate SMEs' use of SaaS and spread it to the base. Thanks to the feedback we have received from thousands of companies and hundreds of thousands of users, we think we are doing a good job. In this respect, we compile the factors that prevent SMEs from using technology (especially SaaS) and the reasons that lead to these factors and solutions and the changes that await us and SMEs in the future under 2 main topics and 6 items.

Obstacles and Solutions

When we examine the results of our research with our own users and the results of international research, we see that some situ-

ations that slow down the use of SaaS by SMEs or even directly prevent it in some cases are as follows:

1. The comfort zone brought by the past

Many companies have been using multiple software solutions for a long time. The initial process of beginning to use these softwares took a long time and caused costs, and starting to actively use them also took a while. At first, leaving the conventional method behind and using the software required a major change in behavior, which, as usual, caused internal and external friction. Considering these, when old technologies became widespread within the company, they turned into comfort zones and led to sensitivity towards change. Unfortunately, technology is growing in a more flexible and faster way than the individual human mind. It keeps changing and getting better and better. When this is the case, the infrastructure plans of 5 to 10 years made in the past are not enough anymore and even plans of 1 to 2 years can be late in some cases.

The solution to this situation is to get used to continuous but small changes instead of sudden and giant changes. SaaS products are constantly evolving and giving way to these changes into our daily lives gradually without disrupting our usage habits.

2. The inability to calculate return on investment

In order to start using SaaS, cost planning is required just like in every process of change. Unfortunately, although it is easy to calculate the cost of software changes, it is difficult to find a deterministic method for calculating the return of this cost. In fact, if we think about this specifically in terms of SaaS, it is relatively easy to explain: no more maintenance costs, no support costs, no update, and backup costs, no training costs... However, there is no established method of presenting these facts to the companies in the form of numbers.

The benefits of each SaaS product to the company are different. For this reason, SaaS providers need to listen to their users well, keep track of data well and develop ways or methods to calculate costs based on past experiences. As a result, questions such as how long companies take switching to the new system, how much time they use to spend in the past and how much time is spent now, at what level are the mistakes made removed, at what level the daily costs are reduced, at what level are the losses caused by the difficulty of use constitute many metrics and when they are considered, this can lead to an almost mathematical formula for

ROI (return on investment). To sum it up, as you can see, it all comes down to SaaS providers focusing on both product and financial user experience.

So what are the SaaS-focused changes that await us and SMEs?

1. Data becoming even more clear
Over time, the digitalization of data will become inevitable. For this reason, companies will increasingly focus on using and making sense of data instead of hiding it. Of course, this will in parallel lead to the importance given to data security and the development of methods for data security. In the upcoming period, we will often see new startups related to enterprise data security.

2. Business software as a neighbor to artificial intelligence
Communicating and data sharing of two software are called integration. However, as the difficulty of using the chosen software and the complexity of the processed data increases, making the-

se integrations, improving and maintaining them will no longer be possible using manpower. For this reason, many software will now be able to communicate with each other thanks to common data structures without the need for additional integration. Thus, many applications can neighbor each other thanks to artificial intelligence that communicates in the same language. We will see a lot of tools, which we can probably call "Data Hubs", with the main purpose to manage, store and forward data across multiple software.

3. Employee-oriented transformation
As the generation changes, the business styles change. This change directly affects the tools used. For many positions, employees now choose employers instead of employers choosing employees. This causes many processes to change according to employees. Even the concepts of remote work and gig economy will change the definition of an employee in all ways. As a result of this, all the systems used must keep up with this change.

4. Increasing emphasis on the importance of user experience and performance
In-house software used to focus solely on problem-solving, now they are focusing on solving problems quickly and easily in addition to solving them. This enables both SaaS to be used faster and to spread their use faster within the company. Day by day, user experience experts will be guiding our business lives and this will have a very rapid impact on productivity.

PRODUCT-LED GROWTH IN MARKETING

Selman Gökçe

UserGuiding, Marketing Specialist

Biography

Selman Gökçe is the author of the blog section that is a part of the UserGuiding software company's content marketing strategy, which provides entrepreneurs with useful materials for product management, marketing, and growth. In addition to assisting in solving various marketing problems of the company, he continues his undergraduate studies in Translation Studies at Boğaziçi University.

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An Overview of Traditional Marketing Methods

Traditional marketing methods cover practices that we are all familiar with for many years. The everlasting advertisements that we encounter every day are the products of these practices. These methods can be summarized under four categories as follows:

Printing: This covers the most classical practices of traditional marketing such as giving advertisements to newspapers and magazines; distributing brochures or printing banners.

Publication: These are the advertisements that are widely used by most companies today to promote their products through media such as radio, television, and internet.

Mail: It is the direct delivery of advertising materials such as brochures and catalogs to consumers by first-hand or via e-mail.

Telemarketing: Last but not least, telemarketing is a more aggressive practice compared to the other methods in which marketeers try to persuade consumers to buy the product they promote.

All of the practices under these four categories, when used regularly, resulting in high costs of customer acquisition.

Experts who have spent their years in marketing claimed that satisfying results could not be achieved at the end of these costs and they tried to find more effective methods in marketing.

The Future of Marketing: Product-led Growth

Product-led Growth, which dozens of blog posts and books were written on, podcasts prepared for and even summits were held, is seen as the future of marketing by marketing experts. We can translate this term into Turkish as "Ürün Merkezli Büyüme" because companies that adopt this strategy place their products at the center of every practice they carry out in the name of marketing and their products are the sole reason for their growth.

There has not been done any study on product-led growth in Turkey that has aroused great interest around the world and become the main marketing strategy of iconic SaaS companies in a short period of time. So what exactly is this practice? How does a product help to grow its company?

Let Your Product Be The Reason of Your Growth

Product-led growth is to design products in a way that takes into account the ever-changing needs of its customers. It is the first and only step to provide unique product experiences that meet the needs of each customer. No matter how easy it sounds, designing these experiences which will make your business grow will emerge as a result of long researches, studies, and trial-and-error.

Quote

"Companies that adopt Product-led Growth strategies not only have higher customer satisfaction rates, but they are growing relatively faster with less customer acquisition costs than businesses based on traditional marketing methods."

Wes Bush
the author of Product-led Growth,

Founder of Product-led Institute and
Frontman of Product-led Summit

Product experience is very important for consumers. The fact that a consumer who buys a product for the first time does not have any idea about the experience with that product will adversely affect the decision-making process; therefore the consumer will turn to the products he or she has had the chance to experience before. Companies that carry out product-led growth strategies enable their users to experience their products at no cost. It is highly probable that users who have a positive product experience process will become regular customers, even supporters of your company and product.
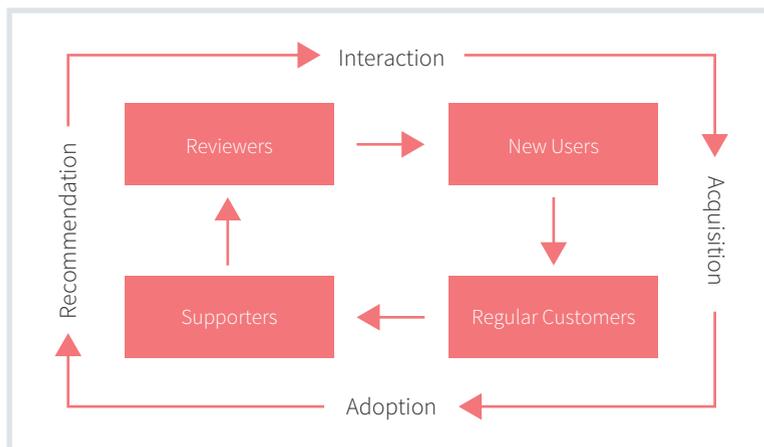
Likewise, it is likely that a customer who has been using your product will stop buying your product if he or she has difficulties while using it. Businesses that put their products at the center of their growth give great importance to the experiences of their present customers. Fixing their existent experiences to ensure that your regular customers continue to buy your product and even making vertical sales are relatively easier and less costly compared to the process of getting new customers.

The product experience, which plays such a large role in the growth of companies, is not a part of the experience of customers with the company in product-led growth strategies, but it is the whole of it. 75% of B2B customers participating in a research conducted in this regard do not want to communicate with any marketer or any other employee of the company during the experience process, which begins with the first hearing of the product name and ends with the complete learning of the product. The products of companies that do not ignore this desire of consumers and that design self-service customer-centric experiences help the companies to increase the rates of customer acquisition, customer transformation, customer protection, and growth. Product-led growth is based on product correction and improvement in increasing these rates.

Product-led Growing Companies Achieve Better Results
After their initial public offering, **companies that carry out Product-led Growth Strategies have better figures than other companies.** This year; **21 major companies,** including the top companies in the list of companies that are offered to the public, **have adopted a product-led growth strategy as their main marketing strategy .**

The total market value of these companies, including big businesses like Slack, Surveymonkey, Smartsheet, Shopify, Dropbox, and Hubspot, is $ 208 billion. In addition, SaaS organizations, which implement Product-led Growth strategies, are able to keep their return on investment higher than other companies as they continuously satisfy their customers and users.

How to Achieve Product-led Growth?

We are faced with many examples where a company that has made Product-led Growth the main marketing strategy has achieved better results in a short time than its rival companies. Changing the marketing perspective of your company, optimizing the proposition of your product's value according to the wishes of your customers, and transforming your product into a growth engine by smoothing the experience of your users are keys to this strategy. When carrying these points into effect, your product should be the focus of all departments from marketing to engineering, design to customer support within your company.
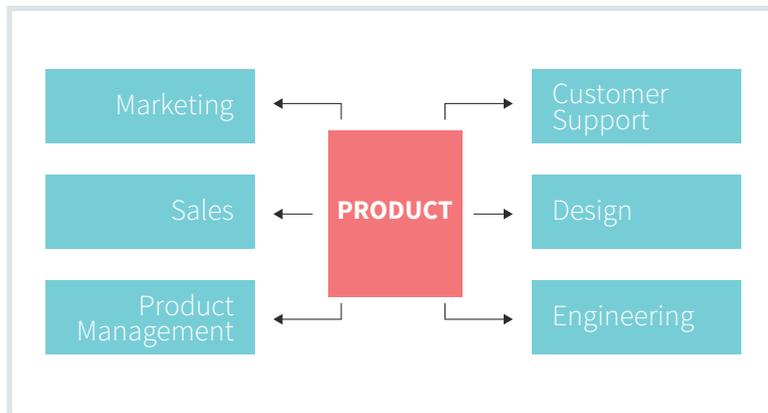
Although I believe that every business should take different steps on the way to product-led growth, the following points will be useful for every company.

Take Advantage of Feedback:

Though designing products that your customers will love is a challenging task, it is easy to draw a roadmap for this design. You can get information from the feedbacks of your customers on the features of what is to be added and removed about your products. The greatest requirement for product-led growth strategies is to create customer-centric experiences. While creating a customer-centric experience, you don't have the option to ignore the feedback of your customers.

Empower Your Support Services:

When your customers face a problem in the product experience, instead of giving high-level efforts to solve the problem, they may prefer a product that they will not face this problem. At any rate, your customers should be able to access your support representatives with as little effort as possible. At this point, the accessibility of your support services is not the only significant thing.

Another feature that makes a support service effective is their knowledge. When customers are transferred from one customer support representative who does not have enough information to another, they can get bored and stop looking for solutions. Having a knowledgeable support service, at this point, will improve your customer's experience with your company.

Get the Right Product-led Growth Criteria:

Regularly updated data has been the driving force behind the growth of all businesses, especially behind SaaS companies. These businesses use a variety of criteria to achieve extremely useful statistics. The value of conventional criteria from traditional marketing methods has become insignificant in these days that product experience is on the rise.

According to a survey conducted on 40 SaaS companies by a consulting company named ReinventGrowth; businesses that adopt a Product-led Growth strategy evaluate their data through five main criteria and measure their customer's product experience. These five criteria help to create consistency between the departments of the business and to identify a common language.

1. Product-Qualified Leads: In traditional marketing methods, the traditional way of acquiring a lead is to find all potential customers, even those with little interest in your product or company, but with the potential to use your product, and these leads are recognized as market-based. The Product-led Growth strategy uses Product-Based Leads, through which you find your users who experience and interact with your product for a while without any money. These leads, through which you can convince to purchase your product or sell vertically, are healthier and enable your sales representatives to spend their time more efficiently.

2. Width of Use: Knowing how much your product is used by users for different purposes will help you determine the width of your product.

3. Depth of Use: BUsing this criterion, you understand whether your users are using all the features of your product or they are using them in their entirety.

4. Utilization Efficiency: It covers the rate at which your users finish tasks that they can complete using your product. This criterion will help you to increase the usability of your product and provide a smooth experience.

5. Frequency of Use: This criterion relates to how often and for how long users interact with the properties of a product. Using this criterion, you can access a lot of data such as which features are used more frequently, which features are preferred by which user profile.

Invest in Product Experience

What is this product experience? **Product Experience** is an important process which customers experience with your company. This process involves the orientation of your customers, the experience of new features added, and the understanding of the value of your product. The task of product managers is to try to prevent customer loss by improving product experience. **The conducted researches** shows that 52% of users will not use the product again after an inefficient product experience.

Get Product-led Orientation Strategy

The most important factor affecting Product-led Growth is the experience of customers during the **onboarding** process. A good orientation process ensures that the user interacts with all the features of the product as quickly as possible and that he or she fully understands the value proposition of the product. Designed on the basis of customer experience, product-based orientation processes play a key role in improving product-led growth criteria.

An effective orientation process, especially in software companies, is designed at the cost of long time and great struggle as a

result of long efforts and trial-and-error. Using software particularly designed to create orientation processes, such as UserGuiding, shortens this process and minimizes costs.

Examples of Product-led Growing Companies

Dropbox

Dropbox is one of the most popular cloud storage in the world. The company was founded and it has managed to become one of the giants of the software world while it did not yet have a challenging rival.

Using the data it regularly collects, Dropbox decides which features of the product can be paid to increase vertical sales. This kind of data is reached by conducting detailed research that they also discuss pricing with their users.

Expensify

Expensify is actively used by many companies, enabling users to manage their spending and effectively control their budgets.

Expensify is based on the total number of active users when charging. This allows the company to resell the product when users share the product with their teams. The product in this application literally sells itself.

Typeform

Typeform is a website that allows you to create cloud surveys and continue research. The only feature that makes the site stand out among its rivals is that it allows you to create highly usable interfaces by customizing them.

It is possible to create a survey without being a member of the Typeform. At the end of the day, the company observed that the members were more active even though it seemed to be a useless feature and Typeform registered a decline of 20% in the number of registered members.

Slack

Slack was not originally designed as a product intended to be marketed. Stewart Butterfield, the founder of Slack, designed the application to help them with a project they were working for.

The reason why the product has 10 million active users per day today is that it was primarily built not for profit but to ensure the best user experience.

Last Sentences

It is an undeniable fact that the future of marketing is Product-led Growth. The Product-led Growth strategy is based on putting the product at the center of your future choices. You can start Product-led Growth today by investing in your Product Experience (an effective orientation process).

The recommendations in this article may not be suitable for all businesses, but everyone with marketing experience may agree that users depend on customer-centric experiences.

TRANSPORTATION TECHNOLOGIES

Transportation Technologies of the Future

The Future of Transport Conference's primary theme for this year is "Do or Die!". The main idea behind this remarkable discourse is to tolerate the change itself and the deterioration of change, and to prevent a transportation crisis that may occur in the next 10-20 years. It was pointed out at The Future of Transport Conference that the increasing traffic jam and air pollution, especially in cities, reached the point of crisis and the solutions for these were discussed. The solutions and suggestions of technological solutions such as semi-autonomous vehicles, aircrafts, maglev trains and many more were presented at The Future of Transport Conference. It seems that in the next 10 years, transportation technologies will be in a very different place than it currently is.

Description

By 2030, the 60% population of the world is expected to live in cities. Today, this ratio is 50%. The number of mega-cities with more than ten million people is expected to continue to increase. At the same time, more than 2 million people in these cities are expected to become the middle class, and people becoming the middle class are expected to be in the desire of having a car. As a result, while approximately 70 million vehicles were sold during 2010, this figure is projected to increase to 125 million by 2025. Some automotive analysts have even made challenging predictions saying that today's $ 1.2 billion global car fleet could double in 2030. Existing urban infrastructures do not support such large increases

if the numerical developments that emerge from the analyzes take place. Time lost by traffic jams, wasted energy, and increased cost of doing business will have a profound impact on services, communications and many other sectors, particularly transportation. At the same time, air pollution and noise pollution, which are inevitable, will have negative effects on life.

The future of transportation technologies is shaped according to the solutions of the above-mentioned problems. While electric motors ensure their future places in terms of transportation, self-driving air and land vehicles R&D studies for eliminating human errors and an integrated transportation system are continuing. The first tests of the shared vehicle technology, which continues to be developed together with self-driving vehicle technology, are carried out with Uber's driver and self-drivings. In addition, faster public transport such as maglev trains, hydrogen trains, and hyperloop is under development or planned. One of the most radical transportation technologies of the future is the studies carried out to bring the current car concept and operation to the airspace. In this way, it is planned to transfer some of the individual and public transportation density on land to airspace by means of air transportation technologies.

1 Railway Transportation

2 Space Transportation

3 Flying Cars

4 Self-driving Vehicles

Basic Problems

1 Moving technological infrastructure to many parts of the world

2 Universalization of traffic system standards for autonomous vehicles

3 Legal responsibilities related to autonomous vehicles

4 Air traffic control and standardization process for aircraft

5 Redesign of urban transport integration according to increasing population

1 Technological infrastructure

Each of the developed and developing transportation technologies brings together the infrastructural requirements. For example, almost all self-driving vehicles are powered by electricity. The problem of charging the self-driving vehicles is solved by charging the user from his home in short distances while public charges are needed for long distances. Infrastructure works are also increasing or decreasing according to the supply and demand balance of the region. In the first half of the 20th century, internal combustion vehicles faced a similar infrastructure problem. At the end of 2012, around 50,000 public charging points were built in the US, Europe, Japan and China. According to the International Energy Agency (IEA) data in the last quarter of 2018, it is 5.2 million. Compared to 2017, it is at a 44% increase. Nevertheless, the majority of charging stations are formed by those built in China, Europe, and the USA. Other countries and regions have not yet reached the level of sufficient infrastructure. As of December 2013, Estonia was the first and only country to complete the distribution of an EV charging network with national coverage, with 165 fast chargers at a maximum distance of 40 to 60 km (25 to 37 km) along highways.

The same infrastructural problem applies to flying vehicles. Infrastructure works will also be required for charging and flying runways of flying vehicles.

2 As with any new technological development, developments in the field of transport bring about regional or international standards.

Although regulations in the field of transport cause regional changes, each refers to the other. The regulations should be established as a result of transportation innovations. These regulations also affect the development process of R&D activities on transportation. Today, certain problems are encountered in the preparation of transportation standards and these problems slow the development of transportation technologies down. The biggest problem of standardization in the field of transportation is the vehicle ownership problem created by combining unmanned technologies (unmanned vehicles, unmanned traffic systems) and building a transportation network that does not need people. The transportation sector has the image to be reshaped in the light of these technological developments. Accordingly, questions such as "Should people own vehicles?" and "Should the responsibility of the gigantic transport network belong to the state or to private institutions?" make difficult to establish standards. While seeking answers to these questions, transportation organizations such as Uber and Lyft continue in full-flow to develop transport technologies such as vehicle sharing.

3 Every new technological advance comes with many legal obligations. But this time the situation is more serious than the others. The reliability of unmanned systems in transport technologies is still controversial and being questioned. There have been 6 fatal self-driving vehicle accidents in total since 2016. While 5 of these were carried out with Level 2 self-driving vehicles, 1 was the accident involving Uber's self-driving vehicle, which was carried out with Level 3 self-driving vehicles and aroused great repercussions in the world. Evaluating accidents involving Level 2 self-dri-

ving vehicles has been relatively easy. The reason for this is that control still belongs to the driver in Level 2 self-driving vehicles. However, the accident involving Uber's Level 3 self-driving vehicle has divided the legal community into two for different reasons. In the accident that a pedestrian lose her life, it was found in the records that the vehicle detected the pedestrian 6 seconds before the collision but decided that it should put on the brakes in the last 1.5 seconds. At the end of the controversial research process, it was decided that the fault was in the driver. This is because the driver was busy with the phone at the time of the accident. Many sectors were convinced with the decision that self-driving technologies are not ready for full autonomy and that the legal infrastructure is not sufficient. It is still a legal problem that responsibility should be imposed on which conditions to self-driving systems and drivers.

4 The situation for setting up unmanned aerial vehicles is slightly different. Although unmanned aerial vehicles are already in use, the concept for transportation is introduced as the flying version of the car. With the widespread use of drones in terms of individual use, air traffic has become more intense than before. Currently, the research of large organizations such as NASA and Lockheed Martin is about how air traffic should be with flying cars. Another research topic is concerned with the areas that flying cars will land and take off. At the sixth eVTOL symposium held in the USA this year, no decision has been reached yet upon discussing whether the landing areas of flying cars are in or out of the city. In addition, one of the topics discussed was how much flying cars would increase noise pollution and the negative effects on the en-

vironment.

5 Another obstacle in front of transportation technologies is the integration of new technological developments in cities in a coherent way. One of the biggest obstacles to this is the high investment cost and the lack of financial resources required to work together and integrate different technological transportation solutions with the city where it is located. Besides, the first target of transportation technologies is metropolises. It is necessary to cooperate with the municipalities in these cities. In this respect, municipalities should start the necessary studies for the integration of these technologies. In the initial phase of the project, technological communication cooperation between the stakeholders determined by the municipality should be facilitated and the course of the project should be maintained. Another obstacle is the necessity of technological coherency of companies in a universal point.

Railway Transportation

Definitions/Terms

Railways are one of the transportation methods that have brought solutions and have been planned to bring solutions to the increasing traffic problems in recent years. Many people can be transported without any traffic problems through railways. For railways that have established a solid place in R&D activities, the technological developments of the last 15 years will be faster than the technological developments of the previous 100 years, accor-

Quote

"People will want to get from A to B as quickly as possible, rather than just traveling by car or rail. We want to solve mobility problems and rail will play an increasing role with high population density."

Andreas Willich
Head of Passenger Transport at BLS

ding to the article in Emily O'Dowd Smartrailworld. The automation, digitization and security enhancement of railway transport have a place at the forefront of these technological developments. According to the data given by The International Energy Agency, 15 trillion passengers per kilometer are expected to be carried in 2050.

1- What Are Self-driving Trains?

Self-driving trains are defined as railway vehicles that can carry station-based passengers without human control. Self-driving technology is called Communication Based Train Control (CBTC). This technology includes communication between the railway, the stations and the train for the management of all railway traffic. The technology used in self-driving trains in conventional train signaling is called Communication Based Train Control (CBTC). Conventional subway rails require signaling and the intervention of a locomotive pilot, whereas CBTC-enabled trains are based solely on man-made data and on their own understanding.

2- What are Hydrails?

Hydrogen trains, also known as Hydrail, are trains that use hyd-

rogen as fuel. The Hydrail concept is not only used for trains that use hydrogen as fuel. It is also used for trains with hybrid engines using hydrogen.

3- What is Maglev?

Maglev technology is a structure that works through the logic of moving the train by taking advantage of the pulling and pushing forces of the magnets in the train and rails. Furthermore, the railway structure used in Maglev trains is different from the traditional railway structure. It does not use any engine and fuel for the movement. Another well-known feature of Maglev technology is that it can reach speeds as high as 600km/h.

4- What is Hyperloop?

Hyperloop is a form of transportation with a propulsion system that reduces friction while providing the movement with a magnetic field in a low-pressure tube. Tubes are used instead of rail. The most remarkable feature is that it can reach speeds of 1000 km/h.

1 Self-driving Trains

Advantages

Higher reliability, higher efficiency, higher uptime, accessibility of further information about trains by attendants and passengers, safe driving in alternative environments such as forestry, etc.

Disadvantages

More cyber security problems, more cost and development process

Used mostly for

Public Transportation, Freight Transportation, Military Use

2 Hydrogen Trains

Advantages

Higher efficiency, safer energy with batteries and supercapacitors, safer

Disadvantages

Safety problems arising from hydrogen fuel, increased costs arising from the storage of hydrogen

Used mostly for

Public Transportation, Freight Transportation

3 Maglev

Advantages

Higher efficiency, lack of CO_2 emissions, lack of movement energy from consumable sources, less travel time, less noise pollution

Disadvantages

Higher cost due to the magnetism of the railway

Used mostly for

Public transport (limited availability), Freight Transportation (limited availability)

4 Hyperloop

Advantages

Higher efficiency, safer, lower travel speeds

Disadvantages

Higher cost

Used mostly for

Public Transportation (limited availability)

Change in Energy Demand in High Scenario Based On the Main Scenario

Source: IEA
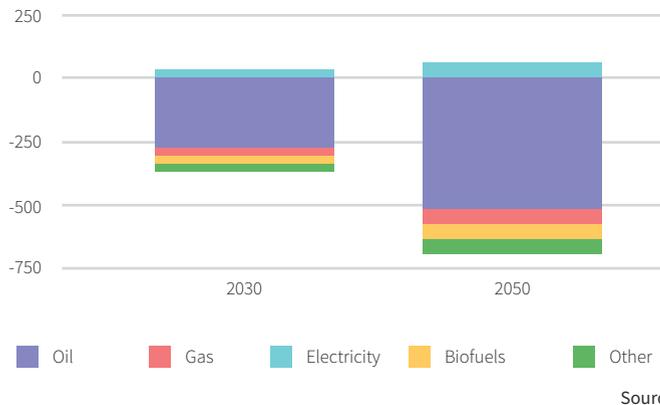
Exemplary Usages

1   Self-Driving Trains

Self-driving train technology can be applied to conventional, hydrogen and maglev trains. Ellen Linnenkamp, Vice President at Strukton Rail North America Inc., emphasized that "more and more trains will be self-driving, and the conditions for the safety and quality of the rail network will be developed". Trains without drivers are already used in most developed cities. However, many of these trains apply to protected infrastructures at low speed. For example; some fully automatic metros such as DLR in the UK and Copenhagen M1 and M2 in Denmark, are currently active. However, there are no fully automatic railway main tracks in the world. The momentary radical changes made by the railways due to the intensity constitute an obstacle to the automatic operation of the trains. In the R&D studies, railways and trains are expected to carry out fully autonomous planning and driving.

2   Hydrogen Trains

Hydrogen Trains, which stand out with their environmental characteristics, were first used in China. A hydrogen-powered passenger train in Germany is currently under test. The Netherlands, Denmark, and Norway started off the R&D activities. The first major project of hydrogen trains was requested by China Railway. There will be 8 trains running on the 17.4 km railway with hydrogen fuels according to the requested project. The demo model of the trains was presented by the awarded company. This project called "Foshan" costs $ 109 million.

3   Maglev

Maglev technology was first introduced by inventor Eric Laithwaite. The first Maglev train, built in 1984, operated at a speed of 42km/h on a railroad of only 600 km. Although Japan reiterated its role as the world leader in setting its own rail land speed record for high-speed rail travel, the Maglev train has not yet been launched for commercial service. This is foreseen to happen in 2027. CJR, one of the Japanese railway companies, reached a speed of 603 km/h. In addition, there are already several Maglev lines in Asia. The most well-known is the Transrapid system in Shanghai, the world's fastest commercial train that can reach 429 km/h. The works of the maglev line were launched last year in South Korea. In Japan, the Chuo Shinkansen line is under construction. At the same time, Japan and China continue to build R&D studies of new high-speed maglev trains.

4 Hyperloop

Hyperloop has been coined for the first time in 2013 when Elon Musk talked to journalists about the idea of Hyperloop. Finally, a total of 1078 km/h speed was reached in the tests carried out in the Nevada Desert. Towards the end of last year, an agreement was signed between the Road and Transport Authority (RTA) and Hyperloop One, which was to meet the plans set forth by the Dubai Future Accelerators (DFA) program. Hyperloop One tested its first engines in May this year and will test the entire system early next year. The company announced that they are in the process of developing new roads in five different countries. Completing the first Hyperloop models by 2020 and achieving ambitious targets for cargo transportation by 2021 were among the company's statements.

Change in Passengers Activity in the High Railway Scenario (based on the Basic Scenario)
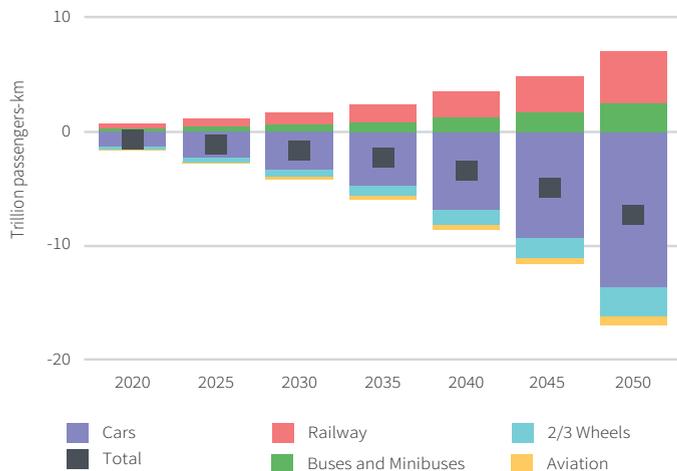
Source: IEA

Important Events

1830
George Stephen, referred to as the father of railways, first used steam trains between Manchester and Liverpool in 1830 for intercity transportation. This event showed the importance of railway transportation in the world.

1883
In 1881, Siemens began building the world's first electric tram line in the Berlin suburb of Lichterfelde, and completed it in 1883. With this development, studies on electric lines and electric motors gained momentum.

1930
Dr. Rudolf Diesel's discovery of the diesel engine in 1892 only came to the railways in 1930.

1984
The first Maglev system was officially launched in 1984 near Birmingham, England. The line served between Birmingham Airport and Birmingham International train station. The system was shut down in 1995 due to reliability issues.

2004
Shanghai Maglev Train, also known as the Transrapid, has a speed of 430 km/h (270 mph). The line was designed to connect to Shanghai Pudong International Airport and central Pudong, the outskirts of Shanghai. It is the most operational maglev train.

2013
Elon Musk explained the idea of Hyperloop, and since then, tests in the Nevada desert have started.

Space Transportation

Definitions and Terms

Space transportation technologies aim at reaching meteors, planets and human-made satellites in space. Another goal of space transportation technologies is to ensure that the current passenger aircraft operate faster and more efficiently. In addition, space transportation will give rise to many new sectors. Almost all of the companies working for space transportation are still continuing their developments in the R&D and testing phases. Recently, the success of the first stages of the reusable spacecraft idea put forward by SpaceX is a milestone for space transportation. The idea that high-cost space vehicles can be re-used, along with these studies, reduces the cost of space transportation.

Exemplary Usage Scenarios

1- Satellite Broadcasting
Satellite broadcasting, one of the largest sub-sectors in the Aerospace Sector, is making arrangements to send satellites to low earth orbit with space transportation.

2- Satellite Internet
These companies are expected to focus on faster and more secure internet connections through low-earth-orbit satellites, wireless broadband, optical communication, and other technologies.

Quote

Corporations and government agencies may be able to tackle technological challenges that will allow point-to-point rocket or hypersonic transport in 50 years time. The average air travel speed has not changed over the past 50 years, we are certainly belated for significant progress."

George Whitesides
President and CEO of Virgin Galactic

3- Deep Space Exploration

These companies are expected to develop high-level missions and travel plans to transfer people and cargo to the Moon, the surface of Mars and its beyond along with the beyond of Earth's atmosphere.

4- Space Construction Materials

These companies are expected to develop infrastructure materials primarily for locations considered to be suitable for settlement on the Moon, Mars or beyond.

5- Ground-based Observation

Observation companies around the world are developing imaging, monitoring and analytical technologies to observe the weather, climate, maritime data, GPS technology, and much more.

6- Asteroid Mining

In the case that transportation to space is possible, minerals are expected to be collected from space, satellites or planets. Currently, Chinese and US companies carry on the works for space mining.

7- Space Debris

These companies are expected to observe and analyze human-made objects, and meteors in orbit in the atmosphere and space. Tracking debris and meteors is to prevent satellites and spacecraft from hitting any object in orbit and space. At the same time, cleaning of space and orbit will be the other task of these companies.

8- Space Tourism

Space tourism is one of the first sectors that come to mind when space transportation is mentioned. Space tourism companies are expected to undertake the task of transporting people in space. Within this scope, companies are responsible for the development and production of technological equipment for space transport.

2016

| $ 412B 39.13% | $ 196B 18.61% | $ 181B 17.19% | $ 117B 11.11% | $ 95B 9,02% | $ 52B 4,94% |

- Internet
- Consumer TV
- Ground Equipment
- Consumer Broadband
- State
- Other

2040

- Ground Equipment
- Consumer TV
- State
- Other

Source: Satellite Industry Association, Morgan Stanley Research.
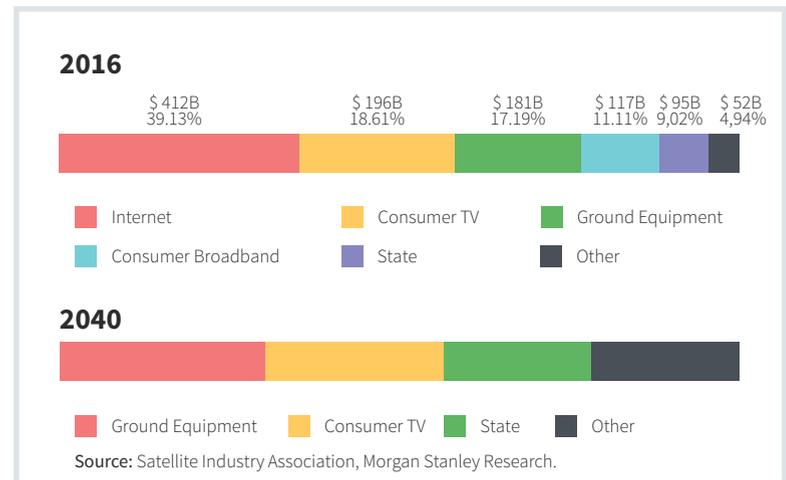
Significant Investments

SpaceX, whose popularity is considerably growing, is not the only company in the field. Jeff Bezos, who is competing with Elon Musk in this sector, founded Blue Origin and started working on reusable space vehicles in space transportation. Jeff Bezos, at the same time, announced that he had sold about $ 1 billion from Amazon's shares to finance Blue Origin. Another competitor company is United La-

unch Alliance. The company, which has signed partnership agreements with aerospace industry giants such as Lockheed Martin and Boeing Defense, has close ties with NASA.

> Boeing bought $ 20 million shares in Virgin Galactic with a vision of commercial hypersonic flight.

> Los Angeles-based startup Relativity Space has the funds it needs to reach orbit, raising $140 million in new investment led by Bond Capital – a fund that includes investor Mary Meeker – and Tribe Capital.

The Dawn of the Entrepreneurial Space Age

Equity Investments From 2009 To Present

Governmental Space Age

1969
Apollo landed
on the moon

Entrepreneurial Space Age

2009
SpaceX launched
the first
commercial
payload

2010
SpaceX published
launch prices;
introduced market
transparency

2012
SpaceX Dragon became
the first commercial
space vehicle to berth
with ISS

2014
SpaceX landed
orbital booster,
ushers in reusability

2015
SpaceX Falcon Heavy
unlocked commercial
deep space operations

2018
SpaceX Falcon Heavy
unlocked commercial
deep space operations

Satellites
250 Companies,
$ 8.3B

Launching
77 Companies,
$ 8.6B

Media and Education
35 Companies,
$ 15B

Biosphere
13 Companies,
$ 515B

Industrials
11 Companies,
$ 154B

**Information and
Research**
8 Companies, $ 77B

Planetary Markets
8 Companies,
$ 244B

Logistics
10 Companies,
$ 147B

$ 18 billion
Cumulative
Investments in
Space

412
Number of
Companies
Receiving
Investment

$ 15B

300

$ 10B

200

100

$ 5B
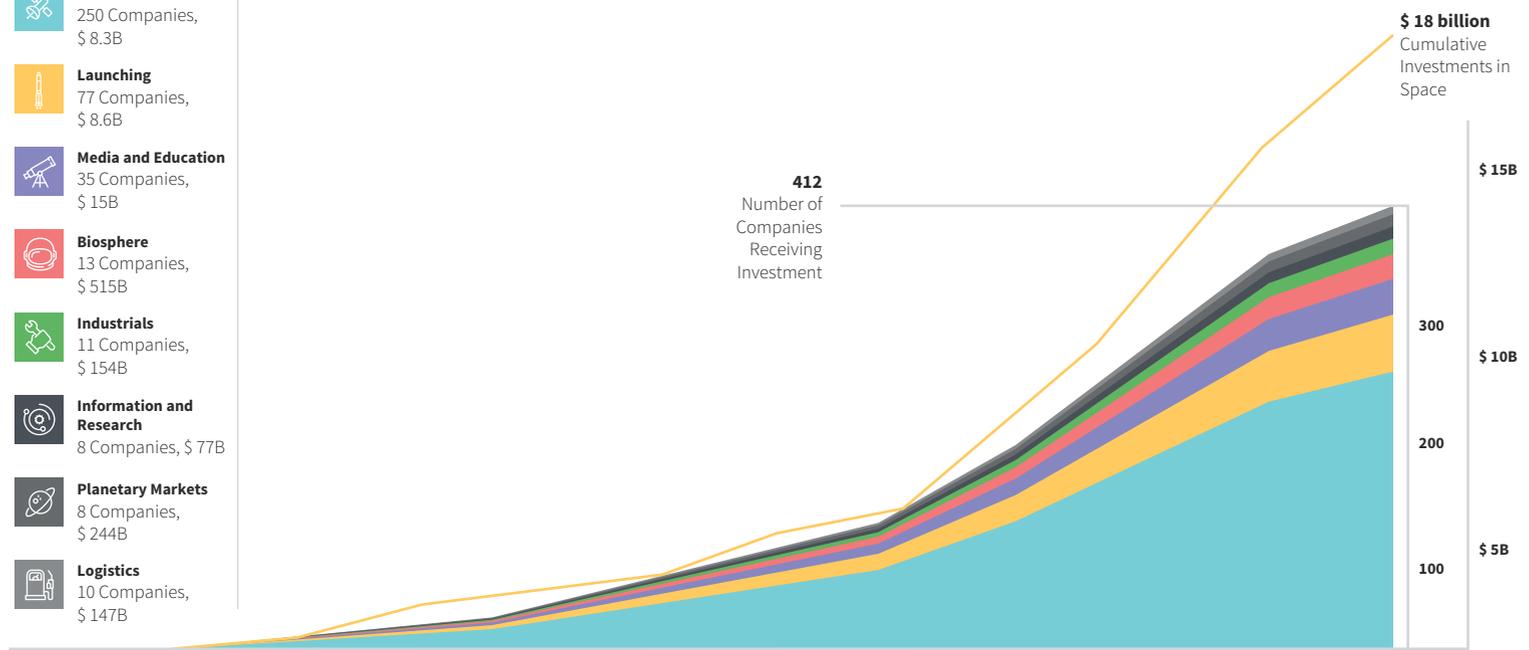
Source: astropreneurs.space

Flying Cars

Flying cars are based on the continuation of the operation of the automobiles in the air, which are used as the most common means of transportation. Accordingly, the main theme of this technology is the fact that people have private flying cars and can move from one point to the other as today's cars do. The same idea includes the public transportation, and transportation sectors.

Definitions and Terms

1- What is Vertical Take-Off and Landing (VTOL)?
VTOL technology allows aircraft to take off and land vertically. Helicopters and drones are examples of VTOL vehicles. Like planes, VTOL vehicles can also fly horizontally after take-off.

2- Rotary Wing Aircraft
Rotary Wing Aircraft are the air vehicles that take off by the lifting force generated from the propeller of the vertically placed rotor, and which hover in the air through this principle.

3- Fixed Wing Aircraft
Fixed Wing Aircraft are vehicles that can fly through the speed of air generated by the shape of their wings and the aircraft's forward airspeed movement.

Quote

"In 2025, flying cars will be the most prominent technology in our lives. "

Eray Altunbozar, CEO of Aircar

1 Vertical Take-Off and Landing (VTOL)

Advantages

Higher mobility, lower take-off time, advanced landing area capability

Disadvantages

Higher power consumption

Used mostly for

Freight Transportation, Private&Commercial Transportation, Military Transportation

2 Rotary Wing Aircraft

Advantages

Increased mobility, lower take-off time, advanced landing area capability area, advanced controllability

Disadvantages

Higher power consumption, lower flight time, lower speed

Used mostly for

Freight Transportation, Private&Commercial Transportation, Military Transportation

3 Fixed Wing Aircraft

Advantages

Higher speed, higher efficiency, lower power consumption, higher travel range

Disadvantages

Lower mobility, higher take-off time, lower landing area capability, lower controllability, higher development process, and cost

Used mostly for

Freight Transportation, Private&Commercial Transportation, Military Transportation

Exemplary Usage Scenarios

While technological advances in the transportation sector continue rapidly with digital cities and driverless automobiles on land, particular technological studies continue in the air.

Flying cars, one of the future technologies in air transportation, have been in the minds of people from the first years of automobiles. Vertical Take-Off and Landing (VTOL) aircraft are more advantageous than other vehicles in take-off and landing, and therefore they have much space for future transport technology.

Drones, better known as, are the most popular ones among VTOL vehicles. The first drone samples were designed to fulfill military purposes. It has a wide range of working areas in search and rescue, data collection, transportation, photography, research and entertainment these days. The focus is on drones that can work in collaboration with future drone technologies and drones that can fly safely in confined spaces. One of these studies is the human transportation. The first prototypes on flying car technology are carried out on rotary-wing aircraft.

Countries already have certain regulations for drones. Some countries are preparing these regulations. This year, the European Flying Car Association (EFCA) put forward a directive. The directives in the United States, the United Kingdom, Canada, India, and Australia are waiting to be published following the final preparation stages. Volocopter, Lilium, Vahana, Ehang 184, Terrafugia, Uber, and Kitty Hawk Cora are companies that are working on flying cars. When the concept designs of the companies were examined, it is realized that some of them preferred to make the take-off and landing vertically and the vehicles that can fly horizontally after take-off, while the other companies preferred to make the vehicles with rotary-wing aircraft.

Problems Preventing Usage

Despite the limited work on flying vehicles, some progress has been achieved. But there are still fundamental problems.

1	**Traffic Management**
2	**Specifying Take-off and Landing Point**
3	**Flight Time**
4	**Noise Pollution**
5	**System Security/Cyber Security**

1   Traffic Management

Nowadays, the number of flying vehicles has considerably boosted with the increasing use of private drones. The airspace already filled with airplanes and helicopters requires many more organizations in the future at the same time. One of the obstacles to flying car technology is air traffic management. Although efforts have

been initiated for traffic management today, standardization has not been reached yet.

2 Specifying Take-off and Landing Point

The positioning of the take-off and landing runways, one of the main debates in eVTOL 2019, is another problem that has not yet been solved for flying vehicle technology. One side recommends that flying cars move from runways built in the city while the other side suggests that runways be located far from the city.

3 Flight Time

One of the biggest technological challenges that VTOL technology faces is battery technology. The biggest disadvantage of vertical flying aircraft is the higher power consumption compared to fixed-wing aircraft. The most striking of the long-distance travel types offered in eVTOL 2019 is the continuous take-off and landing from the cities in between. According to this idea, the long-distance travel plan will be planned considering the runways in the cities in between.

4 Noise Pollution

Noise pollution is one of the biggest problems of aircraft. This problem is exacerbated with flying cars. Companies continue to work on propeller models that produce less noise in order to overcome this problem.

5 System Security/Cyber Security

Another problem that arises with increasing driverless systems is cybersecurity threats. Companies are continuing their studies for safe communication between the flying car and ground control stations or air traffic centers.

Important Investments and Agreements

Flying car technology, which is currently in the R&D and testing stages, is expected to have a $ 1.5 trillion market in 2040, according to Morgan Stanley's data. Flying car technology, which will take advantage of many sectors in the meantime, will bring new sectors and investments.

Companies prefer to continue with experienced partners to overcome these limits. For example, Uber signed a consultancy agreement with NASA on traffic management and course of flight.

Based on this data from Morgan Stanley, we are at an early stage for flying vehicles; but the use of flying vehicles is expected to become widespread around 2040. In this process, flying vehicles that will be obtained with the increase in efficiency of the battery and processors will be more functional.

The Global Urban Air Mobility Addressable Market (Baseline Scenario)

Legend: ROW, Europe, China, USA
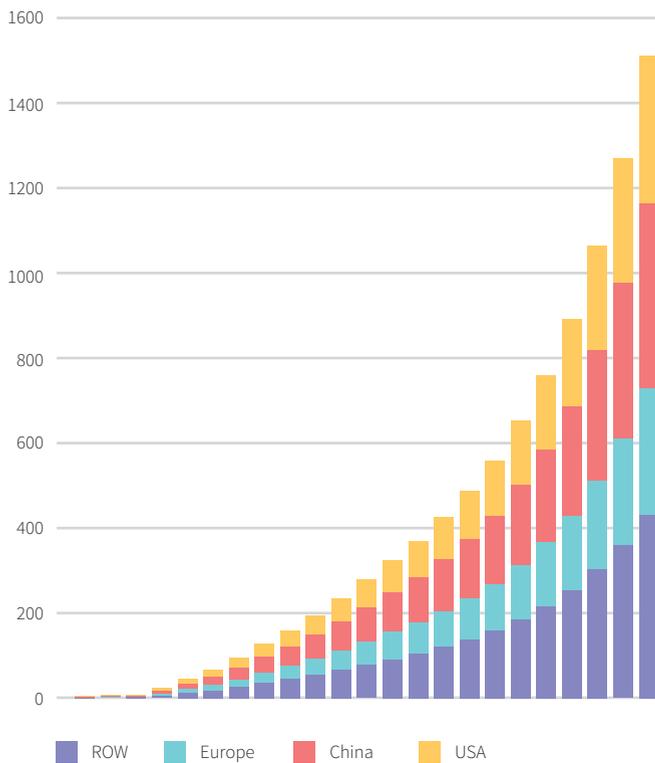
Source: Morgan Stanley Research

AirCar

AirCar was founded by Eray Altunbozar in 2017. AirCar aims to transform the flying cars, one of the most important developments of the transportation technology of the future, into products for our country, and global markets. AirCar started designing the first prototype in 2017. AirCar states that the first product will carry 2 people with a maximum speed of 120 km/h along with a 72 km flight range. AirCar also adds that its first products will include unmanned driving technology and flight support assistants.

At a Glance

Motto
With AirCar, say hello to the future!

Location
Turkey

Establishment year
2017

Investment Received
-

Website
www.aircarcorp.com

Category
Aviation

Quote

"When we look to tomorrow at AirCar Corp., we are thinking of flying cars with enthusiasm. It's time. AirCar will pave the way for tomorrow's urban transportation. Our future vision is an all-electric, autonomous flying car. With its technology, AirCar answers questions about flying cars of the future."

CEO Eray Altunbozar

Lillium

✦LILIUM

Co-founded in 2015 by Daniel Wiegand, Sebastian Born, Patrick Nathen, and MatthiasMeiner, Lilium GmbH is a high-tech center for transportation technology in Munich. The team met while studying at the Technical University of Munich. Lillium, which designed a flying car with a capacity of 4 passengers, is well beyond the standard designs. The vehicle acquiring vertical take-off and landing ability has a speed of 300 km/h. Lillium claims that 300 km distance can be covered just in 60 minutes.

Today, Lilium has raised more than $ 100 million in funding and employs more than 300 people. They also state that they are ready to work with all countries that are interested in this technology and see potential in it.

At a Glance

Motto
We believe in a world where anyone can fly anywhere, at any time.

Location
Munich

Establishment year
2015

Investment Received
$ 100 million

Website
www.lilium.com

Category
Aviation

Quote

"We believe in a world where anyone can fly anywhere, anytime. That world has never been this close."

Daniel Wiegand,
Co-Founder&CEO

Self-driving Vehicles

Self-driving vehicle (AV) technology is used to refer vehicles with full autonomy without any need for driver assistance. Autonomous capability in self-driving vehicles is indicated in 5 levels. Increasing levels provide significant advantages such as personal security, time-savings for drivers, comfort and freedom inside the vehicle, reduced environmental damage, and costs of transportation. At the same time, it can bring about completely new industries in the automotive sector, leading to significant changes in profit pools and the skills needed (such as software expertise or cybersecurity).

While AV technology offers a revolutionary change, the adoption will be evolutionary. Level 4 autonomy, operating within virtual geographical boundaries, is expected to be disruptive and favorable between 2020 and 2022, and then fully adopted. Autonomy with Level 5 technology -operating always anytime, anywhere- is expected to arrive by 2030 at the earliest and with more adoption by then. These developments are expected to change the way people having the greatest impact on vehicle ownership and public transportation use think about mobility in urban environments.

Definitions and Terms

What is autonomous?

Autonomous is the equivalent of the automatic concept used in electromechanical systems. Autonomous systems can make their own decisions. For example, the vehicle, which receives the com-

Quote

"Cars can drive themselves. So you will have your own space in the backseat where you can sit and enjoy yourself."

John Krafcik, CEO Waymo.

mand "I want to go home", gives its own decisions such as route determination and driving characteristics.

What is Self-Driving?

Unlike the concept of autonomous, self-driving, which means driving by oneself, leaves the decision-making process to the driver. When in a self-driving vehicle, the driver must always be ready to take the vehicle's control.

Battery Electric Vehicles (BEV)

They are electrically powered vehicles using energy stored in rechargeable battery packs. These vehicles do not use any motor other than the electric motor. Moreover, the only fuel used is electricity.

Hybrid Electric Vehicles (HEV)

These automobiles are developed through the operation of an auxiliary electric motor as well as a gasoline or diesel engine. While the electric motor saves fuel at low speeds, it acts as an auxiliary element where performance is required. The battery is charged via the gasoline or diesel engine.

Plug-in Hybrid Electric Vehicles (PHEV)

This is the plug-in version of hybrid vehicles.

Internal Combustion Engines (ICE)

They are conventional engines operating with liquid fuels such as gasoline, diesel and LPG.

Levels of Driving Automation

Source: synopsys

No Automation	Driver Assistance	Partial Automation	Conditional Automation	High Automation	Full Automation
Manual control. One performs all driving tasks (steering, acceleration, braking, etc.)	The vehicle has a single autonomous system (for example, it monitors speed via cruise control).	The vehicle can steer and accelerate. One can still monitor all tasks and can take control at any time.	Environmental detection capabilities. The vehicle is able to perform most driving tasks, but human intervention is still required.	The vehicle performs all driving tasks under certain circumstances. Geo-fencing is required. Human intervention is still an option.	The vehicle performs all driving tasks under all circumstances. There is no need for human attention in interaction.

1 Autonomous and Self-Driving

Advantages

Higher safety, higher comfort, lower time consumption, lower carbon emissions, higher efficiency, lower noise pollution

Disadvantages

More cybersecurity issues, more environmental pollution during production, higher cost, higher development process

Used mostly for

Private Transportation (limited availability)

2 Battery Electric Vehicles (BEV)

Advantages

Higher comfort, higher performance, lower carbon emissions, higher efficiency, lower noise pollution, lower fuel costs

Disadvantages

Lower coverage, higher fuel storage time

Used mostly for

Private Transportation, Public Transportation, Commercial Transportation

3 Hybrid Electric Cars (HEV) and Plug-in Hybrid Electric Vehicles (PHEV)

Advantages

Higher performance, lower carbon emissions, higher efficiency

Disadvantages

Higher production cost, higher development process

Used mostly for

Private Transportation, Public Transportation, Commercial Transportation

4 Internal Combustion Engines (ICE)

Advantages

Higher range, shorter fuel-ing time

Disadvantages

Lower comfort, lower performance, higher carbon emissions, lower efficiency, higher noise pollution, higher fuel cost, non-renewable fuel

Used mostly for

Private Transportation, Public Transportation, Commercial Transportation, Military Transportation

Global Opinion Divided On Autonomous Vehicles (2018)

Country	In favor	Not sure	Against
India	49%	46%	5%
China	46%	50%	5%
South Korea	38%	55%	8%
Saudi Arabia	35%	57%	9%
South Africa	34%	57%	9%
Russia	33%	58%	10%
Brazil	31%	61%	8%
Turkey	28%	63%	9%
Spain	25%	63%	13%
France	24%	52%	25%
Japan	24%	60%	16%
USA	22%	54%	24%
Germany	19%	50%	31%
England	19%	57%	24%
Canada	18%	58%	24%

- I am in favor of autonomous cars and can't wait to use them
- I am not sure about autonomous cars, but I find the idea interesting
- I am against autonomous cars, and I would never use them

Source: Ipsos

Exemplary Usage Scenarios

1 Electric Vehicles

As automobile manufacturers and governments are struggling to combat fuel emissions, they are getting ready for removing only cars with an internal combustion engine configuration.

Electric vehicles (EVs) and hybrid electric vehicles (HEVs) carry on with growing, and in 2025 EVs and HEVs will account for about 30% of all vehicle sales. In 2016, 1% of automobile sales came from plug-in electric vehicles (PEV).

The electric and hybrid automotive sectors are projected to increase from only 3% of global market share to approximately 23% of global sales in the same period. This corresponds to approximately 70% of the market share of ICE vehicles in pure market in 2025. This, especially in emerging markets, comes down about 40% by 2030.

Global Electric Vehicle Outlook

2015	1%	98%
2020	3% 1% 7%	88%
2025	9% 3% 20%	68%
2030	18% 2% 39%	41%

■ BEVs ■ PHEVs ■ Full + Mid Hybrids ■ Pure ICE
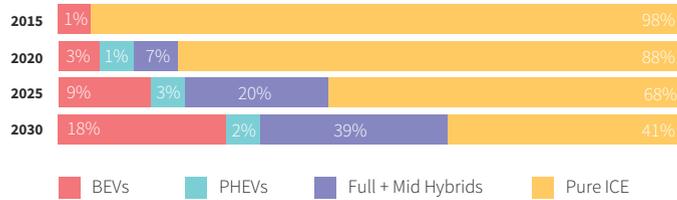
Source: J.P. Morgan estimates

2 Autonomous Vehicles

Self-driving vehicles have started to appear on the roads with private usage these days. Currently, more than 80 companies in California are testing self-driving vehicles. Compared to previous years, people started to rely more on self-driving vehicles or to lean towards at the same time. In addition, new approaches such as self-driving trucks and self-driving motorbikes have been started testing. Tesla and BYD continue racing to be the top by selling approximately 250,000 vehicles in 2018 Self-driving EV sales. It is possible to say that self-driving EV sales will increase in the coming years.
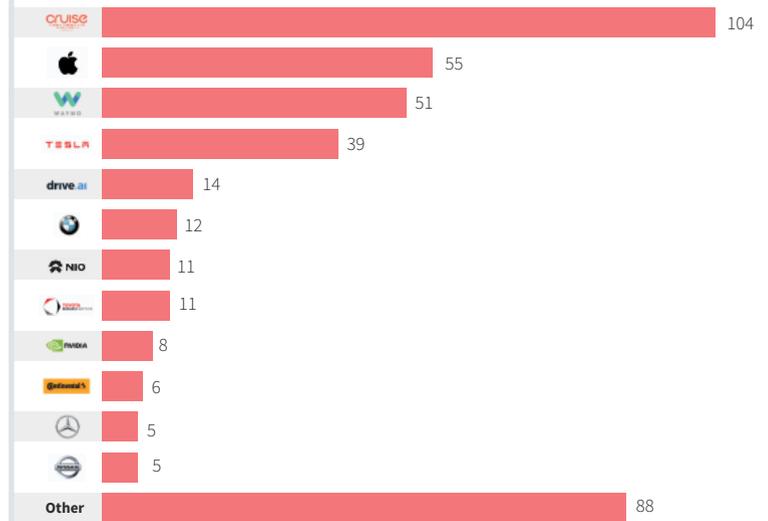
Market Status (Investments)

In both North America and Europe, hybrid and BEV cars will take the lead in the automotive market in the coming years. In Europe, plug-in electric vehicles (BEV and PHEV) accounted for 2% of total automotive sales in 2017. Of this figure, the value of total sales is expected to be 9% in 2025, which corresponds to almost 1.5 million cars.

The Companies Testing Self-Driving Cars in California

Number of autonomous vehicles registered for testing on public roads in California (9 May 2018)

cruise	104
Apple	55
Waymo	51
TESLA	39
drive.ai	14
BMW	12
NIO	11
	11
NVIDIA	8
Continental	6
Mercedes	5
	5
Other	88

Source: statista

Vehicles using only internal combustion engines (ICE) are not expected to be in the automotive sector in 2025. It is highly probable that plug-in electric cars and hybrid electric cars will fill the major part of this market gap. During this period, according to J. P. Morgan's estimates; HEVs and EVs, which reached a total sales rate of 26% with 1.8 million in the automotive market, are expected to be the sales of Japan and Korea with 384,000 vehicles which correspond to 6% sales rate. On the other hand, the aggressive fuel economy of the US forces automotive manufacturers to expand their EV options. As a result, EV (BEV, PHEV, HEV) sales in 2025 are estimated to be 38% of the total sales.

Light-duty vehicle sales by fuel type, 2020-2050

Million Vehicles

Reference Case | Autonomous Battery Electric Vehicle | Autonomous Hybrid Electric Vehicle

Legend: Hybrid electric | Battery Electric | Conventional gasoline | Other
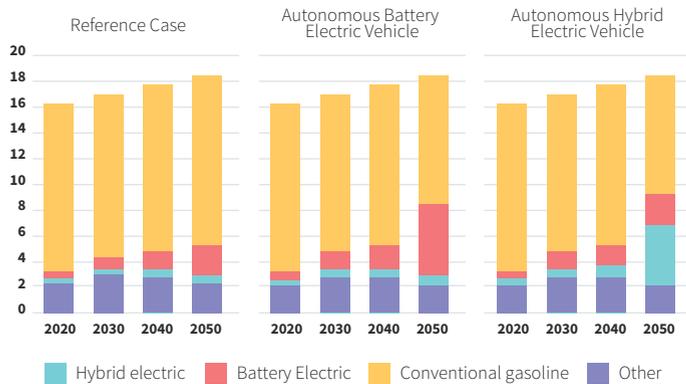
Source: US Energy Information Administration, Annual Energy Outlook 2018

Estimated North American Light Vehicle Sales By Power Type

Legend: ICE | Full and Mid Hybrids | PHEV | BEV
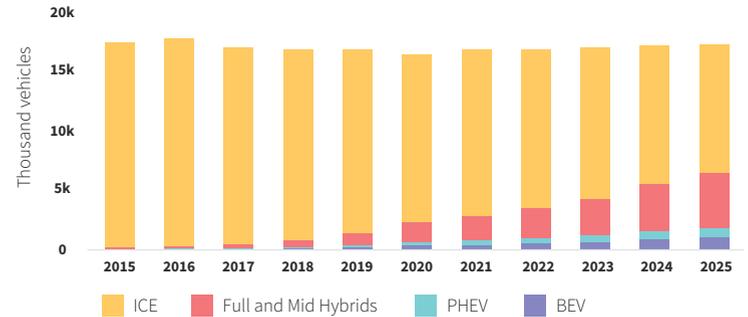
Source: J.P. Morgan estimates
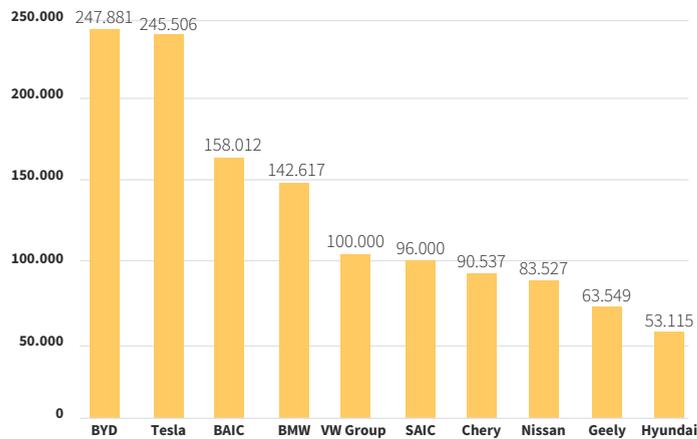
In terms of production and sales of EV, no country can come close to China. According to JP Morgan data, the country is expected to meet strikingly 59% of global sales by 2025. Smaller battery, short-range, low-cost production of mini-EVs boost their popularity in China. According to J.P. Morgan estimates, China will realize 46% of total EV sales in 2020 by producing 2.5 million EVs. This figure is 25% above the Chinese Government's target.

Global EV Sales - 2018

BYD	247.881
Tesla	245.506
BAIC	158.012
BMW	142.617
VW Group	100.000
SAIC	96.000
Chery	90.537
Nissan	83.527
Geely	63.549
Hyundai	53.115

Source: The Driven

Comma.ai

Comma.ai was founded in 2015 by George Hotz in California. The mission of the company is an open-source autopilot system. Released in the same year, Openpilot was tried and it had a good run on a 2016 Acura Lx. Openpilot can turn the vehicle into a Level 2 self-driving vehicle by integrating a road-facing camera and a module for communicating with the vehicle to those vehicles with adaptive cruise control and lane tracking. As its name implies, open-source Openpilot is being integrated into different vehicles day by day by many developers and multiplying the range of usage. In total, 10,000,000 miles have been covered by using Openpilot. The CEO of the company likens Openpilot and other self-driving vehicle systems to Android and iOS mobile operating systems.

CEO George Hotz, who likens iOS to Tesla's autopilot system, relates Openpilot to Android, and claims that other autopilot systems will fall off the radar in time and opt for Openpilot.

At a Glance

Motto
Make driving chill

Investment Received
$ 5 million

Location
USA

Website
www.comma.ai.com

Establishment year
2015

Category
Autonomous vehicle software

Quote

"We use all this data to create behavioral models of human driving. We are now very good at localizing this driving data to find out where the car actually goes. train models to drive like people? From this and the data, how do we actually Comma.ai is working on it."

George Hotz
Comma.ai CEO

DISRUPTIVE TECHNOLOGIES
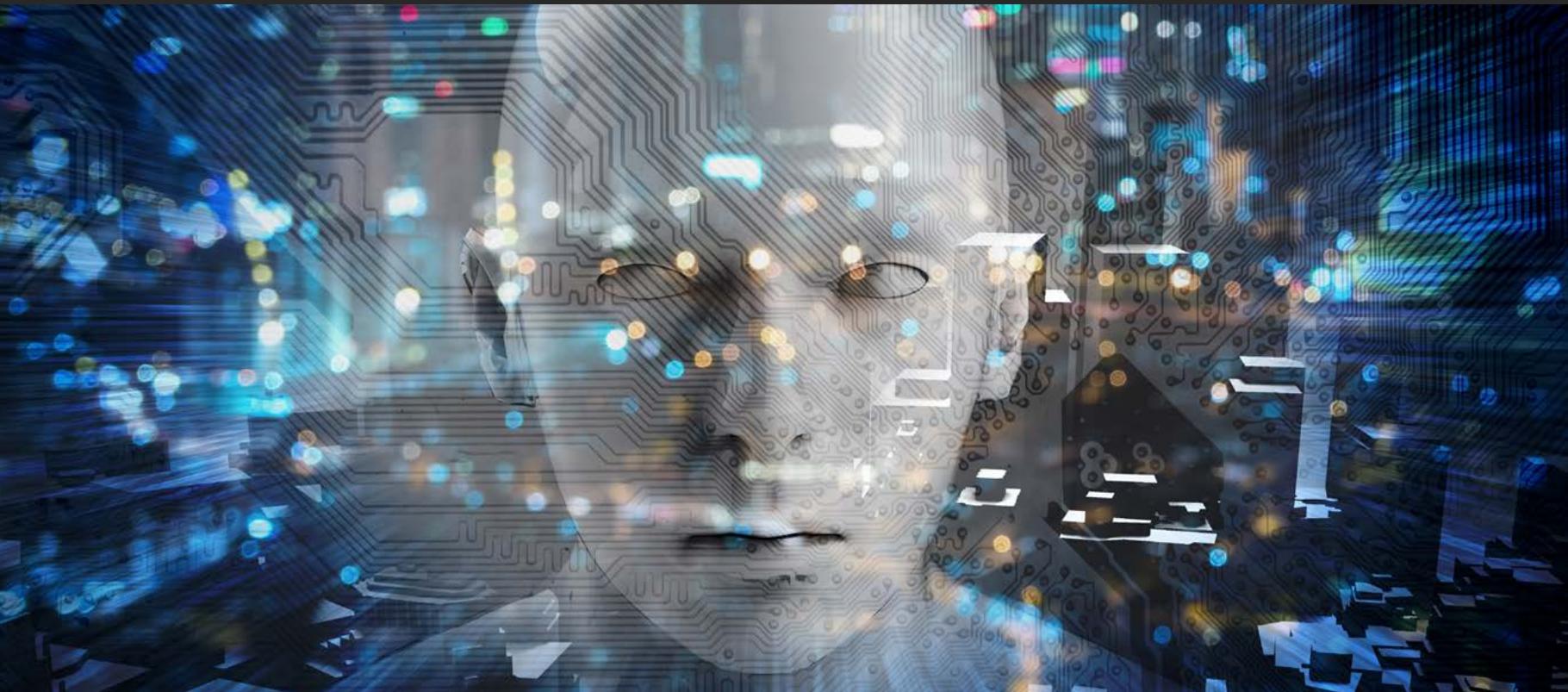
Bora Özkent

Author and Advisor

Biography

He develops individuals and corporations in the fields of innovation, entrepreneurship, emerging technologies and customer experience.

Özkent has a passion for creativity, digital transformation, game-changing initiatives, innovations that shape the future, and for unique customer experience design.

Apart from his career as a writer, speaker, and consultant, Özkent instructs "Human and Technology" at the Post Graduate Program in Learning, Innovation, Technology and Entrepreneurship at Istanbul Bilgi University. Before Özkent instructed "Entrepreneurship" lessons in Koç University MBA program for 4 years.

Özkent is a TEDx Speaker and has 4 books in the fields of innovation and customer experience: "Innovation Manifest for Big Cooperations", "Innovation – Step by Step", "Priceless" and "Customer Experience 2.0".

Tesla Makes Disruptive Innovation on Live and Nobody Knows What's Happening!

We love disruptive innovation stories.
In these stories, the rookie entrepreneur with innovative technology eliminates the established players of the sector.

The disruptive innovations reminds me of the Yeşilçam scenarios where one day, after the poor boy in the old Turkish films became rich and he came across his factory boss who has a daughter and says the cliché: *"I am the young one you once called poor!"*.

For example, Netflix's is exactly of this nature:

In 2000, its entrepreneurs wanted to sell Netflix to Blockbuster, the giant of video rentals, for $ 50 million.

As he talks about the response of the managers of Blockbuster, the co-founder of Netflix Marc Randolph says "They laughed at us."

Netflix, which they said 'poor' once upon a time, has a market value of $ 127 billion today. The Blockbuster signboard only adorns the window of a symbolic store embraced by its employees.

What is Disruptive Innovation?

Clayton Christensen has firstly introduced the concept of disruptive innovation in his book "The Innovator's Dilemma". In his book, which is "one of the six greatest business books of all time" accor-

ding to The Economist, Christensen explains why the leaders have failed against new technologies.

According to him, market leaders are in the pursuit of maintaining their positions and they tend to ignore the technologies that would hamper their leadership.

Because the first priority for them is to maintain the large market in their hands. However, when a disruptive technology appears, there is either no market or even very small compared to the current income of the leader players. Even the most farsighted leaders perceive this as a distraction in addition to their current business.

Therefore, disruptive technologies are always developed by entrepreneurs who are trying to enter the sector. After all, a $1 billion market can be quite appealing for a startup with a $0 income.

Entrepreneurs in markets ignored by established players realize the noncompetitive market, develop their products and business models continuously, grow slowly at first, and then rapidly grow, eventually attacking even the primary markets of established players.

The values achieved by technology startups after this challenging journey now enable them to become too strong for large firms to respond to them, even if large firms wish.

For example, the relationship of Mercedes -one of the leading players in the automotive market- with Tesla, is an interesting and dramatic example of the approach of large corporations to disruptive innovations.

Mercedes, which is interested in electric vehicles, buys a 10% share in Tesla by investing $ 50 million in 2009. While this money allows Tesla to overcome the 2008 financial crisis, it gives Mercedes an opportunity of discovering electric car technologies. In this respect, it is impossible not to appreciate the action of Mercedes.

On the other hand, Mercedes sells 10% of its shares around 780 million dollars in 2014, especially since it thinks that Tesla Model S is starting to be rival to its luxury vehicles. The instinct of established players is on the job to protect its market.

Today, Tesla and Mercedes have a market value of 60 billion dollars. So, the student has become the master or it will. If Mercedes continued to cooperate with Tesla, where would it be today in the production of electric vehicles and how the market value of the company would rise? It is impossible not to wonder.

Why is Tesla a Disruptive Innovation Candidate?

Tesla has not been a player, yet it has disrupted the automotive sector. It would not be right to put Tesla in a success story similar to those of iPhone and Nokia, Uber and taxi companies, and Kodak and mobile phone applications. The number of Tesla's sales of 360,000 units in 2019 will not satisfy the giant rivals such as VW, Toyota, Ford, and Mercedes.

But…

There is a "but".

It even has two "but"s…

The first but is this:
As you can see from the table, Tesla is the market leader in electric cars. Moreover, the table includes not only pure electric vehicles such as Tesla but also hybrid vehicles.

Is it important to be the leader of the electric vehicle market?

Both no and yes.

No, because 1.5 million electric cars were sold in 2018. This is a drop in the ocean compared to the automobile market of 80 million. This is the main argument of those who claim that Tesla is not a disruptive innovation: The electric car market is so small, so what is the big deal about Tesla's becoming the leader of this market?

There is a point that people who think like this are missing: The electric car market is growing very fast, almost doubling every year. If the increase in the sales of electric vehicles continues in this way, 48 million units of electric vehicles will hit the streets in 2023.

Isn't the disruptive potential of being the apparent leader of a market that will grow so fast quite obvious?

In addition, I expect that the sales of electric vehicles will increase with a much sharper escalation. Because as the number of produ-

ction of these vehicles increases, their quality improves and the costs rapidly decrease thanks to the captured economies of scale. For example, a high-tech Tesla Model 3 Performance and Toyota Camry are sold at the same prices in the US market today.

Although Tesla is a small producer, the second and indeed even more important reason for its disruptive innovation potential is its autonomous driving investments.

Tesla, and Google's subsidiary Waymo are neck and neck to develop autonomous vehicles. The reason lying behind Tesla and Google's giving so much importance to autonomous driving that is not the traveling of car owners more comfortable. The main target is to set autonomous fleets of taxi.

In cities where ridesharing services like Uber, Lyft, and Didi are inf-

luential, it is known that people give up driving their own cars. On the other hand, the use of these services is still quite costly. For example, when you have your own vehicle in the USA, the average cost is around 70 cents per mile. You should spend $ 1.2 per mile in Uber.

The cost of a ride with autonomous taxi fleets will go down 26 cents per mile. These vehicles will serve much longer hours since they do not have any costs and the efficiency of use is high. You will be able to travel the one-third cost of driving your own car thanks to autonomous taxi fleets.

There is no need to be a soothsayer to predict that the car market will shrink.

There will be more journeys with fewer cars. Moreover, since these journeys will be under the control of fleet operators such as Tesla, Waymo and perhaps Uber, most of the current car brands will completely disappear and some of them will become subcontractors.

Will Tesla Manage to Disrupt the Automobile Industry?

Before answering this question, I must make one thing clear. I've been investing in Tesla stocks for a long time, so I can't completely be objective about Tesla.

On the other hand, by looking at Tesla's incredible growth momentum, its ability to produce increasingly efficient and popular

electric vehicles, and its continuous development of autonomous driving capabilities, I can easily say that Tesla has already radically influenced the automotive sector, which has remained almost unchanged for 100 years. The years ahead will show how the established players of the sector will respond to Tesla's game-changing effect. But in my opinion, for Tesla, which has started to develop electric autonomous vehicles 10 years ago before the established players, the actual rivals will come out of the technology giants such as Google, Amazon, and Tencent.

Let's see what the next years will show us.

FLYING CARS
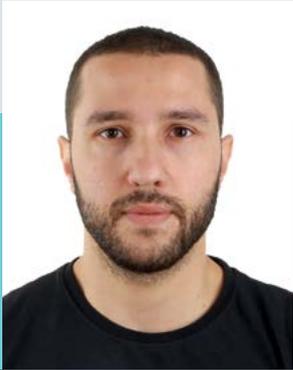
Eray Altunbozar

AirCar, Founder & CEO

Biography

After completing his undergraduate studies at The State University of New York, he completed his Master's Degree at Harvard University. After working in corporate companies for four years, he founded Outliers Notebook in 2016 and AirCar in 2017.

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The age of flying cars begins!

The European Aviation Safety Agency (EASA) issued certification standards for small-category flying vehicles capable of vertical take-off and landing (VTOL) on 2 July 2019. These vehicles, which can carry a maximum 9 people and which have a weight limit of 3175 kilograms, will be piloted. Specifying that all of the designs, the number of which is approaching 200 are designed differently from each other, EASA stated the safety criteria they expect from the vehicles in the certification standards it has issued, without standardizing the details such as shape, wing, propeller.

In sum, whether we call these devices flying cars or VTOL, the flying car age that we all dream of, started legally in 2019. Companies that develop models that meet the standards set by EASA will start their commercial operations in the years coming.

EHang 184, which is a company based in China, has begun selling the models it has tested since 2016 even though the certification process has not yet been completed. In addition, Volocopter, a German company, started flying taxi services in 2019.

AirCar Concept

Things go little differently in the Americas. The Federal Aviation Administration (FAA), the agency of the U.S. Department of Transportation, lags behind Europe in innovative aviation for the first time in history and it has not yet issued a certification standard for flying cars. However, NASA continues to work on this matter in recent years. It regularly organizes symposia with American and European flying car companies and continues to work on issues such as airline route design and vehicle safety. The FAA is expected to issue regulations soon. Moreover, in contrast to EASA allowing only flights with pilot, FAA is expected to standardize for fully autonomous flying as well.

Studies on flying cars have been in progress since 2012. While the giant companies such as Uber, Airbus and Boeing continue their works on prototypes, Volocopter, Ehang and Lilium, which can be considered as the first startups of the sector, are invested over $ 100 million each. To date, more than 70 companies have already invested over US$ 1B in the development of VTOL concept vehicles (Booz Allen Hamilton, 2018) Again in 2019, even if Aston Martin and Porsche stated that they are interested in flying cars, it has been only startup companies that still carried the flag forward and started manned tests. 2019 continues to be a year in which processes expedite and investments increase for the flying car market.

The reflection of flying cars in global and Turkey and differences of ecosystem

Turkey aviation industry has long been unable to go beyond the production of spare parts, and assembly lines. However, the sector has come to life through the leadership of entrepreneurs in recent years. I founded AirCar, which is the first flying car company in Turkey, in 2017. Cezeri model was introduced by Selçuk Bayraktar in 2019. AirCar will start testing the full model in the first quarter of 2020. It can be foreseen that Cezeri will perform test flights in the first half of 2020. Now that two models have already been designed in Turkey, it can be said that we have entered the sector at the right time as a country.

Since Turkey does not have a legislator position in the aviation sector, our aviation law is bound to EASA standards. At this point, we think that Turkey's cautious attitude towards innovations in general, will be more constructive in the field of flying cars. Moreover, I can say that Istanbul is a candidate to be one of the most favorable cities for the adaptation of flying cars as a result of the unresolved traffic problem, calm weather and the strait that provi-

des a fully secure line for flights.

The greatest lack of Turkey compared to Europe, America, and China is the lack of trained personnel in the fields that will produce the flying car, the investments of government being made selectively and that the specialized fund has not invested in this area yet. At the same time, engineer costs in dollars being four times lower than they are in China and governmental incentives for staff working in R&D studies can be specified as areas that Turkey is advantageous.

Short-term and long-term future of flying cars

As societies, although we see the arrival of flying cars in a distant future, taking a look at the past to see the future will be sufficient. Social prejudices about flying cars are the lack of regulation, airline management, the unready state of the system, the lack of landing and take-off areas, and most importantly concerns about safety.

The same concerns, however, occurred in 1908 when Henry Ford wanted to design the Model T automobile and sell it at a price that a middle-class American family could buy. In those years, horse carriages were a well-functioning and accepted means of transport; but there were no roads for automobiles, legal regulations, gas stations, repair shops, and driving license courses. Despite these criteria and prejudices, Model T sold 15 million between 1908 and 1927, the years when it was produced, and it closed the age of horse carriages and opened the age of automobiles. Model T is still the third-best-selling automobile in the world. Automobiles are more than just being a disruptive technology, they are in our lives as vehicles that change the future of humanity.

How quick can we adapt ourselves to flying cars? According to The Porsche Consulting, 23,000 eVTOL vehicles will create a 74 billion dollars market in 2035 (Porsche Consulting, 2019). However, we have a more optimistic view about this. We predict that 20 million flying cars will be in the air for the next 20 years after the production of flying vehicles that meet the standards set by EASA and FAA has been started. We calculate that AirCar models, which will be produced in full electric, fully autonomous and safety standards, will be released around 20,000 dollars after 2022, indicating an economic model that cars will gradually be replaced by flying cars. At what speed this will happen depends on the hard work of startups like us.

AirWays

> " *Mark my word: A combination airplane and motorcar is coming. You may smile, but it will come."*
>
> Henry Ford

TECHNOLOGY COMMUNICATION IN DIGITAL TRANSFORMATION

Dr. Sertaç Doğanay

Technology Communicator, Academician

Biography

He is a technology communicator, academician, consultant, and writer. He is a graduate of Istanbul Faculty of Medicine. He held positions of a brand manager, corporate communication manager, marketing manager, and marketing sales director during 10 years of experience in the pharmaceutical industry. Lecturing, giving speeches and writing extensively on future trends, new technologies, innovation, cybersecurity, digital transformation applications, digital marketing, and digital health; Dr. Sertaç Doğanay instructed Digital Marketing Communications lessons at the MBA program of Yeditepe University between 2013-2018. He has been teaching "Technology Communications" at Kadir Has University as of spring 2019. It is a first course having this name and content opened in a university, both in Turkey and in the world. As of spring 2019, he has been teaching "Medicine of the Future and New Medical Technologies" at Istanbul Faculty of Medicine where he graduated. As of 2018, he has been working as a technology communications consultant at Boğaziçi University's Cyber Security Centre - Management and Information Systems.   As of September 2019, he is preparing and presenting a TV program called Transforming World at Bloomberg HT.

Important Role of Technology Communication in Digital Transformation

In the 21st century, but especially in the last 10 years, the changes created by the developing technologies in the business world and our social lives are difficult to follow and adapt. Change is not unique to this age, it has always existed in our world, but before this, the Moore curve, which represents scientific and technological progress, was increasing so slowly that perhaps it would have been 200 years before the world we lived in looked and felt differently. For example; if you had lived in the 12th century, your life would not have been much different than it had been in the 11th century. Today, however, it takes about 5 to 6 years for a new technology to have a completely transformative effect on our lives and our work. Given the fact that technology is growing exponentially, this time will become shorter in the future. The main question to be asked here is: What happens when the change in technology exceeds our ability to understand it?

You are unlikely to hear the terms of technology communication and technology communicator from someone else before, because, until July 2018, I wasn't talking about these terms either. Not only did I speak of these terms, but I also began to examine the issue at an academic level.

I wanted to write this article in answer to questions like what a technology communicator does, how he/she avails, and why he/she is an integral part of digital transformation.

Let me answer: While our technology has the potential to perform more, we will be contented with less. Because there is no way to integrate a technology that we don't understand into our lives or what we do.

Let's Make New Technologies "Understandable" to Give Their Due

The practical and common use of new technologies is only possible through enhancing the adaptation ability of people from all walks of life. Whether you are a senior executive in a corporate company or a worker; whether you are a civil servant or a communicator and marketing expert like me… Technology has become a very important part of what we all do. But these technologies are not easy to understand. Technology and communication dis-

ciplines must combine the forces to make new technologies understandable, especially for people having no grasp of technical terminology. I am so pleased that I have been the first person putting "Technology Communication" concept into words in Turkey by bringing these two disciplines together and I have been very well welcomed. So much so that in the spring of 2019, breaking new ground, I opened the "Technology Communications" course at Kadir Has University. I am more than proud to educate the first technology communicators of the country in this new field. Thanks to Monster Notebook having been a sponsor with no terms for my course, 38 students, each from different faculties, produced contents by summarizing the books I provided for them throughout the semester. You can access the contents via teknolojiiletisimi.com. I also presented the curriculum and outcomes of this course at a workshop organized at the University of Oxford in June.

To sum up, I think that "technology communication" studies that will be accomplished to disclose technology more effectively in order to carry out this quick transformation should be evaluated under six important headings:

> Activities to be carried out by companies producing or marketing technology to effectively transfer this to their corporate and individual customers.

> Activities to be carried out by institutions using technology in order to transfer technology effectively to their employees.

> Activities that will be carried out to adapt the departments to

each other in projects involving employees in technical positions such as IT, data scientists and employees who have limited technical knowledge (HR, marketing, sales, corporate communication) and thus to increase efficiency.

> Activities to be carried out by technology entrepreneurs to transfer information to potential investors and potential customers.
> Activities to be carried out by governmental and non-governmental organizations that wish to increase the level of technology literacy of society.
> Activities to explore, read, and comment on the impact of new technological trends on the business and discuss the outcomes at the level of management.

As the famous scientist Marie Curie says:

> *"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less."*

As a person who writes articles about technology and innovation, gives professional speeches and provides consultancy services, I had the opportunity to examine the relations of many companies from different sectors with new technologies. As a result of my observations; I found that company employees who do not have technical knowledge cannot easily comprehend and adapt complex technologies whereas employees with technical knowledge have difficulty in simplifying these technologies while explaining them.

Apart from believing wholeheartedly in the necessity of technology communication in order for our institutions to internalize the culture of technology and innovation, and to increase its value by using new technologies, I believe that it is a fact supported by data.

TEKsystems, an information technology and services incorporated company, publishes a yearly report called IT Forecast Survey in consultation with senior Information Technology (IT) Executives from leading companies around the world.

Presenting valuable statistics in many fields ranging from the importance of competencies to technology trends in the field of Information Technology, the part that I care about in terms of tech-

nology communication in this report and I want to share with you is as follows:

When asked to the IT managers interviewed in the report as "What is the biggest challenge to US Companies Meeting Their IT Goals and Objectives? ", the participants pointed out the following problems:

33%   **Organizational alignment**

17%   **Management**

20%   **Communication skills**

9%   **Sphere of activity and structure**

12%   **Competency measurement**

7%   **Partnerships**

So, what is the crux of these problems and how can technology communicators working in institutions solve these problems? Let's briefly examine some of them:

Organizational Alignment Problems

Whether a company produces, sells or uses technology; one of the biggest problems that have arisen in companies since complex technologies involved in business processes is the lack of communication between the personnel in charge of technology and

the administrative personnel. Employees who do not have any technical background develop a prejudice against understanding the new technologies by thinking the language used by technical personnel is too complex, which makes their adaptation to technology difficult. On the other hand, technical personnel continues to use the technical language in other fields, and as a result, communication problems appear.

Technology communicator, as a bridge between the technical and administrative departments, aims to enable people communicate with each other easily and effectively every so often. Technology communicator carries out various communication activities until he/she is sure that technical personnel expresses themselves fully and administrative personnel understands the technology at issue in all respects.

Communication Problems

Technical personnel cannot understand the administrative objectives of the institution and cannot figure out the administrative jargon of most institutions; in return, administrative personnel are often unaware of the institution's innovations and technologies for business development.

In today's world where technology is advancing at a great pace, it is vital for companies that want to survive in the tough competitive environment of the business world to find/develop technologies that serve the institution's objectives and to integrate them immediately into business processes.

However, if the technical personnel in the institution cannot fully comprehend the needs of the administrative strategy adopted by the institution, they cannot develop suitable projects. Likewise, if the administrative personnel cannot understand new technology, they cannot use it effectively for the administrative interests of the institution.

After a comprehensive study about technology and the aims of the institution, the technology communicator explains the crux of the matter to the parties in its simplest form. When necessary, he/she brings technical and administrative personnel together and makes sure that they communicate effectively.

The Problem of Partnerships

It is of great importance that personnel in the midst of technology can convince personnel who do not have the technical knowledge to invest in new technologies and use them effectively so that they do not miss the different innovations that will advantage the institution. However, technical departments have always been isolated from administrative departments in most cases. Technology communicator aims to improve the communication skills of technical personnel and make them a part of corporate decision-making processes through storytelling, effective speech, data visualization, and data storytelling training organized for technical personnel.

Nowadays, every company is a technology company in a way, whether you are working in the finance, health, energy or food industry. The path of all the businesses in the world somehow crosses with technology. As I said in the beginning, the way to take advantage of these technologies is to understand them well.

DESIGN THINKING

Emrah Yayıcı

Keynote Speaker, Author, Partner, BA-Works, Keytorc, UXservices, ArtBizTech

Biography

Being the managing partners of BA-Works, EXplori, UXservices, Keytorc, Continium and ArtBizTech, Emrah Yayıcı; is also the president of IIBA (International Institute of Business Analysis) Turkey Chapter, and the chairman of bang.Prix which is a digital art platform that brings art and technology together. Having books published on Amazon.com about design thinking, experience design, business analysis and artful thinking in the fields of innovation, Emrah Yayıcı makes speeches about these fields around the world.

Exploring "The New" through Art and Philosophy

Recently, design thinking and Agile transformation projects are among the most important topics of the business world both in our country and in the world. Design Thinking enables companies to discover the most innovative product, service, customer and employee experience ideas; Agile methods enable these ideas to be implemented as quickly as possible. Developing, prototyping and conceptualizing solution ideas through Design Thinking workshops before Agile projects enable Agile teams to see the big picture from the very beginning of the project and create the product backlog with the right way to meet user needs. In addition, the fact that the users representing the target audience (persona) are included in the Design Thinking works (design "with" customers "not for" customers) paves the way for the development of the reflexes of the Agile teams to be user-oriented while creating user stories in the continuation of the projects.

Design Thinking works consist of four stages. The business problem (challenge) is determined in the first stage. This business problem can be a customer-oriented problem, such as how a company can reach customers that have not been adequately reached with

innovative digital product and service ideas, or it can be an organizational problem on how to boost the energy of employees. In the second stage, which lasts about two weeks, the target audience affected by this business or organizational problem is identified, and onsite interviews are conducted with the people representing this audience. After the interviews are completed, the third stage, which is the workshop stage, is initiated and the results of the research are analyzed with different techniques with fifteen to twenty participants who are invited from different departments of the company, and innovative ideas are determined through these insights, and then ideas of first priority are chosen and prototyped as solution concepts. In the last stage, which lasts for one week, user opinions are received through prototypes, and the executives of the company are met to clarify the cost-benefit analysis and implementation plan of the new solution concept.

Although Design Thinking is a proven methodology with approximately twenty effective techniques, the most important success criterion we have observed in nearly fifty works to date is that the team members participating in the work can use their right brain functions as actively as their left brain's in the course of the work. Empathy and asking the right questions during the user researches; catching patterns in the stage of analyzing and transforming these researches into insights; creativity and different thinking in the stage of developing innovative ideas through insights; visual thinking in the prototyping stage, and functions of critical thinking in the user evaluation stage should be activated. The most effective way to activate these right brain functions is to take advantage of art as people who achieved extraordinary works from different

disciplines throughout history did. In order to trigger these functions during the Design Thinking works, we conduct Artful Thinking practices, which are also used by significant academic institutions such as Harvard and MIT. One of these practices is a digital artwork called the bang. Neuro that we created by combining artificial intelligence and virtual reality technologies with the principles of neuroaesthetics. Scientific researches show that our brains create "the new" by combining the information that it hides with the activation of the CPEB molecule. That is to say, "the new" is revealed through the combination of the things we know we do not know much (unknown-knowns) rather than what we know already (know-known) or we don't know we don't know (unknown-unknowns). In our Design Thinking workshops, we enable participants to enter into an abstract world, to think outside the box, and to experience an unknown-knowns in their minds through bang. Neuro

artwork. In this way, we prepare for the stages of determining insights and developing ideas.

In Design Thinking works, the most impressive ideas emerge from the deepest insights while the deepest insights emerge from what they feel (feeling) rather than what customers do (doing) or what they think (what they think). The techniques we use to show how customers feel are empathy maps and customer journey maps. The points we call the moment of truth on these maps represent the most positive or negative "moments" that customers feel at every stage of their experiences. According to the principles of behavioral economics, the more firms can enter into environmental, social and individual contexts of customers (context) by predicting irrational expectations of them (predicting irrationality), the more impressive "moments" they can give to their customers. In order to be able to predict the irrational expectations and behaviors of the customers; in other words, to determine deep insights in Design Thinking, the teams in the work must have the highest awareness and they must look at the research results from different perspectives. In order to facilitate this, we make Philosophical Thinking practices in our workshops. Plato describes people who are chained to a cave in his famous allegory. People can only see shadows projected on the wall they are facing. They think that the shadows on the wall are real and they have no idea of the actual causes of the shadows. They believe that their lives/experiences belong to the real world. Coming out of the world of Plato's superficial shadows (needs and problems) in the famous cave allegory, we travel to a world of ideas where deep insights and "new" ideas await us to be discovered through the practices of philosophy and

mind-mapping techniques that we applied throughout Design Thinking workshops.

Neuroscience studies carried out in the field of human resources shows that the energy and inspiration level of people are at the highest level, they go into the flow state, and dopamine levels, one of the hormones necessary for creativity, increase when people create the new as a team. In Design Thinking works, coming of people together and thinking the new together (think together) and doing the new together in Agile projects (do together) helps to increase the level of dopamine and the courage to create, revitalize the spirit of innovation and entrepreneurship in a methodological structure within the company.

Aylin Öztürk

Softtech, Innovation Solution Architect

Biography

She is a graduate of the Department of International Relations at Boğaziçi University. She started her career as a banker in 1998 and later continued as a business analyst in the IT sector. She works as an Innovation Consultant at Softtech, and serves as an advisory board member and mentor in the fields of entrepreneurship, innovation, digital transformation and digital art in various platforms. She is a Design Thinking Trainer and Facilitator.

Design Thinking: A human-centered approach to work

Design Thinking is a user-centered (human-centered) way of problem-solving and it encourages the combination of creative and analytical thinking while solving problems. It is also an interdisciplinary and collaborative thinking method. It brings disciplines together to find solutions with a multi-layered technique that will result in the products people need and desire. Creative collaboration is at the center of design thinking. The mission of design thinking is to transform technology perfectly into human value.

Designers can create what we like by integrating what is desirable from a human point of view with those that are technologically and economically viable. Therefore, those who say why we don't use this perspective while producing our solutions approach the problems with design thinking and develop solutions with this method.

The development of creativity techniques in the 1950s and the emergence of new design methods in the 1960s led to the idea of design thinking as a creative approach to problems. John E. Arnold is one of the first authors to use the term "design thinking" (1959). The 1980s witnessed the rise of human-centered design and design-centered business management. IDEO design con-

sulting firm was founded in the 1990s, and it became one of the first design companies to demonstrate design processes based on design methods and design thinking. This methodology has become popular in the business world with the beginning of the 21st century. The approach of Design Thinking has been quickly adopted by the prominent brands of the world such as Apple, Google, Samsung, and GE, and it is being taught at the leading universities such as Stanford, Harvard, and MIT.

IMAGINATION

CREATIVITY

EMPATHY

INNOVATION

VALUE CREATION
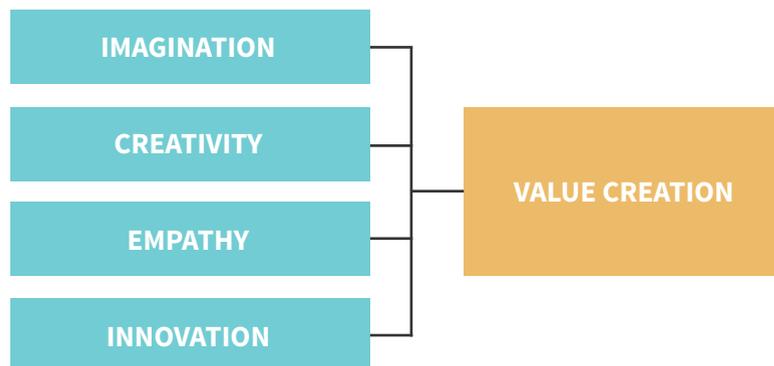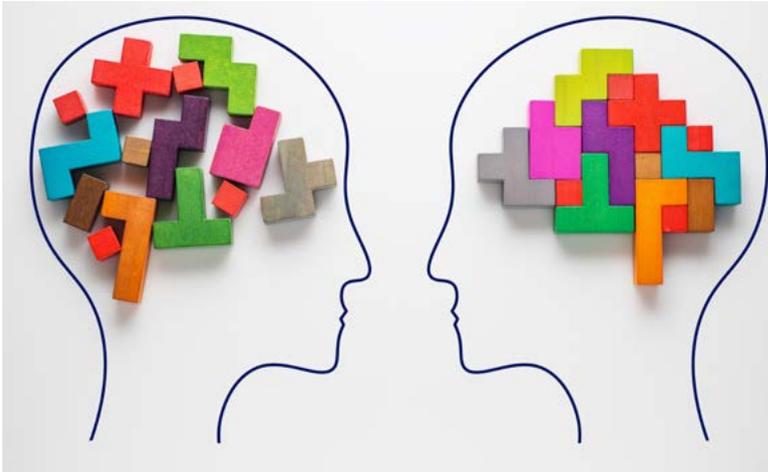
Quote

"Design Thinking is a method of meeting people's needs and desires in a technologically feasible and strategically viable way."

Tim Brown - Executive Chair – IDEO

The keys to carry out this methodology are creativity and empathy. Design has become a key area for innovation and technology as a result of the design thinking approach's coming at the forefront in problem-solving. The design thinking process firstly identifies the problem. This process is focused on understanding (empathy). The method involves focusing on the needs of the user, looking at the problem from many perspectives and testing it. There are five basic stages:

Empathise

Research

Generating an idea

Prototype

Test

Time has shown us that non-human centered approaches, designs, products and services cannot be successful. The more products that touch people, appeal our emotions, and that are close to the most we desire, the more satisfied we are. In this case, design thinking is a very appropriate method in this process as companies strive to develop innovations by empathizing with their cus-

Design Thinking:
A Non-Linear Process

Empathy

LEARN ABOUT USERS THROUGH TESTING

EMPATHIZE TO DEFINE THE PROBLEM

Define

TESTS REVEAL INSIGHTS THAT REDEFINES THE PROBLEM

Generating an idea

PROTOTYPES SPARK NEW IDEAS

Prototype

TESTS GIVE BIRTH TO NEW IDEAS FOR THE PROJECT

Test
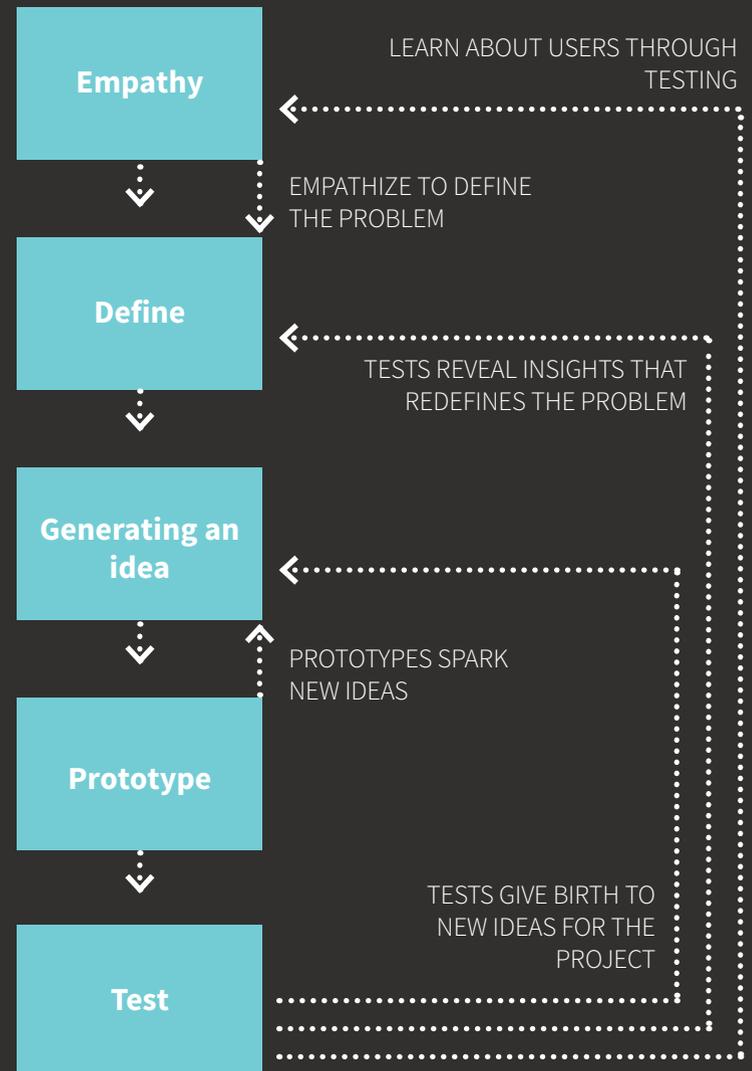
tomers.

Design Thinking:

> It is a human-centered methodology: In contrast to the product-oriented approach, design thinking methodology focuses on people and produces solutions within this framework.

> It is based on insights: It is developed on the basis of the insights arising from the research conducted with the target audience rather than depending on opinions, predictions, and anticipations.

> It is based on empathy: It focuses not only on the problems and needs of the target audience but also on their emotions.

> The solution produced is visually expressed, prototyped in the first place: The "design thinking" teams can reach the best solution with minimum cost and effort through the iteratively prepared prototypes.

> It allows us to find simplicity in chaos.

> It creates real values for customers.

> It is used as a structural framework to understand and implement innovation.

> It contributes to the growth of companies.

Principles of Design Thinking

> Empathy should be developed with the owners of the problem.

> It requires a collaborative team.

> Ideas should be given a positive response.

> Progress is made by putting on it; it is iterative.

> There must be at peace with constraints.

> Taking action is more effective than words.

> It requires thinking outside the box.

Creativity and Thinking Outside The Box

Thinking outside the box is at the center of design thinking. The best way to bring out creativity is to discover how the interaction of art, design and technology can help you solve problems and inspire you for the creative solutions that your customers want. Thinking like an artist is the most effective way to reveal creativity in design thinking. To think like an artist;

> Express problems in different statements to produce new perspectives.

> Gather information, gain in-depth knowledge to solve complexity, to make sense and to distinguish emerging features/patterns.

> Find relationships between ideas and events that don't seem to be related.

> Ask open-ended questions.

> Use your imagination to produce ideas.

> Push the limits of your potential.

> Get used to working with constraints.

> Use all your senses to reveal insights.

> Activate the vision, put flesh on the bones with the practice.

For years, design has been seen as the work of designers. With the introduction of design thinking into the business world, it is high time first to identify the problem and then design the solution process together.

LEARNING AGILITY

Seniha Koçyiğit

Softtech, Deputy General Manager

Biography

Seniha Koçyiğit graduated from METU Department of Psychology (Major) and Education Units (Minor). She completed her masters degree in the Department of Business Administration at Marmara University in the field of Strategic Human Resources Management. She began her professional career in the human resources field in the banking sector and later worked at Garanti Technology. Subsequently, she served as Deputy General Manager in charge of both Human Resources and Strategic Planning and Operations at Metglobal Group, and most recently as Board Member. Koçyigit started to work in coaching in 2012 and in the same year completed the coaching training of EGCP (EurAsian Gestalt Coaching Program) which is one of the coaching schools accredited by ICF (International Coaching Federation). Most recently, she is the Deputy General Manager of Softtech. She currently serves as Assistant General Manager responsible for Product Development, Strategy and Human Resources at Softtech.

Future of Technology, Business and Labor

Technologies that accelerate the development of automation such as Robotics and Artificial Intelligence, offer features such as high efficiency, safety and ease in business processes; however at the same time these technologies also have a broad impact on skills and wages in the business processes of the modern world. Today, it is on the agenda to automate many activities of employees and to manage or transform them through automatic processes. Career companies like Linkedin and Monster digitize and transform the job search processes of employees. In addition, the number of independent employees who do not work under an institution increases day by day. Companies such as Uber, Upwork and Etsy challenge the traditional way of doing business and play a leader role in the implementation of new business models. All these developments in business models and in the way of doing business, which accelerates the change in technolog, transform and will continue to transform the existing employee and employer relationship.

On the way to the future of the business, we can talk about three main dimensions that are mainly affected.

Work	Workface	Workplace

Changes in the future of work, work itself, workforce, and workplace.

Workface

2- Who can do the work?

With new talent platforms and contracts , who can do it? How do we use the continuity of talents from full-time employees to managed services, freelancers, employees and all the crowd?

3- Physical distance

1- Automation level

2 - Talent category
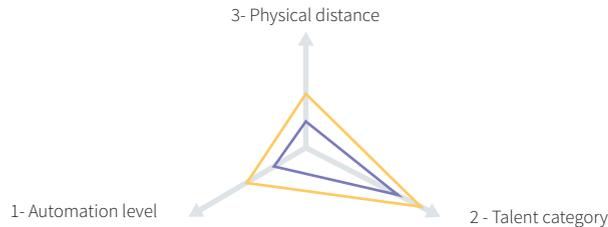
Work

1- Which jobs can be automated ?

What can be done with the increasing robotics, cognitive, artificial intelligence technologies and intelligent machines?

Workplace

3- Where is the work done?

How do the workplaces and work applications reshape where and how work is done through the combination of new collaborators, team work and digital reality technologies?

— Available work options   — Future work options

Source Deloitte analysis

Imagine: Imagine the possibilities of the future using insights that define your strategy for transforming the workforce into the future. Set goals by adding value and meaning to cost and efficiency.

Build: Analyze and redesign your work, workforce and workplace options using the value of automation.

Activate: To adapt to new working methods by developing skills appropriate for next generation experiences; review organization, leadership and workforce development programs.

Workplaces are also changing

Partner   Scattered

Physical proximity

Physical-to-physical interactions

Physical-to-virtual interactions

Virtual-to-virtual interactions

Source Deloitte analysis

In this transformation process; businesses will need to show ways to the customers and employees to create value and meaning to use these trends. To be successful at this point; we have to redefine jobs, workforce and workplace. In doing so, there are three main factors to consider:

This transformation process will also require us to review our talent management processes. While working to attract, develop and retain talents; we anticipate that this process will evolve as follows with alternative working arrangements that will emerge in the future.

A new model for talent management
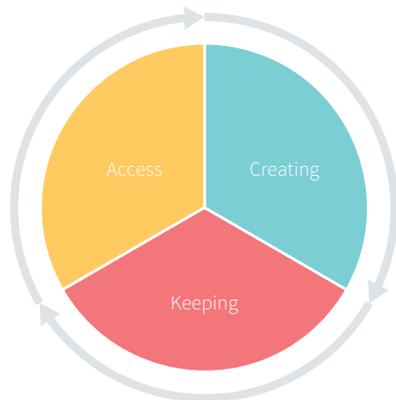
Source Deloitte analysis

Problems of the Transforming Labor Force

> Labor markets are under pressure and human resources and talents cannot be used effectively.

> Stagnant or declining household income in developed economies is fueling public discontent.

> For many people, the mismatch between skills, work and location limits income-generating opportunities.

> Cross-border migration movements can provide opportunities to fill some skills gaps. However, these movements can also create social tensions.

> Many activities carried out by employees today have the potential to be automated.

> Digitalized talent platforms can provide strong matches between employees and jobs.

> Developing technology creates new business and income opportunities.

> Globally, we live in a period in which the opportunities brought about by the digitalization of the economy have started to be captured by sector and by companies.

> 50% of the population of the world, defined as offline population, limits the potential to utilize digital resources.

And Suggested Solution Areas

The compulsory change brought about by digital technologies can present significant challenges for both politicians, business leaders and employees. There are several solution areas for all these problems:

Developing new education systems for a changing workplace: Politicians working with education providers (traditional and non-traditional) can do more to develop basic STEM skills in school systems and bring critical and systematic thinking skills to the forefront as well as creativity.

Adopting a role in which the private sector leads training: Firms can identify the skill sets required for the effective use of technology and play a more active role in education and training to meet these skills.

Creating incentives to treat and invest in human resources like other capital areas: Politicians can encourage companies to invest in human capital through tax advantages and other incentives.

Building partnerships between the public and the private sector for the creation of digital infrastructures: Lack of digital infrastructure prevents digital benefits for some emerging economies; public-private partnerships to be established can help to eliminate market failures.

Revenue adjustment: If automation (full or partial) leads to a significant reduction in employment and/ or further pressure on wages; some ideas such as universal basic income, conditional transfers and adapted social security networks, can be considered and tested by making new arrangements in this area.

Reorganizing safety nets: As high rates of change occur between business, sectors, locations, activities and skill requirements, new approaches to safety nets can be evaluated and adopted.

Using effective technology solutions: The technology based solutions can be used for effective interaction of skills and capabilities required for the labor market. Politicians can address issues such as the benefits and variability that digital platforms can bring to meet business skill needs.

Accelerating business opportunities in businesses, creating digital business opportunities: Creation of new traditional and digital job descriptions can be accelerated to generate revenue, including new forms of entrepreneurship.

Gaining an innovation perspective for human and machine interaction: Investments can be made in solutions that increase the productivity of interaction between man and machine but also will bring different and often higher skills and new technology interfaces into use.

Making room for creative solutions: Innovative advantages of technology that are effective can be applied to create economic growth, development and demand.

Quote

"The workforce is changing dramatically."

Rick Jensen
Chief Talent Officer at Intuit

In this process, while both the workforce and the business world expect such a change, when we look at what new factors will support the adaptation of the workforce to new periods; First of all, we see how important the concept of Curiosity gene and Curiosity intelligence is. Parallel to this concept, Learning Agility is an important skill that is needed more than ever in the competence based Human Resources world.

In fact, while the VUCA, which first emerged from the US military to describe the increasingly complex situation of the world in the 1990s-volatility, uncertainty, complexity and ambiguity in English-has become a familiar concept for all of us, Learning Agility is creating an increasingly important need to flow towards and within.

While the jobs we do and the new roles of the future bring different needs to our agenda, it is important for individuals to adapt and prepare for these needs.

In order to manage VUCA correctly; we need to be adaptive to events in the changing world conditions. What should be done in areas that we cannot intervene; In this intense change process it is needed to adapt to the new conditions required by the situation, to take the right risks, to be flexible to take the right steps and to continue on the road without giving up.

With this new age; durability, flexibility, resilience, well-being, agility concepts occur. These concepts are among the new key concepts of the business world.

Today and in the near future, when we examine which competences we need to look at to tackle uncertainty, we come across the concept of Learning Agility. While this concept was firstly defined as Mental Agility, People Agility, Change Agility, Results Agility, Self - Awareness; Dr. W. Warner Burke, defines it with 9 different concepts: Flexibility, Speed, Experimenting, Performance Risk Taking, Interpersonal Risk Taking, Collaborating, Information Gathering, Feedback Seeking and Reflecting. But when we go down to the essence of the concept, what the concept addresses is the critical

Quote

"People will not only educate resources for future jobs, they will create future jobs. In this process, technology will continue to be at the heart of the future; but it will undoubtedly play a greater role in the coming years. "

Jonathan Grudin
Principal Researcher at Microsoft

importance of gaining -in the most effective and rapid manner within the framework of new dynamics- the insight of what to do in the first and new environments.

When we look at the competencies covering this concept; Mental Agility, Social Agility, Change Agility, Result Agility and Learning Agility come to the fore. The important thing is that we manage the integration of these concepts with culture.

Knowing what to do when you don't know what to do

The critical point here is how we adapt our past learning to new and different situations and expand our learning.

Learning Agility

Learning agility measures an individual's ability to learn.

Mental Agility

Critical thinking, different perspective to problems, coping with uncertainty and complexity

Change Agility

Being curious and creative, being open to trying new ideas, being able to cope with change in an effective way.

Human Agility

To establish a relationship and deal with people of different characteristics, to manage people in a constructive way.

Personal Awareness

Conclusion Agility

Being result-oriented and often showing a sense of urgency, impulse, passion and a strong commitment to achieving individual and team goals

For this, we can become agile learning professors by respecting differences, valuing different perspectives and knowledge in each individual, encompassing new and unusual views, strengthening the focus of results and the muscle of execution and of course supporting our discernment and systematic thinking skills.

This leads us to experience and to see change as an ordinary learning process.

These concepts reveal to us that the most important agenda of the new age is the learning agility. The main reason for this is the need to reposition ourselves within our current position and to strengthen our ability to create new paths and new routes while taking all possibilities into account.

On the basis of this concept lies the motto: learn, work, learn, change, forget, re-learn, work, learn, change, forget, re-learn, work… On the other hand, learning agility is seen as the definition of adapting to subjects without experience and showing high performance in uncertainty.

The critical point here is the correct specification of the essence without drowning in the concepts. While talking about speed, agility it is critical that we look at their adaptation to our existing cultures without losing focus. In other words, the most important feature of adapting in today's world is to forget and re-learn.

Another reason why the concept of learning is gaining importance nowadays is that the skills that we encounter with technology are changing in the new age. The skills required for the future workfor-

ce are elements that cannot be easily automated. Critical thinking skills, complex problem solving, design thinking, creativity and innovation, emotional intelligence and much more are some of the new skills we need to stay relevant.

With the VUCA era, we will begin to feel more and more about the technological developments that will affect the business world and the digitalization that develops in the future. In this era, in which we experienced great changes and transformations, we will be confronted with a fast automation and technology network with industrial 4.0. As we mentioned before; mechanization, artificial intelligence, digitalization will gradually free us from routine operational tasks in our daily lives and we will need to prepare ourselves for new and different business areas that will emerge and make necessary investments to prepare our valuable resources for these new needs. However, although we care and prioritize these investments, we consciously acknowledge that such preparations will never end and therefore new roles and labor needs that cannot be anticipated can emerge at any time. It will be more important than ever to carry the intellectual capital -which is the most valuable resource of yesterday, today and tomorrow- to the maturity level that includes the intelligent labor models that are open to experience, nurtured by broad perspectives, and that will lead themselves to upskill-reskill sets with their self-awareness for the new-era needs. In the new period, which will require in-depth analysis, more scientific human resources and general management research with a high-quality focus, it is very valuable to experience the migration of human potential to different dimensions.

Statistics

If each country matches the fastest-growing neighbors' progress towards gender parity, global GDP may rise to $ 12 trillion in 2025.

Learning Agility

2025 Global GDP% increased
by the usual business scenario

Incremental GDP, trillion $

Region	GDP%	Incremental GDP
India	16%	0.7
Latin America	14%	1.1
China	12%	2.5
Sub-Saharan Africa	12%	0.3
North America and Oceania	11%	3.1
The World	11%	11.8
Middle East and North Africa	11%	0.6
South Asia (except India)	11%	0.1
Western Europe	9%	2.1
Eastern Europe and Middle Asia	9%	0.4
East and Southeast Asia (Except China)	8%	0.9
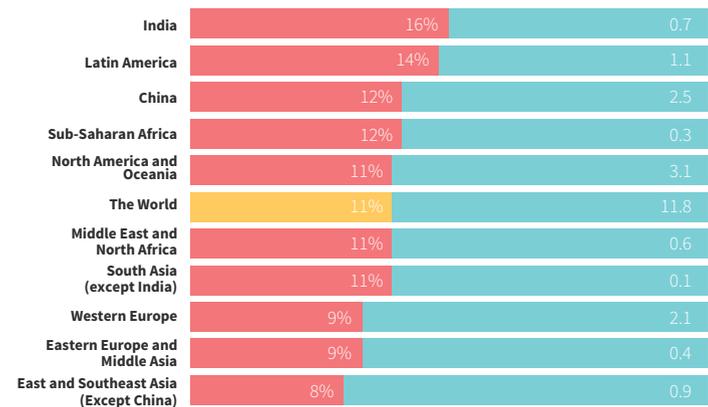
Source Source IHS; ILO; Oxford Economics; World Input-Output Database; national statistical agencies; McKinsey Global Growth Model; McKinsey Global Institute analysis

In the next decade, while employment, health, and STEM professions have grown rapidly, jobs in support, catering, and manufacturing-production may fall.

	Employment growth in 2017-30 the midpoint automation scenario, % of 2017 employment	Employment in 2017, millions
Health care professionals	48%	6.1
STEM specialists	37%	7.0
Health aids, technicians and health	30%	11.9
Creators and art management	21%	2.8
Business / legal experts	20%	14.1
Managers	18%	8.7
Education and labor training	18%	10.2
Customer service and sales	10%	16.5
Property maintenance and agriculture	9%	7.0
Constructors	6%	6.9
Transportation Services	3%	5.3
Mechanical installation and repair	-3%	6.1
Community services	-4%	6.8
Production and machine operations	-5%	12.9
Catering	-5%	14.1
Office support	-11%	20.7

Quote

"We don't know what the world will look like in 10 years. The best focus for people is to make the transitions as effective and painless as possible, as opposed to worrying about what the end is."

Michael Spence
Nobel Prize Winner Economist

ENTREPRENEURSHIP AND ECOSYSTEM

Yalçın Sezen

Türkiye İş Bankası, Deputy General Manager

Biography

Yalçın Sezen was born in İzmir in 1965. He is a graduate of Middle East Technical University, Faculty of Economics and Administrative Sciences. In 1987, he started his professional life at Türkiye İş Bankası A.Ş. at the Board of Inspectors and after serving in managerial positions in various departments of İş Bankası since 1998, on 13 April, 2011, he was promoted to Deputy General Manager. Yalçın Sezen is responsible for Retail Banking Business Units. He is married, and has two children.

The Role of Banks in the Entrepreneurship Ecosystem

Entrepreneurship, and especially technology initiatives, have been on the agenda since the early 2000s. The dreams of starting out in small dorm rooms or garages of homes and turning into a billion-dollar company attract many talented and creative people to this area. The most important factor that ensures continuity of interest and growth is digital transformation.

Digital transformation, which started in the early 1990s, when computers became capable of doing most of the routine work and creating value for companies; has accelerated with the development and use of internet infrastructure. The rapid and inexpensive development of new technologies, the fact that mobile telephones became part of daily life, the ability to collect big data and extract insight through processing, all together started a new era in human history since the mid-2000s. Digital transformation has made it possible for an initiative, which sees a need that has not yet been met in any subject or a current disruption and focuses on this field with all its resources, to reach customers and grow by developing products much faster and at a lower cost than before. Thus, in all sectors, new actors and new ways of doing business with digital business models, which are involved in the competition for interest and wallet shares of individuals, are created and have increased their effectiveness at a remarkable pace.

Banking has become one of the areas that these new players are most interested in. The fintechs focusing on the innovative delivery of financial services using technology began to stand out as an alternative to banks in 2009 and beyond particularly in the US and Europe, with their easy interfaces, low fees and user experience-oriented approaches.

After Fintechs started to gain customers and high investments, the discussions about how strong competition they are against banks have intensified. At this point, the idea that prevailed is that the collaborations of corporations and fintechs are the best approach for both parties and their customers. Brett King, in his book Bank 4.0 titled "Banking Everywhere", emphasizes that the importance of experience is much higher than the channels and products, and that every action and service to be provided to the customer should be within the context of contextualization and personalization. Today, banks and fintechs are able to combine their strengths and provide their customers with personal and contextual experiences; new business models such as platforms and banking-as-a-service are evolving.

When the sense of "trust" feeling, expert knowledge especially of the complex products, physical contact points that can be reached at the time of need and corporate competencies such as risk management that banks offer to their customers is combined with the rapid mobility of fintechs resulting from the technological competencies and their small natures, it makes it easier for individuals to quickly launch new value suggestions for the market.

Technology is also making it possible to establish collaborations quickly and easily. Through APIs that enable different systems to communicate with each other, Fintechs can enable the customers to have access to the financial services offered by banks from their own contact points, while banks can enrich their digital channels with the value recommendations offered by fintechs. As İş Bankası, we have been investing in this field since 2017, when we launched our first API. Through our API portal, which we opened in 2018, today we offer our 32 APIs not only to fintechs but also to companies and developers from all sectors.

In addition to technology, critical developments in the field of regulation continue at full speed. With the "open banking" approach which is in line with the concept of banking everywhere, the regulatory authorities aim to harmonize the legal infrastructure with the digital world so that individuals can receive personal services at the most convenient time for them. The European Union Payment Services Directive known as PSD2 and the Open Banking regulations in the UK require that financial institutions' product and service infrastructures to be shared with other institutions and in particular enterprises. With the Law No. 6493 of, "Payment and Securities Settlement Systems, Payment Services and Electronic Money Institutions" enacted on 22.11.2019 in our country, open banking regulations were put into practice. Likewise, we see that regulations enabling remote customer acquisition have been implemented in many countries or that it is been worked on to get into action soon.

It is not difficult to foresee that the rapid transformation in the banking sector that we have seen in the last 10 years will continue in the coming years. In order to keep up with this speed, the banks which are the big and old institutions of the sector, need to give more importance to innovation and entrepreneurship than ever before. It is an inevitable necessity for traditional institutions that were not born in the Digital Age and that need to complete digital transformation to realize this process by establishing their "two-handed" organizational structures. In other words, in doing our usual work we must be able to transform the current while keeping up with the new ways of doing business required by the digital world and on the other hand, we must be able to build the future by anticipating trends. As İş Bankası, we believe in what we will become in the future and what legacy we will leave to future generations, and we are moving forward by bringing together the relevant points. While working with initiatives in this process accelerates both parties, we can say that with the new products the financial services sector will grow by creating value for the entire ecosystem.

As İş Bankası, we have been actively involved in the entrepreneurship eco-system of our country since 2016. To this date, we have carried out collaborations, campaigns and conceptualization studies with many initiatives. We cooperated extensively with initiatives in our most important product and service designs. In order to support initiatives that we believe can create synergy with İş Bankası in this field, we established Maxis, our corporate venture capital company, and became the main investor in the Innovative Venture Capital Mutual Fund, and made our first investments in 2019. With the Workup Entrepreneurship Program, of which we are the main supporters, we have made solid contributions to the development and scaling of enterprises that can benefit our country's economy.

Through Maxitech and the Softtech China Shanghai office under SoftTech, which we established in Silicon Valley, we also take advantage of opportunities for cooperation by monitoring developments in the world's most important entrepreneurial ecosystem on the spot.

On the one hand, we have added the culture we learned with these steps to the great transformation within our institution. With the agile work model, we continue to change our way of doing business in strategic areas. We also deepen our work in areas such as artificial intelligence, machine learning, robotic technologies, and blockchain every day. With these technologies, we carry out our activities with a focus on constantly increasing our service quality and continuously improving the customer experience.

As a banking platform, our aim is to provide a lean and integrated experience to our customers in line with their life cycle, needs, and expectations. This institution, which was established with an entrepreneurial spirit, will be one of the most important focus for us in 2020 as it was in the previous years.

Bank 4.0, Banking Everywhere Never At a Bank, Wiley Publishing, 2018

The Ambidextrous CEO article: https://hbr.org/2011/06/the-ambidextrous-ceo

ANGEL INVESTING

Ömer Erkmen

Angel Investor and Entrepreneur Mentor

Biography

Ömer Erkmen was graduated from Istanbul Technical University in 1979 and from the UCSB Computer Sciences masters program in 1984. After his corporate business life as a CRM educator and advisor for Microsoft, he transferred to Mekanik as Board Member. With the acquisition of the company by Zomato in 2015, he started to take a more active role in entrepreneurship and investment fields. As a founder, mentor and investor, he has been involved in many projects and is currently working constantly on entrepreneurship. Initiatives he was included: Scorp, Flightrecorder, Ideasoft, Blesh, Temizlikyolda, Bionluk, Kolay Randevu, Connected2me, Erasmusinn, and English Ninjas.

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Angel Investing and Angel Investors in Turkey

I do not know who said "I am an angel" first in our country? I mean, as in I'm an angel investor! Regardless of who says that, even if you count from the right or left, we are talking about a FEW HUNDRED people in total.

However;

According to the data compiled from the Banking Regulation and Supervision Agency (BRSA), the total number of millionaires resident in Turkey and abroad increased to 20.176 at the end of June 2019."

Translation: These TWO HUNDRED THOUSAND people have an average of 6 Million TL cash bank account.

The person who transfers his/her own money (cash, TL in the bank or possibly foreign exchange J) to the next generation ventures by his/her own decision!

What is his/her expectation and what does he/she get in return?

Expectation is to take several (3-5) times more of what he/she invested, in 3-5 years. The entrepreneur also promises to give shares in exchange for money.

In the case of minority shares, in other words, a few percents; the investment amount is typically 25-50 thousand TL. This is called the minimum investment amount (ticket size). Since this amount is small, usually a few angels enter the Round of Investment (investment made in a certain period with a certain company valuation).

This investment, typically called seed investment, amounts to several hundred thousand TL and the valuation is determined to be several million TL. Although the concepts of seed and pre-seed investment are a little mixed up, this usually comes into play as the first investment and there are approximately 10% of investor shares in the company.

If the Company is not incorporated, investments and shares are transferred after it is converted to Inc., or if the company does not exists after the establishment of a new Inc. company.

Angels are not limited to seed or pre-seed investments, of course, they can also invest in more advanced ventures as a group or with Venture Capital Mutual Funds (VCs).

In order to act together, there are angels who set up Angel Investment Networks and carry out their investment processes as well as angels who act individually and even are VC managers themselves, investing in their own names. These processes can be summarized as finding startups, evaluating, investing, and following up.

Entrepreneurship, using a new generation of technology, is an easy-to-try, "popular" topic! For many reasons, most of these attempts fail. As a matter of fact, I think the ease of experimentation explains the high quantity of this number. The number of successful investments does not increase over time, but since the number of people trying it increases, the failure rate is also increasing.

This ratio is important for angel investors because, unlike traditional ventures, the failure probability of the new generation increases, but if they succeed, then the returns are not by % but by multiplier. Instead of 10 to 15% annual interest or profit rate, they can get back 3-5 times and sometimes 20-30 times in 3-5 years. Therefore angel investors prefer investing in 10-20 projects instead of investing in 1 to 2 projects and waiting.

With the Individual Participation Capital system, people who have an annual income of 200.000 TL or who have 1 million TL in cash, can be an Individual Participation Investor (IPI). Individuals who became IPI can benefit from tax advantages as well as taking role in emerging crowdfundings as "qualified investor". In short, we can say that IPI= "official angel investor ".

This is not obligatory and not so common in Turkey. At the beginning of the article, I shared the BRSA data to draw attention that all millionaires in Turkey can potentially become angel investors (IPI in an official sense). The law-making, this definition was published in 2013, and since then there are 476 IPIs, and you can see in the Ministry of Treasury and Finance Progress Report that they have invested in 35 projects in the first quarter of 2019 for a total of approximately 12 million TL.

My view is that the issue is not the lack of investor or investment, but the lack of mentality, knowledge, and skills. I think and hope that this deficiency will be reduced with the efforts of those who have the appropriate mentality, knowledge, and skills rather than the efforts of the State or large institutions.

CONTRACT BASED INVESTMENT

Assoc. Dr. İlhan Yılmaz

Galatasaray University, Faculty Member

Biography

He is specialized in international private law and works as a faculty member in the Faculty of Law at Galatasaray University. He teaches international private law, international investment law, international commercial arbitration and international investment arbitration at undergraduate, graduate and doctorate levels. Since 2004, he has been supporting many ventures by providing consultancy and supporting as an angel investor within the entrepreneurship ecosystem.

CONTRACT BASED INVESTMENT

A Method for Financing Beginning / Early Stage Ventures: SAFE

In order for an adventure that begins with an entrepreneur and his/her idea to become a venture, other instruments are needed. Undoubtedly, among these other instruments, the most important thing to move the venture from the early stages to the desired or targeted advanced stages from the start-up is money and funding.

In Silicon Valley on the west coast of the United States, where the first codes of the entrepreneurial world are said to have been written, there are various methods used for the money or funding that is vital for a venture. Of course, it should be noted that these methods are not specific to Silicon Valley or the United States. They

are used in the same or similar way anywhere in the world. While some of these methods are, the financing of a venture or investment, which we can call conventional or classic, some others are specific to or- more accurate to say- originated from to the Silicon Valley. For example like the subject of this article; SAFE.

Before moving to SAFE, it is worthy to remember briefly the methods of financing a venture. The first thing that comes to mind is the entrepreneur financing the venture with his/her own resources. Here, the entrepreneur finances his/her venture by spending on personal savings, even on credit cards and/or by receiving money from a close relative or friend. In this self-financing model called bootstrapping, the entrepreneur at least in the early stages, aims to raise his/her venture's value to high amounts by financing it without turning to any other financing model, developing his/her product, launching it to the market and not giving any shares to investors during this period. However, apart from its bene-

fits, there are some drawbacks to this method. Depending on the entrepreneur's equity, funding may decrease or end at the most critical stage. Financing stress can jeopardize the venture if the production phase is long or does not result in immediate income generation. Failure to divide the risk can also be recorded as a separate drawback.

A traditional method is the financing of the venture with classical bank loans or credits. As mentioned above, it can be considered as an added value in this process to have the venture fully owned by the entrepreneur, without any dilution. However, in this model, interest payments, repayments determined with definite dates and the collaterals that can be requested by banks to obtain the related credit, may all appear as disadvantages for the entrepreneur.

Another model is capital financing, also called as the "Equity Financing", and in this model, the transaction is more direct. In the early stage, funding providers- generally Angel Investors, Venture Capital, and Private Equity Funds- have agreed to invest the agreed capital in the venture or the company in exchange for a certain percentage of shares. However, in addition to selling a simple share, this share transfer also means the transfer of certain control rights and a higher share of the company by the entrepreneur since he/she is still in charge. In this way, the shares of the entrepreneur in the venture in the early stage will be decreased with the investment and mostly at a noticeable rate. This may be costly for the entrepreneur and may even discourage him/ her.

Although not common, especially where the venture has the potential to generate income and profits in a short period of time, the concept of Revenue/ Profit Share Financing may also be mentioned.

Crowd Financing, which has been on the agenda of venture finance in recent years, is another method. In particular, this method is able to carry out market testing for the product as well as finance the commercialization of the product in question. This model is implemented in two ways: Rewards-Based and Equity-Based. In the reward-based model, the target of the product is provided by purchasing incentives to the consumers without any capital or share exchange. At the same time, a potential crowd for the product is created and brand awareness for the product can also be achieved. In this method, the cost for commercialization of the product is thus funded by potential consumers through incentives or rewards (such as two for one campaigns). In equity-based crowd financing, again, mostly potential consumers or small investors buy the shares of the venture/ company in relatively small numbers that does not exceed the specified figure. Equity-based crowd financing requires more bureaucracy and legal preparation than the other. Because in equity-based financing regulatory institutions such as the capital markets of the respective economies are also involved. Thus, the transaction becomes more complex and high legal and regulatory costs may be incurred. In addition, the funds collected in both methods may not cover the costs of commercializing the product. Thus, in addition to not reaching the goals as a result of a long-term or expensive campaign, existing resources can also be wasted. It must be noted finally about crow-

dfunding/ financing that, with the "Share-Based Crowd Funding Notification" of the Capital Markets Board, published on October 3, 2019, on the Official Gazette of Turkey, this method may be available to entrepreneurs in Turkey. Since the legislation is only one week old as of the date of this article, it will not be possible to comment on its implementation capacity. As it can be understood from the name of the Notification, it requires only an equity-based

or share-based crowdfunding. In the notification, the principles regarding the platforms that will make the financing, the principles related to the activities of these platforms, the platform membership and campaign process of the people who will invest through crowd financing and the principles regarding the use of the fund and the fund to be collected and the venture companies are all arranged in detail. When we look at the notification in general, we can say that compared to some other financing models, it may impose an additional burden on an entrepreneur at the beginning

or early stages. As a matter of fact, we have stated that this financing model also has a disadvantage.

In order to approach the subject of our article, a financing model that is frequently used by angel investors in initial / early-stage investments in finance can be converted into a share called "Convertible Financing". In this method, the entrepreneur can find capital quickly. At this stage, long negotiations on the value of the initiative are unnecessary. Because as there is no actual direct sale or partnership at this stage, many savings are achieved on transactions, time and legal costs. In this method, there are two different

models: Debt Financing and Equity Financing. In the convertible debt model, entrepreneur gives investors a debt bill in return for the money they will invest in the company. In this debt bill, if the related debt amount will be invested to the company by the investors in the next investment round, it gives the right to convert the debt to shares with the same share price determined for the next

investment round (generally with a discount) and with the same economic and control rights. In this model, interest and maturity are foreseen in favor of the investor. Thus, if the entrepreneur does not receive a new investment within the determined period, the investor shall be entitled to demand the relevant debt together with the interest. As a result, if there is no new investment round, the entrepreneur may either extend the maturity of the deed under more unfavorable terms or may be forced by the investor to liquidate the company.

However, it is often used as an advantageous model for the entrepreneur. Because, in this system, financing can be rapidly provided especially by angel investors. On the other hand, the entrepreneur is prevented from losing control of the company at an early stage, and the decrease in shares is also postponed. In addition, since there is no agreement and long-term negotiations on the valuation of the company in this system, there will be less documentation and legal costs. Because in convertible financing, the valuation of the company is left to the next round of investment. Thus, in the first stage, with the valuation of the investors who invest in this way and the investors in the next round, a wide-based valuation investor group is formed. In this way, other investors' valuation ideas about investment are also important. It is a certain fact that the biggest factor in the investor's view of an early-stage venture is closely related to what other investors think about that venture. The right of the first investor to convert the share with a discount in line with the valuation in the next round of investment will reveal different stock valuation for different investors. Of course, this result can be explained by the difference between initially receiving

more risk and then coming to help. This is called "High Resolution Fundraising" by Paul Graham, co-founder of Y-Combinator.

In the equity version, not in debt, there will be no maturity and interest. When we look at it, we can say that debt financing contains more provisions in favor of investors. In both versions, in the next investment round which is the time of conversion to share, each per-share value to be paid by the investor holding the convertible note may be discounted at a rate (eg. 20%) determined in the document according to the share price that the investor will pay in return for the investment. The main idea is to provide more rewards to the investor who invested early and at the same time took more risk.

Y-Combinator was established in 2005 in Silicon Valley and is a start-up accelerator center for early-stage ventures. The company makes the earliest venture capital or seed funding for start-ups. With this, however, the company is not only a company investing money or a venture capital company. In their own words, they define themselves as "more than money". They make small investments in return for small shares in the start-up companies they fund and provide all other support in making them reach a level where more funding than the initial stage is achieved. It helps start-up entrepreneurs on two main levels. The first is to work with entrepreneurs on their ideas, and the second is to give the entrepreneurs the necessary assistance in their dealings with investors or potential company buyers. The format is to invest a small amount ($ 150,000) in a large number of initial ventures selected twice a year for quarterly periods. During this three-month period, Y-Com-

binator asks the entrepreneurs to move to Silicon Valley. Since its foundation, the Y-Combinator has funded over 2000 startup ventures. It is stated that the value of venture companies funded in this way exceeds USD 100 billion.

Y-Combinator, which enables entrepreneurs to fund their ideas by making their first funding, also prepares these ventures for future investment tours. Having invested in thousands of start-up companies in this way, Y-Combinator introduced a financing instrument, called SAFE in 2013, to be used in making this investment. SAFE stands for "Simple Agreement for Future Equity. And it also makes sense considering the meaning of the term: "safe". The concept aims to make the first seed investment to be taken by the start-up companies both "simple" and "safe" for both the entrepreneur and the investor and while doing this it also makes a nice wordplay.

SAFE is not a bill payable or debt agreement. The investor receives the company's share at a later date in return for the money he/she puts into the company. In this respect, the obligatory has been developed as an alternative to convertible financing. It protects the interests of both the entrepreneurial companies and the investors. Other debt instruments, as mentioned above, can have many negative consequences. However, SAFE aims to be simple for both investors and entrepreneurs. The only clause to be negotiated by the parties during the investment is the valuation cap. With the standard SAFE text prepared in this way, accuracy and speed advantages can be obtained. Therefore, for start-up companies and investors, the cost of this investment transaction will be almost zero. Unlike conventionally priced investment rounds, there are not many documents and numerous provisions that require negotiation. A single, short and simple document is quickly understood and the investment/financing is achieved by the company. The SAFE contractual texts are available in various versions on the Y-Combinator website as open source. The related document can be downloaded, the values specific to the investment can be entered and completed with dates and signatures.

The document presented as a standard SAFE agreement or document is an agreement between the entrepreneur and the investor, and is about the amount of investment to be done by the investor in the entrepreneur's company. Subsequently, no definite price is determined for the investor's share of the company in exchange for this investment. The value of the shares will be determined according to the value determined in the first equity financing/ investment after SAFE, and the SAFE equivalent amount will be converted to shares in this equity financing round. During the SAFE signature phase, the entrepreneur and the investor will also agree on a maximum valuation cap that the venture/ company can reach in the relevant equity financing. In the standard SAFE, there is no determination of the lower limit of the subsequent investment amount. In other words, regardless of the amount to be invested in the next investment round, the SAFE amount will be converted to a share with the value of the company in that round. If the pre-money value of the company is lower than the valuation cap specified in SAFE, the conversion to share will be made over that valuation. But if the value of the company in this investment round is higher than the valuation cap, then the valuation cap will be used and the SAFE amount will be converted to shares through this valuation cap. In this case, in particular, it means that the SAFE investor has received shares at a cheaper price than the investor in the next round. This is a way to reward the first or early stage risk-taker. For example, an investor buys a SAFE from the valuation cap of 5 million TL. Let's assume that the company has already agreed with the investors in a different investment round to purchasing shares with a valuation of 10 million TL before the investment. In this case, the investor holding the SAFE will pay a 50% lower price per share than the investor in the capital investment round. This is because the valuation of the SAFE owner investor will be based on the valuation cap of 5 million TL in SAFE, not 10 million.

The other possibility is that, if the pre-investment valuation figure of the company is lower than the valuation cap in SAFE in the next investment round, if there is a capital investment of 4 million TL pre-investment value as in the example, then the valuation cap

will have no effect on this transaction. The SAFE owner and the subsequent investor will have shares with the same value.

Unlike the debt-equity financing, the investor in SAFE does not have the right to reclaim the invested amount when a subsequent round of capital investment takes place. With the next investment round, the investment of the SAFE investor as described above will be converted to shares and SAFE will be terminated. This is because the aim of SAFE is to turn investors to shareholders. By the way, it is worth mentioning another difference of SAFE. There is no fixed date at SAFE. SAFE will remain valid until a capital investment or a tour of investment that will cause the SAFE owner to get the mentioned shares or his/her money; the sale of the company; or the initial public offering or liquidation of the company, whichever comes first. There is no need for, an extension or negotiation. Of course, it can be changed by the parties if necessary.

In the event that the company is acquired or merged with another company; in other words, the case of a change in the control of the company is also a reason for SAFE's conversion to shares. In one of these situations, the investor holding the SAFE may either request the conversion of SAFE from the valuation cap to shares or, depending on the valuation of the company in the relevant transaction, may choose to take back the money he/she has invested. The fact that which of these preferences is to the advantage of the SAFE owner will depend on the value of the acquisition or merger of the company. The SAFE owner's request to get the money he/she has invested, instead of conversion to shares, may occur in cases where the valuation of the company is below the valuation cap.

In the event of a public offering, the SAFE owner will either want to convert from the valuation cap to shares or request the SAFE amount back.

The basic provisions in the standard SAFE are as described above. Below, we will mention other provisions that may be included in the standard SAFE.

As a special provision frequently used, a specific discount can be applied in favor of the SAFE holder, from the amount that the new investor will pay for each share, which will be taken as the basis in conversion to shares during the subsequent round of investment. When this reduction clause is added to the standard SAFE, then there will be a SAFE with both a valuation cap and a discount rate. After the calculation is made, the SAFE investor will be able to choose between the agreed discount rate (which is around 20%) and the valuation cap, whichever gives him/her more shares.

Another possibility is that the reduction takes place but the valuation cap is removed from SAFE. In this case, instead of the valuation cap, it is agreed that the owner of the SAFE will convert to shares on a price with a discount rate (eg. 20%) determined at the per-share value of the next round of investment.

A final possibility is that the MFN provision included in SAFE, instead of the valuation cap and the discount. MFN is the abbreviation of "Most Favored Nation", which is used in international law (including commercial and investment law). The principle is to ensure that the countries that are parties to a contract in which this

provision exists, apply the same rights/ provisions to those contracting parties that include this MFN provision if they award more favorable provisions/ rights in other contracts with other countries Interestingly, this provision or clause can also be adopted in investment financing. When the MFN provision as a SAFE provision is adopted, it means that, for example, the valuation cap and/ or discount rates in the subsequent SAFEs of the company will be applied to this first SAFE. The countries will be replaced by investors, so to speak. In fact, the clause could also be referred to as the Most Favored Investor or the Most Favored Safe Investor. It should be noted, however, that when there is a round of capital investment before a new SAFE is made, since there will no longer be a new SAFE to be based on, the SAFE investor will become a shareholder at the same price as the new investor and the MFN provision will not be applicable. We must add that in the template SAFE forms, in order to protect the SAFE investor for this situation, it is stipulated that the future investment in the capital investment should be minimum 250.000 USD (Approximately 1.5 million TL) otherwise there is no obligation to convert to shares. This threshold is intended to protect the SAFE investor in an extremely low capital round with an artificially high corporate valuation.

As explained above, SAFE has been used as a de facto instrument in the financing of many startup ventures. However, the Y-Combinator changed its existing SAFE format after more than 4 years. The most important change in the new version SAFE is that the valuation cap is post-money rather than pre-money. In fact, the result will not change much if the entrepreneurial company makes only one SAFE. However, when multiple SAFEs are performed in sequence,

there will be a difference from the previous version. For example, let the company have a SAFE of 2 million TL with a pre-investment valuation cap of 8 million TL. Let the company get another 2 million TL investment in the same SAFE document a year later. At SAFE, where the pre-money valuation cap is used, the company will receive an investment of 8 million TL/ where the post-money valuation cap of 12 million TL is used it will get an investment of 4 million TL. In SAFE, which is based on the pre-money valuation cap, investors will own 33,33% of the company while the entrepreneur owns -66,66%. In the new version of SAFE, which is based on the post-money valuation cap, the investors will own 40%, while the entrepreneur owns 60% of shares, according to the 10 million post-money valuation cap for the increasing investment of 4 million. The source of the difference is that in the new version SAFE, which is based on post-money valuation, subsequent SAFE investors dilute the shares of entrepreneurs and this reduction is not valid for current or previous SAFE investors. As a result, the most important advantage of the new version SAFE over the previous one is that both entrepreneurs and investors can more precisely calculate exactly how many shares of the company have been sold. We should also add that compared to the first SAFE, the new version is more favorable because when there is more than one SAFE investment to a company, the previous SAFE investors are not subject to dilution by subsequent SAFE investors. Let us just mention the most important difference here.

In some other respects, we see that certain rights granted to capital investors or direct shareholders are also given to the SAFE investor in the new version. For example, SAFE investors are granted

the right to purchase additional shares in order to maintain their share rates in subsequent investments.

SAFE texts have been prepared as forms and are intended to advance rapidly using the various forms described above without making any changes to the text under normal circumstances. For this reason, the new version SAFE has also a provision stating that this agreement will not be modified by the parties, the S at the beginning of agreement referring to "simple". However, it should be noted here that the parties have the right to make these changes at any time within the scope of the contract. When the parties change their SAFE text using these rights, there may be a departure from the SAFE form. However, in our opinion, such investment agreements, which can be converted to shares containing the provision to leave the valuation subject- which is the most important aspect of the SAFE system- to the next capital investment round, may function as a form of SAFE in a basic and fast way. This may be as valuable as money for early-stage investments by taking the required investment and focusing on the work or product, instead of entering into valuation negotiations with investors - sometimes against the entrepreneur and others against the investor.

In conclusion, it may be possible to implement the SAFE texts in early-stage investments in Turkey. It is important to note that some of the provisions existent only in US law may need to be further revised in terms of Turkish commercial and tax law.

Basic funding methods of initial-stage startups:

> Bootstrapping
> Equity Financing
> Revenue/ Profit Share
> Crowd Funding
> Convertible Financing

ECOSYSTEM COMPARISONS

KWe believe that with globalization, the success of people and businesses is irrelevant to location thanks to the internet and hyper-mobility and we try to see the world as a big village. Yet, the truth remains the opposite. The importance of location has increased for people and businesses and even the popularization of some locations has become an unstoppable megatrend. Becoming a center of attraction especially for enterprises and technology firms has become kind of a race among countries.

Ecosystem Comparisons

Top 30 Global Startup Ecosystems

	Ranking	Change since 2017		Ranking	Change since 2017
Silicon Valley	1	0	Chicago	17	▲ 1
New York	2	0	Bangalore	18	▲ 2
London	3-4	0	Washington	19	New
Beijing		▲ 1	San Diego	20	New
Boston	5	0	Denver - Boulder	21	New
Tel Aviv	6-7	0	Lausanne-Bern Geneva	22	New
Los Angeles		▲ 3	Sydney	23	▼ -6
Shanghai	8	0	Vancouver	24	▼ -9
Paris	9	▲ 2	Hong Kong	25	New
Berlin	10	▼ -3			
Stockholm	11	▲ 3	26-30 in alphabetical order		
Seattle	12	▼ -2	Atlanta		New
Toronto - Waterloo	13	▲ 3	Barcelona		New
Singapore	14	▼ -2	Dublin	26-30	New
Amsterdam SartupDelta	15	▲ 4	Miami		New
Austin	16	▼ -3	Munich		New

Country	Order	Change since 2017	Country	Order	Change since 2017
USA	1	-	Netherlands	6	▲ +9
England	2	-	Sweden	7	▼ -1
Canada	3	-	Switzerland	8	-
Israel	4	-	Germany	9	▼ -4
Australia	5	▲ +6	Spain	10	▲ +4

City	Order	Changes On An Annual Basis	City	Order	Change since 2017
Singapore	1	-	Hong Kong	9	▲ 1
Zurich	2	-	Stockholm	10	▼ -3
Geneva	3	-	Tokio	11	▲ 5
London	4	-	Sydney	12	▲ 1
Amsterdam	5	-	Berlin	13	▼ -1
Toronto	6	-	Frankfurt	14	▼ -3
New York	7	▲ 1	Vienna	15	-
San Fransico	8	▲ 1			

Movement in the Global Innovation Index
Top 10 - 2019

	1	2	3	4	5	6	7	8	9	10
2019	CH	SE	US	NL	GB	FI	DK	SG	DE	IL
2018	CH	NL	SE	GB	SG	US	FI	DK	DE	IE
2017	CH	SE	NL	US	GB	DK	SG	FI	DE	IE
2016	CH	SE	GB	US	FI	SG	IE	DK	NL	DE
2015	CH	GB	SE	NL	US	FI	SG	IE	LU	DK

Israel is in the Top 10 for the first

Singapore is in Top 5 of the GII in 2018

The Netherlands is in the Top 3 in 2017. Sweden took the second place for the second time.

Germany is in the Top 10 again in 2016.

Switzerland ranks first at GII every year since 2011

CH-Switzerland **GB**-England **SE**-Sweden **NL**-Netherlands **US**-United States **FI**-Finland
SG-Singapore **IE**-Ireland **LU**-Luxemburg **DK**-Denmark **DE**-Germany **IL**-Israel

Source:
Global Innovation Index 2019 (WIPO, INSEAD, Cornell)
https://www.globalinnovationindex.org/gii-2019-report

THE ECOSYSTEM OF TURKEY

Key Inferences

A Quick Look at the Ecosystem

Connecting the East and the West, Turkey is a dynamic and growing G20 economy. Ongoing successful economic reforms and support programs support investment proposals, including startups.

Turkey is an attractive market for startups with its young, educated demographic and its modernizing economy supported by high internet penetration (Global ranking: In Facebook users: 9th, in Instagram users: 6th, in Twitter users: 7th, in YouTube users: 10th)

Turkey has been positioned as the international center for main sectors, which are supported by unique and strong market foundations. Currently, Turkey establishes around 550 ventures every year and is the biggest startup center in Southern Europe with its 488 million dollars worth angel and VC funding rising between 2010- 2018.

With a series of new mutual funds starting in 2019, the initial investment level is expected to reach new levels of $ 200 million annually. This has enabled startups in Turkey to be more competitive globally.

Moreover, while it lags behind Western Europe in terms of total

venture funding, Turkey showed a series of impressive output in recent years. In 2018 alone, three Turkish companies were sold, each with more than $ 250 million. And this trend continues in 2019, and in the first quarter, only two ventures were invested more than $ 100 million.
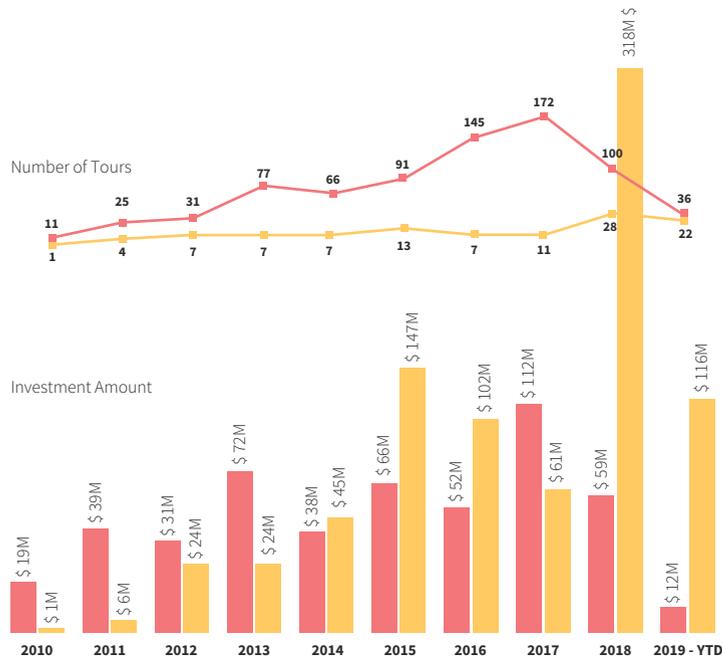
Source: The State of Turkish Startup Ecosystem
2019 - Türkiye Cumhuriyeti Yatırım Ofisi

Comparison of Eary Stage Investments Between "Ventures in Turkey" and "Turkey Diaspora"

■ Early Stage (Ventures in Turkey)
■ Early Stage (Turkey Diaspora)

Number of Tours

11   25   31   77   66   91   145   172   100   36

1   4   7   7   7   13   7   11   28   22

318M $

Investment Amount

$ 19M $ 39M $ 31M $ 72M $ 38M $ 66M $ 52M $ 112M $ 59M $ 12M

$ 1M $ 6M $ 24M $ 24M $ 45M $ 147M $ 102M $ 61M $ 116M

| 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 - YTD |

Only disclosed equity fund tours are counted.
Pre-Seed, Seed, Post-Seed, Series A, B, C, D, E are included.

Excludes Private Equity, Non-Equity, Secondary and
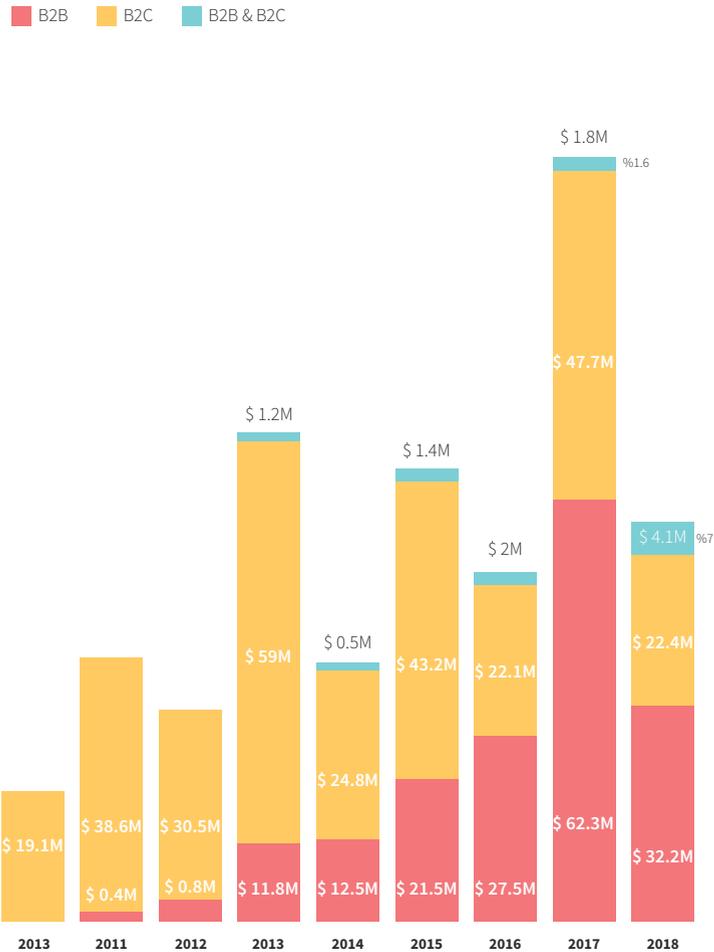Post-IPO transactions, Grants, ICOs and Convertible Debts.

The top five acquisitions between 2010-2018 in Turkey are as follows

The top five exits are as follows, considering the abroad ventures of Turkey Diaspora (ie. ventures having their sales and marketing teams abroad while software teams are based in Turkey)

01   **Trendyol**
Alibaba
$ 728M, 82%

01   **Trendyol**
Alibaba
$ 728M, 82%

02   **Yemeksepeti**
Delivery Hero
$ 589M, 100%

02   **Yemeksepeti**
Delivery Hero
$ 589M, 100%

03   **Gram Games**
Zynga
$ 259, 100%

03   **Opsgenie**
Atlassian
$ 295, 100%

04   **Gittigidiyor**
eBay
$ 218, 100%

04   **Gram Games**
Zynga
$ 259, 100%

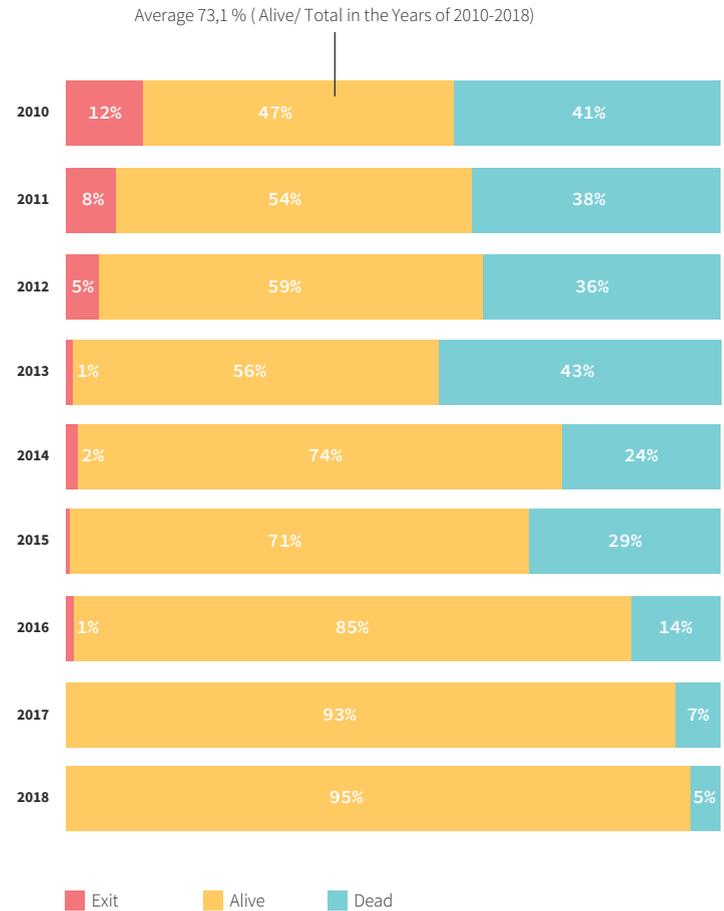**05**   **Markafoni**
Naspers
$ 203M, 100%

05   **Gittigidiyor**
eBay
$ 218, 100%

Source: *The State of Turkish Startup Ecosystem 2019*

Early Stage Investment Amounts Announced By Business Type

■ B2B ■ B2C ■ B2B & B2C
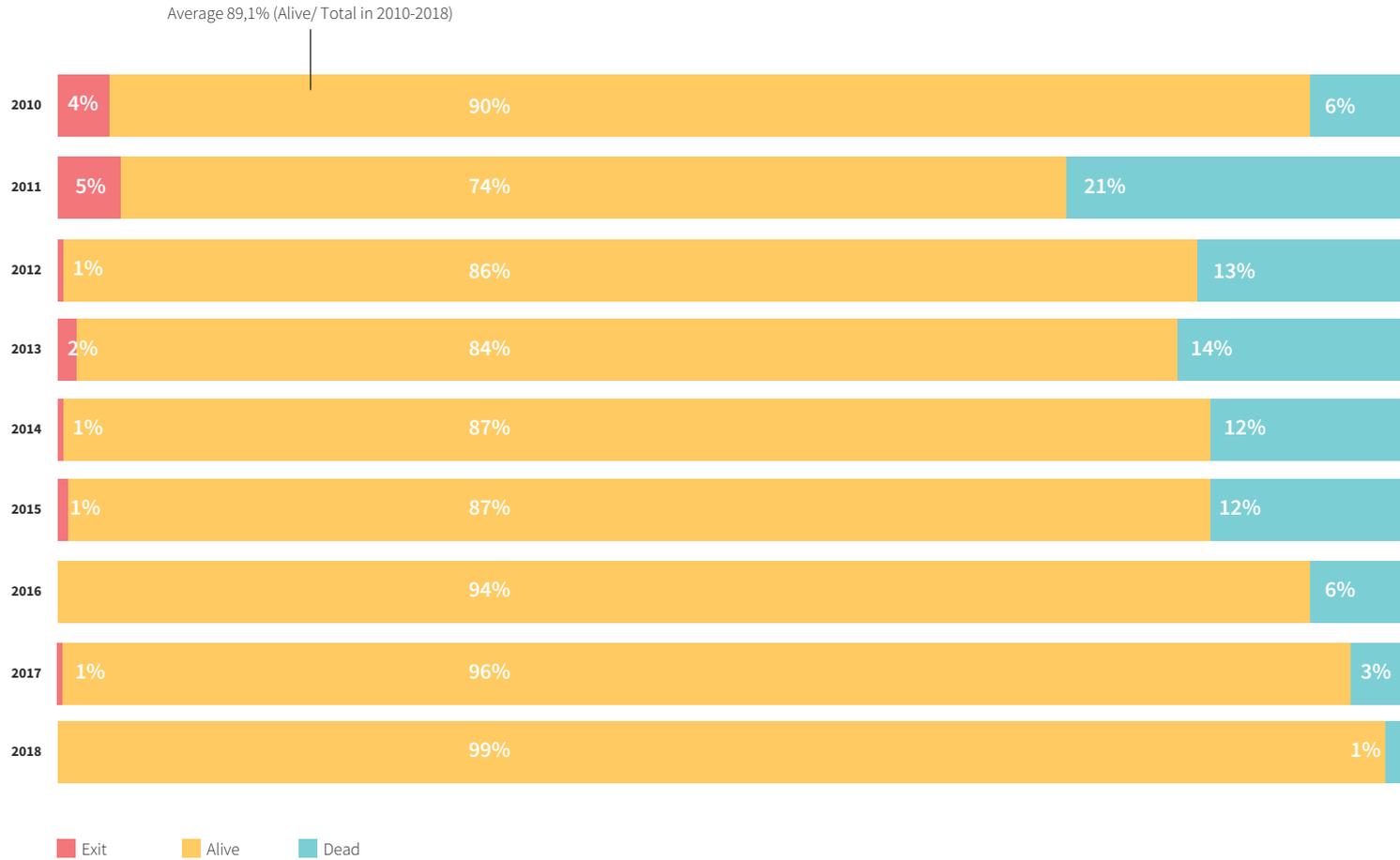

Source: *startups.watch*

Turkish B2C ventures classified by their consequences

Average 73,1 % (Alive/ Total in the Years of 2010-2018)

2010	12%	47%	41%
2011	8%	54%	38%
2012	5%	59%	36%
2013	1%	56%	43%
2014	2%	74%	24%
2015		71%	29%
2016	1%	85%	14%
2017		93%	7%
2018		95%	5%

■ Exit ■ Alive ■ Dead

How to read the graph: 47% of the B2C ventures established in 2010 is still alive.

Source: *startups.watch*

Turkish B2B ventures classified by their consequences

Average 89,1% (Alive/ Total in 2010-2018)

Year	Exit	Alive	Dead
2010	4%	90%	6%
2011	5%	74%	21%
2012	1%	86%	13%
2013	2%	84%	14%
2014	1%	87%	12%
2015	1%	87%	12%
2016		94%	6%
2017	1%	96%	3%
2018		99%	1%

■ Exit　■ Alive　■ Dead

How to read the chart: 90% of the B2B ventures established in 2010 are still alive.

Source: *startups.watch*

THE ECOSYSTEM OF THE U.S.

Burak Arık

Maxitech, CEO

Biography

Burak Arık, the General Manager of Maxitech, who played an important role in the digital formation of İş Bankası, was appointed to this position in 2016. While Maxitech, in its office in Silicon Valley at the heart of the technology, is creating cooperation opportunities for İş Bankası and Turkey's leading technology company SoftTech, it also has started to provide the corporate innovation services to Turkey's other pioneer organizations for them to stand out in global competition through innovation. Prior to his position at Maxitech, Burak Arık worked at Softtech for 10 years in many different projects of İş Bankası and has 18 years of experience in the sector. He is married and has two children.
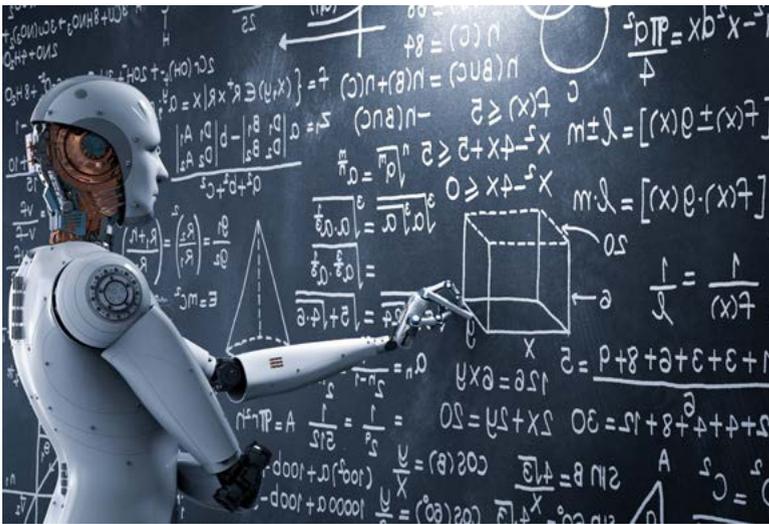
All Paths Lead to Data in 2020 and Afterwards

According to regular market surveys conducted in Silicon Valley and the US in each quarter, we have witnessed in 2019 a significant mobility especially in the areas of Artificial Intelligence, autonomous systems, and edge computing. In this article, we tried to explain how this trend affects 2020 and beyond.

Development of Artificial Intelligence and Its Impacts in the Sector

Today, artificial intelligence is a subject that almost everyone in the field of technology is familiar with and even tries to improve as much as possible. On the one hand, employees continue to worry about whether they'd be out of business in the future and on the other hand the development of technology does not slow down a bit. Nowadays, while artificial intelligence is an issue where companies establish their own teams, complete their trainings and continue their infrastructure investments, the companies who want an advantage in the competition also carry on cooperations with the ventures. Artificial intelligence applications span many different areas such as customer support, cybersecurity, payment technologies, agriculture, in-house processes, and employee pro-

ductivity. However, the acquisition of artificial intelligence competencies within the institution is a topic that requires investment and time. In order for artificial intelligence algorithms to work, there are many preliminary tasks such as collecting, transferring and cleaning the data to ensure quality. Subsequent synthesis by analysts, selecting the right models and features with data scientists so artificial intelligence can make deductions, require significant labor.

It is difficult and costly for companies to develop artificial intelligence solutions within themselves, and the number of experts in this field is very low compared to demand. Therefore, we will see more ventures in 2020 in order to meet this demand gap and offer the services of intelligent intelligence as a service to the users. On the other hand, Automated ML- AutoML- platforms will come to the fore. These platforms require less labor by making decisi-

ons such as data collection, cleaning, model and feature selection again through machine learning.In other words, systems that will make machine learning more efficient develop their engines with artificial intelligence.

This applies not only to artificial intelligence but also to software development in general. In other words, the need for software development and therefore software developers in the world is increasing day by day. Competent resources of newly trained engineers are not sufficient in response to demand. For this reason, it is an important competitive advantage for corporations to develop software much faster, more efficient and with less labor. This leads to an increase in the number of platforms we call "low-code platforms" day by day. These platforms enable faster application development than traditional software development languages.

On the other hand, we are witnessing the development of an artificial intelligence supported test tool to test these newly developed applications.

We saw the first examples of intelligent digital assistants with Amazon Alexa, Siri, and Google Assistant. Yes, digital assistants are still not perfect, but they learn very fast. With the increasing number of ventures in this field, sound technologies and natural language processing are a continuing trend. As an extension of this trend, Artificial General Intelligence (AGI), which allows artificial intelligence to perceive and respond to concepts and situations such as human intelligence as well as vertical expertise, is also another subject studied in Silicon Valley. We think that the researches on this subject will yield fruit in the year 2030 and AGI practices will enter our lives more.

Another important issue for institutions is the efficiency of processes. When a company with thousands of employees performs hundreds of thousands of operations every day, a few seconds of improvement in just one step of the process means significant cost savings in total. It is known that Business Process Management (BPM) tools have been in use for many years. However, it is not possible to develop all the processes of the company on these systems.

Companies have processes that involve many different tools that are not systematically used or that are not integrated. Especially in recent years, these have been automated with robotic process automation (RPA) tools, and they are made by means of computer

Quote

"2019 was the year of the foundation of the blockchain. I think that in 2020, blockchain projects that prioritize usage scenarios and have applications that create value for the end-user will increase."

Duygu Clark
Y-Combinator Investor

programs called "robots" instead of employees. Another trend we observed is the rise of systems capable of discovering processes that would be the subject of RPA rather than RPA itself. Because employees can spend their daily lives with unnamed streams by using many different screens/ tools that are not systematic and have no integration. So it is with the "discovery" of these flows and subsequent modeling in BPM or RPA tools, that result in huge productivity gains. The optimization of the processes running on these tools is done with tools called process mining. These tools offer opportunities for improvement by following the footsteps of processes in different systems.

Necessity of Edge Computing

One of the main sources of data is the impact of field studies. In particular, the value of the instantaneous data obtained from the machines and the meaning to be derived from this data cannot

Quote

"The world is in a new era of technology with the scaling of processor power with cloud computing, the reduction of data storage costs and the increase of data collection with the Internet of things and sensors. Organizations that collect and make sense of data will be ahead of their competitors."

Yiğit Ihlamur
Vela Partners Founder

be denied.

The instant processing of data collected from tools and devices in the field provides an incredible advantage, especially in large production facilities; however, this also requires the need for a high level of computing power. At the moment, these calculations on the cloud are both inefficient in terms of data transfer and costly, as cloud service providers often make pricing based on data transfer. In addition, positioning the processor power in the cloud level causes a critical waste of time. For example, if you detect an anomaly in the production line of a factory that produces at very high speeds, you may have produced hundreds of products incorrectly.

In order to reduce this cost and respond immediately to a possible anomaly and take precautions, the method of processing calculations and decisions in small pieces, close to the sources providing the data, and transferring only meaningful data should be preferred. This is an indication that Edge Computing technology will be more active in 2020.

We can also see another contribution of edge computing in self-driving vehicle technology. A car should be able to evaluate a situation itself through its camera, not in the cloud environment. We observed that many autonomous vehicles from drones to cars continued to develop in 2019. Tesla vehicles have become a normal sight in San Francisco, and their self-driving features are now available on highways. Maybe there are years before we can see vehicles that can go completely autonomously; however, these technologies paved the way for technologies that will touch our lives

in a shorter time. With the help of OCR based devices that measure people's attention levels, in 2019, we started to see the systems that can stop the vehicle in case of an accident that occurs when the driver does not look at the road. As traffic lights started to emit signals directly in areas such as Palo Alto, autonomous vehicles are able to access the information about when and which color would light and complete the decision-making process in less time. The autonomous robots in the restaurants have begun to carry out errands between customers and the kitchen to help waiters. In 2020, we will continue to see startups that produce these tools and technologies that provide the infrastructure, especially through Vision Technologies and Edge Computing technologies.

Useful Blockchain Applications

Blockchain is a technology that companies are trying to address a real problem with, often referred to as the infrastructure of Bitcoin and other cryptocurrencies, and has been one of the most debated subjects in recent years. Especially in 2018, the tremendous momentum that it had achieved was replaced, because of the problematic ICO examples, by a period in which more down-to-earth usage scenarios were discussed. We have seen that applications in the supply chain area have started to take investment. There was a serious potential for blockchain in the ethically challenging issues, such as the supply of diamonds and jewelery. The unchangeable structure of the Blockchain facilitated the monitoring of products in particular where the source had to be kept under control. This paved the way for its use in other enterprises requiring a supply chain.

When we examine the companies that have investments in the blockchain area, we believe that there will be improvements in scale in 2020, and more usage methods will begin to accumulate around.

The areas above are only the visible part of the iceberg. In recent years, there has been great progress in data collection and processing. As a result of the developments in technologies such as edge computing and 5G that will pave the way for data collection and the democratization of artificial intelligence, it is obvious that institutions that can collect data and make inferences by processing it correctly will gain a competitive advantage in the coming year and beyond. The next period in data processing can be Quantum Informatics. When we think that traditional computers are

working as 0 or 1 whereas quantum computers can address infinite numbers between 0 and 1, it will be possible to carry out operations (such as portfolio optimizations in finance, risk analysis, investment strategic decisions) that require processing of high volumes which could not be performed by traditional computers, at the same time. With Quantum Informatics, which is one of our active working areas as Maxitech, we will be able to see the big data being processed with quantum computers and algorithms in the next 5 years. Data and data related work are seen as the new industrial revolution. In 2020 and after, all roads will start in data and lead to data and companies that can use this data will increase & multiply their values.

THE ECOSYSTEM OF CHINA AND THE FAR EAST

Onur Yavuz

Softtech China, CEO

Biography

Onur Yavuz, who completed the Computer Engineering program at Istanbul Technical University in 2008, started to work as a software engineer at Softtech. Then, he worked as a software analyst at the same company. From 2013 to 2016, Yavuz worked as a team leader in Softtech Architecture Team. Between 2016 and 2018, he worked as a director at DevOps Team. Since 2018, Yavuz has been working as General Manager of Softtech China.

The Ecosystem of China

Before moving on to the startup ecosystem in China, it is useful to provide information about the economic situation and internet use. Economic growth in the first three quarters of 2019 has reduced to 6.2% due to trade wars and slowdown in domestic consumption and the expectation for 2020 is that it will remain below 6%. The trade wars between the US and China, which were cited as one of the reasons of the slowdown of the growth rate, and USA's inclusion of eight more Chinese technology companies, one
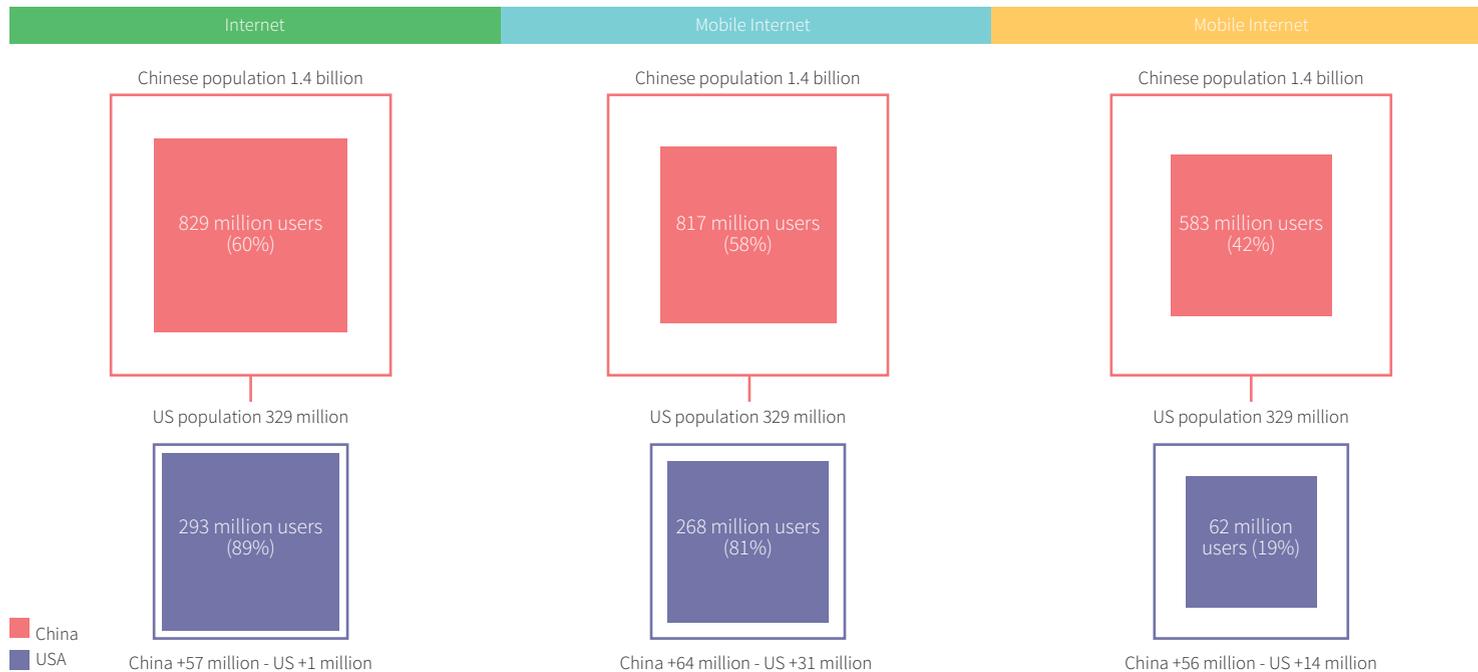
of them being Huawei, in the sanction list as a result of this trade wars were important issues on the agenda in 2019. According to a survey made by Silicon Valley Bank, two out of every three Chinese startups expressed concern about the negative effects of the trade war. Despite these negative developments, technology investments in China continue in 2019 at full speed. Particularly in

line with the innovative policies set by the Chinese Government, in order to advance digital transformations both in the public and private sectors, technology investments are expected to reach $ 256 billion in 2019. According to China Internet Report 2019; with its 1.4 billion population, the number of Internet users in China reached 60% of the population with 829 million (the same num-

China and US Internet at a Glance

Although China's internet penetration rate is only 60%, the actual scale means almost three times the number of Internet users in the United States. The difference in mobile payments is even wider: more people pay with their phones in China than in the US.

Internet	Mobile Internet	Mobile Internet
Chinese population 1.4 billion	Chinese population 1.4 billion	Chinese population 1.4 billion
829 million users (60%)	817 million users (58%)	583 million users (42%)
US population 329 million	US population 329 million	US population 329 million
293 million users (89%)	268 million users (81%)	62 million users (19%)
China +57 million - US +1 million	China +64 million - US +31 million	China +56 million - US +14 million

■ China
■ USA

Source CNNIC, Çin Ulusal İstatistik Bürosu, ABD Nüfus Sayımı Bürosu

ber in the US is 89% with 293 million). In China, more than 98% of this number is mobile internet users, while 583 million people use mobile payments as a means of payment. Although the figures are large, the rate of mobile internet use is only 58% of the general population, while mobile payment usage is 42%. This shows that China is still a growing mobile internet and payment market. More than 50 million user growth in one year is the biggest indicator of this.

As for the city ecosystems, according to the data of the Startup Genome's 2019 Global Initiative Ecosystem Report; the capital Beijing, rose one place up compared to the previous report and shared the third place with London, while the Shanghai ecosystem maintained its eighth place.

Among the emerging Chinese ecosystems are: Hong Kong, which is known for its open approach; Shenzhen, the capital of hardware and IoT and Hangzhou the e-commerce headquarter of Alibaba.

While both Beijing and Shanghai ecosystems showed close to full performance in criteria such as; entrepreneurial success rate, talent pool, sectoral knowledge, success in creating intellectual pro-

perty and local market access, Beijing comes to the fore in startup funding, scaling and experience. Shanghai, an international ecosystem, is the country's leader, particularly in terms of access and connections to the global market. In addition, Shanghai with its 24% female entrepreneurs, is one of the three leading ecosystems in the world in that category.

Although both cities compete a tight race in the Artificial Intelligence and FinTech areas, Beijing seems to have taken the lead this year with the success of the artificial intelligence firm Byte-Dance, the creator of TikTok (total valuation of $ 75 billion). Shanghai stands out with EdTech and gaming industries and the fact that the Shanghai based e-learning platform 17zuoye has recently exceeded $ 1 billion valuations with the latest investment can be shown as an example. In the field of industrial production and robotics, Shenzhen is still the locomotive of the country and UBTech Robotics with an investment of 820 million dollars has become the latest example that emerged in this city.

Third Global Ecosystem

Beijing China

Ecosystem Phase: **Attraction Center**

Beijing ranks second in the world after Silicon Valley on unicorns. Two of the three unicorns worldwide are from Beijing.

Sub-Sector Power: **Artificial Intelligence, Big Data and Analytics**

Beijing is home to 1,070 Artificial Intelligence companies, in other words, 26% of China's total. Bytedance, the Beijing-based Artificial Intelligence unicorn, has achieved a $ 3 billion fund and its value raised to $ 75 billion, becoming the world's largest privately funded startup in 2018. Zhongguancun, Beijing's technology center, hosts 10 AI laboratories. China is building a 2.1 billion-dollar AI technology park in the suburban Mentougou district of Beijing.

Sub-Sector Power: **FinTech**

Beijing's financial sector is composed of 17% of the economic activity of the city in 2017. Beijing FinTech Demonstration Zone opened in 2018. Tiger Brokers, an online brokerage house, raised $ 80 million in 2018 and achieved unicorn status. Baidu's FinTech branch Du Xiaoman Financial, increased $ 1.9 billion in 2018 and received a $ 2.89 billion loan from Tianjin Bank.

Quote

"Beijing's greatest innovation asset lies in its leading educational resources.
The annual 200,000 university graduates in Beijing, many of which enter the startup scene in a way, made this city a pioneering innovation zone as it is today. "

Jordan Zhu
Senior Manager, Department of Global Incubation

Why invest in Beijing?

🏅 Second Global Ecosystem
Artificial intelligence

🏅 Fourth Global Ecosystem
FinTech

Software Startup Output

| 7,5k - 10k |
Global Avg: 1.010

Ecosystem Value

| $ 142 billion |
Global Median $ 5 billion

6
**Exit from Growth Index**

4
Growth Index Output

3
Fund Growth Index

Calculated on a scale of 1 (lowest) to 10 (highest)

Reasons to move your Startup to Beijing

Zhongguancun, Beijing's technology center: Around 9,000 technology companies call it home, including Baidu, Sina Corp., and Lenovo.

Government support: The regional government has committed itself to bring $ 2.2 billion private capital into technical projects and pay loan interest of $ 14.9 million to reduce capital borrowing costs of startups.

Early Fund Per Startup
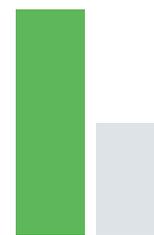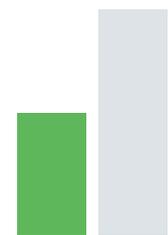
$ 599k
Avg: $ 284k

Total Early Stage Fund
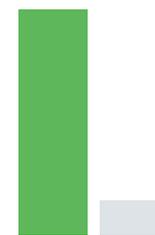
$ 5.9 billion
Avg: $ 837 million

Software Engineer Salary

$ 31.1k
Avg: $ 58.3k

Eighth Global Ecosystem

Shanghai China

Ecosystem Phase: **Attraction Center**

Sub-Sector Power: **Edtech**

There are more than 1,000 Edtech companies based in Shanghai and they received about $ 1.3 billion venture capital between 2015-2017. Retech Technology, a vocational training startup, raised $ 18 million in a public offering in 2017 and 17zuoye is an online learning platform with unicorn. In 2018, with the leadership of Temasek Holdings, it raised $ 250 million in E series funding. In January 2019, Zhangmen, a K-12 course provider, raised $ 350 million in E Series financing from China Media Capital and CICC Alpha.

Sub-Sector Power: **Game**

China accounts for about 25% of the global revenue and the world's largest mobile gaming market. Shanghai's gaming industry is expected to reach more than $ 15 billion by 2020. Shanghai is home to more than 130 game startups that are satellites for industry giants such as EA, Ubisoft and Virturos. In addition, it hosts ChinaJoy, Asia's largest gaming fair with more than 340,000 participants, including the participation of giant players such as Shanghai, Sony, Xiomi, and HTC.

Quote

"*Shanghai is a very impressive mix of investment centers that help global innovations, startups working together and connecting entrepreneurial dreams to innovation.*"

Howard Wang
Incubation Director, Shanghai Caohejing
Innovation Center

Why should you invest
in Shanghai?

Reasons to move your startup
to Shanghai

Second Global Ecosystem
Game industry

Fifth Global Ecosystem
EdTech

Software Startup Output

3k - 4k

Global Avg: 1,010

Ecosystem Value

$ 52 billion

Global Median $ 5 billion

**9**

Exit from
Growth
Index

5

Growth
Index
Output

3

Fund
Growth
Index

Abundant funding: Shanghai's venture capital network includes around 5,000 angel investors and unions. There are $ 970 million science and technology innovation investors in Shanghai.

R&D investment: Zhangjiang Hi-Tech Park, also called as China's Silicon Valley, has more than 400 R&D institutions.
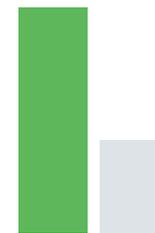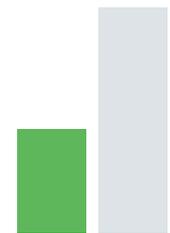
Early Fund Per Startup
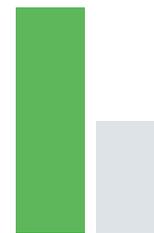
$ 513k
Avg: $ 284k

Total Early Stage Fund

$ 2 billion
Avg: $ 837 million

Software Engineer Salary

$ 26.5k
Avg: $ 58.3k

Calculated on a scale of 1 (lowest) to 10 (highest)

Top Chinese Internet Players

|	Company	CEO	Selected Investors	List	Market Value / Valuation ($ billion)
1	Tencent Holdings	Pony MA	IDG Capital, Lippo Group, Naspers, PCCW	HKG: 700	418
2	Alibaba Group	Daniel ZHANG	DST Global, GGV Capital, Goldman Sachs, SoftBank, Temasek Holdings	NYSE: BABA	416
3	Ant Financial	Eric JING	Alibaba Group, NSSF, CDIB, CCB International	Private	150
4	Toutiao (Bytedance)	ZHANG Yiming	Sequoia Capital China, SIG Asia Investments, Sina Weibo, Softbank Group	Private	75
5	Didi Chuxing	CHENG Wei	Matrix Partners, Tiger Global Management, Softbank Corp.	Private	56
6	Meituan-Dianping	WANG Xing	Alibaba Group, General Atlantic, Hillhouse Capital Group, Northern Light Venture Capital, Sequoia Capital China	HKG: 3690	45
7	JD.com	Richard LIU	DST Global, Google, Sequoia Capital China, Tiger Global Management, Walmart	NASDAQ: JD	40
8	Baidu	Robin LI	DFJ, Google, ePlanet Capital, Peninsula Capital, Integrity Partners	NASDAQ: BIDU	39
9	Lufax	Gregory D GIBB	CICC, COFCO, Arbor Ventures, BlackPine Private Equity	Private	39
10	NetEase	DING Lei	SoftBank Capital	NASDAQ: NTES	34
11	Xiaomi	LEI Jun	DST Global, Goldman Sachs, JP Morgan Chase & Co., Morgan Stanley, Temasek Holdings	HKG: 1810	30
12	Pinduoduo	Colin HUANG	IDG Capital, Sequoia Capital, Tencent Holdings, Gaorong Capital, Lightspeed Capital	NASDAQ: PDD	23
13	Tencent Music	PANG Kar Shun	Spotify	NTSE: TME	23
14	WeBank	GU Min	Tencent Holdings	Private	21
15	Ctrip	Jane SUN	IDG Capital, SAIF Partners, Capital Today, SIIC Investment	NASDAQ: CTRP	19
16	Kuaishou	SU Hua	Tencent Holdings	Private	18
17	Cainiao Logistics	Daniel ZHANG	GIC, Khazanah Nasional, Temasek Holdings	Private	15
18	JD Digits	CHEN Qiangsheng	JD, Sequoia Capital China, CICC, COFCO, China Taiping Insurance	Private	15
19	iQiyi	GONG Yu	Baidu, Xiaomi, Providence Equity Partners, Sequoia Capital	NASDAQ: IQ	13
20	Bitmain Technologies	WANG Haichao	Coatue Management, Sequoia Capital China, IDG Capital	Private	12

Source Crunchbase, CBinsights, company filings, avcj, caixin, reuters, hurun. As of Jun 10, 2019

What about the Chinese startups? First of all, let's start with China's technology giants. The two biggest players in China's technology world remained unchanged in 2019 as well. One of the top 10 companies with largest valuation globally, Tencent ($ 418B), the creator of WeChat, and E-Commerce leader Alibaba ($ 416B) dominated the internet this year. Behind them are Alibaba's FinTech initiative Ant Financial ($ 150B), TikTok's creator ByteDance ($ 75B), "China's Uber" Didi Chuxing ($ 56B).

According to CBInsights data, as of October 2019, 99 out of a total of 409 unicorns in the world (*unicorn: company exceeding a total valuation of $ 1 billion) are located in China. In China, where exists one of every four unicorns in the world, the number of companies in this list is 16 in 2019. Beijing-based artificial intelligence and robotics firm Horizon Robotics, which entered the list in 2019 with an investment of 600 million dollars, is one of the prominent com-

panies in this list. As of the first three quarters of 2019; There are a total of 114 Chinese companies that have investments over $ 100 million, including ByteDance, Megvii, Didi Chuxing, Byton, iFlyTek, and NIO. The number of companies going through public offering is 59 for now. Among the companies going through public offering this year; Douyu TV, a Twitch-like live broadcasting platform, an artificial intelligence FinTech 9F Group, and Starbuck's biggest rival in China, Luckin Coffee stand out. ByteDance, AntFinancial and Didi Chuxing are the companies that are expected to go through public offering in 2020. As in 2018, Sequoia Capital China and IDG Capital stand out in the most active venture capitals of the year.
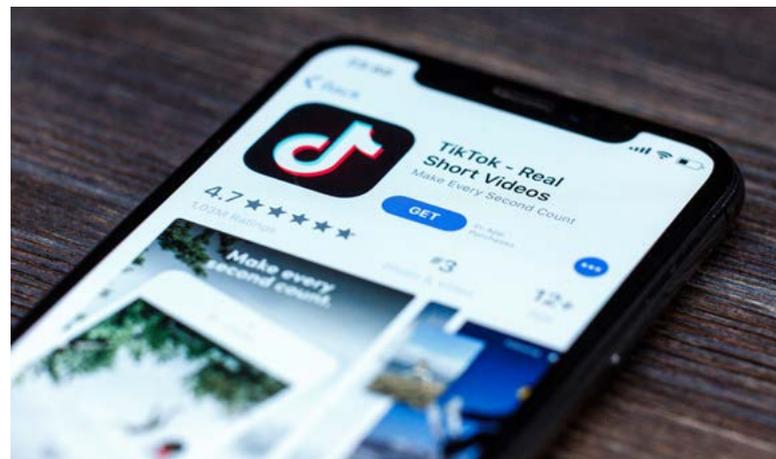
So, what happened in 2019? What are the trends and promising sectors/ technologies?

Super-App Trend, Social E-Commerce and Short Video Services

China's "Super App" (a platform, which collects sub-applications

that provide many different services under the umbrella of an application) trend that started with WeChat and AliPay has spread to the rest of the world. Facebook Messenger's chatbot, gaming, and mobile payment plug-ins; the Line application in Japan, which was only a messaging platform at first but then became a platform, offering different services such as digital wallet and news broadcast; The Go-Jek application, which started in Indonesia as a motorcycle calling application and now offering more than 18 services from ordering food to mobile payment, are just a few examples of "super-app" s. It is inevitable that this platform trend, which recognizes consumers better thanks to its different services and offers more customized services, will continue to increase in the coming years. Similarly, the e-commerce industry is increasingly "socializing". Similar to Alibaba's e-commerce platform Taobao and Pinduoduo, which sells wholesale to lower-income groups, especially in rural China, Amazon introduced the service "Live" where products are introduced, and instant sales are made through live broadcasts. Instagram also introduced instant checkout feature to consumers. Social e-commerce has also been a trend driven by China and followed by the rest of the world. In terms of content and short video, the TikTok application developed by Beijing-based ByteDance, started from China and became a phenomenon all over the world. Snapchat and Facebook started to offer services that would be competing with TikTok in this field.

5G

Under the leadership of Huawei and with the support of three major Telecom operators, pilot 5G studies have begun in many cities (with 167 million people) and by the end of the year, the installation of 200,000 base stations across the country is planned to be completed. By 2025, China has announced its goal to provide an uninterrupted 5G service to 460 million people. According to the 2019 China Internet Report, China shared the first place with the USA in the ranking of countries ready for the transition to 5G, and it is not difficult to predict that China will revolutionize in the areas and industries such as smart cities, autonomous vehicles, IoT, medical services and augmented reality. The fact that drivers at the 2019 Shanghai Motor Show can drive a self-driving car in Beijing, 1000 km away, with a delay of 10 milliseconds or a Chinese doctor performing a successful operation in a remote location using a 5G technology, and robotic surgical arm can give an idea of the potential of 5G.

China Sets a Goal to Become a Global Leader in Artificial Intelligence by 2030

In 2017, The Ministry of Science and Technology in China defined Baidu, Alibaba, Tencent and iFlyTek as the first group of companies that advocated the development of various aspects of AI; Sensetime joined the ranks in 2018.

Baidu

Autonomous Vehicles

The company has committed to invest 10 billion yuan to 100 enterprises in autonomous driving

Alibaba Group

Smart Cities

A chip subsidiary Pingtouge was established with AI semiconductor improvement plans

Tencent 腾讯

Medical Imaging

Focused on five key diseases: colorectal, lung, breast, cervical cancer and eye

科大讯飞 iFLYTEK

Smart Audio Technologies

As of December 2018, 920 thousand software developers have been working on voice recognition and 23 dialects are covered

商汤 sensetime

Face Recognition

Co-leader of Artificial Intelligence research park in Malasia that completed the R&D work in Beijing and HK

Source SCMP ve ChinAI

Artificial Intelligence

China has set its goal to become the world leader in artificial intelligence in 2030. This is supported by state policies, university alliances, and private sector initiatives. In the artificial intelligence initiative established by the Ministry of Science and Technology; leading actors of the private sector came together in order to specialize in different artificial intelligence areas. For the time being, the companies in this initiative consisting of five companies and the areas they lead are as follows;

Baidu - Autonomous Vehicle

Alibaba - Smart Cities

Tencent - Medical Imaging

iFlyTek - Voice Recognition

Sensetime - Face Recognition

SenseTime Most Funded Chinese Artificial Intelligence Startup

Company	Total Funding (million $)	Selected Investors
SenseTime	2,640	Alibaba Group, CICC, Qualcomm, Temasek Holdings, Tiger Global Management
Megvii	1,360	Alibaba Group, Ant Financial, Macquarie Group, Qiming Venture Partners, SK Group
UBTech Robotics	940	CreditEase, Haier, Qiming Venture Partners, Telstra Ventures, Tencent Holdings
AIWAYS	792	Mingchi Fund, Group
Horizon Robotics	700	Hillhouse Capital Group, Intel Capital, Linear Venture, SK Hynix, Vertex Ventures
9F Group	581	Cinda International Holding, IDG Capital, Ping An Ventures, SBI Investment, SIG China (SIG Asia Investments)
G7	510	Bank of China, Eastern Bell Capital, Temasek Holdings, Tencent Holdings, Total Ventures
Yitu Technology	355	Gaorong Capital, GC Capital, Sequoia Capital China, Shanghai Pudong Development Bank, ZhenFund
Mobvoi	253	Google, Sequoia Capital China, SIG China (SIG Asia Investments), Volkswagen Group, ZhenFund
Tongdun Technology	250	China Growth Capital, GGV Capital, IDG Capital, Linear Venture, Qiming Venture Partners

Source Crunchbase

In the last five years, artificial intelligence investments have increased 5 times throughout China. The largest example of this is SenseTime , the highest valued ($ 7.5 billion) artificial intelligence company in the world; but companies such as Megvii, UBTech Robotics, and YITU come to the forefront with their investments and technologies.

So, where does China use artificial intelligence? In China, we have begun to see examples of artificial intelligence in almost all sectors and verticals, such as public safety, smart cities, and offices, autonomous driving, finance, health, industrial production. To give some real life examples;

> Facial recognition payment at Futian subway station in Shenzhen

> Cashless shopping experience using face recognition in hundreds of smart vending machines in nearly 1000 Seven Eleven branches

> Making transactions by confirming customers with face recognition at smart ATMs in 4 major banks of China

> Ping An Good Doctor's artificial intelligence-supported clinics in a telephone booth, where users consult a virtual doctor who collects health-related data through text and voice interactions

> Robots serving rooms in Alibaba's Flyzoo Hotel on Hangzhou campus, room doors opening with facial recognition system and "self-check-in" service

> Ordering via kiosk at KFC shops in Shanghai and paying with

face recognition

> A virtual reality experience in which a personalized avatar trying outfits in three-dimensional trial rooms on the E-Commerce site JD.com

> Chinese news compilation service Toutiao offering personalized news recommendations with artificial intelligence algorithms

> Tracking employees and students in some offices and schools with face recognition technology

> Informing / guiding passengers by using face recognition at airports

> DeepGlint's use of 3D image analysis and pattern recognition technologies to pick up a wanted criminal for 20 years

> Shenzhen-based company, Intellifusion begin to detect traffic violators using high-resolution cameras and artificial intelligence technology

> Beijing-based augmented reality company Xloong, developed smart glasses to access real-time face, ID card and license plate information linked to the police database

Autonomous Vehicles, Blockchain

Autonomous vehicle test drives have been going on for a while on private roads, which are 123 km long in Beijing and 37 km long in Shanghai. A total of 48 companies, including Pony.ai, NIO, WeRide.ai, are competing in the sector led by Baidu. In China, which is planning a mass transition to autonomous vehicle technology

in 2027, this sector is undoubtedly going to be active in the coming years. On the other hand, China, which for a long time just followed and researched the trend of Blockchain, announced that it was working on the yuan indexed digital currency through the Central Bank and asked financial institutions to accelerate the adaptation of blockchain technology. This heralds that in 2020 and the following years, blockchain technology will be used in financial transactions, especially in China, and alternative usage scenarios will emerge.

Result

In China, artificial intelligence is still the most popular and promising sector. Artificial intelligence is followed by life sciences (health, biotechnology, medicine, medical, etc.) and production&robotic industry. According to the results of the research, artificial intelligence, life sciences and clean/green energy which we will hear more in the future are among the industries that will mark the next 10 years. Quantum & Edge Computing and Flexible Display are among the areas that are still in their early ages for the time being but will increase due to the developments in the hardware industry. As can be seen from all the examples in the article, while China has copied examples from other countries, it now has become a pioneering ecosystem that the rest of the world has taken as an example with the advances in technology and business models. I think that the business models and technologies created by this unique market will continue to be adopted by other countries to their own brands in 2020 and the following years.

THE ECOSYSTEM OF EUROPE

Umut Esen

Softtech, Consultant - FinTech, Entrepreneurship, Collaborations

Biography

He started his career as a software engineer and then founded his own software house. Later, he moved to Financial Technology by working at HSBC Digital Channels.
At Softtech, he worked as an Architectural Consultant in Customer-Oriented Transformation, Basic Banking Transformation and Digital Transformation studies of İş Bankası and then carried out the establishment of an innovation team as the Innovation Director, and carried out innovation projects. He was a mentor in the Workup Entrepreneurship Program, bang.Prix Platform; performed as a jury member at ITU Big Bang 2018 and provided technical review services for Maxis Venture Capital. In recent years, he has focused on financial technologies, platform models and the European ecosystem, and has been working as a consultant on cooperation, investment, and procurement of start-up and technology firms.

Contact Information

https://www.linkedin.com/in/umutessen/
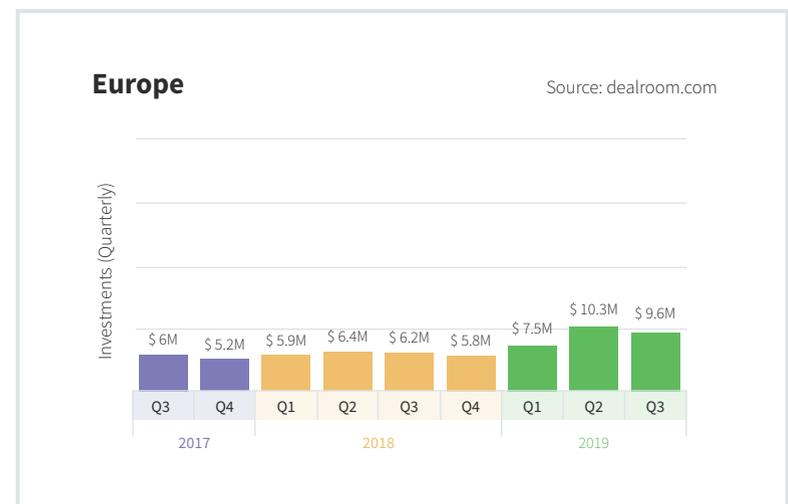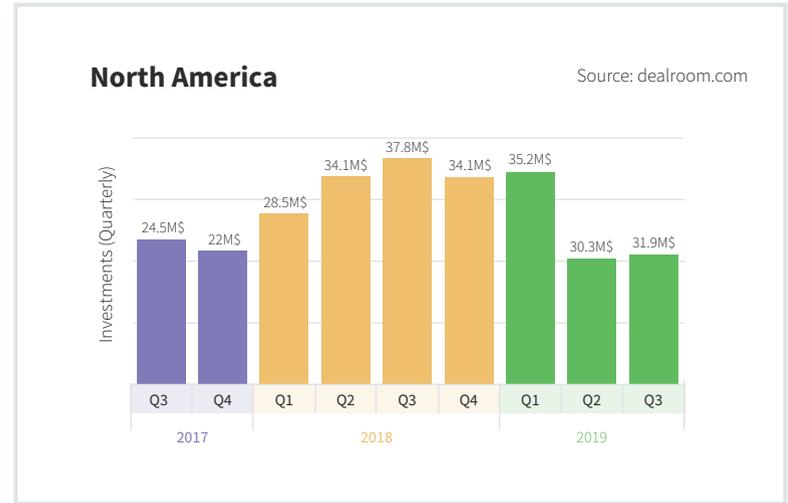https://twitter.com/umutessen

The Ecosystem of Europe

Europe continues to exist in the shadow of Silicon Valley, which has become the indisputable world leader ecosystem for many years, and China, which has achieved high growth in entrepreneurship in recent years. Silicon Valley, by attracting world-wide talents, getting high investments and its entrepreneurship ecosystem and knowledge, and Asia with its high population and growth trend; are not expected to leave the leadership to Europe for a while. Yet Europe is expected to have its 3rd place in the game by increasing the impact.

Investments by Region

Quarter Investments

Europe   Source: dealroom.com

Investments (Quarterly)

$ 6M	$ 5.2M	$ 5.9M	$ 6.4M	$ 6.2M	$ 5.8M	$ 7.5M	$ 10.3M	$ 9.6M
Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
2017		2018				2019		

Asia   Source: dealroom.com

Investments (Quarterly)

- $ 41.2M (Q2 2018)
- $ 29M (Q4 2017)
- $ 30.5M (Q3 2018)
- $ 29.7M (Q4 2018)
- $ 26.5M (Q3 2017)
- $ 18.8M (Q1 2018)
- $ 18.2M (Q1 2019)
- $ 15.1M (Q2 2019)
- $ 18.8M (Q3 2019)

| Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 |
| 2017 | | 2018 | | | | 2019 | | |

North America   Source: dealroom.com

Investments (Quarterly)

- 37.8M$ (Q3 2018)
- 34.1M$ (Q2 2018)
- 34.1M$ (Q4 2018)
- 35.2M$ (Q1 2019)
- 28.5M$ (Q1 2018)
- 24.5M$ (Q3 2017)
- 22M$ (Q4 2017)
- 30.3M$ (Q2 2019)
- 31.9M$ (Q3 2019)

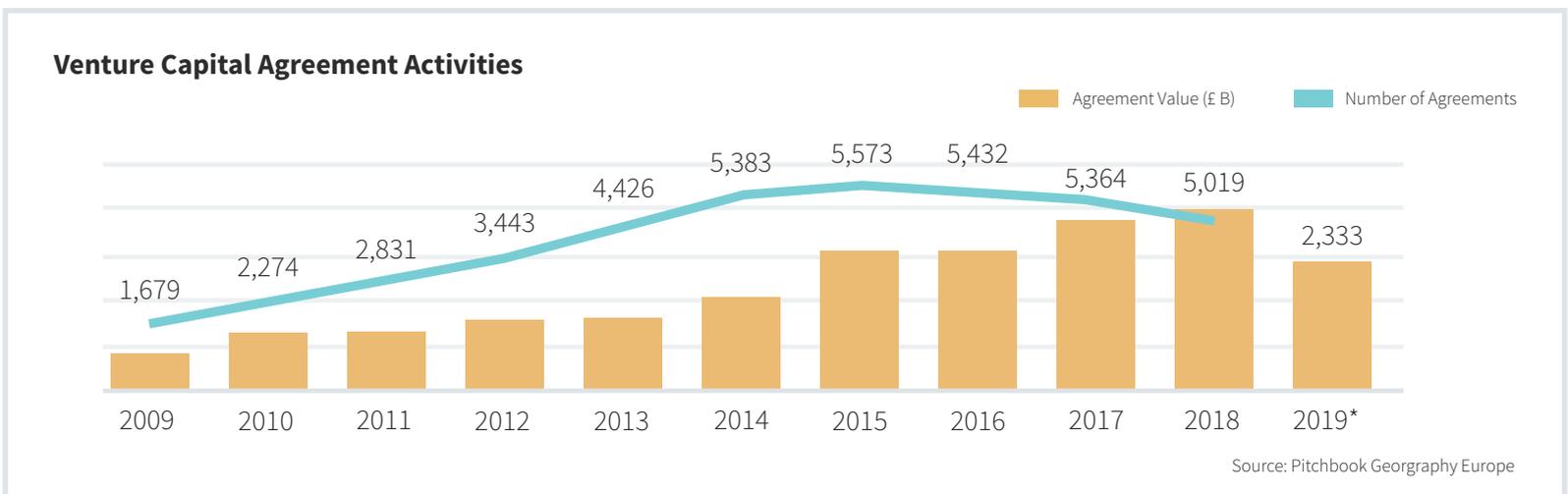| Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 |
| 2017 | | 2018 | | | | 2019 | | |

With this, a rapidly growing entrepreneurial ecosystem in Europe, especially in the FinTech field, is developing. Although there has been a decline in investment numbers, the strong increase in investment amounts continues. This trend is due to the fact that

FinTechs based in England and Germany have started to succeed and have access to additional investments and show that the entrepreneurial ecosystem in Europe is beginning to mature.

Venture Capital Agreement Activities

■ Agreement Value (£ B)   ▬ Number of Agreements

- 1,679 (2009)
- 2,274 (2010)
- 2,831 (2011)
- 3,443 (2012)
- 4,426 (2013)
- 5,383 (2014)
- 5,573 (2015)
- 5,432 (2016)
- 5,364 (2017)
- 5,019 (2018)
- 2,333 (2019*)

| 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019* |

Source: Pitchbook Georgraphy Europe

If we look at the main factors underlying the success of the European ecosystem;

> Europe as a whole is the world's largest economy with 25K Euro GDP per capita and a population of 500 million. (ref: European Commission Report)

> European countries are in a better position to reach other markets in the world, including the rapidly growing markets in Africa and Asia. In the first year of the ventures, 65% of them open another international office. (ref: Startup HeatMap Europe 2019) Looking at international business volumes, Europe's connection with the world is at a very high level. (ref: European Commission Report)

> In many countries in Europe, ventures are facilitated in setting up a business and there exists a structure that allows them to conduct their business in a transparent and fair manner. (ref: Doing Business 2020 - World Bank Group Report)

> Europe is emerging as a third eco-system that can compete with the US and China in technology with many universities such as Oxford, Cambridge, UCL, Imperial College London, ETH Zurich, and Delft University of Technology. (ref: World University Rankings 2019)

> Europe is also a center of attraction in accessing and attracting talents. While EU countries enjoy the freedom of movement on the continent, they also use increasingly flexible rules in recruiting talents from farther away. Europe is expected to come to the forefront in attracting talent due to recent changes in the approach of America, especially in immigration policies. Since 2016, the rate of founders being foreign-born increased by 30% (ref: Startup HeatMap Europe 2019)

> In particular, European institutions are at the forefront of pioneering industrialization and finance, and they are a center of attraction for technological initiatives and collaborations and institutional investments. (Pwc EuropeanPrivate Business Survey 2019) Source: PwC European Private Business Survey 2019

Interest to use future technologies in Europe and distribution of interest by countries

Technology	Interest
Internet of Things	46%
Robotics	33%
Artificial Intelligence	23%
3D printing	21%
Virtual reality	20%
Augmented reality	16%
Blockchain	15%
Drones	9%

Source: PwC European Private Business Survey 2019

European Ecosystem Comparison

Both the strongest and weakest aspects of the European ecosystem stem from the convergence of numerous countries in the ecosystem. The ecosystem that spans many cities and countries makes it difficult to understand the magnitude globally.
However, in a large number of different locations, a widespread and rich ecosystem of accelerators and incubations has been formed around each country's own focus. Ventures are supported at many points and they target 4-5 focuses in Europe as a growth location and forms some level steps in a way.

Startup HeatMap assessed, in a study of the preferences of enterprises, how the residents in Europe were seen as a center of attraction for entrepreneurship. London and Berlin stand out as two main centers in all aspects, particularly in investment. In the light of the Brexit uncertainty, London has lost North and Baltic countries' support for enterprises compared to last year (-19%), while the interest of enterprises in central and Eastern Europe increased for London (+5% points) and decreased for Berlin (-19% points). This data shows that Brexit is dividing Europe and initiatives are beginning to have to choose between two different ways.

However, there is a very active ecosystem in cities such as Tel-Aviv, Stockholm, Paris, Barcelona, Lisbon, Amsterdam and Talinn.

England: England has become one of the prominent FinTech centers in the world by combining London's potential as being one of the world's top 3 financial center with the establishment of the

Source: Startup HeatMap Europe 2019
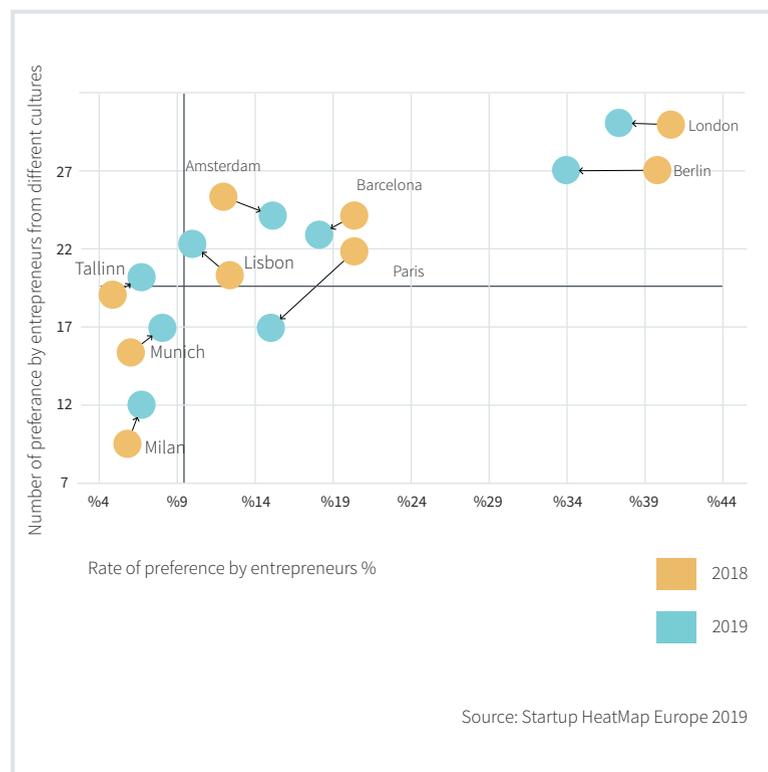
first FinTech sandbox in the world by FCA. In 2018, FCA also introduced the first global FinTech regulation pool, thus offering great flexibility to all ventures on regulation.

Despite Brexit concerns and uncertainty in England, investments in enterprises continue throughout 2019 with no signs of slowing down. Investments focus generally on FinTech (Greensill - Cash Management - 2019 3Q $ 650M , Ebury - SME International Trade 2019 4Q $ 840M , Sumup - POS - $ 330M, etc.) health and biotechnology. (CMR Surgical - Robotic Surgery System - 2019 3Q $ 200M,

Babylon Health 2019 3Q $550 M - Doctor Consultation Practice, etc.) However, in line with our forecasts in the technology report published in 2018, there is also an increase in investments, especially in regulation solutions (OneTrust - privacy and compliance - 2019 3Q $ 200M). For example; OneTrust, a privacy and compliance company, invested $ 200 million in 2019 3Q.

In addition to FinTech, England is also home to startups in educational and marketing technologies.

Germany: With its strong industry and the influence of the banking sector, Germany stands out especially in the Internet of Things, FinTech and B2C market solutions. Although Germany showed signs of recession in the third quarter of the year, achieving negative GDP growth for two consecutive quarters, venture investments continued to grow strongly. Particularly problems in the automotive sector (due to innovations in autonomous and electric vehicles) and the banking sector, (due to the excessive increase in Deutsche Bank derivatives market risk, the decrease in commission income, and the fact that PSD2 and GAFA take an active part in finance) investors are turning towards ventures.

Germany followed England particularly in FinTech with the investments that N26 (New Generation Banking- 2019 3Q $ 170M) and Wirecard (International Money Transfer- 2019 2Q $ 1B) got in 2019. However, in particular, investments in the Consumer Marketplace Solutions (FlixBus- bus ticket marketplace - 2019 3Q $ 500M, Cluno - Car Rental Subscription - 2019 3Q $ 155M) continue to increase. Germany comes to the fore by initiatives focusing on the industry

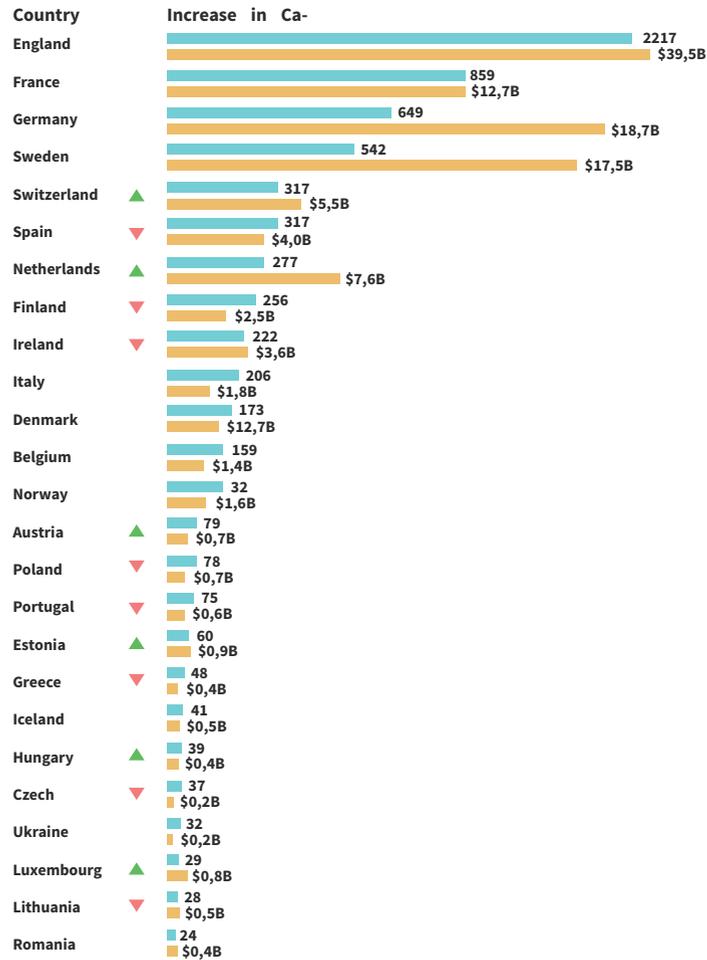(Durr - Automobile Factory Production Expansion - 2019 3Q $ 850M).

France: In France, ventures are active in the areas of SaaS (21,4%), Education (7.1%- compared to the 7.1% EU average) and Green Technologies (7.1%- compared to the 6.4% EU average). Many French enterprises operate entirely on B2B (%60,9) and mostly function to receive income from the eurozone (%71). (ref: startup- monitor.eu)

Due to the breadth of the banking sector, there is also an active market in FinTech. In France, the Edtech ecosystem, particularly at EdtechParis, is supported by the presence of two Edtech VC funds, Educapital and Brighteye Ventures. In addition, ventures and industry organizations such as EdTech Observatory and EdTech France are working to expand the Edtech industry in France.

Israel: Israel is an important player compared to the size of the country, especially in terms of investments and exits. Tel Aviv ranks third in the number of AI ventures in general.
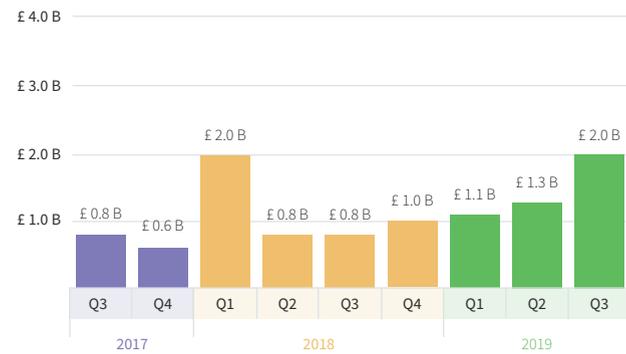
Venture Capital Investments

Total VC Investments (Before 2019)

Country	Number of ventures receiving investment	Investment Amount
England	2217	$39,5B
France	859	$12,7B
Germany	649	$18,7B
Sweden	542	$17,5B
Switzerland ▲	317	$5,5B
Spain ▼	317	$4,0B
Netherlands ▲	277	$7,6B
Finland ▼	256	$2,5B
Ireland ▼	222	$3,6B
Italy	206	$1,8B
Denmark	173	$12,7B
Belgium	159	$1,4B
Norway	32	$1,6B
Austria ▲	79	$0,7B
Poland ▼	78	$0,7B
Portugal ▼	75	$0,6B
Estonia ▲	60	$0,9B
Greece ▼	48	$0,4B
Iceland	41	$0,5B
Hungary ▲	39	$0,4B
Czech ▼	37	$0,2B
Ukraine	32	$0,2B
Luxembourg ▲	29	$0,8B
Lithuania ▼	28	$0,5B
Romania	24	$0,4B

■ Number of ventures receiving investment
■ Investment Amount

ref:Tech Scaleup Europe Country Index 2019

Germany

	2017		2018				2019		
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
	£0.8 B	£0.6 B	£2.0 B	£0.8 B	£0.8 B	£1.0 B	£1.1 B	£1.3 B	£2.0 B

France

	2017		2018				2019		
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
	£0.6 B	£0.7 B	£0.8 B	£1.4 B	£0.8 B	£0.8 B	£1.3 B	£1.5 B	£1.1 B

United Kingdom

Rest of Europe

Institutions such as Google, NVidia, and Intel are investing in artificial intelligence with the centers they opened in Israel. Another area of expertise of the ventures in Israel is cybersecurity.

Sweden: In Sweden, ventures are focused on SaaS (23,5%) and Green Technologies (5.9%). Sweden is at the top of Europe for media and creative ventures (13,7%, compared to 4.6% of the EU). It stands out with Klarna in the field of FinTech. Klarna, which offers e-commerce installment services, has reached a value of $ 5.5B with the investment of $ 460M it received in 2019 3Q.

Netherlands: The Dutch venture ecosystem is one of the most diversified centers in the sector. There are ventures in trendy sectors and traditional sectors such as industrial technology and Hardware production (11,1%) or Software as a Service (15,3%) and Green Technology. The Netherlands also offers tax advantages to employees. The Netherlands, which is a relatively small ecosystem in terms of investment in particular, benefits the most from Brexit uncertainties. (ref: startupheatmap)

Switzerland: The Swiss ecosystem is particularly prominent in terms of industrial solutions, IT Security and Crypto technologies. The Crypto Valley in Zurich is seen as one of the spherical blockchain points. Switzerland is also home to the Etherium Foundation.

Lithuania: Lithuania, which is a relatively small ecosystem compared to other ecosystems, stands out especially in the FinTech area with its regulation pool. The Government provides Electronic Money Licensing and Banking License services. In Lithuania, a ca-

pital investment of EUR 1M and a commission fee of $ 50 Thousand (expected to be reduced to $ 5 Thousand) is sufficient for a banking license that can operate throughout Europe.

Estonia: Estonia is a relatively small ecosystem compared to other ecosystems, enabling e-citizenship and Estonian Startup Visa structures to establish ventures that can operate throughout Europe. In Estonia, it is possible to establish a company remotely to a figure of less than $ 300 within a period of 15 minutes.

FinTech Domination in Europe

Europe, especially in order to compete with GAFA, prefers to progress with FinTechs instead of advancing with its own technology companies. FinTech sector has grown rapidly and has become the leading sector of entrepreneurship in Europe. The FinTech sector is expected to continue this trend by growing 23,84% CAGR between 2019-2025. (ref: Global FinTech market Size Report - Valuates)

Forecasts for the Future of FinTechs in Europe

The "Challenger Bank" wind will continue to strengthen.
In recent years, FinTechs in Europe have grown very rapidly and a significant number of startups exceeded the $ 1 billion threshold. With the latest investment in 2019 the N26 reached $ 3.5 billion valuation, making it the largest of the 7 unicorns in digital banking in Europe.

European FinTech ventures have created more than twice the value of all European technology initiatives.

Unvalued Startups Over $ 1M

FinTech	Exit(sales) valued over $ 1M 128M£
Corporate Software	33% 54M£
Game	20% 45M£
Food	11% 41M£
Transportation	7% 29M£
Music	7% 20M£
Travel	4% 16M£
Health	4% 9M£

Source: Dealroom.co Healt excludes biotech.
Value created since 2013
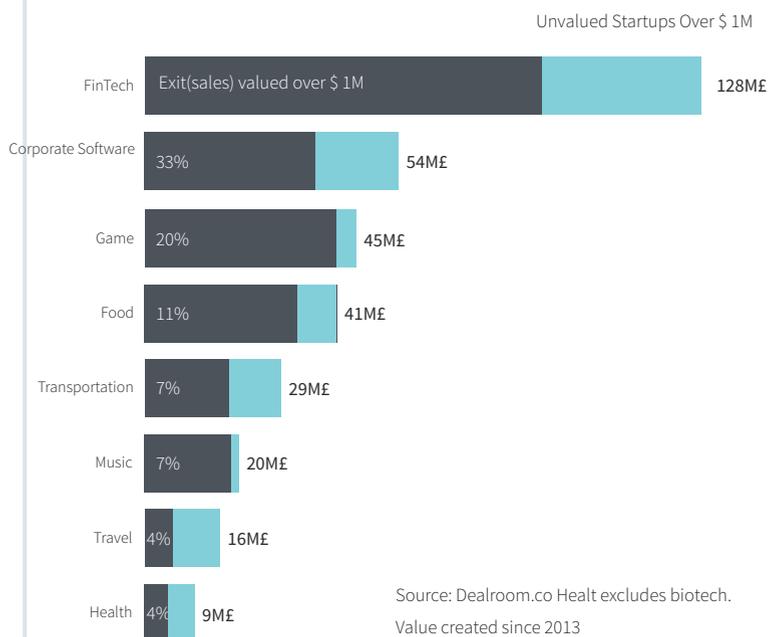
All "Challenger Banks" will start to spread to the global market with an increase in investments from outside Europe..
Monzo and N26 started to enter the American market.

Revolut, after completing the process of obtaining e-money license in England and banking license in Lithuania, is preparing for entry into 24 different markets.

After major successes in payments, Europe is a rising star in all key vertical areas of FinTech today.

Valuation	Banking	Payments	Asset management	Debt & Mortgage	Insurance	Blockchain	Artificial intelligence
$ 1B +	monzo, N26, Revolut, METRO BANK, avaloq, Numbro, DEPOSIT SOLUTIONS	adyen, Klarna., sumup, TransferWise, checkout.com, iZettle, Skrill, bambora, nexi, worldpay, wirecard, nets	FLOW TRADERS, eFront, allfunds, eToro, iON, FNZ, Plus500, Alfa	OakNorth, Greensill, TransUnion, Lendo, Money Super Market	esure	BITFURY	UiPath
$ 250-1B	Atom bank, solarisBank, STARLING BANK, monese, kreditech, bynk	Trustly, heidelpay, QIWI WALLET, GOCARDLESS, SOLDO, moneyfarm, CURVE, Currencycloud	360T, TRAYPORT, TRADEPLUS, raisin., moneyfarm, LIQID, scalable CAPITAL	Nordax Bank, oodle, ZOPA, FINANZCHECK.de, Lendify, Funding Circle, Rate%Setter, smava	Simply Business, wefox, prima, BIMA, álan, FRI:DAY	Ledger, SEBA, nexo, SAGA, SETL	TAIGER, omni:us
$ 100-250 M	TRUELAYER, qonto, TANDEM, JAJA	Billie, Rapyd, TransferMate	MOONFARE, capital.com	FUTURE FINANCE, october, younited credit, finexkap	ZEGO, Cytora, COYA	BLOCKCHAIN	Comply Advantage, DUCO
$ 0-100 M	tink, tide, aprilabank, bud., 10x, PENTA, Clear.Bank, lunar way	Slim Pay, PAYSEND, MIURA, kantox, twisto, divido, fourthline, Modulr, Lydia	Calastone, LAFINBOX, goji, iBanFirst, TRADEIX, netwealth, elinvar, Delio	Trussle, auxmoney, crossland, molo, monga, Funding Options, lendable, mojo, GROWTH STREET, mintos	AZUR, getsafe, DIGITAL INSURANCE GROUP, ottonova, simplesurance, yulife, hedvig, +Simple.fr, anorak	Aave, tangem, Bitwala, Gem, Fractal Blockchain, everledger, NEUFUND	Thought Machine, FRISS, Fraugster, aire, ADVER 2020, cleo., OPENGAMMA, NORDIGEN, BLICKWIN, PAYLEAD

FinTechs partnering with technology companies outside Europe will achieve faster growth.

We expect the European FinTechs, which have established partnerships with companies entering the financial sector in America and the Far East, to achieve a much faster growth when they combine the mature software technologies obtained from these partnerships with their own regulation technologies. For example, we believe that Revolut's recent collaboration with Quickbooks should

be monitored in this context.

While the existing "Challenger Banks" are strengthening, it will be difficult for new ones to emerge, and new FinTechs will focus more on co-operation with existing "Challenger Banks".

FinTech, which reaches directly to the customer, has started to provide more advanced and complete services by performing fast

collaborations with the revenue sharing model among them. In the coming period, FinTechs are expected to exceed both local regulations and to start stealing market share from banks by cooperating to provide more holistic solutions.

With the overcoming of infrastructure problems of open banking solutions, FinTechs that will meet the multiple integration needs that will be required in the international expansion will strengthen.

With Open Banking, customers can see their accounts in multiple banks at the same time. Both the cumbersome structure of large banks and their passive-aggressive resistance to open their APIs make open banking transition difficult. Account integrators and API platform FinTechs that will address the needs of integrating accounts, meeting API integrations and security needs, will come to the forefront.

Due to international growth, regulation technology firms that have the ability to adapt to local laws will continue to stand out.

Managing different regulatory needs of different countries will challenge FinTechs seeking rapid expansion. Initiatives focused on customer recognition, regulatory reporting and security solutions will come to the fore.

FinTech solutions that will add additional features to FinTechs or increase their efficiency in the back office will come to the forefront.

FinTechs, which started out as simple spending and payment com-

panies, reached a certain number of customers and with that their appetite for creating services that would generate additional income started to increase. With the increasing number of customers, productivity needs will come to the forefront. FinTechs seeking speed will cooperate with other FinTechs instead of improving these features by themselves.

FinTechs that focus on unmediation and platform models will be strengthened.

In the financial world, where commission rates are rapidly falling, unmediation will become the main trend. In this context, P2P models such as the financing market will come to the forefront.

FinTechs that will focus on data and data security will come to the fore.

Startups that focus on data rather than commission rates, and use it in different areas will be more successful. Data security startups, such as GDPR, will be at the forefront as well as startups that make sense of data.

FinTechs serving SMEs will continue to strengthen.

Although the digitalization of the SME sector is at much lower levels, the need for digitalization is rapidly increasing. We expect the FinTechs that focus on SMEs to come to the forefront, especially due to the increased individual competition.

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